JIM WALTER RESOURCES, INC.

NORTH RIVER NO. 1 UNDERGROUND MINE

P-3222 Revision R-38

COARSE REFUSE DISPOSAL AREA NO. 1 MODIFICATION

FOR

ALABAMA SURFACE MINING COMMISSION

BY

PERC ENGINEERING CO., INC.

P.O. BOX 1712

JASPER, AL 35502

Phone: (205)-384-5553

PERC
ENGINEERING CO., INC.

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June 4, 2014

Mr. Michael Harrison, P.E.
Alabama Surface Mining Commission
Post Office Box 2390
Jasper, Alabama 35502-2390

RE: Jim Walter Resources, Inc.
North River No. 1 Underground Mine
P-3222 Revision R-38

Dear Michael:

I hereby certify the attached detailed coarse refuse disposal area modification design plans for Coarse Refuse Disposal Area No. 1 for the above referenced mine are in accordance with the Regulations of the Alabama Surface Mining Commission as adopted by Act 81-435 of December 18, 1981 and amended to date, and are true and correct to the best of my knowledge and belief. This modification consist of a modification in the Drainage Control Plan to include some Site Specific Slope Bench Designs in addition to the Typical Designs.

If you have any questions or required additional information, please feel free to call.

Sincerely,
PERC Engineering Co., Inc.

Leslie G. Stephens, P.L.S. & P.E.
AL Reg. No. 14117-E

NOTES

1) The modification of the Coarse Refuse Disposal Area No. 1 consist of the Design of different size Slope Benches in Areas 1 thru 19 as Identified on Map 5 of 5 within these plans. The Typical Slope Benches will be utilized in all other areas as shown in the Previously Approved Plans. The Site Specific Design Slope Benches will range in size from 6.2' to 14.3' in width from the invert of the Slope Bench to the Out slope Crown turning down to the next invert downslope.

2) Slope Bench Areas 1 thru 18 are located on the West side of the Coarse Refuse Disposal Area No.1 adjacent to the large Alabama Power Transmission Line and also on the North Tip of the Refuse Pile in the NE 1/4 of NE 1/4 of Section 31, Township 16 South, Range 10 West. These Slope Benches were constructed in excess of 8 years ago and only require minor grading to ensure the proper freeboard for the 100 year 6 hour rainfall design event.

3) Slope Bench Area 19 is near the Guard Office coming into the Mine site and is a short Bench at the toe of the Refuse Pile.

4) All out slopes lying between these two locations on the East Side and North Side of the Refuse Pile will be constructed as the Typical Slope Benches either 24' wide on the East side or 20' wide on the North side.

5) The only modification to the previously approved Coarse Refuse Disposal Area No. 1 plans in this revision is the Site Specific Design of Slope Benches 1 thru 19.

U.S. Department of Labor

Mine Safety and Health Administration
1030 London Drive, Suite 400
Birmingham, AL 35211-4542

AUG 27 2014

Rob Dzurino, Mine Manager
North River #1 Mine, ID No. 01-00759
Jim Walter Resources, Inc.
3114 County Road 63 S
Berry, AL 35546

Dear Mr. Dzurino:

Your modification plan dated August 6, 2014, submitted by PERC Engineering Co., Inc., for Coarse Refuse Disposal Area No. 1 (MSHA ID 1211-AL11-00131-002), is **hereby acknowledged.**

If you have any questions concerning this matter, please contact the District Plans Group at (205) 290-7302, ext. 261.

Sincerely,

Richard A. Gates
District Manager

cc: PERC Engineering Co., Inc.
Attn: Leslie G. Stephens
P. O. Box 1712
Jasper, AL 35502

INTRODUCTION

The purpose of this study was to fulfill The Mine Safety and Health Administration's requirements for the design and plan approval of proposed waste banks as outlined in Title 30 - Mineral Resources, Chapter 1, Part 77, dated July 1, 1991, and Alabama Surface Mining Commission's regulations.

INVESTIGATIVE FINDINGS

Eleven (11) borings and four (4) test pits, from previous revisions, were made at or near the proposed waste bank NE Expansion site. The boring and test pit locations are shown in Section II-A. Results from the borings indicate a sandstone and shale foundation material. Boring logs are found on Drawing No. 3 of 5. The waste bank will consist of coarse refuse produced by the North River No. 1 Underground Mine. Our findings indicate that the design slopes as shown in the accompanying set of plans are stable with factors of safety higher than those recommended in the Design Guidelines prepared by the regulatory authorities.

Our field and laboratory testing and the computer output data from the stability analysis are included in the sections on Investigative Procedures and Stability Analyses, respectively.

SITE LOCATION

The waste bank site is located in Fayette County, Alabama approximately three (3) miles south of the Berry Community. The waste bank area is located in the SW ¼ of SW ¼ of Section 29; NE ¼ of NE ¼, SW ¼ of NE ¼, SE ¼ of NE ¼, NE ¼ of SE ¼, NW ¼ of SE ¼ and SE ¼ of SE ¼ of Section 31; NW ¼ of NW ¼, NE ¼ of NW ¼, SW ¼ of NW ¼, SE ¼ of NW ¼, NW ¼ of SW ¼, NE ¼ of SW ¼ and SW ¼ of SW ¼ of Section 32, all within Township 16 South, Range 10 West, Fayette County, Alabama, as found on the Berry and Berry S.E. U.S. Quadrangles. The waste bank site will be located on land under control by Jim Walter Resources, Inc. (See Map 1 of 5 for site location).

SITE GEOLOGY

The disposal site is underlain by rocks of the Pottsville Formation of the Pennsylvania age. This strata consist primarily of alternating sandstones, shaley sandstones, shales, sandy shales, coal seams, and underclays. The strike of the Pottsville formations in the area is in the southeasterly direction. The formation dips to the southwest at a very small angle. The area is in the Appalachian Plateau physiographic province, and seismic zone 2. Faults were not found to exist at the proposed disposal site. Faults in the vicinity are not active and pose no imminent hazard to the waste bank.

UNDERGROUND MINE LOCATIONS

Proposed Coarse Refuse Disposal Area No. 1 NE Modification is underlain by underground workings. These workings are in excess of 500 feet below the proposed waste bank site floor. With this cover and the age of the workings, in excess of 25 years, significant interaction of the proposed waste bank site and mine workings is not anticipated. (See Map 2 of 5 for underground mine locations).

WASTE BANK DESCRIPTION

The waste bank will consist of a reduction in area of North River No. 1 Mine's existing waste bank on the northeast and west slopes of North River No. 1 Mine's existing coarse refuse area located within the NE ¼ of the NW ¼ and NW ¼ of the NW ¼ of Section 32; all within Township 16 South, Range 10 West, Fayette County, Alabama. Construction of the waste bank is to be performed using the refuse that was produced prior to the cessation of operations at the North River Mine No. 1 Preparation Plant. All other provisions of the original design plans and any subsequent modifications will be done as previously approved. Coarse Refuse is no longer being produced at the North River Mine No. 1 Preparation Plant. The coarse refuse will be spread in 24 inch (maximum) lifts and compacted to 90% of the standard proctor density.

FIELD TESTING AND SAMPLING

Field operations performed by Jim Walter Resources, Inc., PERC Engineering Co., Inc., and Walker Drilling Services (from previous revisions) were conducted in accordance with ASTM standard specifications where applicable, as well as procedures adopted for the specific appraisal of conditions existing at the North River No. 1 Underground Mine site.

BORING METHOD

Twelve (12) borings were performed, in previous revisions, at the proposed disposal area site. All borings were made using Rotary Drills. This set up was rotated at high speeds and cuttings were brought to the surface by circulating air under high pressure, shelby tubes, or by core barrel.

No additional borings were performed as this modification is proposed to reduce the area of the refuse disposal site and being as such, all borings were performed in prior revisions/modifications.

BORING RESULTS

Resulting values and analysis are form prior borings and indicate a solid foundation material. Foundation material at the waste bank site as indicated, by samples, are found to be competent sandstone and shale. These resulting investigations show the material to be of a sound and excellent nature. (See Map 3 of 5 for Boring Sites and Results).

LABORATORY TESTING

No laboratory testing was performed for this revision/modification, as the same material is being used in this modification and all results presented in this revision are from the prior modification design plans. Laboratory testing was conducted by Perc Engineering Co., Inc., Jasper, Alabama and Ground Engineering and Testing Services, Birmingham, Alabama. The samples selected for the testing program and the procedures used for the various tests are presented in the following discussion.

Two samples of the fill material, coarse refuse, were taken from the existing coarse refuse disposal site and two samples of cover material were taken from the proposed waste bank site. Each sample underwent laboratory classification analyses which included the following tests:

1) Standard Proctor Compaction Tests,
2) Triaxial Shear Testing (consolidated undrained), and
3) Quality Analysis

Laboratory specimens of the proposed fill material from which triaxial shear testing was performed were remolded to a density equivalent to 90% of the maximum proctor density at a moisture content of optimum plus 3%.

The material selected to represent the fill material is coarse refuse consisting of grayish shale, silty clay, and sandstone. Results of testing indicate a density of 128.31 pounds per cubic foot with an optimum moisture of 9.2%. Triaxial shear testing resulted in a angle of internal friction of 34.5 degrees, and a effective cohesion of 180 pounds per square foot.

The foundation material is to be a sandstone and shale material. An effective cohesion of 10,000.0 pounds per square foot, a density of 170.0 pounds per cubic foot, and an angle of internal friction of 45.0 degrees were assumed.

Additional testing was performed on the proposed cover materials to be used during the abandonment of the waste bank. These test results are as follows.
Soil Classification testing determined the cover material to be a Sandy Silty Clay (CL-ML) with typical parameters listed on the next page and lab reports identified as Basin 024 Dam and Foundation material. The plan is to recover all soil material from the NE Expansion area to be used for the cover material. I feel these soil test results are representative of the area added for this Coarse Refuse NE Expansion.

SOIL PARAMETERS

The soil and foundation parameters selected for the design are shown below. These values used are the results of laboratory testing by PERC Engineering Co., Inc., Jasper, Alabama and Ground Engineering and Testing of Birmingham, Alabama.

MATERIAL	LOCATION	UNIT WEIGHT (WET) PCF	EFFECTIVE ANGLE OF FRICTION	EFFECTIVE COHESION PSF
Coarse Refuse	Waste Bank	128.31	34.5 degrees	180.0
Sandstone	Foundation	170.0	45.0 degrees	10,0000.0
Sandy Silty Clay (CL-ML)	Cover Material	128.18	26.6 degrees	230.4

METHODOLOGY

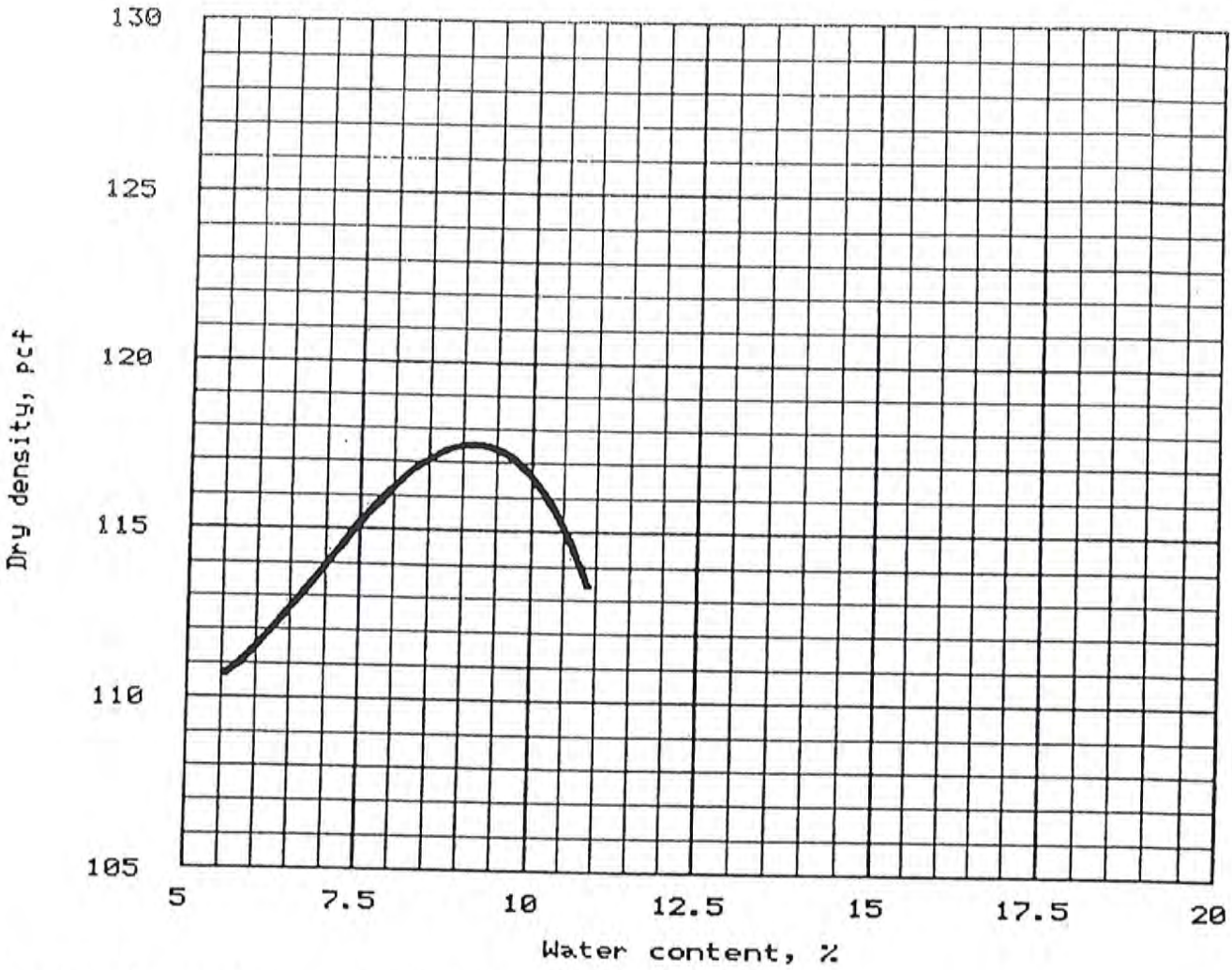
The proposed waste bank was evaluated under static loading conditions. A pore pressure ratio of 0.1 was utilized in the stability analyses. The stability analyses were performed using an approximate form of the limiting equilibrium approach as developed by Bishop. The location of the failure surface yielding the minimum safety factor was determined by allowing the computer to use a grid and search routine. The computer program used was the Reame Slope Stability program by Dr. Yang H. Huang, P.E. of the University of Kentucky.

RESULTS OF ANALYSES

Results of these stability analyses show that the North River No.1 Underground Mine's Coarse Refuse Disposal Area No.1 NE Expansion area can be built safely. See map 4 of 5 for the cross-sections locations upon which the stability analyses were performed. Tabular results of the analyses are as follows:

SECTION	STATIC SAFETY FACTOR
I-I'	2.070
J-J'	2.059
K-K'	1.807

* All calculations performed using simplified Bishop Method of Analysis.



"Standard" Proctor, ASTM D 698, Method C

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO	%				%	%

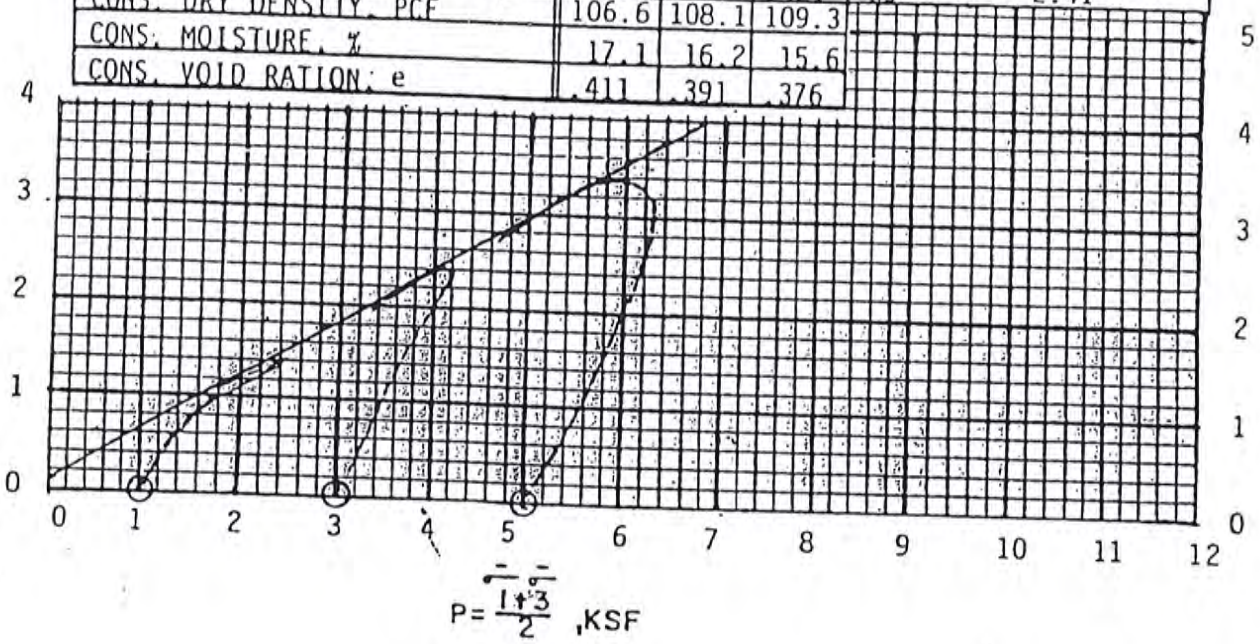
TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 9.2 % Maximum dry density = 117.5 pcf	COARSE REFUSE
Project No.: Project: PITTSBURG & MIDWAY COAL Location: NORTH RIVER UNDERGROUND #1 Date: 3-05-1992	Remarks: SAMPLE B-1
PROCTOR TEST REPORT PERC ENGINEERING CO., INC.	Fig. No. _____

TRIAXAL SHEAR/CONSOLIDATED UNDRAINED/PORE PRESSURE

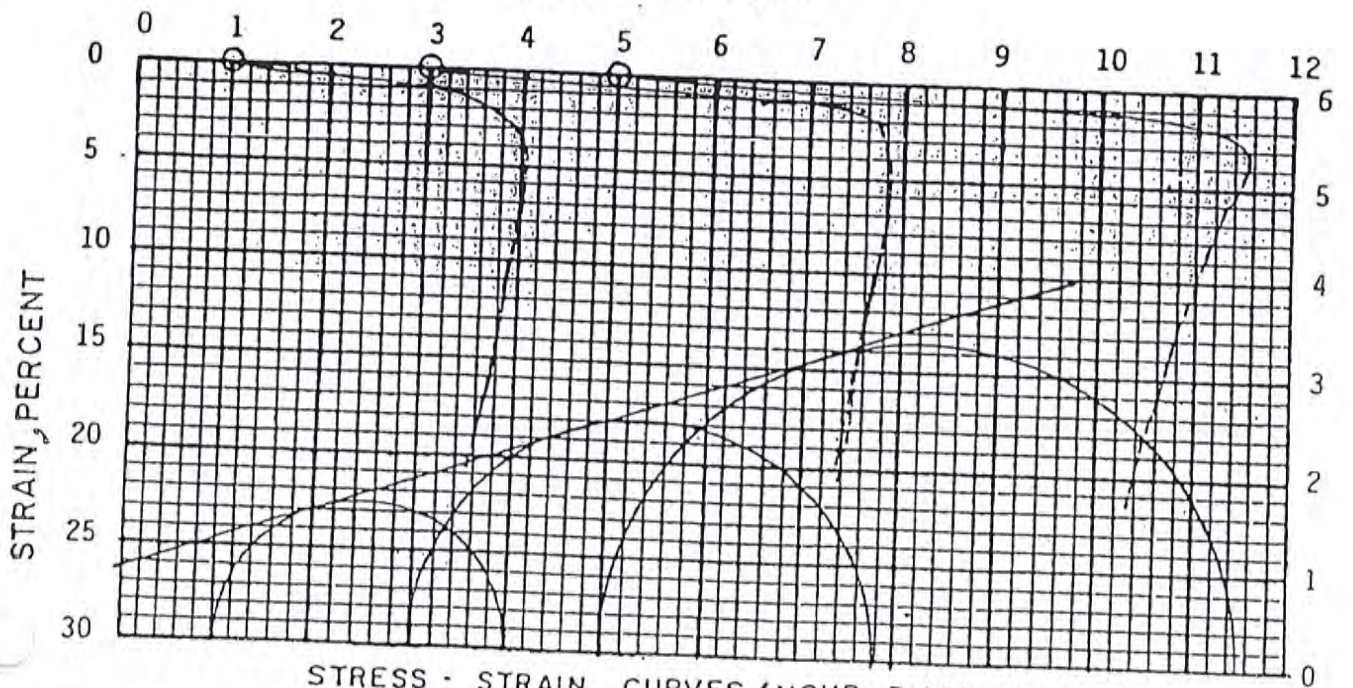
JOB NO. B1778	JOB NAME Perc Engineering	BORING/PIT NO. B-1
REVIEWED	LOCATION PMNR #1	SAMPLE NO./TYPE S-1
DATE 09/91	TEST PROCEDURE Remolded 90%	DEPTH/ELEV. 0

SPECIMEN NO.	1	2	3
CONFINING PRESSURE, KSF	1	3	5
INITIAL DRY DENSITY, PCF	105.9	105.9	105.9
INITIAL MOISTURE, %	9.2	9.2	9.2
INITIAL VOID RATION, e	.421	.421	.421
CONS. DRY DENSITY, PCF	106.6	108.1	109.3
CONS. MOISTURE, %	17.1	16.2	15.6
CONS. VOID RATION, e	.411	.391	.376

TOTAL ϕ = 18°
TOTAL C = 0.45 ksf
EFF. ϕ = 34.5°
EFF. C = 0.18 ksf
Gs = 2.41

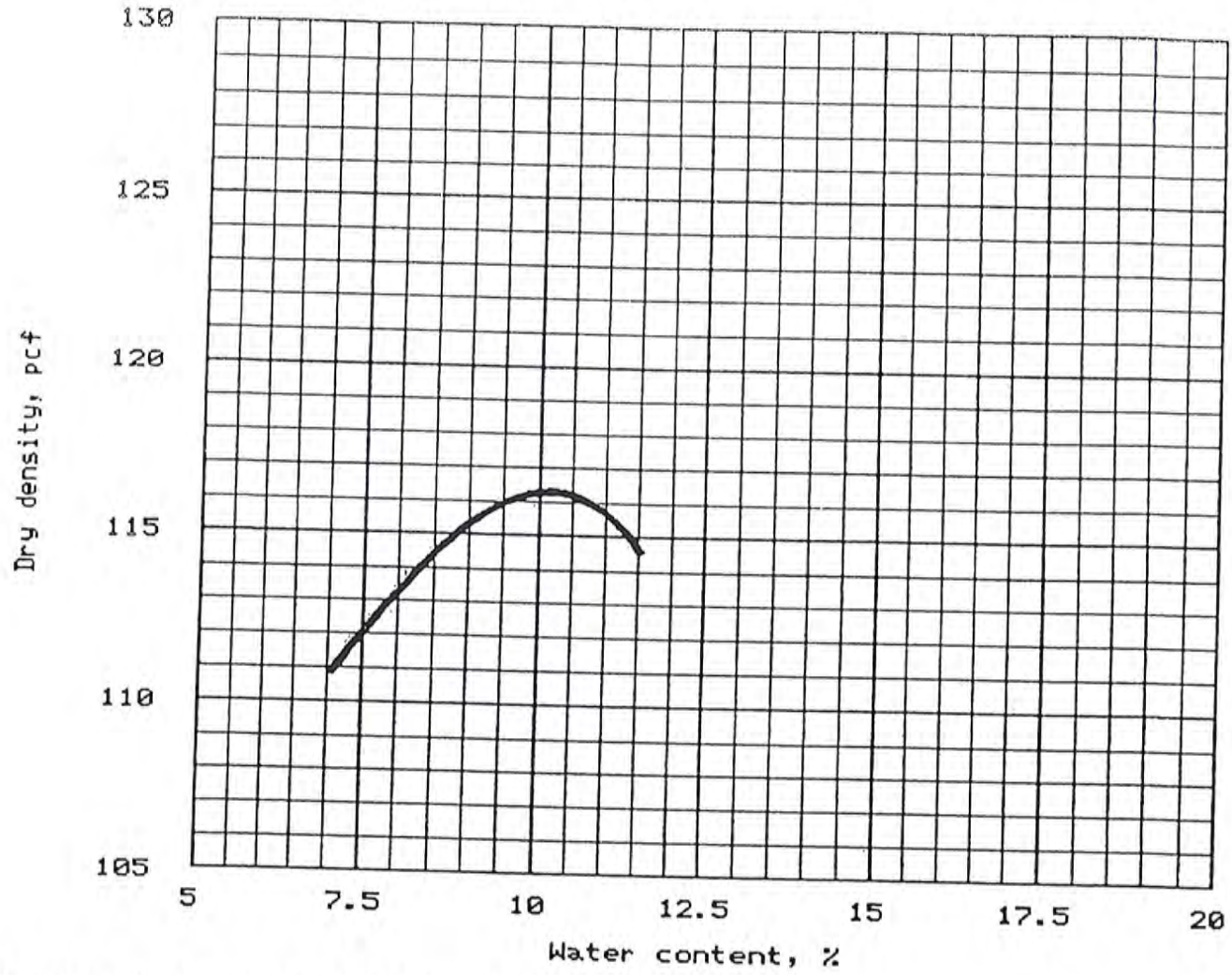


AXIAL STRESS, KSF



STRESS - STRAIN CURVES / MOHR DIAGRAMS

GROUND ENGINEERING
AND TESTING SERVICE, INC



"Standard" Proctor, ASTM D 698, Method C

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
	USCS	AASHTO	%				%	%

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 10.2 % Maximum dry density = 116.3 pcf	COARSE REFUSE

Project No.:
Project: PITTSBURG & MIDWAY COAL MINING CO
Location: NORTH RIVER UNDERGROUND #1

Date: 3-05-1992

Remarks:
SAMPLE B-2

PROCTOR TEST REPORT

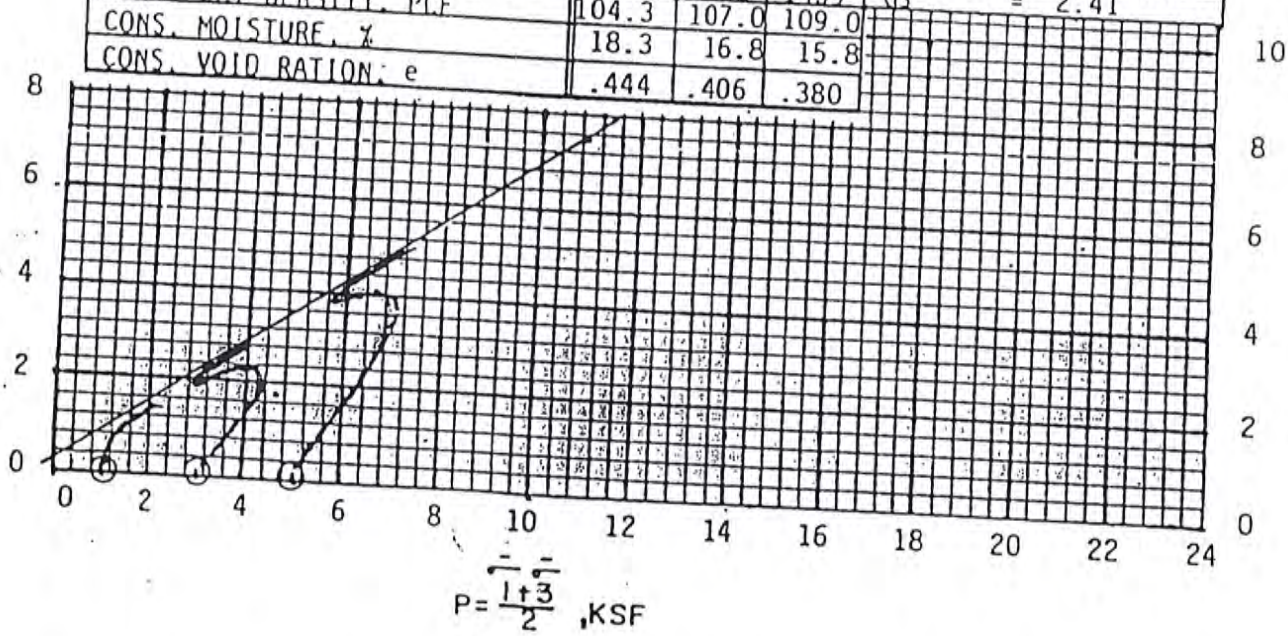
PERC ENGINEERING CO., INC.

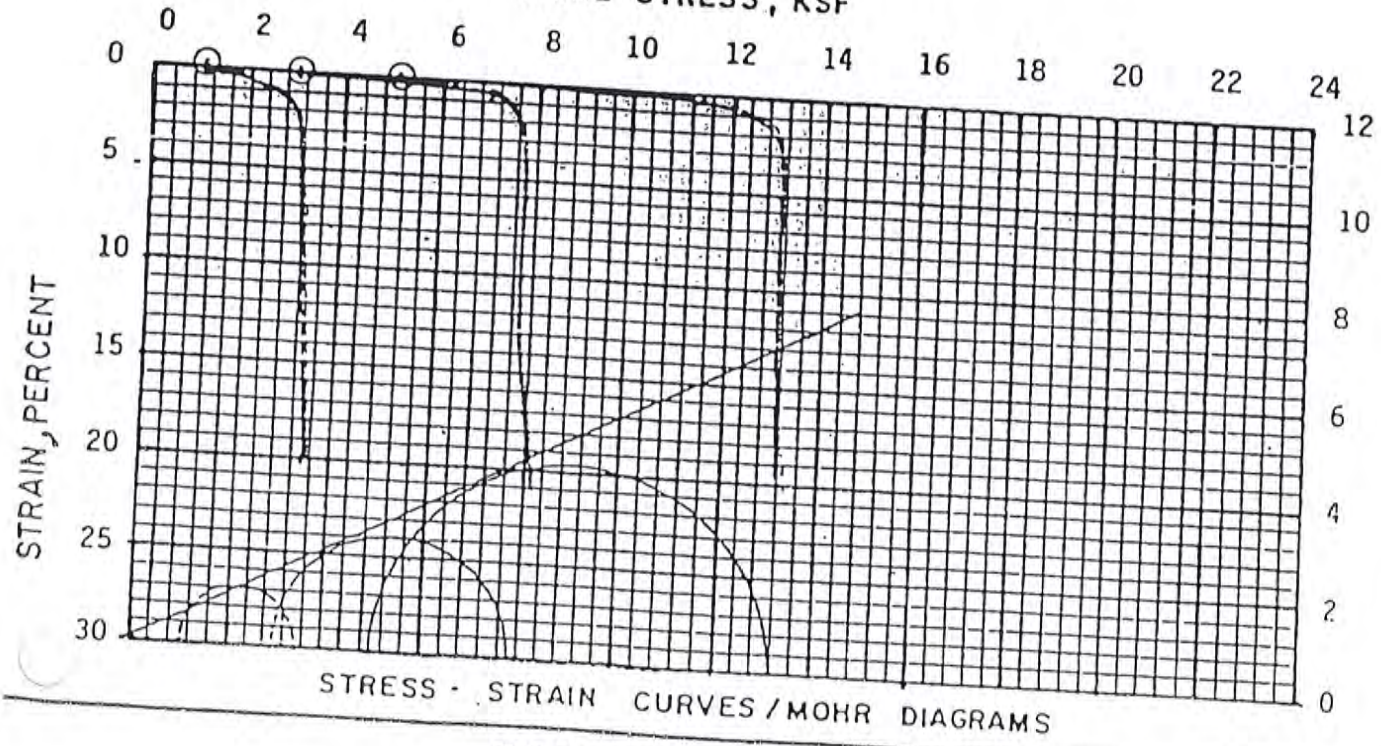
Fig. No. _____

TRIAXAL SHEAR/CONSOLIDATED UNDRAINED/PORE PRESSURE

JOB NO. B1778	JOB NAME Perc Engineering	BORING/PIT NO. B-2
REVIEWED	LOCATION PMNR #2	SAMPLE NO./TYPE S-2
DATE 09/91	TEST PROCEDURE Remolded 90%	DEPTH/ELEV. 0

SPECIMEN NO.	1	2	3	
CONFINING PRESSURE, KSF	1	3	5	TOTAL ϕ = 17.2°
INITIAL DRY DENSITY, PCF	104.2	104.3	104.5	TOTAL C = 0.4 ksf
INITIAL MOISTURE, %	10.2	10.2	10.2	EFF. ϕ = 38.7°
INITIAL VOID RATION, e	.444	.435	.439	EFF. C = 0.12 ksf
CONS. DRY DENSITY, PCF	104.3	107.0	109.0	Gs = 2.41
CONS. MOISTURE, %	18.3	16.8	15.8	
CONS. VOID RATION, e	.444	.406	.380	





STRESS - STRAIN CURVES / MOHR DIAGRAMS

GROUND ENGINEERING
AND TESTING SERVICE INC.

PERC ENGINEERING CO., INC.
CIVIL ENGINEERS & LAND SURVEYORS

TELEPHONE (205) 384-6553
FACSIMILE (205) 384-6491

P.O. BOX 1712
JASPER, ALABAMA 35502

OVERBURDEN ANALYSIS:

COMPANY NAME: Pittsburg & Midway Coal Co.

MINE NAME : Underground #1

DRILL HOLE #: Topsoil

COLLECTED BY/DATE: P&M /

ANALYZED BY/DATE: JR,JD,MW/3-5-92

-All analysis performed according to EPA Standards.

Sample No.	PASTE pH	% SULFUR	MAX. POT. *ACIDITY	NEUT. *POT.	A-B *ACCOUNT	ACID FORMING?
B-3	4.98	0.020	0.625	-0.25	-0.875	N
B-4	4.98	0.003	0.094	0.0	-0.094	N
AVERAGE	4.98	0.012	0.360	-0.125	-0.485	N

*Calculated in tons $CaCo_3$ per 100 tons of material.
**Averages do not include coal seams to be mined or intervals below lowest seam.

PERC ENGINEERING CO., INC.
CIVIL ENGINEERS & LAND SURVEYORS

TELEPHONE (205) 384-5553
FACSIMILE (205) 384-6401

P.O. BOX 1712
JASPER, ALABAMA 35502

OVERBURDEN ANALYSIS:

COMPANY NAME: Pittsburg & Midway Coal Co.
COLLECTED BY/DATE: JK / 12-91

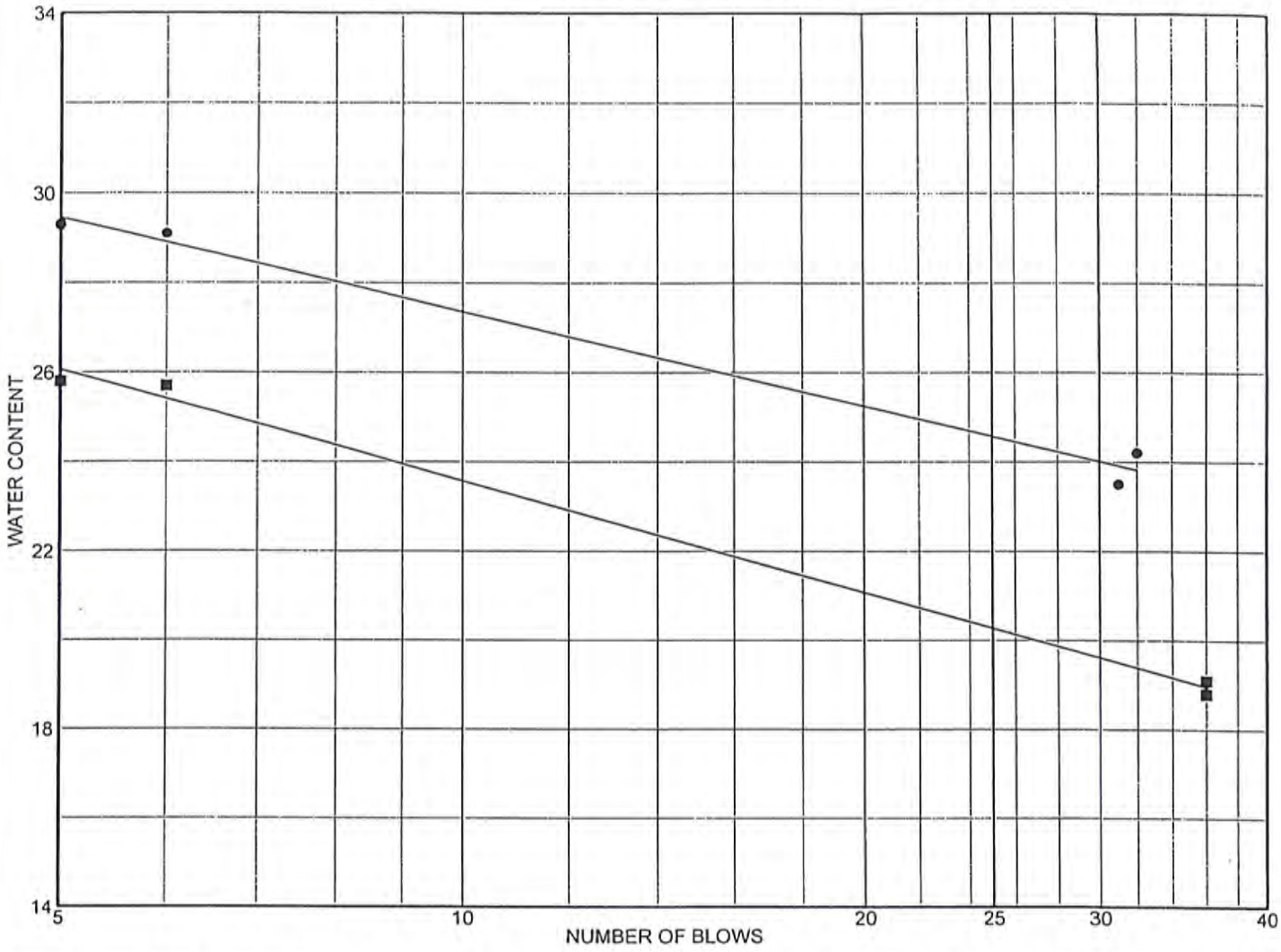
MINE NAME : Underground #1
ANALYZED BY/DATE: MW / 2-5-92

DRILL HOLE #: Coarse Refuse
-All analysis performed according to EPA Standards.

Sample No.	PASTE pH	% SULFUR	MAX. POT. *ACIDITY	NEUT. *POT.	A-B *ACCOUNT	ACID FORMING?
B-1	6.07	1.610	50.31	56.25	5.940	N
B-2	7.38	2.010	62.81	85.00	22.190	N
AVERAGE	6.725	1.810	56.56	70.63	14.065	N

Calculated in tons $CaCo_3$ per 100 tons of material.
*Averages do not include coal seams to be mined or intervals below lowest seam.

LIQUID AND PLASTIC LIMITS TEST REPORT



	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Sandy silty clay	25	19	6	73.01	52.2	CL-ML
■	Sandy silty clay	20	16	4	84.00	53.0	CL-ML

Project No. **Client:** CHEVRON MINING

Project: BASIN 024

BASIN 024

● **Location:** NORTH RIVER MINE

■ **Location:** NORTH RIVER MINE

Remarks:

● DAM MATERIAL

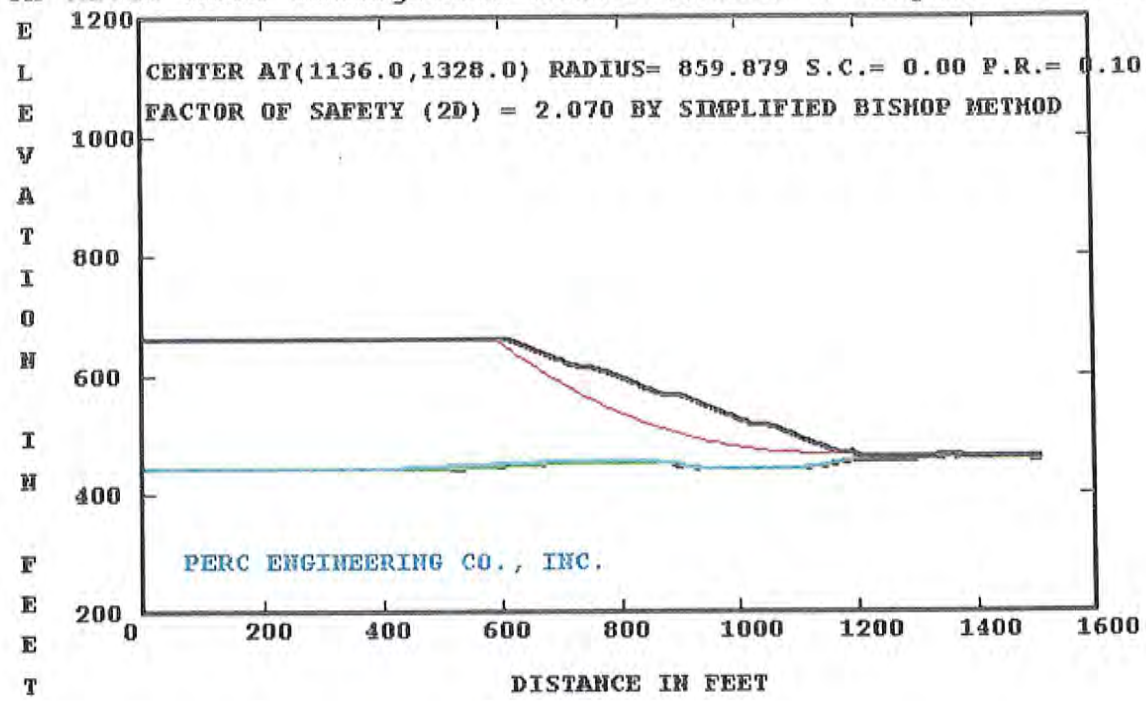
■ FOUNDATION MATERIAL

PERC ENGINEERING CO., INC.

Jasper, Alabama

DATE 4-15-2009

North River No.1 Underground Coarse Refuse NE Expansion I-I'



REAME (ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EARTHWORKS)
THIS 2004 VERSION IS LICENSED BY CIVIL ENGINEERING SOFTWARE CENTER TO

PERC ENGINEERING CO., INC.

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TITLE -North River No.1 Underground Coarse Refuse NE Expansion I-I'

NO. OF STATIC AND SEISMIC CASES (NCASE) = 1

NO. OF NONCIRCULAR SLIP SURFACES (NSS) = 0

TWO-DIMENSIONAL ANALYSIS (THREED = 0)

CASE NO. 1 SEISMIC COEFFICIENT (SEIC) =0.000

NO. OF BOUNDARY LINES (NBL) = 4

NO. OF POINTS ON BOUNDARY LINE 1 = 18

1	X COORD.= 0	Y COORD.= 440
2	X COORD.= 360.22	Y COORD.= 440
3	X COORD.= 471.73	Y COORD.= 440
4	X COORD.= 669.94	Y COORD.= 449.94
5	X COORD.= 864.45	Y COORD.= 450
6	X COORD.= 887.39	Y COORD.= 450
7	X COORD.= 888.36	Y COORD.= 450
8	X COORD.= 896.11	Y COORD.= 447.52
9	X COORD.= 960.76	Y COORD.= 440
10	X COORD.= 1094.29	Y COORD.= 440
11	X COORD.= 1151.25	Y COORD.= 447.04
12	X COORD.= 1187.9	Y COORD.= 452.54
13	X COORD.= 1199.43	Y COORD.= 455
14	X COORD.= 1258.25	Y COORD.= 455
15	X COORD.= 1342.78	Y COORD.= 460
16	X COORD.= 1365.36	Y COORD.= 460
17	X COORD.= 1493.71	Y COORD.= 455.3
18	X COORD.= 1510.88	Y COORD.= 455

NO. OF POINTS ON BOUNDARY LINE 2 = 17

1	X COORD.= 0	Y COORD.= 440
2	X COORD.= 438.28	Y COORD.= 440
3	X COORD.= 666.37	Y COORD.= 451.44
4	X COORD.= 864.38	Y COORD.= 451.5
5	X COORD.= 887.39	Y COORD.= 451.5
6	X COORD.= 899.39	Y COORD.= 451.5
7	X COORD.= 909.5	Y COORD.= 448.27
8	X COORD.= 967.64	Y COORD.= 441.5
9	X COORD.= 1087.13	Y COORD.= 441.5
10	X COORD.= 1139.16	Y COORD.= 447.92
11	X COORD.= 1174.79	Y COORD.= 453.28
12	X COORD.= 1189.89	Y COORD.= 456.5
13	X COORD.= 1254.14	Y COORD.= 456.5
14	X COORD.= 1338.68	Y COORD.= 461.5
15	X COORD.= 1368.02	Y COORD.= 461.5

16 X COORD.= 1498.86 Y COORD.= 456.71
17 X COORD.= 1510.88 Y COORD.= 456.5

NO. OF POINTS ON BOUNDARY LINE 3 = 18
1 X COORD.= 0 Y COORD.= 440
2 X COORD.= 360.22 Y COORD.= 440
3 X COORD.= 658.03 Y COORD.= 454.94
4 X COORD.= 864.38 Y COORD.= 455
5 X COORD.= 864.38 Y COORD.= 451.5
6 X COORD.= 887.39 Y COORD.= 451.5
7 X COORD.= 899.39 Y COORD.= 451.5
8 X COORD.= 909.5 Y COORD.= 448.27
9 X COORD.= 967.64 Y COORD.= 441.5
10 X COORD.= 1087.13 Y COORD.= 441.5
11 X COORD.= 1139.16 Y COORD.= 447.92
12 X COORD.= 1174.79 Y COORD.= 453.28
13 X COORD.= 1189.89 Y COORD.= 456.5
14 X COORD.= 1215.07 Y COORD.= 460
15 X COORD.= 1244.57 Y COORD.= 460
16 X COORD.= 1329.1 Y COORD.= 465
17 X COORD.= 1374.22 Y COORD.= 465
18 X COORD.= 1510.88 Y COORD.= 460

NO. OF POINTS ON BOUNDARY LINE 4 = 47
1 X COORD.= 0 Y COORD.= 658.01
2 X COORD.= 168.31 Y COORD.= 658.4
3 X COORD.= 212.18 Y COORD.= 658.5
4 X COORD.= 589.02 Y COORD.= 659.38
5 X COORD.= 594.92 Y COORD.= 660
6 X COORD.= 609.04 Y COORD.= 661.41
7 X COORD.= 612.62 Y COORD.= 660
8 X COORD.= 625.29 Y COORD.= 655
9 X COORD.= 688.68 Y COORD.= 630
10 X COORD.= 701.15 Y COORD.= 625
11 X COORD.= 713.43 Y COORD.= 620
12 X COORD.= 725.72 Y COORD.= 615
13 X COORD.= 734.17 Y COORD.= 611.56
14 X COORD.= 754.19 Y COORD.= 613.58
15 X COORD.= 763.25 Y COORD.= 610
16 X COORD.= 775.89 Y COORD.= 605
17 X COORD.= 826.48 Y COORD.= 585
18 X COORD.= 839.12 Y COORD.= 580
19 X COORD.= 851.44 Y COORD.= 575
20 X COORD.= 876.08 Y COORD.= 565
21 X COORD.= 879.32 Y COORD.= 563.68
22 X COORD.= 892.03 Y COORD.= 565
23 X COORD.= 899.34 Y COORD.= 565.7
24 X COORD.= 901.11 Y COORD.= 565
25 X COORD.= 913.73 Y COORD.= 560
26 X COORD.= 976.87 Y COORD.= 535
27 X COORD.= 989.35 Y COORD.= 530
28 X COORD.= 1001.69 Y COORD.= 525
29 X COORD.= 1014.04 Y COORD.= 520
30 X COORD.= 1024.47 Y COORD.= 515.78
31 X COORD.= 1044.49 Y COORD.= 517.82
32 X COORD.= 1051.61 Y COORD.= 515
33 X COORD.= 1064.22 Y COORD.= 510

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34 X COORD.= 1127.29        Y COORD.= 485
35 X COORD.= 1139.82        Y COORD.= 480
36 X COORD.= 1152.34        Y COORD.= 475
37 X COORD.= 1164.87        Y COORD.= 470
38 X COORD.= 1169.62        Y COORD.= 468.1
39 X COORD.= 1188.21        Y COORD.= 470
40 X COORD.= 1189.64        Y COORD.= 470.15
41 X COORD.= 1190.01        Y COORD.= 470
42 X COORD.= 1202.54        Y COORD.= 465
43 X COORD.= 1215.07        Y COORD.= 460
44 X COORD.= 1244.57        Y COORD.= 460
45 X COORD.= 1329.1         Y COORD.= 465
46 X COORD.= 1374.22        Y COORD.= 465
47 X COORD.= 1510.88        Y COORD.= 460

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
 1       0.000       0.000       0.050       0.000       0.000       0.000
        -0.320      -0.116       0.000       0.124       0.150       0.213
         0.000       0.059       0.000      -0.037      -0.017
 2       0.000       0.050       0.000       0.000       0.000      -0.319
        -0.116       0.000       0.123       0.150       0.213       0.000
         0.059       0.000      -0.037      -0.017
 3       0.000       0.050       0.000   99999.000       0.000       0.000
        -0.319      -0.116       0.000       0.123       0.150       0.213
         0.139       0.000       0.059       0.000      -0.037
 4       0.002       0.002       0.002       0.105       0.100      -0.394
        -0.395      -0.394      -0.401      -0.407      -0.407      -0.407
         0.101      -0.395      -0.396      -0.395      -0.396      -0.406
        -0.406      -0.407       0.104       0.096      -0.395      -0.396
        -0.396      -0.401      -0.405      -0.405      -0.405       0.102
        -0.396      -0.397      -0.396      -0.399      -0.399      -0.399
        -0.400       0.102       0.105      -0.405      -0.399      -0.399
         0.000       0.059       0.000      -0.037

MIN. DEPTH OF TALLEST SLICE (DMIN) = 0
NO. OF RADIUS CONTROL ZONES (NRCZ) = 1

RADIUS DECREMENT (RDEC) FOR ZONE 1 = 0
NO. OF CIRCLES (NCIR) FOR ZONE 1 = 5
ID NO. FOR FIRST CIRCLE (INFC) FOR ZONE 1 = 1
NO. OF BOTTOM LINES (NOL) FOR ZONE 1 = 1
LINE NO. (LINO)  BEG. NO. (NBP)  END NO. (NEP)
      1                1               18

UNIT WEIGHT OF WATER (GW) = 62.4

SOIL NO.      COHESION      FRIC. ANGLE   UNIT WEIGHT
 1             10000         45            170
 2             230.4         26.56         128.18
 3             180           34.5          128.31

