November 7, 1985

TO: File

FROM: Randy Harden

RE: NOV #85-4-15-1, Abatement Response Plans received on September 20, 1985, Soldier Creek Coal Company, Soldier Canyon Mine, ACT/007/018

Soldier Creek submitted abatement plans in response to a violation concerning failure to construct sediment pond according to approved mine plans. These abatement plans modify the existing plan by placing additional riprap material on the toe of the outslope of the sediment pond and in the perennial stream channel.

The plans and modifications provided are not adequate to meet the requirements for sediment pond design, stream channel design and slope stability as required in the Regulations. Deficiencies in the design and the abatement plan are as follows:

1. The pond does not meet the combined inslope and outslope requirements of 1v:5h.

2. The riprap material placed in the perennial stream channel acts as a diversion to the stream channel. This effect causes instability of the stream channel and increases the erosion of the opposite stream bank and the bottom of the stream channel.

3. Calculations for the stability of the sediment pond are not sufficient to show stability. Calculations by the Division indicate that the proposed has a factor of safety which is considerably less than 1.5. Design of embankments, including the opposite stream channel, must be revised and complete stability analysis of the embankments must be provided to ensure stability of 1.5 static.

It is recommended that the operator develop revised plans for the sediment pond design so that the structure meets the requirements of the regulations. Protection of the perennial stream channel with riprap material (bottom and both sides) may be considered in conjunction with diversion of the stream channel similar to that currently proposed by the operator. A more suitable alternative to riprap may be the installation of a culvert in the stream channel and backfill over the culvert to the extent as required. In either case the combined outslope requirements of the sediment pond must be met, and the diversion or culverting of the perennial stream channel must be designed to pass the 100 year - 24 hour precipitation event.

The operator is not in compliance with the regulations listed below. Additional design and modifications to the sediment pond structure must comply with these regulations and any other regulations which the modifications may be affected by.

UMC 817.44 Hydrologic Balance: Stream Channel Diversions

(b)(1) The longitudinal profile of the stream, the channel, and the flood plain shall be designed and constructed to remain stable and to prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow or to runoff outside the permit area....Erosion control structures such as channel lining structures, retention basins, and artificial channel roughness structures shall be used in diversions anly when approved by the Division as being necessary to control erosion...

(b)(2) The combination of channel, bank, and flood plain configurations shall be adequate to pass sefely. the peak runoff of a 10 year - 24 hour precipitation event for temporary diversions. a 100 year - 24 hour precipitation event for permanent diversions, or larger events, as specified by the Division. However, the capacity of the channel itself should be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream of the diversion.

UMC 817.46 Hydrologic Balance: Sedimentation Ponds

(a)(2) Be located as near as possible to the disturbed area and out of perennial streams, unless approved by the Division.

(l) The minimum width of the embankment shall not be less than the quotient of (H+35)/5, where H is the height of the embankment as measured from the upstream toe of the embankment.

(m) The combined upstream and downstream side slopes of the embankment shall not be less than 1v:5h, with neither slope steeper than 1v:2h. Slopes shall be designed to be stable in all cases, even if flatter side slopes are required.

(r) Each pond shall be designed and inspected during construction under the supervisor of, and certified after construction be, a registered professional engineer.

UMC 817.101 Backfilling and Grading: General Requirements

(b)(1) ...All applicable requirements for insuring a static factor of safety of 1.5 and protecting the hydrologic balance of the surrounding terrain as specified in this regulation, the program and the Act shall be met.

Calculations regarding the stability of the sediment pond and stream channel embankments are as attached to this memo(computer printouts).

cc: W. Hedberg
J. Helfrich
S. Linner
1010R-32

SLOPES 6 SLOPE STABILITY ANALYSIS

PROJECT NAME SOLDIER CREEK SEDIMENT POND - R. HARDEN

SOIL PARAMETERS

SOIL NUM	UNIT WEIGHT	FRICTION ANGLE	COHESION LB/FT2
1	120.00	28.3	288.00
2	150.00	36.0	0.00
3	62.40	0.0	0.00

PORE PRESSURE PARAMETERS

PORE NUM	DEPTH FACTOR (LB/FT3)	100% PRESSURE OR ELEV	0% HEAD ELEVATION
1	62.40	0.00	0.00
2	0.00	0.00	0.00

POINT PARAMETERS

POINT NUM	HORIZONTAL COORDINATE (X)	VERTICAL COORDINATE (Y)
1	64.000	53.000
2	96.000	53.000
3	64.000	45.600
4	80.000	45.600
5	100.000	54.000
6	105.000	55.000
7	111.000	51.000
8	119.000	38.000
9	129.000	38.000
10	138.000	38.000
11	143.000	55.000
12	114.500	46.000
13	118.500	46.000
14	140.500	46.000
15	500.000	100.000
16	10.000	53.000

LINE DATA INPUT

LINE NUM	LINE OPTION	BEGINNING POINT	ENDING POINT	SOIL NUM	DESCRIPTION
1		1	2	3	POND ELEVATION
2		3	4	1	POND BOTTOM

3		4	2	1	INSLOPE
4		2	5	1	CREST
5		5	6	1	CREST
6		6	7	1	OUTSLOPE RR/SOIL
7		7	12	1	SOIL OUTSLOPE
8		12	8	1	SOIL TOE
9		7	13	2	RIPRAP ABOVE H2O
10		13	9	2	RIPRAP TOE
11		8	9	1	RIPRAP BASE
12		9	10	1	CHANNEL BOTTOM
13		10	14	1	STREAM BANK
14		14	11	1	STREAM BANK
15	P	12	13	1	
16		13	14	3	CHANNEL LEVEL
17	P	2	12	1	PHREATIC LINE
18	P	1	2	1	WATER LEVEL
19	P	13	14	1	WATER LEVEL
20		11	15	1	GROUND SURFACE
21		16	1	3	
22		16	3	1	
23	P	16	1	1	

Data Documents SS-338-1478-11

COMPILED DATA LISTING

XCOORDINATE= 10.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	-.1370370	54.370	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 64.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	0.0000000	45.600	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 80.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	.4624999	8.600	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 96.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	.2500000	29.000	1

LINES BELOW ARE PORE PRESSURE

2	-.3783783	89.324	1

XCOORDINATE= 100.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	.2000000	34.000	1

LINES BELOW ARE PORE PRESSURE

2	-.3783783	89.324	1

XCOORDINATE= 105.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	1

LINES BELOW ARE PORE PRESSURE

2	-.3783783	89.324	1

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XCOORDINATE= 111.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	2
2	-1.4285714	209.571	1

LINES BELOW ARE PORE PRESSURE

3	-.3783783	89.324	1

XCOORDINATE= 114.500

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	2
2	-1.7777777	249.555	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	46.000	1

XCOORDINATE= 118.500

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	46.000	3
2	-.7619047	136.285	2
3	-1.7777777	249.555	1

LINES BELOW ARE PORE PRESSURE

4	0.0000000	46.000	1

XCOORDINATE= 119.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	46.000	3
2	-.7619047	136.285	2
3	0.0000000	38.000	1

LINES BELOW ARE PORE PRESSURE

4	0.0000000	46.000	1

XCOORDINATE= 129.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	46.000	3
2	0.0000000	38.000	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	46.000	1

XCOORDINATE= 138.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	46.000	3
2	3.2000000	-403.600	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	46.000	1

XCOORDINATE= 140.500

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NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	3.6000000	-459.800	1

XCOORDINATE= 143.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	.1260504	36.974	1

