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FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
ENGINEERING REPORT

Prepared for:

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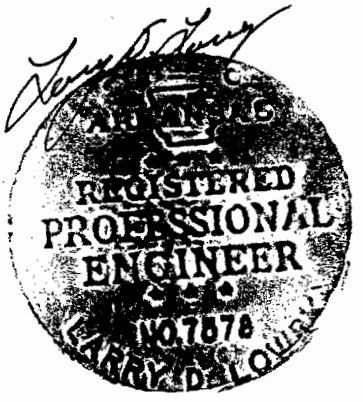

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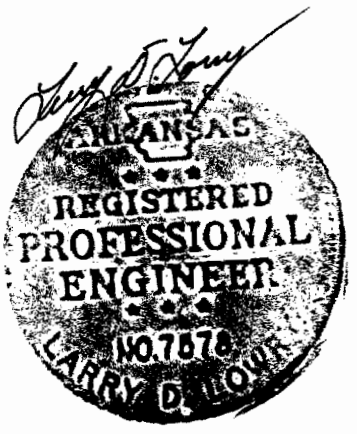

FINAL CLOSURE MODIFICATIONS
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INTRODUCTION

As a condition of Permit Nos. 123SR2 and 162SR2, the Arkansas Department of Pollution Control and Ecology (ADPC&E) has required Sunray Services, Inc., to implement strict control of the soil to be used for final cap construction. Soil to be used for the liner or the compacted clay portion of the final cap must have greater than 30 percent passing the No. 200 sieve, if all of the chert over 1-inch diameter is segregated from the soil. This report has been developed in order to ensure that a supply of final cap material is readily available. It contains information provided in previously submitted modification and closure reports. Implementation of this report will begin immediately upon approval of the ADPC&E.

Only previously filled Class I areas of Site 3 and Site 4 will be vertically expanded. No virgin ground will be expanded upon. These areas have a leachate collection system in place, therefore, leachate from the expansion will be controlled by the same system.

The Site 4, Class IV liner design shall consist of 1 foot of clean washed limestone and 2 feet of recompacted clay, meeting the specifications as indicated in the section entitled CLASS IV LINER CONSTRUCTION on page 7.

A 12-inch thick gravel blanket will be placed on top of the compacted clay liner to act as a leachate collection system. The leachate will collect in a trench and be transported to a collection tank via an HDPE pipe. Separate leachate collection tanks will be used for the Class I and Class IV areas. This will allow for more accurate monitoring of leachate produced by each fill area.

This report is presented in response to ADPC&E's conditions of approval to the permit modification. If there is a change in the design and/or operation of the landfill which affects this report, revisions will be made and submitted to the ADPC&E for approval.

LANDFILL LIFE AND VOLUME

The proposed vertical expansion of the Site 3 and the Site 4, Class I areas will provide approximately 1,408,252 cubic yards of total airspace with a usable volume of approximately 1,180,772 cubic yards. This is the combined volume based on vertically expanding each site individually. The current rate of fill is 18,000 cubic yards per month. This figure includes 10,000 cubic yards of compacted waste and 8,000 cubic yards of daily and intermediate cover compacted in place each month. It is expected that this rate will increase by approximately 50 percent by the end of this year, yielding a monthly fill volume of 27,000 cubic yards; 15,000 cubic yards of waste, and 12,000 cubic yards of daily and intermediate cover compacted in place each month. At the newly projected rate, the combined life of the Site 3 and Site 4, Class I areas is approximately 43.7 months (1,180,772 cubic yards ÷ 27,000 cubic yards/month).

The proposed Class IV area of Site 4 will provide approximately 207,839 cubic yards of usable volume after subtracting the volume of the 12-inch gravel blanket, the clay liner and the final cap. When added to the existing 5,100 cubic yards of volume remaining in the approved Site 3, Class IV area, this provides a combined total of approximately 212,939 cubic yards of usable volume. The current rate of fill in the approved Class IV area is 1,210 cubic yards per month. This figure includes 850 cubic yards of compacted waste and 360 cubic yards of monthly and intermediate cover. With the expected 50 percent increase, the fill rate will be 1,815 cubic yards per month. At the newly projected rate, the combined life expectancy of the Class IV areas is 117 months.