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES (NSLI) = 10
NO. OF ADD. CIRCLES (NAC) = 3
ANALYSIS BY SIMPLIFIED BISHOP METHOD (MTHD=2)
NUMBER OF FORCES (NFO)= 0
```

SOFT SOIL NUMBER (SSN)= 0

PORE PRESSURE RATIO (RU) = 0.1

NO. OF SOILS WITH DIFFERENT PORE PRESSURE RATIO (NSDP) = 0
INPUT COORD. OF GRID POINTS 1,2,AND 3

POINT 1 X COORD. = 860 Y COORD. = 1185
POINT 2 X COORD. = 860 Y COORD. = 660
POINT 3 X COORD. = 1280 Y COORD. = 660

X INCREMENT (XINC) = 52 Y INCREMENT (YINC) = 52
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2 (ND12) = 5
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3 (ND23) = 4
ONLY A SUMMARY TABLE IS PRINTED (NPRT = 0)
SLICES WILL BE SUBDIVIDED

AUTOMATIC SEARCH WILL FOLLOW AFTER GRID

FACTORS OF SAFETY BASED ON GRID

IN THE FOLLOWING TABLE WARNING INDICATES HOW MANY TIMES THE
MAXIMUM RADIUS IS LIMITED BY THE END POINTS OF GROUND LINES

CENTER X COORDINATE	CENTER Y COORDINATE	NO. OF CIRCLE TOTAL	CRITIC.	RADIUS	LOWEST F.S.	WARNING
860	1185	8	6	602.530	2.363	0
860	1080	8	5	508.617	2.219	0
860	975	8	5	406.273	2.150	0
860	870	8	5	305.890	2.235	0
860	765	8	7	193.246	2.184	0
860	660	8	7	94.865	2.221	0
965	1185	11	10	648.042	2.148	0
965	1080	11	4	560.613	2.123	0
965	975	11	4	460.394	2.168	0
965	870	11	10	345.993	2.200	0
965	765	11	4	255.228	2.253	0
965	660	8	7	122.568	2.416	0
1070	1185	11	8	706.735	2.115	0
1070	1080	11	9	613.976	2.146	0
1070	975	11	10	488.661	2.164	0
1070	870	11	9	408.739	2.223	0
1070	765	11	10	271.197	2.279	0
1070	660	11	3	189.780	2.451	0
1175	1185	11	10	714.473	2.094	0
1175	1080	11	7	620.643	2.145	0
1175	975	11	8	504.778	2.134	0
1175	870	11	6	413.712	2.194	0
1175	765	17	12	296.074	2.271	0
1175	660	11	4	190.740	2.176	0
1280	1185	5	1	727.442	2.321	0
1280	1080	11	7	621.303	2.459	0
1280	975	5	1	517.808	2.491	0
1280	870	5	1	412.992	7.009	0
1280	765	11	7	306.435	20.078	0
1280	660	11	7	201.618	19.141	0

GRID IS EXPANDED AS FOLLOWS SO MINIMUM FACTOR OF SAFETY FALLS WITHIN THE GRID

860	1290	8	6	701.304	2.536	0
965	1290	8	5	735.505	2.198	0
1070	1290	11	8	789.511	2.102	0
1175	1290	11	9	820.264	2.099	0
1280	1290	11	8	828.514	2.186	0

LOWEST FACTOR OF SAFETY AT EACH GRID POINT IS TABULATED BELOW

COORDINATE	860.000	965.000	1070.000	1175.000	1280.000
1290.000	2.536	2.198	2.102	2.099	2.186
1185.000	2.363	2.148	2.115	2.094	2.321
1080.000	2.219	2.123	2.146	2.145	2.459
975.000	2.150	2.168	2.164	2.134	2.491
870.000	2.235	2.200	2.223	2.194	7.009
765.000	2.184	2.253	2.279	2.271	20.078
660.000	2.221	2.416	2.451	2.176	19.141

MINIMUM FACTORS OF SAFETY OCCUR AT THE FOLLOWING 6 CENTERS

FACTOR OF SAFETY = 2.094 AT (1175.000,1185.000)
FACTOR OF SAFETY = 2.123 AT (965.000,1080.000)
FACTOR OF SAFETY = 2.150 AT (860.000,975.000)
FACTOR OF SAFETY = 2.134 AT (1175.000,975.000)
FACTOR OF SAFETY = 2.184 AT (860.000,765.000)
FACTOR OF SAFETY = 2.176 AT (1175.000,660.000)

AUTOMATIC SEARCH WILL BE MADE ONLY ON THE CENTER WITH THE SMALLEST F.S. MORE SEARCH FROM OTHER CENTER MAY BE NEEDED TO ENSURE THAT MINIMUM F.S. IS OBTAINED.

AT POINT (1175 1185) RADIUS 714.473
THE MINIMUM FACTOR OF SAFETY IS 2.094

FACTORS OF SAFETY BASED ON SEARCH

IN THE FOLLOWING TABLE WARNING INDICATES HOW MANY TIMES THE MAXIMUM RADIUS IS LIMITED BY THE END POINTS OF GROUND LINES

CENTER X COORDINATE	CENTER Y COORDINATE	NO. OF CIRCLE TOTAL	CRITIC.	RADIUS	LOWEST F.S.	WARNING
1175	1185	11	10	714.473	2.094	0
1227	1185	11	10	718.508	2.172	0
1123	1185	11	9	715.105	2.113	0
1175	1237	11	9	768.195	2.093	0
1175	1289	11	9	819.281	2.100	0
1227	1237	11	8	775.997	2.151	0
1123	1237	11	2	770.097	2.089	0
1071	1237	11	9	747.667	2.107	0
1123	1289	11	2	821.414	2.077	0
1123	1341	11	10	864.578	2.080	0
1175	1289	11	9	819.281	2.100	0
1071	1289	11	8	788.589	2.102	0
1136	1289	11	2	821.333	2.076	0
1149	1289	11	2	821.454	2.090	0
1136	1302	11	2	834.177	2.073	0

1136	1315	11	2	847.026	2.071	0
1136	1328	11	2	859.879	2.070	0
1136	1341	11	2	872.737	2.071	0
1149	1328	11	2	859.993	2.070	0
1123	1328	11	9	855.863	2.079	0

AT POINT (1136 1328) RADIUS 859.879

THE MINIMUM FACTOR OF SAFETY IS 2.070

AFTER SEARCH, MINIMUN F.S. STILL FALLS OUTSIDE THE GRID, SO GRID IS EXPANDED

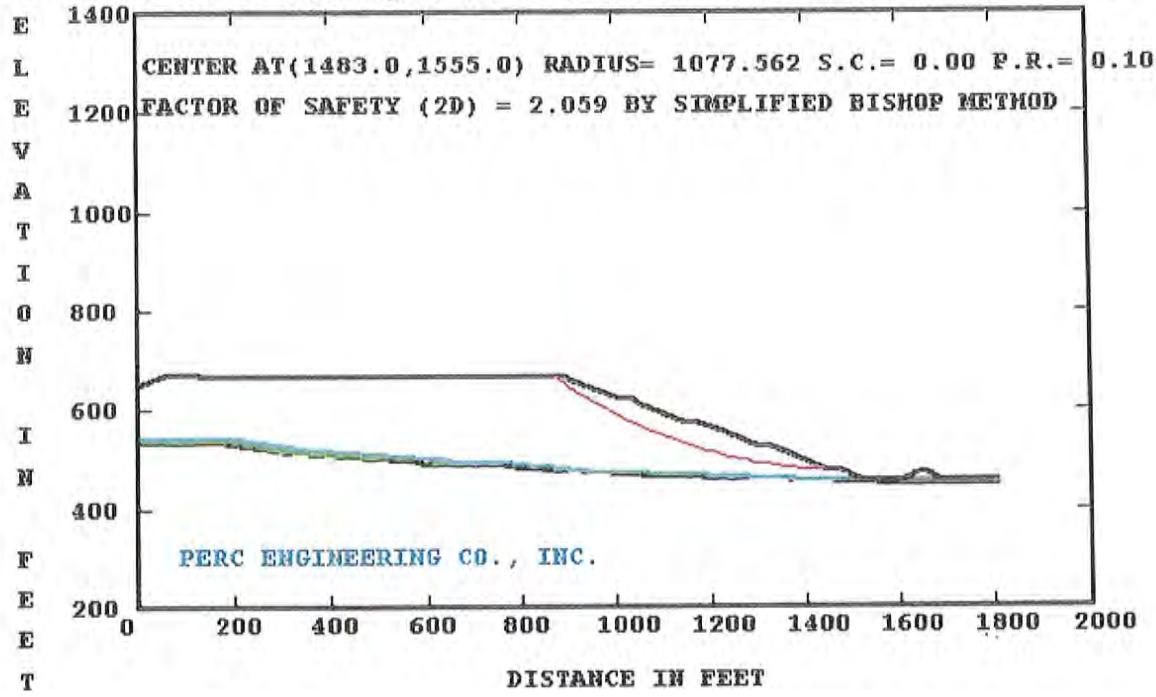
CENTER X COORDINATE	CENTER Y COORDINATE	NO. OF CIRCLE TOTAL	CRITIC.	RADIUS	LOWEST F.S.	WARNING
860	1395	8	7	792.296	2.633	0
965	1395	8	6	830.169	2.249	0
1070	1395	11	9	879.924	2.085	0
1175	1395	11	8	930.357	2.074	0
1280	1395	5	1	937.076	2.177	0

SUMMARY OF SLICE INFORMATION FOR MOST CRITICAL SLIP SURFACE

SL. NO.	SOIL NO.	SLICE WIDTH	SLICE HEIGHT	WATER HEIGHT	BOTTOM SINE	TOTAL WEIGHT	EFFEC. WEIGHT	RESIS. MOMENT	DRIVING MOMENT
1	3	0.868	0.021	0.000	.054	.235E+01	.212E+01	.136E+06	.109E+03
2	3	0.868	0.063	0.000	.055	.699E+01	.629E+01	.138E+06	.329E+03
3	3	0.868	0.103	0.000	.056	.115E+02	.104E+02	.141E+06	.552E+03
4	3	0.868	0.143	0.000	.057	.159E+02	.144E+02	.143E+06	.778E+03
5	3	0.868	0.182	0.000	.058	.203E+02	.183E+02	.145E+06	.101E+04
6	3	0.868	0.220	0.000	.059	.245E+02	.221E+02	.148E+06	.124E+04
7	3	0.868	0.258	0.000	.060	.287E+02	.258E+02	.150E+06	.147E+04
8	3	0.410	0.284	0.000	.060	.150E+02	.135E+02	.715E+05	.778E+03
9	3	0.458	0.303	0.000	.061	.178E+02	.160E+02	.804E+05	.933E+03
10	3	0.868	0.332	0.000	.062	.369E+02	.332E+02	.154E+06	.196E+04
11	3	0.105	0.352	0.000	.062	.474E+01	.427E+01	.188E+05	.254E+03
12	3	0.370	0.268	0.000	.063	.127E+02	.115E+02	.641E+05	.685E+03
13	3	0.393	0.091	0.000	.063	.458E+01	.412E+01	.633E+05	.248E+03
							SUM	.145E+07	.103E+05

AT CENTER (1136.000 , 1328.000) WITH RADIUS 859.879 AND SEIS. COEFF. 0.00
FACTOR OF SAFETY BY NORMAL METHOD IS 140.423
FACTOR OF SAFETY BY SIMPLIFIED BISHOP METHOD IS 2.070

North River No.1 Underground Coarse Refuse NE Expansion J-J'



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REAME (ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EARTHWORKS)
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INPUT FILE NAME  -C:\REAME2004\ChevronRefuseJJ.DAT

TITLE -North River No.1 Underground Coarse Refuse NE Expansion J-J'

NO. OF STATIC AND SEISMIC CASES (NCASE) = 1

NO. OF NONCIRCULAR SLIP SURFACES (NSS) = 0

TWO-DIMENSIONAL ANALYSIS ( THREED = 0 )


CASE NO.  1   SEISMIC COEFFICIENT (SEIC) =0.000

NO. OF BOUNDARY LINES (NBL) = 4

NO. OF POINTS ON BOUNDARY LINE 1 = 16
 1  X COORD.= 0              Y COORD.= 533.5
 2  X COORD.= 180            Y COORD.= 533.5
 3  X COORD.= 298.84         Y COORD.= 515.34
 4  X COORD.= 577.69         Y COORD.= 496.61
 5  X COORD.= 602.19         Y COORD.= 488.5
 6  X COORD.= 735.46         Y COORD.= 488.5
 7  X COORD.= 765.65         Y COORD.= 488.5
 8  X COORD.= 790.23         Y COORD.= 485.55
 9  X COORD.= 849.03         Y COORD.= 479.98
 10 X COORD.= 928.6          Y COORD.= 474.28
 11 X COORD.= 1057.2         Y COORD.= 468.99
 12 X COORD.= 1183.04        Y COORD.= 463.84
 13 X COORD.= 1364.2         Y COORD.= 458.73
 14 X COORD.= 1551.92        Y COORD.= 453.66
 15 X COORD.= 1792.53        Y COORD.= 449.18
 16 X COORD.= 1804.94        Y COORD.= 446.89

NO. OF POINTS ON BOUNDARY LINE 2 = 18
 1  X COORD.= 0              Y COORD.= 536.5
 2  X COORD.= 196.22         Y COORD.= 536.5
 3  X COORD.= 320.62         Y COORD.= 517.49
 4  X COORD.= 603.31         Y COORD.= 498.5
 5  X COORD.= 624.47         Y COORD.= 491.5
 6  X COORD.= 735.46         Y COORD.= 491.5
 7  X COORD.= 779.72         Y COORD.= 491.5
 8  X COORD.= 812.16         Y COORD.= 487.6
 9  X COORD.= 868.18         Y COORD.= 482.29
 10 X COORD.= 943.24         Y COORD.= 476.92
 11 X COORD.= 1068.58        Y COORD.= 471.76
 12 X COORD.= 1192.82        Y COORD.= 466.69
 13 X COORD.= 1372.19        Y COORD.= 461.63
 14 X COORD.= 1519.62        Y COORD.= 457.64
 15 X COORD.= 1526.22        Y COORD.= 455
 16 X COORD.= 1598.78        Y COORD.= 455
 17 X COORD.= 1600.78        Y COORD.= 455.8
 18 X COORD.= 1804.94        Y COORD.= 449.89

NO. OF POINTS ON BOUNDARY LINE 3 = 20
 1  X COORD.= 0              Y COORD.= 540
 2  X COORD.= 215.15         Y COORD.= 540
 3  X COORD.= 346.02         Y COORD.= 520
 4  X COORD.= 629.14         Y COORD.= 500.99
 5  X COORD.= 635.35         Y COORD.= 500
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6 X COORD.= 650.45 Y COORD.= 495
7 X COORD.= 660.84 Y COORD.= 491.5
8 X COORD.= 779.72 Y COORD.= 491.5
9 X COORD.= 812.16 Y COORD.= 487.6
10 X COORD.= 868.18 Y COORD.= 482.29
11 X COORD.= 943.24 Y COORD.= 476.92
12 X COORD.= 1068.58 Y COORD.= 471.76
13 X COORD.= 1192.82 Y COORD.= 466.69
14 X COORD.= 1372.19 Y COORD.= 461.63
15 X COORD.= 1519.62 Y COORD.= 457.64
16 X COORD.= 1526.22 Y COORD.= 455
17 X COORD.= 1598.78 Y COORD.= 455
18 X COORD.= 1600.78 Y COORD.= 455.8
19 X COORD.= 1609.29 Y COORD.= 459.2
20 X COORD.= 1804.94 Y COORD.= 453.39

NO. OF POINTS ON BOUNDARY LINE 4 = 49
1 X COORD.= 0 Y COORD.= 650.74
2 X COORD.= 19.95 Y COORD.= 657.78
3 X COORD.= 40.42 Y COORD.= 665
4 X COORD.= 54.59 Y COORD.= 670
5 X COORD.= 61.27 Y COORD.= 672.26
6 X COORD.= 86.81 Y COORD.= 670
7 X COORD.= 88.59 Y COORD.= 669.89
8 X COORD.= 124.96 Y COORD.= 670
9 X COORD.= 125.22 Y COORD.= 670
10 X COORD.= 863.91 Y COORD.= 667.85
11 X COORD.= 885.1 Y COORD.= 669.9
12 X COORD.= 898.17 Y COORD.= 665
13 X COORD.= 911.02 Y COORD.= 660
14 X COORD.= 999.09 Y COORD.= 625
15 X COORD.= 1011.12 Y COORD.= 620.22
16 X COORD.= 1031.12 Y COORD.= 622.26
17 X COORD.= 1036.79 Y COORD.= 620
18 X COORD.= 1049.31 Y COORD.= 615
19 X COORD.= 1149.87 Y COORD.= 575
20 X COORD.= 1156.14 Y COORD.= 572.51
21 X COORD.= 1176.14 Y COORD.= 574.54
22 X COORD.= 1187.51 Y COORD.= 570
23 X COORD.= 1200.03 Y COORD.= 565
24 X COORD.= 1212.54 Y COORD.= 560
25 X COORD.= 1225.1 Y COORD.= 555
26 X COORD.= 1300.49 Y COORD.= 525
27 X COORD.= 1301.16 Y COORD.= 524.73
28 X COORD.= 1303.83 Y COORD.= 525
29 X COORD.= 1321.16 Y COORD.= 526.76
30 X COORD.= 1325.56 Y COORD.= 525
31 X COORD.= 1338.08 Y COORD.= 520
32 X COORD.= 1438.42 Y COORD.= 480
33 X COORD.= 1446.18 Y COORD.= 476.91
34 X COORD.= 1466.18 Y COORD.= 478.93
35 X COORD.= 1476.18 Y COORD.= 475
36 X COORD.= 1483.69 Y COORD.= 472
37 X COORD.= 1488.69 Y COORD.= 470
38 X COORD.= 1501.2 Y COORD.= 465
39 X COORD.= 1513.71 Y COORD.= 460
40 X COORD.= 1526.22 Y COORD.= 455
41 X COORD.= 1598.78 Y COORD.= 455
42 X COORD.= 1611.29 Y COORD.= 460
43 X COORD.= 1623.8 Y COORD.= 465
44 X COORD.= 1636.27 Y COORD.= 470
45 X COORD.= 1641.28 Y COORD.= 472
46 X COORD.= 1653.29 Y COORD.= 472
47 X COORD.= 1658.29 Y COORD.= 470
48 X COORD.= 1689.03 Y COORD.= 457.71

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 49 X COORD.= 1804.94        Y COORD.= 455.56

LINE NO. AND SLOPE OF EACH SEGMENT ARE:
 1       0.000      -0.153      -0.067      -0.331       0.000       0.000
        -0.120      -0.095      -0.072      -0.041      -0.041      -0.028
        -0.027      -0.019      -0.185
 2       0.000      -0.153      -0.067      -0.331       0.000       0.000
        -0.120      -0.095      -0.072      -0.041      -0.041      -0.028
        -0.027      -0.400       0.000       0.400      -0.029
 3       0.000      -0.153      -0.067      -0.159      -0.331      -0.337
         0.000      -0.120      -0.095      -0.072      -0.041      -0.041
        -0.028      -0.027      -0.400       0.000       0.400       0.400
        -0.030
 4       0.353       0.353       0.353       0.338      -0.088      -0.062
         0.003       0.000      -0.003       0.097      -0.375      -0.389
        -0.397      -0.397       0.102      -0.399      -0.399      -0.398
        -0.397       0.101      -0.399      -0.399      -0.400      -0.398
        -0.398      -0.403       0.101       0.102      -0.400      -0.399
        -0.399      -0.398       0.101      -0.393      -0.399      -0.400
        -0.400      -0.400      -0.400       0.000       0.400       0.400
         0.401       0.399       0.000      -0.400      -0.400      -0.019

MIN. DEPTH OF TALLEST SLICE (DMIN) = 0
NO. OF RADIUS CONTROL ZONES (NRCZ) = 1

RADIUS DECREMENT (RDEC) FOR ZONE 1 = 0
NO. OF CIRCLES (NCIR) FOR ZONE 1 = 5
ID NO. FOR FIRST CIRCLE (INFC) FOR ZONE 1 = 1
NO. OF BOTTOM LINES (NOL) FOR ZONE 1 = 1
LINE NO. (LINO)  BEG. NO. (NBP)  END NO. (NEP)
      1                1               16

UNIT WEIGHT OF WATER (GW) = 62.4

SOIL NO.      COHESION      FRIC. ANGLE   UNIT WEIGHT
 1             10000         45            170
 2             230.4         26.56         128.18
 3             180           34.5          128.31

USE PORE PRESSURE RATIO
USE GRID
NO. OF SLICES (NSLI) = 10
NO. OF ADD. CIRCLES (NAC) = 3
ANALYSIS BY SIMPLIFIED BISHOP METHOD (MTHD=2)
NUMBER OF FORCES (NFO)= 0
SOFT SOIL NUMBER (SSN)= 0

PORE PRESSURE RATIO (RU) = 0.1

NO. OF SOILS WITH DIFFERENT PORE PRESSURE RATIO (NSDP) = 0
INPUT COORD. OF GRID POINTS 1,2,AND 3

POINT 1 X COORD. = 1220   Y COORD. = 1360
POINT 2 X COORD. = 1220   Y COORD. = 660
POINT 3 X COORD. = 1780   Y COORD. = 660

X INCREMENT (XINC) = 68     Y INCREMENT (YINC) = 68
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2 (ND12) = 5
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3 (ND23) = 4
DETAILED PRINTOUT (NPRT = 2)
SLICES WILL BE SUBDIVIDED

AUTOMATIC SEARCH WILL FOLLOW AFTER GRID

FACTORS OF SAFETY BASED ON GRID
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AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 896.846

ITERATION = 1  FACTOR OF SAFETY  =3.844
ITERATION = 2  FACTOR OF SAFETY  =3.844

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 869.784

ITERATION = 1  FACTOR OF SAFETY  =2.648
ITERATION = 2  FACTOR OF SAFETY  =2.647
ITERATION = 3  FACTOR OF SAFETY  =2.647

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 842.722

ITERATION = 1  FACTOR OF SAFETY  =2.507
ITERATION = 2  FACTOR OF SAFETY  =2.506
ITERATION = 3  FACTOR OF SAFETY  =2.506

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 815.659

ITERATION = 1  FACTOR OF SAFETY  =2.389
ITERATION = 2  FACTOR OF SAFETY  =2.387
ITERATION = 3  FACTOR OF SAFETY  =2.387

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 788.597

ITERATION = 1  FACTOR OF SAFETY  =2.246
ITERATION = 2  FACTOR OF SAFETY  =2.244
ITERATION = 3  FACTOR OF SAFETY  =2.244

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 788.597

ITERATION = 1  FACTOR OF SAFETY  =35.489
ITERATION = 2  FACTOR OF SAFETY  =35.489

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 781.832

ITERATION = 1  FACTOR OF SAFETY  =2.281
ITERATION = 2  FACTOR OF SAFETY  =2.278
ITERATION = 3  FACTOR OF SAFETY  =2.278

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 775.066

ITERATION = 1  FACTOR OF SAFETY  =2.418
ITERATION = 2  FACTOR OF SAFETY  =2.416
ITERATION = 3  FACTOR OF SAFETY  =2.416

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 768.301

ITERATION = 1  FACTOR OF SAFETY  =3.028
ITERATION = 2  FACTOR OF SAFETY  =3.025
ITERATION = 3  FACTOR OF SAFETY  =3.025

AT CENTER (1220.0 , 1360.0) WITH RADIUS OF 768.301

ITERATION = 1  FACTOR OF SAFETY  =4.215
ITERATION = 2  FACTOR OF SAFETY  =4.214
ITERATION = 3  FACTOR OF SAFETY  =4.214

AT CENTER (1220.000 ,   1360.000) WITH RADIUS 788.597 LOWEST F.S.=  2.244


AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 756.902

ITERATION = 1  FACTOR OF SAFETY  =3.663
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ITERATION = 2  FACTOR OF SAFETY  =3.662

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 730.896

ITERATION = 1  FACTOR OF SAFETY  =2.501
ITERATION = 2  FACTOR OF SAFETY  =2.500
ITERATION = 3  FACTOR OF SAFETY  =2.500

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 704.890

ITERATION = 1  FACTOR OF SAFETY  =2.359
ITERATION = 2  FACTOR OF SAFETY  =2.358
ITERATION = 3  FACTOR OF SAFETY  =2.358

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 678.884

ITERATION = 1  FACTOR OF SAFETY  =2.241
ITERATION = 2  FACTOR OF SAFETY  =2.239
ITERATION = 3  FACTOR OF SAFETY  =2.239

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 652.878

ITERATION = 1  FACTOR OF SAFETY  =2.200
ITERATION = 2  FACTOR OF SAFETY  =2.198
ITERATION = 3  FACTOR OF SAFETY  =2.198

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 646.377

ITERATION = 1  FACTOR OF SAFETY  =2.254
ITERATION = 2  FACTOR OF SAFETY  =2.251
ITERATION = 3  FACTOR OF SAFETY  =2.251

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 639.875

ITERATION = 1  FACTOR OF SAFETY  =2.683
ITERATION = 2  FACTOR OF SAFETY  =2.681
ITERATION = 3  FACTOR OF SAFETY  =2.681

AT CENTER (1220.0 , 1220.0) WITH RADIUS OF 633.374

ITERATION = 1  FACTOR OF SAFETY  =3.538
ITERATION = 2  FACTOR OF SAFETY  =3.537
ITERATION = 3  FACTOR OF SAFETY  =3.537

AT CENTER (1220.000 ,   1220.000) WITH RADIUS 652.878 LOWEST F.S.=  2.198


AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 616.957

ITERATION = 1  FACTOR OF SAFETY  =3.513
ITERATION = 2  FACTOR OF SAFETY  =3.513

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 592.594

ITERATION = 1  FACTOR OF SAFETY  =2.378
ITERATION = 2  FACTOR OF SAFETY  =2.378
ITERATION = 3  FACTOR OF SAFETY  =2.378

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 568.231

ITERATION = 1  FACTOR OF SAFETY  =2.246
ITERATION = 2  FACTOR OF SAFETY  =2.245
ITERATION = 3  FACTOR OF SAFETY  =2.245

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 543.868
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ITERATION = 1  FACTOR OF SAFETY  =2.157
ITERATION = 2  FACTOR OF SAFETY  =2.155
ITERATION = 3  FACTOR OF SAFETY  =2.155

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 519.505

ITERATION = 1  FACTOR OF SAFETY  =2.297
ITERATION = 2  FACTOR OF SAFETY  =2.295
ITERATION = 3  FACTOR OF SAFETY  =2.295

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 562.140

ITERATION = 1  FACTOR OF SAFETY  =2.208
ITERATION = 2  FACTOR OF SAFETY  =2.207
ITERATION = 3  FACTOR OF SAFETY  =2.207

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 556.050

ITERATION = 1  FACTOR OF SAFETY  =2.185
ITERATION = 2  FACTOR OF SAFETY  =2.183
ITERATION = 3  FACTOR OF SAFETY  =2.183

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 549.959

ITERATION = 1  FACTOR OF SAFETY  =2.168
ITERATION = 2  FACTOR OF SAFETY  =2.166
ITERATION = 3  FACTOR OF SAFETY  =2.166

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 537.778

ITERATION = 1  FACTOR OF SAFETY  =2.154
ITERATION = 2  FACTOR OF SAFETY  =2.152
ITERATION = 3  FACTOR OF SAFETY  =2.152

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 531.687

ITERATION = 1  FACTOR OF SAFETY  =2.173
ITERATION = 2  FACTOR OF SAFETY  =2.170
ITERATION = 3  FACTOR OF SAFETY  =2.170

AT CENTER (1220.0 , 1080.0) WITH RADIUS OF 525.596

ITERATION = 1  FACTOR OF SAFETY  =2.221
ITERATION = 2  FACTOR OF SAFETY  =2.219
ITERATION = 3  FACTOR OF SAFETY  =2.219

AT CENTER (1220.000 ,   1080.000) WITH RADIUS 537.778 LOWEST F.S.=  2.152


AT CENTER (1220.0 , 940.0) WITH RADIUS OF 477.013

ITERATION = 1  FACTOR OF SAFETY  =3.455
ITERATION = 2  FACTOR OF SAFETY  =3.455

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 454.625

ITERATION = 1  FACTOR OF SAFETY  =2.330
ITERATION = 2  FACTOR OF SAFETY  =2.329
ITERATION = 3  FACTOR OF SAFETY  =2.329

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 432.237

ITERATION = 1  FACTOR OF SAFETY  =2.238
ITERATION = 2  FACTOR OF SAFETY  =2.237
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ITERATION = 3  FACTOR OF SAFETY  =2.237

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 409.850

ITERATION = 1  FACTOR OF SAFETY  =2.221
ITERATION = 2  FACTOR OF SAFETY  =2.219
ITERATION = 3  FACTOR OF SAFETY  =2.219

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 387.462

ITERATION = 1  FACTOR OF SAFETY  =2.320
ITERATION = 2  FACTOR OF SAFETY  =2.318
ITERATION = 3  FACTOR OF SAFETY  =2.318

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 426.641

ITERATION = 1  FACTOR OF SAFETY  =2.221
ITERATION = 2  FACTOR OF SAFETY  =2.220
ITERATION = 3  FACTOR OF SAFETY  =2.220

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 421.044

ITERATION = 1  FACTOR OF SAFETY  =2.209
ITERATION = 2  FACTOR OF SAFETY  =2.208
ITERATION = 3  FACTOR OF SAFETY  =2.208

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 415.447

ITERATION = 1  FACTOR OF SAFETY  =2.211
ITERATION = 2  FACTOR OF SAFETY  =2.210
ITERATION = 3  FACTOR OF SAFETY  =2.210

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 404.253

ITERATION = 1  FACTOR OF SAFETY  =2.238
ITERATION = 2  FACTOR OF SAFETY  =2.237
ITERATION = 3  FACTOR OF SAFETY  =2.237

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 398.656

ITERATION = 1  FACTOR OF SAFETY  =2.262
ITERATION = 2  FACTOR OF SAFETY  =2.260
ITERATION = 3  FACTOR OF SAFETY  =2.260

AT CENTER (1220.0 , 940.0) WITH RADIUS OF 393.059

ITERATION = 1  FACTOR OF SAFETY  =2.287
ITERATION = 2  FACTOR OF SAFETY  =2.285
ITERATION = 3  FACTOR OF SAFETY  =2.285

AT CENTER (1220.000 ,   940.000) WITH RADIUS 421.044 LOWEST F.S.=  2.208


AT CENTER (1220.0 , 800.0) WITH RADIUS OF 337.069

ITERATION = 1  FACTOR OF SAFETY  =3.716
ITERATION = 2  FACTOR OF SAFETY  =3.716

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 315.592

ITERATION = 1  FACTOR OF SAFETY  =2.499
ITERATION = 2  FACTOR OF SAFETY  =2.499

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 294.116
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ITERATION = 1  FACTOR OF SAFETY  =2.380
ITERATION = 2  FACTOR OF SAFETY  =2.379
ITERATION = 3  FACTOR OF SAFETY  =2.379

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 272.639

ITERATION = 1  FACTOR OF SAFETY  =2.266
ITERATION = 2  FACTOR OF SAFETY  =2.265
ITERATION = 3  FACTOR OF SAFETY  =2.265

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 251.163

ITERATION = 1  FACTOR OF SAFETY  =2.420
ITERATION = 2  FACTOR OF SAFETY  =2.419
ITERATION = 3  FACTOR OF SAFETY  =2.419

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 288.747

ITERATION = 1  FACTOR OF SAFETY  =2.336
ITERATION = 2  FACTOR OF SAFETY  =2.335
ITERATION = 3  FACTOR OF SAFETY  =2.335

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 283.378

ITERATION = 1  FACTOR OF SAFETY  =2.313
ITERATION = 2  FACTOR OF SAFETY  =2.312
ITERATION = 3  FACTOR OF SAFETY  =2.312

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 278.009

ITERATION = 1  FACTOR OF SAFETY  =2.289
ITERATION = 2  FACTOR OF SAFETY  =2.288
ITERATION = 3  FACTOR OF SAFETY  =2.288

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 267.270

ITERATION = 1  FACTOR OF SAFETY  =2.254
ITERATION = 2  FACTOR OF SAFETY  =2.252
ITERATION = 3  FACTOR OF SAFETY  =2.252

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 261.901

ITERATION = 1  FACTOR OF SAFETY  =2.266
ITERATION = 2  FACTOR OF SAFETY  =2.265
ITERATION = 3  FACTOR OF SAFETY  =2.265

AT CENTER (1220.0 , 800.0) WITH RADIUS OF 256.532

ITERATION = 1  FACTOR OF SAFETY  =2.321
ITERATION = 2  FACTOR OF SAFETY  =2.320
ITERATION = 3  FACTOR OF SAFETY  =2.320

AT CENTER (1220.000 ,   800.000) WITH RADIUS 267.270 LOWEST F.S.=  2.252


AT CENTER (1220.0 , 660.0) WITH RADIUS OF 197.124

ITERATION = 1  FACTOR OF SAFETY  =4.561
ITERATION = 2  FACTOR OF SAFETY  =4.560
ITERATION = 3  FACTOR OF SAFETY  =4.560

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 176.826

ITERATION = 1  FACTOR OF SAFETY  =2.919
ITERATION = 2  FACTOR OF SAFETY  =2.919
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ITERATION = 3  FACTOR OF SAFETY  =2.919

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 156.527

ITERATION = 1  FACTOR OF SAFETY  =2.729
ITERATION = 2  FACTOR OF SAFETY  =2.729

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 136.229

ITERATION = 1  FACTOR OF SAFETY  =2.684
ITERATION = 2  FACTOR OF SAFETY  =2.684

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 115.930

ITERATION = 1  FACTOR OF SAFETY  =2.825
ITERATION = 2  FACTOR OF SAFETY  =2.824
ITERATION = 3  FACTOR OF SAFETY  =2.824

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 151.452

ITERATION = 1  FACTOR OF SAFETY  =2.712
ITERATION = 2  FACTOR OF SAFETY  =2.712

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 146.378

ITERATION = 1  FACTOR OF SAFETY  =2.698

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 141.303

ITERATION = 1  FACTOR OF SAFETY  =2.688
ITERATION = 2  FACTOR OF SAFETY  =2.688

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 131.154

ITERATION = 1  FACTOR OF SAFETY  =2.689
ITERATION = 2  FACTOR OF SAFETY  =2.689

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 126.079

ITERATION = 1  FACTOR OF SAFETY  =2.711
ITERATION = 2  FACTOR OF SAFETY  =2.711
ITERATION = 3  FACTOR OF SAFETY  =2.711

AT CENTER (1220.0 , 660.0) WITH RADIUS OF 121.005

ITERATION = 1  FACTOR OF SAFETY  =2.755
ITERATION = 2  FACTOR OF SAFETY  =2.755
ITERATION = 3  FACTOR OF SAFETY  =2.755

AT CENTER (1220.000 ,   660.000) WITH RADIUS 136.229 LOWEST F.S.=  2.684


AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 900.793

ITERATION = 1  FACTOR OF SAFETY  =3.355
ITERATION = 2  FACTOR OF SAFETY  =3.355
ITERATION = 3  FACTOR OF SAFETY  =3.355

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 881.973

ITERATION = 1  FACTOR OF SAFETY  =2.174
ITERATION = 2  FACTOR OF SAFETY  =2.172
ITERATION = 3  FACTOR OF SAFETY  =2.172

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 863.153
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ITERATION = 1  FACTOR OF SAFETY  =2.129
ITERATION = 2  FACTOR OF SAFETY  =2.127
ITERATION = 3  FACTOR OF SAFETY  =2.127

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 844.333

ITERATION = 1  FACTOR OF SAFETY  =2.114
ITERATION = 2  FACTOR OF SAFETY  =2.111
ITERATION = 3  FACTOR OF SAFETY  =2.111

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 825.512

ITERATION = 1  FACTOR OF SAFETY  =2.306
ITERATION = 2  FACTOR OF SAFETY  =2.303
ITERATION = 3  FACTOR OF SAFETY  =2.303

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 858.448

ITERATION = 1  FACTOR OF SAFETY  =2.119
ITERATION = 2  FACTOR OF SAFETY  =2.117
ITERATION = 3  FACTOR OF SAFETY  =2.117

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 853.743

ITERATION = 1  FACTOR OF SAFETY  =2.111
ITERATION = 2  FACTOR OF SAFETY  =2.109
ITERATION = 3  FACTOR OF SAFETY  =2.109

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 849.038

ITERATION = 1  FACTOR OF SAFETY  =2.109
ITERATION = 2  FACTOR OF SAFETY  =2.106
ITERATION = 3  FACTOR OF SAFETY  =2.106

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 839.627

ITERATION = 1  FACTOR OF SAFETY  =2.130
ITERATION = 2  FACTOR OF SAFETY  =2.127
ITERATION = 3  FACTOR OF SAFETY  =2.127

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 834.922

ITERATION = 1  FACTOR OF SAFETY  =2.144
ITERATION = 2  FACTOR OF SAFETY  =2.141
ITERATION = 3  FACTOR OF SAFETY  =2.141

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 834.922

ITERATION = 1  FACTOR OF SAFETY  =88.203
ITERATION = 2  FACTOR OF SAFETY  =88.203

AT CENTER (1360.0 , 1360.0) WITH RADIUS OF 830.217

ITERATION = 1  FACTOR OF SAFETY  =2.210
ITERATION = 2  FACTOR OF SAFETY  =2.207
ITERATION = 3  FACTOR OF SAFETY  =2.207

AT CENTER (1360.000 ,   1360.000) WITH RADIUS 849.038 LOWEST F.S.=  2.106


AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 760.849

ITERATION = 1  FACTOR OF SAFETY  =3.330
ITERATION = 2  FACTOR OF SAFETY  =3.330
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AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 742.906

ITERATION = 1  FACTOR OF SAFETY  =2.117
ITERATION = 2  FACTOR OF SAFETY  =2.115
ITERATION = 3  FACTOR OF SAFETY  =2.115

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 724.964

ITERATION = 1  FACTOR OF SAFETY  =2.124
ITERATION = 2  FACTOR OF SAFETY  =2.122
ITERATION = 3  FACTOR OF SAFETY  =2.122

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 756.363

ITERATION = 1  FACTOR OF SAFETY  =2.158
ITERATION = 2  FACTOR OF SAFETY  =2.157
ITERATION = 3  FACTOR OF SAFETY  =2.157

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 751.878

ITERATION = 1  FACTOR OF SAFETY  =2.141
ITERATION = 2  FACTOR OF SAFETY  =2.139
ITERATION = 3  FACTOR OF SAFETY  =2.139

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 747.392

ITERATION = 1  FACTOR OF SAFETY  =2.123
ITERATION = 2  FACTOR OF SAFETY  =2.121
ITERATION = 3  FACTOR OF SAFETY  =2.121

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 738.421

ITERATION = 1  FACTOR OF SAFETY  =2.113
ITERATION = 2  FACTOR OF SAFETY  =2.111
ITERATION = 3  FACTOR OF SAFETY  =2.111

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 733.935

ITERATION = 1  FACTOR OF SAFETY  =2.112
ITERATION = 2  FACTOR OF SAFETY  =2.110
ITERATION = 3  FACTOR OF SAFETY  =2.110

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 729.449

ITERATION = 1  FACTOR OF SAFETY  =2.116
ITERATION = 2  FACTOR OF SAFETY  =2.114
ITERATION = 3  FACTOR OF SAFETY  =2.114

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 707.021

ITERATION = 1  FACTOR OF SAFETY  =2.179
ITERATION = 2  FACTOR OF SAFETY  =2.176
ITERATION = 3  FACTOR OF SAFETY  =2.176

AT CENTER (1360.0 , 1220.0) WITH RADIUS OF 689.078

ITERATION = 1  FACTOR OF SAFETY  =2.277
ITERATION = 2  FACTOR OF SAFETY  =2.275
ITERATION = 3  FACTOR OF SAFETY  =2.275

AT CENTER (1360.000 ,   1220.000) WITH RADIUS 733.935 LOWEST F.S.=  2.110


AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 620.905
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ITERATION = 1  FACTOR OF SAFETY  =3.469
ITERATION = 2  FACTOR OF SAFETY  =3.469

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 604.296

ITERATION = 1  FACTOR OF SAFETY  =2.158
ITERATION = 2  FACTOR OF SAFETY  =2.156
ITERATION = 3  FACTOR OF SAFETY  =2.156

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 587.687

ITERATION = 1  FACTOR OF SAFETY  =2.167
ITERATION = 2  FACTOR OF SAFETY  =2.165
ITERATION = 3  FACTOR OF SAFETY  =2.165

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 616.752

ITERATION = 1  FACTOR OF SAFETY  =2.172
ITERATION = 2  FACTOR OF SAFETY  =2.170
ITERATION = 3  FACTOR OF SAFETY  =2.170

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 612.600

ITERATION = 1  FACTOR OF SAFETY  =2.163
ITERATION = 2  FACTOR OF SAFETY  =2.161
ITERATION = 3  FACTOR OF SAFETY  =2.161

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 608.448

ITERATION = 1  FACTOR OF SAFETY  =2.155
ITERATION = 2  FACTOR OF SAFETY  =2.154
ITERATION = 3  FACTOR OF SAFETY  =2.154

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 600.144

ITERATION = 1  FACTOR OF SAFETY  =2.158
ITERATION = 2  FACTOR OF SAFETY  =2.157
ITERATION = 3  FACTOR OF SAFETY  =2.157

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 595.992

ITERATION = 1  FACTOR OF SAFETY  =2.160
ITERATION = 2  FACTOR OF SAFETY  =2.158
ITERATION = 3  FACTOR OF SAFETY  =2.158

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 591.839

ITERATION = 1  FACTOR OF SAFETY  =2.164
ITERATION = 2  FACTOR OF SAFETY  =2.162
ITERATION = 3  FACTOR OF SAFETY  =2.162

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 571.078

ITERATION = 1  FACTOR OF SAFETY  =2.173
ITERATION = 2  FACTOR OF SAFETY  =2.170
ITERATION = 3  FACTOR OF SAFETY  =2.170

AT CENTER (1360.0 , 1080.0) WITH RADIUS OF 554.470

ITERATION = 1  FACTOR OF SAFETY  =2.415
ITERATION = 2  FACTOR OF SAFETY  =2.412
ITERATION = 3  FACTOR OF SAFETY  =2.412

AT CENTER (1360.000 ,   1080.000) WITH RADIUS 608.448 LOWEST F.S.=  2.154
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AT CENTER (1360.0 , 940.0) WITH RADIUS OF 480.960

ITERATION = 1  FACTOR OF SAFETY  =3.735
ITERATION = 2  FACTOR OF SAFETY  =3.735

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 466.286

ITERATION = 1  FACTOR OF SAFETY  =2.177
ITERATION = 2  FACTOR OF SAFETY  =2.175
ITERATION = 3  FACTOR OF SAFETY  =2.175

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 451.611

ITERATION = 1  FACTOR OF SAFETY  =2.197
ITERATION = 2  FACTOR OF SAFETY  =2.195
ITERATION = 3  FACTOR OF SAFETY  =2.195

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 477.292

ITERATION = 1  FACTOR OF SAFETY  =2.215
ITERATION = 2  FACTOR OF SAFETY  =2.214
ITERATION = 3  FACTOR OF SAFETY  =2.214

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 473.623

ITERATION = 1  FACTOR OF SAFETY  =2.196
ITERATION = 2  FACTOR OF SAFETY  =2.195
ITERATION = 3  FACTOR OF SAFETY  =2.195

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 469.954

ITERATION = 1  FACTOR OF SAFETY  =2.179
ITERATION = 2  FACTOR OF SAFETY  =2.178
ITERATION = 3  FACTOR OF SAFETY  =2.178

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 462.617

ITERATION = 1  FACTOR OF SAFETY  =2.175
ITERATION = 2  FACTOR OF SAFETY  =2.174
ITERATION = 3  FACTOR OF SAFETY  =2.174

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 458.948

ITERATION = 1  FACTOR OF SAFETY  =2.179
ITERATION = 2  FACTOR OF SAFETY  =2.177
ITERATION = 3  FACTOR OF SAFETY  =2.177

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 455.280

ITERATION = 1  FACTOR OF SAFETY  =2.187
ITERATION = 2  FACTOR OF SAFETY  =2.185
ITERATION = 3  FACTOR OF SAFETY  =2.185

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 436.937

ITERATION = 1  FACTOR OF SAFETY  =2.275
ITERATION = 2  FACTOR OF SAFETY  =2.273
ITERATION = 3  FACTOR OF SAFETY  =2.273

AT CENTER (1360.0 , 940.0) WITH RADIUS OF 422.262

ITERATION = 1  FACTOR OF SAFETY  =2.437
ITERATION = 2  FACTOR OF SAFETY  =2.435
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ITERATION = 3  FACTOR OF SAFETY  =2.435

AT CENTER (1360.000 ,   940.000) WITH RADIUS 462.617 LOWEST F.S.=  2.174


AT CENTER (1360.0 , 800.0) WITH RADIUS OF 341.016

