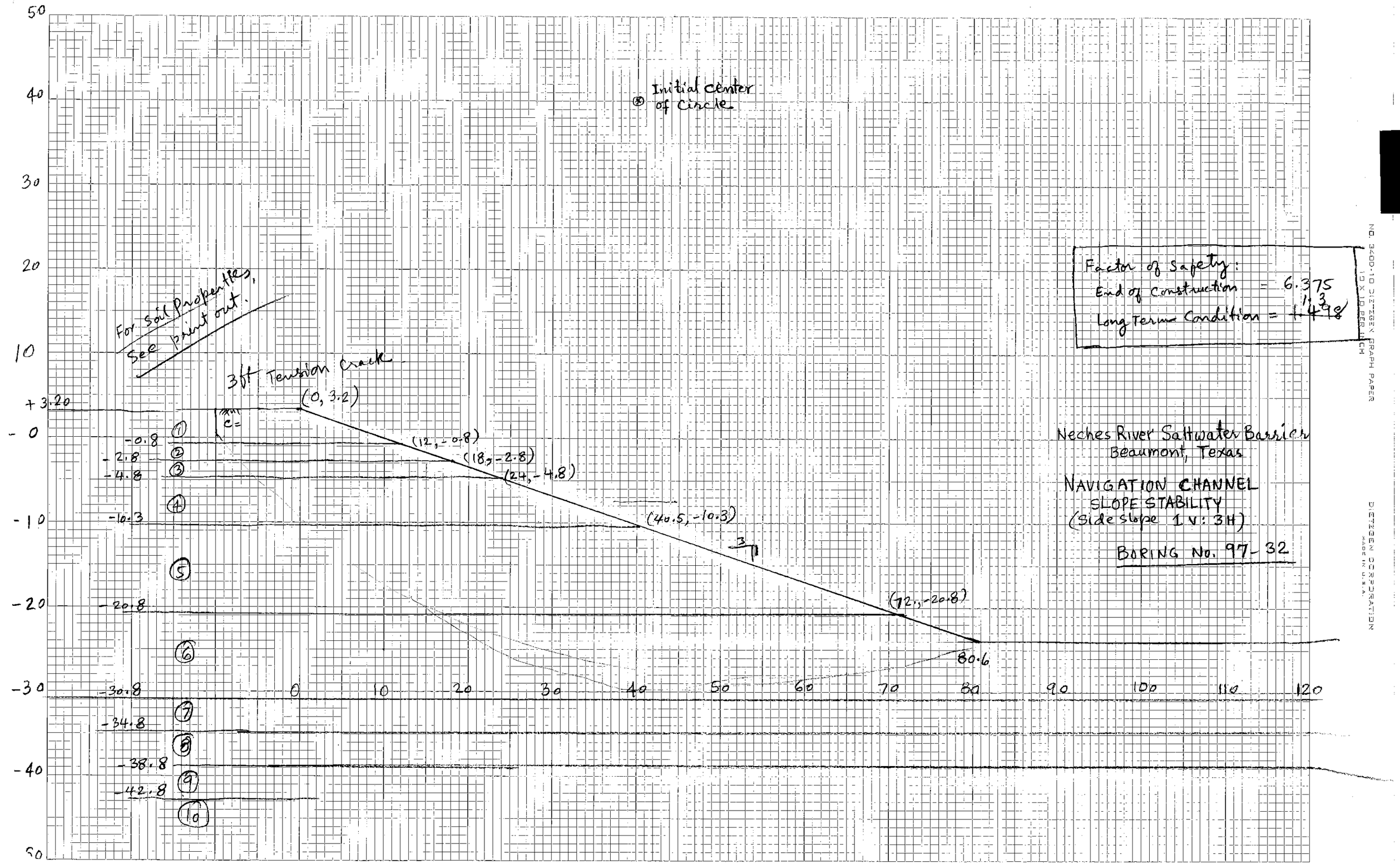
Initial center of circle
For soil properties, see print out.
3ft Tension Crack
(0, 3.2)
(12, -0.8)
(18, -2.8)
(24, -4.8)
(40.5, -10.3)
(72, -20.8)
80.6
3
1
Factor of Safety:
End of Construction = 6.375
Long Term Condition = 1.498
Neches River Saltwater Barrier
Beaumont, Texas
NAVIGATION CHANNEL
SLOPE STABILITY
(Side slope 1 V: 3H)
BORING No. 97-32
+3.20
-0.8
-2.8
-4.8
-10.3
-20.8
-30.8
-34.8
-38.8
-42.8
50
40
30
20
10
0
-10
-20
-30
-40
0
10
20
30
40
50
60
70
80
90
100
110
120

Ref

HEADING

NECHES RIVER SALTWATER BARRIER

Boring No. 97-32

Navigation Channel

Slope Stability Analysis - Construction Condition

PROFILE LINES

1	1 Fat Clay, Hard		
	-40.00	3.20	
	.00	3.20	
	12.00	-.80	
2	2		
	-40.00	-.80	
	12.00	-.80	
	18.00	-2.80	
3	3		
	-40.00	-2.80	
	18.00	-2.80	
	24.00	-4.80	
4	4		
	-40.00	-4.80	
	24.00	-4.80	
	40.50	-10.30	
5	5		

	-40.00	-10.30
	40.50	-10.30
	72.00	-20.80
6	6	
	-40.00	-20.80
	72.00	-20.80
	80.60	-24.00
	120.00	-24.00
7	7	
	-40.00	-30.80
	120.00	-30.80
8	8	
	-40.00	-34.80
	120.00	-34.80
9	9	
	-40.00	-38.80
	120.00	-38.80
10	10	
	-40.00	-45.80
	120.00	-45.80