XCOORDINATE= 500.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER

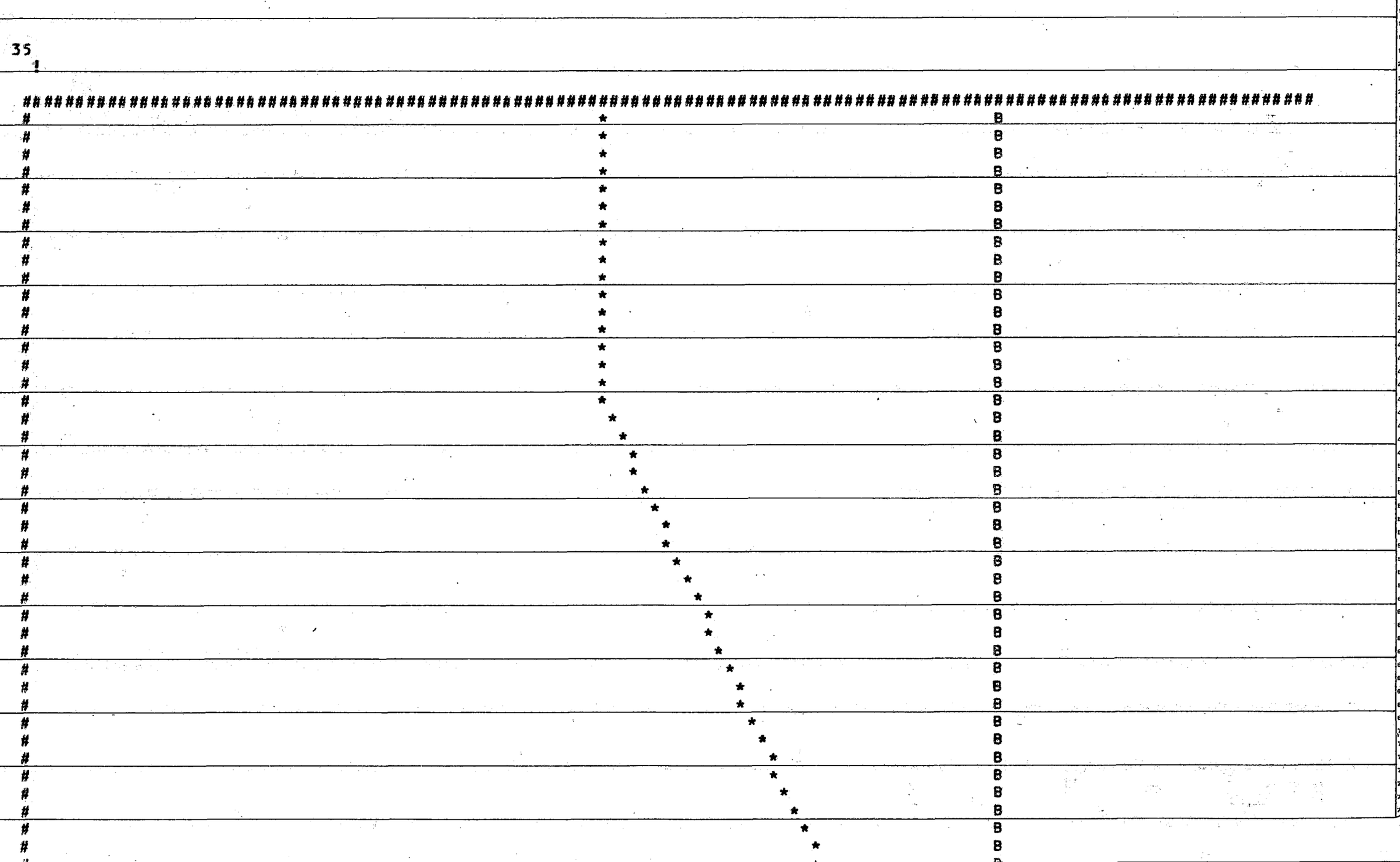
Data Documents SS-338-1478-11

SLOPES 6 SLOPE STABILITY ANALYSIS
INPUT DATA GRAPHICAL PRINTOUT

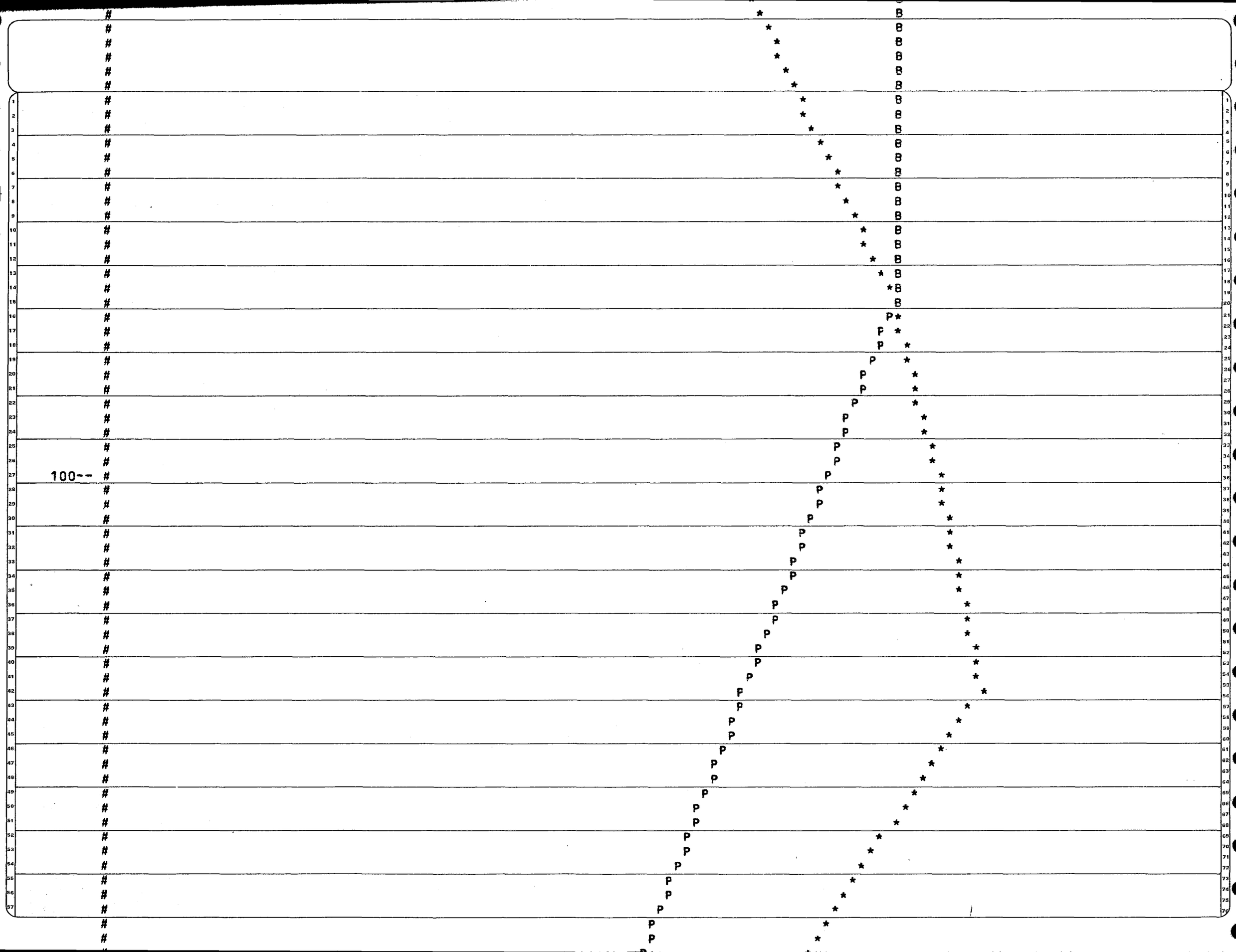
PROJECT NAME: SOLDIER CREEK SEDIMENT POND - R. HARDEN