SOIL BALANCE

The current rate of soil usage for the Class I areas is 8,000 cubic yards per month for daily and intermediate cover. The current rate of soil usage for the Class IV area is 360 cubic yards per month for monthly cover. The soil volumes required were calculated on the basis that an additional 50 percent of soil would be needed for a 50 percent increase in the waste volume. This is a conservative value that, in all likelihood, could actually be much less under normal field conditions. Projected soil requirements are 12,000 cubic yards per month for the Class I areas and 540 cubic yards per month for the Class IV areas. Soil balance calculations were revised to account for a 4-foot thick cap and for the screening of a portion of the final cap material.

The estimated quantity of soil needed for the construction of the vertical expansion of the Class I areas and the construction of the Class IV area is as follows:

Description	Total Net Volume Soil Required	Unscreened Portion	Screened Portion
Class I Daily, Intermediate Cover	524,400 cy	524,400 cy	0
Class I Final Cap	227,480 cy	75,827 cy	151,653 cy
Class IV Daily, Intermediate Cover	63,354 cy	63,354 cy	0
Class IV Liner	22,587 cy	22,587 cy	0
Class IV Final Cap	50,094 cy	16,698 cy	33,396 cy
TOTALS	887,915	702,866 cy	185,049 cy

Daily, monthly, intermediate, and vegetative cover, and the Class IV liner do not require screening. The portion of the final cap for the Class I and Class IV areas is comprised of 2 feet of compacted clay. To obtain the volume of soil to

be excavated for screening, the volume of screened soil must be multiplied by a factor to account for the loss of material greater than 1 inch. The average percent passing the 1-inch sieve was 64.54 percent. This value was estimated from the geotechnical analyses performed at the site. The screened portion soil volume must be multiplied by a factor of 1.55 to obtain the excavation volume.

Screened Soil Volume	185,049 cubic yards
	x 1.55
TOTAL EXCAVATED FOR SCREENING	286,826 cubic yards
Unscreened Soil Volume	702,866 cubic yards
TOTAL EXCAVATED SOIL VOLUME	989,692 cubic yards

The estimated quantity of soil available from Site 3 and Site 4 is summarized below.

Borrow from Site 3	79,889 cubic yards
Borrow from South Part of Site 4	382,533 cubic yards
*Cap Material Available for Re-Use	40,333 cubic yards
Borrow from Northern Part of Site 4	833,550 cubic yards
TOTAL SOIL AVAILABLE	1,336,305 cubic yards

* Final cover material already in place that will be removed prior to proceeding with vertical expansion.

There is an excess of approximately 346,613 cubic yards available. The soil balance volume sheet has been provided in Appendix C.

EXCAVATION OF SOIL

Soil will be selectively excavated in order to minimize the amount of screening needed to create suitable final cap and liner material. When an area of extremely gravely soil is encountered, a dozer or blade will scarify that area then push this material to the side and allow the scraper to extract a better quality material.

Paddle wheel scrapers will be used during excavation. The paddle can be set relatively close to the cutting edge of the scraper to expel the larger stones. The scrapers will deposit their loads near the screening area.

SOIL EVALUATION

The subsurface investigation at the Sunray Tontitown Landfill consisted of soil drilling, test pit excavation, and soil sampling.

The drilling program consisted of drilling four soil borings. The shallow soil borings were advanced to auger refusal using a CME-75 drilling rig equipped with 6-inch hollow-stem augers. Samples were taken continuously using a CME contin-

uous sampler. Additionally, thin wall (Shelby) tube samples were obtained in selected horizons.

The soil borings were logged in the field on the basis of samples collected with the continuous sampler, auger cuttings, and the drilling rig characteristics and reactions. The borings were logged on standardized boring log forms using Unified Soil Classification (USC) system methods. Soil samples were obtained from the continuous sampler and from selected cuttings. These samples were placed in glass jars and labeled.

Test Pits

Thirty-seven test pits were excavated at the site. The test pit excavation program was undertaken to obtain samples for geotechnical testing. The test pits were excavated using a Caterpillar 426 hydraulic backhoe with a 13-foot arm and a 2-foot wide bucket. The walls and base of each test pit were inspected and mapped to a depth of 4 feet below the ground surface. Below depths of 4 feet, the soils were inspected at the surface.