HEADING

NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

MATERIAL PROPERTIES

1

122.00 Unit Weight

Conventional Shear

4500.00 .00

Piezometric Line

1.00

2

125.00 Unit Weight

Conventional Shear

1100.00 .00

Piezometric Line

1.00

3

120.00 Unit Weight

Conventional Shear

200.00 .00

Piezometric Line

1.00

4

110.00 Unit Weight

Conventional Shear

.00 26.00

Piezometric Line

1.00

5

115.00 Unit Weight

Conventional Shear

.00 28.00

Piezometric Line

1.00

6

122.00 Unit Weight

Conventional Shear

2000.00 .00

Piezometric Line

1.00

7

120.00 Unit Weight

Conventional Shear

1600.00 .00

Piezometric Line

1.00

8

125.00 Unit Weight

Ref

Conventional Shear

4000.00 .00

Piezometric Line

1.00

9

125.00 Unit Weight

Conventional Shear

4000.00 .00

Piezometric Line

1.00

10

120.00 Unit Weight

Conventional Shear

2000.00 .00

Piezometric Line

1.00

PIEZOMETRIC LINES

1 62.40

-40.00 .00

200.00 .00

SLOPE GEOMETRY

-40.00 3.20

.00 3.20

80.60 -24.00

Ref

120.00 -24.00

SURFACE PRESSURE DATA

9.60	.00	.00	.00
80.60	-24.00	1497.60	.00
120.00	-24.00	1497.60	.00

ANALYSIS/COMPUTATION

Circular Search

40.00 40.00 1.00 -50.00

Tangent

-30.00

CRAck depth

3

PROcedure for computation of Factor of Safety

SPENCER

PLOT

COMPUTE

```
1          UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

           Date:  9:25:1998   Time:  9:16:59   Input file: C:\WINUT3\RE


           TABLE NO. 1
           ****************************************
           * COMPUTER PROGRAM DESIGNATION - UTEXAS3 *
           * Originally Coded By Stephen G. Wright  *
           * Version No. 1.120                      *
           * Last Revision Date 10/08/92            *
           * (C) Copyright 1985-1992 S. G. Wright   *
           * All Rights Reserved                    *
           ****************************************

           ************************************************************
**
           *
 *
           *      RESULTS OF COMPUTATIONS PERFORMED USING THIS COMPUTER
 *
           * PROGRAM SHOULD NOT BE USED FOR DESIGN PURPOSES UNLESS THEY
 *
           * HAVE BEEN VERIFIED BY INDEPENDENT ANALYSES, EXPERIMENTAL
 *
           * DATA OR FIELD EXPERIENCE. THE USER SHOULD UNDERSTAND THE
 *
           * ALGORITHMS AND ANALYTICAL PROCEDURES USED IN THE COMPUTER
 *
           * PROGRAM AND MUST HAVE READ ALL DOCUMENTATION FOR THIS
 *
           * PROGRAM BEFORE ATTEMPTING ITS USE.
 *
           *
 *
           *      NEITHER THE UNIVERSITY OF TEXAS NOR STEPHEN G. WRIGHT
 *
           * MAKE OR ASSUME LIABILITY FOR ANY WARRANTIES, EXPRESSED OR
 *
           * IMPLIED, CONCERNING THE ACCURACY, RELIABILITY, USEFULNESS
 *
           * OR ADAPTABILITY OF THIS COMPUTER PROGRAM.
 *
           *
 *
           ************************************************************
**
```

1 UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

Date: 9:25:1998 Time: 9:16:59 Input file: C:\WINUT3\RE

NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 2
****
* NEW PROFILE LINE DATA *
****