HORIZONTAL SCALE 1"= 2'
VERTICAL SCALE 1"= 2'

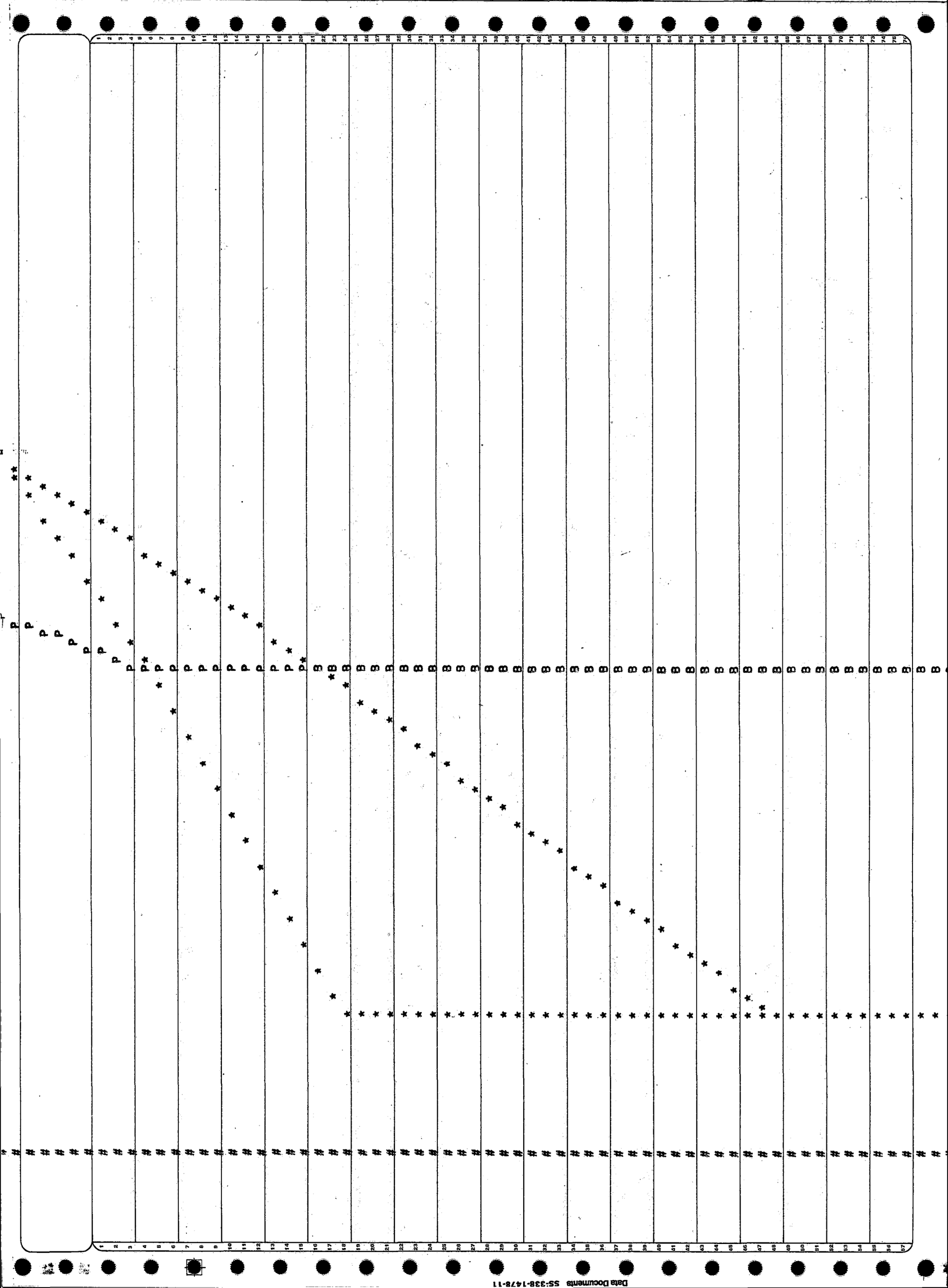
35



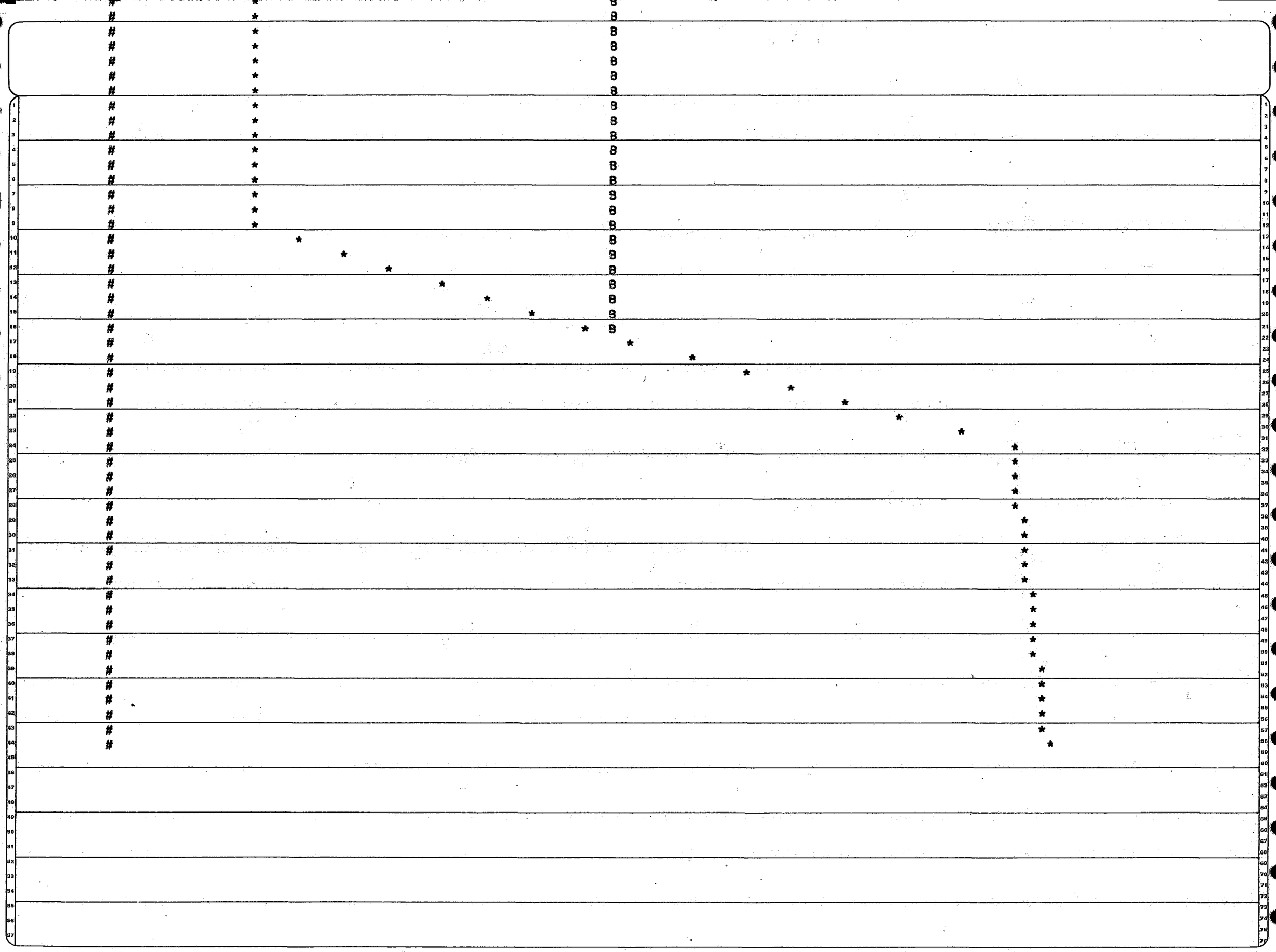
Data Documents SS-338-1478-11



Data Documents SS-338-1478-11



Data Documents SS:338-1478-11



Data Documents SS-338-1478-11

SLOPES 6 SLOPE STABILITY ANALYSIS

PROJECT NAME SOLDIER CREEK SEDIMENT POND - R. HARDEN

X COORDINATE 140.000 Y COORDINATE 46.000
MINIMUM FACTOR OF SAFETY WAS 1.999 FOUND AT RADIUS 5.195

X COORDINATE 140.000 Y COORDINATE 48.000
MINIMUM FACTOR OF SAFETY WAS 1.818 FOUND AT RADIUS 4.950

X COORDINATE 140.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.726 FOUND AT RADIUS 4.705

X COORDINATE 140.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.784 FOUND AT RADIUS 6.888

X COORDINATE 142.000 Y COORDINATE 48.000
MINIMUM FACTOR OF SAFETY WAS 2.450 FOUND AT RADIUS 6.983

X COORDINATE 138.000 Y COORDINATE 48.000
MINIMUM FACTOR OF SAFETY WAS 1.654 FOUND AT RADIUS 7.678

X COORDINATE 136.000 Y COORDINATE 46.000
MINIMUM FACTOR OF SAFETY WAS 1.949 FOUND AT RADIUS 7.413

X COORDINATE 138.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.599 FOUND AT RADIUS 8.242

X COORDINATE 138.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.576 FOUND AT RADIUS 7.997

X COORDINATE 138.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.638 FOUND AT RADIUS 10.180

X COORDINATE 140.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.726 FOUND AT RADIUS 4.705

X COORDINATE 136.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.542 FOUND AT RADIUS 10.970

X COORDINATE 134.000 Y COORDINATE 48.000
MINIMUM FACTOR OF SAFETY WAS 1.833 FOUND AT RADIUS 9.896

X COORDINATE 136.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.535 FOUND AT RADIUS 10.735

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MINIMUM FACTOR OF SAFETY WAS 1.505 FOUND AT RADIUS 10.723

X COORDINATE 136.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.537 FOUND AT RADIUS 11.290

X COORDINATE 138.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.599 FOUND AT RADIUS 8.242

X COORDINATE 134.000 Y COORDINATE 50.000
MINIMUM FACTOR OF SAFETY WAS 1.556 FOUND AT RADIUS 11.270

X COORDINATE 136.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.537 FOUND AT RADIUS 11.290

X COORDINATE 135.000 Y COORDINATE 53.000
MINIMUM FACTOR OF SAFETY WAS 1.494 FOUND AT RADIUS 12.776

X COORDINATE 134.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.480 FOUND AT RADIUS 14.018

X COORDINATE 133.000 Y COORDINATE 55.000
MINIMUM FACTOR OF SAFETY WAS 1.484 FOUND AT RADIUS 15.259

X COORDINATE 135.000 Y COORDINATE 55.000
MINIMUM FACTOR OF SAFETY WAS 1.534 FOUND AT RADIUS 13.341

X COORDINATE 134.000 Y COORDINATE 53.000
MINIMUM FACTOR OF SAFETY WAS 1.478 FOUND AT RADIUS 13.736

X COORDINATE 134.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.523 FOUND AT RADIUS 12.644

X COORDINATE 133.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.522 FOUND AT RADIUS 14.977

X COORDINATE 135.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.507 FOUND AT RADIUS 13.059

X COORDINATE 134.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.523 FOUND AT RADIUS 12.644