ITERATION = 1  FACTOR OF SAFETY  =4.136
ITERATION = 2  FACTOR OF SAFETY  =4.136

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 328.010

ITERATION = 1  FACTOR OF SAFETY  =2.296
ITERATION = 2  FACTOR OF SAFETY  =2.295
ITERATION = 3  FACTOR OF SAFETY  =2.295

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 315.004

ITERATION = 1  FACTOR OF SAFETY  =2.287
ITERATION = 2  FACTOR OF SAFETY  =2.286
ITERATION = 3  FACTOR OF SAFETY  =2.286

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 301.998

ITERATION = 1  FACTOR OF SAFETY  =2.263
ITERATION = 2  FACTOR OF SAFETY  =2.261
ITERATION = 3  FACTOR OF SAFETY  =2.261

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 288.993

ITERATION = 1  FACTOR OF SAFETY  =2.500
ITERATION = 2  FACTOR OF SAFETY  =2.498
ITERATION = 3  FACTOR OF SAFETY  =2.498

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 311.753

ITERATION = 1  FACTOR OF SAFETY  =2.284
ITERATION = 2  FACTOR OF SAFETY  =2.282
ITERATION = 3  FACTOR OF SAFETY  =2.282

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 308.501

ITERATION = 1  FACTOR OF SAFETY  =2.275
ITERATION = 2  FACTOR OF SAFETY  =2.274
ITERATION = 3  FACTOR OF SAFETY  =2.274

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 305.250

ITERATION = 1  FACTOR OF SAFETY  =2.264
ITERATION = 2  FACTOR OF SAFETY  =2.262
ITERATION = 3  FACTOR OF SAFETY  =2.262

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 298.747

ITERATION = 1  FACTOR OF SAFETY  =2.273
ITERATION = 2  FACTOR OF SAFETY  =2.271
ITERATION = 3  FACTOR OF SAFETY  =2.271

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 295.495

ITERATION = 1  FACTOR OF SAFETY  =2.302
ITERATION = 2  FACTOR OF SAFETY  =2.300
ITERATION = 3  FACTOR OF SAFETY  =2.300

AT CENTER (1360.0 , 800.0) WITH RADIUS OF 292.244
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ITERATION = 1  FACTOR OF SAFETY  =2.369
ITERATION = 2  FACTOR OF SAFETY  =2.367
ITERATION = 3  FACTOR OF SAFETY  =2.367

AT CENTER (1360.000 ,   800.000) WITH RADIUS 301.998 LOWEST F.S.=  2.261


AT CENTER (1360.0 , 660.0) WITH RADIUS OF 201.072

ITERATION = 1  FACTOR OF SAFETY  =4.741
ITERATION = 2  FACTOR OF SAFETY  =4.741

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 188.614

ITERATION = 1  FACTOR OF SAFETY  =2.483
ITERATION = 2  FACTOR OF SAFETY  =2.483

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 176.157

ITERATION = 1  FACTOR OF SAFETY  =2.504
ITERATION = 2  FACTOR OF SAFETY  =2.504
ITERATION = 3  FACTOR OF SAFETY  =2.504

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 197.957

ITERATION = 1  FACTOR OF SAFETY  =2.629
ITERATION = 2  FACTOR OF SAFETY  =2.629

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 194.843

ITERATION = 1  FACTOR OF SAFETY  =2.490
ITERATION = 2  FACTOR OF SAFETY  =2.490

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 191.729

ITERATION = 1  FACTOR OF SAFETY  =2.487
ITERATION = 2  FACTOR OF SAFETY  =2.486

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 185.500

ITERATION = 1  FACTOR OF SAFETY  =2.480
ITERATION = 2  FACTOR OF SAFETY  =2.480
ITERATION = 3  FACTOR OF SAFETY  =2.480

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 182.386

ITERATION = 1  FACTOR OF SAFETY  =2.483
ITERATION = 2  FACTOR OF SAFETY  =2.482
ITERATION = 3  FACTOR OF SAFETY  =2.482

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 179.271

ITERATION = 1  FACTOR OF SAFETY  =2.490
ITERATION = 2  FACTOR OF SAFETY  =2.490
ITERATION = 3  FACTOR OF SAFETY  =2.490

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 163.700

ITERATION = 1  FACTOR OF SAFETY  =2.660
ITERATION = 2  FACTOR OF SAFETY  =2.659
ITERATION = 3  FACTOR OF SAFETY  =2.659

AT CENTER (1360.0 , 660.0) WITH RADIUS OF 151.243
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ITERATION = 1  FACTOR OF SAFETY  =3.533
ITERATION = 2  FACTOR OF SAFETY  =3.532
ITERATION = 3  FACTOR OF SAFETY  =3.532

AT CENTER (1360.000 ,   660.000) WITH RADIUS 185.500 LOWEST F.S.=  2.480


AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 904.608

ITERATION = 1  FACTOR OF SAFETY  =3.734
ITERATION = 2  FACTOR OF SAFETY  =3.733

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 904.608

ITERATION = 1  FACTOR OF SAFETY  =6.771
ITERATION = 2  FACTOR OF SAFETY  =6.771

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 893.597

ITERATION = 1  FACTOR OF SAFETY  =2.116
ITERATION = 2  FACTOR OF SAFETY  =2.113
ITERATION = 3  FACTOR OF SAFETY  =2.113

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 882.586

ITERATION = 1  FACTOR OF SAFETY  =2.100
ITERATION = 2  FACTOR OF SAFETY  =2.097
ITERATION = 3  FACTOR OF SAFETY  =2.097

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 882.586

ITERATION = 1  FACTOR OF SAFETY  =96.524
ITERATION = 2  FACTOR OF SAFETY  =96.524

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 871.576

ITERATION = 1  FACTOR OF SAFETY  =2.248
ITERATION = 2  FACTOR OF SAFETY  =2.245
ITERATION = 3  FACTOR OF SAFETY  =2.245

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 890.844

ITERATION = 1  FACTOR OF SAFETY  =2.115
ITERATION = 2  FACTOR OF SAFETY  =2.113
ITERATION = 3  FACTOR OF SAFETY  =2.113

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 888.092

ITERATION = 1  FACTOR OF SAFETY  =2.113
ITERATION = 2  FACTOR OF SAFETY  =2.110
ITERATION = 3  FACTOR OF SAFETY  =2.110

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 885.339

ITERATION = 1  FACTOR OF SAFETY  =2.111
ITERATION = 2  FACTOR OF SAFETY  =2.108
ITERATION = 3  FACTOR OF SAFETY  =2.108

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 879.834

ITERATION = 1  FACTOR OF SAFETY  =2.120
ITERATION = 2  FACTOR OF SAFETY  =2.117
ITERATION = 3  FACTOR OF SAFETY  =2.117

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 877.081
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ITERATION = 1  FACTOR OF SAFETY  =2.149
ITERATION = 2  FACTOR OF SAFETY  =2.146
ITERATION = 3  FACTOR OF SAFETY  =2.146

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 874.328

ITERATION = 1  FACTOR OF SAFETY  =2.194
ITERATION = 2  FACTOR OF SAFETY  =2.191
ITERATION = 3  FACTOR OF SAFETY  =2.191

AT CENTER (1500.0 , 1360.0) WITH RADIUS OF 860.565

ITERATION = 1  FACTOR OF SAFETY  =2.669
ITERATION = 2  FACTOR OF SAFETY  =2.667
ITERATION = 3  FACTOR OF SAFETY  =2.667

AT CENTER (1500.000 ,   1360.000) WITH RADIUS 882.586 LOWEST F.S.=  2.097


AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 764.659

ITERATION = 1  FACTOR OF SAFETY  =4.078
ITERATION = 2  FACTOR OF SAFETY  =4.078

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 764.659

ITERATION = 1  FACTOR OF SAFETY  =7.281
ITERATION = 2  FACTOR OF SAFETY  =7.281

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 754.914

ITERATION = 1  FACTOR OF SAFETY  =2.141
ITERATION = 2  FACTOR OF SAFETY  =2.138
ITERATION = 3  FACTOR OF SAFETY  =2.138

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 745.170

ITERATION = 1  FACTOR OF SAFETY  =2.192
ITERATION = 2  FACTOR OF SAFETY  =2.189
ITERATION = 3  FACTOR OF SAFETY  =2.189

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 762.223

ITERATION = 1  FACTOR OF SAFETY  =3.310
ITERATION = 2  FACTOR OF SAFETY  =3.310
ITERATION = 3  FACTOR OF SAFETY  =3.310

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 762.223

ITERATION = 1  FACTOR OF SAFETY  =18.330
ITERATION = 2  FACTOR OF SAFETY  =18.330

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 759.787

ITERATION = 1  FACTOR OF SAFETY  =2.124
ITERATION = 2  FACTOR OF SAFETY  =2.121
ITERATION = 3  FACTOR OF SAFETY  =2.121

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 757.351

ITERATION = 1  FACTOR OF SAFETY  =2.132
ITERATION = 2  FACTOR OF SAFETY  =2.130
ITERATION = 3  FACTOR OF SAFETY  =2.130
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AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 752.478

ITERATION = 1  FACTOR OF SAFETY  =2.152
ITERATION = 2  FACTOR OF SAFETY  =2.149
ITERATION = 3  FACTOR OF SAFETY  =2.149

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 750.042

ITERATION = 1  FACTOR OF SAFETY  =2.164
ITERATION = 2  FACTOR OF SAFETY  =2.161
ITERATION = 3  FACTOR OF SAFETY  =2.161

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 747.606

ITERATION = 1  FACTOR OF SAFETY  =2.178
ITERATION = 2  FACTOR OF SAFETY  =2.175
ITERATION = 3  FACTOR OF SAFETY  =2.175

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 735.426

ITERATION = 1  FACTOR OF SAFETY  =2.283
ITERATION = 2  FACTOR OF SAFETY  =2.280
ITERATION = 3  FACTOR OF SAFETY  =2.280

AT CENTER (1500.0 , 1220.0) WITH RADIUS OF 725.681

ITERATION = 1  FACTOR OF SAFETY  =2.714
ITERATION = 2  FACTOR OF SAFETY  =2.712
ITERATION = 3  FACTOR OF SAFETY  =2.712

AT CENTER (1500.000 ,   1220.000) WITH RADIUS 759.787 LOWEST F.S.=  2.121


AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 624.710

ITERATION = 1  FACTOR OF SAFETY  =4.728
ITERATION = 2  FACTOR OF SAFETY  =4.728

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 624.710

ITERATION = 1  FACTOR OF SAFETY  =26.867
ITERATION = 2  FACTOR OF SAFETY  =26.867

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 616.054

ITERATION = 1  FACTOR OF SAFETY  =2.182
ITERATION = 2  FACTOR OF SAFETY  =2.179
ITERATION = 3  FACTOR OF SAFETY  =2.179

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 607.397

ITERATION = 1  FACTOR OF SAFETY  =2.194
ITERATION = 2  FACTOR OF SAFETY  =2.191
ITERATION = 3  FACTOR OF SAFETY  =2.191

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 622.546

ITERATION = 1  FACTOR OF SAFETY  =4.009
ITERATION = 2  FACTOR OF SAFETY  =4.009

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 620.382

ITERATION = 1  FACTOR OF SAFETY  =2.179
ITERATION = 2  FACTOR OF SAFETY  =2.177
ITERATION = 3  FACTOR OF SAFETY  =2.177
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AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 618.218

ITERATION = 1  FACTOR OF SAFETY  =2.181
ITERATION = 2  FACTOR OF SAFETY  =2.179
ITERATION = 3  FACTOR OF SAFETY  =2.179

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 613.889

ITERATION = 1  FACTOR OF SAFETY  =2.180
ITERATION = 2  FACTOR OF SAFETY  =2.177
ITERATION = 3  FACTOR OF SAFETY  =2.177

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 611.725

ITERATION = 1  FACTOR OF SAFETY  =2.179
ITERATION = 2  FACTOR OF SAFETY  =2.177
ITERATION = 3  FACTOR OF SAFETY  =2.177

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 609.561

ITERATION = 1  FACTOR OF SAFETY  =2.184
ITERATION = 2  FACTOR OF SAFETY  =2.181
ITERATION = 3  FACTOR OF SAFETY  =2.181

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 598.741

ITERATION = 1  FACTOR OF SAFETY  =2.373
ITERATION = 2  FACTOR OF SAFETY  =2.370
ITERATION = 3  FACTOR OF SAFETY  =2.370

AT CENTER (1500.0 , 1080.0) WITH RADIUS OF 590.084

ITERATION = 1  FACTOR OF SAFETY  =3.592
ITERATION = 2  FACTOR OF SAFETY  =3.591
ITERATION = 3  FACTOR OF SAFETY  =3.591

AT CENTER (1500.000 ,   1080.000) WITH RADIUS 611.725 LOWEST F.S.=  2.177


AT CENTER (1500.0 , 940.0) WITH RADIUS OF 484.761

ITERATION = 1  FACTOR OF SAFETY  =5.598
ITERATION = 2  FACTOR OF SAFETY  =5.597

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 477.829

ITERATION = 1  FACTOR OF SAFETY  =2.268
ITERATION = 2  FACTOR OF SAFETY  =2.265
ITERATION = 3  FACTOR OF SAFETY  =2.265

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 470.896

ITERATION = 1  FACTOR OF SAFETY  =2.369
ITERATION = 2  FACTOR OF SAFETY  =2.366
ITERATION = 3  FACTOR OF SAFETY  =2.366

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 483.028

ITERATION = 1  FACTOR OF SAFETY  =5.001
ITERATION = 2  FACTOR OF SAFETY  =5.000

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 481.295

ITERATION = 1  FACTOR OF SAFETY  =2.233
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ITERATION = 2  FACTOR OF SAFETY  =2.231
ITERATION = 3  FACTOR OF SAFETY  =2.231

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 479.562

ITERATION = 1  FACTOR OF SAFETY  =2.249
ITERATION = 2  FACTOR OF SAFETY  =2.247
ITERATION = 3  FACTOR OF SAFETY  =2.247

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 476.095

ITERATION = 1  FACTOR OF SAFETY  =2.288
ITERATION = 2  FACTOR OF SAFETY  =2.286
ITERATION = 3  FACTOR OF SAFETY  =2.286

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 474.362

ITERATION = 1  FACTOR OF SAFETY  =2.311
ITERATION = 2  FACTOR OF SAFETY  =2.309
ITERATION = 3  FACTOR OF SAFETY  =2.309

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 472.629

ITERATION = 1  FACTOR OF SAFETY  =2.337
ITERATION = 2  FACTOR OF SAFETY  =2.335
ITERATION = 3  FACTOR OF SAFETY  =2.335

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 463.964

ITERATION = 1  FACTOR OF SAFETY  =2.414
ITERATION = 2  FACTOR OF SAFETY  =2.411
ITERATION = 3  FACTOR OF SAFETY  =2.411

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 463.964

ITERATION = 1  FACTOR OF SAFETY  =30.215
ITERATION = 2  FACTOR OF SAFETY  =30.215

AT CENTER (1500.0 , 940.0) WITH RADIUS OF 457.031

ITERATION = 1  FACTOR OF SAFETY  =2.668
ITERATION = 2  FACTOR OF SAFETY  =2.665
ITERATION = 3  FACTOR OF SAFETY  =2.665

AT CENTER (1500.000 ,   940.000) WITH RADIUS 481.295 LOWEST F.S.=  2.231


AT CENTER (1500.0 , 800.0) WITH RADIUS OF 344.812

ITERATION = 1  FACTOR OF SAFETY  =7.339
ITERATION = 2  FACTOR OF SAFETY  =7.339

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 339.861

ITERATION = 1  FACTOR OF SAFETY  =2.306
ITERATION = 2  FACTOR OF SAFETY  =2.304
ITERATION = 3  FACTOR OF SAFETY  =2.304

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 334.909

ITERATION = 1  FACTOR OF SAFETY  =2.330
ITERATION = 2  FACTOR OF SAFETY  =2.328
ITERATION = 3  FACTOR OF SAFETY  =2.328

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 343.574
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ITERATION = 1  FACTOR OF SAFETY  =6.796
ITERATION = 2  FACTOR OF SAFETY  =6.796

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 342.336

ITERATION = 1  FACTOR OF SAFETY  =5.344
ITERATION = 2  FACTOR OF SAFETY  =5.344

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 341.098

ITERATION = 1  FACTOR OF SAFETY  =2.309
ITERATION = 2  FACTOR OF SAFETY  =2.307
ITERATION = 3  FACTOR OF SAFETY  =2.307

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 338.623

ITERATION = 1  FACTOR OF SAFETY  =2.306
ITERATION = 2  FACTOR OF SAFETY  =2.304
ITERATION = 3  FACTOR OF SAFETY  =2.304

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 337.385

ITERATION = 1  FACTOR OF SAFETY  =2.310
ITERATION = 2  FACTOR OF SAFETY  =2.308
ITERATION = 3  FACTOR OF SAFETY  =2.308

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 336.147

ITERATION = 1  FACTOR OF SAFETY  =2.318
ITERATION = 2  FACTOR OF SAFETY  =2.316
ITERATION = 3  FACTOR OF SAFETY  =2.316

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 329.958

ITERATION = 1  FACTOR OF SAFETY  =2.457
ITERATION = 2  FACTOR OF SAFETY  =2.454
ITERATION = 3  FACTOR OF SAFETY  =2.454

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 325.006

ITERATION = 1  FACTOR OF SAFETY  =2.705
ITERATION = 2  FACTOR OF SAFETY  =2.703
ITERATION = 3  FACTOR OF SAFETY  =2.703

AT CENTER (1500.0 , 800.0) WITH RADIUS OF 325.006

ITERATION = 1  FACTOR OF SAFETY  =17.694
ITERATION = 2  FACTOR OF SAFETY  =17.694

AT CENTER (1500.000 ,   800.000) WITH RADIUS 339.861 LOWEST F.S.=  2.304


AT CENTER (1500.0 , 660.0) WITH RADIUS OF 204.863

ITERATION = 1  FACTOR OF SAFETY  =11.433
ITERATION = 2  FACTOR OF SAFETY  =11.433

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 200.731

ITERATION = 1  FACTOR OF SAFETY  =2.760
ITERATION = 2  FACTOR OF SAFETY  =2.758
ITERATION = 3  FACTOR OF SAFETY  =2.758

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 196.598
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ITERATION = 1  FACTOR OF SAFETY  =3.173
ITERATION = 2  FACTOR OF SAFETY  =3.171
ITERATION = 3  FACTOR OF SAFETY  =3.171

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 203.830

ITERATION = 1  FACTOR OF SAFETY  =10.997
ITERATION = 2  FACTOR OF SAFETY  =10.997

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 202.797

ITERATION = 1  FACTOR OF SAFETY  =9.543
ITERATION = 2  FACTOR OF SAFETY  =9.543

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 201.764

ITERATION = 1  FACTOR OF SAFETY  =3.419
ITERATION = 2  FACTOR OF SAFETY  =3.419
ITERATION = 3  FACTOR OF SAFETY  =3.419

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 199.698

ITERATION = 1  FACTOR OF SAFETY  =2.832
ITERATION = 2  FACTOR OF SAFETY  =2.831
ITERATION = 3  FACTOR OF SAFETY  =2.831

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 198.665

ITERATION = 1  FACTOR OF SAFETY  =2.920
ITERATION = 2  FACTOR OF SAFETY  =2.919
ITERATION = 3  FACTOR OF SAFETY  =2.919

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 197.632

ITERATION = 1  FACTOR OF SAFETY  =3.031
ITERATION = 2  FACTOR OF SAFETY  =3.030
ITERATION = 3  FACTOR OF SAFETY  =3.030

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 192.466

ITERATION = 1  FACTOR OF SAFETY  =4.530
ITERATION = 2  FACTOR OF SAFETY  =4.530
ITERATION = 3  FACTOR OF SAFETY  =4.530

AT CENTER (1500.0 , 660.0) WITH RADIUS OF 188.334

ITERATION = 1  FACTOR OF SAFETY  =7.221
ITERATION = 2  FACTOR OF SAFETY  =7.221

AT CENTER (1500.000 ,   660.000) WITH RADIUS 200.731 LOWEST F.S.=  2.758


AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 907.823

ITERATION = 1  FACTOR OF SAFETY  =2.496
ITERATION = 2  FACTOR OF SAFETY  =2.493
ITERATION = 3  FACTOR OF SAFETY  =2.493

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 907.823

ITERATION = 1  FACTOR OF SAFETY  =874.082
ITERATION = 2  FACTOR OF SAFETY  =874.082

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 903.858
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ITERATION = 1  FACTOR OF SAFETY  =2.593
ITERATION = 2  FACTOR OF SAFETY  =2.590
ITERATION = 3  FACTOR OF SAFETY  =2.590

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 903.858

ITERATION = 1  FACTOR OF SAFETY  =5.690
ITERATION = 2  FACTOR OF SAFETY  =5.690

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 903.858

ITERATION = 1  FACTOR OF SAFETY  =86.986
ITERATION = 2  FACTOR OF SAFETY  =86.986

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 899.894

ITERATION = 1  FACTOR OF SAFETY  =2.733
ITERATION = 2  FACTOR OF SAFETY  =2.731
ITERATION = 3  FACTOR OF SAFETY  =2.731

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 899.894

ITERATION = 1  FACTOR OF SAFETY  =11.024
ITERATION = 2  FACTOR OF SAFETY  =11.024

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 899.894

ITERATION = 1  FACTOR OF SAFETY  =107.182
ITERATION = 2  FACTOR OF SAFETY  =107.182

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 895.930

ITERATION = 1  FACTOR OF SAFETY  =3.575
ITERATION = 2  FACTOR OF SAFETY  =3.573
ITERATION = 3  FACTOR OF SAFETY  =3.573

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 895.930

ITERATION = 1  FACTOR OF SAFETY  =116.467
ITERATION = 2  FACTOR OF SAFETY  =116.467

AT CENTER (1640.0 , 1360.0) WITH RADIUS OF 891.965

ITERATION = 1  FACTOR OF SAFETY  =143.459
ITERATION = 2  FACTOR OF SAFETY  =143.459

AT CENTER (1640.000 ,   1360.000) WITH RADIUS 907.823 LOWEST F.S.=  2.493


AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 767.847

ITERATION = 1  FACTOR OF SAFETY  =2.563
ITERATION = 2  FACTOR OF SAFETY  =2.560
ITERATION = 3  FACTOR OF SAFETY  =2.560

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 767.847

ITERATION = 1  FACTOR OF SAFETY  =4.591
ITERATION = 2  FACTOR OF SAFETY  =4.590
ITERATION = 3  FACTOR OF SAFETY  =4.590

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 767.847

ITERATION = 1  FACTOR OF SAFETY  =758.554
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ITERATION = 2  FACTOR OF SAFETY  =758.554

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 763.878

ITERATION = 1  FACTOR OF SAFETY  =4.409
ITERATION = 2  FACTOR OF SAFETY  =4.407
ITERATION = 3  FACTOR OF SAFETY  =4.407

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 763.878

ITERATION = 1  FACTOR OF SAFETY  =7.216
ITERATION = 2  FACTOR OF SAFETY  =7.216

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 763.878

ITERATION = 1  FACTOR OF SAFETY  =73.998
ITERATION = 2  FACTOR OF SAFETY  =73.998

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 759.909

ITERATION = 1  FACTOR OF SAFETY  =91.400
ITERATION = 2  FACTOR OF SAFETY  =91.400

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 755.939

ITERATION = 1  FACTOR OF SAFETY  =99.050
ITERATION = 2  FACTOR OF SAFETY  =99.050

AT CENTER (1640.0 , 1220.0) WITH RADIUS OF 751.970

ITERATION = 1  FACTOR OF SAFETY  =121.640
ITERATION = 2  FACTOR OF SAFETY  =121.640

AT CENTER (1640.000 ,   1220.000) WITH RADIUS 767.847 LOWEST F.S.=  2.560


AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 627.871

ITERATION = 1  FACTOR OF SAFETY  =6.758
ITERATION = 2  FACTOR OF SAFETY  =6.757

AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 627.871

ITERATION = 1  FACTOR OF SAFETY  =641.449
ITERATION = 2  FACTOR OF SAFETY  =641.449

AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 623.897

ITERATION = 1  FACTOR OF SAFETY  =61.590
ITERATION = 2  FACTOR OF SAFETY  =61.590

AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 619.923

ITERATION = 1  FACTOR OF SAFETY  =75.622
ITERATION = 2  FACTOR OF SAFETY  =75.622

AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 615.949

ITERATION = 1  FACTOR OF SAFETY  =81.634
ITERATION = 2  FACTOR OF SAFETY  =81.634

AT CENTER (1640.0 , 1080.0) WITH RADIUS OF 611.975

ITERATION = 1  FACTOR OF SAFETY  =99.832
ITERATION = 2  FACTOR OF SAFETY  =99.832
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AT CENTER (1640.000 ,   1080.000) WITH RADIUS 627.871 LOWEST F.S.=  6.757


AT CENTER (1640.0 , 940.0) WITH RADIUS OF 487.895

ITERATION = 1  FACTOR OF SAFETY  =521.525
ITERATION = 2  FACTOR OF SAFETY  =521.525

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 483.917

ITERATION = 1  FACTOR OF SAFETY  =49.121
ITERATION = 2  FACTOR OF SAFETY  =49.121

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 479.938

ITERATION = 1  FACTOR OF SAFETY  =59.824
ITERATION = 2  FACTOR OF SAFETY  =59.824

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 486.901

ITERATION = 1  FACTOR OF SAFETY  =458.693
ITERATION = 2  FACTOR OF SAFETY  =458.693

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 485.906

ITERATION = 1  FACTOR OF SAFETY  =396.115
ITERATION = 2  FACTOR OF SAFETY  =396.115

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 484.911

ITERATION = 1  FACTOR OF SAFETY  =48.594
ITERATION = 2  FACTOR OF SAFETY  =48.594

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 482.922

ITERATION = 1  FACTOR OF SAFETY  =50.582
ITERATION = 2  FACTOR OF SAFETY  =50.582

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 481.927

ITERATION = 1  FACTOR OF SAFETY  =54.571
ITERATION = 2  FACTOR OF SAFETY  =54.571

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 480.933

ITERATION = 1  FACTOR OF SAFETY  =59.344
ITERATION = 2  FACTOR OF SAFETY  =59.344

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 475.959

ITERATION = 1  FACTOR OF SAFETY  =64.208
ITERATION = 2  FACTOR OF SAFETY  =64.208

AT CENTER (1640.0 , 940.0) WITH RADIUS OF 471.981

ITERATION = 1  FACTOR OF SAFETY  =78.031
ITERATION = 2  FACTOR OF SAFETY  =78.031

AT CENTER (1640.000 ,   940.000) WITH RADIUS 484.911 LOWEST F.S.=  48.594


AT CENTER (1640.0 , 800.0) WITH RADIUS OF 347.920

ITERATION = 1  FACTOR OF SAFETY  =378.703
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ITERATION = 2  FACTOR OF SAFETY  =378.703

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 343.936

ITERATION = 1  FACTOR OF SAFETY  =36.501
ITERATION = 2  FACTOR OF SAFETY  =36.501

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 339.953

ITERATION = 1  FACTOR OF SAFETY  =43.979
ITERATION = 2  FACTOR OF SAFETY  =43.979

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 346.924

ITERATION = 1  FACTOR OF SAFETY  =351.972
ITERATION = 2  FACTOR OF SAFETY  =351.972

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 345.928

ITERATION = 1  FACTOR OF SAFETY  =272.427
ITERATION = 2  FACTOR OF SAFETY  =272.427

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 344.932

ITERATION = 1  FACTOR OF SAFETY  =36.060
ITERATION = 2  FACTOR OF SAFETY  =36.060

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 342.940

ITERATION = 1  FACTOR OF SAFETY  =37.577
ITERATION = 2  FACTOR OF SAFETY  =37.577

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 341.945

ITERATION = 1  FACTOR OF SAFETY  =40.110
ITERATION = 2  FACTOR OF SAFETY  =40.110

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 340.949

ITERATION = 1  FACTOR OF SAFETY  =43.743
ITERATION = 2  FACTOR OF SAFETY  =43.743

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 335.969

ITERATION = 1  FACTOR OF SAFETY  =46.749
ITERATION = 2  FACTOR OF SAFETY  =46.749

AT CENTER (1640.0 , 800.0) WITH RADIUS OF 331.986

ITERATION = 1  FACTOR OF SAFETY  =56.228
ITERATION = 2  FACTOR OF SAFETY  =56.228

AT CENTER (1640.000 ,   800.000) WITH RADIUS 344.932 LOWEST F.S.=  36.060


AT CENTER (1640.0 , 660.0) WITH RADIUS OF 207.944

ITERATION = 1  FACTOR OF SAFETY  =243.790

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 203.956

ITERATION = 1  FACTOR OF SAFETY  =23.926
ITERATION = 2  FACTOR OF SAFETY  =23.926

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 199.968
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ITERATION = 1  FACTOR OF SAFETY  =28.085
ITERATION = 2  FACTOR OF SAFETY  =28.085

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 206.947

ITERATION = 1  FACTOR OF SAFETY  =205.420
ITERATION = 2  FACTOR OF SAFETY  =205.420

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 205.950

ITERATION = 1  FACTOR OF SAFETY  =146.880
ITERATION = 2  FACTOR OF SAFETY  =146.880

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 204.953

ITERATION = 1  FACTOR OF SAFETY  =23.632
ITERATION = 2  FACTOR OF SAFETY  =23.632

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 202.959

ITERATION = 1  FACTOR OF SAFETY  =24.504
ITERATION = 2  FACTOR OF SAFETY  =24.504

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 201.962

ITERATION = 1  FACTOR OF SAFETY  =25.921
ITERATION = 2  FACTOR OF SAFETY  =25.921

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 200.965

ITERATION = 1  FACTOR OF SAFETY  =28.013
ITERATION = 2  FACTOR OF SAFETY  =28.013

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 195.980

ITERATION = 1  FACTOR OF SAFETY  =29.185
ITERATION = 2  FACTOR OF SAFETY  =29.185

AT CENTER (1640.0 , 660.0) WITH RADIUS OF 191.992

ITERATION = 1  FACTOR OF SAFETY  =34.470
ITERATION = 2  FACTOR OF SAFETY  =34.470

AT CENTER (1640.000 ,   660.000) WITH RADIUS 204.953 LOWEST F.S.=  23.632


AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 904.784

ITERATION = 1  FACTOR OF SAFETY  =6.634
ITERATION = 2  FACTOR OF SAFETY  =6.634

AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 904.784

ITERATION = 1  FACTOR OF SAFETY  =150.853
ITERATION = 2  FACTOR OF SAFETY  =150.853

AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 903.226

ITERATION = 1  FACTOR OF SAFETY  =7.111
ITERATION = 2  FACTOR OF SAFETY  =7.111

AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 901.668

ITERATION = 1  FACTOR OF SAFETY  =7.940
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ITERATION = 2  FACTOR OF SAFETY  =7.940

AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 900.110

ITERATION = 1  FACTOR OF SAFETY  =9.752
ITERATION = 2  FACTOR OF SAFETY  =9.752

AT CENTER (1780.0 , 1360.0) WITH RADIUS OF 898.552

ITERATION = 1  FACTOR OF SAFETY  =16.771
ITERATION = 2  FACTOR OF SAFETY  =16.771

AT CENTER (1780.000 ,   1360.000) WITH RADIUS 904.784 LOWEST F.S.=  6.634


AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 764.847

ITERATION = 1  FACTOR OF SAFETY  =6.108
ITERATION = 2  FACTOR OF SAFETY  =6.108

AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 764.847

ITERATION = 1  FACTOR OF SAFETY  =146.319
ITERATION = 2  FACTOR OF SAFETY  =146.319

AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 763.609

ITERATION = 1  FACTOR OF SAFETY  =6.653
ITERATION = 2  FACTOR OF SAFETY  =6.653

AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 762.371

ITERATION = 1  FACTOR OF SAFETY  =7.632
ITERATION = 2  FACTOR OF SAFETY  =7.632

AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 761.132

ITERATION = 1  FACTOR OF SAFETY  =9.946
ITERATION = 2  FACTOR OF SAFETY  =9.946

AT CENTER (1780.0 , 1220.0) WITH RADIUS OF 759.894

ITERATION = 1  FACTOR OF SAFETY  =17.049
ITERATION = 2  FACTOR OF SAFETY  =17.049

AT CENTER (1780.000 ,   1220.000) WITH RADIUS 764.847 LOWEST F.S.=  6.108


AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 624.938

ITERATION = 1  FACTOR OF SAFETY  =6.267
ITERATION = 2  FACTOR OF SAFETY  =6.267

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 624.938

ITERATION = 1  FACTOR OF SAFETY  =139.270
ITERATION = 2  FACTOR OF SAFETY  =139.270

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 624.163

ITERATION = 1  FACTOR OF SAFETY  =7.179
ITERATION = 2  FACTOR OF SAFETY  =7.179

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 624.163
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ITERATION = 1  FACTOR OF SAFETY  =419.055
ITERATION = 2  FACTOR OF SAFETY  =419.055

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 623.388

ITERATION = 1  FACTOR OF SAFETY  =8.830
ITERATION = 2  FACTOR OF SAFETY  =8.830

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 622.613

ITERATION = 1  FACTOR OF SAFETY  =11.780
ITERATION = 2  FACTOR OF SAFETY  =11.780

AT CENTER (1780.0 , 1080.0) WITH RADIUS OF 621.838

ITERATION = 1  FACTOR OF SAFETY  =20.646
ITERATION = 2  FACTOR OF SAFETY  =20.645

AT CENTER (1780.000 ,   1080.000) WITH RADIUS 624.938 LOWEST F.S.=  6.267


AT CENTER (1780.0 , 940.0) WITH RADIUS OF 485.082

ITERATION = 1  FACTOR OF SAFETY  =48.571
ITERATION = 2  FACTOR OF SAFETY  =48.571

AT CENTER (1780.0 , 940.0) WITH RADIUS OF 485.082

ITERATION = 1  FACTOR OF SAFETY  =128.692
ITERATION = 2  FACTOR OF SAFETY  =128.692

AT CENTER (1780.0 , 940.0) WITH RADIUS OF 484.844

ITERATION = 1  FACTOR OF SAFETY  =152.465
ITERATION = 2  FACTOR OF SAFETY  =152.465

AT CENTER (1780.0 , 940.0) WITH RADIUS OF 484.607

ITERATION = 1  FACTOR OF SAFETY  =192.092
ITERATION = 2  FACTOR OF SAFETY  =192.092

AT CENTER (1780.0 , 940.0) WITH RADIUS OF 484.369

ITERATION = 1  FACTOR OF SAFETY  =271.340
ITERATION = 2  FACTOR OF SAFETY  =271.340

AT CENTER (1780.0 , 940.0) WITH RADIUS OF 484.132

ITERATION = 1  FACTOR OF SAFETY  =509.261
ITERATION = 2  FACTOR OF SAFETY  =509.261

AT CENTER (1780.000 ,   940.000) WITH RADIUS 485.082 LOWEST F.S.=  48.571


AT CENTER (1780.0 , 800.0) WITH RADIUS OF 345.342

ITERATION = 1  FACTOR OF SAFETY  =113.039
ITERATION = 2  FACTOR OF SAFETY  =113.039

AT CENTER (1780.0 , 800.0) WITH RADIUS OF 345.057

ITERATION = 1  FACTOR OF SAFETY  =132.850
ITERATION = 2  FACTOR OF SAFETY  =132.850

AT CENTER (1780.0 , 800.0) WITH RADIUS OF 344.772
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ITERATION = 1  FACTOR OF SAFETY  =165.870
ITERATION = 2  FACTOR OF SAFETY  =165.870

AT CENTER (1780.0 , 800.0) WITH RADIUS OF 344.488

ITERATION = 1  FACTOR OF SAFETY  =231.951
ITERATION = 2  FACTOR OF SAFETY  =231.951

AT CENTER (1780.0 , 800.0) WITH RADIUS OF 344.203

ITERATION = 1  FACTOR OF SAFETY  =430.300
ITERATION = 2  FACTOR OF SAFETY  =430.300

AT CENTER (1780.000 ,   800.000) WITH RADIUS 345.342 LOWEST F.S.=  113.039


AT CENTER (1780.0 , 660.0) WITH RADIUS OF 205.956

ITERATION = 1  FACTOR OF SAFETY  =90.961
ITERATION = 2  FACTOR OF SAFETY  =90.961

AT CENTER (1780.0 , 660.0) WITH RADIUS OF 205.553

ITERATION = 1  FACTOR OF SAFETY  =104.103
ITERATION = 2  FACTOR OF SAFETY  =104.103

AT CENTER (1780.0 , 660.0) WITH RADIUS OF 205.150

ITERATION = 1  FACTOR OF SAFETY  =127.429
ITERATION = 2  FACTOR OF SAFETY  =127.429

AT CENTER (1780.0 , 660.0) WITH RADIUS OF 204.748

ITERATION = 1  FACTOR OF SAFETY  =174.075
ITERATION = 2  FACTOR OF SAFETY  =174.075

AT CENTER (1780.0 , 660.0) WITH RADIUS OF 204.345

ITERATION = 1  FACTOR OF SAFETY  =314.367
ITERATION = 2  FACTOR OF SAFETY  =314.367

AT CENTER (1780.000 ,   660.000) WITH RADIUS 205.956 LOWEST F.S.=  90.961


GRID IS EXPANDED AS FOLLOWS SO MINIMUM FACTOR OF SAFETY FALLS WITHIN THE GRID


AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 1036.790

ITERATION = 1  FACTOR OF SAFETY  =4.033
ITERATION = 2  FACTOR OF SAFETY  =4.033

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 1008.407

ITERATION = 1  FACTOR OF SAFETY  =2.797
ITERATION = 2  FACTOR OF SAFETY  =2.796
ITERATION = 3  FACTOR OF SAFETY  =2.796

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 980.024

ITERATION = 1  FACTOR OF SAFETY  =2.662
ITERATION = 2  FACTOR OF SAFETY  =2.661
ITERATION = 3  FACTOR OF SAFETY  =2.661
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AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 951.640

ITERATION = 1  FACTOR OF SAFETY  =2.551
ITERATION = 2  FACTOR OF SAFETY  =2.549
ITERATION = 3  FACTOR OF SAFETY  =2.549

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 923.257

ITERATION = 1  FACTOR OF SAFETY  =2.420
ITERATION = 2  FACTOR OF SAFETY  =2.418