PROFILE LINE 1 - MATERIAL TYPE = 1
Fat Clay, Hard

Point	X	Y
1	-40.000	3.200
2	.000	3.200
3	12.000	-.800

PROFILE LINE 2 - MATERIAL TYPE = 2

Point	X	Y
1	-40.000	-.800
2	12.000	-.800
3	18.000	-2.800

PROFILE LINE 3 - MATERIAL TYPE = 3

Point	X	Y
1	-40.000	-2.800
2	18.000	-2.800
3	24.000	-4.800

PROFILE LINE 4 - MATERIAL TYPE = 4

Point	X	Y
1	-40.000	-4.800
2	24.000	-4.800

3	40.500	-10.300

PROFILE LINE 5 - MATERIAL TYPE = 5

Point	X	Y
1	-40.000	-10.300
2	40.500	-10.300
3	72.000	-20.800

PROFILE LINE 6 - MATERIAL TYPE = 6

Point	X	Y
1	-40.000	-20.800
2	72.000	-20.800
3	80.600	-24.000
4	120.000	-24.000

PROFILE LINE 7 - MATERIAL TYPE = 7

Point	X	Y
1	-40.000	-30.800
2	120.000	-30.800

PROFILE LINE 8 - MATERIAL TYPE = 8

Point	X	Y
1	-40.000	-34.800
2	120.000	-34.800

PROFILE LINE 9 - MATERIAL TYPE = 9

Point	X	Y
1	-40.000	-38.800
2	120.000	-38.800

PROFILE LINE 10 - MATERIAL TYPE = 10

```
              Point       X              Y

                1       -40.000        -45.800
                2       120.000        -45.800

          All new profile lines defined - No old lines retained
1         UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

          Date:  9:25:1998   Time:  9:16:59   Input file: C:\WINUT3\RE

              NECHES RIVER SALTWATER BARRIER

              Navigation Channel

              Slope Stability Analysis - Construction Condition


          TABLE NO.  3
          ************************************************************
**********
          * NEW MATERIAL PROPERTY DATA - CONVENTIONAL/FIRST-STAGE COMP
UTATIONS *
          ************************************************************
**********

          DATA FOR MATERIAL TYPE  1


               Unit weight of material =  122.000

               CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
               Cohesion - - - - - - - -    4500.000
               Friction angle - - - - -    .000 degrees

               Pore water pressures defined by piezometric line
               Number of the piezometric line used =  1
               Negative pore pressures set to zero

          DATA FOR MATERIAL TYPE  2


               Unit weight of material =  125.000

               CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
               Cohesion - - - - - - - -    1100.000
               Friction angle - - - - -    .000 degrees
```

```
     Pore water pressures defined by piezometric line
     Number of the piezometric line used =  1
     Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  3


     Unit weight of material =  120.000

     CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
     Cohesion - - - - - - - -     200.000
     Friction angle - - - - -    .000 degrees

     Pore water pressures defined by piezometric line
     Number of the piezometric line used =  1
     Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  4


     Unit weight of material =  110.000

     CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
     Cohesion - - - - - - - -        .000
     Friction angle - - - - -  26.000 degrees

     Pore water pressures defined by piezometric line
     Number of the piezometric line used =  1
     Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  5


     Unit weight of material =  115.000

     CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
     Cohesion - - - - - - - -        .000
     Friction angle - - - - -  28.000 degrees

     Pore water pressures defined by piezometric line
     Number of the piezometric line used =  1
     Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  6
```

```
Unit weight of material =  122.000

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
Cohesion - - - - - - - -    2000.000
Friction angle - - - - -    .000 degrees

Pore water pressures defined by piezometric line
Number of the piezometric line used =  1
Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  7


Unit weight of material =  120.000

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
Cohesion - - - - - - - -    1600.000
Friction angle - - - - -    .000 degrees

Pore water pressures defined by piezometric line
Number of the piezometric line used =  1
Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  8


Unit weight of material =  125.000

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
Cohesion - - - - - - - -    4000.000
Friction angle - - - - -    .000 degrees

Pore water pressures defined by piezometric line
Number of the piezometric line used =  1
Negative pore pressures set to zero

DATA FOR MATERIAL TYPE  9


Unit weight of material =  125.000

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
Cohesion - - - - - - - -    4000.000
Friction angle - - - - -    .000 degrees

Pore water pressures defined by piezometric line
Number of the piezometric line used =  1
Negative pore pressures set to zero
```

```
DATA FOR MATERIAL TYPE 10


     Unit weight of material =  120.000

     CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
     Cohesion - - - - - - - -    2000.000
     Friction angle - - - - -    .000 degrees

     Pore water pressures defined by piezometric line
     Number of the piezometric line used =  1
     Negative pore pressures set to zero

All new material properties defined - No old data retained
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    NECHES RIVER SALTWATER BARRIER

    Navigation Channel

    Slope Stability Analysis - Construction Condition


TABLE NO.  5
*************************************************************
*********
* NEW PIEZOMETRIC LINE DATA - CONVENTIONAL/FIRST-STAGE COMPU
TATIONS *
*************************************************************
*********

Line
 No.    Point       X           Y

  1 - Unit weight of water =   62.40

  1        1     -40.000        .000

  1        2     200.000        .000


All new piezometric lines defined - No old lines retained
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    NECHES RIVER SALTWATER BARRIER
```

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 9
****
* NEW SLOPE GEOMETRY DATA *
****

All new data input - No old data retained

Slope Coordinates -

Point	X	Y
1	-40.000	3.200
2	.000	3.200
3	80.600	-24.000
4	120.000	-24.000

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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 10
****
* NEW SURFACE PRESSURE DATA - CONVENTIONAL/FIRST-STAGE COMPUTATIONS *
****

ALL NEW DATA INPUT - NO OLD DATA RETAINED

Surface Pressures -

Point	X	Y	Normal Pressure	Shear Stress
1	9.600	.000	.000	.000
2	80.600	-24.000	1497.600	.000
3	120.000	-24.000	1497.600	.000

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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 15
****
* NEW ANALYSIS/COMPUTATION DATA *
****

Circular Shear Surface(s)

Automatic Search Performed

Starting Center Coordinate for Search at -
X = 40.000
Y = 40.000

Required accuracy for critical center (= minimum spacing between grid points) = 1.000

Critical shear surface not allowed to pass below Y = -50
.000

For the initial mode of search
all circles are tangent to horizontal line at -
Y = -30.000

Depth of crack = 3.000

Procedure used to compute the factor of safety: SPENCER

THE FOLLOWING REPRESENT EITHER DEFAULT OR PREVIOUSLY DEFINED
VALUES:

Initial trial estimate for the factor of safety = 3.000

Initial trial estimate for side force inclination = 15.000
degrees

(Applicable to Spencer's procedure only)

Maximum number of iterations allowed for
calculating the factor of safety = 40

Allowed force imbalance for convergence = 100.000

Allowed moment imbalance for convergence = 100.000

Initial trial values for factor of safety (and side force in
clination
for Spencer's procedure) will be kept constant during search

Maximum subtended angle to be used for subdivision of the
circle into slices = 3.00 degrees

Search will be continued to locate a more critical shear
surface (if one exists) after the initial mode is complete

Depth of water in crack = .000

Unit weight of water in crack = 62.400

Seismic coefficient = .000

Conventional (single-stage) computations to be performed
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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 18
INFORMATION FOR CURRENT MODE OF SEARCH - All Circles Are Tan
gent
to a Horizontal Line at Y = -30.000

Center Coordinates X	Y	Radius	1-Stage Factor of Safety	Side Force Inclination (degrees)	Iterati ons
10.00	10.00	40.00	8.772	-3.20	14
40.00	10.00	40.00	9.667	-4.39	16
70.00	10.00	40.00	21.887	-.24	40
10.00	40.00	70.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
40.00	40.00	70.00	7.538	-4.92	12

```
     70.00      40.00      70.00  14.614       -2.91         26
     10.00      70.00     100.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     40.00      70.00     100.00   7.393       -4.56         11
     70.00      70.00     100.00  11.211       -4.81         19

     10.00     100.00     130.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     40.00     100.00     130.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     70.00     100.00     130.00  10.069       -5.06         17

     35.00      65.00      95.00   7.459       -4.34         11
     40.00      65.00      95.00   7.384       -4.62         11
     45.00      65.00      95.00   7.385       -4.90         11
     35.00      70.00     100.00   7.482       -4.29         12
     45.00      70.00     100.00   7.378       -4.83         11
     35.00      75.00     105.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     40.00      75.00     105.00   7.408       -4.50         11
     45.00      75.00     105.00   7.380       -4.77         11

     50.00      65.00      95.00   7.586       -5.12         12
     50.00      70.00     100.00   7.597       -5.04         12
     50.00      75.00     105.00   7.620       -4.97         12

     42.00      67.00      97.00   7.375       -4.70         11
     45.00      67.00      97.00   7.381       -4.87         11
     48.00      67.00      97.00   7.456       -5.02         11
     42.00      70.00     100.00   7.378       -4.67         11
     48.00      70.00     100.00   7.470       -4.97         11
     42.00      73.00     103.00   7.383       -4.63         11
     45.00      73.00     103.00   7.378       -4.79         11
     48.00      73.00     103.00   7.487       -4.93         12

     39.00      64.00      94.00   7.391       -4.57         11
     42.00      64.00      94.00   7.376       -4.74         11
     45.00      64.00      94.00   7.388       -4.91         11
     39.00      67.00      97.00   7.396       -4.54         11
     39.00      70.00     100.00   7.404       -4.50         11

     41.00      66.00      96.00   7.379       -4.66         11
     42.00      66.00      96.00   7.375       -4.72         11
     43.00      66.00      96.00   7.374       -4.77         11
     41.00      67.00      97.00   7.380       -4.65         11
     43.00      67.00      97.00   7.374       -4.76         11
     41.00      68.00      98.00   7.381       -4.64         11
```