X COORDINATE 134.500 Y COORDINATE 52.500
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X COORDINATE 133.500 Y COORDINATE 52.500
MINIMUM FACTOR OF SAFETY WAS 1.518 FOUND AT RADIUS 13.265

X COORDINATE 134.000 Y COORDINATE 53.500
MINIMUM FACTOR OF SAFETY WAS 1.477 FOUND AT RADIUS 13.877

Data Documents SS-338-1478-11

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                X COORDINATE        134.000   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   1.480 FOUND AT RADIUS        14.018

                X COORDINATE        134.500   Y COORDINATE        53.000
MINIMUM FACTOR OF SAFETY WAS   1.482 FOUND AT RADIUS        13.256

                X COORDINATE        133.500   Y COORDINATE        53.000
MINIMUM FACTOR OF SAFETY WAS   1.520 FOUND AT RADIUS        14.215

                X COORDINATE        134.000   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   1.480 FOUND AT RADIUS        14.018

                X COORDINATE        133.750   Y COORDINATE        53.750
MINIMUM FACTOR OF SAFETY WAS   1.476 FOUND AT RADIUS        14.187

                X COORDINATE        133.500   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   1.477 FOUND AT RADIUS        14.498

                X COORDINATE        134.000   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   1.480 FOUND AT RADIUS        14.018

                X COORDINATE        133.750   Y COORDINATE        53.500
MINIMUM FACTOR OF SAFETY WAS   1.476 FOUND AT RADIUS        14.117

                X COORDINATE        133.500   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   1.477 FOUND AT RADIUS        14.498

                X COORDINATE        133.625   Y COORDINATE        53.625
MINIMUM FACTOR OF SAFETY WAS   1.477 FOUND AT RADIUS        14.272

                X COORDINATE        133.750   Y COORDINATE        53.875
MINIMUM FACTOR OF SAFETY WAS   1.476 FOUND AT RADIUS        14.222

                X COORDINATE        133.875   Y COORDINATE        53.625
MINIMUM FACTOR OF SAFETY WAS   1.476 FOUND AT RADIUS        14.032

                X COORDINATE        133.625   Y COORDINATE        53.625
MINIMUM FACTOR OF SAFETY WAS   1.477 FOUND AT RADIUS        14.272


   SEARCH ROUTINE FOUND MINIMUM BISHOP F.S. =  1.476
XCOORDINATE =      133.750      YCOORDINATE =      53.750     RADIUS =      14.187
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Data Documents SS-338-1478-11

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                    SLOPES 6 SLOPE STABILITY ANALYSIS
      PROJECT NAME SOLDIER CREEK SEDIMENT POND   -  R. HARDEN

                X COORDINATE        112.000   Y COORDINATE        52.000
MINIMUM FACTOR OF SAFETY WAS   3.144 FOUND AT RADIUS        12.396

                X COORDINATE        112.000   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   2.988 FOUND AT RADIUS        12.311

                X COORDINATE        112.000   Y COORDINATE        56.000
MINIMUM FACTOR OF SAFETY WAS   2.896 FOUND AT RADIUS        14.761

                X COORDINATE        112.000   Y COORDINATE        58.000
MINIMUM FACTOR OF SAFETY WAS   2.865 FOUND AT RADIUS        17.106