ITERATION = 3  FACTOR OF SAFETY  =2.418

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 916.161

ITERATION = 1  FACTOR OF SAFETY  =2.444
ITERATION = 2  FACTOR OF SAFETY  =2.441
ITERATION = 3  FACTOR OF SAFETY  =2.441

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 909.066

ITERATION = 1  FACTOR OF SAFETY  =2.539
ITERATION = 2  FACTOR OF SAFETY  =2.537
ITERATION = 3  FACTOR OF SAFETY  =2.537

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 901.970

ITERATION = 1  FACTOR OF SAFETY  =2.651
ITERATION = 2  FACTOR OF SAFETY  =2.649
ITERATION = 3  FACTOR OF SAFETY  =2.649

AT CENTER (1220.0 , 1500.0) WITH RADIUS OF 901.970

ITERATION = 1  FACTOR OF SAFETY  =6.153
ITERATION = 2  FACTOR OF SAFETY  =6.153

AT CENTER (1220.000 ,   1500.000) WITH RADIUS 923.257 LOWEST F.S.=  2.418


AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 1040.738

ITERATION = 1  FACTOR OF SAFETY  =3.450
ITERATION = 2  FACTOR OF SAFETY  =3.449
ITERATION = 3  FACTOR OF SAFETY  =3.449

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 1020.056

ITERATION = 1  FACTOR OF SAFETY  =2.270
ITERATION = 2  FACTOR OF SAFETY  =2.268
ITERATION = 3  FACTOR OF SAFETY  =2.268

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 999.375

ITERATION = 1  FACTOR OF SAFETY  =2.201
ITERATION = 2  FACTOR OF SAFETY  =2.199
ITERATION = 3  FACTOR OF SAFETY  =2.199

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 978.694

ITERATION = 1  FACTOR OF SAFETY  =2.139
ITERATION = 2  FACTOR OF SAFETY  =2.136
ITERATION = 3  FACTOR OF SAFETY  =2.136

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 958.013
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ITERATION = 1  FACTOR OF SAFETY  =2.280
ITERATION = 2  FACTOR OF SAFETY  =2.277
ITERATION = 3  FACTOR OF SAFETY  =2.277

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 994.205

ITERATION = 1  FACTOR OF SAFETY  =2.185
ITERATION = 2  FACTOR OF SAFETY  =2.183
ITERATION = 3  FACTOR OF SAFETY  =2.183

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 989.034

ITERATION = 1  FACTOR OF SAFETY  =2.170
ITERATION = 2  FACTOR OF SAFETY  =2.167
ITERATION = 3  FACTOR OF SAFETY  =2.167

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 983.864

ITERATION = 1  FACTOR OF SAFETY  =2.154
ITERATION = 2  FACTOR OF SAFETY  =2.152
ITERATION = 3  FACTOR OF SAFETY  =2.152

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 973.523

ITERATION = 1  FACTOR OF SAFETY  =2.121
ITERATION = 2  FACTOR OF SAFETY  =2.118
ITERATION = 3  FACTOR OF SAFETY  =2.118

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 968.353

ITERATION = 1  FACTOR OF SAFETY  =2.138
ITERATION = 2  FACTOR OF SAFETY  =2.135
ITERATION = 3  FACTOR OF SAFETY  =2.135

AT CENTER (1360.0 , 1500.0) WITH RADIUS OF 963.183

ITERATION = 1  FACTOR OF SAFETY  =2.180
ITERATION = 2  FACTOR OF SAFETY  =2.177
ITERATION = 3  FACTOR OF SAFETY  =2.177

AT CENTER (1360.000 ,   1500.000) WITH RADIUS 973.523 LOWEST F.S.=  2.118


AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1044.557

ITERATION = 1  FACTOR OF SAFETY  =3.429
ITERATION = 2  FACTOR OF SAFETY  =3.428
ITERATION = 3  FACTOR OF SAFETY  =3.428

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1044.557

ITERATION = 1  FACTOR OF SAFETY  =7.117
ITERATION = 2  FACTOR OF SAFETY  =7.117

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1031.744

ITERATION = 1  FACTOR OF SAFETY  =2.087
ITERATION = 2  FACTOR OF SAFETY  =2.084
ITERATION = 3  FACTOR OF SAFETY  =2.084

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1018.930

ITERATION = 1  FACTOR OF SAFETY  =2.117
ITERATION = 2  FACTOR OF SAFETY  =2.114
ITERATION = 3  FACTOR OF SAFETY  =2.114
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AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1041.354

ITERATION = 1  FACTOR OF SAFETY  =2.074
ITERATION = 2  FACTOR OF SAFETY  =2.071
ITERATION = 3  FACTOR OF SAFETY  =2.071

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1041.354

ITERATION = 1  FACTOR OF SAFETY  =9.178
ITERATION = 2  FACTOR OF SAFETY  =9.178

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1038.150

ITERATION = 1  FACTOR OF SAFETY  =2.076
ITERATION = 2  FACTOR OF SAFETY  =2.073
ITERATION = 3  FACTOR OF SAFETY  =2.073

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1038.150

ITERATION = 1  FACTOR OF SAFETY  =46.488
ITERATION = 2  FACTOR OF SAFETY  =46.488

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1034.947

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.078
ITERATION = 3  FACTOR OF SAFETY  =2.078

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1028.540

ITERATION = 1  FACTOR OF SAFETY  =2.093
ITERATION = 2  FACTOR OF SAFETY  =2.090
ITERATION = 3  FACTOR OF SAFETY  =2.090

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1025.337

ITERATION = 1  FACTOR OF SAFETY  =2.099
ITERATION = 2  FACTOR OF SAFETY  =2.096
ITERATION = 3  FACTOR OF SAFETY  =2.096

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1022.134

ITERATION = 1  FACTOR OF SAFETY  =2.100
ITERATION = 2  FACTOR OF SAFETY  =2.097
ITERATION = 3  FACTOR OF SAFETY  =2.097

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1022.134

ITERATION = 1  FACTOR OF SAFETY  =182.316
ITERATION = 2  FACTOR OF SAFETY  =182.316

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 1006.117

ITERATION = 1  FACTOR OF SAFETY  =2.198
ITERATION = 2  FACTOR OF SAFETY  =2.195
ITERATION = 3  FACTOR OF SAFETY  =2.195

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 993.304

ITERATION = 1  FACTOR OF SAFETY  =2.597
ITERATION = 2  FACTOR OF SAFETY  =2.595
ITERATION = 3  FACTOR OF SAFETY  =2.595

AT CENTER (1500.0 , 1500.0) WITH RADIUS OF 993.304
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ITERATION = 1  FACTOR OF SAFETY  =7.512
ITERATION = 2  FACTOR OF SAFETY  =7.512

AT CENTER (1500.000 ,   1500.000) WITH RADIUS 1041.354 LOWEST F.S.=  2.071


AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1047.798

ITERATION = 1  FACTOR OF SAFETY  =2.245
ITERATION = 2  FACTOR OF SAFETY  =2.242
ITERATION = 3  FACTOR OF SAFETY  =2.242

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1047.798

ITERATION = 1  FACTOR OF SAFETY  =990.714
ITERATION = 2  FACTOR OF SAFETY  =990.714

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1043.066

ITERATION = 1  FACTOR OF SAFETY  =2.313
ITERATION = 2  FACTOR OF SAFETY  =2.310
ITERATION = 3  FACTOR OF SAFETY  =2.310

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1043.066

ITERATION = 1  FACTOR OF SAFETY  =100.934
ITERATION = 2  FACTOR OF SAFETY  =100.934

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1038.333

ITERATION = 1  FACTOR OF SAFETY  =2.418
ITERATION = 2  FACTOR OF SAFETY  =2.416
ITERATION = 3  FACTOR OF SAFETY  =2.416

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1038.333

ITERATION = 1  FACTOR OF SAFETY  =10.122
ITERATION = 2  FACTOR OF SAFETY  =10.122

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1038.333

ITERATION = 1  FACTOR OF SAFETY  =126.144
ITERATION = 2  FACTOR OF SAFETY  =126.144

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1033.601

ITERATION = 1  FACTOR OF SAFETY  =3.215
ITERATION = 2  FACTOR OF SAFETY  =3.213
ITERATION = 3  FACTOR OF SAFETY  =3.213

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1033.601

ITERATION = 1  FACTOR OF SAFETY  =147.110
ITERATION = 2  FACTOR OF SAFETY  =147.110

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1028.869

ITERATION = 1  FACTOR OF SAFETY  =3.822
ITERATION = 2  FACTOR OF SAFETY  =3.820
ITERATION = 3  FACTOR OF SAFETY  =3.820

AT CENTER (1640.0 , 1500.0) WITH RADIUS OF 1028.869

ITERATION = 1  FACTOR OF SAFETY  =369.263
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ITERATION = 2  FACTOR OF SAFETY  =369.263

AT CENTER (1640.000 ,   1500.000) WITH RADIUS 1047.798 LOWEST F.S.=  2.242


AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1044.738

ITERATION = 1  FACTOR OF SAFETY  =7.315
ITERATION = 2  FACTOR OF SAFETY  =7.315

AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1044.738

ITERATION = 1  FACTOR OF SAFETY  =153.582
ITERATION = 2  FACTOR OF SAFETY  =153.582

AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1042.946

ITERATION = 1  FACTOR OF SAFETY  =7.776
ITERATION = 2  FACTOR OF SAFETY  =7.776

AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1041.154

ITERATION = 1  FACTOR OF SAFETY  =8.570
ITERATION = 2  FACTOR OF SAFETY  =8.570

AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1039.363

ITERATION = 1  FACTOR OF SAFETY  =10.245
ITERATION = 2  FACTOR OF SAFETY  =10.245

AT CENTER (1780.0 , 1500.0) WITH RADIUS OF 1037.571

ITERATION = 1  FACTOR OF SAFETY  =16.599
ITERATION = 2  FACTOR OF SAFETY  =16.599

AT CENTER (1780.000 ,   1500.000) WITH RADIUS 1044.738 LOWEST F.S.=  7.315


AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1176.688

ITERATION = 1  FACTOR OF SAFETY  =4.219
ITERATION = 2  FACTOR OF SAFETY  =4.219

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1146.606

ITERATION = 1  FACTOR OF SAFETY  =2.947
ITERATION = 2  FACTOR OF SAFETY  =2.946
ITERATION = 3  FACTOR OF SAFETY  =2.946

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1116.525

ITERATION = 1  FACTOR OF SAFETY  =2.816
ITERATION = 2  FACTOR OF SAFETY  =2.815
ITERATION = 3  FACTOR OF SAFETY  =2.815

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1086.443

ITERATION = 1  FACTOR OF SAFETY  =2.714
ITERATION = 2  FACTOR OF SAFETY  =2.713
ITERATION = 3  FACTOR OF SAFETY  =2.713

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1056.362

ITERATION = 1  FACTOR OF SAFETY  =2.619
ITERATION = 2  FACTOR OF SAFETY  =2.617
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AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1119.564

ITERATION = 1  FACTOR OF SAFETY  =2.240
ITERATION = 2  FACTOR OF SAFETY  =2.237
ITERATION = 3  FACTOR OF SAFETY  =2.237

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1108.452

ITERATION = 1  FACTOR OF SAFETY  =2.206
ITERATION = 2  FACTOR OF SAFETY  =2.204
ITERATION = 3  FACTOR OF SAFETY  =2.204

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1102.896

ITERATION = 1  FACTOR OF SAFETY  =2.208
ITERATION = 2  FACTOR OF SAFETY  =2.205
ITERATION = 3  FACTOR OF SAFETY  =2.205

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1097.340

ITERATION = 1  FACTOR OF SAFETY  =2.222
ITERATION = 2  FACTOR OF SAFETY  =2.219
ITERATION = 3  FACTOR OF SAFETY  =2.219

AT CENTER (1360.000 ,   1640.000) WITH RADIUS 1108.452 LOWEST F.S.=  2.204


AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1184.506

ITERATION = 1  FACTOR OF SAFETY  =3.331
ITERATION = 2  FACTOR OF SAFETY  =3.331
ITERATION = 3  FACTOR OF SAFETY  =3.331

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1184.506

ITERATION = 1  FACTOR OF SAFETY  =7.669
ITERATION = 2  FACTOR OF SAFETY  =7.669

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1170.323

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.081
ITERATION = 3  FACTOR OF SAFETY  =2.081

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1156.141

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.077
ITERATION = 3  FACTOR OF SAFETY  =2.077

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1141.958

ITERATION = 1  FACTOR OF SAFETY  =2.198
ITERATION = 2  FACTOR OF SAFETY  =2.195
ITERATION = 3  FACTOR OF SAFETY  =2.195

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1166.778

ITERATION = 1  FACTOR OF SAFETY  =2.077
ITERATION = 2  FACTOR OF SAFETY  =2.074
ITERATION = 3  FACTOR OF SAFETY  =2.074

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1163.232

ITERATION = 1  FACTOR OF SAFETY  =2.064
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ITERATION = 3  FACTOR OF SAFETY  =2.617

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1048.842

ITERATION = 1  FACTOR OF SAFETY  =2.655
ITERATION = 2  FACTOR OF SAFETY  =2.653
ITERATION = 3  FACTOR OF SAFETY  =2.653

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1041.321

ITERATION = 1  FACTOR OF SAFETY  =2.787
ITERATION = 2  FACTOR OF SAFETY  =2.785
ITERATION = 3  FACTOR OF SAFETY  =2.785

AT CENTER (1220.0 , 1640.0) WITH RADIUS OF 1033.801

ITERATION = 1  FACTOR OF SAFETY  =3.001
ITERATION = 2  FACTOR OF SAFETY  =2.999
ITERATION = 3  FACTOR OF SAFETY  =2.999

AT CENTER (1220.000 ,   1640.000) WITH RADIUS 1056.362 LOWEST F.S.=  2.617


AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1180.682

ITERATION = 1  FACTOR OF SAFETY  =3.568
ITERATION = 2  FACTOR OF SAFETY  =3.568
ITERATION = 3  FACTOR OF SAFETY  =3.568

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1158.457

ITERATION = 1  FACTOR OF SAFETY  =2.382
ITERATION = 2  FACTOR OF SAFETY  =2.380
ITERATION = 3  FACTOR OF SAFETY  =2.380

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1136.233

ITERATION = 1  FACTOR OF SAFETY  =2.305
ITERATION = 2  FACTOR OF SAFETY  =2.303
ITERATION = 3  FACTOR OF SAFETY  =2.303

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1114.008

ITERATION = 1  FACTOR OF SAFETY  =2.210
ITERATION = 2  FACTOR OF SAFETY  =2.207
ITERATION = 3  FACTOR OF SAFETY  =2.207

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1091.783

ITERATION = 1  FACTOR OF SAFETY  =2.263
ITERATION = 2  FACTOR OF SAFETY  =2.261
ITERATION = 3  FACTOR OF SAFETY  =2.261

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1130.677

ITERATION = 1  FACTOR OF SAFETY  =2.284
ITERATION = 2  FACTOR OF SAFETY  =2.282
ITERATION = 3  FACTOR OF SAFETY  =2.282

AT CENTER (1360.0 , 1640.0) WITH RADIUS OF 1125.120

ITERATION = 1  FACTOR OF SAFETY  =2.263
ITERATION = 2  FACTOR OF SAFETY  =2.261
ITERATION = 3  FACTOR OF SAFETY  =2.261
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ITERATION = 2  FACTOR OF SAFETY  =2.061
ITERATION = 3  FACTOR OF SAFETY  =2.061

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1163.232

ITERATION = 1  FACTOR OF SAFETY  =72.839
ITERATION = 2  FACTOR OF SAFETY  =72.839

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1159.686

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1152.595

ITERATION = 1  FACTOR OF SAFETY  =2.097
ITERATION = 2  FACTOR OF SAFETY  =2.094
ITERATION = 3  FACTOR OF SAFETY  =2.094

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1149.049

ITERATION = 1  FACTOR OF SAFETY  =2.124
ITERATION = 2  FACTOR OF SAFETY  =2.121
ITERATION = 3  FACTOR OF SAFETY  =2.121

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1145.504

ITERATION = 1  FACTOR OF SAFETY  =2.158
ITERATION = 2  FACTOR OF SAFETY  =2.155
ITERATION = 3  FACTOR OF SAFETY  =2.155

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1127.776

ITERATION = 1  FACTOR OF SAFETY  =2.393
ITERATION = 2  FACTOR OF SAFETY  =2.390
ITERATION = 3  FACTOR OF SAFETY  =2.390

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1127.776

ITERATION = 1  FACTOR OF SAFETY  =71.200
ITERATION = 2  FACTOR OF SAFETY  =71.200

AT CENTER (1500.000 ,   1640.000) WITH RADIUS 1163.232 LOWEST F.S.=  2.061


AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1187.774

ITERATION = 1  FACTOR OF SAFETY  =2.156
ITERATION = 2  FACTOR OF SAFETY  =2.153
ITERATION = 3  FACTOR OF SAFETY  =2.153

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1187.774

ITERATION = 1  FACTOR OF SAFETY  =1100.801
ITERATION = 2  FACTOR OF SAFETY  =1100.801

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1181.819

ITERATION = 1  FACTOR OF SAFETY  =2.244
ITERATION = 2  FACTOR OF SAFETY  =2.241
ITERATION = 3  FACTOR OF SAFETY  =2.241

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1181.819
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ITERATION = 1  FACTOR OF SAFETY  =126.985
ITERATION = 2  FACTOR OF SAFETY  =126.985

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1175.864

ITERATION = 1  FACTOR OF SAFETY  =2.322
ITERATION = 2  FACTOR OF SAFETY  =2.319
ITERATION = 3  FACTOR OF SAFETY  =2.319

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1175.864

ITERATION = 1  FACTOR OF SAFETY  =14.319
ITERATION = 2  FACTOR OF SAFETY  =14.319

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1175.864

ITERATION = 1  FACTOR OF SAFETY  =151.530
ITERATION = 2  FACTOR OF SAFETY  =151.530

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1169.909

ITERATION = 1  FACTOR OF SAFETY  =2.511
ITERATION = 2  FACTOR OF SAFETY  =2.508
ITERATION = 3  FACTOR OF SAFETY  =2.508

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1169.909

ITERATION = 1  FACTOR OF SAFETY  =258.041
ITERATION = 2  FACTOR OF SAFETY  =258.041

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1163.954

ITERATION = 1  FACTOR OF SAFETY  =3.705
ITERATION = 2  FACTOR OF SAFETY  =3.703
ITERATION = 3  FACTOR OF SAFETY  =3.703

AT CENTER (1640.0 , 1640.0) WITH RADIUS OF 1163.954

ITERATION = 1  FACTOR OF SAFETY  =3.937
ITERATION = 2  FACTOR OF SAFETY  =3.936
ITERATION = 3  FACTOR OF SAFETY  =3.936

AT CENTER (1640.000 ,   1640.000) WITH RADIUS 1187.774 LOWEST F.S.=  2.153


AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1184.703

ITERATION = 1  FACTOR OF SAFETY  =8.053
ITERATION = 2  FACTOR OF SAFETY  =8.052

AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1184.703

ITERATION = 1  FACTOR OF SAFETY  =155.009
ITERATION = 2  FACTOR OF SAFETY  =155.009

AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1182.733

ITERATION = 1  FACTOR OF SAFETY  =8.520
ITERATION = 2  FACTOR OF SAFETY  =8.520

AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1180.763

ITERATION = 1  FACTOR OF SAFETY  =9.316
ITERATION = 2  FACTOR OF SAFETY  =9.316
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AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1178.793

ITERATION = 1  FACTOR OF SAFETY  =10.967
ITERATION = 2  FACTOR OF SAFETY  =10.967

AT CENTER (1780.0 , 1640.0) WITH RADIUS OF 1176.823

ITERATION = 1  FACTOR OF SAFETY  =16.773
ITERATION = 2  FACTOR OF SAFETY  =16.773

AT CENTER (1780.000 ,   1640.000) WITH RADIUS 1184.703 LOWEST F.S.=  8.052


AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1316.571

ITERATION = 1  FACTOR OF SAFETY  =4.399
ITERATION = 2  FACTOR OF SAFETY  =4.399

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1285.160

ITERATION = 1  FACTOR OF SAFETY  =3.092
ITERATION = 2  FACTOR OF SAFETY  =3.091
ITERATION = 3  FACTOR OF SAFETY  =3.091

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1253.749

ITERATION = 1  FACTOR OF SAFETY  =2.977
ITERATION = 2  FACTOR OF SAFETY  =2.976
ITERATION = 3  FACTOR OF SAFETY  =2.976

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1222.339

ITERATION = 1  FACTOR OF SAFETY  =2.884
ITERATION = 2  FACTOR OF SAFETY  =2.883
ITERATION = 3  FACTOR OF SAFETY  =2.883

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1190.928

ITERATION = 1  FACTOR OF SAFETY  =2.827
ITERATION = 2  FACTOR OF SAFETY  =2.825
ITERATION = 3  FACTOR OF SAFETY  =2.825

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1183.075

ITERATION = 1  FACTOR OF SAFETY  =2.877
ITERATION = 2  FACTOR OF SAFETY  =2.875
ITERATION = 3  FACTOR OF SAFETY  =2.875

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1175.222

ITERATION = 1  FACTOR OF SAFETY  =2.870
ITERATION = 2  FACTOR OF SAFETY  =2.868
ITERATION = 3  FACTOR OF SAFETY  =2.868

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1175.222

ITERATION = 1  FACTOR OF SAFETY  =11.785
ITERATION = 2  FACTOR OF SAFETY  =11.785

AT CENTER (1220.0 , 1780.0) WITH RADIUS OF 1167.370

ITERATION = 1  FACTOR OF SAFETY  =3.358
ITERATION = 2  FACTOR OF SAFETY  =3.357
ITERATION = 3  FACTOR OF SAFETY  =3.357
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AT CENTER (1220.000 ,   1780.000) WITH RADIUS 1190.928 LOWEST F.S.=  2.825

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1320.626

ITERATION = 1  FACTOR OF SAFETY  =3.701
ITERATION = 2  FACTOR OF SAFETY  =3.701
ITERATION = 3  FACTOR OF SAFETY  =3.701

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1297.210

ITERATION = 1  FACTOR OF SAFETY  =2.502
ITERATION = 2  FACTOR OF SAFETY  =2.500
ITERATION = 3  FACTOR OF SAFETY  =2.500

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1273.794

ITERATION = 1  FACTOR OF SAFETY  =2.421
ITERATION = 2  FACTOR OF SAFETY  =2.419
ITERATION = 3  FACTOR OF SAFETY  =2.419

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1250.378

ITERATION = 1  FACTOR OF SAFETY  =2.328
ITERATION = 2  FACTOR OF SAFETY  =2.325
ITERATION = 3  FACTOR OF SAFETY  =2.325

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1226.962

ITERATION = 1  FACTOR OF SAFETY  =2.328
ITERATION = 2  FACTOR OF SAFETY  =2.326
ITERATION = 3  FACTOR OF SAFETY  =2.326

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1267.940

ITERATION = 1  FACTOR OF SAFETY  =2.400
ITERATION = 2  FACTOR OF SAFETY  =2.398
ITERATION = 3  FACTOR OF SAFETY  =2.398

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1262.086

ITERATION = 1  FACTOR OF SAFETY  =2.377
ITERATION = 2  FACTOR OF SAFETY  =2.375
ITERATION = 3  FACTOR OF SAFETY  =2.375

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1256.232

ITERATION = 1  FACTOR OF SAFETY  =2.339
ITERATION = 2  FACTOR OF SAFETY  =2.337
ITERATION = 3  FACTOR OF SAFETY  =2.337

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1256.232

ITERATION = 1  FACTOR OF SAFETY  =52.563
ITERATION = 2  FACTOR OF SAFETY  =52.563

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1244.524

ITERATION = 1  FACTOR OF SAFETY  =2.317
ITERATION = 2  FACTOR OF SAFETY  =2.315
ITERATION = 3  FACTOR OF SAFETY  =2.315

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1238.670

ITERATION = 1  FACTOR OF SAFETY  =2.311
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ITERATION = 2  FACTOR OF SAFETY  =2.308
ITERATION = 3  FACTOR OF SAFETY  =2.308

AT CENTER (1360.0 , 1780.0) WITH RADIUS OF 1232.816

ITERATION = 1  FACTOR OF SAFETY  =2.312
ITERATION = 2  FACTOR OF SAFETY  =2.310
ITERATION = 3  FACTOR OF SAFETY  =2.310

AT CENTER (1360.000 ,   1780.000) WITH RADIUS 1238.670 LOWEST F.S.=  2.308


AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1324.455

ITERATION = 1  FACTOR OF SAFETY  =3.333
ITERATION = 2  FACTOR OF SAFETY  =3.333
ITERATION = 3  FACTOR OF SAFETY  =3.333

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1324.455

ITERATION = 1  FACTOR OF SAFETY  =8.298
ITERATION = 2  FACTOR OF SAFETY  =8.298

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1309.205

ITERATION = 1  FACTOR OF SAFETY  =2.141
ITERATION = 2  FACTOR OF SAFETY  =2.139
ITERATION = 3  FACTOR OF SAFETY  =2.139

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1293.955

ITERATION = 1  FACTOR OF SAFETY  =2.109
ITERATION = 2  FACTOR OF SAFETY  =2.106
ITERATION = 3  FACTOR OF SAFETY  =2.106

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1278.706

ITERATION = 1  FACTOR OF SAFETY  =2.134
ITERATION = 2  FACTOR OF SAFETY  =2.131
ITERATION = 3  FACTOR OF SAFETY  =2.131

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1305.393

ITERATION = 1  FACTOR OF SAFETY  =2.130
ITERATION = 2  FACTOR OF SAFETY  =2.127
ITERATION = 3  FACTOR OF SAFETY  =2.127

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1301.580

ITERATION = 1  FACTOR OF SAFETY  =2.114
ITERATION = 2  FACTOR OF SAFETY  =2.111
ITERATION = 3  FACTOR OF SAFETY  =2.111

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1297.768

ITERATION = 1  FACTOR OF SAFETY  =2.111
ITERATION = 2  FACTOR OF SAFETY  =2.108
ITERATION = 3  FACTOR OF SAFETY  =2.108

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1290.143

ITERATION = 1  FACTOR OF SAFETY  =2.109
ITERATION = 2  FACTOR OF SAFETY  =2.106
ITERATION = 3  FACTOR OF SAFETY  =2.106
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AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1286.331

ITERATION = 1  FACTOR OF SAFETY  =2.112
ITERATION = 2  FACTOR OF SAFETY  =2.109
ITERATION = 3  FACTOR OF SAFETY  =2.109

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1282.518

ITERATION = 1  FACTOR OF SAFETY  =2.119
ITERATION = 2  FACTOR OF SAFETY  =2.116
ITERATION = 3  FACTOR OF SAFETY  =2.116

AT CENTER (1500.0 , 1780.0) WITH RADIUS OF 1263.456

ITERATION = 1  FACTOR OF SAFETY  =2.411
ITERATION = 2  FACTOR OF SAFETY  =2.408
ITERATION = 3  FACTOR OF SAFETY  =2.408

AT CENTER (1500.000 ,   1780.000) WITH RADIUS 1293.955 LOWEST F.S.=  2.106


AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1327.750

ITERATION = 1  FACTOR OF SAFETY  =2.121
ITERATION = 2  FACTOR OF SAFETY  =2.118
ITERATION = 3  FACTOR OF SAFETY  =2.118

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1327.750

ITERATION = 1  FACTOR OF SAFETY  =1213.610
ITERATION = 2  FACTOR OF SAFETY  =1213.610

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1320.525

ITERATION = 1  FACTOR OF SAFETY  =2.151
ITERATION = 2  FACTOR OF SAFETY  =2.148
ITERATION = 3  FACTOR OF SAFETY  =2.148

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1320.525

ITERATION = 1  FACTOR OF SAFETY  =153.059
ITERATION = 2  FACTOR OF SAFETY  =153.059

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1313.301

ITERATION = 1  FACTOR OF SAFETY  =2.192
ITERATION = 2  FACTOR OF SAFETY  =2.189
ITERATION = 3  FACTOR OF SAFETY  =2.189

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1313.301

ITERATION = 1  FACTOR OF SAFETY  =36.143
ITERATION = 2  FACTOR OF SAFETY  =36.143

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1313.301

ITERATION = 1  FACTOR OF SAFETY  =188.868
ITERATION = 2  FACTOR OF SAFETY  =188.868

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1306.076

ITERATION = 1  FACTOR OF SAFETY  =2.477
ITERATION = 2  FACTOR OF SAFETY  =2.475
ITERATION = 3  FACTOR OF SAFETY  =2.475
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AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1298.851

ITERATION = 1  FACTOR OF SAFETY  =2.715
ITERATION = 2  FACTOR OF SAFETY  =2.713
ITERATION = 3  FACTOR OF SAFETY  =2.713

AT CENTER (1640.0 , 1780.0) WITH RADIUS OF 1298.851

ITERATION = 1  FACTOR OF SAFETY  =4.488
ITERATION = 2  FACTOR OF SAFETY  =4.488
ITERATION = 3  FACTOR OF SAFETY  =4.488

AT CENTER (1640.000 ,   1780.000) WITH RADIUS 1327.750 LOWEST F.S.=  2.118


AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1324.675

ITERATION = 1  FACTOR OF SAFETY  =8.818
ITERATION = 2  FACTOR OF SAFETY  =8.818

AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1324.675

ITERATION = 1  FACTOR OF SAFETY  =155.482
ITERATION = 2  FACTOR OF SAFETY  =155.482

AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1322.564

ITERATION = 1  FACTOR OF SAFETY  =9.301
ITERATION = 2  FACTOR OF SAFETY  =9.301

AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1320.454

ITERATION = 1  FACTOR OF SAFETY  =10.119
ITERATION = 2  FACTOR OF SAFETY  =10.119

AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1318.344

ITERATION = 1  FACTOR OF SAFETY  =11.793
ITERATION = 2  FACTOR OF SAFETY  =11.793

AT CENTER (1780.0 , 1780.0) WITH RADIUS OF 1316.233

ITERATION = 1  FACTOR OF SAFETY  =17.408
ITERATION = 2  FACTOR OF SAFETY  =17.408

AT CENTER (1780.000 ,   1780.000) WITH RADIUS 1324.675 LOWEST F.S.=  8.818


LOWEST FACTOR OF SAFETY AT EACH GRID POINT IS TABULATED BELOW

COORDINATE  1220.000  1360.000  1500.000  1640.000  1780.000
  1780.000     2.825     2.308     2.106     2.118     8.818
  1640.000     2.617     2.204     2.061     2.153     8.052
  1500.000     2.418     2.118     2.071     2.242     7.315
  1360.000     2.244     2.106     2.097     2.493     6.634
  1220.000     2.198     2.110     2.121     2.560     6.108
  1080.000     2.152     2.154     2.177     6.757     6.267
   940.000     2.208     2.174     2.231    48.594    48.571
   800.000     2.252     2.261     2.304    36.060   113.039
   660.000     2.684     2.480     2.758    23.632    90.961

MINIMUM FACTORS OF SAFETY OCCUR AT THE FOLLOWING  2  CENTERS

FACTOR OF SAFETY = 2.061 AT (1500.000,1640.000)
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FACTOR OF SAFETY = 2.152 AT (1220.000,1080.000)

AUTOMATIC SEARCH WILL BE MADE ONLY ON THE CENTER WITH THE SMALLEST F.S.  MORE
SEARCH FROM OTHER CENTER MAY BE NEEDED TO ENSURE THAT MINIMUM F.S. IS
OBTAINED.


AT POINT ( 1500  1640 ) RADIUS 1163.232
THE MINIMUM FACTOR OF SAFETY IS 2.061

FACTORS OF SAFETY BASED ON SEARCH

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1184.506

ITERATION = 1  FACTOR OF SAFETY  =3.331
ITERATION = 2  FACTOR OF SAFETY  =3.331
ITERATION = 3  FACTOR OF SAFETY  =3.331

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1184.506

ITERATION = 1  FACTOR OF SAFETY  =7.669
ITERATION = 2  FACTOR OF SAFETY  =7.669

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1170.323

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.081
ITERATION = 3  FACTOR OF SAFETY  =2.081

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1156.141

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.077
ITERATION = 3  FACTOR OF SAFETY  =2.077

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1141.958

ITERATION = 1  FACTOR OF SAFETY  =2.198
ITERATION = 2  FACTOR OF SAFETY  =2.195
ITERATION = 3  FACTOR OF SAFETY  =2.195

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1166.778

ITERATION = 1  FACTOR OF SAFETY  =2.077
ITERATION = 2  FACTOR OF SAFETY  =2.074
ITERATION = 3  FACTOR OF SAFETY  =2.074

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1163.232

ITERATION = 1  FACTOR OF SAFETY  =2.064
ITERATION = 2  FACTOR OF SAFETY  =2.061
ITERATION = 3  FACTOR OF SAFETY  =2.061

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1163.232

ITERATION = 1  FACTOR OF SAFETY  =72.839
ITERATION = 2  FACTOR OF SAFETY  =72.839

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1159.686

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1152.595
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ITERATION = 1  FACTOR OF SAFETY  =2.097
ITERATION = 2  FACTOR OF SAFETY  =2.094
ITERATION = 3  FACTOR OF SAFETY  =2.094

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1149.049

ITERATION = 1  FACTOR OF SAFETY  =2.124
ITERATION = 2  FACTOR OF SAFETY  =2.121
ITERATION = 3  FACTOR OF SAFETY  =2.121

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1145.504

ITERATION = 1  FACTOR OF SAFETY  =2.158
ITERATION = 2  FACTOR OF SAFETY  =2.155
ITERATION = 3  FACTOR OF SAFETY  =2.155

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1127.776

ITERATION = 1  FACTOR OF SAFETY  =2.393
ITERATION = 2  FACTOR OF SAFETY  =2.390
ITERATION = 3  FACTOR OF SAFETY  =2.390

AT CENTER (1500.0 , 1640.0) WITH RADIUS OF 1127.776

ITERATION = 1  FACTOR OF SAFETY  =71.200
ITERATION = 2  FACTOR OF SAFETY  =71.200

AT CENTER (1500.000 ,   1640.000) WITH RADIUS 1163.232 LOWEST F.S.=  2.061


AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1186.342

ITERATION = 1  FACTOR OF SAFETY  =4.442
ITERATION = 2  FACTOR OF SAFETY  =4.442

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1176.120

ITERATION = 1  FACTOR OF SAFETY  =2.110
ITERATION = 2  FACTOR OF SAFETY  =2.107
ITERATION = 3  FACTOR OF SAFETY  =2.107

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1176.120

ITERATION = 1  FACTOR OF SAFETY  =15.428
ITERATION = 2  FACTOR OF SAFETY  =15.428

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1165.899

ITERATION = 1  FACTOR OF SAFETY  =2.137
ITERATION = 2  FACTOR OF SAFETY  =2.134
ITERATION = 3  FACTOR OF SAFETY  =2.134

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1165.899

ITERATION = 1  FACTOR OF SAFETY  =92.843
ITERATION = 2  FACTOR OF SAFETY  =92.843

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1183.786

ITERATION = 1  FACTOR OF SAFETY  =2.373
ITERATION = 2  FACTOR OF SAFETY  =2.371
ITERATION = 3  FACTOR OF SAFETY  =2.371

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1183.786
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ITERATION = 1  FACTOR OF SAFETY  =11.949
ITERATION = 2  FACTOR OF SAFETY  =11.949

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1181.231

ITERATION = 1  FACTOR OF SAFETY  =2.092
ITERATION = 2  FACTOR OF SAFETY  =2.089
ITERATION = 3  FACTOR OF SAFETY  =2.089

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1181.231

ITERATION = 1  FACTOR OF SAFETY  =13.086
ITERATION = 2  FACTOR OF SAFETY  =13.086

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1178.676

ITERATION = 1  FACTOR OF SAFETY  =2.100
ITERATION = 2  FACTOR OF SAFETY  =2.097
ITERATION = 3  FACTOR OF SAFETY  =2.097

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1178.676

ITERATION = 1  FACTOR OF SAFETY  =13.887
ITERATION = 2  FACTOR OF SAFETY  =13.887

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1173.565

ITERATION = 1  FACTOR OF SAFETY  =2.119
ITERATION = 2  FACTOR OF SAFETY  =2.116
ITERATION = 3  FACTOR OF SAFETY  =2.116

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1173.565

ITERATION = 1  FACTOR OF SAFETY  =19.407
ITERATION = 2  FACTOR OF SAFETY  =19.407

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1171.010

ITERATION = 1  FACTOR OF SAFETY  =2.130
ITERATION = 2  FACTOR OF SAFETY  =2.127
ITERATION = 3  FACTOR OF SAFETY  =2.127

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1171.010

ITERATION = 1  FACTOR OF SAFETY  =68.839
ITERATION = 2  FACTOR OF SAFETY  =68.839

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1168.454

ITERATION = 1  FACTOR OF SAFETY  =2.119
ITERATION = 2  FACTOR OF SAFETY  =2.116
ITERATION = 3  FACTOR OF SAFETY  =2.116

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1168.454

ITERATION = 1  FACTOR OF SAFETY  =17.639
ITERATION = 2  FACTOR OF SAFETY  =17.639

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1155.678