42.00	68.00	98.00	7.376	-4.69	11
43.00	68.00	98.00	7.374	-4.74	11
44.00	67.00	97.00	7.376	-4.81	11
44.00	68.00	98.00	7.375	-4.80	11
42.00	69.00	99.00	7.377	-4.68	11
43.00	69.00	99.00	7.374	-4.73	11
44.00	69.00	99.00	7.375	-4.79	11

At the end of the current mode of search the most critical circle which was found has the following values -
X-center = 43.00 Y-center = 68.00 Radius = 98.00

Factor of Safety = 7.374 Side Force Inclination = -4.74

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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 19
INFORMATION FOR CURRENT MODE OF SEARCH - All Circles Have the Same Radius - Radius = 98.000

Center Coordinates X	Y	Radius	1-Stage Factor of Safety	Side Force Inclination (degrees)	Iterations
13.00	38.00	98.00	Bottom of circle exceeds allowable depth - CIRCLE REJECTED		
43.00	38.00	98.00	Bottom of circle exceeds allowable depth - CIRCLE REJECTED		
73.00	38.00	98.00	Bottom of circle exceeds allowable depth - CIRCLE REJECTED		
13.00	68.00	98.00	See Message on Next Line(s)		

CIRCLE DOES NOT INTERSECT SLOPE

```
     73.00      68.00      98.00  12.571      -4.49         22
     13.00      98.00      98.00 See Message on Next Line(s)
DEPTH OF CRACK IS GREATER THAN DEPTH OF CIRCLE

     43.00      98.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     73.00      98.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE


     38.00      63.00      98.00   7.260      -4.23         11
     43.00      63.00      98.00   7.355      -4.37         11
     48.00      63.00      98.00   7.560      -4.50         12
     38.00      68.00      98.00   7.412      -4.47         11
     48.00      68.00      98.00   7.460      -5.00         11
     38.00      73.00      98.00   7.445      -4.84         11
     43.00      73.00      98.00   7.670      -5.09         12
     48.00      73.00      98.00   7.745      -5.40         12

     33.00      58.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     38.00      58.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     43.00      58.00      98.00  10.168      -4.45         17
     33.00      63.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     33.00      68.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE


     35.00      60.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     38.00      60.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     41.00      60.00      98.00   9.554      -4.54         16
     35.00      63.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     41.00      63.00      98.00   7.306      -4.32         11
     35.00      66.00      98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     38.00      66.00      98.00   6.790      -4.18         10
     41.00      66.00      98.00   6.744      -4.34         10
```

```
     44.00     63.00     98.00   7.387     -4.40        11
     44.00     66.00     98.00   6.802     -4.46        10
     38.00     69.00     98.00   7.499     -4.53        12
     41.00     69.00     98.00   7.472     -4.71        11
     44.00     69.00     98.00   7.471     -4.88        11

     40.00     65.00     98.00   6.546     -4.17        10
     41.00     65.00     98.00   6.565     -4.21        10
     42.00     65.00     98.00   6.587     -4.24        10
     40.00     66.00     98.00   6.757     -4.29        10
     42.00     66.00     98.00   6.740     -4.39        10
     40.00     67.00     98.00   7.105     -4.45        11
     41.00     67.00     98.00   7.094     -4.50        11
     42.00     67.00     98.00   7.087     -4.55        11

     39.00     64.00     98.00   6.416     -4.01         9
     40.00     64.00     98.00   6.430     -4.05         9
     41.00     64.00     98.00   6.448     -4.08        10
     39.00     65.00     98.00   6.550     -4.13        10
     39.00     66.00     98.00   6.772     -4.24        10

     39.00     63.00     98.00   7.271     -4.26        11
     40.00     63.00     98.00   7.286     -4.29        11
     38.00     64.00     98.00   6.406     -3.98         9
     38.00     65.00     98.00   6.569     -4.08        10

     37.00     63.00     98.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     37.00     64.00     98.00   6.414     -3.94         9
     37.00     65.00     98.00   6.592     -4.03        10

At the end of the current mode of search the most critical
circle which was found has the following values -
X-center =     38.00     Y-center =     64.00     Radius =
   98.00
Factor of Safety =   6.406     Side Force Inclination =  -3.
98


***** CAUTION ***** FACTOR OF SAFETY COULD NOT BE COMPUTED F
OR SOME
                         OF GRID POINTS AROUND THE MINIMUM
***** RESULTS MAY BE ERRONEOUS *****
1        UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

Date:  9:25:1998   Time:  9:16:59   Input file: C:\WINUT3\RE

    NECHES RIVER SALTWATER BARRIER

    Navigation Channel
```

Slope Stability Analysis - Construction Condition

TABLE NO. 18
INFORMATION FOR CURRENT MODE OF SEARCH - All Circles Are Tan
gent
to a Horizontal Line at Y = -34.000

Center Coordinates X	Y	Radius	1-Stage Factor of Safety	Side Force Inclination (degrees)	Iterati ons
8.00	34.00	68.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
38.00	34.00	68.00	6.600	-4.23	10
68.00	34.00	68.00	10.959	-3.13	18
8.00	64.00	98.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
68.00	64.00	98.00	8.901	-4.33	14
8.00	94.00	128.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
38.00	94.00	128.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
68.00	94.00	128.00	8.417	-4.23	13
33.00	59.00	93.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
38.00	59.00	93.00	6.391	-4.03	9
43.00	59.00	93.00	6.466	-4.21	9
33.00	64.00	98.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
43.00	64.00	98.00	6.495	-4.13	9
33.00	69.00	103.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
38.00	69.00	103.00	See Message on Next Line(s)		
CIRCLE DOES NOT INTERSECT SLOPE					
43.00	69.00	103.00	6.531	-4.07	10