                X COORDINATE        112.000   Y COORDINATE        60.000
MINIMUM FACTOR OF SAFETY WAS   2.870 FOUND AT RADIUS        19.715

                X COORDINATE        114.000   Y COORDINATE        56.000
MINIMUM FACTOR OF SAFETY WAS   2.545 FOUND AT RADIUS        14.657

                X COORDINATE        116.000   Y COORDINATE        54.000
MINIMUM FACTOR OF SAFETY WAS   2.443 FOUND AT RADIUS        16.285

                X COORDINATE        118.000   Y COORDINATE        52.000
MINIMUM FACTOR OF SAFETY WAS   2.418 FOUND AT RADIUS        13.225

                X COORDINATE        120.000   Y COORDINATE        50.000
MINIMUM FACTOR OF SAFETY WAS   1.140 FOUND AT RADIUS         4.981

                X COORDINATE        122.000   Y COORDINATE        48.000
MINIMUM FACTOR OF SAFETY WAS   1.153 FOUND AT RADIUS         4.565

                X COORDINATE        118.000   Y COORDINATE        48.000
MINIMUM FACTOR OF SAFETY WAS   1.316 FOUND AT RADIUS         1.666

                X COORDINATE        120.000   Y COORDINATE        52.000
MINIMUM FACTOR OF SAFETY WAS   1.182 FOUND AT RADIUS         6.585

                X COORDINATE        122.000   Y COORDINATE        48.000
MINIMUM FACTOR OF SAFETY WAS   1.153 FOUND AT RADIUS         4.565

                X COORDINATE        121.000   Y COORDINATE        51.000
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MINIMUM FACTOR OF SAFETY WAS 1.068 FOUND AT RADIUS 3.854

X COORDINATE 122.000 Y COORDINATE 52.000
MINIMUM FACTOR OF SAFETY WAS 1.073 FOUND AT RADIUS 7.773

X COORDINATE 123.000 Y COORDINATE 53.000
MINIMUM FACTOR OF SAFETY WAS 1.031 FOUND AT RADIUS 9.168

X COORDINATE 124.000 Y COORDINATE 54.000
MINIMUM FACTOR OF SAFETY WAS 1.004 FOUND AT RADIUS 10.564

X COORDINATE 125.000 Y COORDINATE 55.000
MINIMUM FACTOR OF SAFETY WAS .989 FOUND AT RADIUS 11.959

X COORDINATE 126.000 Y COORDINATE 56.000
MINIMUM FACTOR OF SAFETY WAS .981 FOUND AT RADIUS 13.355

X COORDINATE 127.000 Y COORDINATE 57.000
MINIMUM FACTOR OF SAFETY WAS .979 FOUND AT RADIUS 14.751

X COORDINATE 128.000 Y COORDINATE 58.000
MINIMUM FACTOR OF SAFETY WAS .983 FOUND AT RADIUS 16.146

X COORDINATE 127.000 Y COORDINATE 56.000
MINIMUM FACTOR OF SAFETY WAS 1.001 FOUND AT RADIUS 13.949

X COORDINATE 126.000 Y COORDINATE 58.000
MINIMUM FACTOR OF SAFETY WAS .999 FOUND AT RADIUS 14.959

X COORDINATE 128.000 Y COORDINATE 58.000
MINIMUM FACTOR OF SAFETY WAS .983 FOUND AT RADIUS 16.146

X COORDINATE 127.000 Y COORDINATE 57.500
MINIMUM FACTOR OF SAFETY WAS .974 FOUND AT RADIUS 15.152

X COORDINATE 127.000 Y COORDINATE 58.000
MINIMUM FACTOR OF SAFETY WAS .973 FOUND AT RADIUS 15.553

X COORDINATE 127.000 Y COORDINATE 58.500
MINIMUM FACTOR OF SAFETY WAS .979 FOUND AT RADIUS 15.953

X COORDINATE 127.500 Y COORDINATE 57.500
MINIMUM FACTOR OF SAFETY WAS .980 FOUND AT RADIUS 15.448

X COORDINATE 126.500 Y COORDINATE 57.500
MINIMUM FACTOR OF SAFETY WAS .978 FOUND AT RADIUS 14.855

X COORDINATE 127.000 Y COORDINATE 58.500
MINIMUM FACTOR OF SAFETY WAS .979 FOUND AT RADIUS 15.953

Data Documents SS-338-1478-11

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                    X COORDINATE        126.750   Y COORDINATE        58.250
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                    X COORDINATE        127.250   Y COORDINATE        58.250
MINIMUM FACTOR OF SAFETY WAS    .972 FOUND AT RADIUS        15.901

                    X COORDINATE        127.500   Y COORDINATE        58.500
MINIMUM FACTOR OF SAFETY WAS    .970 FOUND AT RADIUS        16.250

                    X COORDINATE        127.750   Y COORDINATE        58.750
MINIMUM FACTOR OF SAFETY WAS    .969 FOUND AT RADIUS        16.599

                    X COORDINATE        128.000   Y COORDINATE        59.000
MINIMUM FACTOR OF SAFETY WAS    .969 FOUND AT RADIUS        16.948

                    X COORDINATE        127.750   Y COORDINATE        58.500
MINIMUM FACTOR OF SAFETY WAS    .971 FOUND AT RADIUS        16.399

                    X COORDINATE        127.500   Y COORDINATE        59.000
MINIMUM FACTOR OF SAFETY WAS    .974 FOUND AT RADIUS        16.651

                    X COORDINATE        128.000   Y COORDINATE        59.000
MINIMUM FACTOR OF SAFETY WAS    .969 FOUND AT RADIUS        16.948

                    X COORDINATE        127.750   Y COORDINATE        58.875
MINIMUM FACTOR OF SAFETY WAS    .969 FOUND AT RADIUS        16.699

                    X COORDINATE        127.875   Y COORDINATE        58.625
MINIMUM FACTOR OF SAFETY WAS    .971 FOUND AT RADIUS        16.573

                    X COORDINATE        127.625   Y COORDINATE        58.625
MINIMUM FACTOR OF SAFETY WAS    .970 FOUND AT RADIUS        16.425

                    X COORDINATE        127.750   Y COORDINATE        58.875
MINIMUM FACTOR OF SAFETY WAS    .969 FOUND AT RADIUS        16.699


   SEARCH ROUTINE FOUND MINIMUM BISHOP F.S. =    .969
XCOORDINATE =      127.750      YCOORDINATE =      58.750      RADIUS =      16.599
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Data Documents SS-338-1478-11

SLOPES 6 SLOPE STABILITY ANALYSIS

PROJECT NAME SOLDIER CREEK SEDIMENT POND - R. HARDEN

CIRCULAR FAILURE SURFACE INFORMATION:

CIRCLE CENTER X COORDINATE	127.750
CIRCLE CENTER Y COORDINATE	58.750
FAILURE CIRCLE RADIUS	16.590
HORIZONTAL ACCELERATION	0.0000 G

NUMBER OF SLICES USED	5
BISHOP SIMPLIFIED F.S.	.969
ORDINARY METHOD F.S.	.688
NORMAL METHOD F.S.	.948

Data Documents SS-338-1478-11

SLOPES 6 SLICE PARAMETER OUTPUT

SLICE	SIN THETA	COS THETA	WEIGHT	TAN PHI	COHSN	PORE FORCE	SIDE FRCE	DELTA Y	DELTA X	ACC WGHT	X	Y
1	.7109146	.7032782	231.69	.726542	0.00	0.00	.000	1.3975	2.76	231.69	11.71	11.75
2	.5905480	.8070024	160.98	.726542	0.00	43.33	.951	.3946	1.07	160.98	9.78	13.39
3	.5425827	.8400023	80.53	.726542	0.00	37.02	1.021	.1614	.50	74.58	9.00	13.93
4	.4460303	.8950178	512.82	.726542	0.00	364.79	1.344	.6889	2.76	265.35	7.36	14.86
5	.3429578	.9393507	110.95	.726542	0.00	104.82	2.722	.1082	.59	10.59	5.68	15.58