ITERATION = 1  FACTOR OF SAFETY  =2.257
ITERATION = 2  FACTOR OF SAFETY  =2.254
ITERATION = 3  FACTOR OF SAFETY  =2.254
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AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1145.456

ITERATION = 1  FACTOR OF SAFETY  =2.815
ITERATION = 2  FACTOR OF SAFETY  =2.813
ITERATION = 3  FACTOR OF SAFETY  =2.813

AT CENTER (1568.0 , 1640.0) WITH RADIUS OF 1145.456

ITERATION = 1  FACTOR OF SAFETY  =5.348
ITERATION = 2  FACTOR OF SAFETY  =5.348

AT CENTER (1568.000 ,   1640.000) WITH RADIUS 1181.231 LOWEST F.S.=  2.089


AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1182.670

ITERATION = 1  FACTOR OF SAFETY  =3.470
ITERATION = 2  FACTOR OF SAFETY  =3.470
ITERATION = 3  FACTOR OF SAFETY  =3.470

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1164.905

ITERATION = 1  FACTOR OF SAFETY  =2.189
ITERATION = 2  FACTOR OF SAFETY  =2.187
ITERATION = 3  FACTOR OF SAFETY  =2.187

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1147.140

ITERATION = 1  FACTOR OF SAFETY  =2.145
ITERATION = 2  FACTOR OF SAFETY  =2.142
ITERATION = 3  FACTOR OF SAFETY  =2.142

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1129.376

ITERATION = 1  FACTOR OF SAFETY  =2.127
ITERATION = 2  FACTOR OF SAFETY  =2.124
ITERATION = 3  FACTOR OF SAFETY  =2.124

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1111.611

ITERATION = 1  FACTOR OF SAFETY  =2.337
ITERATION = 2  FACTOR OF SAFETY  =2.334
ITERATION = 3  FACTOR OF SAFETY  =2.334

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1142.699

ITERATION = 1  FACTOR OF SAFETY  =2.138
ITERATION = 2  FACTOR OF SAFETY  =2.135
ITERATION = 3  FACTOR OF SAFETY  =2.135

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1138.258

ITERATION = 1  FACTOR OF SAFETY  =2.131
ITERATION = 2  FACTOR OF SAFETY  =2.128
ITERATION = 3  FACTOR OF SAFETY  =2.128

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1133.817

ITERATION = 1  FACTOR OF SAFETY  =2.126
ITERATION = 2  FACTOR OF SAFETY  =2.124
ITERATION = 3  FACTOR OF SAFETY  =2.124

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1124.934

ITERATION = 1  FACTOR OF SAFETY  =2.133
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ITERATION = 2  FACTOR OF SAFETY  =2.130
ITERATION = 3  FACTOR OF SAFETY  =2.130

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1120.493

ITERATION = 1  FACTOR OF SAFETY  =2.132
ITERATION = 2  FACTOR OF SAFETY  =2.129
ITERATION = 3  FACTOR OF SAFETY  =2.129

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1120.493

ITERATION = 1  FACTOR OF SAFETY  =22.168
ITERATION = 2  FACTOR OF SAFETY  =22.168

AT CENTER (1432.0 , 1640.0) WITH RADIUS OF 1116.052

ITERATION = 1  FACTOR OF SAFETY  =2.203
ITERATION = 2  FACTOR OF SAFETY  =2.199
ITERATION = 3  FACTOR OF SAFETY  =2.199

AT CENTER (1432.000 ,   1640.000) WITH RADIUS 1133.817 LOWEST F.S.=  2.124


AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1252.481

ITERATION = 1  FACTOR OF SAFETY  =3.324
ITERATION = 2  FACTOR OF SAFETY  =3.323
ITERATION = 3  FACTOR OF SAFETY  =3.323

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1252.481

ITERATION = 1  FACTOR OF SAFETY  =7.968
ITERATION = 2  FACTOR OF SAFETY  =7.968

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1237.749

ITERATION = 1  FACTOR OF SAFETY  =2.108
ITERATION = 2  FACTOR OF SAFETY  =2.105
ITERATION = 3  FACTOR OF SAFETY  =2.105

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1223.017

ITERATION = 1  FACTOR OF SAFETY  =2.086
ITERATION = 2  FACTOR OF SAFETY  =2.083
ITERATION = 3  FACTOR OF SAFETY  =2.083

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1208.285

ITERATION = 1  FACTOR OF SAFETY  =2.159
ITERATION = 2  FACTOR OF SAFETY  =2.156
ITERATION = 3  FACTOR OF SAFETY  =2.156

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1234.066

ITERATION = 1  FACTOR OF SAFETY  =2.098
ITERATION = 2  FACTOR OF SAFETY  =2.095
ITERATION = 3  FACTOR OF SAFETY  =2.095

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1230.383

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.080
ITERATION = 3  FACTOR OF SAFETY  =2.080

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1230.383
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ITERATION = 1  FACTOR OF SAFETY  =136.667
ITERATION = 2  FACTOR OF SAFETY  =136.667

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1226.700

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.080
ITERATION = 3  FACTOR OF SAFETY  =2.080

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1219.334

ITERATION = 1  FACTOR OF SAFETY  =2.092
ITERATION = 2  FACTOR OF SAFETY  =2.089
ITERATION = 3  FACTOR OF SAFETY  =2.089

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1215.651

ITERATION = 1  FACTOR OF SAFETY  =2.104
ITERATION = 2  FACTOR OF SAFETY  =2.101
ITERATION = 3  FACTOR OF SAFETY  =2.101

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1211.968

ITERATION = 1  FACTOR OF SAFETY  =2.125
ITERATION = 2  FACTOR OF SAFETY  =2.122
ITERATION = 3  FACTOR OF SAFETY  =2.122

AT CENTER (1500.0 , 1708.0) WITH RADIUS OF 1193.552

ITERATION = 1  FACTOR OF SAFETY  =2.407
ITERATION = 2  FACTOR OF SAFETY  =2.404
ITERATION = 3  FACTOR OF SAFETY  =2.404

AT CENTER (1500.000 ,   1708.000) WITH RADIUS 1226.700 LOWEST F.S.=  2.080


AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1116.531

ITERATION = 1  FACTOR OF SAFETY  =3.359
ITERATION = 2  FACTOR OF SAFETY  =3.358
ITERATION = 3  FACTOR OF SAFETY  =3.358

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1116.531

ITERATION = 1  FACTOR OF SAFETY  =7.387
ITERATION = 2  FACTOR OF SAFETY  =7.387

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1102.968

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.069
ITERATION = 3  FACTOR OF SAFETY  =2.069

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1089.406

ITERATION = 1  FACTOR OF SAFETY  =2.099
ITERATION = 2  FACTOR OF SAFETY  =2.096
ITERATION = 3  FACTOR OF SAFETY  =2.096

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1113.140

ITERATION = 1  FACTOR OF SAFETY  =2.081
ITERATION = 2  FACTOR OF SAFETY  =2.078
ITERATION = 3  FACTOR OF SAFETY  =2.078
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AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1113.140

ITERATION = 1  FACTOR OF SAFETY  =9.252
ITERATION = 2  FACTOR OF SAFETY  =9.252

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1109.750

ITERATION = 1  FACTOR OF SAFETY  =2.077
ITERATION = 2  FACTOR OF SAFETY  =2.074
ITERATION = 3  FACTOR OF SAFETY  =2.074

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1109.750

ITERATION = 1  FACTOR OF SAFETY  =35.298
ITERATION = 2  FACTOR OF SAFETY  =35.298

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1106.359

ITERATION = 1  FACTOR OF SAFETY  =2.074
ITERATION = 2  FACTOR OF SAFETY  =2.071
ITERATION = 3  FACTOR OF SAFETY  =2.071

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1099.578

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.069
ITERATION = 3  FACTOR OF SAFETY  =2.069

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1096.187

ITERATION = 1  FACTOR OF SAFETY  =2.063
ITERATION = 2  FACTOR OF SAFETY  =2.060
ITERATION = 3  FACTOR OF SAFETY  =2.060

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1096.187

ITERATION = 1  FACTOR OF SAFETY  =48.954
ITERATION = 2  FACTOR OF SAFETY  =48.954

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1092.797

ITERATION = 1  FACTOR OF SAFETY  =2.079
ITERATION = 2  FACTOR OF SAFETY  =2.076
ITERATION = 3  FACTOR OF SAFETY  =2.076

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1075.844

ITERATION = 1  FACTOR OF SAFETY  =2.216
ITERATION = 2  FACTOR OF SAFETY  =2.214
ITERATION = 3  FACTOR OF SAFETY  =2.214

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1062.282

ITERATION = 1  FACTOR OF SAFETY  =2.459
ITERATION = 2  FACTOR OF SAFETY  =2.456
ITERATION = 3  FACTOR OF SAFETY  =2.456

AT CENTER (1500.0 , 1572.0) WITH RADIUS OF 1062.282

ITERATION = 1  FACTOR OF SAFETY  =12.595
ITERATION = 2  FACTOR OF SAFETY  =12.595

AT CENTER (1500.000 ,   1572.000) WITH RADIUS 1096.187 LOWEST F.S.=  2.060
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AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1048.555

ITERATION = 1  FACTOR OF SAFETY  =3.423
ITERATION = 2  FACTOR OF SAFETY  =3.423
ITERATION = 3  FACTOR OF SAFETY  =3.423

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1048.555

ITERATION = 1  FACTOR OF SAFETY  =7.131
ITERATION = 2  FACTOR OF SAFETY  =7.131

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1035.698

ITERATION = 1  FACTOR OF SAFETY  =2.085
ITERATION = 2  FACTOR OF SAFETY  =2.083
ITERATION = 3  FACTOR OF SAFETY  =2.083

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1022.840

ITERATION = 1  FACTOR OF SAFETY  =2.117
ITERATION = 2  FACTOR OF SAFETY  =2.114
ITERATION = 3  FACTOR OF SAFETY  =2.114

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1045.341

ITERATION = 1  FACTOR OF SAFETY  =2.073
ITERATION = 2  FACTOR OF SAFETY  =2.071
ITERATION = 3  FACTOR OF SAFETY  =2.071

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1045.341

ITERATION = 1  FACTOR OF SAFETY  =9.178
ITERATION = 2  FACTOR OF SAFETY  =9.178

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1042.127

ITERATION = 1  FACTOR OF SAFETY  =2.075
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1042.127

ITERATION = 1  FACTOR OF SAFETY  =45.495
ITERATION = 2  FACTOR OF SAFETY  =45.495

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1038.912

ITERATION = 1  FACTOR OF SAFETY  =2.079
ITERATION = 2  FACTOR OF SAFETY  =2.076
ITERATION = 3  FACTOR OF SAFETY  =2.076

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1032.483

ITERATION = 1  FACTOR OF SAFETY  =2.092
ITERATION = 2  FACTOR OF SAFETY  =2.089
ITERATION = 3  FACTOR OF SAFETY  =2.089

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1029.269

ITERATION = 1  FACTOR OF SAFETY  =2.097
ITERATION = 2  FACTOR OF SAFETY  =2.094
ITERATION = 3  FACTOR OF SAFETY  =2.094

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1026.054
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ITERATION = 1  FACTOR OF SAFETY  =2.099
ITERATION = 2  FACTOR OF SAFETY  =2.096
ITERATION = 3  FACTOR OF SAFETY  =2.096

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1026.054

ITERATION = 1  FACTOR OF SAFETY  =213.536
ITERATION = 2  FACTOR OF SAFETY  =213.536

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 1009.982

ITERATION = 1  FACTOR OF SAFETY  =2.199
ITERATION = 2  FACTOR OF SAFETY  =2.196
ITERATION = 3  FACTOR OF SAFETY  =2.196

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 997.125

ITERATION = 1  FACTOR OF SAFETY  =2.594
ITERATION = 2  FACTOR OF SAFETY  =2.591
ITERATION = 3  FACTOR OF SAFETY  =2.591

AT CENTER (1500.0 , 1504.0) WITH RADIUS OF 997.125

ITERATION = 1  FACTOR OF SAFETY  =7.669
ITERATION = 2  FACTOR OF SAFETY  =7.669

AT CENTER (1500.000 ,   1504.000) WITH RADIUS 1045.341 LOWEST F.S.=  2.071


AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1118.366

ITERATION = 1  FACTOR OF SAFETY  =4.755
ITERATION = 2  FACTOR OF SAFETY  =4.755

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1109.028

ITERATION = 1  FACTOR OF SAFETY  =2.122
ITERATION = 2  FACTOR OF SAFETY  =2.119
ITERATION = 3  FACTOR OF SAFETY  =2.119

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1109.028

ITERATION = 1  FACTOR OF SAFETY  =14.020
ITERATION = 2  FACTOR OF SAFETY  =14.020

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1099.689

ITERATION = 1  FACTOR OF SAFETY  =2.122
ITERATION = 2  FACTOR OF SAFETY  =2.119
ITERATION = 3  FACTOR OF SAFETY  =2.119

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1099.689

ITERATION = 1  FACTOR OF SAFETY  =22.371
ITERATION = 2  FACTOR OF SAFETY  =22.371

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1090.350

ITERATION = 1  FACTOR OF SAFETY  =2.310
ITERATION = 2  FACTOR OF SAFETY  =2.307
ITERATION = 3  FACTOR OF SAFETY  =2.307

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1106.693
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ITERATION = 1  FACTOR OF SAFETY  =2.127
ITERATION = 2  FACTOR OF SAFETY  =2.124
ITERATION = 3  FACTOR OF SAFETY  =2.124

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1106.693

ITERATION = 1  FACTOR OF SAFETY  =16.348
ITERATION = 2  FACTOR OF SAFETY  =16.348

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1104.358

ITERATION = 1  FACTOR OF SAFETY  =2.130
ITERATION = 2  FACTOR OF SAFETY  =2.127
ITERATION = 3  FACTOR OF SAFETY  =2.127

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1104.358

ITERATION = 1  FACTOR OF SAFETY  =24.966
ITERATION = 2  FACTOR OF SAFETY  =24.966

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1102.023

ITERATION = 1  FACTOR OF SAFETY  =2.133
ITERATION = 2  FACTOR OF SAFETY  =2.130
ITERATION = 3  FACTOR OF SAFETY  =2.130

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1097.354

ITERATION = 1  FACTOR OF SAFETY  =2.147
ITERATION = 2  FACTOR OF SAFETY  =2.144
ITERATION = 3  FACTOR OF SAFETY  =2.144

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1095.019

ITERATION = 1  FACTOR OF SAFETY  =2.183
ITERATION = 2  FACTOR OF SAFETY  =2.180
ITERATION = 3  FACTOR OF SAFETY  =2.180

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1092.685

ITERATION = 1  FACTOR OF SAFETY  =2.235
ITERATION = 2  FACTOR OF SAFETY  =2.232
ITERATION = 3  FACTOR OF SAFETY  =2.232

AT CENTER (1568.0 , 1572.0) WITH RADIUS OF 1081.011

ITERATION = 1  FACTOR OF SAFETY  =2.782
ITERATION = 2  FACTOR OF SAFETY  =2.780
ITERATION = 3  FACTOR OF SAFETY  =2.780

AT CENTER (1568.000 ,   1572.000) WITH RADIUS 1099.689 LOWEST F.S.=  2.119


AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1114.695

ITERATION = 1  FACTOR OF SAFETY  =3.440
ITERATION = 2  FACTOR OF SAFETY  =3.440
ITERATION = 3  FACTOR OF SAFETY  =3.440

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1097.706

ITERATION = 1  FACTOR OF SAFETY  =2.151
ITERATION = 2  FACTOR OF SAFETY  =2.148
ITERATION = 3  FACTOR OF SAFETY  =2.148
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AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1080.718

ITERATION = 1  FACTOR OF SAFETY  =2.113
ITERATION = 2  FACTOR OF SAFETY  =2.110
ITERATION = 3  FACTOR OF SAFETY  =2.110

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1063.729

ITERATION = 1  FACTOR OF SAFETY  =2.119
ITERATION = 2  FACTOR OF SAFETY  =2.116
ITERATION = 3  FACTOR OF SAFETY  =2.116

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1093.459

ITERATION = 1  FACTOR OF SAFETY  =2.132
ITERATION = 2  FACTOR OF SAFETY  =2.130
ITERATION = 3  FACTOR OF SAFETY  =2.130

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1089.212

ITERATION = 1  FACTOR OF SAFETY  =2.125
ITERATION = 2  FACTOR OF SAFETY  =2.122
ITERATION = 3  FACTOR OF SAFETY  =2.122

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1084.965

ITERATION = 1  FACTOR OF SAFETY  =2.118
ITERATION = 2  FACTOR OF SAFETY  =2.116
ITERATION = 3  FACTOR OF SAFETY  =2.116

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1076.471

ITERATION = 1  FACTOR OF SAFETY  =2.109
ITERATION = 2  FACTOR OF SAFETY  =2.106
ITERATION = 3  FACTOR OF SAFETY  =2.106

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1072.224

ITERATION = 1  FACTOR OF SAFETY  =2.107
ITERATION = 2  FACTOR OF SAFETY  =2.104
ITERATION = 3  FACTOR OF SAFETY  =2.104

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1067.977

ITERATION = 1  FACTOR OF SAFETY  =2.109
ITERATION = 2  FACTOR OF SAFETY  =2.106
ITERATION = 3  FACTOR OF SAFETY  =2.106

AT CENTER (1432.0 , 1572.0) WITH RADIUS OF 1046.741

ITERATION = 1  FACTOR OF SAFETY  =2.349
ITERATION = 2  FACTOR OF SAFETY  =2.346
ITERATION = 3  FACTOR OF SAFETY  =2.346

AT CENTER (1432.000 ,   1572.000) WITH RADIUS 1072.224 LOWEST F.S.=  2.104


AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1116.990

ITERATION = 1  FACTOR OF SAFETY  =3.308
ITERATION = 2  FACTOR OF SAFETY  =3.308
ITERATION = 3  FACTOR OF SAFETY  =3.308

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1116.990
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ITERATION = 1  FACTOR OF SAFETY  =7.759
ITERATION = 2  FACTOR OF SAFETY  =7.759

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1104.410

ITERATION = 1  FACTOR OF SAFETY  =2.078
ITERATION = 2  FACTOR OF SAFETY  =2.075
ITERATION = 3  FACTOR OF SAFETY  =2.075

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1091.831

ITERATION = 1  FACTOR OF SAFETY  =2.116
ITERATION = 2  FACTOR OF SAFETY  =2.113
ITERATION = 3  FACTOR OF SAFETY  =2.113

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1113.845

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1113.845

ITERATION = 1  FACTOR OF SAFETY  =8.546
ITERATION = 2  FACTOR OF SAFETY  =8.546

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1110.700

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1110.700

ITERATION = 1  FACTOR OF SAFETY  =10.884
ITERATION = 2  FACTOR OF SAFETY  =10.884

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1107.555

ITERATION = 1  FACTOR OF SAFETY  =2.073
ITERATION = 2  FACTOR OF SAFETY  =2.070
ITERATION = 3  FACTOR OF SAFETY  =2.070

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1107.555

ITERATION = 1  FACTOR OF SAFETY  =49.734
ITERATION = 2  FACTOR OF SAFETY  =49.734

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1101.265

ITERATION = 1  FACTOR OF SAFETY  =2.086
ITERATION = 2  FACTOR OF SAFETY  =2.083
ITERATION = 3  FACTOR OF SAFETY  =2.083

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1098.121

ITERATION = 1  FACTOR OF SAFETY  =2.094
ITERATION = 2  FACTOR OF SAFETY  =2.091
ITERATION = 3  FACTOR OF SAFETY  =2.091

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1094.976

ITERATION = 1  FACTOR OF SAFETY  =2.096
ITERATION = 2  FACTOR OF SAFETY  =2.092
ITERATION = 3  FACTOR OF SAFETY  =2.092
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AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1094.976

ITERATION = 1  FACTOR OF SAFETY  =94.652
ITERATION = 2  FACTOR OF SAFETY  =94.652

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1079.252

ITERATION = 1  FACTOR OF SAFETY  =2.216
ITERATION = 2  FACTOR OF SAFETY  =2.213
ITERATION = 3  FACTOR OF SAFETY  =2.213

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1066.672

ITERATION = 1  FACTOR OF SAFETY  =2.614
ITERATION = 2  FACTOR OF SAFETY  =2.611
ITERATION = 3  FACTOR OF SAFETY  =2.611

AT CENTER (1517.0 , 1572.0) WITH RADIUS OF 1066.672

ITERATION = 1  FACTOR OF SAFETY  =8.020
ITERATION = 2  FACTOR OF SAFETY  =8.020

AT CENTER (1517.000 ,   1572.000) WITH RADIUS 1113.845 LOWEST F.S.=  2.067


AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1116.072

ITERATION = 1  FACTOR OF SAFETY  =3.417
ITERATION = 2  FACTOR OF SAFETY  =3.417
ITERATION = 3  FACTOR OF SAFETY  =3.417

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1116.072

ITERATION = 1  FACTOR OF SAFETY  =7.839
ITERATION = 2  FACTOR OF SAFETY  =7.839

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1101.576

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.078
ITERATION = 3  FACTOR OF SAFETY  =2.078

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1087.081

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.080
ITERATION = 3  FACTOR OF SAFETY  =2.080

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1112.448

ITERATION = 1  FACTOR OF SAFETY  =2.102
ITERATION = 2  FACTOR OF SAFETY  =2.100
ITERATION = 3  FACTOR OF SAFETY  =2.100

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1112.448

ITERATION = 1  FACTOR OF SAFETY  =21.665
ITERATION = 2  FACTOR OF SAFETY  =21.665

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1108.824

ITERATION = 1  FACTOR OF SAFETY  =2.095
ITERATION = 2  FACTOR OF SAFETY  =2.092
ITERATION = 3  FACTOR OF SAFETY  =2.092
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AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1105.200

ITERATION = 1  FACTOR OF SAFETY  =2.087
ITERATION = 2  FACTOR OF SAFETY  =2.085
ITERATION = 3  FACTOR OF SAFETY  =2.085

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1097.952

ITERATION = 1  FACTOR OF SAFETY  =2.074
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1094.328

ITERATION = 1  FACTOR OF SAFETY  =2.063
ITERATION = 2  FACTOR OF SAFETY  =2.060
ITERATION = 3  FACTOR OF SAFETY  =2.060

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1094.328

ITERATION = 1  FACTOR OF SAFETY  =177.720
ITERATION = 2  FACTOR OF SAFETY  =177.720

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1090.704

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1072.585

ITERATION = 1  FACTOR OF SAFETY  =2.199
ITERATION = 2  FACTOR OF SAFETY  =2.196
ITERATION = 3  FACTOR OF SAFETY  =2.196

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1058.090

ITERATION = 1  FACTOR OF SAFETY  =2.381
ITERATION = 2  FACTOR OF SAFETY  =2.378
ITERATION = 3  FACTOR OF SAFETY  =2.378

AT CENTER (1483.0 , 1572.0) WITH RADIUS OF 1058.090

ITERATION = 1  FACTOR OF SAFETY  =50.390
ITERATION = 2  FACTOR OF SAFETY  =50.390

AT CENTER (1483.000 ,   1572.000) WITH RADIUS 1094.328 LOWEST F.S.=  2.060


AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1115.613

ITERATION = 1  FACTOR OF SAFETY  =3.479
ITERATION = 2  FACTOR OF SAFETY  =3.479
ITERATION = 3  FACTOR OF SAFETY  =3.479

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1115.613

ITERATION = 1  FACTOR OF SAFETY  =13.987
ITERATION = 2  FACTOR OF SAFETY  =13.987

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1100.235

ITERATION = 1  FACTOR OF SAFETY  =2.098
ITERATION = 2  FACTOR OF SAFETY  =2.096
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ITERATION = 3  FACTOR OF SAFETY  =2.096

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1084.857

ITERATION = 1  FACTOR OF SAFETY  =2.081
ITERATION = 2  FACTOR OF SAFETY  =2.078
ITERATION = 3  FACTOR OF SAFETY  =2.078

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1069.479

ITERATION = 1  FACTOR OF SAFETY  =2.170
ITERATION = 2  FACTOR OF SAFETY  =2.167
ITERATION = 3  FACTOR OF SAFETY  =2.167

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1096.390

ITERATION = 1  FACTOR OF SAFETY  =2.088
ITERATION = 2  FACTOR OF SAFETY  =2.085
ITERATION = 3  FACTOR OF SAFETY  =2.085

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1092.546

ITERATION = 1  FACTOR OF SAFETY  =2.076
ITERATION = 2  FACTOR OF SAFETY  =2.073
ITERATION = 3  FACTOR OF SAFETY  =2.073

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1088.701

ITERATION = 1  FACTOR OF SAFETY  =2.076
ITERATION = 2  FACTOR OF SAFETY  =2.073
ITERATION = 3  FACTOR OF SAFETY  =2.073

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1081.012

ITERATION = 1  FACTOR OF SAFETY  =2.090
ITERATION = 2  FACTOR OF SAFETY  =2.087
ITERATION = 3  FACTOR OF SAFETY  =2.087

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1077.168

ITERATION = 1  FACTOR OF SAFETY  =2.107
ITERATION = 2  FACTOR OF SAFETY  =2.104
ITERATION = 3  FACTOR OF SAFETY  =2.104

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1073.323

ITERATION = 1  FACTOR OF SAFETY  =2.135
ITERATION = 2  FACTOR OF SAFETY  =2.132
ITERATION = 3  FACTOR OF SAFETY  =2.132

AT CENTER (1466.0 , 1572.0) WITH RADIUS OF 1054.101

ITERATION = 1  FACTOR OF SAFETY  =2.349
ITERATION = 2  FACTOR OF SAFETY  =2.346
ITERATION = 3  FACTOR OF SAFETY  =2.346

AT CENTER (1466.000 ,   1572.000) WITH RADIUS 1092.546 LOWEST F.S.=  2.073


AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1133.065

ITERATION = 1  FACTOR OF SAFETY  =3.412
ITERATION = 2  FACTOR OF SAFETY  =3.411
ITERATION = 3  FACTOR OF SAFETY  =3.411
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AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1133.065

ITERATION = 1  FACTOR OF SAFETY  =7.835
ITERATION = 2  FACTOR OF SAFETY  =7.835

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1118.423

ITERATION = 1  FACTOR OF SAFETY  =2.085
ITERATION = 2  FACTOR OF SAFETY  =2.082
ITERATION = 3  FACTOR OF SAFETY  =2.082

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1103.781

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.077
ITERATION = 3  FACTOR OF SAFETY  =2.077

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1089.139

ITERATION = 1  FACTOR OF SAFETY  =2.191
ITERATION = 2  FACTOR OF SAFETY  =2.188
ITERATION = 3  FACTOR OF SAFETY  =2.188

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1114.763

ITERATION = 1  FACTOR OF SAFETY  =2.078
ITERATION = 2  FACTOR OF SAFETY  =2.075
ITERATION = 3  FACTOR OF SAFETY  =2.075

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1111.102

ITERATION = 1  FACTOR OF SAFETY  =2.065
ITERATION = 2  FACTOR OF SAFETY  =2.062
ITERATION = 3  FACTOR OF SAFETY  =2.062

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1111.102

ITERATION = 1  FACTOR OF SAFETY  =221.233
ITERATION = 2  FACTOR OF SAFETY  =221.233

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1107.442

ITERATION = 1  FACTOR OF SAFETY  =2.070
ITERATION = 2  FACTOR OF SAFETY  =2.067
ITERATION = 3  FACTOR OF SAFETY  =2.067

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1100.121

ITERATION = 1  FACTOR OF SAFETY  =2.096
ITERATION = 2  FACTOR OF SAFETY  =2.093
ITERATION = 3  FACTOR OF SAFETY  =2.093

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1096.460

ITERATION = 1  FACTOR OF SAFETY  =2.123
ITERATION = 2  FACTOR OF SAFETY  =2.120
ITERATION = 3  FACTOR OF SAFETY  =2.120

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1092.800

ITERATION = 1  FACTOR OF SAFETY  =2.154
ITERATION = 2  FACTOR OF SAFETY  =2.151
ITERATION = 3  FACTOR OF SAFETY  =2.151

AT CENTER (1483.0 , 1589.0) WITH RADIUS OF 1074.497
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ITERATION = 1  FACTOR OF SAFETY  =2.373
ITERATION = 2  FACTOR OF SAFETY  =2.370
ITERATION = 3  FACTOR OF SAFETY  =2.370

AT CENTER (1483.000 ,   1589.000) WITH RADIUS 1111.102 LOWEST F.S.=  2.062


AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1099.078

ITERATION = 1  FACTOR OF SAFETY  =3.424
ITERATION = 2  FACTOR OF SAFETY  =3.423
ITERATION = 3  FACTOR OF SAFETY  =3.423

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1099.078

ITERATION = 1  FACTOR OF SAFETY  =7.853
ITERATION = 2  FACTOR OF SAFETY  =7.853

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1084.734

ITERATION = 1  FACTOR OF SAFETY  =2.077
ITERATION = 2  FACTOR OF SAFETY  =2.074
ITERATION = 3  FACTOR OF SAFETY  =2.074

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1070.390

ITERATION = 1  FACTOR OF SAFETY  =2.087
ITERATION = 2  FACTOR OF SAFETY  =2.084
ITERATION = 3  FACTOR OF SAFETY  =2.084

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1095.492

ITERATION = 1  FACTOR OF SAFETY  =2.096
ITERATION = 2  FACTOR OF SAFETY  =2.093
ITERATION = 3  FACTOR OF SAFETY  =2.093

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1095.492

ITERATION = 1  FACTOR OF SAFETY  =23.667
ITERATION = 2  FACTOR OF SAFETY  =23.667

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1091.906

ITERATION = 1  FACTOR OF SAFETY  =2.089
ITERATION = 2  FACTOR OF SAFETY  =2.086
ITERATION = 3  FACTOR OF SAFETY  =2.086

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1088.320

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.080
ITERATION = 3  FACTOR OF SAFETY  =2.080

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1081.148

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.069
ITERATION = 3  FACTOR OF SAFETY  =2.069

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1077.562

ITERATION = 1  FACTOR OF SAFETY  =2.062
ITERATION = 2  FACTOR OF SAFETY  =2.059
ITERATION = 3  FACTOR OF SAFETY  =2.059
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AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1077.562

ITERATION = 1  FACTOR OF SAFETY  =147.776
ITERATION = 2  FACTOR OF SAFETY  =147.776

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1073.976

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.069
ITERATION = 3  FACTOR OF SAFETY  =2.069

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1056.046

ITERATION = 1  FACTOR OF SAFETY  =2.204
ITERATION = 2  FACTOR OF SAFETY  =2.201
ITERATION = 3  FACTOR OF SAFETY  =2.201

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1041.702

ITERATION = 1  FACTOR OF SAFETY  =2.393
ITERATION = 2  FACTOR OF SAFETY  =2.390
ITERATION = 3  FACTOR OF SAFETY  =2.390

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1041.702

ITERATION = 1  FACTOR OF SAFETY  =26.355
ITERATION = 2  FACTOR OF SAFETY  =26.355

AT CENTER (1483.000 ,   1555.000) WITH RADIUS 1077.562 LOWEST F.S.=  2.059


AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1082.084

ITERATION = 1  FACTOR OF SAFETY  =3.432
ITERATION = 2  FACTOR OF SAFETY  =3.432
ITERATION = 3  FACTOR OF SAFETY  =3.432

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1082.084

ITERATION = 1  FACTOR OF SAFETY  =7.880
ITERATION = 2  FACTOR OF SAFETY  =7.880

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1067.897

ITERATION = 1  FACTOR OF SAFETY  =2.075
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1053.709

ITERATION = 1  FACTOR OF SAFETY  =2.094
ITERATION = 2  FACTOR OF SAFETY  =2.091
ITERATION = 3  FACTOR OF SAFETY  =2.091

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1078.537

ITERATION = 1  FACTOR OF SAFETY  =2.090
ITERATION = 2  FACTOR OF SAFETY  =2.087
ITERATION = 3  FACTOR OF SAFETY  =2.087

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1078.537

ITERATION = 1  FACTOR OF SAFETY  =26.409
ITERATION = 2  FACTOR OF SAFETY  =26.409
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AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1074.990

ITERATION = 1  FACTOR OF SAFETY  =2.084
ITERATION = 2  FACTOR OF SAFETY  =2.082
ITERATION = 3  FACTOR OF SAFETY  =2.082

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1071.443

ITERATION = 1  FACTOR OF SAFETY  =2.079
ITERATION = 2  FACTOR OF SAFETY  =2.076
ITERATION = 3  FACTOR OF SAFETY  =2.076

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1064.350

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.069
ITERATION = 3  FACTOR OF SAFETY  =2.069

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1060.803

ITERATION = 1  FACTOR OF SAFETY  =2.063
ITERATION = 2  FACTOR OF SAFETY  =2.060
ITERATION = 3  FACTOR OF SAFETY  =2.060

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1060.803

ITERATION = 1  FACTOR OF SAFETY  =125.959
ITERATION = 2  FACTOR OF SAFETY  =125.959

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1057.256

ITERATION = 1  FACTOR OF SAFETY  =2.075
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1039.522

ITERATION = 1  FACTOR OF SAFETY  =2.207
ITERATION = 2  FACTOR OF SAFETY  =2.204
ITERATION = 3  FACTOR OF SAFETY  =2.204

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1025.334

ITERATION = 1  FACTOR OF SAFETY  =2.410
ITERATION = 2  FACTOR OF SAFETY  =2.408
ITERATION = 3  FACTOR OF SAFETY  =2.408

AT CENTER (1483.0 , 1538.0) WITH RADIUS OF 1025.334

ITERATION = 1  FACTOR OF SAFETY  =18.329
ITERATION = 2  FACTOR OF SAFETY  =18.329

AT CENTER (1483.000 ,   1538.000) WITH RADIUS 1060.803 LOWEST F.S.=  2.060


AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1099.537

ITERATION = 1  FACTOR OF SAFETY  =3.371
ITERATION = 2  FACTOR OF SAFETY  =3.370
ITERATION = 3  FACTOR OF SAFETY  =3.370

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1099.537

ITERATION = 1  FACTOR OF SAFETY  =7.320
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ITERATION = 2  FACTOR OF SAFETY  =7.320

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1086.142

ITERATION = 1  FACTOR OF SAFETY  =2.072
ITERATION = 2  FACTOR OF SAFETY  =2.070
ITERATION = 3  FACTOR OF SAFETY  =2.070

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1072.747

ITERATION = 1  FACTOR OF SAFETY  =2.105
ITERATION = 2  FACTOR OF SAFETY  =2.102
ITERATION = 3  FACTOR OF SAFETY  =2.102

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1096.188

ITERATION = 1  FACTOR OF SAFETY  =2.077
ITERATION = 2  FACTOR OF SAFETY  =2.075
ITERATION = 3  FACTOR OF SAFETY  =2.075

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1096.188

ITERATION = 1  FACTOR OF SAFETY  =9.223
ITERATION = 2  FACTOR OF SAFETY  =9.223

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1092.839

ITERATION = 1  FACTOR OF SAFETY  =2.074
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1092.839

ITERATION = 1  FACTOR OF SAFETY  =37.093
ITERATION = 2  FACTOR OF SAFETY  =37.093

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1089.491

ITERATION = 1  FACTOR OF SAFETY  =2.073
ITERATION = 2  FACTOR OF SAFETY  =2.070
ITERATION = 3  FACTOR OF SAFETY  =2.070

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1082.793

ITERATION = 1  FACTOR OF SAFETY  =2.075
ITERATION = 2  FACTOR OF SAFETY  =2.072
ITERATION = 3  FACTOR OF SAFETY  =2.072

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1079.445

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.077
ITERATION = 3  FACTOR OF SAFETY  =2.077

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1076.096

ITERATION = 1  FACTOR OF SAFETY  =2.085
ITERATION = 2  FACTOR OF SAFETY  =2.082
ITERATION = 3  FACTOR OF SAFETY  =2.082

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1059.353

ITERATION = 1  FACTOR OF SAFETY  =2.217
ITERATION = 2  FACTOR OF SAFETY  =2.214
ITERATION = 3  FACTOR OF SAFETY  =2.214