33.00	54.00	88.00	6.525	-3.83	10
38.00	54.00	88.00	6.400	-4.08	9
43.00	54.00	88.00	6.448	-4.28	9
35.00	56.00	90.00	6.465	-3.91	10
38.00	56.00	90.00	6.395	-4.06	9
41.00	56.00	90.00	6.402	-4.19	9
35.00	59.00	93.00	6.464	-3.89	10
41.00	59.00	93.00	6.416	-4.14	9
35.00	62.00	96.00	See Message on Next Line(s)		

CIRCLE DOES NOT INTERSECT SLOPE

38.00	62.00	96.00	6.391	-4.01	9
41.00	62.00	96.00	6.435	-4.10	10
37.00	58.00	92.00	6.414	-3.99	9
38.00	58.00	92.00	6.392	-4.04	9
39.00	58.00	92.00	6.377	-4.09	9
37.00	59.00	93.00	6.413	-3.98	9
39.00	59.00	93.00	6.382	-4.08	9
37.00	60.00	94.00	6.412	-3.98	9
38.00	60.00	94.00	6.390	-4.02	9
39.00	60.00	94.00	6.388	-4.06	9
38.00	57.00	91.00	6.394	-4.05	9
39.00	57.00	91.00	6.375	-4.10	9
40.00	57.00	91.00	6.387	-4.14	9
40.00	58.00	92.00	6.392	-4.12	9
40.00	59.00	93.00	6.397	-4.11	9
39.00	56.00	90.00	6.378	-4.11	9
40.00	56.00	90.00	6.382	-4.15	9

At the end of the current mode of search the most critical circle which was found has the following values -
X-center = 39.00 Y-center = 57.00 Radius =
91.00

Factor of Safety = 6.375 Side Force Inclination = -4.
10
1 UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

Date: 9:25:1998 Time: 9:16:59 Input file: C:\WINUT3\RE

NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 19

```
INFORMATION FOR CURRENT MODE OF SEARCH - All Circles Have th
e
Same Radius   -   Radius =    91.000
-----------------------------------------------------------
-
                                    1-Stage
Center Coordinates                  Factor  Side Force
                                      of    Inclination
     X         Y       Radius       Safety   (degrees)   Iterati
ons


      9.00     27.00     91.00 Bottom of circle exceeds allo
wable
                                 depth - CIRCLE REJECTED
     39.00     27.00     91.00 Bottom of circle exceeds allo
wable
                                 depth - CIRCLE REJECTED
     69.00     27.00     91.00 Bottom of circle exceeds allo
wable
                                 depth - CIRCLE REJECTED
      9.00     57.00     91.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     69.00     57.00     91.00   9.489      -4.11        15
      9.00     87.00     91.00 See Message on Next Line(s)
Last Trial Values =              13.007       4.29        35
(Last Trial Values Shown Above Are Not Correct Final Values)
VALUE OF SIDE FORCE INCLINATION BECAME OUTSIDE RANGE OF

FROM  -80.00 TO   10.00 DEGREES

     39.00     87.00     91.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     69.00     87.00     91.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE


     34.00     52.00     91.00 See Message on Next Line(s)
CIRCLE DOES NOT INTERSECT SLOPE

     39.00     52.00     91.00   9.759      -4.54        16
     44.00     52.00     91.00   9.910      -4.65        16
     34.00     57.00     91.00   6.493      -3.86        10
     44.00     57.00     91.00   6.489      -4.26         9
     34.00     62.00     91.00   7.546      -4.39        12
     39.00     62.00     91.00   7.475      -4.68        11
     44.00     62.00     91.00   7.481      -4.97        12

     36.00     54.00     91.00   9.002      -4.53        14
```

39.00	54.00	91.00	9.030	-4.62	14
42.00	54.00	91.00	9.103	-4.70	15
36.00	57.00	91.00	6.438	-3.95	10
42.00	57.00	91.00	6.430	-4.20	9
36.00	60.00	91.00	7.158	-4.30	11
39.00	60.00	91.00	7.112	-4.47	11
42.00	60.00	91.00	7.095	-4.63	11
38.00	56.00	91.00	7.207	-4.32	11
39.00	56.00	91.00	7.220	-4.36	11
40.00	56.00	91.00	7.236	-4.39	11
38.00	57.00	91.00	6.394	-4.05	9
40.00	57.00	91.00	6.387	-4.14	9
38.00	58.00	91.00	6.569	-4.15	10
39.00	58.00	91.00	6.552	-4.20	10
40.00	58.00	91.00	6.538	-4.25	10

At the end of the current mode of search the most critical circle which was found has the following values -
X-center = 39.00 Y-center = 57.00 Radius =
91.00

Factor of Safety = 6.375 Side Force Inclination = -4.
10

1 UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Construction Condition

TABLE NO. 21
***** 1-STAGE FINAL CRITICAL CIRCLE INFORMATION *****
X Coordinate of Center - - - - - - - 39.000
Y Coordinate of Center - - - - - - - 57.000
Radius - - - - - - - - - - - - - - - 91.000
Factor of Safety - - - - - - - - - - 6.375
Side Force Inclination - - - - - - - -4.10

Number of circles tried - - - - - - 177
No. of circles F calc. for - - - - - 139

1 UTEXAS3 - VER. 1.120 - 10/08/92 - (C) 1985-1992 S. G. WRIGHT

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NECHES RIVER SALTWATER BARRIER

Navigation Channel

Boring No. 97-32

Ref

HEADING

NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Long Term Condition

sloughing of slope is expected with side slope 1 on 3

PROFILE LINES

No major slope failure is indicated

1	1 Fat Clay, Hard		
	-40.00	3.20	
	.00	3.20	
	12.00	-.80	
2	2		
	-40.00	-.80	
	12.00	-.80	
	18.00	-2.80	
3	3		
	-40.00	-2.80	
	18.00	-2.80	
	24.00	-4.80	
4	4		
	-40.00	-4.80	
	24.00	-4.80	
	40.50	-10.30	
5	5		