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COMPILED DATA LISTING

XCOORDINATE= 10.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	-.0074074	46.074	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 64.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	0.0000000	45.600	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 80.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	53.000	3
2	.4624999	8.600	1

LINES BELOW ARE PORE PRESSURE

3	0.0000000	53.000	1

XCOORDINATE= 96.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	.2500000	29.000	1

LINES BELOW ARE PORE PRESSURE

2	-.4545454	96.636	1

XCOORDINATE= 100.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	.2000000	34.000	1

LINES BELOW ARE PORE PRESSURE

2	-.4545454	96.636	1

XCOORDINATE= 105.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	1

LINES BELOW ARE PORE PRESSURE

2	-.4545454	96.636	1

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XCOORDINATE= 111.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	2
2	-1.4285714	209.571	1

LINES BELOW ARE PORE PRESSURE

3	-.4545454	96.636	1

XCOORDINATE= 114.500

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.6666666	125.000	2
2	-1.7777777	249.555	1

LINES BELOW ARE PORE PRESSURE

3	-.4545454	96.636	1

XCOORDINATE= 118.500

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.7619047	136.285	2
2	-1.7777777	249.555	1

LINES BELOW ARE PORE PRESSURE

3	-.4545454	96.636	1

XCOORDINATE= 119.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	-.7619047	136.285	2
2	0.0000000	38.000	1

LINES BELOW ARE PORE PRESSURE

3	-.4545454	96.636	1

XCOORDINATE= 129.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	0.0000000	38.000	1

LINES BELOW ARE PORE PRESSURE

2	0.0000000	38.000	1

XCOORDINATE= 138.000

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	3.2000000	-403.600	1

LINES BELOW ARE PORE PRESSURE

2	.3827160	-14.814	1

XCOORDINATE= 140.500

NUM	SLOPE	INTERCEPT	SOIL NUMBER
1	3.6000000	-459.800	1

LINES BELOW ARE PORE PRESSURE

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```
XCOORDINATE=        143.000
 NUM       SLOPE        INTERCEPT       SOIL NUMBER
   1       .2866242          14.012          1