Test pit samples were submitted for geotechnical testing. Samples were obtained either directly from the test pit, or from the materials brought to the surface by the backhoe. The field logging of the soils, soil and rock stratigraphy, and other features such as water entry, etc., were documented on standardized test pit forms. Test pit logs are presented in Appendix E. All test pits were back-filled upon completion of the logging and sampling process.

The soil samples collected from test pits were placed in plastic bags, sealed, and labeled. Bulk soil samples obtained from test pit locations were collected in heavy duty plastic bags and placed inside 5 gallon plastic buckets for support during transportation to the laboratory. All samples were then transported to the laboratory for geotechnical analysis.

Geotechnical Laboratory Testing

Geotechnical laboratory tests were performed on 26 representative soil samples obtained from four soil borings and the 19 test pits. The geotechnical tests were conducted in conformance with American Society for Testing and Materials (ASTM) standards.

The geotechnical laboratory testing program was conducted to delineate the engineering characteristics of the soils and determine the suitability of the on-site borrow materials for use as landfill cover and liner materials.

Geotechnical laboratory tests included sieve and hydrometer grain size analyses, Atterberg limits, moisture content, density, and soil identification (USC system). Additionally, eight samples were tested for standard proctor densities and hydraulic conductivity.

The results of the geotechnical laboratory testing are presented in Appendix G. The geotechnical laboratory procedures were based on those developed by the ASTM.

Geotechnical Laboratory Testing Results

Results from the geotechnical laboratory testing are presented in Table 1. The soils encountered in the test pits and soil borings were classified as silty gravels, clayey gravels with sand, clayey gravels, and clayey gravels with sand.

Hydraulic Conductivity tests were conducted on soil material passing a 3/8-inch sieve. The material was then remolded to 95 percent compaction. Hydraulic conductivity values for these materials ranged from 1.71×10^{-6} to 7.38×10^{-7} cm/sec.

The percent of material passing the No. 200 sieve for all samples tested ranged from 17.3 to 93.6 percent. The samples collected from the soil borings had a greater percentage of material passing the No. 200 sieve as compared with samples collected from the test pits. The difference is due to the fact that the continuous sampler used in the soil borings did not collect as much rock as in the test pits.

The percent of material passing the No. 200 sieve for materials collected from the test pits ranged from 17.3 to 53 percent.

Drawing 8 of 15 indicates those areas where greater than 30 percent of the material passes the No. 200 sieve. These areas have been labeled as A, B, and C.

Area A has the highest number of locations (four out of eight) sampled with a percentage passing No. 200 greater than 30. The average of the four locations greater than 30 percent is 36.5 percent. The average of all eight locations is 31.6 percent.

Area B has two locations out of four with percentages passing No. 200 greater than 30. The average of the two locations is 45.81 percent, and the average of all four is 35.35 percent. TP-4-25 has 53 percent passing and causes the averages to be high.

Area C has two locations out of seven with percentages passing No. 200 greater than 30. The average of the two locations is 36.75 percent, and the average of all seven locations is 25.2 percent. However, only material near test pit TP-3-2 will be utilized for borrow material.

Portions of the areas, that appear to be material with a percent passing the No. 200 sieve greater than 30, have been outlined on Drawing 8 of 15. The apparent volume of material in the outlined areas of A, B, and C are 152,785, 137,974, and 4,704 cubic yards, respectively.

However, a small amount of material outside these outlined areas may be used if it is mixed with material coming from inside these areas, such that the percent passing the No. 200 of the mixture is greater than 30. Composite materials must be sampled prior to placement to ensure that the percent passing the No. 200 is greater than 30.

SOIL SCREENING

The screening system to be utilized at the Tontitown location will be similar to the unit depicted in a proposal from Central Manufacturing, Inc. The two stage stationary unit is capable of screening 90 tons of excavated material into 60 tons of minus 1-inch material, and 20 tons of minus 3-inch plus 1-inch material in an hour. Information on trommel units can be found in Appendix A. A front-end loader with a 3 cubic yard bucket, will be needed to load the excavated soil into the feed hopper. The screened soil will be scooped up with a loader, placed into dump trucks, and hauled to the areas in need. If the screened soil is not immediately needed, it can be stockpiled in an area designated by the landfill manager. The oversized material will ride across the top of the screen and fall through the end chute.