		-40.00	-10.30
		40.50	-10.30
		72.00	-20.80
6	6		
		-40.00	-20.80
		72.00	-20.80
		80.60	-24.00
		120.00	-24.00
7	7		
		-40.00	-30.80
		120.00	-30.80
8	8		
		-40.00	-34.80
		120.00	-34.80
9	9		
		-40.00	-38.80
		120.00	-38.80
10	10		
		-40.00	-45.80
		120.00	-45.80

HEADING

NECHES RIVER SALTWATER BARRIER

Navigation Channel

Slope Stability Analysis - Long Term Condition

MATERIAL PROPERTIES

1

122.00 Unit Weight

Conventional Shear

.00 24.00

Piezometric Line

1.00

2

125.00 Unit Weight

Conventional Shear

.00 22.00

Piezometric Line

1.00

3

120.00 Unit Weight

Conventional Shear

.00 18.00

Piezometric Line

1.00

4

110.00 Unit Weight

Conventional Shear

.00 26.00

Piezometric Line

1.00

5

115.00 Unit Weight

Conventional Shear

.00 28.00

Piezometric Line

1.00

6

122.00 Unit Weight

Conventional Shear

.00 24.00

Piezometric Line

1.00

7

120.00 Unit Weight

Conventional Shear

.00 17.00

Piezometric Line

1.00

8

125.00 Unit Weight

Ref

Conventional Shear

.00 22.00

Piezometric Line

1.00

9

125.00 Unit Weight

Conventional Shear

.00 23.00

Piezometric Line

1.00

10

120.00 Unit Weight

Conventional Shear

.00 22.00

Piezometric Line

1.00

PIEZOMETRIC LINES

1 62.40

-40.00 .00

200.00 .00

SLOPE GEOMETRY

-40.00 3.20

.00 3.20

80.60	-24.00
120.00	-24.00

SURFACE PRESSURE DATA

9.60	.00	.00	.00
80.60	-24.00	1497.60	.00
120.00	-24.00	1497.60	.00

ANALYSIS/COMPUTATION

Circular Search

40.00	40.00	.50	-50.00

Tangent

-30.00

PROcedure for computation of Factor of Safety

SPENCER

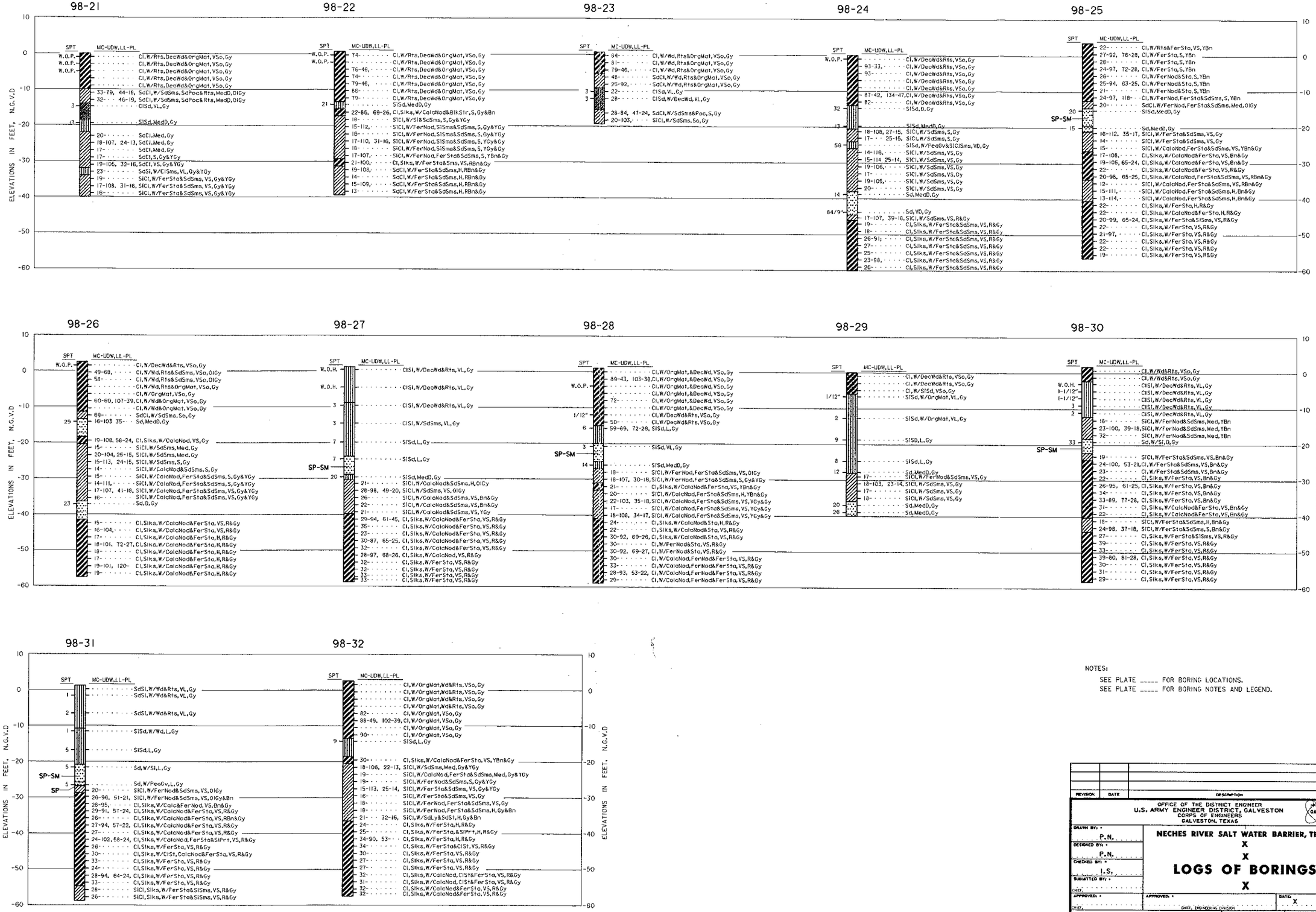
PLOT

PRINT Input Data

COMPUTE

SUMMARY OF UNCONFINED COMPRESSION TEST RESULTS
NECHES RIVER SALT WATER BARRIER
BEAUMONT, TEXAS
TABLE-

BORING NO.	DEPTH (FT.)	DENSITY DATA Moisture Cont. %	DENSITY DATA Dry Wt (pcf)	MECHANICAL ANALYSIS Gvl.	MECHANICAL ANALYSIS Sand	MECHANICAL ANALYSIS Fine	ATTERBURG LIMITS L.L.	ATTERBURG LIMITS P.L.	% STRAIN @ MAX. STRESS	UNCON. COMP. STR (pcf)	CLASSIFICATION
98-21	24-26	18.2	106.6	0	18	82	24.0	13.0	3.9	630	Sandy Clay, Medium stiff, Gray