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AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1045.958

ITERATION = 1  FACTOR OF SAFETY  =2.490
ITERATION = 2  FACTOR OF SAFETY  =2.488
ITERATION = 3  FACTOR OF SAFETY  =2.488

AT CENTER (1500.0 , 1555.0) WITH RADIUS OF 1045.958

ITERATION = 1  FACTOR OF SAFETY  =10.737
ITERATION = 2  FACTOR OF SAFETY  =10.737

AT CENTER (1500.000 ,   1555.000) WITH RADIUS 1086.142 LOWEST F.S.=  2.070


AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1098.619

ITERATION = 1  FACTOR OF SAFETY  =3.482
ITERATION = 2  FACTOR OF SAFETY  =3.481
ITERATION = 3  FACTOR OF SAFETY  =3.481

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1098.619

ITERATION = 1  FACTOR OF SAFETY  =15.169
ITERATION = 2  FACTOR OF SAFETY  =15.169

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1083.377

ITERATION = 1  FACTOR OF SAFETY  =2.092
ITERATION = 2  FACTOR OF SAFETY  =2.089
ITERATION = 3  FACTOR OF SAFETY  =2.089

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1068.135

ITERATION = 1  FACTOR OF SAFETY  =2.080
ITERATION = 2  FACTOR OF SAFETY  =2.077
ITERATION = 3  FACTOR OF SAFETY  =2.077

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1052.893

ITERATION = 1  FACTOR OF SAFETY  =2.178
ITERATION = 2  FACTOR OF SAFETY  =2.175
ITERATION = 3  FACTOR OF SAFETY  =2.175

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1079.566

ITERATION = 1  FACTOR OF SAFETY  =2.083
ITERATION = 2  FACTOR OF SAFETY  =2.080
ITERATION = 3  FACTOR OF SAFETY  =2.080

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1075.756

ITERATION = 1  FACTOR OF SAFETY  =2.071
ITERATION = 2  FACTOR OF SAFETY  =2.068
ITERATION = 3  FACTOR OF SAFETY  =2.068

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1071.945

ITERATION = 1  FACTOR OF SAFETY  =2.073
ITERATION = 2  FACTOR OF SAFETY  =2.070
ITERATION = 3  FACTOR OF SAFETY  =2.070

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1064.324

ITERATION = 1  FACTOR OF SAFETY  =2.093
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ITERATION = 2  FACTOR OF SAFETY  =2.090
ITERATION = 3  FACTOR OF SAFETY  =2.090

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1060.514

ITERATION = 1  FACTOR OF SAFETY  =2.114
ITERATION = 2  FACTOR OF SAFETY  =2.111
ITERATION = 3  FACTOR OF SAFETY  =2.111

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1056.703

ITERATION = 1  FACTOR OF SAFETY  =2.143
ITERATION = 2  FACTOR OF SAFETY  =2.140
ITERATION = 3  FACTOR OF SAFETY  =2.140

AT CENTER (1466.0 , 1555.0) WITH RADIUS OF 1037.651

ITERATION = 1  FACTOR OF SAFETY  =2.350
ITERATION = 2  FACTOR OF SAFETY  =2.347
ITERATION = 3  FACTOR OF SAFETY  =2.347

AT CENTER (1466.000 ,   1555.000) WITH RADIUS 1075.756 LOWEST F.S.=  2.068


AT POINT ( 1483  1555 ) RADIUS 1077.562

THE MINIMUM FACTOR OF SAFETY IS 2.059

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1077.562

ITERATION = 1  FACTOR OF SAFETY  =2.062
ITERATION = 2  FACTOR OF SAFETY  =2.059
ITERATION = 3  FACTOR OF SAFETY  =2.059

AT CENTER (1483.0 , 1555.0) WITH RADIUS OF 1077.562

ITERATION = 1  FACTOR OF SAFETY  =147.776
ITERATION = 2  FACTOR OF SAFETY  =147.776
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SUMMARY OF SLICE INFORMATION FOR MOST CRITICAL SLIP SURFACE

SL. NO.	SOIL NO.	SLICE WIDTH	SLICE HEIGHT	WATER HEIGHT	BOTTOM SINE	TOTAL WEIGHT	EFFEC. WEIGHT	RESIS. MOMENT	DRIVING MOMENT
1	3	1.476	0.093	0.000	-.025	.177E+02	.159E+02	.298E+06	.482E+03
2	3	1.476	0.279	0.000	-.024	.528E+02	.475E+02	.322E+06	.136E+04
3	3	1.476	0.462	0.000	-.023	.876E+02	.788E+02	.345E+06	.213E+04
4	3	1.476	0.644	0.000	-.021	.122E+03	.110E+03	.368E+06	.278E+04
5	3	1.476	0.823	0.000	-.020	.156E+03	.140E+03	.390E+06	.333E+04
6	3	1.476	1.000	0.000	-.018	.189E+03	.171E+03	.413E+06	.377E+04
7	3	1.476	1.176	0.000	-.017	.223E+03	.200E+03	.435E+06	.410E+04
8	3	0.839	1.312	0.000	-.016	.141E+03	.127E+03	.257E+06	.243E+04
9	3	0.637	1.240	0.000	-.015	.101E+03	.913E+02	.191E+06	.167E+04
10	3	1.476	0.841	0.000	-.014	.159E+03	.143E+03	.393E+06	.246E+04
11	3	1.476	0.281	0.000	-.013	.532E+02	.479E+02	.322E+06	.743E+03
							SUM	.373E+07	.253E+05

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AT CENTER (1483.000 , 1555.000) WITH RADIUS 1077.562 AND SEIS. COEFF. 0.00
FACTOR OF SAFETY BY NORMAL METHOD IS 147.778
FACTOR OF SAFETY BY SIMPLIFIED BISHOP METHOD IS 2.059
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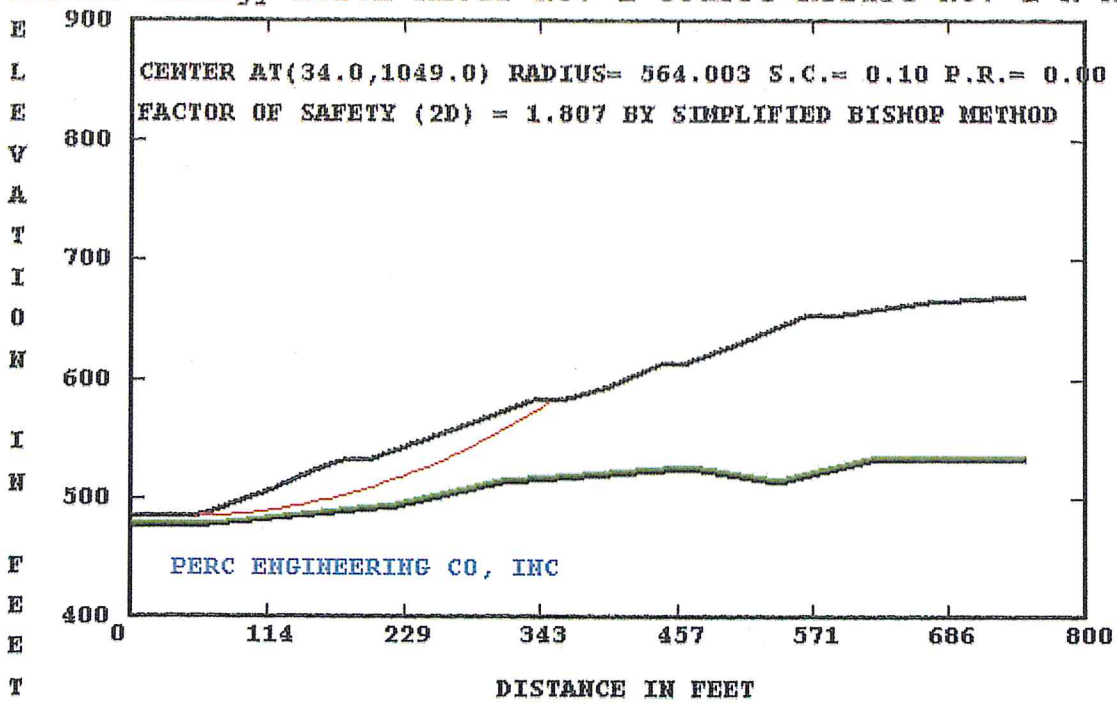
Walter Energy North River No. 1 Coarse Refuse No. 1 K-K'



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REAME (ROTATIONAL EQUILIBRIUM ANALYSIS OF MULTILAYERED EARTHWORKS)
THIS 2008 VERSION IS LICENSED BY CIVIL ENGINEERING SOFTWARE CENTER TO

PERC ENGINEERING CO, INC

INPUT FILE NAME -V:\Eng105\REAME\North River\Coarse Refuse No. 1 West Slope K-K'.DAT

TITLE -Walter Energy North River No. 1 Coarse Refuse No. 1 K-K'

NO. OF STATIC AND SEISMIC CASES (NCASE) = 1

NO. OF NONCIRCULAR FAILURE SURFACES (NNS) = 0

TWO-DIMENSIONAL ANALYSIS (THREED = 0)

ANALYSIS BY DETERMINISTIC METHOD (PROB = 0)

CASE NO. 1 SEISMIC COEFFICIENT (SEIC) =0.100

NO. OF BOUNDARY LINES (NBL) = 3

NO. OF POINTS ON BOUNDARY LINE 1 = 8

1	X COORD.= 0	Y COORD.= 476.61
2	X COORD.= 64.64	Y COORD.= 477.09
3	X COORD.= 221.21	Y COORD.= 493.292
4	X COORD.= 310.36	Y COORD.= 513.1
5	X COORD.= 467.26	Y COORD.= 525.55
6	X COORD.= 542.14	Y COORD.= 513.48
7	X COORD.= 619.76	Y COORD.= 531.96
8	X COORD.= 749.82	Y COORD.= 531.91

NO. OF POINTS ON BOUNDARY LINE 2 = 8

1	X COORD.= 0	Y COORD.= 479.61
2	X COORD.= 64.64	Y COORD.= 480.09
3	X COORD.= 221.21	Y COORD.= 496.29
4	X COORD.= 310.364	Y COORD.= 516.1
5	X COORD.= 467.26	Y COORD.= 528.55
6	X COORD.= 542.14	Y COORD.= 516.48
7	X COORD.= 619.76	Y COORD.= 534.96
8	X COORD.= 749.82	Y COORD.= 534.91

NO. OF POINTS ON BOUNDARY LINE 3 = 24

1	X COORD.= 0	Y COORD.= 484.53
2	X COORD.= 51.02	Y COORD.= 485
3	X COORD.= 67.01	Y COORD.= 489
4	X COORD.= 73.03	Y COORD.= 491
5	X COORD.= 118.2	Y COORD.= 508
6	X COORD.= 120.15	Y COORD.= 509
7	X COORD.= 121.55	Y COORD.= 510
8	X COORD.= 160.92	Y COORD.= 526
9	X COORD.= 176.44	Y COORD.= 532.6
10	X COORD.= 184.26	Y COORD.= 532
11	X COORD.= 196.96	Y COORD.= 532.13
12	X COORD.= 286.22	Y COORD.= 564
13	X COORD.= 336.44	Y COORD.= 582.26
14	X COORD.= 338.85	Y COORD.= 582
15	X COORD.= 359.34	Y COORD.= 582.07
16	X COORD.= 399.36	Y COORD.= 595
17	X COORD.= 442.56	Y COORD.= 613.56
18	X COORD.= 461.86	Y COORD.= 613.33
19	X COORD.= 512.57	Y COORD.= 631
20	X COORD.= 567.46	Y COORD.= 654.15
21	X COORD.= 583.79	Y COORD.= 652.68
22	X COORD.= 584.43	Y COORD.= 653
23	X COORD.= 667.62	Y COORD.= 665.11
24	X COORD.= 749.82	Y COORD.= 670

LINE NO. AND SLOPE OF EACH SEGMENT ARE:

1	0.007	0.103	0.222	0.079	-0.161	0.238

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          0.000
 2        0.007        0.103        0.222        0.079       -0.161        0.238
          0.000
 3        0.009        0.250        0.332        0.376        0.513        0.714
          0.406        0.425       -0.077        0.010        0.357        0.364
         -0.108        0.003        0.323        0.430       -0.012        0.348
          0.422       -0.090        0.500        0.146        0.059

MIN. DEPTH OF TALLEST SLICE (DMIN) = 0
NO. OF RADIUS CONTROL ZONES (NRCZ) = 1

RADIUS DECREMENT (RDEC) FOR ZONE 1 = 0
NO. OF CIRCLES (NCIR) FOR ZONE 1 = 5
NO. OF BOTTOM LINES (NOL) FOR ZONE 1 = 1
LINE NO. (LINO)  BEG. NO. (NBP)  END NO. (NEP)
      1               1              8

ENGLISH UNITS ARE USED WITH DISTANCE IN FEET AND FORCE IN POUND.

SOIL  ENVELOPE COHESION    FRIC. ANGLE     UNIT WEIGHTT
 No.    (TSSE)    (C)         (PHID)          (G)
  1       1 10000.000         45.000         170.000
  2       1   180.000         34.500         128.310

NO SEEPAGE
USE GRID
NO. OF SLICES (NSLI) = 10
NO. OF ADD. CIRCLES (NAC) = 3
ANALYSIS BY SIMPLIFIED BISHOP METHOD (MTHD=2)
NUMBER OF FORCES (NFO)= 0
SOFT SOIL NUMBER (SSN)= 0
INPUT COORD. OF GRID POINTS 1,2,AND 3

POINT 1 X COORD. =-20     Y COORD. = 1115
POINT 2 X COORD. =-20     Y COORD. = 640
POINT 3 X COORD. = 360    Y COORD. = 640

X INCREMENT (XINC) = 24     Y INCREMENT (YINC) = 24
NO. OF DIVISIONS BETWEEN POINTS 1 AND 2 (ND12) = 5
NO. OF DIVISIONS BETWEEN POINTS 2 AND 3 (ND23) = 4
FACTOR OF SAFETY OF EACH CIRCLE IS PRINTED (NPRT = 1)
SLICES WILL BE SUBDIVIDED

AUTOMATIC SEARCH WILL FOLLOW AFTER GRID

FACTORS OF SAFETY BASED ON GRID

****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    630.787    0.000    627.557    2.169    624.327    2.457
    621.097    2.671    617.867    3.669
LOWEST FACTOR OF SAFETY = 0.000 AND OCCURS AT RADIUS= 630.787


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    535.843    2.138    533.774    2.194    531.705    2.358
    529.636    2.717    527.567    4.017
LOWEST FACTOR OF SAFETY = 2.138 AND OCCURS AT RADIUS= 535.843


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    440.924    2.678    440.290    2.980    439.657    3.461
    439.024    4.508    438.390    8.546
LOWEST FACTOR OF SAFETY = 2.678 AND OCCURS AT RADIUS= 440.924
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****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    346.048 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 346.048


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    251.267 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 251.267


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    156.751 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 156.751

AT POINT (75.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    633.455    4.018    624.752    1.835    616.049    1.890
    607.346    1.959    598.643    2.165
    631.280    3.053    629.104    1.823    626.928    1.827
    622.577    1.847    620.401    1.860    618.225    1.874
LOWEST FACTOR OF SAFETY = 1.823 AND OCCURS AT RADIUS= 629.104

AT POINT (75.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    538.960    4.345    530.737    1.838    522.514    1.858
    514.291    1.946    506.067    2.481
    536.904    3.343    534.848    1.835    532.793    1.835
    528.681    1.843    526.625    1.848    524.570    1.853
LOWEST FACTOR OF SAFETY = 1.835 AND OCCURS AT RADIUS= 534.848

AT POINT (75.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    444.465    4.631    436.632    1.813    428.799    1.882
    420.966    2.079    413.133    3.090
    442.506    3.590    440.548    1.808    438.590    1.809
    434.673    1.822    432.715    1.836    430.757    1.856
LOWEST FACTOR OF SAFETY = 1.808 AND OCCURS AT RADIUS= 440.548

AT POINT (75.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    349.969    5.199    342.820    1.862    335.671    1.943
    328.522    2.160    321.373    2.638
    348.182    4.159    346.395    1.852    344.607    1.854
    341.033    1.874    339.246    1.892    337.458    1.915
LOWEST FACTOR OF SAFETY = 1.852 AND OCCURS AT RADIUS= 346.395

AT POINT (75.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    255.474    6.270    249.570    1.890    243.666    1.926
    237.763    1.995    231.859    2.200
    253.998    5.115    252.522    2.411    251.046    1.888
    248.094    1.894    246.618    1.901    245.142    1.912
LOWEST FACTOR OF SAFETY = 1.888 AND OCCURS AT RADIUS= 251.046

AT POINT (75.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    160.978    7.212    156.375    1.810    151.771    1.799
    147.168    1.909    142.564    2.360
    155.224    1.803    154.073    1.797    152.922    1.796
    150.620    1.810    149.469    1.830    148.318    1.863
LOWEST FACTOR OF SAFETY = 1.796 AND OCCURS AT RADIUS= 152.922

AT POINT (170.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    618.015    2.974    606.039    1.886    594.063    1.925
    582.087    1.954    570.111    2.441
    615.021    1.868    612.027    1.871    609.033    1.878
    603.045    1.895    600.051    1.905    597.057    1.916
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LOWEST FACTOR OF SAFETY = 1.868 AND OCCURS AT RADIUS= 615.021

AT POINT (170.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:

525.277	3.332	513.874	1.915	502.472	1.928
491.070	1.992	479.667	2.235		
522.426	2.197	519.576	1.908	516.725	1.911
511.024	1.921	508.173	1.923	505.323	1.925

LOWEST FACTOR OF SAFETY = 1.908 AND OCCURS AT RADIUS= 519.576

AT POINT (170.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:

432.538	4.148	421.827	1.923	411.116	1.957
400.405	2.010	389.694	2.036		
429.861	2.474	427.183	1.922	424.505	1.921
419.150	1.928	416.472	1.936	413.794	1.946

LOWEST FACTOR OF SAFETY = 1.921 AND OCCURS AT RADIUS= 424.505

AT POINT (170.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:

339.800	4.659	329.758	1.970	319.716	1.969
309.674	1.960	299.633	2.092		
317.206	1.969	314.695	1.967	312.185	1.959
307.164	1.968	304.653	1.987	302.143	2.021

LOWEST FACTOR OF SAFETY = 1.959 AND OCCURS AT RADIUS= 312.185

AT POINT (170.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:

245.695	4.646	236.581	1.985	227.466	1.982
218.352	2.050	209.237	2.321		
234.302	1.981	232.023	1.979	229.745	1.980
225.188	1.991	222.909	2.004	220.630	2.023

LOWEST FACTOR OF SAFETY = 1.979 AND OCCURS AT RADIUS= 232.023

AT POINT (170.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:

151.200	4.872	142.479	2.230	133.757	2.254
125.036	2.374	116.314	2.999		
149.020	3.705	146.839	2.230	144.659	2.229
140.298	2.232	138.118	2.236	135.938	2.243

LOWEST FACTOR OF SAFETY = 2.229 AND OCCURS AT RADIUS= 144.659

AT POINT (265.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:

603.602	2.851	589.271	1.922	574.941	1.900
560.610	1.923	546.280	2.270		
585.689	1.912	582.106	1.906	578.524	1.903
571.358	1.899	567.776	1.902	564.193	1.910

LOWEST FACTOR OF SAFETY = 1.899 AND OCCURS AT RADIUS= 571.358

AT POINT (265.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:

508.926	2.833	495.845	1.913	482.765	1.903
469.685	1.982	456.605	2.223		
492.575	1.903	489.305	1.900	486.035	1.900
479.495	1.910	476.225	1.926	472.955	1.951

LOWEST FACTOR OF SAFETY = 1.900 AND OCCURS AT RADIUS= 489.305

AT POINT (265.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:

414.390	2.885	401.533	1.953	388.677	1.976
375.820	2.037	362.963	2.301		
411.176	1.973	407.962	1.965	404.748	1.960
398.319	1.952	395.105	1.958	391.891	1.967

LOWEST FACTOR OF SAFETY = 1.952 AND OCCURS AT RADIUS= 398.319

AT POINT (265.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:

320.130	3.104	307.671	2.020	295.212	2.007
282.753	2.066	270.294	2.556		
304.556	2.016	301.441	2.014	298.327	2.012
292.097	2.006	288.982	2.013	285.868	2.031

LOWEST FACTOR OF SAFETY = 2.006 AND OCCURS AT RADIUS= 292.097

AT POINT (265.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:

226.489	3.466	214.783	2.108	203.076	2.111
191.370	2.151	179.664	2.252		
223.562	2.183	220.636	2.140	217.709	2.118
211.856	2.107	208.929	2.107	206.003	2.108

LOWEST FACTOR OF SAFETY = 2.107 AND OCCURS AT RADIUS= 211.856

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AT POINT (265.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    133.718    4.487    122.709    2.376    111.701    2.239
    100.693    2.087     89.685    2.102
    108.949    2.196    106.197    2.156    103.445    2.118
     97.941    2.063     95.189    2.049     92.437    2.056
LOWEST FACTOR OF SAFETY = 2.049 AND OCCURS AT RADIUS= 95.189


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (360.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    591.595    2.177    574.326    2.120    557.057    2.066
    539.788    2.008    522.518    2.008
    552.739    2.053    548.422    2.037    544.105    2.022
    535.470    1.993    531.153    1.969    526.836    1.981
LOWEST FACTOR OF SAFETY = 1.969 AND OCCURS AT RADIUS= 531.153

AT POINT (360.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    501.385    3.285    484.056    2.096    466.727    2.030
    449.398    1.972    432.069    1.937
    427.737    2.007    423.405    2.268    419.073    4.270
LOWEST FACTOR OF SAFETY = 1.937 AND OCCURS AT RADIUS= 432.069

AT POINT (360.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    406.683    3.301    389.786    2.079    372.889    2.008
    355.991    1.954    339.094    2.041
    368.664    1.995    364.440    1.981    360.216    1.967
    351.767    1.941    347.543    1.940    343.319    1.948
LOWEST FACTOR OF SAFETY = 1.940 AND OCCURS AT RADIUS= 347.543

AT POINT (360.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    311.980    3.405    295.915    2.117    279.849    2.053
    263.783    2.069    247.717    2.115
    291.898    2.099    287.882    2.081    283.865    2.065
    275.832    2.047    271.816    2.045    267.800    2.055
LOWEST FACTOR OF SAFETY = 2.045 AND OCCURS AT RADIUS= 271.816

AT POINT (360.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    217.278    3.793    202.656    2.346    188.034    2.308
    173.412    2.261    158.790    2.179
    155.135    2.138    151.479    2.089    147.824    2.584
LOWEST FACTOR OF SAFETY = 2.089 AND OCCURS AT RADIUS= 151.479

AT POINT (360.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    122.576    5.108    109.045    3.069     95.514    2.909
     81.983    2.813     68.452    2.895
     92.131    2.878     88.749    2.845     85.366    2.821
     78.600    2.813     75.218    2.823     71.835    2.849
LOWEST FACTOR OF SAFETY = 2.813 AND OCCURS AT RADIUS= 81.983


GRID IS EXPANDED AS FOLLOWS SO MINIMUM FACTOR OF SAFETY FALLS WITHIN THE GRID


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    725.746    1.944    721.658    1.983    717.571    2.217
    713.483    2.904    709.396    3.641
LOWEST FACTOR OF SAFETY = 1.944 AND OCCURS AT RADIUS= 725.746

AT POINT (75.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    727.951    3.798    718.219    1.841    708.487    1.871
    698.755    1.998    689.022    2.216
    725.518    2.744    723.085    1.830    720.652    1.835
    715.786    1.846    713.353    1.853    710.920    1.859
LOWEST FACTOR OF SAFETY = 1.830 AND OCCURS AT RADIUS= 723.085

AT POINT (170.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
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    710.894    2.732    698.601    1.861    686.309    1.884
    674.016    1.971    661.723    2.282
    707.821    1.861    704.748    1.860    701.675    1.861
    695.528    1.862    692.455    1.865    689.382    1.872
LOWEST FACTOR OF SAFETY = 1.860 AND OCCURS AT RADIUS= 704.748

AT POINT (265.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    698.304    2.905    683.105    1.951    667.906    1.925
    652.707    1.929    637.508    2.107
    679.306    1.940    675.506    1.934    671.706    1.928
    664.106    1.922    660.307    1.922    656.507    1.923
LOWEST FACTOR OF SAFETY = 1.922 AND OCCURS AT RADIUS= 660.307


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (360.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    666.003    2.165    651.463    2.122    636.923    2.078
    622.383    2.045    607.843    2.210
    633.288    2.068    629.653    2.056    626.018    2.038
    618.748    2.059    615.113    2.085    611.478    2.130
LOWEST FACTOR OF SAFETY = 2.038 AND OCCURS AT RADIUS= 626.018


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 1210.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    734.528 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 734.528


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    640.872 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 640.872


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 1020.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    547.680 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 547.680


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 925.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    455.235 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 455.235


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 830.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    364.108 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 364.108


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 735.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    275.609 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 275.609
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****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-115.0 , 640.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    193.380 1000.000
LOWEST FACTOR OF SAFETY = 1000.000 AND OCCURS AT RADIUS= 193.380


LOWEST FACTOR OF SAFETY AT EACH GRID POINT IS TABULATED BELOW

COORDINATE  -115.000   -20.000    75.000   170.000   265.000   360.000
  1210.000  1000.000     1.944     1.830     1.860     1.922     2.038
  1115.000  1000.000     0.000     1.823     1.868     1.899     1.969
  1020.000  1000.000     2.138     1.835     1.908     1.900     1.937
   925.000  1000.000     2.678     1.808     1.921     1.952     1.940
   830.000  1000.000  1000.000     1.852     1.959     2.006     2.045
   735.000  1000.000  1000.000     1.888     1.979     2.107     2.089
   640.000  1000.000  1000.000     1.796     2.229     2.049     2.813

MINIMUM FACTORS OF SAFETY OCCUR AT THE FOLLOWING  4  CENTERS

FACTOR OF SAFETY = 0.000 AT (-20.000,1115.000)
FACTOR OF SAFETY = 1.808 AT (75.000,925.000)
FACTOR OF SAFETY = 1.796 AT (75.000,640.000)
FACTOR OF SAFETY = 2.049 AT (265.000,640.000)

AUTOMATIC SEARCH WILL BE MADE ONLY ON THE CENTER WITH THE SMALLEST F.S.

AT POINT (-20.0 , 1115.0) RADIUS 630.787
THE MINIMUM FACTOR OF SAFETY IS 0.000

FACTORS OF SAFETY BASED ON SEARCH

****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (-20.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    630.787    2.005    627.557    2.169    624.327    2.457
    621.097    2.671    617.867    3.669
LOWEST FACTOR OF SAFETY = 2.005 AND OCCURS AT RADIUS= 630.787


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (4.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    630.483    1.840    625.865    1.936    621.247    2.130
    616.628    2.654    612.010    3.386
LOWEST FACTOR OF SAFETY = 1.840 AND OCCURS AT RADIUS= 630.483


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    631.091    1.857    625.077    1.836    619.063    1.919
    613.048    2.197    607.034    3.932
    629.588    1.820    628.084    1.822    626.581    1.827
    623.573    1.849    622.070    1.866    620.566    1.889
LOWEST FACTOR OF SAFETY = 1.820 AND OCCURS AT RADIUS= 629.588


****  WARNING AT NEXT CENTER  ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (52.0 , 1115.0) THE RADIUS AND FACTOR OF SAFETY ARE:
    632.611    1.857    625.198    1.843    617.785    1.880
    610.372    1.968    602.959    2.516
    630.758    1.843    628.904    1.835    627.051    1.839
    623.345    1.850    621.491    1.860    619.638    1.870
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LOWEST FACTOR OF SAFETY = 1.835 AND OCCURS AT RADIUS= 628.904

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1139.0) THE RADIUS AND FACTOR OF SAFETY ARE:

655.069	1.862	648.916	1.842	642.763	1.904
636.610	2.134	630.457	3.500		
653.530	1.828	651.992	1.831	650.454	1.835
647.377	1.850	645.839	1.863	644.301	1.881

LOWEST FACTOR OF SAFETY = 1.828 AND OCCURS AT RADIUS= 653.530

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1091.0) THE RADIUS AND FACTOR OF SAFETY ARE:

607.116	1.850	601.252	1.838	595.387	1.949
589.522	2.260	583.658	3.287		
605.650	1.812	604.184	1.817	602.718	1.825
599.785	1.856	598.319	1.878	596.853	1.908

LOWEST FACTOR OF SAFETY = 1.812 AND OCCURS AT RADIUS= 605.650

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1067.0) THE RADIUS AND FACTOR OF SAFETY ARE:

583.143	1.851	577.441	1.848	571.739	1.983
566.037	2.323	560.335	3.230		
581.717	1.811	580.292	1.819	578.866	1.831
576.015	1.871	574.590	1.902	573.164	1.939

LOWEST FACTOR OF SAFETY = 1.811 AND OCCURS AT RADIUS= 581.717

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1043.0) THE RADIUS AND FACTOR OF SAFETY ARE:

559.172	1.858	553.647	1.870	548.122	2.013
542.597	2.380	537.072	3.173		

LOWEST FACTOR OF SAFETY = 1.858 AND OCCURS AT RADIUS= 559.172

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (52.0 , 1067.0) THE RADIUS AND FACTOR OF SAFETY ARE:

584.787	1.860	577.569	1.831	570.351	1.867
563.133	2.023	555.915	2.900		
582.982	1.839	581.178	1.826	579.373	1.828
575.764	1.835	573.960	1.841	572.155	1.852

LOWEST FACTOR OF SAFETY = 1.826 AND OCCURS AT RADIUS= 581.178

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (4.0 , 1067.0) THE RADIUS AND FACTOR OF SAFETY ARE:

582.484	1.890	578.294	1.999	574.103	2.219
569.913	2.708	565.723	3.329		

LOWEST FACTOR OF SAFETY = 1.890 AND OCCURS AT RADIUS= 582.484

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1067.0) THE RADIUS AND FACTOR OF SAFETY ARE:

583.462	1.848	577.381	1.832	571.300	1.940
565.219	2.233	559.138	3.235		
581.941	1.808	580.421	1.813	578.901	1.820

575.861 1.848 574.340 1.870 572.820 1.899
LOWEST FACTOR OF SAFETY = 1.808 AND OCCURS AT RADIUS= 581.941

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (40.0 , 1067.0) THE RADIUS AND FACTOR OF SAFETY ARE:
583.842 1.853 577.382 1.825 570.922 1.902
564.462 2.154 558.003 3.629
582.227 1.825 580.612 1.813 578.997 1.817
575.767 1.836 574.152 1.852 572.537 1.873
LOWEST FACTOR OF SAFETY = 1.813 AND OCCURS AT RADIUS= 580.612

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1073.0) THE RADIUS AND FACTOR OF SAFETY ARE:
589.451 1.849 583.333 1.831 577.214 1.930
571.095 2.218 564.976 4.007
587.922 1.809 586.392 1.813 584.862 1.820
581.803 1.846 580.273 1.866 578.743 1.893
LOWEST FACTOR OF SAFETY = 1.809 AND OCCURS AT RADIUS= 587.922

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1061.0) THE RADIUS AND FACTOR OF SAFETY ARE:
577.472 1.847 571.430 1.833 565.388 1.947
559.346 2.247 553.304 3.220
575.961 1.808 574.451 1.813 572.940 1.820
569.919 1.851 568.409 1.875 566.898 1.906
LOWEST FACTOR OF SAFETY = 1.808 AND OCCURS AT RADIUS= 575.961

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1055.0) THE RADIUS AND FACTOR OF SAFETY ARE:
571.482 1.847 565.480 1.835 559.478 1.954
553.476 2.262 547.473 3.204
569.982 1.807 568.481 1.813 566.981 1.821
563.980 1.855 562.479 1.880 560.978 1.914
LOWEST FACTOR OF SAFETY = 1.807 AND OCCURS AT RADIUS= 569.982

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1049.0) THE RADIUS AND FACTOR OF SAFETY ARE:
565.493 1.848 559.531 1.838 553.570 1.962
547.608 2.276 541.646 3.189
564.003 1.807 562.512 1.813 561.022 1.823
558.041 1.859 556.551 1.887 555.060 1.921
LOWEST FACTOR OF SAFETY = 1.807 AND OCCURS AT RADIUS= 564.003

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (34.0 , 1043.0) THE RADIUS AND FACTOR OF SAFETY ARE:
559.504 1.848 553.584 1.841 547.664 1.969
541.744 2.289 535.823 3.173
558.024 1.807 556.544 1.814 555.064 1.825
552.104 1.864 550.624 1.893 549.144 1.927
LOWEST FACTOR OF SAFETY = 1.807 AND OCCURS AT RADIUS= 558.024

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (40.0 , 1049.0) THE RADIUS AND FACTOR OF SAFETY ARE:

565.886	1.847	559.533	1.825	553.180	1.922
546.827	2.193	540.474	3.817		
564.297	1.821	562.709	1.810	561.121	1.815
557.944	1.839	556.356	1.859	554.768	1.885

LOWEST FACTOR OF SAFETY = 1.810 AND OCCURS AT RADIUS= 562.709

**** WARNING AT NEXT CENTER ****
MAXIMUM RADIUS IS LIMITED BY END POINT OF GROUND LINE

AT POINT (28.0 , 1049.0) THE RADIUS AND FACTOR OF SAFETY ARE:

565.164	1.856	559.593	1.864	554.023	2.006
548.452	2.366	542.882	3.188		

LOWEST FACTOR OF SAFETY = 1.856 AND OCCURS AT RADIUS= 565.164

AT POINT (34.0 , 1049.0) RADIUS 564.003

THE MINIMUM FACTOR OF SAFETY IS 1.807

SUMMARY OF SLICE INFORMATION FOR MOST CRITICAL FAILURE SURFACE

SL. NO.	SOIL NO.	SLICE WIDTH	SLICE HEIGHT	WATER HEIGHT	BOTTOM SINE	TOTAL WEIGHT	EFFEC. WEIGHT	RESIS. MOMENT	DRIVING MOMENT
1	2	14.829	1.567	0.000	.045	.298E+04	.298E+04	.266E+07	.244E+06
2	2	6.020	3.851	0.000	.064	.297E+04	.297E+04	.176E+07	.274E+06
3	2	8.963	6.008	0.000	.077	.691E+04	.691E+04	.356E+07	.687E+06
4	2	29.812	11.468	0.000	.112	.439E+05	.439E+05	.198E+08	.519E+07
5	2	6.395	15.952	0.000	.144	.131E+05	.131E+05	.560E+07	.178E+07
6	2	1.950	17.034	0.000	.151	.426E+04	.426E+04	.181E+07	.597E+06
7	2	1.400	17.776	0.000	.154	.319E+04	.319E+04	.135E+07	.452E+06
8	2	20.067	20.574	0.000	.173	.530E+05	.530E+05	.219E+08	.806E+07
9	2	19.303	24.754	0.000	.208	.613E+05	.613E+05	.248E+08	.105E+08
10	2	10.509	27.531	0.000	.234	.371E+05	.371E+05	.147E+08	.689E+07
11	2	5.011	28.902	0.000	.248	.186E+05	.186E+05	.732E+07	.359E+07
12	2	7.820	27.984	0.000	.259	.281E+05	.281E+05	.111E+08	.560E+07
13	2	12.700	24.888	0.000	.278	.406E+05	.406E+05	.160E+08	.850E+07
14	2	4.281	23.191	0.000	.293	.127E+05	.127E+05	.503E+07	.278E+07
15	2	29.812	23.761	0.000	.323	.909E+05	.909E+05	.354E+08	.213E+08
16	2	29.812	23.284	0.000	.376	.891E+05	.891E+05	.340E+08	.234E+08
17	2	25.355	21.079	0.000	.425	.686E+05	.686E+05	.258E+08	.199E+08
18	2	4.457	19.154	0.000	.451	.110E+05	.110E+05	.410E+07	.333E+07
19	2	29.812	16.350	0.000	.482	.625E+05	.625E+05	.235E+08	.200E+08
20	2	15.951	11.390	0.000	.522	.233E+05	.233E+05	.913E+07	.797E+07
21	2	2.410	8.418	0.000	.538	.260E+04	.260E+04	.109E+07	.913E+06
22	2	11.451	3.808	0.000	.551	.560E+04	.560E+04	.308E+07	.200E+07
							SUM	.273E+09	.154E+09

AT CENTER (34.000 , 1049.000) WITH RADIUS 564.003 AND SEIS. COEFF. 0.10
FACTOR OF SAFETY BY NORMAL METHOD IS 1.776
FACTOR OF SAFETY BY SIMPLIFIED BISHOP METHOD IS 1.807

SUMMARY OF STABILITY ANALYSIS

FACTOR OF FAFETY IS DETERMINED BY SIMPLIFIED BISHOP METHOD
NUMBER OF CASES = 1

CASE 1 SEISMIC COEFFICIENT = 0.1
FACTOR OF SAFETY = 1.807

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DRAINAGE CONTROL

Drainage will be routed over, around, and under the waste bank through a series of diversions, slope benches, downdrains, and two existing underdrains. They are shown on the attached Grading Plan Map 4 of 5 and Abandonment Grading Plan/Drainage Control Plan Map 5 of 5. The specifications for the diversion ditches follows this section. See the original design plans for additional diversion, slope bench, and downdrain specifications.

During the design of the slope benches and downdrains, some slope benches were designed site specific and some were designed for typical configurations. The typical slope bench was designed for the largest drainage area of 4.3 acres and the downdrain was designed for the largest drainage area of 37 acres. Whether existing or proposed in this revision they have been designed and analyzed as shown on the following pages in the attached design data and on the attached Grading Plan Map 4 of 5. Computer outputs, cross-sections, and lining specifications for the slope benches and downdrains follow this section.

Slope benches and downdrains will be constructed in the locations as shown and in accordance to the specifications described later in these detailed design plans. Slope benches, diversions, and down drains will be rough graded as soon as possible and will be finish graded including the addition of 2 feet of non-toxic, non-acid forming, and non-combustible cover material and appropriate channel lining upon the completion of outslope grading and setback construction of the next slope bench. The outslopes below the slope benches and diversions will be finish graded including the addition of 2 feet of non-toxic, non-acid forming, and non-combustible cover material and vegetated upon the completion of the setback construction of the next slope bench and diversion. Typical design information for the slope benches and downdrains are attached.

The previous underdrains were installed during the abandonment of the existing slurry impoundment. The new and extended underdrains were designed using the computer model SEDCAD4, utilizing a 10 yr. - 24 hr., Type II storm event of 6.0 inches of rainfall. The maximum storm runoff from the underdrain watershed under surface conditions of curve

number of 100 and 81 were calculated. The runoff volume of the watershed with a curve number of 81 was subtracted from the watershed with a curve number of 100 to obtain the infiltration volume. The time required for the infiltration volume to move through the fill was determined by dividing the vertical distance of travel by the permeabilty of the fill material. The maximum cross sectional area of the underdrain was then determined by using Darcy's Equation. The underdrain calculations for the NE Expansion area are attached.

SEDIMENT CONTROL

Sediment produced by the construction, use, maintenance, and reclamation of Coarse Refuse Disposal Area No. 1 will be through Basins 001A, 001, 010, 010A, 015, 016, 018A, 018 and 024. The basin locations are shown on the permit map.

SPECIFICATIONS FOR DIVERSION CHANNELS AND DIVERSION BERMS

1. Diversions shall be designed, constructed, and maintained in a manner which prevents additional contributions of suspended solids to stream flow and to runoff outside the permit area, to the extent possible, using the best technology currently available. Appropriate sediment control measures for these diversions may include, but not be limited to, maintenance of appropriate gradients, channel lining, revegetation, roughness structures, and detention basins.