  LINES BELOW ARE PORE PRESSURE
   2       .3827160         -14.814          1


XCOORDINATE=        300.000
 NUM       SLOPE        INTERCEPT       SOIL NUMBER
```

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SLOPES 6 SLOPE STABILITY ANALYSIS

PROJECT NAME SOLDIER CREEK SEDIMENT POND - R. HARDEN

SOIL PARAMETERS

SOIL NUM	UNIT WEIGHT	FRICTION ANGLE	COHESION LB/FT2
1	120.00	28.3	288.00
2	150.00	36.0	0.00
3	62.40	0.0	0.00

PORE PRESSURE PARAMETERS

PORE NUM	DEPTH FACTOR (LB/FT3)	100% PRESSURE OR ELEV	0% HEAD ELEVATION
1	62.40	0.00	0.00
2	0.00	0.00	0.00

POINT PARAMETERS

POINT NUM	HORIZONTAL COORDINATE (X)	VERTICAL COORDINATE (Y)
1	64.000	53.000
2	96.000	53.000
3	64.000	45.600
4	80.000	45.600
5	100.000	54.000
6	105.000	55.000
7	111.000	51.000
8	119.000	38.000
9	129.000	38.000
10	138.000	38.000
11	143.000	55.000
12	114.500	46.000
13	118.500	46.000
14	140.500	46.000
15	300.000	100.000
16	10.000	53.000
17	10.000	46.000

LINE DATA INPUT

LINE NUM	LINE OPTION	BEGINNING POINT	ENDING POINT	SOIL NUM	DESCRIPTION
1		1	2	3	POND ELEVATION

2		3	4	1	POND BOTTOM
3		4	2	1	INSLOPE
4		2	5	1	CREST
5		5	6	1	CREST
6		6	7	1	OUTSLOPE RR/SOIL
7		7	12	1	SOIL OUTSLOPE
8		12	8	1	SOIL TOE
9		7	13	2	RIPRAP ABOVE H2O
10		13	9	2	RIPRAP TOE
11		8	9	1	RIPRAP BASE
12		9	10	1	CHANNEL BOTTOM
13		10	14	1	STREAM BANK
14		14	11	1	STREAM BANK
15	P	9	10	1	CHANNEL BOTTOM
16	P	2	9	1	PHREATIC LINE
17	P	10	15	1	PHREATIC LINE
18	P	1	2	1	WATER LEVEL
19		16	1	3	WATER LEVEL
20	P	16	1	1	PHREATIC LINE