98-21	30-32	18.9	105.0	0	16	84	32.0	16.0	4.6	2090	Sandy Clay, Very stiff, Gray & yellowish gray
98-22	24-26	16.9	110.0	0	16	84	31.0	16.0	6	1980	Silty Clay, W / silt & sand seams,Very stiff, Gray & yellowish gray
98-23	16-18	27.9	84.9	0	14	86	47.0	24.0	4.3	1270	Silty Clay, W / sand seams & sand pockets, Stiff, Gray
98-24	10-12	41.7	77.8	0	1	99	134.0	47.0	3.6	90	Clay, W / decayed wood & roots, Very soft, Gray
98-24	28-30	14.7	114.1	0	8	92	25.0	14.0	10.5	2170	Silty Clay, W / sand seams, Very stiff, Gray
98-24	44.5-46	17.0	107.0	0	12	88	39.0	18.0	7.5	2000	Silty Clay, W / sand seams, Very stiff, Red & Gray
98-25	32-34	19.0	104.8	-	-	-	65.0	24.0	3.2	2220	Clay, W / calc nod & fer stains, slks, Very stiff, Brown & gray
98-25	40-42	15.3	111.4	-	-	-	-	-	3.4	3660	Clay, W / calc nod, fer stains, & sd sms, Very stiff, Reddish brown & gray
98-26	25-27	19.5	104.4	0	2	98	25.0	15.0	5	560	Silty Clay, W / sand seams, Medium stiff, Gray
98-26	35-37	16.8	106.6	0	7	93	41.0	18.0	4	2010	Silty Clay, W / sand seams, stiff, Gray
98-35	6.5-8	17.5	111.7	-	-	-	33.0	17.0	6.8	1370	Silty Clay, Stiff, Gray
98-40	14-16	76.4	43.9	-	-	-	-	-	2.1	70	Clay, W / decayed wood roots & organic material, Very soft, Gray
98-40	22-24	20.5	102.2	0	3	97	47.0	20.0	3.6	2030	Silty Clay, W / sand seams, Very stiff, Olive gray
98-40	32-34	25.5	94.5	-	-	-	-	-	3.3	2190	Clay, W / fer stains, slks,Very stiff, Reddish brown & gray
98-42	14-16	37.6	81.0	0	4	95	63.0	25.0	2.5	1060	Clay, W / fer nod & fer stains, Stiff,Yellowish brown



NOTES:

SEE PLATE _____ FOR BORING LOCATIONS.
SEE PLATE _____ FOR BORING NOTES AND LEGEND.

REVISION	DATE	DESCRIPTION	BY

OFFICE OF THE DISTRICT ENGINEER
U.S. ARMY ENGINEER DISTRICT, GALVESTON
CORPS OF ENGINEERS
GALVESTON, TEXAS

DRAWN BY: P.N.
DESIGNED BY: P.N.
CHECKED BY: I.S.
SUBMITTED BY:
CHIEF,
APPROVED:
CHIEF,

APPROVED:
CHIEF, ENGINEERING DIVISION
DATE: X

NECHES RIVER SALT WATER BARRIER, TEXAS
X
X
LOGS OF BORINGS
X

SCALE: AS SHOWN
SPEC. DATE:
DRAWING NUMBER: X
SHEET X OF X FILE NO. X

Prepared under the direction of
Nicholas J. Buechler, Lt. Col. (P), C.E.,
District Engineer