2. No diversion shall be located so as to increase the potential for land slides and no diversion shall be constructed on existing land slides.

3. When no longer needed, each temporary diversion shall be removed and the affected land regraded, topsoiled, and revegetated in accordance with Rules 880-X-10C-.10, 880-X-10C-.11, 880-X-10C-.52 - 880-X-10C-.58, 880-X-10C-.60, and 880-X-10C-.62.

4. Channel linings, when slopes are between 1-3 percent shall consist of both perennial and annual grasses and when slopes are greater than 3 percent, shall consist of riprap or be cut into non-erodible material.

5. Freeboard shall provide protection for transition of flows and for critical areas such as swales and curves along the entire channel length.

6. Energy dissipators shall be installed, when necessary, at discharge points where natural streams and exit velocity of the diversion ditch flow is greater than that of the receiving stream.

7. Excess excavated material not necessary for diversion channel geometry or regrading of the channel shall be disposed of in accordance with Rule 880-X-10C-.36.

8. Topsoil removed from the diversion excavations shall be handled in accordance with Rule 880-X-10C-.07 through 880-X-10C-.11.

9. Diversions shall not be constructed or operated to divert water into underground mines.

10. The embankment or berm foundation area shall be cleared of all organic matter, all surfaces sloped to no steeper than lv:lh and the entire foundation surface scarified.

11. The entire embankment or berm shall be compacted to 90% density, based on standard proctor as outlined in ASTM.

12. The material placed in the berm shall be free of sod, roots, stones over 6 inches in diameter, and other objectionable materials. The fill material shall be placed and spread over the entire fill area, starting at the lowest point of the foundation, in layers not to exceed 12 inches in thickness. Construction of the fill shall be undertaken only at such times as the moisture content of the fill material will permit satisfactory compaction in accordance with paragraph 11.

13. The berm and all disturbed areas shall be seeded with both perennial and annual grasses in order to insure that erosion is minimized. Hay bales or riprap may be placed at the toe of the berm immediately upon completion of construction.

14. All berms shall be examined quarterly for structural weakness, instability, erosion, or other hazardous conditions and maintenance performed as necessary.

RIP-RAP CLASSIFICATION SPECIFICATIONS

CLASS 1 RIP-RAP

No more than 10% of the stone will have a diameter greater than twelve (12) inches; no more than 50% of the stone will have a diameter less than ten (10) inches; and no more than 10% of the stone will have a diameter of less than six (6) inches. The thickness of the rip-rap liner will be no less than twelve (12) inches.

CLASS 2 RIP-RAP

No more than 10% of the stone will have a diameter greater than sixteen (16) inches; no more than 50% of the stone will have a diameter less than twelve (12) inches; and no more than 10% of the stone will have a diameter of less than six (6) inches. The thickness of the rip-rap liner will be no less than sixteen (16) inches.

CLASS 3 RIP-RAP

No more than 10% of the stone will have a diameter greater than twenty two (22) inches; no more than 50% of the stone will have a diameter less than sixteen (16) inches; and no more than 10% of the stone will have a diameter of less than eight (8) inches. The thickness of the rip-rap liner will be no less than twenty two (22) inches.

CLASS 4 RIP-RAP

No more than 10% of the stone will have a diameter greater than twenty seven (27) inches; no more than 50% of the stone will have a diameter less than twenty two (22) inches; and no more than 10% of the stone will have a diameter of less than ten (10) inches. The thickness of the rip-rap liner will be no less than twenty seven (27) inches.

CLASS 5 RIP-RAP

No more than 10% of the stone will have a diameter greater than thirty four (34) inches; no more than 50% of the stone will have a diameter less than twenty seven (27) inches; and no more than 10% of the stone will have a diameter of less than sixteen (16) inches. The thickness of the rip-rap liner will be no less than thirty four (34) inches.

Chevron Mining Inc.

North River No.1 Underground Mine

P-3222 R-34

Coarse Refuse Disposal Area No.1 NE Expansion

Typical Downdrains

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour Event

LGS

PERC ENGINEERING CO., INC.
1606 HWY 78 WEST
JASPER, AL 35501

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

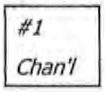
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Typical Downdrain



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	37.000	37.000	131.06	11.69

Structure Detail:

Structure #1 (Nonerodible Channel)

Typical Downdrain

Trapezoidal Nonerodible Channel Inputs:

Material: Concrete, Rubble

Bottom Width (ft)	Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Manning's n	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)
10.00	2.0:1	2.0:1	40.0	0.0220	0.50		

Nonerodible Channel Results:

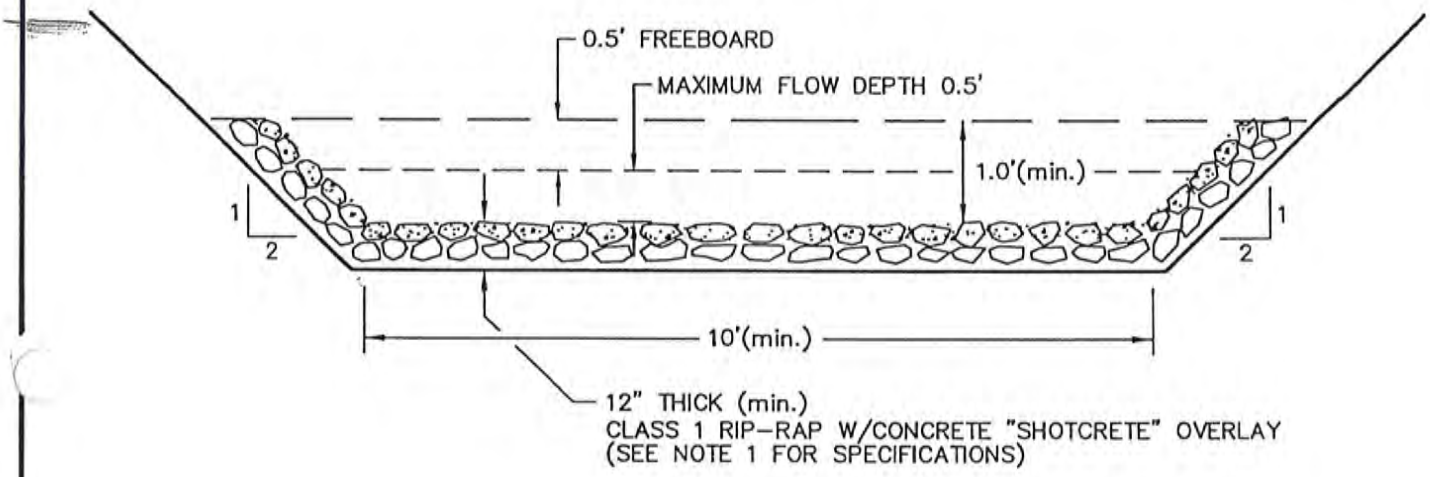
	w/o Freeboard	w/ Freeboard
Design Discharge:	131.06 cfs	
Depth:	0.48 ft	0.98 ft
Top Width:	11.94 ft	13.94 ft
Velocity:	24.66 fps	
X-Section Area:	5.31 sq ft	
Hydraulic Radius:	0.437	
Froude Number:	6.51	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	37.000	0.065	0.000	0.000	81.000	F	131.06	11.694
	Σ	**37.000**						**131.06**	**11.694**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	5.00	10.00	200.00	2.230	0.024
		8. Large gullies, diversions, and low flowing streams	12.50	200.00	1,600.00	10.600	0.041
#1	**1**	**Time of Concentration:**					**0.065**



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ENGINEERING CO., INC.

Chevron Mining Inc.
North River Underground No. 1
P-3222 R-34
Coarse Refuse Disposal Area No. 1
NE Expansion Typical Downdrain

DRAWN BY: L.G.S. DWG. NAME: PMNRCRTD	DATE: 4/20/09
APPROVED BY: L.G.S.	SCALE: NONE

Chevron Mining Inc.
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No.1
Typical Slope Bench

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC ENGINEERING CO., INC.
1606 HWY 78 WEST
JASPER, AL 35501

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

Storm Type:	Rainfall Event

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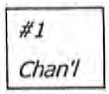
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Typical



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	4.330	4.330	13.63	1.37

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Typical

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
8.7:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

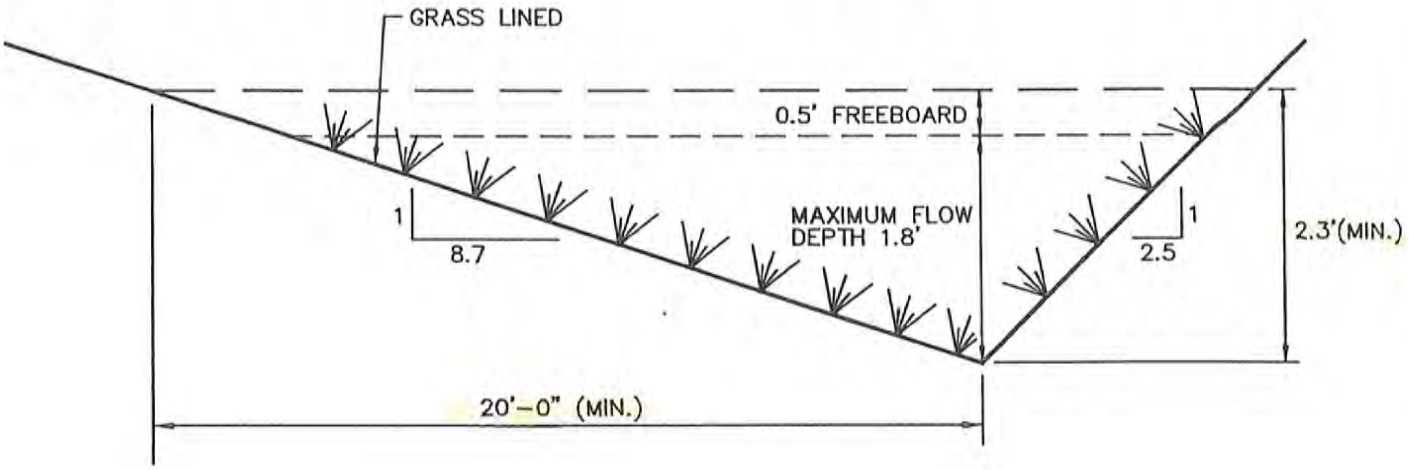
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	13.63 cfs		13.63 cfs	
Depth:	1.17 ft	1.67 ft	1.82 ft	2.32 ft
Top Width:	13.10 ft	18.70 ft	20.38 ft	25.98 ft
Velocity:	1.78 fps		0.73 fps	
X-Section Area:	7.67 sq ft		18.55 sq ft	
Hydraulic Radius:	0.576		0.896	
Froude Number:	0.41		0.14	
Roughness Coefficient:	0.0579		0.1884	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	4.330	0.175	0.000	0.000	81.000	F	13.63	1.369
	Σ	**4.330**						**13.63**	**1.369**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	40.00	50.00	125.00	6.320	0.005
		8. Large gullies, diversions, and low flowing streams	0.50	6.50	1,300.00	2.120	0.170
#1	**1**	**Time of Concentration:**					**0.175**



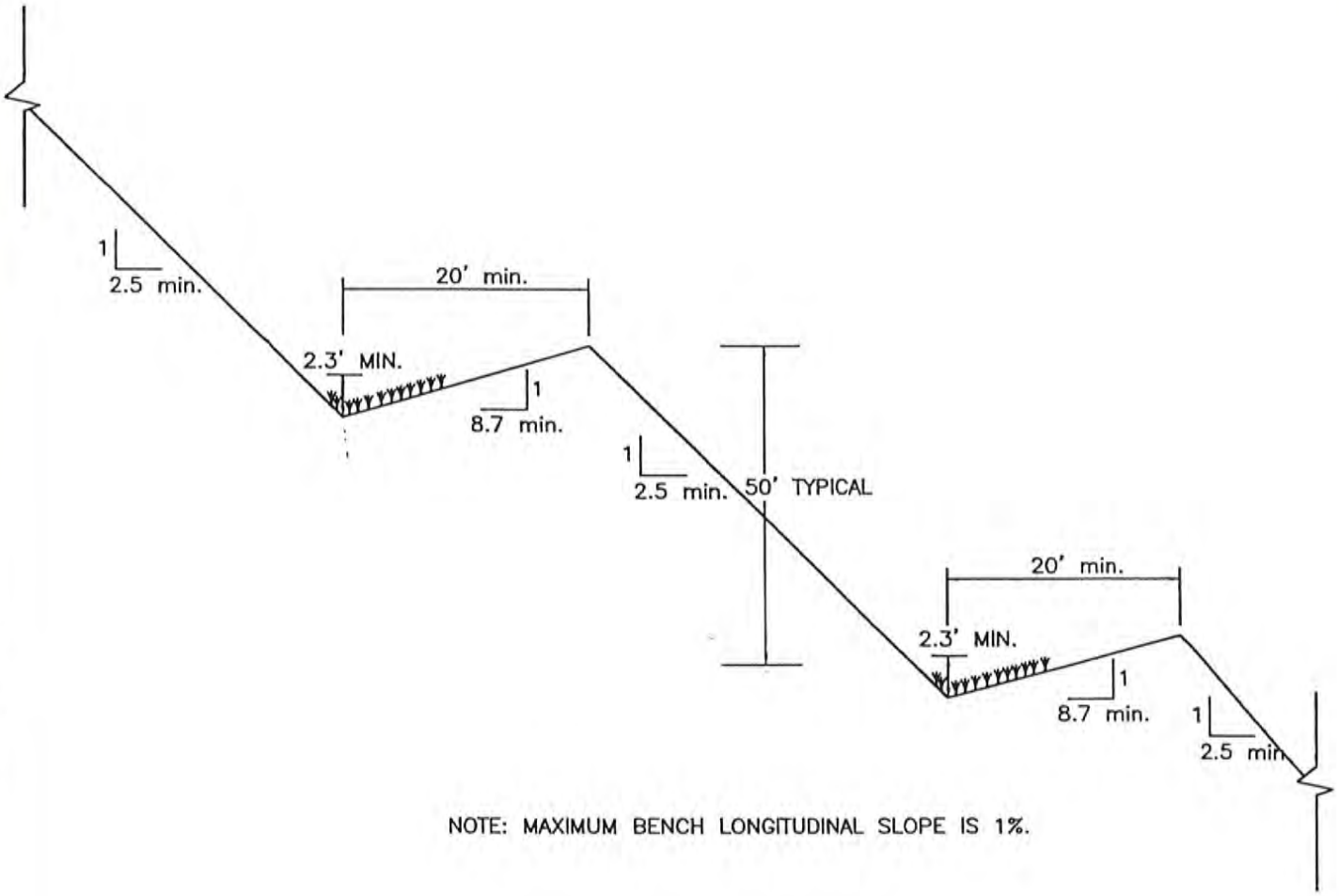
GRASS LINING TO CONSIST OF A MIXTURE OF FESCUE, BERMUDA, AND SERICEA GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

PERC ENGINEERING CO., INC.

Chevron Mining, Inc.
North River Underground No. 1 P-3222
Coarse Refuse Disposal Area No. 1
NE Expansion
Typical Slope Bench

DRAWN BY: L.E. DWG. NAME: coarse refuse slope	DATE: 4/16/2009
APPROVED BY: L.G.S.	SCALE: NONE



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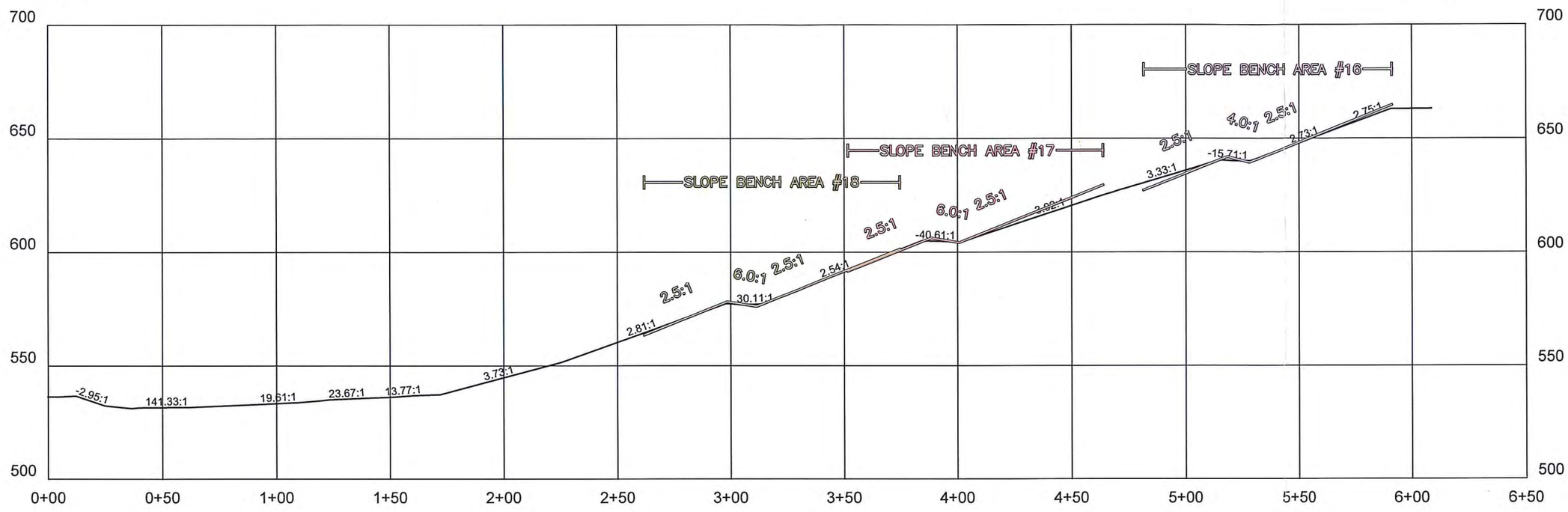
PERC ENGINEERING CO. INC.

Chevron Mining, Inc.
North River Underground No. 1 P-3222
Coarse Refuse Disposal Area No. 1
NE Expansion
Slope Bench Typical

DRAWN BY: L.E. DWG. NAME: coarse refuse slope typ	DATE: 4/16/2009
APPROVED BY: L.G.S.	SCALE: NONE



LEGEND

2.96:1	EXISTING SLOPE
———	EXISTING GROUND

PERC
ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Alabama 35501
P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5553 Office (205) 295-3114 Fax

drawn by: S.A.E.
checked by: L.E.
scale: 1" = 50'
cd no:
rev no./date:

job number: 13-00035-002
last field survey: Oct 2013
f.b./page:
dwg name: Terrace topo-OCT 2013
rev no./date:

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131P
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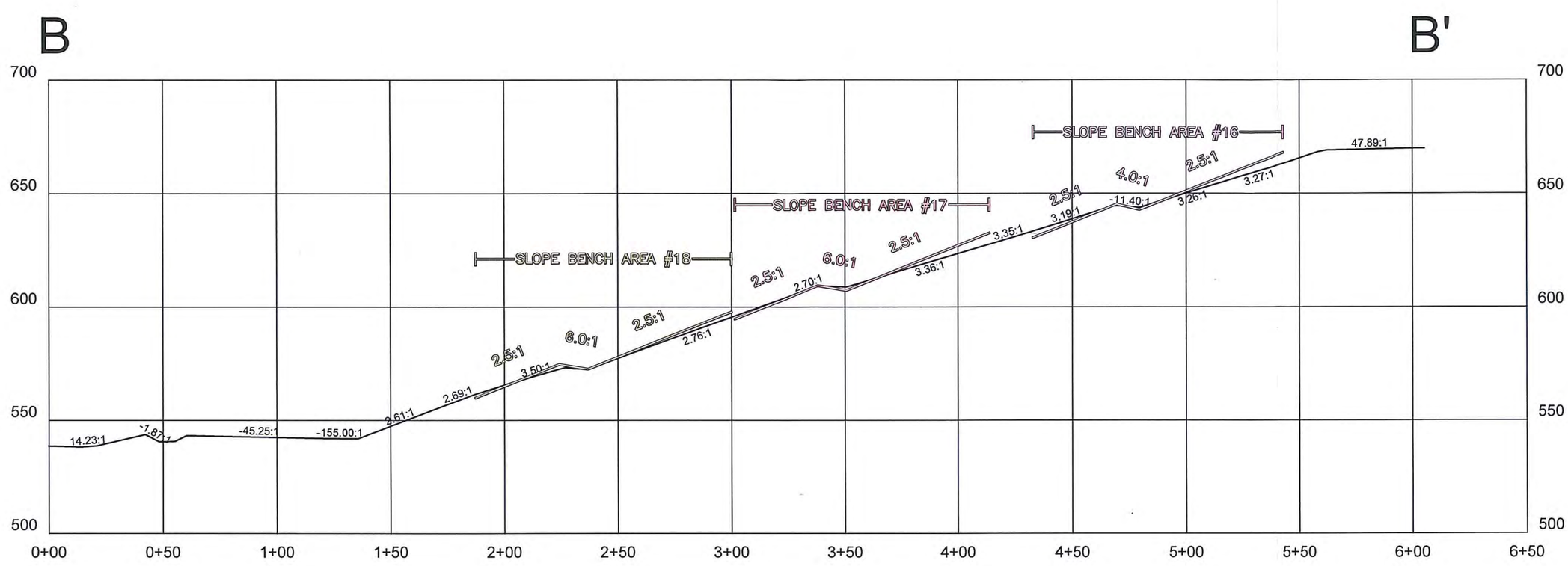

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SHEET 2 OF 11

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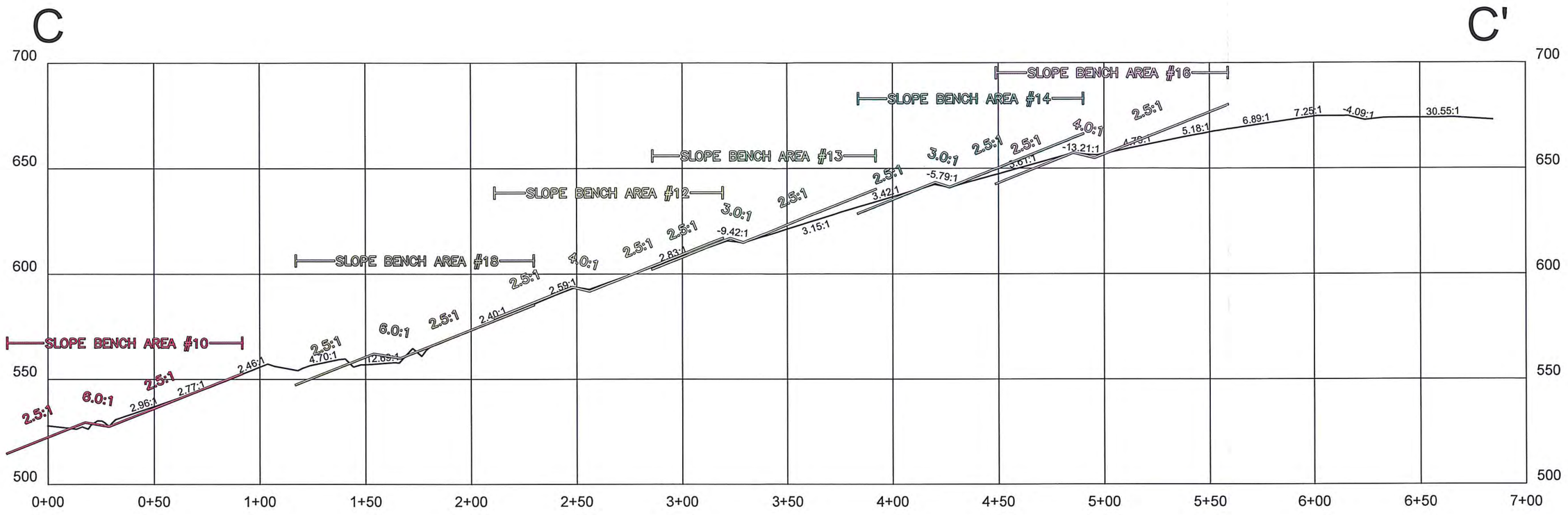

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SHEET 3 OF 15

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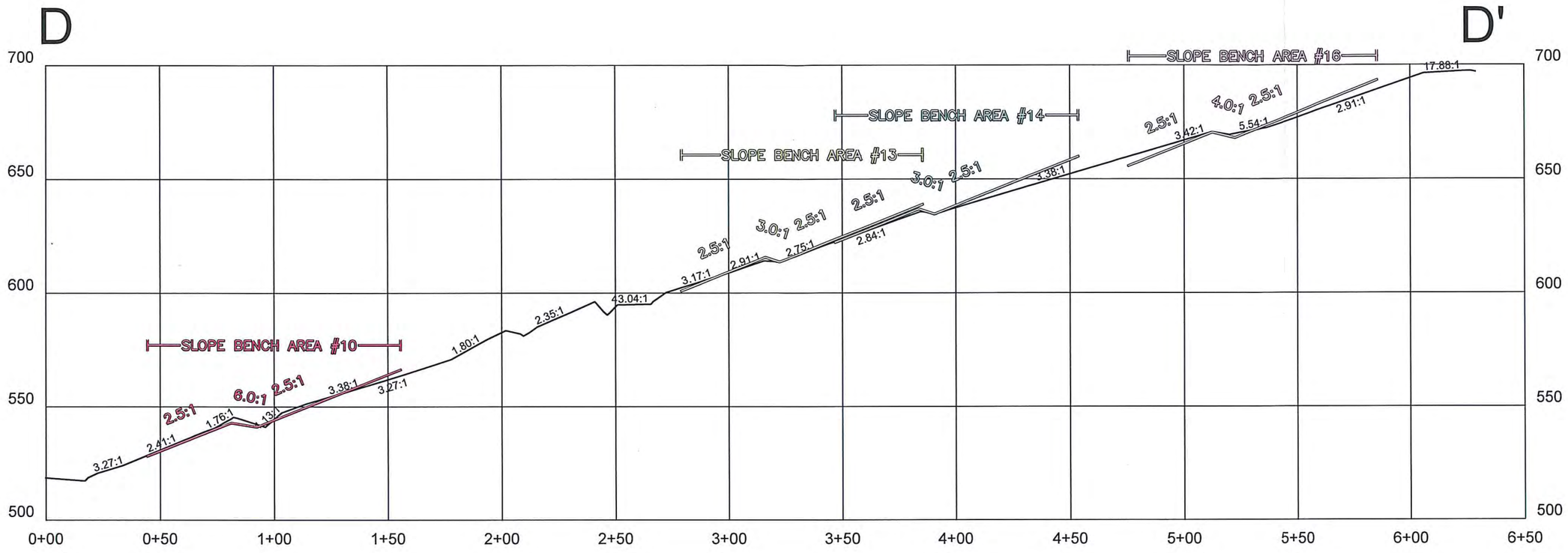

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SHEET 4 OF 11

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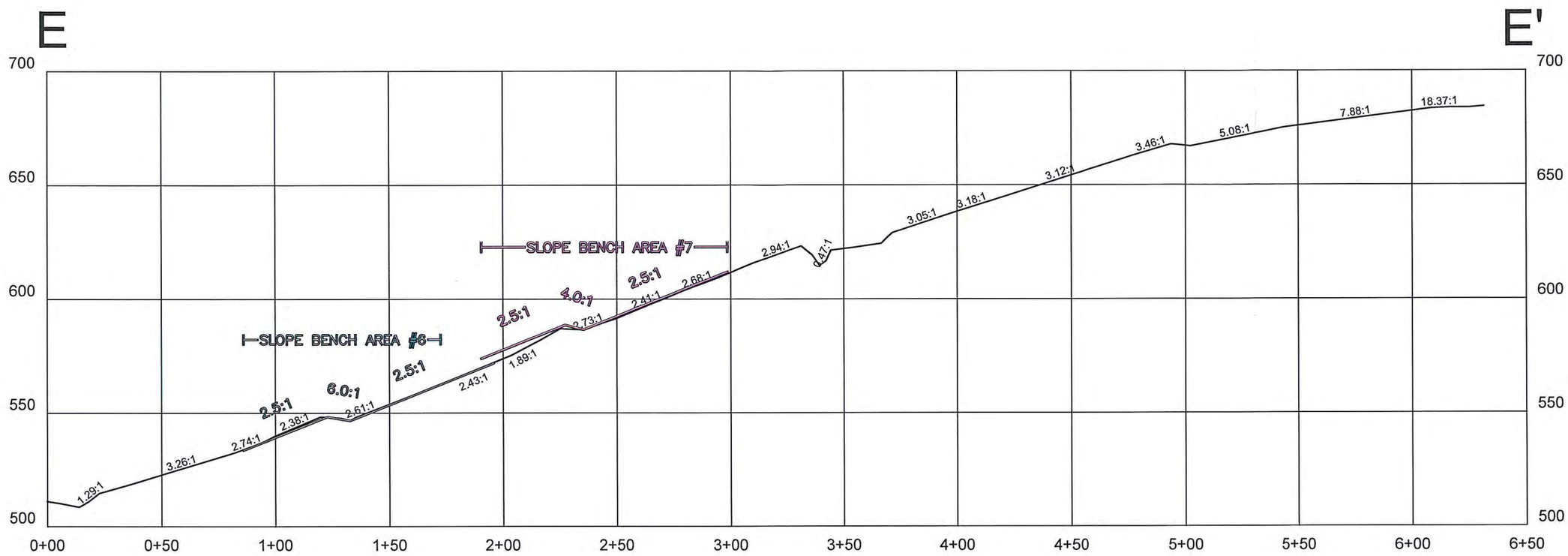

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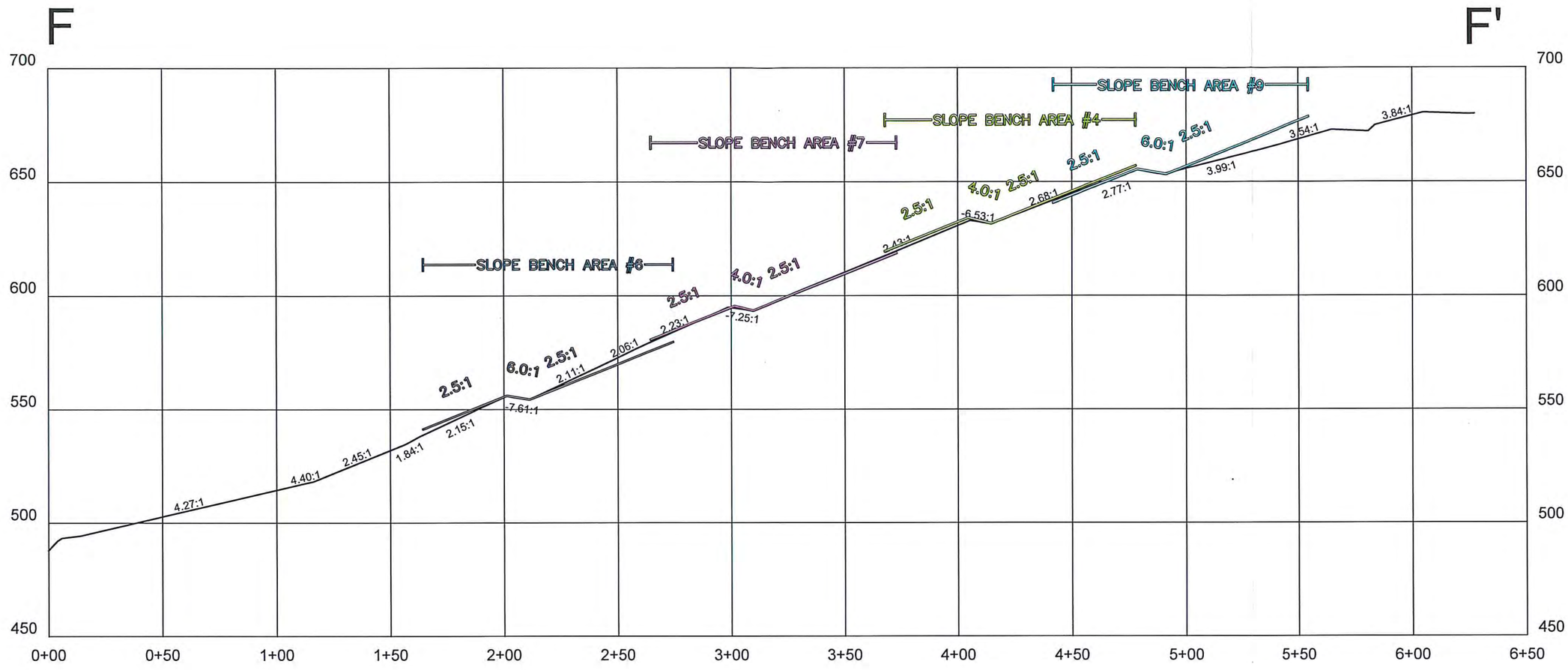

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SHEET 6 OF 11

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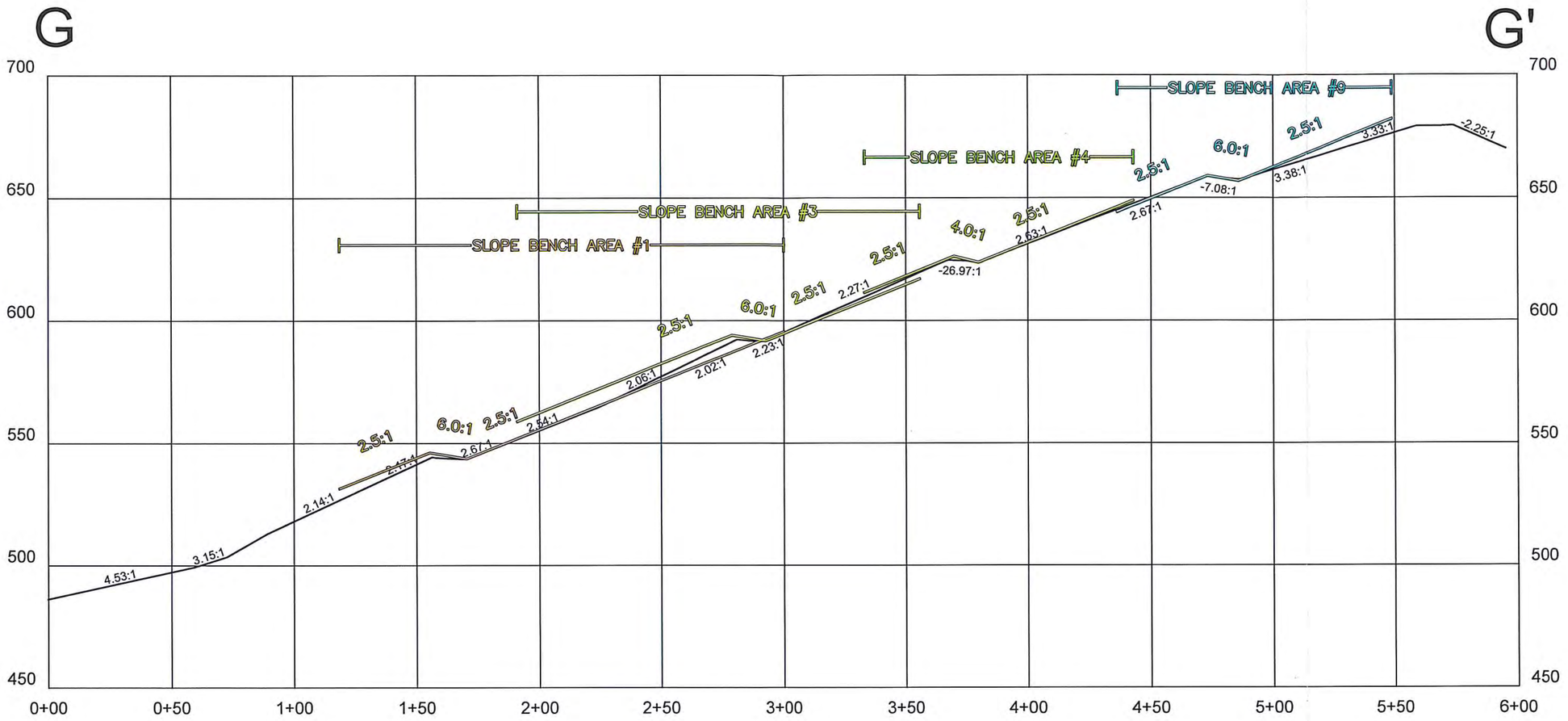

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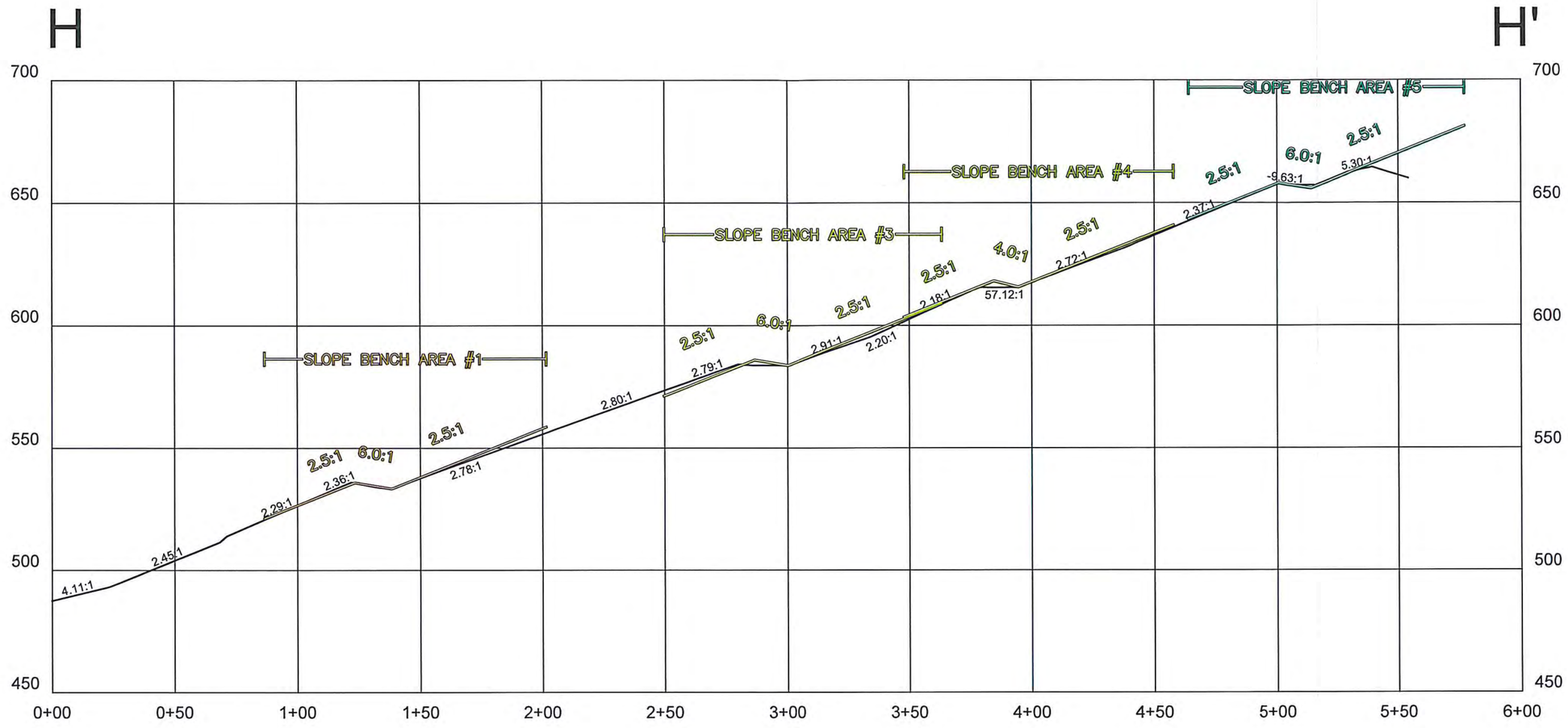

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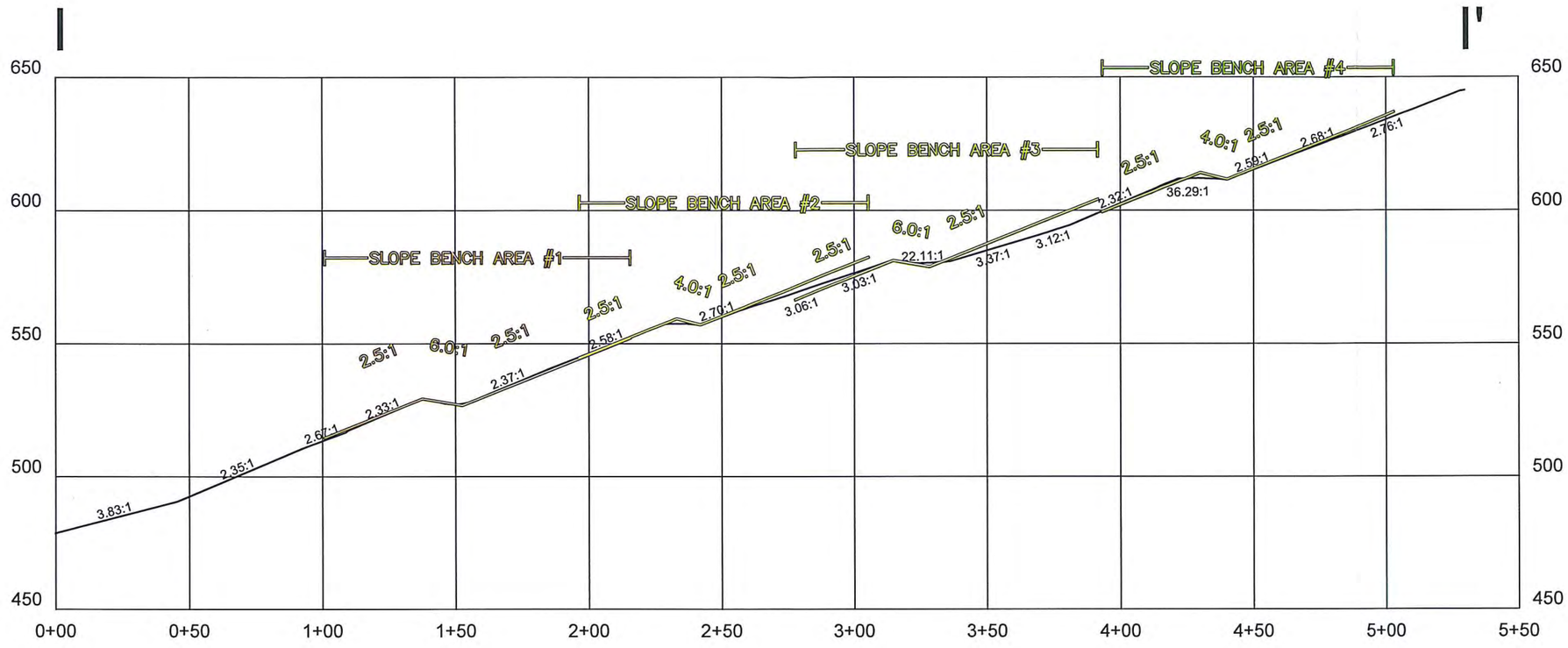

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Coarse Refuse Disposal Area No. 1

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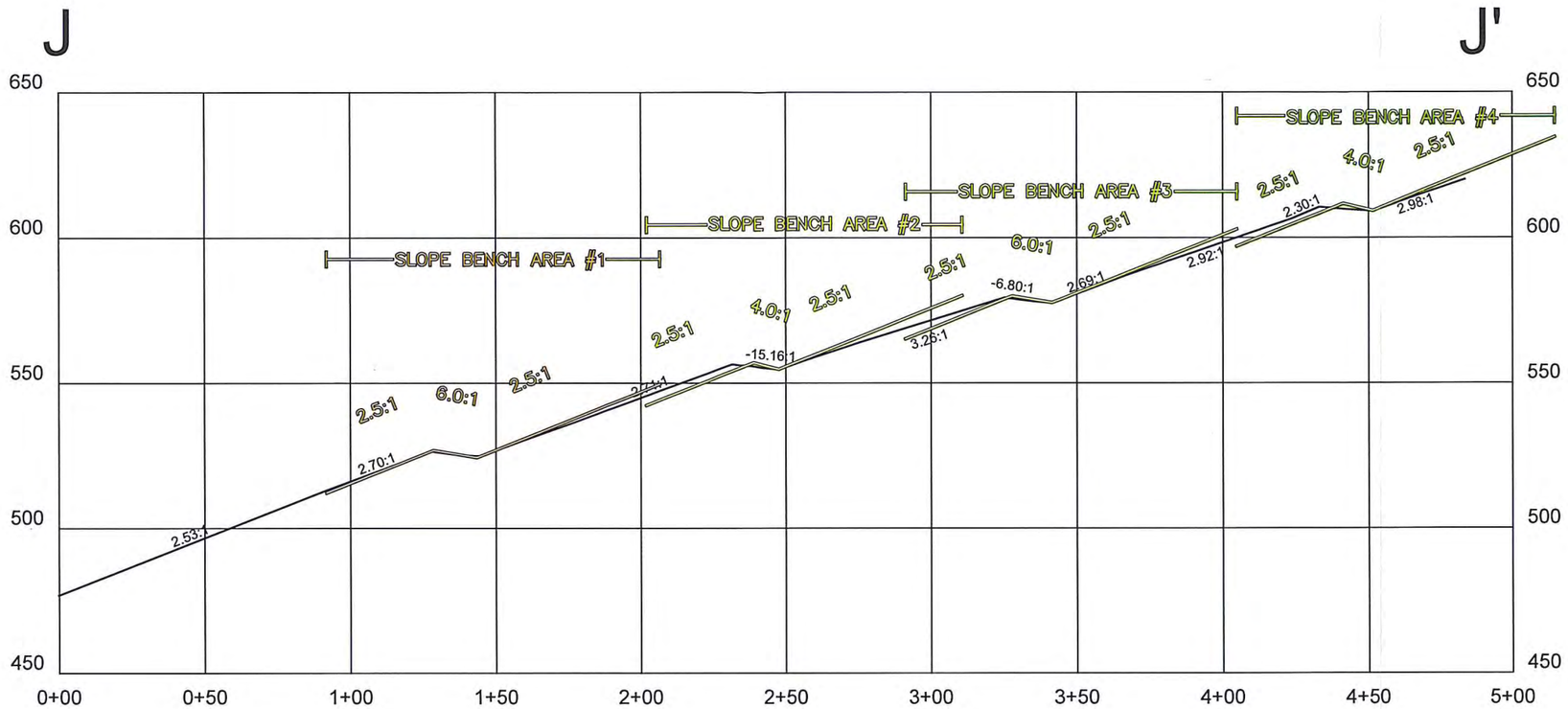

LEGEND

2.96:1 EXISTING SLOPE

EXISTING GROUND

PERC
ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Alabama 35501
P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5553 Office (205) 295-3114 Fax

drawn by: S.A.E.
checked by: L.E.
scale: 1" = 50'
cd no:
rev no./date:

job number: 13-00035-002
last field survey: Oct 2013
f.b./page:
dwg name: Terrace topo-OCT 2013
rev no./date:

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1

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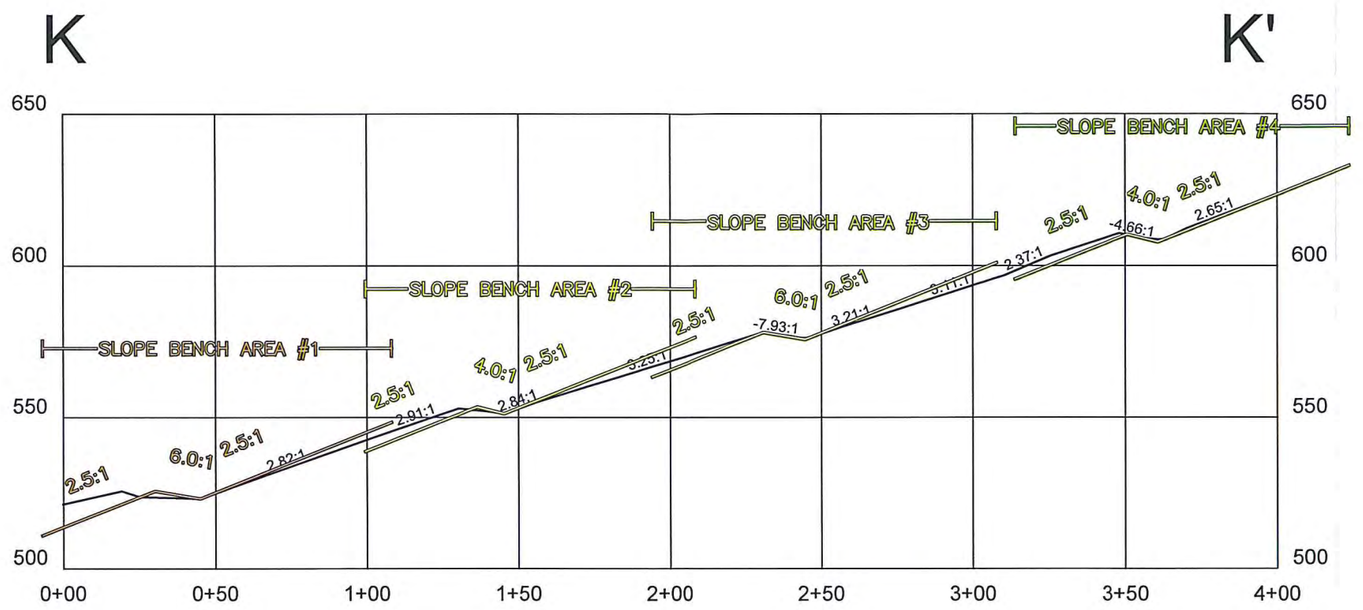

LEGEND

2.96:1 EXISTING SLOPE

EXISTING GROUND

PERC
ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Alabama 35501
P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5553 Office (205) 295-3114 Fax

drawn by: S.A.E.
checked by: L.E.
scale: 1" = 50'
cd no:
rev no./date:

job number: 13-00035-002
last field survey: Oct 2013
f.b./page:
dwg name: Terrace topo-OCT 2013
rev no./date:

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1

SHEET 11 OF 11

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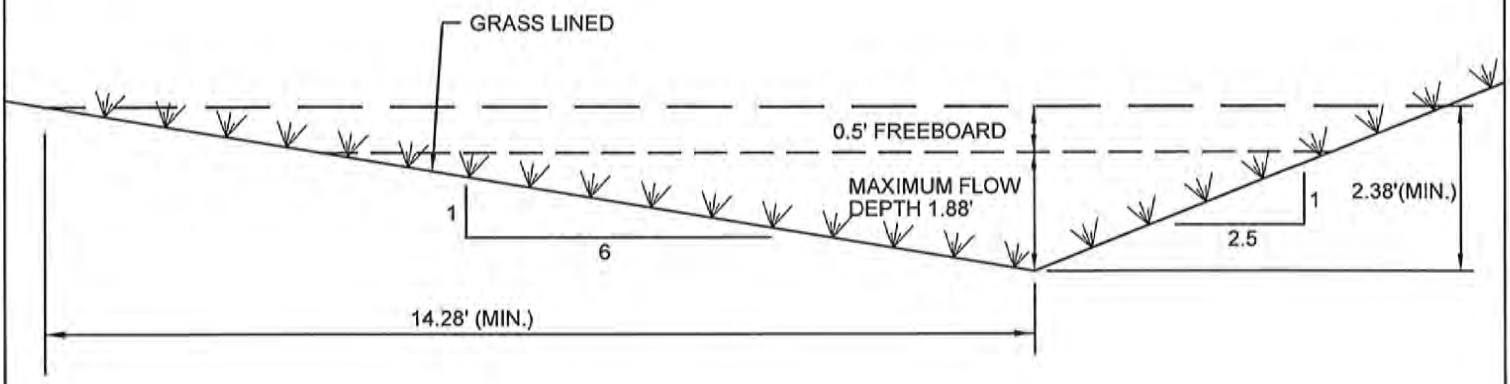


GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #1

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1800 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 295-7114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 1

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
P.O. Box 1712
Jasper, Alabama 35502

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

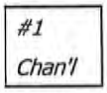
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 1



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	5.760	5.760	11.69	1.21

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 1

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

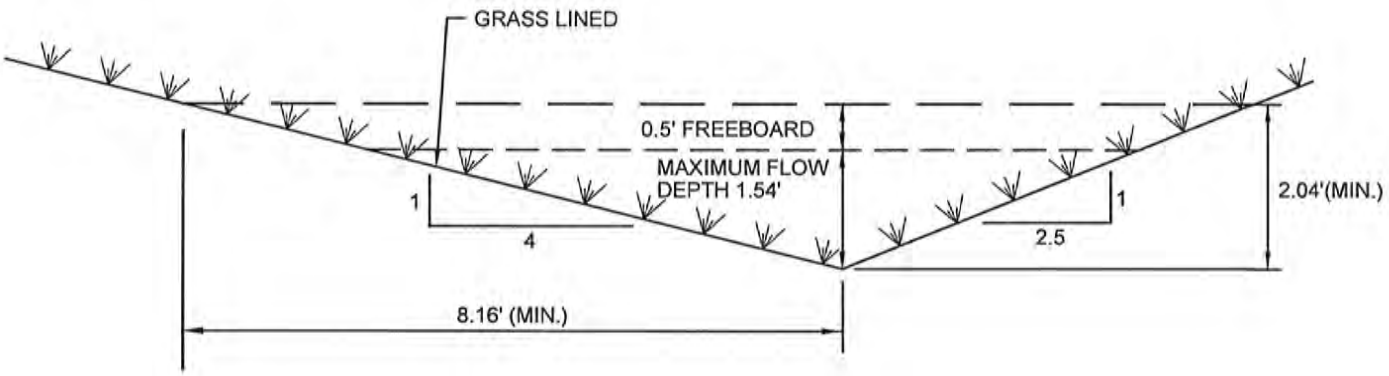
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	11.69 cfs		11.69 cfs	
Depth:	1.22 ft	1.72 ft	1.88 ft	2.38 ft
Top Width:	10.35 ft	14.60 ft	16.00 ft	20.25 ft
Velocity:	1.85 fps		0.78 fps	
X-Section Area:	6.30 sq ft		15.05 sq ft	
Hydraulic Radius:	0.593 ft		0.916 ft	
Froude Number:	0.42		0.14	
Roughness Coefficient:	0.0567		0.1809	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	5.760	0.154	0.000	0.000	74.000	M	11.69	1.210
	Σ	**5.760**						**11.69**	**1.210**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	40.63	39.00	96.00	5.090	0.005
		8. Large gullies, diversions, and low flowing streams	2.16	51.00	2,365.00	4.400	0.149
#1	**1**	**Time of Concentration:**					**0.154**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #2

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1713-35502
(205) 384-8553 Office (205) 295-3114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 2

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
P.O. Box 1712
Jasper, Alabama 35502

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

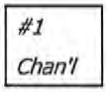
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 2



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.720	1.720	3.49	0.36

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 2

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

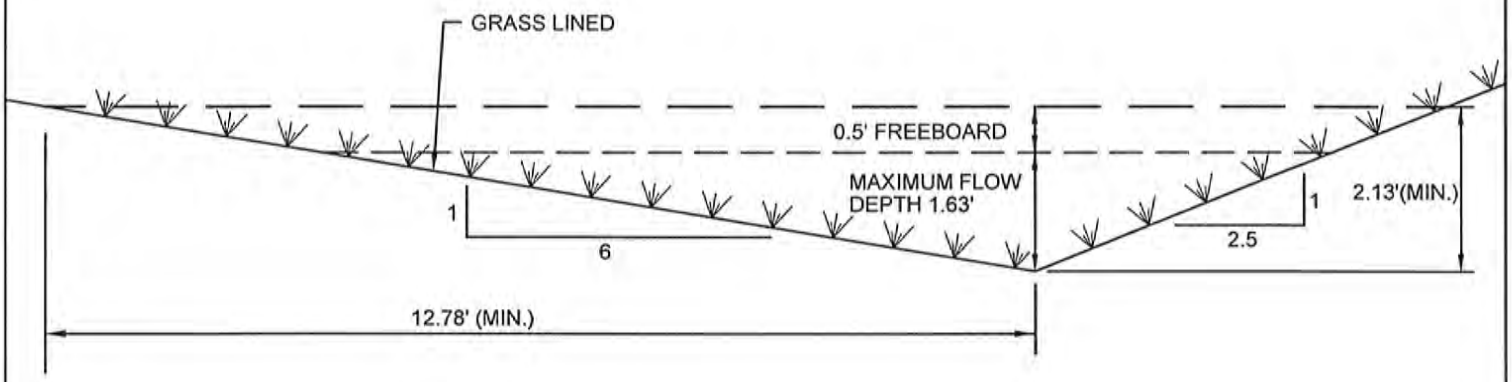
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	3.49 cfs		3.49 cfs	
Depth:	0.93 ft	1.43 ft	1.54 ft	2.04 ft
Top Width:	6.05 ft	9.30 ft	10.04 ft	13.29 ft
Velocity:	1.24 fps		0.45 fps	
X-Section Area:	2.82 sq ft		7.75 sq ft	
Hydraulic Radius:	0.445 ft		0.738 ft	
Froude Number:	0.32		0.09	
Roughness Coefficient:	0.0699		0.2699	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.720	0.129	0.000	0.000	74.000	M	3.49	0.361
	Σ	**1.720**						**3.49**	**0.361**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	29.07	25.00	86.00	4.310	0.005
		8. Large gullies, diversions, and low flowing streams	1.17	17.00	1,455.00	3.240	0.124
#1	**1**	**Time of Concentration:**					**0.129**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #3

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 385-3114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 3

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
P.O. Box 1712
Jasper, Alabama 35502

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

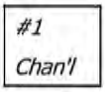
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 3



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	3.000	3.000	6.09	0.63

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 3

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

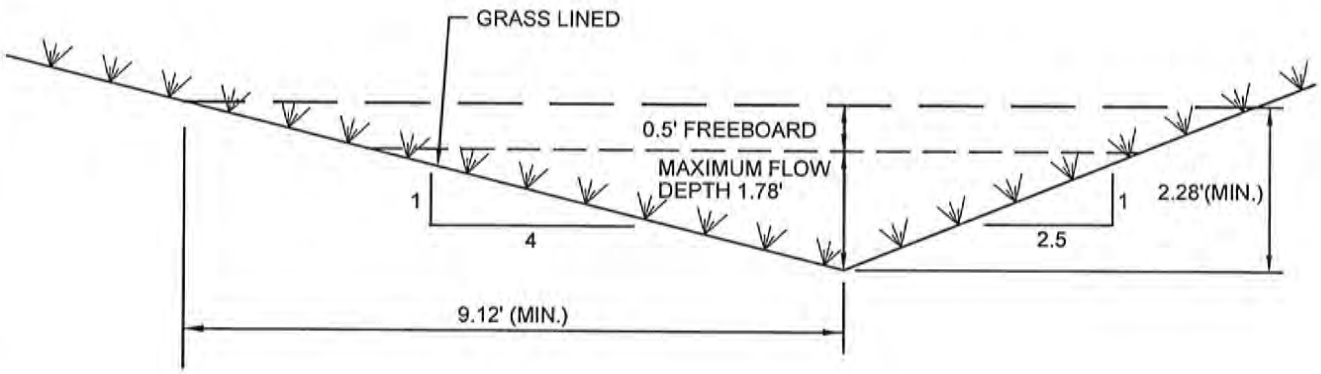
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	6.09 cfs		6.09 cfs	
Depth:	1.00 ft	1.50 ft	1.63 ft	2.13 ft
Top Width:	8.54 ft	12.79 ft	13.85 ft	18.10 ft
Velocity:	1.42 fps		0.54 fps	
X-Section Area:	4.29 sq ft		11.28 sq ft	
Hydraulic Radius:	0.489 ft		0.793 ft	
Froude Number:	0.35		0.11	
Roughness Coefficient:	0.0652		0.2363	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	3.000	0.156	0.000	0.000	74.000	M	6.09	0.630
	Σ	**3.000**						**6.09**	**0.630**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	42.86	33.00	77.00	5.230	0.004
		8. Large gullies, diversions, and low flowing streams	1.48	29.50	2,000.00	3.640	0.152
#1	**1**	**Time of Concentration:**					**0.156**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #4

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1718-35502
(205) 384-3553 Office (205) 295-7114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 4

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
P.O. Box 1712
Jasper, Alabama 35502

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

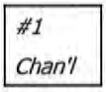
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 4



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	3.290	3.290	6.67	0.69

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 4

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

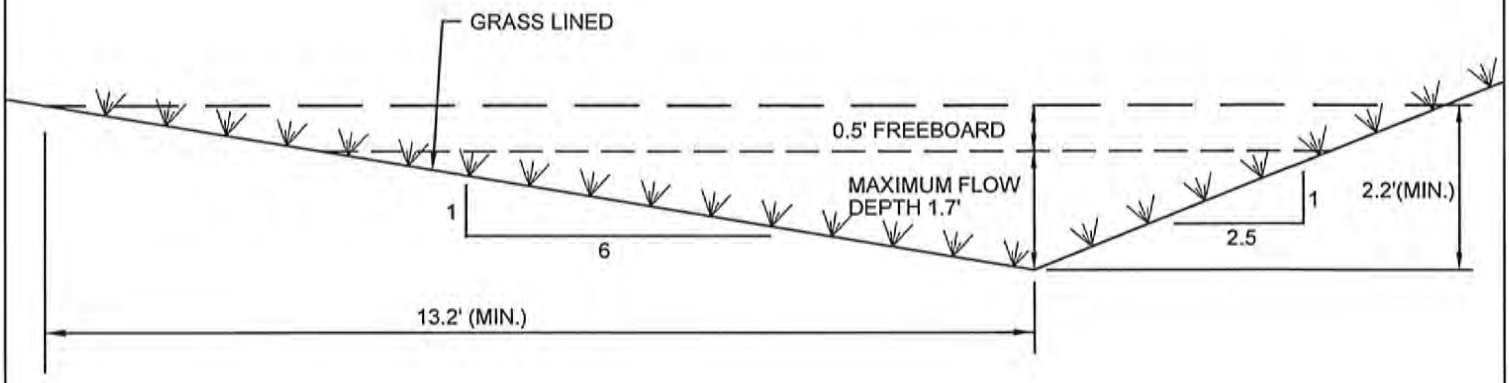
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	6.67 cfs		6.67 cfs	
Depth:	1.13 ft	1.63 ft	1.78 ft	2.28 ft
Top Width:	7.32 ft	10.57 ft	11.58 ft	14.83 ft
Velocity:	1.62 fps		0.65 fps	
X-Section Area:	4.12 sq ft		10.32 sq ft	
Hydraulic Radius:	0.538 ft		0.852 ft	
Froude Number:	0.38		0.12	
Roughness Coefficient:	0.0608		0.2069	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	3.290	0.164	0.000	0.000	74.000	M	6.67	0.691
	Σ	**3.290**						**6.67**	**0.691**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	36.36	20.00	55.00	4.820	0.003
		8. Large gullies, diversions, and low flowing streams	1.47	31.00	2,110.00	3.630	0.161
#1	**1**	**Time of Concentration:**					**0.164**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #5

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1806 Hwy. 78 West Jasper, AL 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 295-3114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 5

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

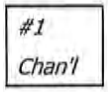
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 5



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	2.450	2.450	7.37	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 5

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

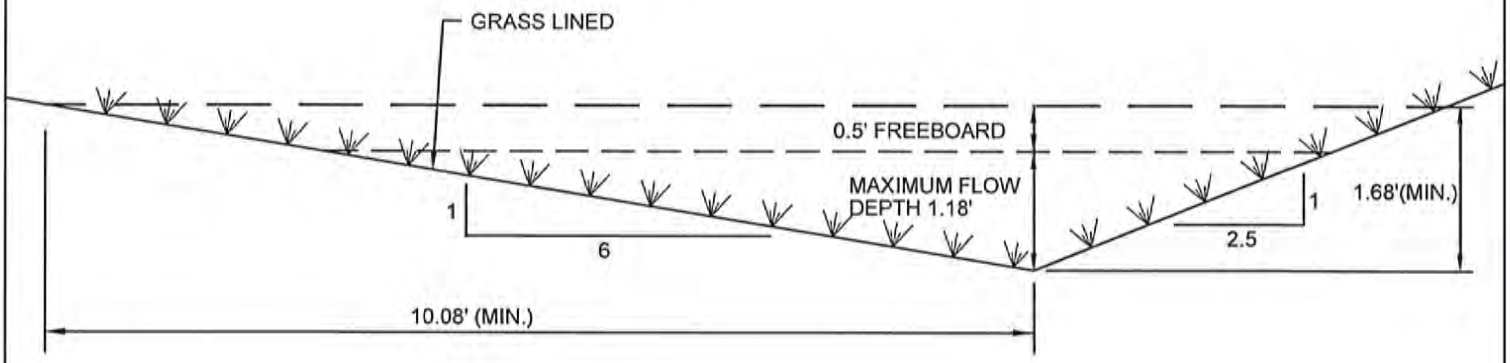
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	7.37 cfs		7.37 cfs	
Depth:	1.06 ft	1.56 ft	1.70 ft	2.20 ft
Top Width:	9.04 ft	13.29 ft	14.44 ft	18.69 ft
Velocity:	1.53 fps		0.60 fps	
X-Section Area:	4.80 sq ft		12.27 sq ft	
Hydraulic Radius:	0.517 ft		0.827 ft	
Froude Number:	0.37		0.11	
Roughness Coefficient:	0.0626		0.2185	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	2.450	0.105	0.000	0.000	74.000	M	7.37	0.630
	Σ	**2.450**						**7.37**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	26.32	20.00	76.00	4.100	0.005
		8. Large gullies, diversions, and low flowing streams	1.60	22.00	1,375.00	3.790	0.100
#1	**1**	**Time of Concentration:**					**0.105**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 2%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #6

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBY:	13-00035-002

PERC
ENGINEERING CO., INC.
1806 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1713-35502
(205) 384-5553 Office (205) 295-3114 Fax

J:\Early\Carbon Projects\North River\Coarse Refuse Terrace Plan\Terrace topo-OCT 2013.dwg 06/03/14 17:23

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 6

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 6

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	0.970	0.970	2.92	0.25

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 6

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	2.0	D, B	0.50			5.0

Vegetated Channel Results:

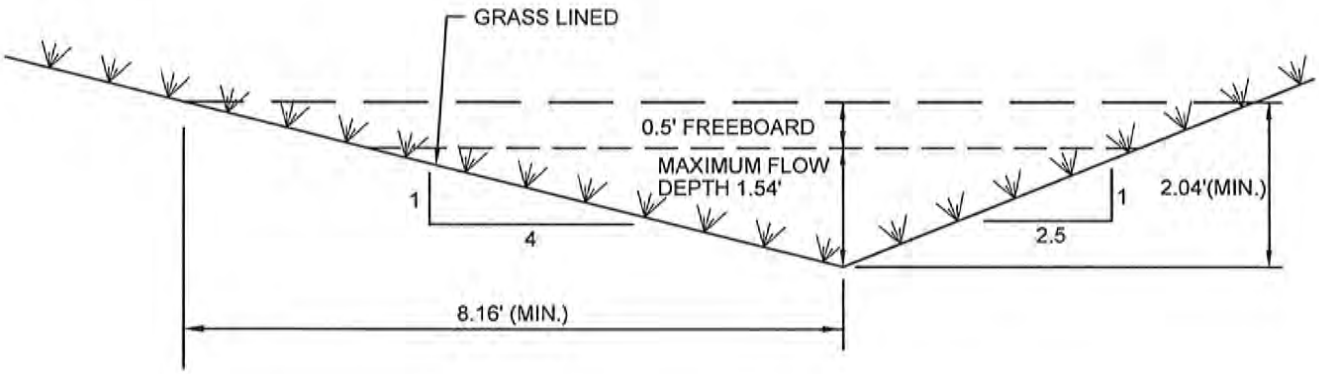
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	2.92 cfs		2.92 cfs	
Depth:	0.70 ft	1.20 ft	1.18 ft	1.68 ft
Top Width:	5.94 ft	10.19 ft	10.00 ft	14.25 ft
Velocity:	1.40 fps		0.50 fps	
X-Section Area:	2.08 sq ft		5.89 sq ft	
Hydraulic Radius:	0.340 ft		0.573 ft	
Froude Number:	0.42		0.11	
Roughness Coefficient:	0.0731		0.2933	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	0.970	0.033	0.000	0.000	74.000	M	2.92	0.249
	Σ	**0.970**						**2.92**	**0.249**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	40.63	39.00	96.00	5.090	0.005
		8. Large gullies, diversions, and low flowing streams	2.04	9.00	441.00	4.280	0.028
#1	**1**	**Time of Concentration:**					**0.033**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #7

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1718-35502
(205) 384-3353 Office (205) 895-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 7

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

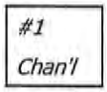
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 7



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.160	1.160	3.49	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 7

Triangular Vegetated Channel Inputs:

Material: Bermuda grass

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			8.0

Vegetated Channel Results:

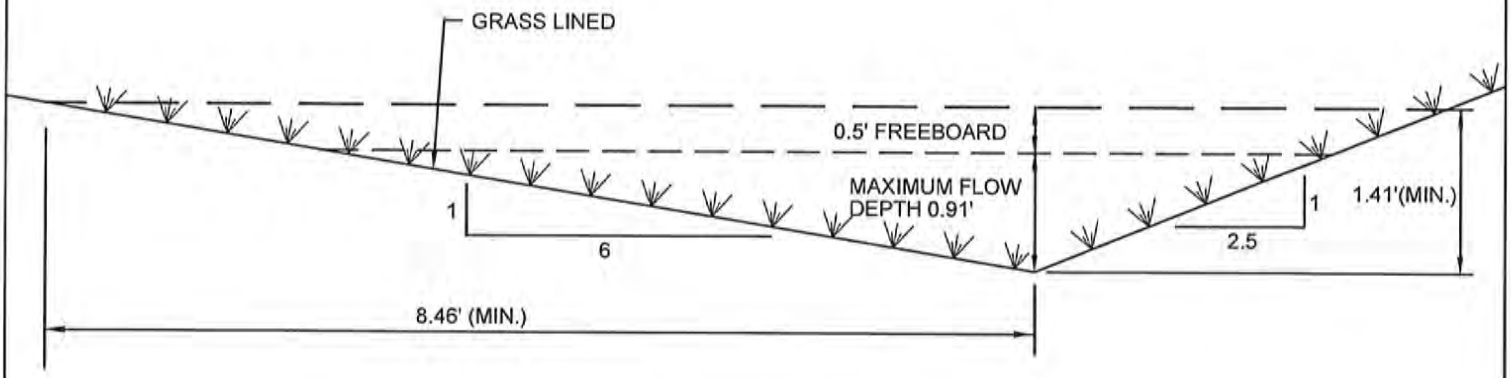
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	3.49 cfs		3.49 cfs	
Depth:	0.93 ft	1.43 ft	1.54 ft	2.04 ft
Top Width:	6.04 ft	9.29 ft	10.04 ft	13.29 ft
Velocity:	1.24 fps		0.45 fps	
X-Section Area:	2.81 sq ft		7.75 sq ft	
Hydraulic Radius:	0.444 ft		0.738 ft	
Froude Number:	0.32		0.09	
Roughness Coefficient:	0.0699		0.2700	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.160	0.037	0.000	0.000	74.000	M	3.49	0.298
	Σ	**1.160**						**3.49**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	42.86	33.00	77.00	5.230	0.004
		8. Large gullies, diversions, and low flowing streams	1.77	8.50	479.00	3.990	0.033
#1	**1**	**Time of Concentration:**					**0.037**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 2%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #8

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1806 Hwy. 78 West Jasper, AL 35501/P.O. Box 1712-35502
(205) 384-8553 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 8

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

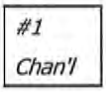
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 8



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	0.300	0.300	0.90	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 8

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	2.0	D, B	0.50			5.0

Vegetated Channel Results:

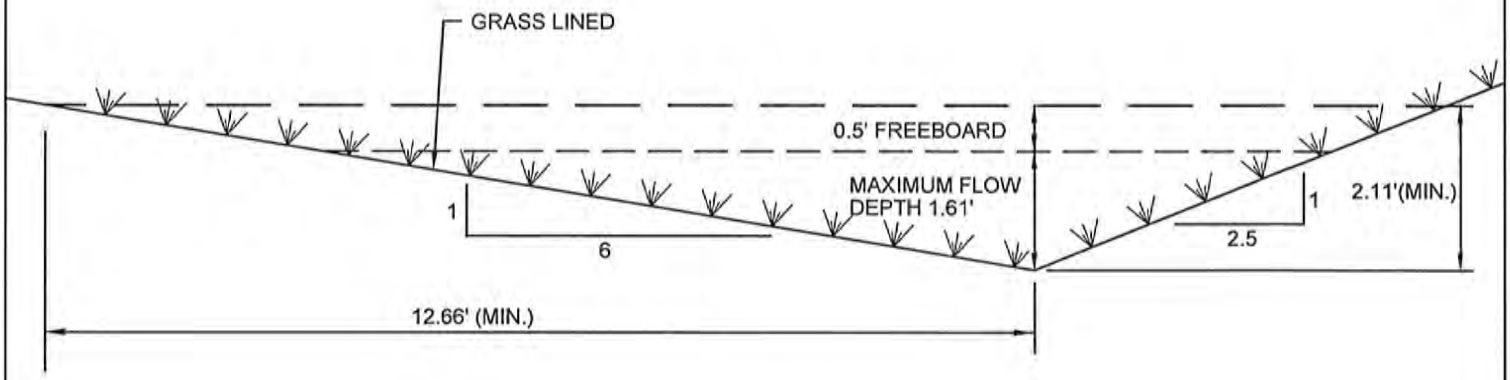
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	0.90 cfs		0.90 cfs	
Depth:	0.49 ft	0.99 ft	0.91 ft	1.41 ft
Top Width:	4.21 ft	8.46 ft	7.72 ft	11.97 ft
Velocity:	0.87 fps		0.26 fps	
X-Section Area:	1.04 sq ft		3.50 sq ft	
Hydraulic Radius:	0.241 ft		0.442 ft	
Froude Number:	0.31		0.07	
Roughness Coefficient:	0.0941		0.4745	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	0.300	0.012	0.000	0.000	74.000	M	0.90	0.077
	Σ	**0.300**						**0.90**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	36.36	20.00	55.00	4.820	0.003
		8. Large gullies, diversions, and low flowing streams	3.47	6.84	197.00	5.580	0.009
#1	**1**	**Time of Concentration:**					**0.012**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #9

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1713-35502
(205) 384-8553 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 9

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

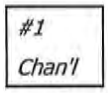
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 9



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.910	1.910	5.74	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 9

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

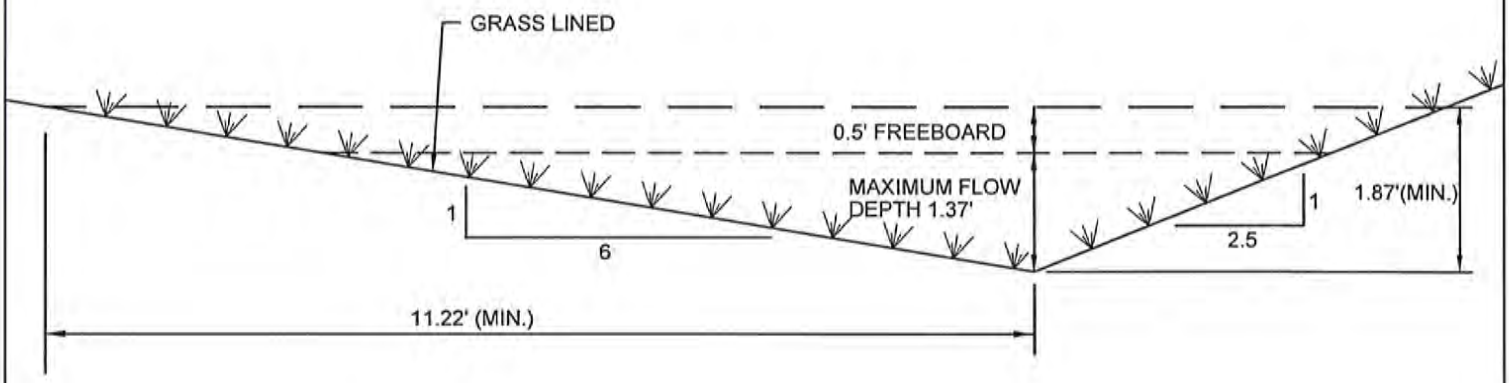
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	5.74 cfs		5.74 cfs	
Depth:	0.99 ft	1.49 ft	1.61 ft	2.11 ft
Top Width:	8.40 ft	12.65 ft	13.67 ft	17.92 ft
Velocity:	1.38 fps		0.52 fps	
X-Section Area:	4.15 sq ft		10.99 sq ft	
Hydraulic Radius:	0.481 ft		0.783 ft	
Froude Number:	0.35		0.10	
Roughness Coefficient:	0.0660		0.2420	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.910	0.062	0.000	0.000	74.000	M	5.74	0.491
	Σ	**1.910**						**5.74**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	26.32	20.00	76.00	4.100	0.005
		8. Large gullies, diversions, and low flowing streams	0.98	6.00	611.00	2.970	0.057
#1	**1**	**Time of Concentration:**					**0.062**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1.5%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #10

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1808 Hwy 78 West Jasper, AL 35501/P.O. Box 1713-35502
(205) 384-5553 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 10

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

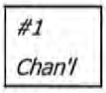
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 10



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.410	1.410	4.24	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 10

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.5	D, B	0.50			5.0

Vegetated Channel Results:

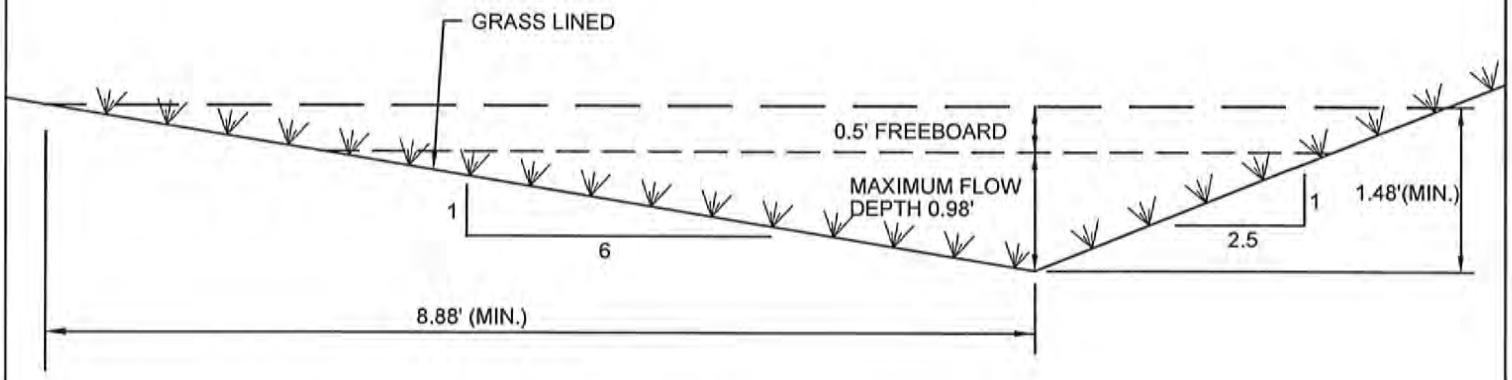
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	4.24 cfs		4.24 cfs	
Depth:	0.83 ft	1.33 ft	1.37 ft	1.87 ft
Top Width:	7.05 ft	11.30 ft	11.63 ft	15.88 ft
Velocity:	1.45 fps		0.53 fps	
X-Section Area:	2.93 sq ft		7.95 sq ft	
Hydraulic Radius:	0.404 ft		0.666 ft	
Froude Number:	0.40		0.11	
Roughness Coefficient:	0.0687		0.2608	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.410	0.031	0.000	0.000	74.000	M	4.24	0.362
	Σ	**1.410**						**4.24**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	46.43	39.00	84.00	5.450	0.004
		8. Large gullies, diversions, and low flowing streams	3.06	16.00	523.00	5.240	0.027
#1	**1**	**Time of Concentration:**					**0.031**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 2%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #11

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1606 Hwy. 78 West Jasper, AL 35501/P.O. Box 1713-35502
(205) 384-5553 Office (205) 295-3114 Fax

J:\Eng\Carlson Projects\JWR\North River\Coarse Refuse Terrace Plan\Terrace topo-OCT 2013.dwg 06/03/14 17:23

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 11

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

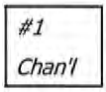
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 11



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	0.420	0.420	1.26	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 11

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	2.0	D, B	0.50			5.0

Vegetated Channel Results:

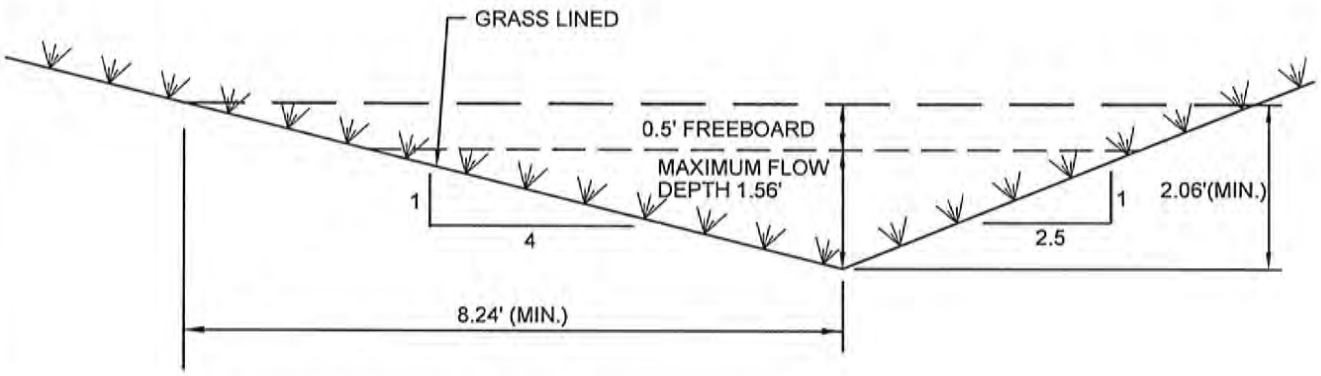
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	1.26 cfs		1.26 cfs	
Depth:	0.55 ft	1.05 ft	0.98 ft	1.48 ft
Top Width:	4.65 ft	8.90 ft	8.31 ft	12.56 ft
Velocity:	0.99 fps		0.31 fps	
X-Section Area:	1.27 sq ft		4.06 sq ft	
Hydraulic Radius:	0.266 ft		0.476 ft	
Froude Number:	0.33		0.08	
Roughness Coefficient:	0.0875		0.4133	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	0.420	0.020	0.000	0.000	74.000	M	1.26	0.108
	Σ	**0.420**						**1.26**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	46.67	14.00	30.00	5.460	0.001
		8. Large gullies, diversions, and low flowing streams	0.99	2.08	210.00	2.980	0.019
#1	**1**	**Time of Concentration:**					**0.020**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #12

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1808 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1713-35502
(205) 384-8353 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 12

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

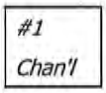
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 12



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.220	1.220	3.67	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 12

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

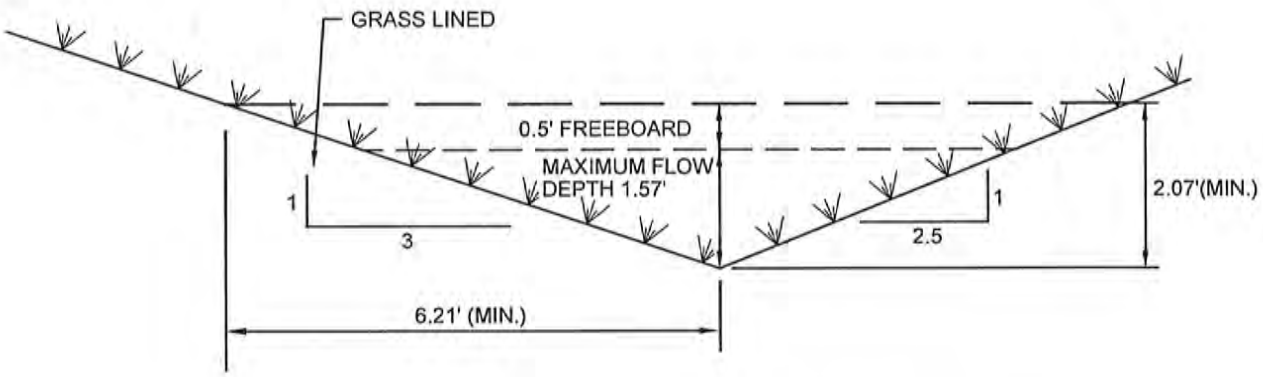
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	3.67 cfs		3.67 cfs	
Depth:	0.94 ft	1.44 ft	1.56 ft	2.06 ft
Top Width:	6.14 ft	9.39 ft	10.15 ft	13.40 ft
Velocity:	1.27 fps		0.46 fps	
X-Section Area:	2.90 sq ft		7.92 sq ft	
Hydraulic Radius:	0.451 ft		0.746 ft	
Froude Number:	0.32		0.09	
Roughness Coefficient:	0.0692		0.2644	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.220	0.058	0.000	0.000	74.000	M	3.67	0.313
	Σ	**1.220**						**3.67**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	38.10	16.00	42.00	4.930	0.002
		8. Large gullies, diversions, and low flowing streams	1.30	9.00	693.00	3.410	0.056
#1	**1**	**Time of Concentration:**					**0.058**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #13

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1600 Hwy 78 West Jasper, AL 35501/P.O. Box 1713-35502
(205) 384-5553 Office (205) 295-7114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 13

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

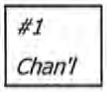
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 13



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.020	1.020	3.07	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 13

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

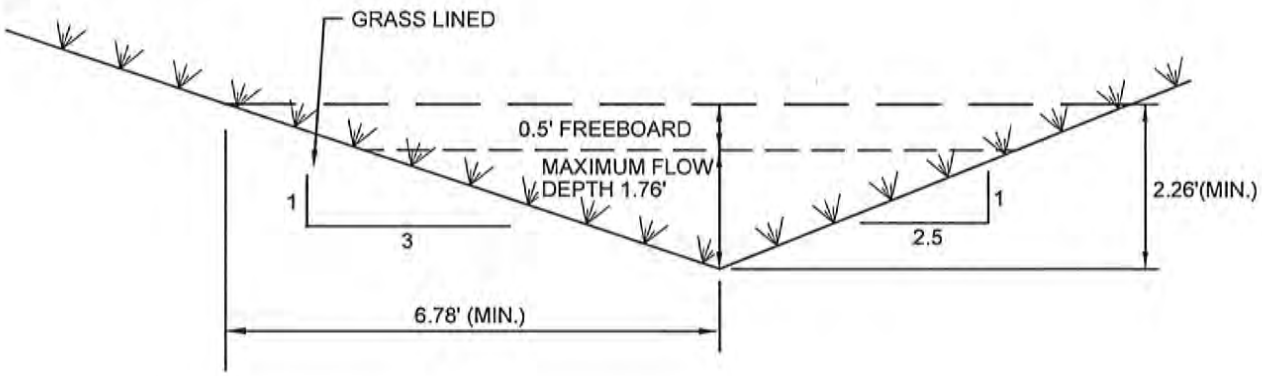
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	3.07 cfs		3.07 cfs	
Depth:	0.95 ft	1.45 ft	1.57 ft	2.07 ft
Top Width:	5.21 ft	7.96 ft	8.65 ft	11.40 ft
Velocity:	1.24 fps		0.45 fps	
X-Section Area:	2.47 sq ft		6.80 sq ft	
Hydraulic Radius:	0.445 ft		0.739 ft	
Froude Number:	0.32		0.09	
Roughness Coefficient:	0.0699		0.2695	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.020	0.058	0.000	0.000	74.000	M	3.07	0.262
	Σ	**1.020**						**3.07**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	27.83	27.00	97.00	4.220	0.006
		8. Large gullies, diversions, and low flowing streams	1.04	6.00	576.00	3.060	0.052
#1	**1**	**Time of Concentration:**					**0.058**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #14

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1808 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1713-35502
(205) 384-8553 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 14

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

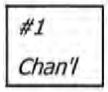
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 14



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.680	1.680	5.05	0.43

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 14

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
3.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

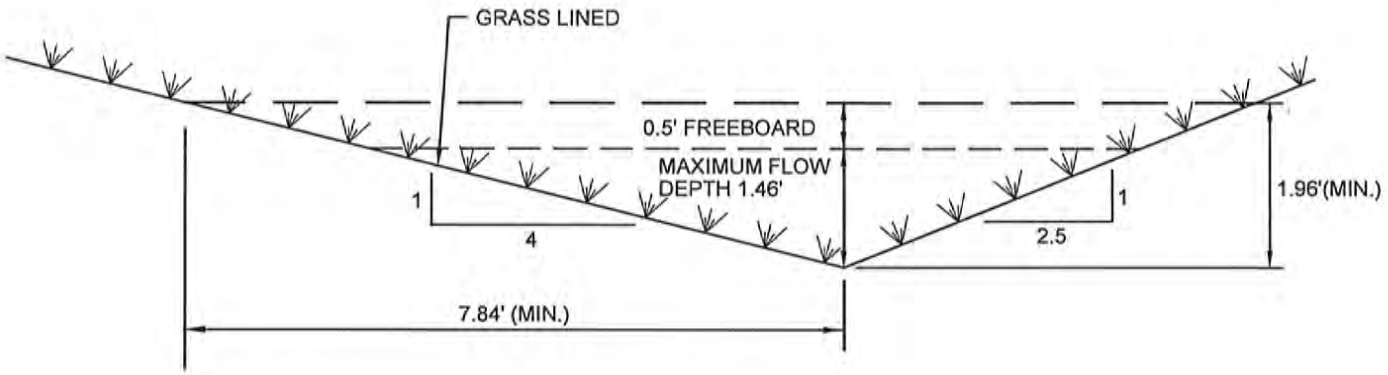
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	5.05 cfs		5.05 cfs	
Depth:	1.10 ft	1.60 ft	1.76 ft	2.26 ft
Top Width:	6.03 ft	8.78 ft	9.65 ft	12.40 ft
Velocity:	1.53 fps		0.60 fps	
X-Section Area:	3.31 sq ft		8.47 sq ft	
Hydraulic Radius:	0.515 ft		0.825 ft	
Froude Number:	0.36		0.11	
Roughness Coefficient:	0.0627		0.2196	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.680	0.044	0.000	0.000	74.000	M	5.05	0.432
	Σ	**1.680**						**5.05**	**0.432**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	28.57	4.00	14.00	4.270	0.000
		8. Large gullies, diversions, and low flowing streams	2.40	18.00	750.00	4.640	0.044
#1	**1**	**Time of Concentration:**					**0.044**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #15

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1608 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 295-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 15

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

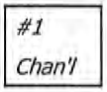
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 15



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	0.890	0.890	2.68	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 15

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

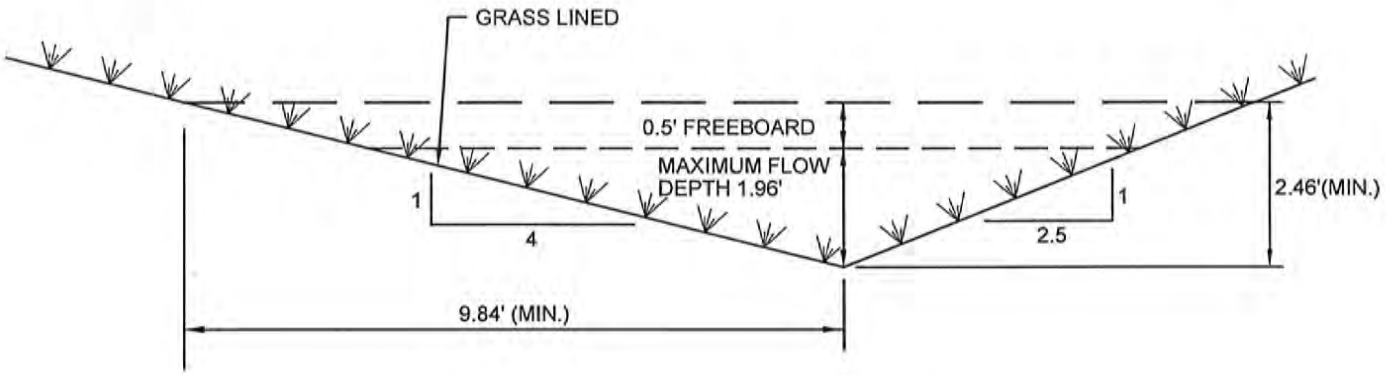
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	2.68 cfs		2.68 cfs	
Depth:	0.86 ft	1.36 ft	1.46 ft	1.96 ft
Top Width:	5.60 ft	8.85 ft	9.46 ft	12.71 ft
Velocity:	1.11 fps		0.39 fps	
X-Section Area:	2.41 sq ft		6.89 sq ft	
Hydraulic Radius:	0.411 ft		0.696 ft	
Froude Number:	0.30		0.08	
Roughness Coefficient:	0.0741		0.3010	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	0.890	0.019	0.000	0.000	74.000	M	2.68	0.229
	Σ	**0.890**						**2.68**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	15.38	26.00	169.00	3.130	0.014
		8. Large gullies, diversions, and low flowing streams	3.91	4.50	115.00	5.930	0.005
#1	**1**	**Time of Concentration:**					**0.019**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #16

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1806 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 393-3114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 16

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 16

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	3.390	3.390	10.19	0.87

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 16

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

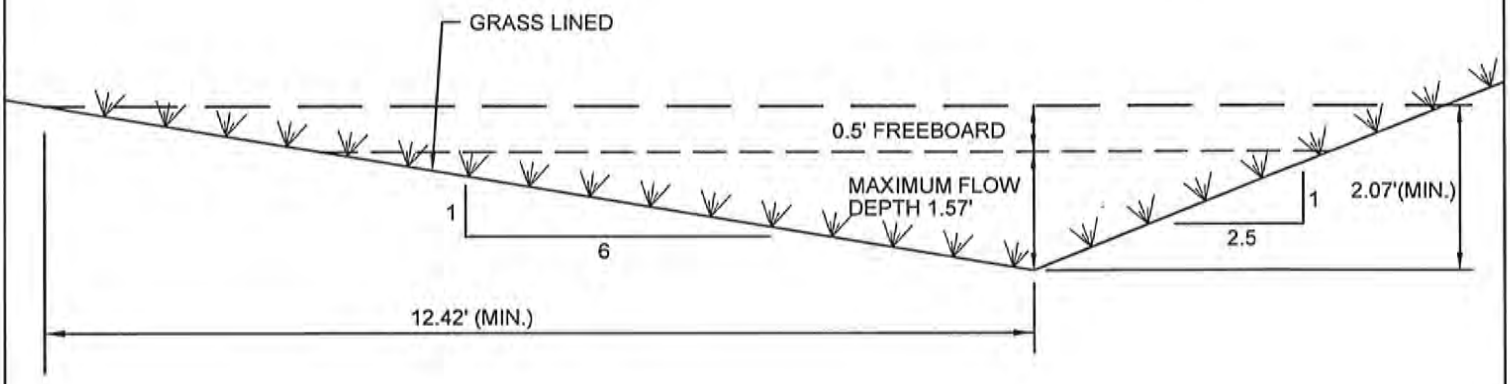
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	10.19 cfs		10.19 cfs	
Depth:	1.28 ft	1.78 ft	1.96 ft	2.46 ft
Top Width:	8.29 ft	11.54 ft	12.72 ft	15.97 ft
Velocity:	1.93 fps		0.82 fps	
X-Section Area:	5.28 sq ft		12.45 sq ft	
Hydraulic Radius:	0.609 ft		0.935 ft	
Froude Number:	0.43		0.15	
Roughness Coefficient:	0.0555		0.1740	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	3.390	0.073	0.000	0.000	74.000	M	10.19	0.871
	Σ	**3.390**						**10.19**	**0.871**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	15.38	26.00	169.00	3.130	0.014
		8. Large gullies, diversions, and low flowing streams	2.91	32.00	1,098.00	5.120	0.059
#1	**1**	**Time of Concentration:**					**0.073**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #17

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1908 Hwy 78 West Jasper, AL 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 295-7114 Fax

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 17

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

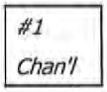
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 17



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.690	1.690	5.08	0.00

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 17