21		17	3	1	POND BOTTOM
22		11	15	1	OPPOSITE BANK

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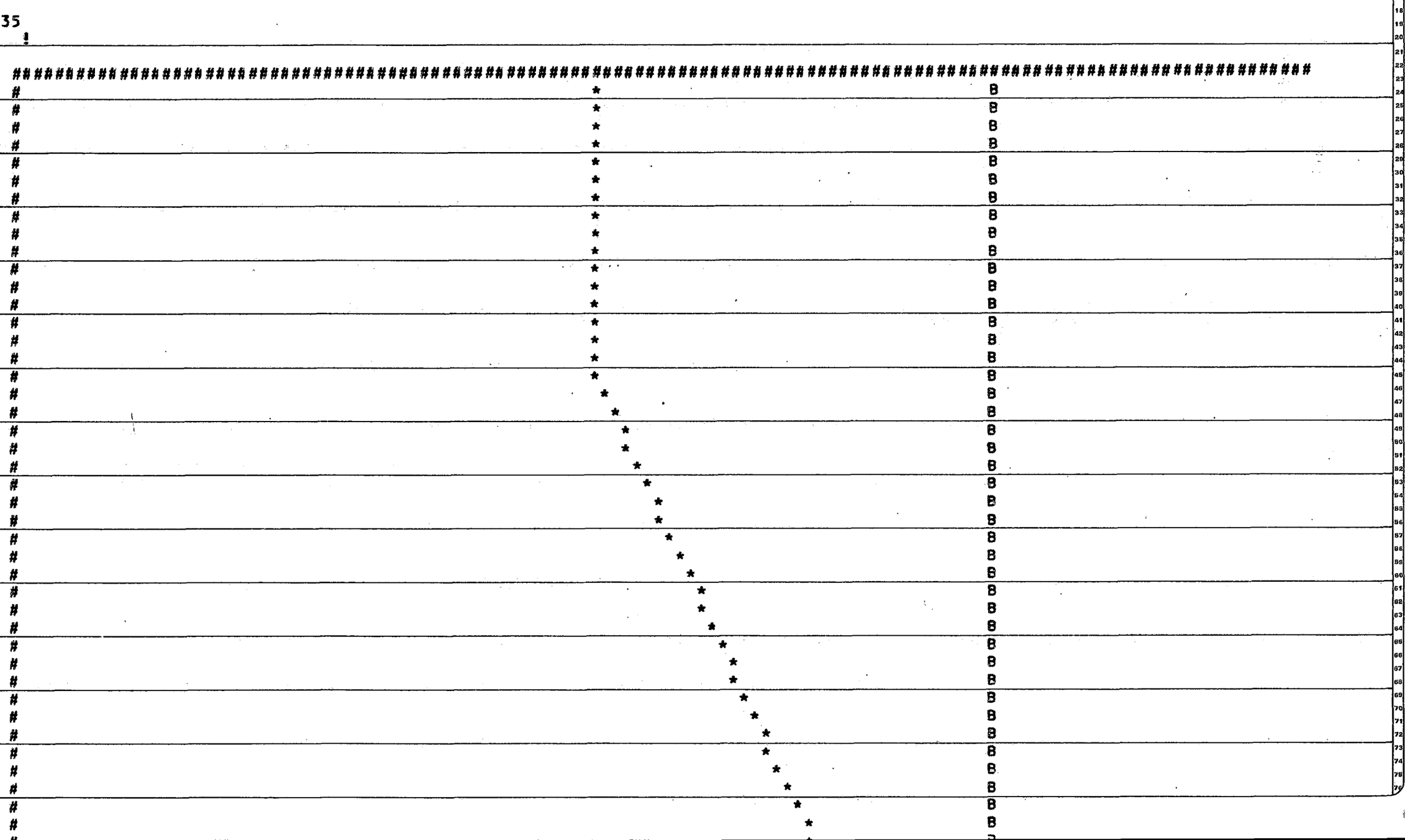
SLOPES 6 SLOPE STABILITY ANALYSIS
INPUT DATA GRAPHICAL PRINTOUT

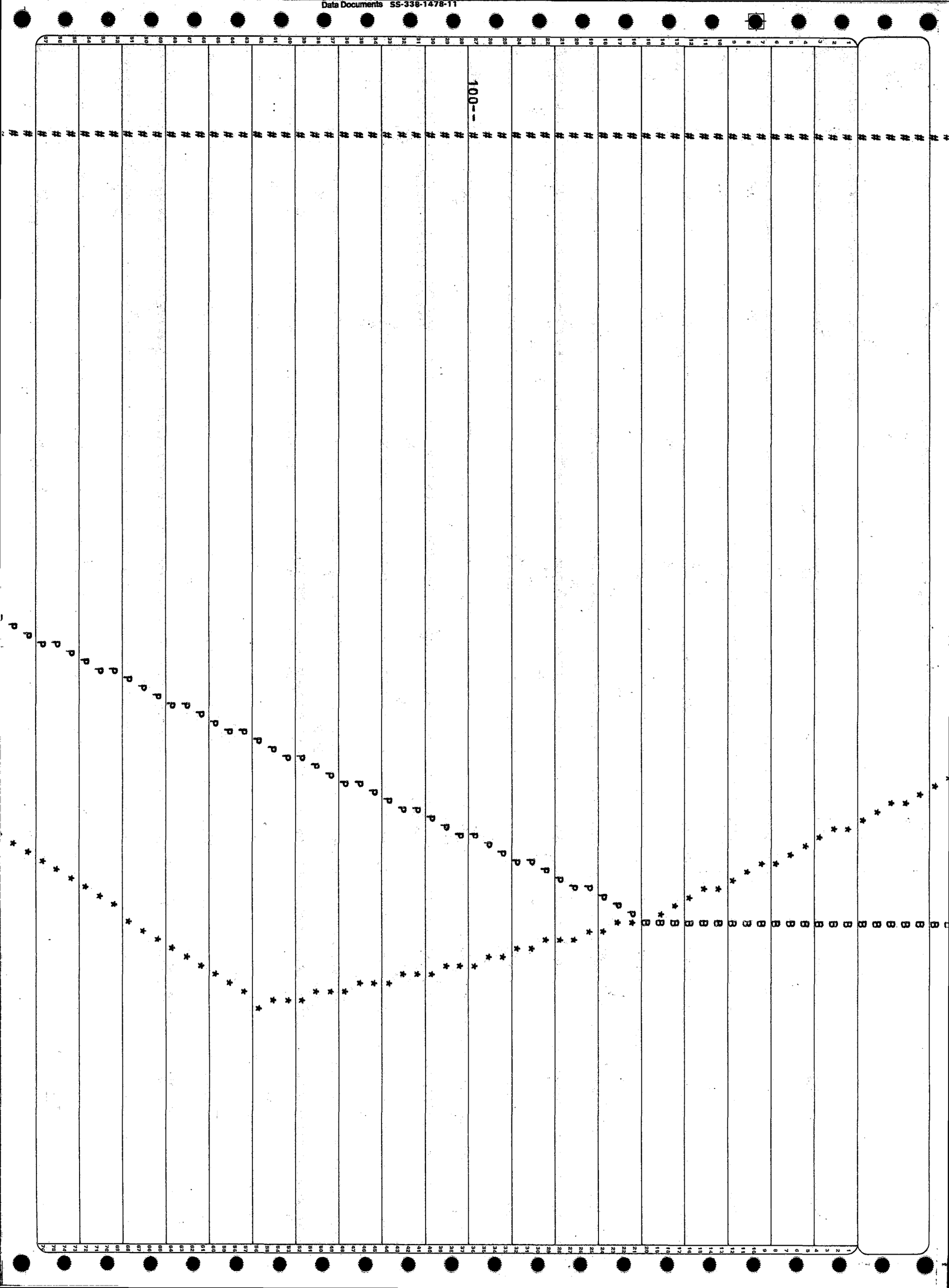
PROJECT NAME: SOLDIER CREEK SEDIMENT POND - R. HARDEN

HORIZONTAL SCALE 1"= 2'
VERTICAL SCALE 1"= 2'

35
!



Data Documents SS-338-1478-11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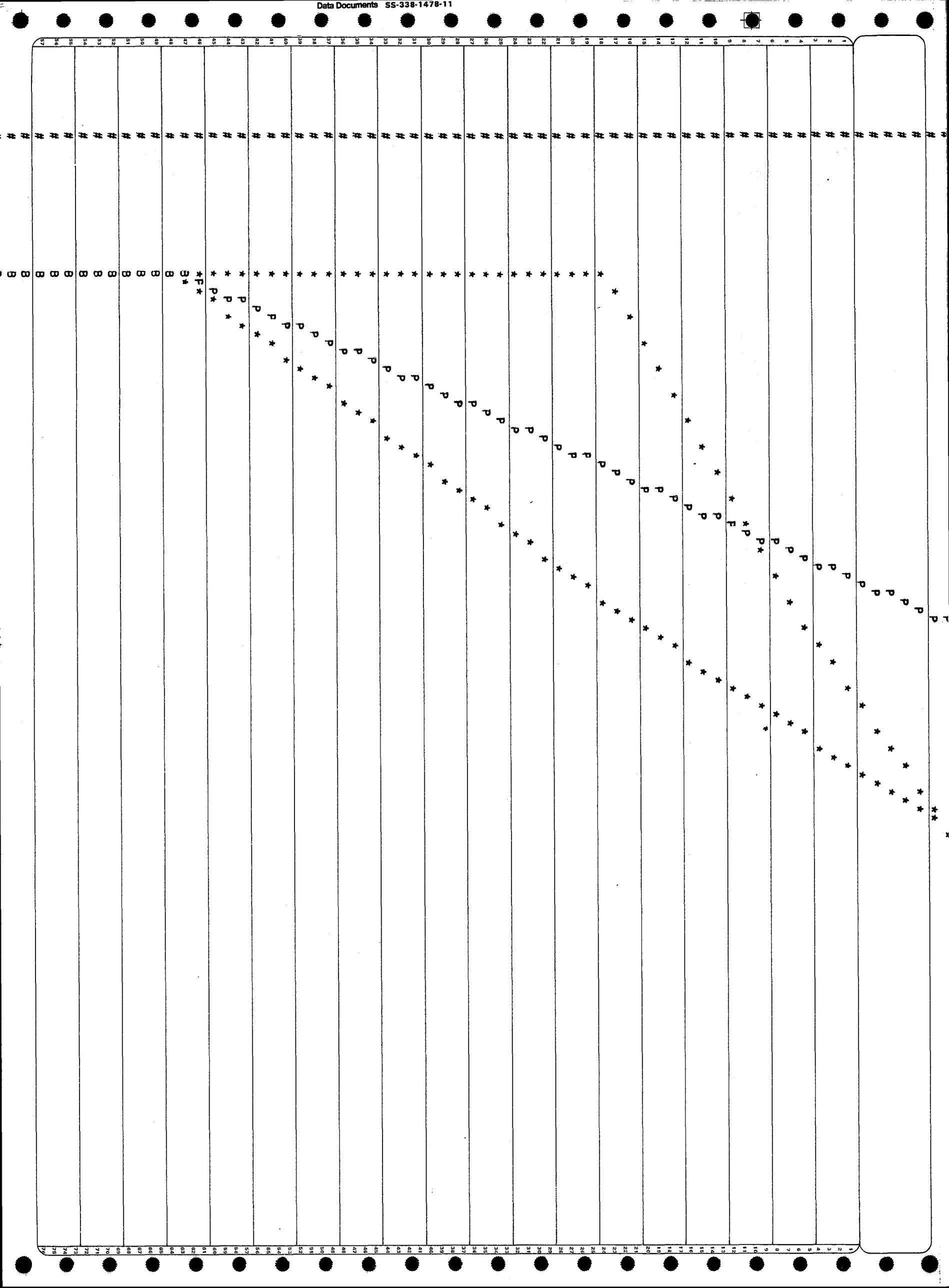

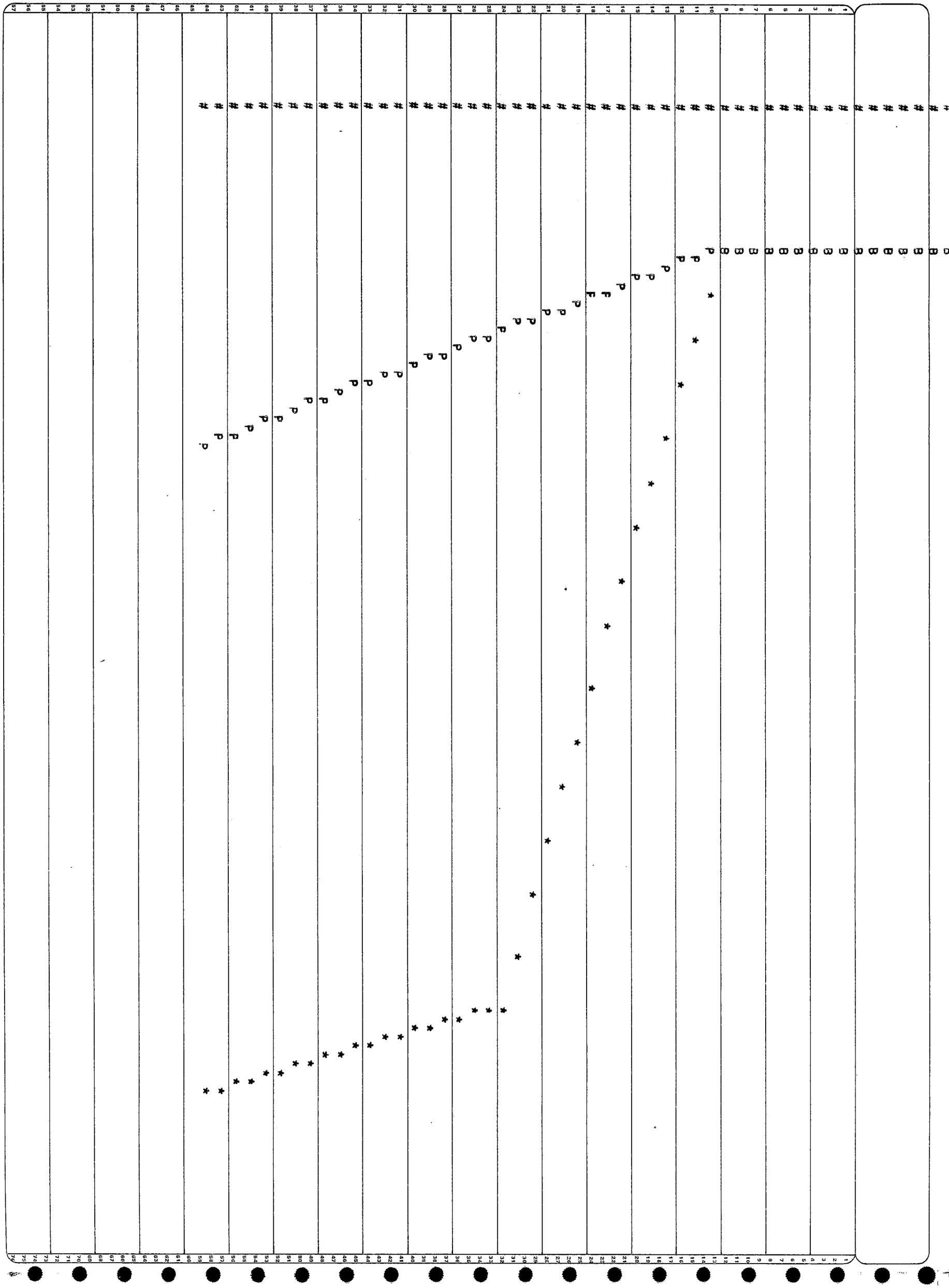

SLOPES 6 SLOPE STABILITY ANALYSIS

PROJECT NAME SOLDIER CREEK SEDIMENT POND - R. HARDEN

CIRCULAR FAILURE SURFACE INFORMATION:

CIRCLE CENTER X COORDINATE	138.000
CIRCLE CENTER Y COORDINATE	64.330
FAILURE CIRCLE RADIUS	26.700
HORIZONTAL ACCELERATION	0.0000 G

NUMBER OF SLICES USED	5
BISHOP SIMPLIFIED F.S.	.967
ORDINARY METHOD F.S.	.959
NORMAL METHOD F.S.	.959

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SLOPES 6 SLICE PARAMETER OUTPUT

SLICE	SIN THETA	COS THETA	WEIGHT	TAN PHI	COHSN	PORE FORCE	SIDE FRCE		DELTA Y	DELTA X	ACC WGHT	X	Y
1	.7150479	.6990754	.66	.726542	0.00	0.00	.000	.0936	.18	.66	19.09	18.66	
2	.6740633	.7386735	69.92	.726542	0.00	0.00	.047	.9371	2.05	69.92	17.97	19.74	
3	.5969121	.8023066	110.25	.726542	0.00	0.00	.357	.7640	2.05	110.25	15.91	21.43	
4	.5198299	.8542697	55.04	.726542	0.00	0.00	.320	.6248	2.05	55.04	13.86	22.81	
5	.4803773	.8770619	.00	.726542	0.00	0.00	.005	.0067	.02	.00	12.82	23.41	

Data Documents SS-338-1478-11