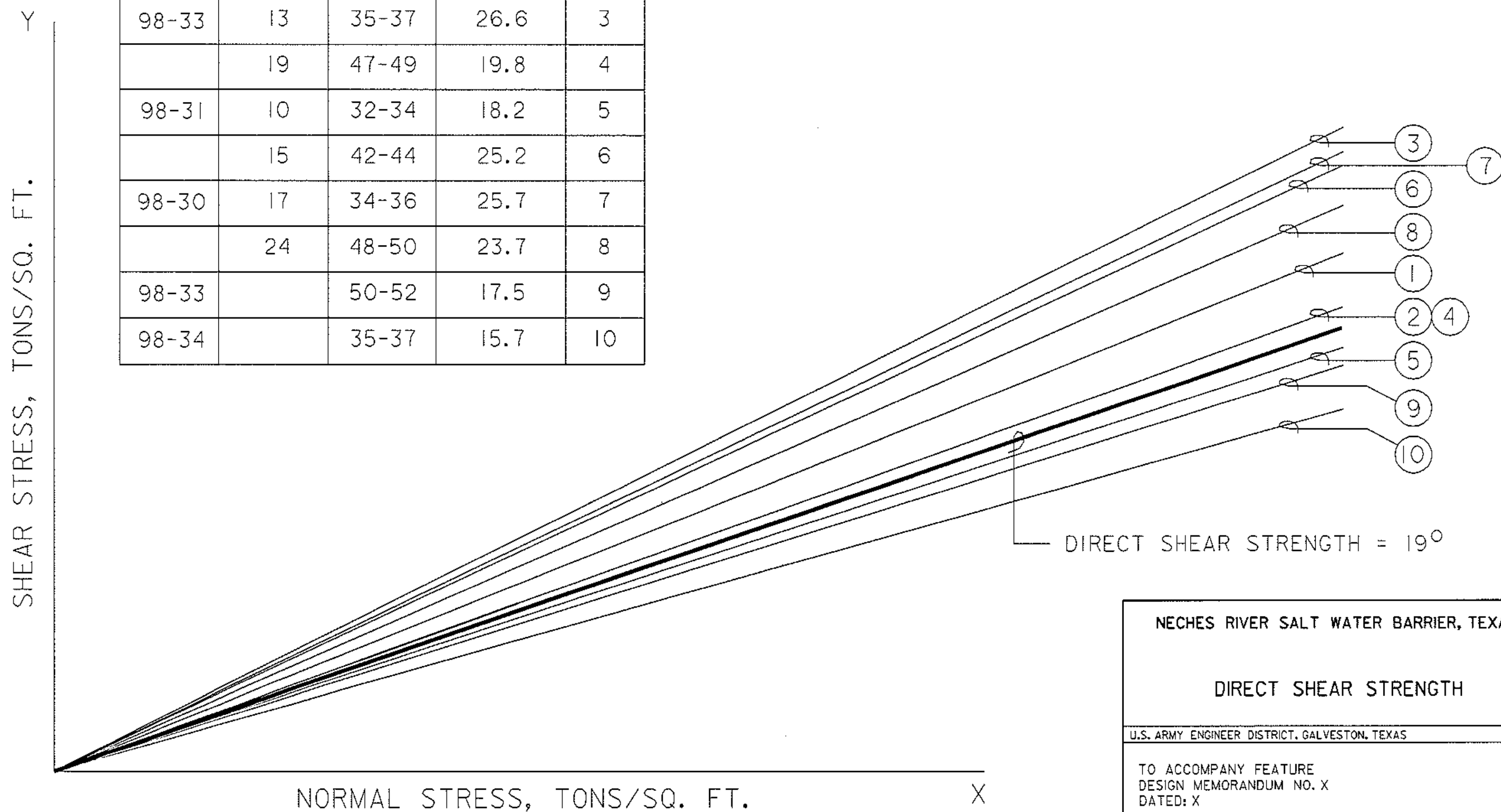
EXHIBIT

DESIGN FILE: /CAD/PROJECT/STATION
CREATED BY: ACCUSHARE
ON: 04/26/1999
AT: 11:19AM

..\user\p_norm\netch\bore2_98.dgn Apr. 06, 1999 12:52:38

DESIGN FILE:
DGNSPECIFICATION$$$
CREATED BY: $$$$
ON: $$$DATE$$$$
AT: $TIME

DIRECT SHEAR STRENGTH				
BORING NO.	SAMPLE NO.	DEPTH (FT.)	ϕ (DEGREES)	LINE NO.
98-39	19	36-38	21.9	1
		50-52	19.8	2
98-33	13	35-37	26.6	3
	19	47-49	19.8	4
98-31	10	32-34	18.2	5
	15	42-44	25.2	6
98-30	17	34-36	25.7	7
	24	48-50	23.7	8
98-33		50-52	17.5	9
98-34		35-37	15.7	10



NECHES RIVER SALT WATER BARRIER, TEXAS

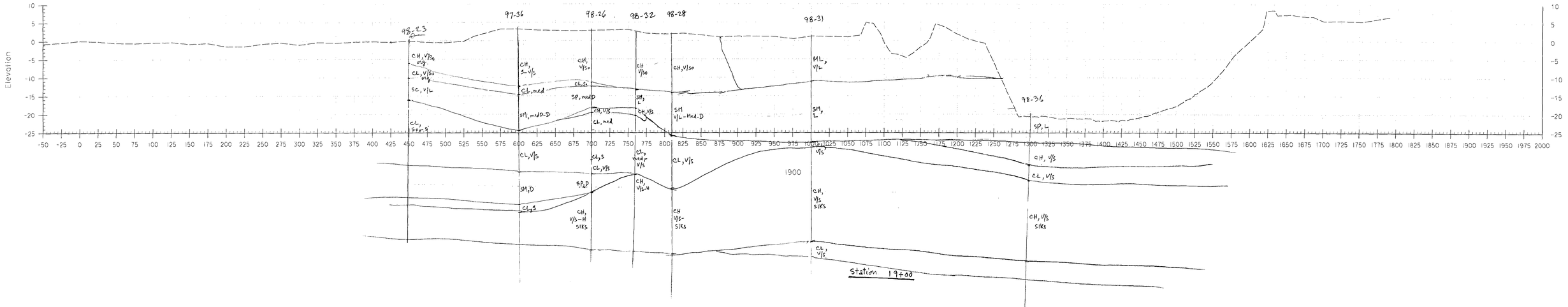
DIRECT SHEAR STRENGTH

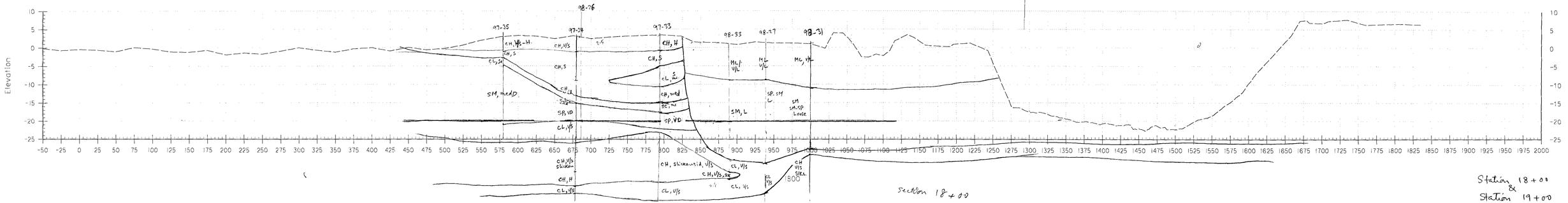
U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

TO ACCOMPANY FEATURE
DESIGN MEMORANDUM NO. X
DATED: X

EXHIBIT

k:\user\p_norm\netch\shear.dgn Apr. 06, 1999 13:06:20





Station 18+00
&
Station 19+00