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

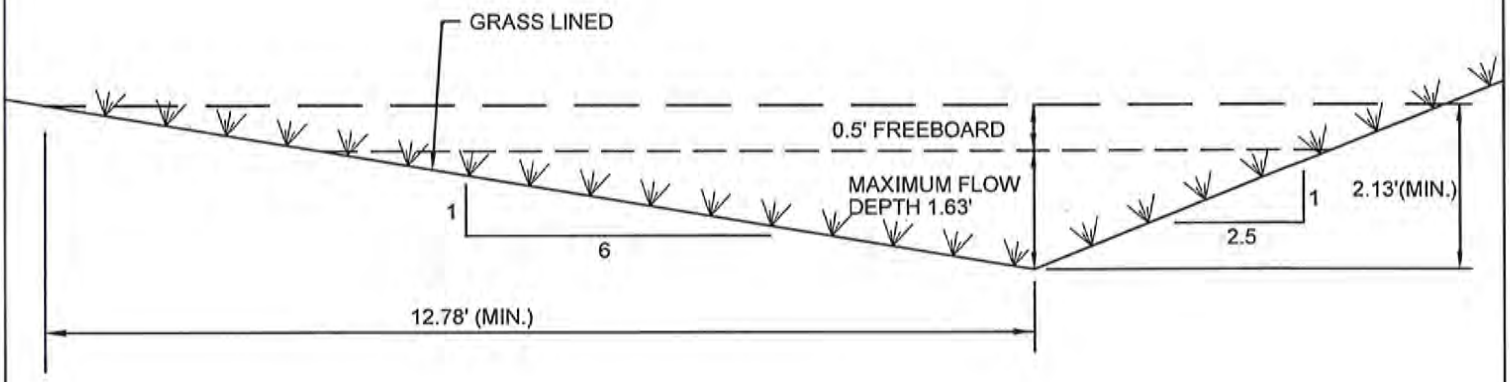
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	5.08 cfs		5.08 cfs	
Depth:	0.95 ft	1.45 ft	1.57 ft	2.07 ft
Top Width:	8.10 ft	12.35 ft	13.30 ft	17.55 ft
Velocity:	1.32 fps		0.49 fps	
X-Section Area:	3.86 sq ft		10.41 sq ft	
Hydraulic Radius:	0.464 ft		0.762 ft	
Froude Number:	0.34		0.10	
Roughness Coefficient:	0.0678		0.2544	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.690	0.045	0.000	0.000	74.000	M	5.08	0.434
	Σ	**1.690**						**5.08**	**0.000**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	27.83	27.00	97.00	4.220	0.006
		8. Large gullies, diversions, and low flowing streams	2.01	12.00	597.00	4.250	0.039
#1	**1**	**Time of Concentration:**					**0.045**



GRASS LINING TO CONSIST OF A MIXTURE OF
FESCUE, BERMUDA, AND BROWN TOP MILLET GRASSES.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area #18

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1606 Hwy 78 West Jasper, AL. 35501/P.O. Box 1712-35502
(205) 384-5553 Office (205) 995-7114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131P
Coarse Refuse Disposal Area No. 1
Slope Bench Area 18

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
1606 Highway 78 West
Jasper, AL 35501

Phone: (205) 384-5553
Email: lstephens@percengineering.com

General Information

Storm Information:

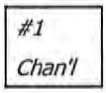
Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 18



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	2.020	2.020	6.07	0.52

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 18

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
6.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

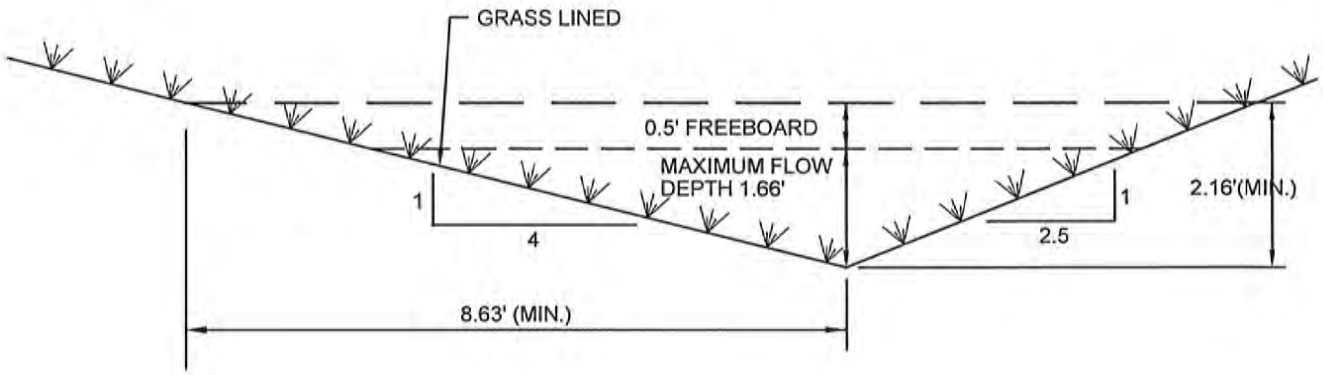
	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	6.07 cfs		6.07 cfs	
Depth:	1.00 ft	1.50 ft	1.63 ft	2.13 ft
Top Width:	8.54 ft	12.79 ft	13.84 ft	18.09 ft
Velocity:	1.42 fps		0.54 fps	
X-Section Area:	4.29 sq ft		11.26 sq ft	
Hydraulic Radius:	0.489 ft		0.792 ft	
Froude Number:	0.35		0.11	
Roughness Coefficient:	0.0652		0.2365	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	2.020	0.118	0.000	0.000	74.000	M	6.07	0.519
	Σ	**2.020**						**6.07**	**0.519**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	666.67	80.00	12.00	20.650	0.000
		8. Large gullies, diversions, and low flowing streams	1.04	13.50	1,299.00	3.050	0.118
#1	**1**	**Time of Concentration:**					**0.118**



GRASS LINING TO CONSIST OF A MIXTURE OF FESCUE, BERMUDA AND BROWN TOP MILLET.

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
I.D. No. 1211-AL11-00131-02
Coarse Refuse Disposal Area No. 1
Slope Bench Area # 19

.DWG NAME:	Terrace topo-OCT 2013	TYPE OF SURVEY:	N/A
.CRD NAME:	N/A	LAST FIELD SURVEY:	N/A
DRAWN BY:	S.A.E.	SCALE:	N/A
APPROVED BY:	L.G.S.	JOB NUMBER:	13-00035-002

PERC
ENGINEERING CO., INC.
1906 Hwy. 78 West Jasper, AL. 35501/P.O. Box 1718-35502
(205) 384-8553 Office (205) 393-3114 Fax

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Jim Walter Resources, Inc
North River No. 1 Underground Mine
P-3222 / I.D. No. 01-00759
ID No. 1211-AL11-00131-02

Coarse Refuse Disposal Area No. 1
Slope Bench Area 19

5.9 Inches, 100 Year - 6 Hour

SCS 6 Hour

LGS

PERC Engineering Co., Inc.
P.O. Box 1712
Jasper, Alabama 35502

Phone: 205-295-3127
Email: lstephens@percengineering.com

General Information

Storm Information:

Storm Type:	Rainfall Event

Accumulated Time (hrs)	Accumulated Depth (in)
0.00	0.0000
0.50	0.2070
1.00	0.4720
1.50	0.7970
2.00	1.3570
2.50	3.5400
3.00	4.1300
3.50	4.6020
4.00	4.9270
4.50	5.2220
5.00	5.4580
5.50	5.6940
6.00	5.9000

Peak 30-minute Intensity: 4.366 in/hr

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Channel	#1	==>	End	0.000	0.000	Slope Bench Area 19

Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	1.604	1.604	4.82	0.41

Structure Detail:

Structure #1 (Vegetated Channel)

Slope Bench Area 19

Triangular Vegetated Channel Inputs:

Material: Grass mixture

Left Sideslope Ratio	Right Sideslope Ratio	Slope (%)	Retardance Classes	Freeboard Depth (ft)	Freeboard % of Depth	Freeboard Mult. x (VxD)	Limiting Velocity (fps)
4.0:1	2.5:1	1.0	D, B	0.50			5.0

Vegetated Channel Results:

	Stability Class D w/o Freeboard	Stability Class D w/ Freeboard	Capacity Class B w/o Freeboard	Capacity Class B w/ Freeboard
Design Discharge:	4.82 cfs		4.82 cfs	
Depth:	1.02 ft	1.52 ft	1.66 ft	2.16 ft
Top Width:	6.66 ft	9.91 ft	10.78 ft	14.03 ft
Velocity:	1.42 fps		0.54 fps	
X-Section Area:	3.41 sq ft		8.95 sq ft	
Hydraulic Radius:	0.489 ft		0.793 ft	
Froude Number:	0.35		0.10	
Roughness Coefficient:	0.0652		0.2364	

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	1.604	0.061	0.000	0.000	74.000	M	4.82	0.412
	Σ	**1.604**						**4.82**	**0.412**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	3. Short grass pasture	40.00	50.00	125.00	5.050	0.006
		8. Large gullies, diversions, and low flowing streams	1.00	6.03	603.00	3.000	0.055
			0.00	0.00	0.00	0.000	0.000
#1	**1**	**Time of Concentration:**					**0.061**

UNDERDRAINS

Underdrains were designed using the computer model SEDCAD4, utilizing a 10 yr - 24 hr., DRN 58, storm event of 6.0 inches of rainfall. The maximum storm runoff from the underdrains watershed under surface conditions of curve number of 100 and 81 were calculated. The runoff volume of the watershed with a curve number of 81 was subtracted from the watershed with a curve number of 100 to obtain the infiltration volume. The time required for the infiltration volume to move through the fill was determined by dividing the vertical distance of travel by the permeability of the fill material. The infiltration flow rate was then determined by dividing the infiltration volume by the time required for infiltration. The cross-sectional area of the underdrain was then determined by using Darcy's Equation and applying a safety factor of 2. The underdrain calculations and specifications are as follows:

Inflow Calculations:

Drainage Area = 65 Acres

R_{100} Runoff volume from Curve Number 100 Watershed = 32.5 Ac-Ft. = 1,495,700 $ft.^3$

R_{81} Runoff volume from Curve Number 81 Watershed = 15.7 Ac-Ft. = 683,829 $ft.^3$

Infiltration Volume = IV = $R_{100} - R_{81}$ = 731,808 $ft.^3$

Permeability of Spoil = P_{sf} = 2.66 x 10^{-3} cm/sec = .0000873 ft/sec

Infiltration Travel Distance = TD =200 ft.

Infiltration Time = T_I TD/P = 200 / .0000873 = 2,290,951 sec.

Infiltration Rate = Q_I = IV/ T_I = 731,808 / 2,290,951 = .3194 ft^3 /sec.

Drain Flow Calculations:

Underdrain Permeability = P_{UD} = 10,000,000 ft^3/yr = .3171 ft^3/sec.
From Table 3-2, attached.

Underdrain Cross Sectional Area = A

Drain Slope = dh/dx = .0375

Drain Flow = Q_D = K A dh/dx = .3194 ft^3 /sec.

Underdrain Cross Sectional Area = A = Q_D / K dh/dx = .3194 / (.3171) (0.0375) = 26.86 ft^2.

For additional slope failure protection two 30 ft^2 cross sectional area underdrains will be installed at the locations shown on Maps 4 of 5 and 5 of 5.
Underdrain dimensions = 10' wide x 3' high

Underdrains were designed with the final configuration in mind and will be more than sufficient for any stages prior to that final confguration. The underdrain area will be cleared of all sharp rock or other material which may cause rupture of the encasing filter fabric. The underdrains will extend under the fills as identified on maps 4 and 5. The underdrain will consist of 3 feet high by 10 feet wide of 3/8 inch to 3 inch sandstone gravel encased in Mirafi 700X or equivalent filter cloth. The filter fabric will be overlapped a minimum of 6 inches at the seams and bound together with wire spaced 6 inches on center to form a continuous uniform encasement. Care will be taken that the overlap be kept free of all soil material to ensure a tight overlap. Should damage occur to the fabric, it will be repaired by replacement or by placing as additional sheet of fabric over the damaged area, ensuring a minimum of 6 inch overlap on undamaged fabric. The filter fabric will be anchored securely when placed to prevent damage from wind and to ensure no movement during the covering operation. The fabric can be anchored by piling the appropriate soil or rock cover material along the edges of the fabric. Filter fabric will be stored in a manner that does not permit its exposure to sunlight. During construction, no filter fabric will be exposed more than three days or as specified by the manufacturer before it is covered with soil material. Should exposure occur in excess of this period, the filter fabric will be replaced. Cover material on the filter fabric will be placed in a manner to prevent damage to fabric. Cover material will be spread in the same direction as the fabric overlap for the underdrain filters. At no place will the dimensions of the underdrain be smaller than those given in the drawings. Equipment crossovers will be limited to not more than two. Each crossover will be cleaned of all contaminating materials placed in the areas. The compaction of the embankment fill material adjacent to the underdrains will be done with rubber tire equipment for the first 12 inches as not to compact or puncture the underdrain.

Chevron Mining Inc.
North River No.1 Underground Mine
Rock Dump Underdrains For NE Expansion

6.00 Inches, 10 Year - 24 Hour

SCS Type II

LGS

PERC ENGINEERING CO., INC.
1606 HWY 78 WEST
JASPER, AL 35501

Phone: 205-295-3127
Email: lstephens@percengineering.com

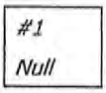
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	6.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Underdrain



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	65.000	65.000	128.13	15.70

Structure Detail:

Structure #1 (Null)

Underdrain

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	65.000	0.212	0.000	0.000	71.000	M	128.13	15.702
	Σ	**65.000**						**128.13**	**15.702**

Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	1.50	13.50	900.00	1.220	0.204
		8. Large gullies, diversions, and low flowing streams	40.00	240.00	600.00	18.970	0.008
#1	**1**	**Time of Concentration:**					**0.212**

Chevron Mining Inc.
North River No.1 Underground Mine
Rock Dump Underdrains For NE Expansion

6.00 Inches, 10 Year - 24 Hour

SCS Type II

LGS

PERC ENGINEERING CO., INC.
1606 HWY 78 WEST
JASPER, AL 35501

Phone: 205-295-3127
Email: lstephens@percengineering.com

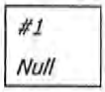
General Information

Storm Information:

Storm Type:	NRCS Type II
Design Storm:	10 yr - 24 hr
Rainfall Depth:	6.000 inches

Structure Networking:

Type	Stru #	(flows into)	Stru #	Musk. K (hrs)	Musk. X	Description
Null	#1	==>	End	0.000	0.000	Underdrain



Structure Summary:

	Immediate Contributing Area (ac)	Total Contributing Area (ac)	Peak Discharge (cfs)	Total Runoff Volume (ac-ft)
#1	65.000	65.000	275.87	32.50

Structure Detail:

Structure #1 (Null)

Underdrain

Subwatershed Hydrology Detail:

Stru #	SWS #	SWS Area (ac)	Time of Conc (hrs)	Musk K (hrs)	Musk X	Curve Number	UHS	Peak Discharge (cfs)	Runoff Volume (ac-ft)
#1	1	65.000	0.212	0.000	0.000	100.000	F	275.87	32.500
	Σ	**65.000**						**275.87**	**32.500**

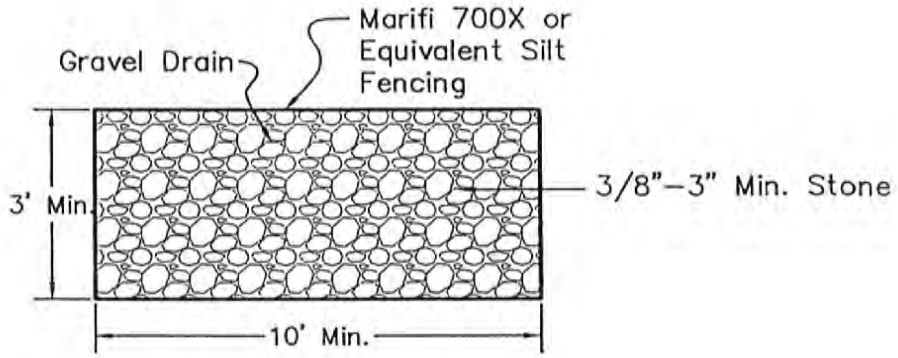
Subwatershed Time of Concentration Details:

Stru #	SWS #	Land Flow Condition	Slope (%)	Vert. Dist. (ft)	Horiz. Dist. (ft)	Velocity (fps)	Time (hrs)
#1	1	5. Nearly bare and untilled, and alluvial valley fans	1.50	13.50	900.00	1.220	0.204
		8. Large gullies, diversions, and low flowing streams	40.00	240.00	600.00	18.970	0.008
#1	**1**	**Time of Concentration:**					**0.212**

		PARTICLE SIZE RANGE				"EFFECTIVE" SIZE		PERMEABILITY COEFFICIENT—k		
		Inches		Millimeters						
		$D_{max.}$	D_{min}	D_{max}	D_{min}	D_{20} in.	D_{10} mm.	Ft./yr.	Ft./mo.	Cm./sec.
TURBULENT FLOW	Derrick STONE	120	36	—	—	48	—	100×10^6	100×10^5	100
	One-man STONE	12	4	—	—	6	—	30×10^6	30×10^5	30
	Clean, fine to coarse GRAVEL	3	1/4	80	10	1/2	—	10×10^6	10×10^5	10
	Fine, uniform GRAVEL	3/8	1/16	8	1.5	1/8	—	5×10^6	5×10^5	5
	Very coarse, clean, uniform SAND	1/8	1/32	3	0.8	1/16	—	3×10^6	3×10^5	3
LAMINAR FLOW	Uniform, coarse SAND	1/8	1/64	2	0.5	—	0.6	0.4×10^6	0.4×10^5	0.4
	Uniform, medium SAND	—	—	0.5	0.25	—	0.3	0.1×10^6	0.1×10^5	0.1
	Clean, well-graded SAND & GRAVEL	—	—	10	0.05	—	0.1	0.01×10^6	0.01×10^5	0.01
	Uniform, fine SAND	—	—	0.25	0.05	—	0.06	4000	400	40×10^{-4}
	Well-graded, silty SAND & GRAVEL	—	—	5	0.01	—	0.02	400	40	4×10^{-4}
	Silty SAND	—	—	2	0.005	—	0.01	100	10	10^{-4}
	Uniform SILT	—	—	0.05	0.005	—	0.006	50	5	0.5×10^{-4}
	Sandy CLAY	—	—	1.0	0.001	—	0.002	5	0.5	0.05×10^{-4}
	Silty CLAY	—	—	0.05	0.001	—	0.0015	1	0.1	0.01×10^{-4}
	CLAY (30 to 50% clay sizes)	—	—	0.05	0.0005	—	0.0008	0.1	0.01	0.001×10^{-4}
	Colloidal CLAY ($-2\mu \leq 50\%$)	—	—	0.01	10Å	—	40Å	0.001	10^{-4}	10^{-9}

FIG. 3-8. Typical values of permeability coefficients.

Chevron Mining Inc.
North River Underground Mine No. 1
Coarse Refuse Disposal Area No. 1
Underdrains for NE Expansion



Underdrain Area
30 Sq. Ft. Min.

Note: Underdrain to consist of non–erodible, non–toxic, and non–acid forming natural or sandstone gravel enclosed in Marifi 700X or equivalent silt fencing. Limestone shall not be used.

coarse refuse underdrain.dwg

CONSTRUCTION NARRATIVE

Construction of the Coarse Refuse Disposal Area No. 1 will follow the previously approved design plans and will occur in three phases. These three phases are listed below:

Phase I - Site Preparation
- Step A - Removal of Vegetation
- Step B - Removal and Segregation of Soil Material

Phase II - Construction
- Step A - Placing and Compacting of Fill Material
- Step B - Construction of Diversions, Slope Benches and Downdrains

Phase III - Revegetation
- Step A - Placement of Cover Material
- Step B - Revegetation

Construction of the expansion of this Coarse Refuse Area No. 1 began in August 2009 when the expansion of the Coarse Refuse Area was approved on August 6,2009 in Revision R-34. The construction of the Waste Bank as per the approved plans have been ongoing since that time to the present. Construction oversight and materials testing for the project will be done by a registered professional engineer or other qualified professional specialist under the direct supervision of a qualified registered professional engineer.

PHASE I

Preparation of the site will consist of the removal of all vegetation and the grubbing of the fill area. Topsoil and subsoil from the site will be stockpiled in order to be replaced on the finished slopes of the proposed waste bank.

PHASE II

The material to be placed in the waste bank shall consist of washer reject produced at North River No.1 Underground Mine. The fill material shall be placed and spread over the entire fill area in layers not to exceed 24 inches in thickness and compacted to 90% of the standard proctor density. Compaction will be accomplished using track equipment that is

available onsite.

Slope benches and downdrains will be constructed in the locations as shown and in accordance to the specifications described earlier. Slope benches (Terraces), diversions, and down drains will be rough graded as soon as possible and will be finish graded including the addition of 2 feet of non-toxic, non-acid forming, and non-combustible cover material and appropriate channel lining upon the completion of outslope grading. Temporary diversion around the work area will be constructed as needed. Grading operations will be conducted to allow runoff and prevent ponding on the work area.

Each slope bench and downdrain will be lined with the appropriate channel lining as specified within the design plans. When rip-rap is used, the riprap will consist of a sound durable sandstone or limestone, not subject to disintegration under the action of water and exposure of the elements. Friable, stratified rocks such as shales and rocks which tend to decompose in the water such as claystones will not be acceptable. Rock gradation will be in accordance with that shown in the designs. Smooth round boulders will not be approved. The material will be free of objectionable amounts of earth, quarry dust, and other foreign material; however, washing will not be required. Slabs and slivers will not be acceptable. Slabs and slivers will be defined as pieces for which the smallest dimension is less than 1/3 the largest dimension of the piece. Riprap need not be hand placed but will be dumped and spread in such a manner as to prevent segregation of sizes, to eliminate voids, and to establish uniformity. Riprap will be roughly graded so that the smaller pieces are adjacent to the earth material and the large pieces near the exposed face. Spalls in the amount not in excess of that required to fill the voids will be permissible. The exposed face will present a reasonable uniform and neat appearance. Grass lined channels will be seeded with grass species in quantities as approved in the reclamation plan and will be fertilized and mulched with the types and rates as specified in the reclamation plan.

PHASE III

The final phase of construction of the North River No.1 Underground Mine's Coarse Refuse Disposal Area No.1 will consist of the placement of the final cover material upon the surface of the waste bank and revegetation. Cover material shall be placed on the surface of the waste bank of Coarse Refuse Disposal Area No.1 to a minimum thickness of two feet. Revegetation shall be performed according to the mixtures and application rates given in the following Permanent Cover-Mixtures and Rates Attachment. Seeding will commence during the first normal planting season to establish a diverse, effective and permanent vegetative cover. Seed bed preparation shall include discing or scarifying the soil to permit seed application and to aid in the mixing of the soil amendments. All areas shall be mulched with hay at a rate of 1 ½ - 3 tons per acre to control erosion, to promote seed germination, and to increase the moisture retention of the soil.

Summary

Phases I, II and III have been completed in segmented area approximately 1500 to 2400 feet in length in the past and this will be accomplished in similar fashion for the remainder of the Coarse Refuse Disposal Area No. 1.

PERMANENT COVER-MIXTURES AND RATES

Spring Planting

Species	Planting Rate	Planting Methods	Planting Dates	Areas to be Planted
Fescue	25#/acre	Broadcast	Spring	All Disturbance
Millet	10#/acre	Broadcast	Spring	All Disturbance
Sericea	35#/acre	Broadcast	Spring	All Disturbance
Bermuda	15#/acre	Broadcast	Spring	All Disturbance

Fall Planting

Species	Planting Rate	Planting Methods	Planting Dates	Areas to be Planted
Sericea	35#/Acre	Broadcast	Spring	All Disturbance
Fescue	40#/Acre	Broadcast	Spring	All Disturbance
Perennial Ryegrass	20#/Acre	Broadcast	Spring	All Disturbance

OPERATIONAL PROCEDURES

Operational procedures for the North River No.1 Underground Mine's Coarse Refuse Disposal Area No.1 will consist of two phases. Phase I will consist of the transporting of the refuse material from the North River No.1 Underground Mine's Preparation Plant to Coarse Refuse Disposal Area No.1 site. Phase II will consist of the inspection and maintenance of the waste bank which is discussed in other sections of this report.

PHASE I

Refuse material produced at the North River No.1 Underground Mine will be transported to the waste bank area using conveyors and mobile equipment. The refuse material will be spread in 24 inch (maximum) lifts and compacted to 90% of the standard proctor

density. This filling operation will continue until the design height and configuration is reached.

INSPECTION

The waste bank will be inspected by a registered professional engineer or other qualified professional specialist under the direct supervision of the qualified professional engineer. Inspections will be made at least quarterly and during times of removal of organic material and topsoil, installation of diversion ditches, placement and compaction of refuse material, and revegetation of the fill. All underdrains and any portion of the Coarse Refuse Area construction that will be covered with fill will be photographed and photos included with the certified report by a registered professional engineer or other qualified professional specialist under the direct supervision of the qualified professional engineer. Certification inspection reports will be filed with the Regulatory Authority stating that proper construction and maintenance are occurring in accordance with approved design plans. Inspection reports will be retained at the facility office.

ABANDONMENT PLAN

Upon reaching the final waste bank configuration the following steps shall be implemented for abandonment:

1. Reporting to MSHA's district manager of the intention to abandon the waste bank.
2. The waste bank will be graded to a 3:1 slope or flatter as the 2 'layers are placed downslope of the radial stacker and after reaching the outerslope limit grading as demonstrated on the following page will be conducted, from the top down, and covered with 2 feet of the best available non-toxic, non-combustible and non-acid forming soil on site and graded to the final design configuration. (See map 5 of 5). Any excess material after construction of the final bench configuration will be hauled back on top of the disposal area.
3. The neutralization potential and pH of the coarse refuse material is as follows:

SUBJECT TEST	FIZZ	%SULFUR	MAXIMUM POTENTIAL ACIDITY	NEUTRALIZATION POTENTIAL (Tons of CaCo3 eq per tons soil)	A - B ACCOUNT	PASTE pH
*Coarse Refuse	Slight	1.81	56.56	70.63	14.065	6.73
*Cover Material	None	0.012	0.36	-1.25	-.485	4.98

*Testing performed by PERC Engineering Co., Inc., and averaged from 2 samples. Methods according to Field and Laboratory Methods Applicable to Overburdens and Mine Spoils.

Note: A-B Account is an expression to illustrate the potential for acid production in a material. The above test results of the spoil material does not show the potential for acid production. Because it does not show the potential for acid production the pH of the material should be considered the lowest produced by this material. As stated in item No. 2, the cover material will be sampled and analyzed to determine the correct amount of soil amendments, including lime, to be added to the cover material. These soil amendments will ensure a diverse effective vegetative growth upon the material.
Based on the above test results the cover material will require 2.6 tons of lime per acre.

4. Revegetation shall be performed according to the mixtures and application rates given in the following Permanent Cover-Mixtures and Rates Attachment. Seeding will commence during the first normal planting season to establish a diverse, effective, and permanent vegetative cover. Topsoil, subsoil, and overburden material will be systematically sampled at a rate of 1 sample per 10 acres and sent to a qualified soil testing laboratory, for analysis to determine type and amount of soil amendments necessary to maintain vegetative growth and applied as recommended. Seed bed preparation shall include discing or scarifying the soil to permit seed application and to aid in the mixing of the soil amendments. All areas shall be mulched with hay at a rate of 1 ½ - 3 ton per acre to control erosion, to promote seed germination, and to increase the moisture retention of the soil.

PERMANENT COVER-MIXTURES AND RATES

Spring Planting

Species	Planting Rate	Planting Methods	Planting Dates	Areas to be Planted
Fescue	25#/acre	Broadcast	Spring	All Disturbance
Millet	10#/acre	Broadcast	Spring	All Disturbance
Bermuda	15#/acre	Broadcast	Spring	All Disturbance

Fall Planting

Species	Planting Rate	Planting Methods	Planting Dates	Areas to be Planted
Fescue	40#/Acre	Broadcast	Spring	All Disturbance
Perennial Ryegrass	20#/Acre	Broadcast	Spring	All Disturbance

COARSE COAL PROCESSING WASTE EMBANKMENT REQUIREMENTS

1) All coarse refuse will be placed in Coarse Refuse Disposal Area No. 1. (See Permit Map.) The disposal plans will be designed using current prudent engineering practices and Regulatory Authority design criteria and certified by a qualified registered professional engineer.

2) All surface drainage will be routed around the outslope of the waste bank by using diversion ditches. The diversion ditches will be designed to pass a peak flow from a 100 yr. - 6 hr. precipitation event.

3) All vegetation and any organic material will be removed prior the construction of the embankment. Any topsoil removed will be segregated and stored on-site for future reclamation needs.

4) All refuse material will be transported and placed in a controlled manner in the waste bank. The liming rate required to neutralize the material will be calculated and submitted to the regulatory authority for approval prior to adjusting the rate.

5) Slopes of the waste bank will be maintained at a minimum slope to be specified within the detailed design plans. The slopes of the waste bank will be designed to exceed a 1.5 minimum long term static safety factor.

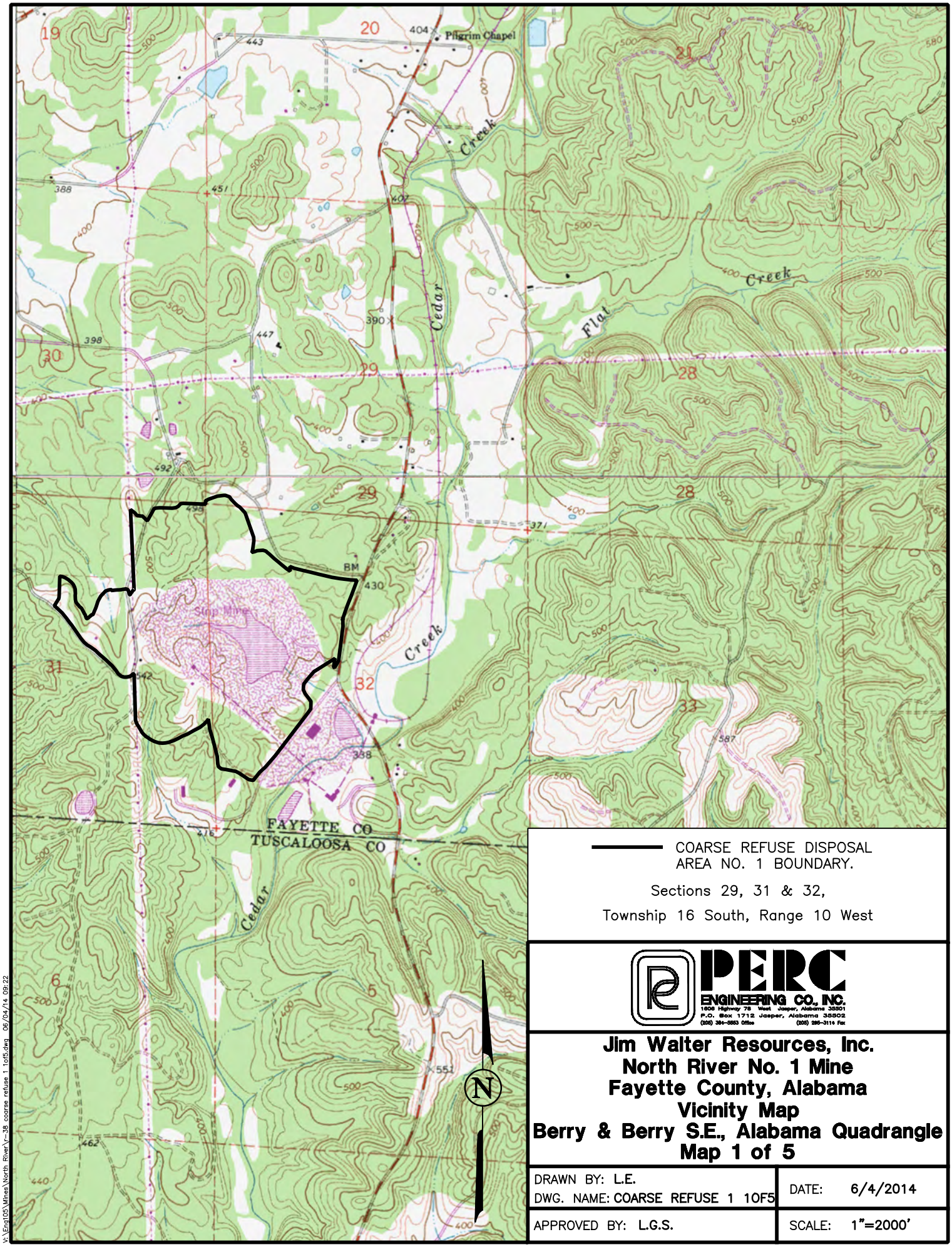
6) Sufficient site and laboratory investigations will be performed on the foundation area and the fill material to be utilized in the design of the fill. If a potential hazard is revealed, the Regulatory Authority will be informed and necessary safety measures will be implemented.

7) The waste bank will be inspected by a registered professional engineer or other qualified professional specialist under the direct supervision of the qualified professional engineer. Inspections will be made at least quarterly and during times of removal of organic material and topsoil, installation of diversion ditches, installation of underdrains, placement and compaction of refuse material, and revegetation of the fill. Photographs of the underdrain will be taken during and after their construction but prior to their cover. Certification inspection reports will be filed with the Regulatory Authority stating that proper construction and maintenance are occurring in accordance with approved design plans. Inspection reports will be retained at the facility office.

8) Upon completion of operations, the waste bank area will be graded using mobile equipment to the configuration approved in the design plans. The waste bank will be covered with 2 feet of non-toxic, non-acid forming, and non-combustible material taken from the area permitted as borrow area as shown on the permit map. Attached are laboratory results of the chemical analysis of the cover material. All disturbed areas will be vegetated with an appropriate combination of grasses and legumes as stated in the reclamation plan, fertilized, and mulched to ensure a permanent diverse vegetative cover. Soil amendments, including lime and fertilizer, will be added and disced into the cover material in rates as recommended by laboratory analysis performed upon the cover material. These soil amendments will ensure a diverse effective vegetative growth upon the material.

DRAWING LIST

Drawing Title	Sheet No.
Vicinity Map	1 of 5
Underground Mine Map	2 of 5
Geotechnical Investigation Map	3 of 5
Grading Plan	4 of 5
Abandonment Grading/Drainage Control Plan	5 of 5



COARSE REFUSE DISPOSAL AREA NO. 1 BOUNDARY.

Sections 29, 31 & 32,

Township 16 South, Range 10 West

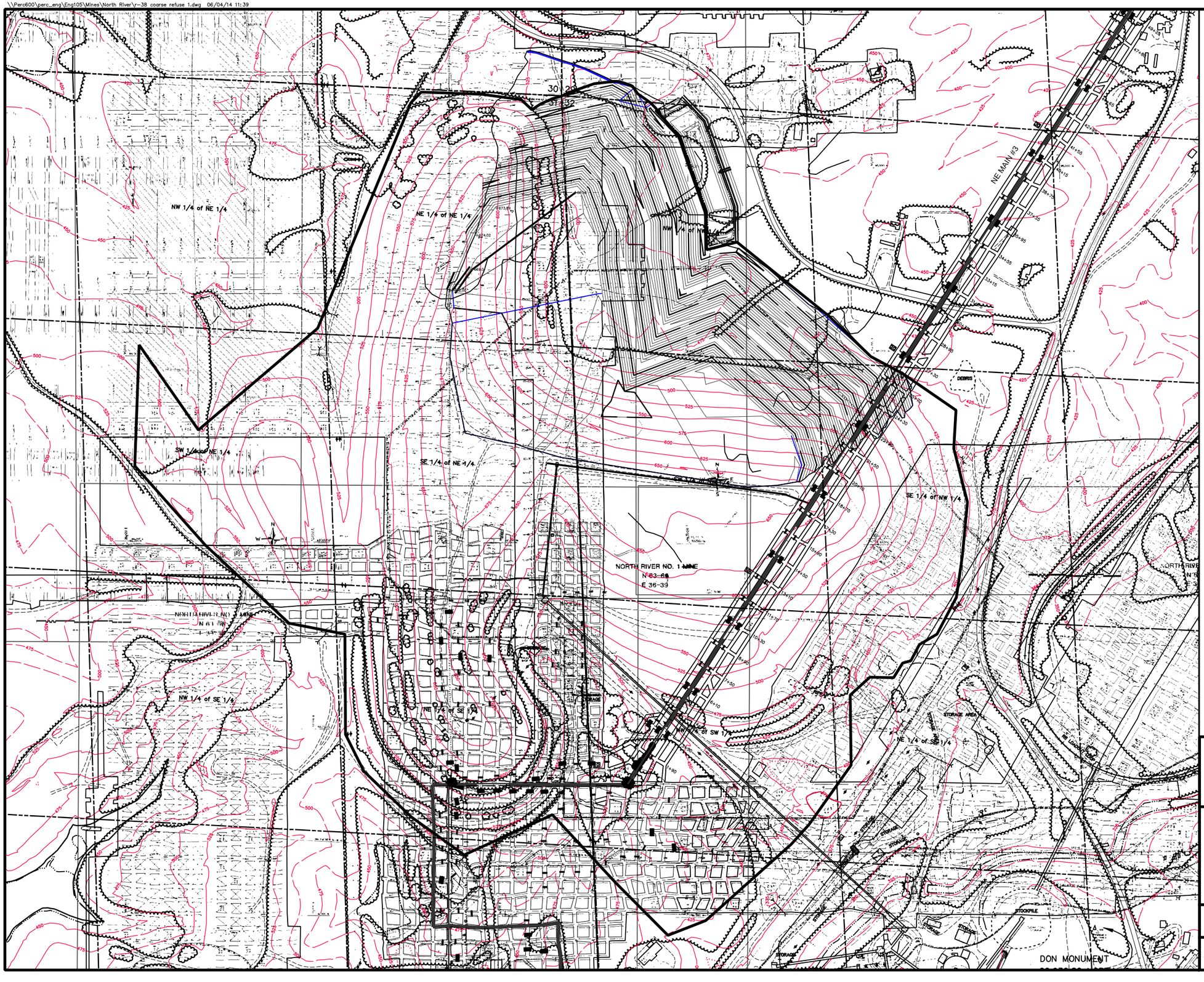
PERC ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Alabama 35501
P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5983 Office (205) 295-3116 Fax

Jim Walter Resources, Inc.
North River No. 1 Mine
Fayette County, Alabama
Vicinity Map
Berry & Berry S.E., Alabama Quadrangle
Map 1 of 5

DRAWN BY: L.E. DWG. NAME: COARSE REFUSE 1 1OF5	DATE: 6/4/2014
APPROVED BY: L.G.S.	SCALE: 1"=2000'

v:\ Engl05\Mines\North River\r-36 coarse refuse 1 1of5.dwg 06/04/14 09:22

\\Perc600\perc_eng\Eng105\Mines\North River\r-38 coarse refuse 1.dwg 06/04/14 11:39



N

LEGEND

COARSE REFUSE DISPOSAL AREA NO. 1 EXISTING BOUNDARY.

UNDERGROUND MINE AREA

PERC
ENGINEERING CO., INC.
1606 Highway 78 West Jasper, Alabama 35501
P.O. Box 1712 Jasper, Alabama 35502
(205) 384-5553 Office (205) 295-3114 Fax

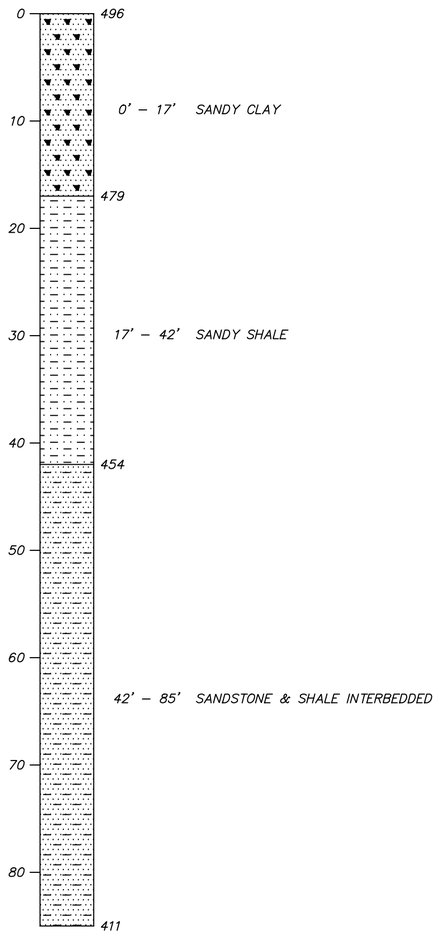
Jim Walter Resources, Inc.

NORTH RIVER NO.1 MINE
UNDERGROUND MINE MAP
MAP 2 OF 5

DRAWN BY: L.E. DWG. NAME: COARSE REFUSE 1	DATE: 6/4/2014
APPROVED BY: L.G.S.	SCALE: 1"=500'

DRILL HOLE #1

ELEVATION: INTERVAL: DESCRIPTION:



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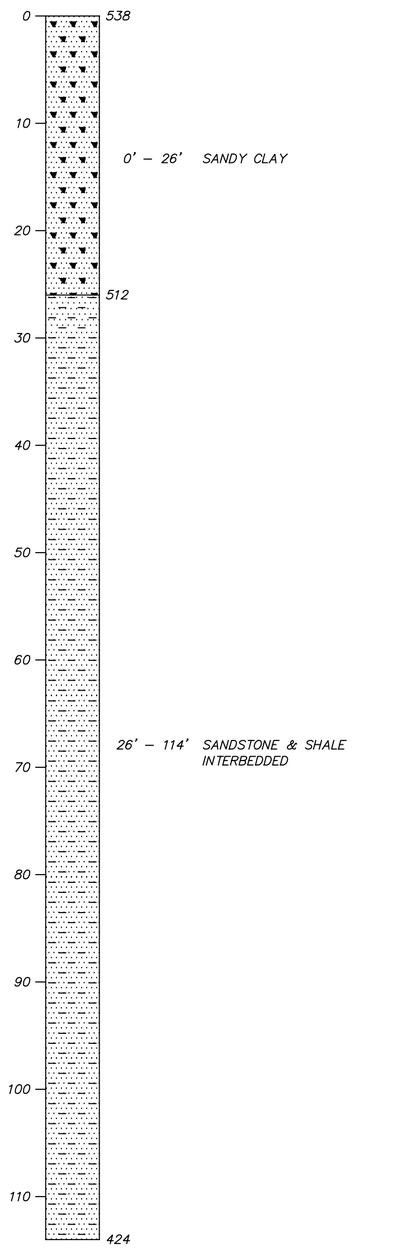
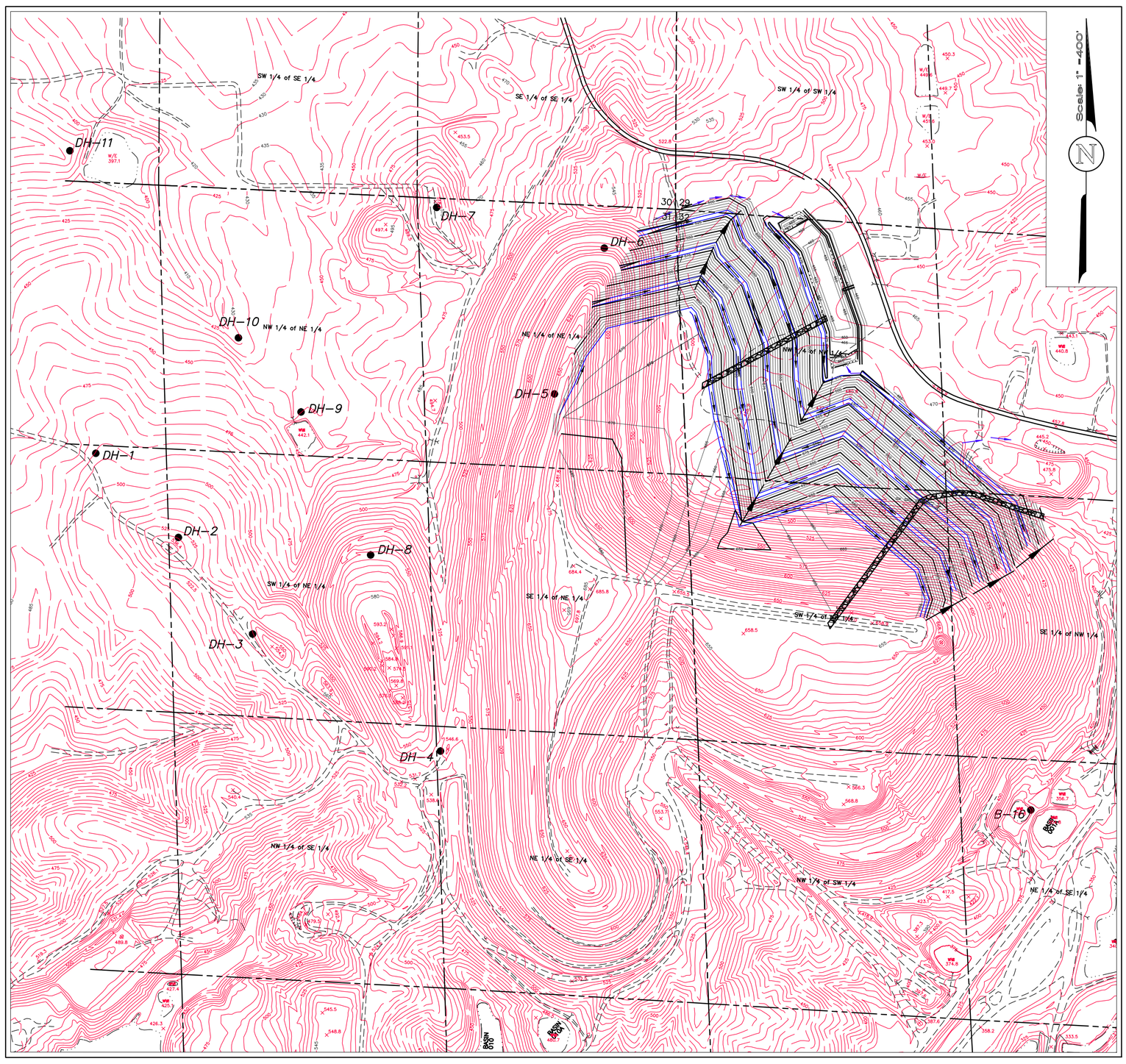
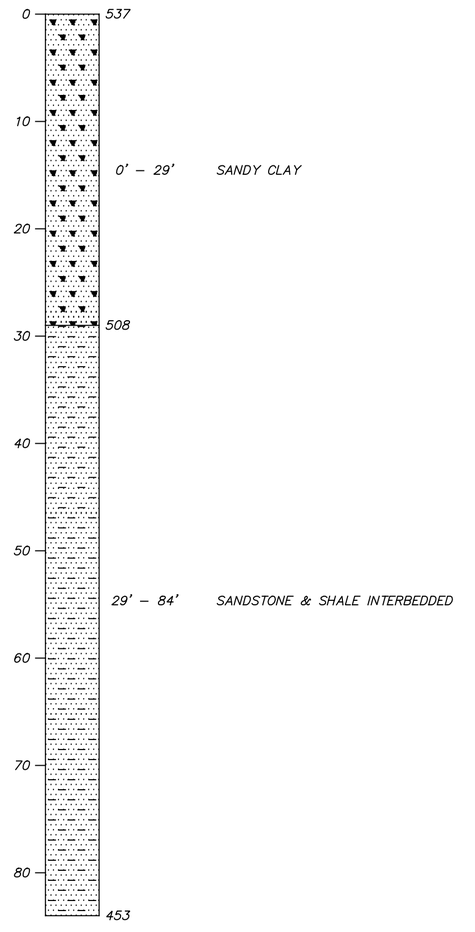




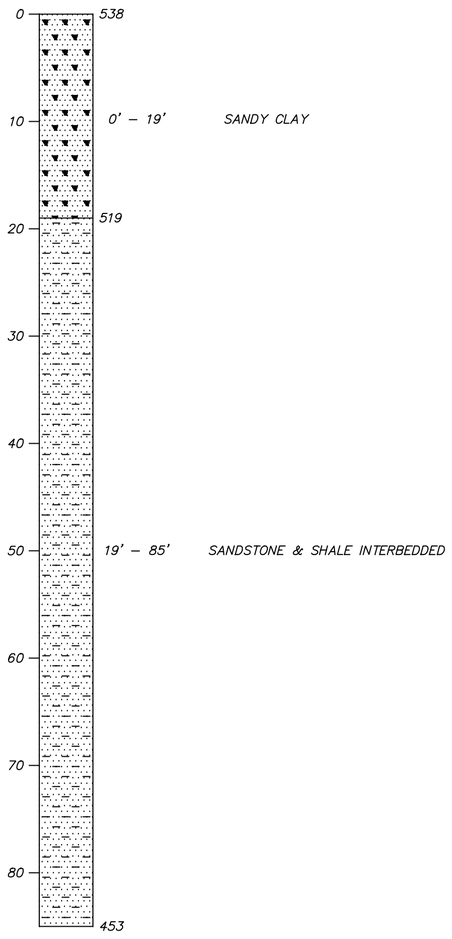
DRILL HOLE #3

ELEVATION: INTERVAL: DESCRIPTION:



DRILL HOLE #4

ELEVATION: INTERVAL: DESCRIPTION:



DRILL HOLE #5

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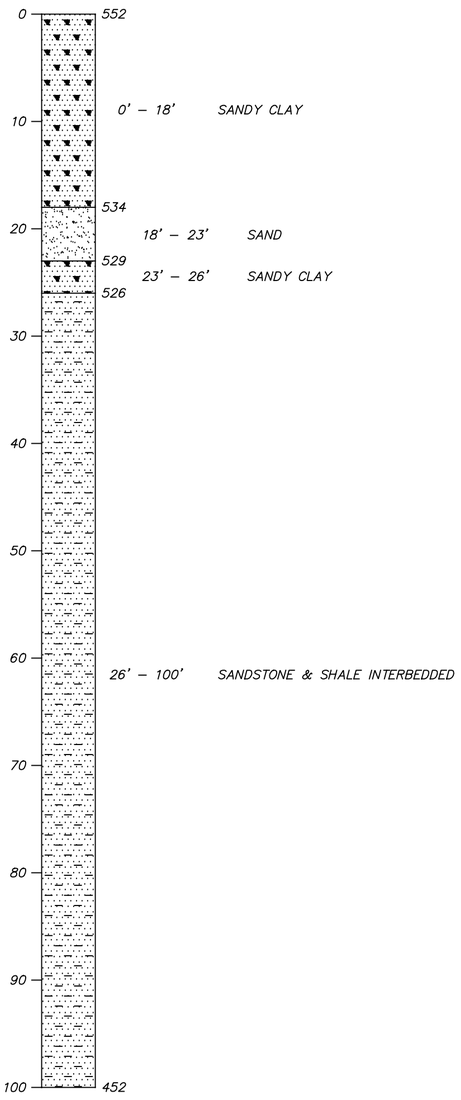
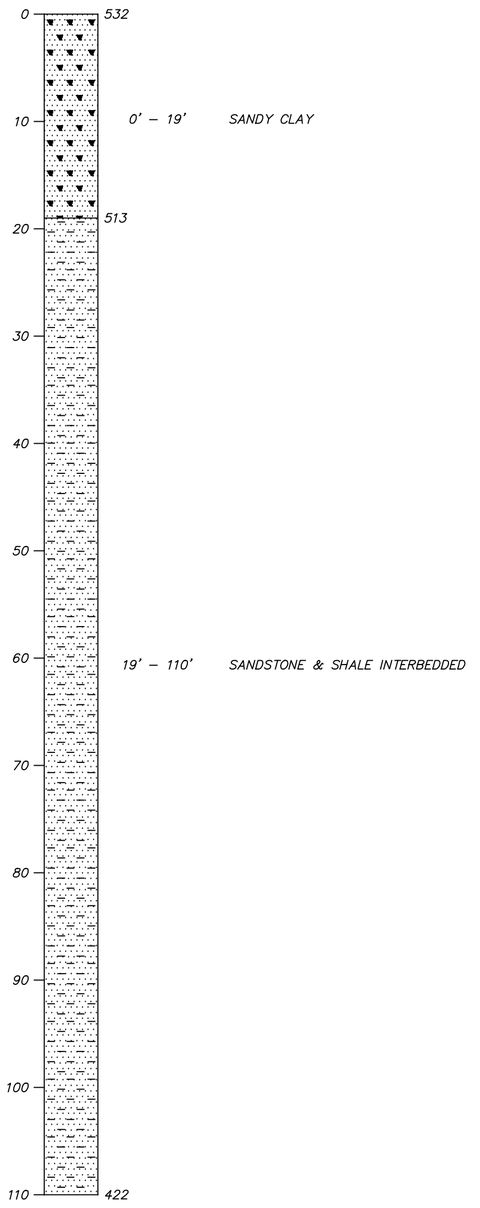


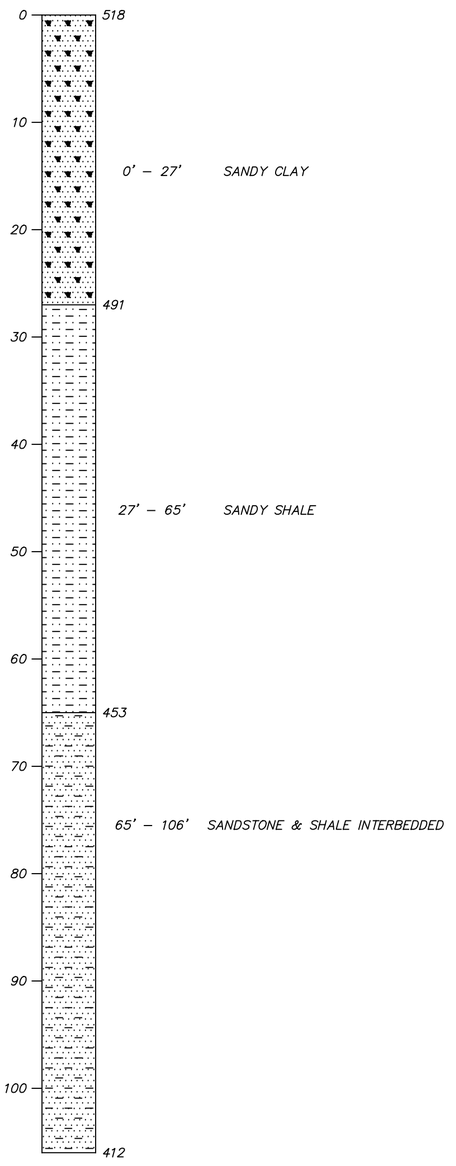
DRILL HOLE #6

ELEVATION: INTERVAL: DESCRIPTION:



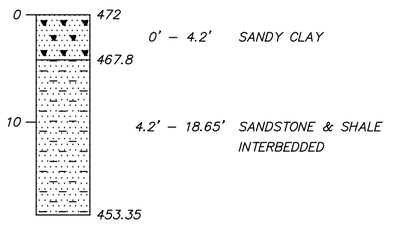
DRILL HOLE #7

ELEVATION: INTERVAL: DESCRIPTION:



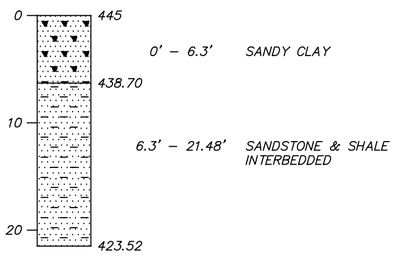
DRILL HOLE #8

ELEVATION: INTERVAL: DESCRIPTION:



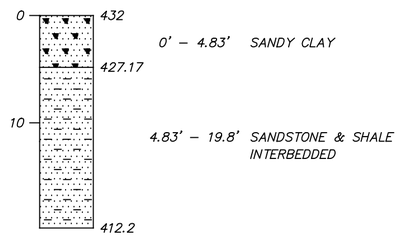
DRILL HOLE #9

ELEVATION: INTERVAL: DESCRIPTION:



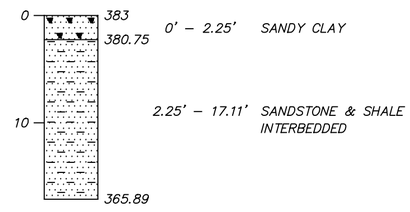
DRILL HOLE #10

ELEVATION: INTERVAL: DESCRIPTION:



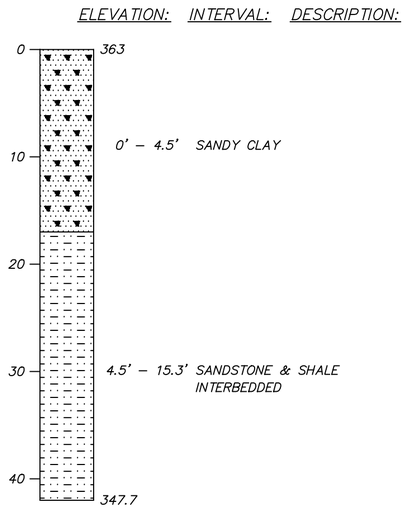
DRILL HOLE #11

ELEVATION: INTERVAL: DESCRIPTION:



DRILL HOLE B–16

ELEVATION: INTERVAL: DESCRIPTION:



LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- DIVERSION
- PROPOSED TERRACE
- SLOPE DOWNDRAIN DIVERSIONS
- UNDERDRAIN
- DH–1 DRILL HOLE

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(205) 384–5553 Office (205) 384–9491 Fax

drawn by: L.E.
checked by: L.G.S.
scale: 1" = 400'
diskette no:
rev no./date:

job number:
initial date:
f.b./page:
dwg name: COARSE REFUSE 1 3OF5
rev no./date: R–38 06/04/2014

Jim Walter Resources, Inc.
North River No. 1 Mine
Coarse Refuse Disposal Area No. 1
Geotechnical Investigation Map
Map 3 of 5

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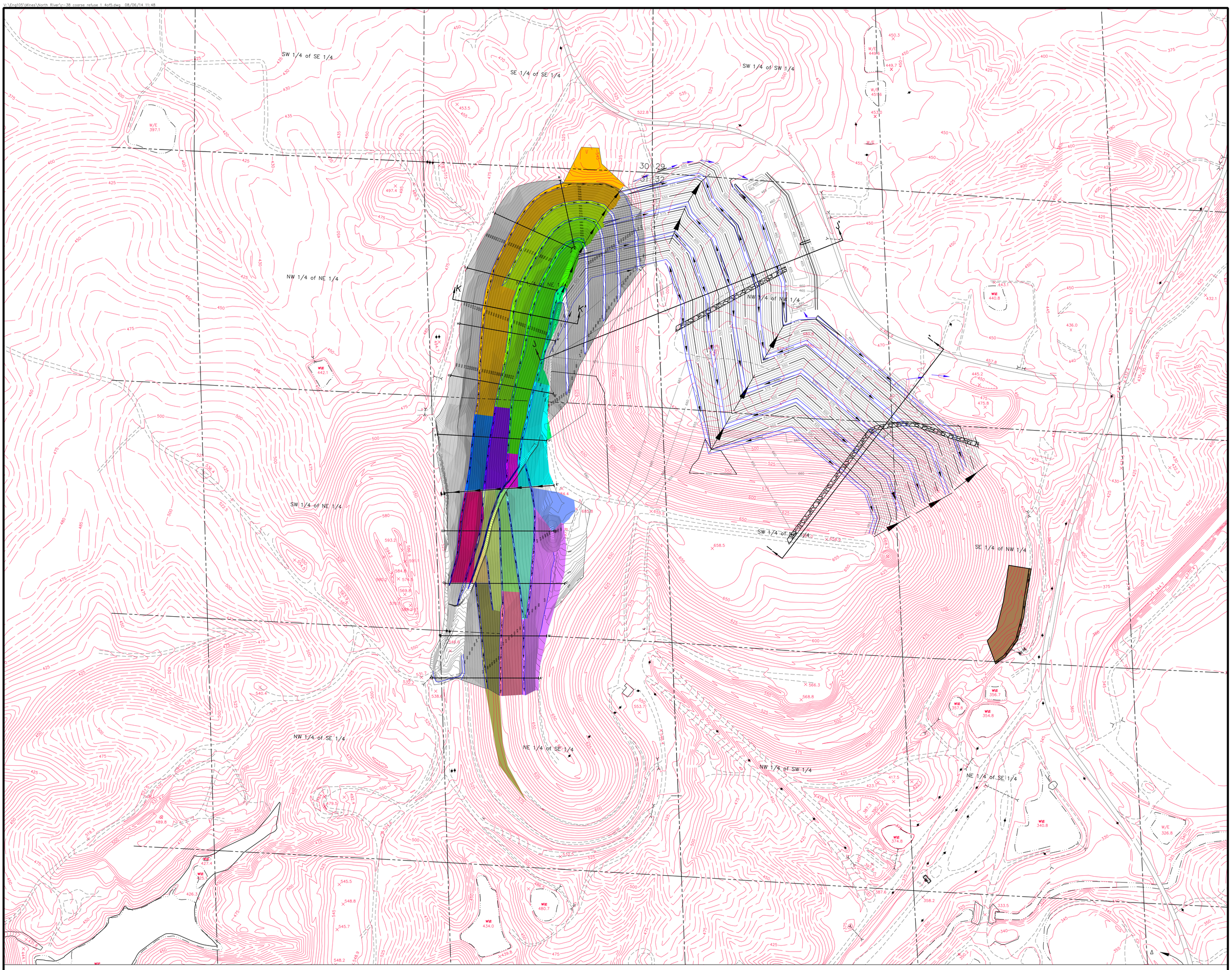
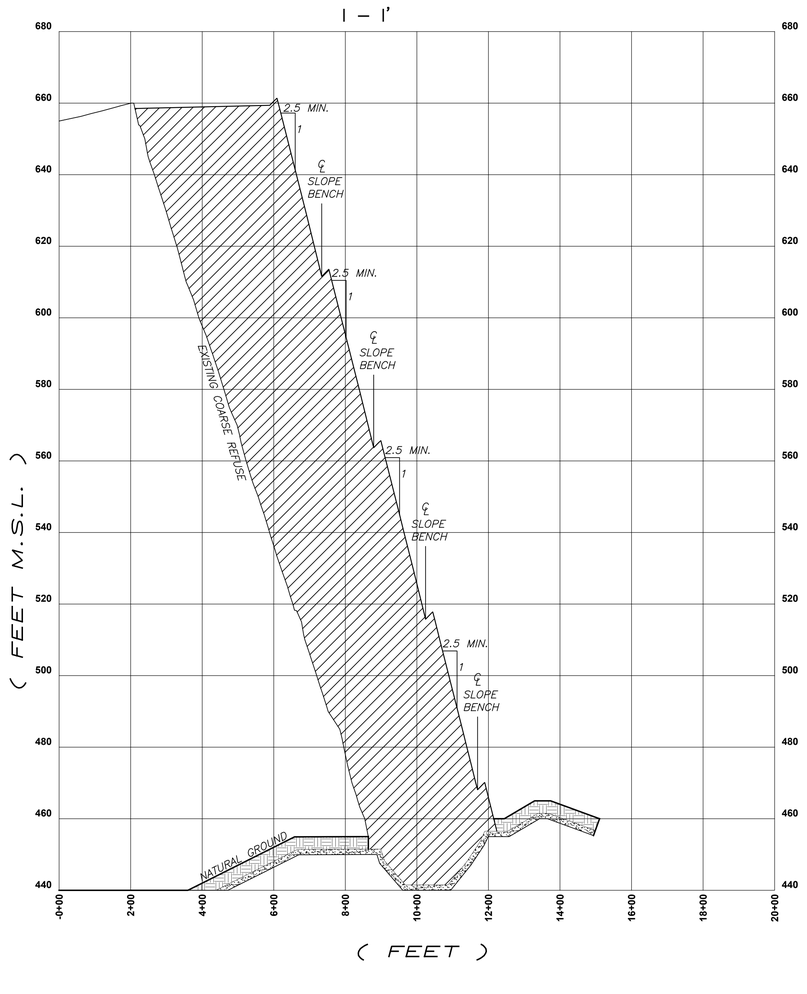
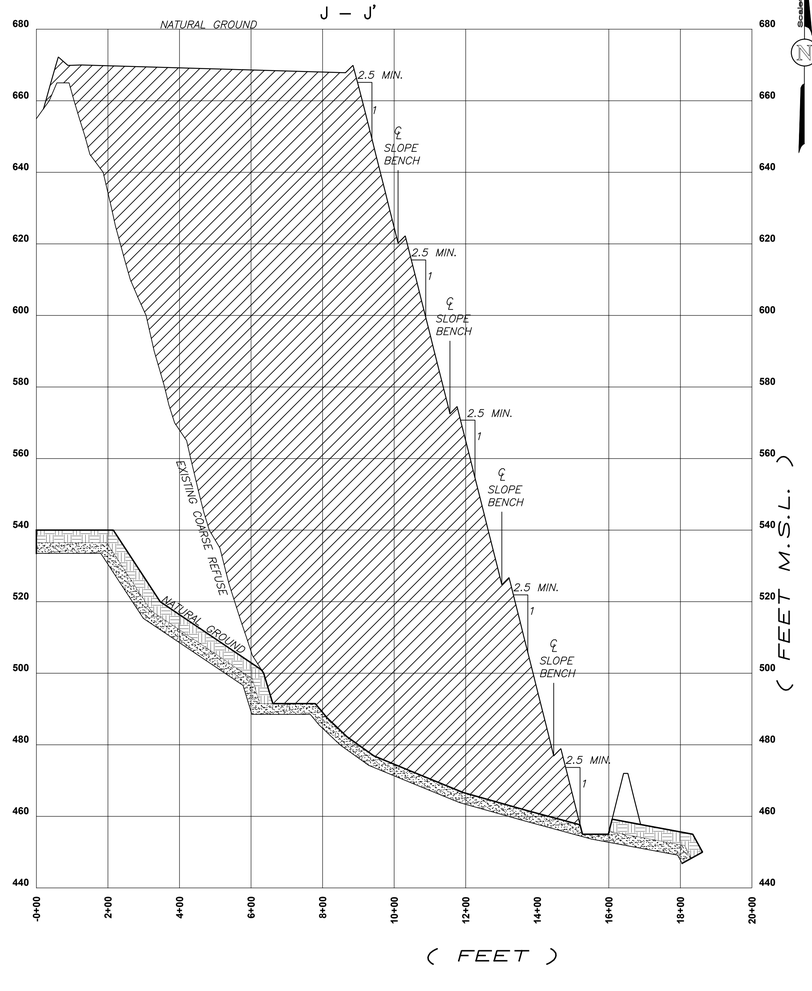


I – I'



J – J'



Scale 1" = 200'

LEGEND

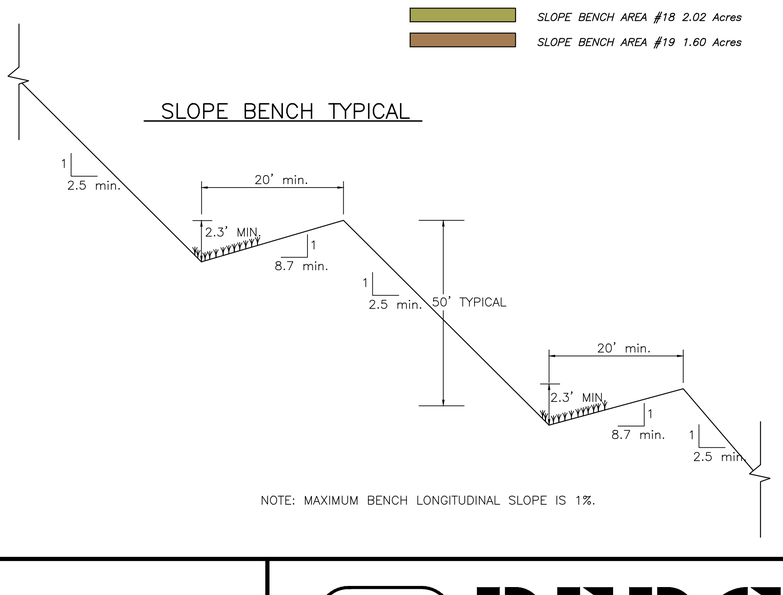
- DRAINAGE DIVIDE
- DIVERSION
- PROPOSED TERRACE
- SLOPE DOWNDRAIN DIVERSIONS
- UNDERDRAIN
- SANDY CLAY
- SANDSTONE & SHALE INTERBEDDED
- COARSE REFUSE
- 500 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- POWER POLE
- PROPOSED CONTOURS
- 500 EXISTING CONTOUR FROM JUNE 2006 AERIAL PHOTO

Note: See Map 5 of 5 for Cross Section K–K' details.

Site Specific Slope Bench Designs

- SLOPE BENCH AREA #1 5.76 Acres
- SLOPE BENCH AREA #2 1.72 Acres
- SLOPE BENCH AREA #3 3.00 Acres
- SLOPE BENCH AREA #4 3.29 Acres
- SLOPE BENCH AREA #5 2.45 Acres
- SLOPE BENCH AREA #6 0.97 Acres
- SLOPE BENCH AREA #7 1.16 Acres
- SLOPE BENCH AREA #8 0.30 Acres
- SLOPE BENCH AREA #9 1.91 Acres
- SLOPE BENCH AREA #10 1.41 Acres
- SLOPE BENCH AREA #11 0.42 Acres
- SLOPE BENCH AREA #12 1.22 Acres
- SLOPE BENCH AREA #13 1.02 Acres
- SLOPE BENCH AREA #14 1.68 Acres
- SLOPE BENCH AREA #15 0.89 Acres
- SLOPE BENCH AREA #16 3.39 Acres
- SLOPE BENCH AREA #17 1.69 Acres
- SLOPE BENCH AREA #18 2.02 Acres
- SLOPE BENCH AREA #19 1.60 Acres

SLOPE BENCH TYPICAL



NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.

Jim Walter Resources, Inc.
North River No. 1 Mine
Coarse Refuse Disposal Area No. 1
Grading Plan
Map 4 of 5

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checked by: L.G.S.
scale: 1" = 200'
diskette no:
rev no./date:

job number:
initial date:
f.b./page:
dwg name: COARSE REFUSE 1
rev no./date: R-38 08-01-2014

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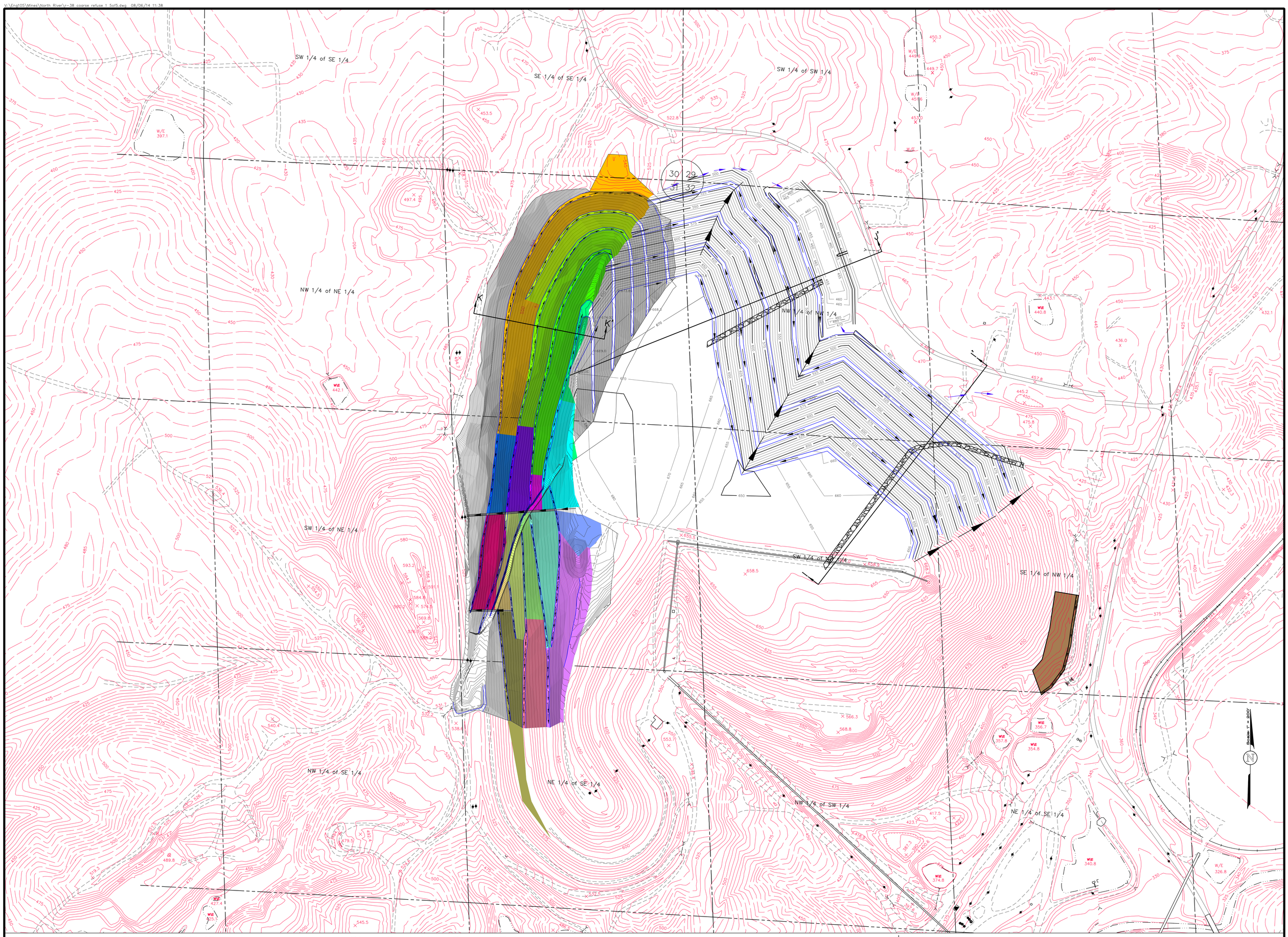

PLAN VIEW LEGEND

- DRAINAGE DIVIDE
- DIVERSION
- PROPOSED TERRACE
- PROPOSED CONTOURS
- SLOPE DOWNDRAIN DIVERSIONS
- EXISTING CONTOUR FROM JUNE 2006 AERIAL PHOTO
- POWER POLE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

Site Specific Slope Bench Designs

SLOPE BENCH AREA #1 5.76 Acres	SLOPE BENCH AREA #10 1.41 Acres
SLOPE BENCH AREA #2 1.72 Acres	SLOPE BENCH AREA #11 0.42 Acres
SLOPE BENCH AREA #3 3.00 Acres	SLOPE BENCH AREA #12 1.22 Acres
SLOPE BENCH AREA #4 3.29 Acres	SLOPE BENCH AREA #13 1.02 Acres
SLOPE BENCH AREA #5 2.45 Acres	SLOPE BENCH AREA #14 1.68 Acres
SLOPE BENCH AREA #6 0.97 Acres	SLOPE BENCH AREA #15 0.89 Acres
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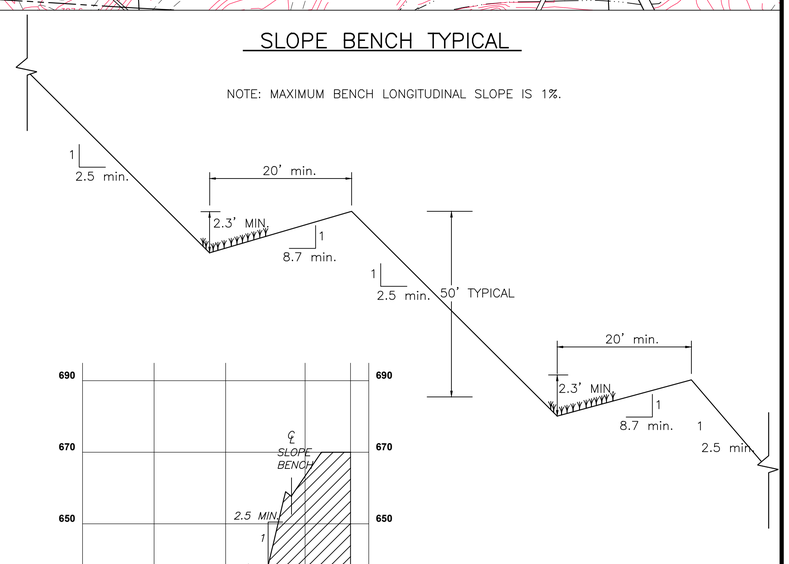
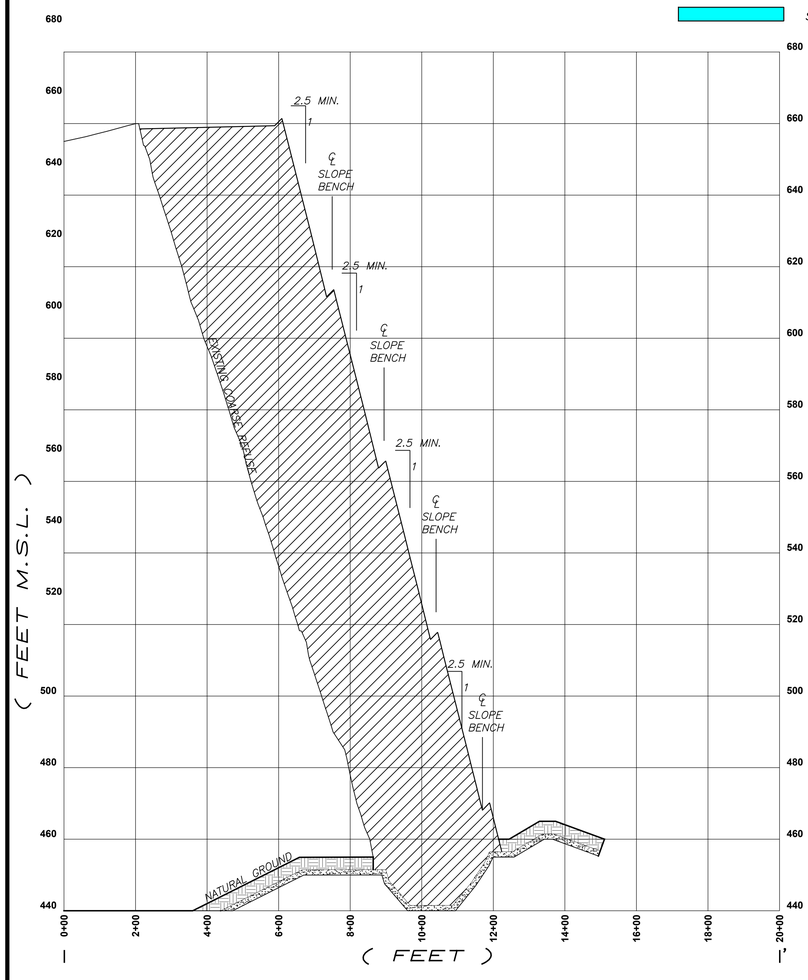
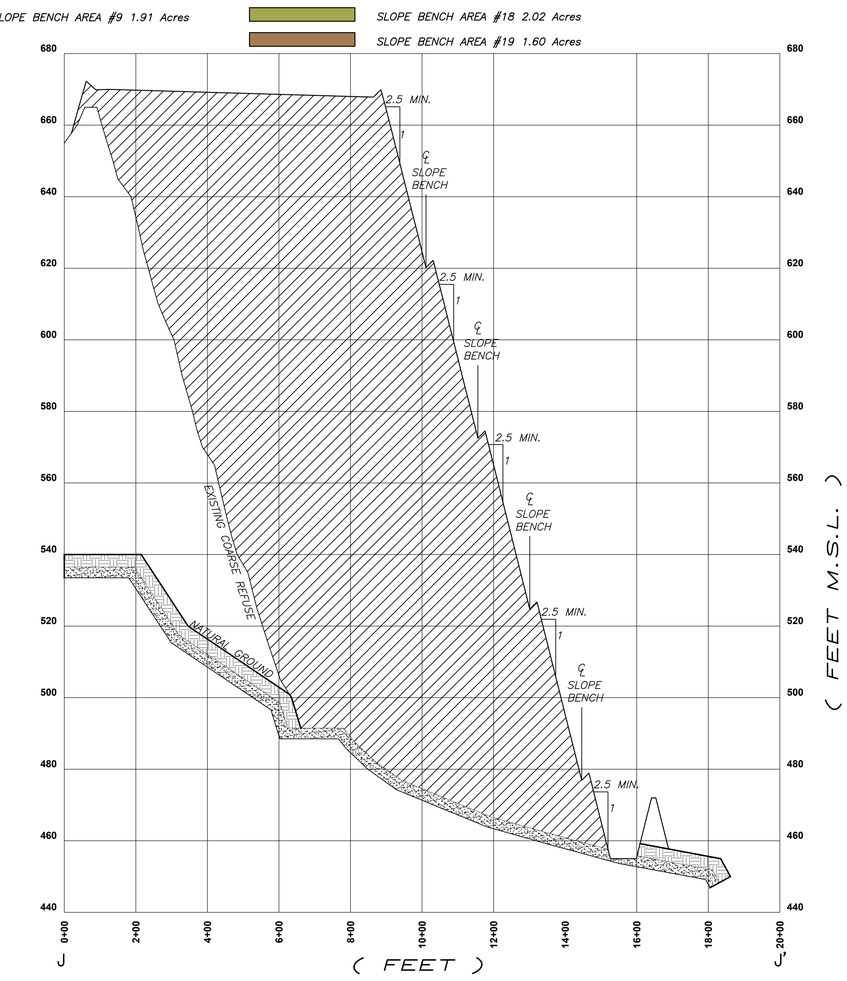
SLOPE BENCH AREA #8 0.30 Acres	SLOPE BENCH AREA #17 1.69 Acres
SLOPE BENCH AREA #9 1.91 Acres	SLOPE BENCH AREA #18 2.02 Acres
	SLOPE BENCH AREA #19 1.60 Acres

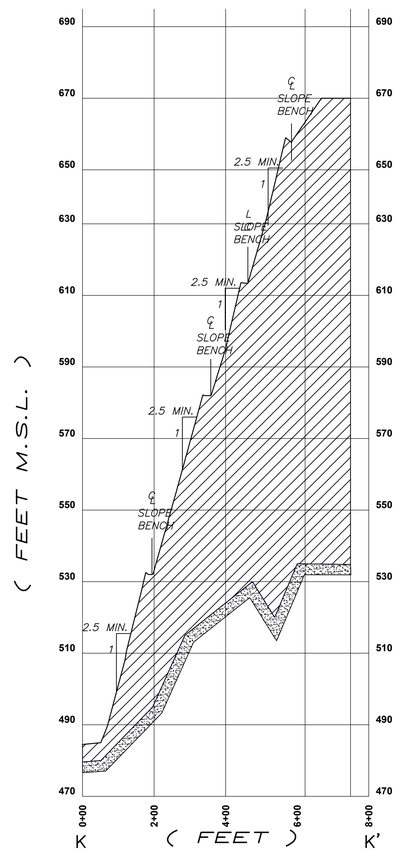
SLOPE BENCH TYPICAL

NOTE: MAXIMUM BENCH LONGITUDINAL SLOPE IS 1%.









X SECTION LEGEND

- UNDERDRAIN
- SANDY CLAY
- SANDSTONE & SHALE INTERBEDDED
- COARSE REFUSE
- FINISHED GRADE

Jim Walter Resources, Inc.
North River No. 1 Mine
Coarse Refuse Disposal Area No. 1
Abandonment Grading Plan/ Drainage Control Plan
5 of 5

drawn by: L.E.
checked by: L.G.S.
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