It is estimated that soil will be screened, on average, 5 hours per day, 20 days per month. Prior to the commencement of screening, a sufficient amount of excavated material should be readily available for the feeding loader. To conserve energy costs and ease the line burden, the system should be limited to two start-ups per day. The power usage is fostered from two 7.5 H.P. electric motors which drive the trommel. A NEMA-12 dual starter housing will protect the wiring of the system switch from rain and dust. Routine cleaning and maintenance should be performed at the end of each day that the system is operated. This will limit the amount of down time and extend the life of the system.

CLASS IV LINER CONSTRUCTION

The specified clay soil will be used for liner construction. The clay liner will be constructed as follows.

- The bottom 8 inches will be compacted in place.
- The other 16 inches shall be excavated and recompacted in 8 inch lifts.
- The 8 inch lifts will be compacted to 95 percent standard proctor density.
- Each of the 8 inch lifts shall be tested to certify a permeability of 1×10^{-6} cm/sec. Testing will be conducted on each 10,000 square feet of liner.
- The soil aggregate mixture will have more than 30 percent passing a No. 200 screen.
- The leachate collection system shall be constructed to drain by gravity.
- The leachate collection trench will be double lined with 3 feet of recompacted clay and 40 mil HDPE.

SURFACE WATER MANAGEMENT

The drainage ditches have been designed to keep the peak flow from a 25-year storm from entering the active fill areas. The Class I areas have been designed with bench drains on the side slopes to divert the water into the let-down ditches. This measure is an optimum deterrent to erosion. The let-down ditches empty into the drainage ditches, which in turn empty into the siltation basins.

The proposed Class IV area has side slopes of approximately 5:1 (horizontal to vertical). With shallow side slopes and a relatively short drainage distance, erosion is not expected to be a problem in the proposed Class IV area.

The siltation basins have been sized to contain the volume of a 25-year, 24-hour storm. Geotextile and riprap will be used in all drainage structures where the water velocity is expected to be greater than 6 feet per second. The drainage benches and other low velocity areas will be seeded with a grass-legume mixture at the rate of 75 pounds per acre. Diversion berms will be used as necessary to re-direct the flow of water from an interim work area.

The Site 4 Northeast Borrow Area has been designed with a siltation basin in the south end to control surface water runoff from the excavated area and minimize the disturbed surface area. The initial disturbed area will be relatively small and will require a small siltation basin. As the borrow area increases the basin will also increase. The pond will contain the volume of a 25-year 24-hour storm. The basin created by the borrow area will have maximum interior slopes of 3:1. This basin will utilize a discharge pipe rather than a spillway for flow control. Due to the depth of the excavation the spillway for this basin would be impractical to construct. The discharge pipe will be sized to handle the 25-year, 24-hour storm. Drainage calculations are provided in Appendix B.

CLOSURE PLAN

General

The ADPC&E will be notified in writing, 180 days prior to the cessation of operation of the Class I areas.

If there is a change in the design and/or operation of the landfill which affects closure and/or post-closure, necessary revisions to the plans and cost estimates will be made and submitted to the ADPC&E for approval.

Progression of Fill

The progression of fill for each class and site location is listed below in the order by which it will be filled.

Site 4 Class I--

This is the area currently being utilized for Class I waste disposal. The modification will be implemented by initially landfilling along the northwest side and continuing along the perimeter in a clockwise manner until mid-way down

the east side. This approach will allow for better surface water management as the landfill progresses south. The fill area will be brought to final grade as it progresses south.

Site 3 Class IV--

This is the area currently being utilized for Class IV waste disposal. The modification will not affect the current progression of fill in this area.

Site 3 Class I--

Filling in this area will commence upon completion of the Site 4, Class I area. The fill will progress from the north to the south.

Site 4 Class IV--

Filling in this area will commence upon completion of the Site 3 Class IV area. The fill will progress from the north to the south.

Final Cap

The final cap will be constructed as landfill development proceeds, only a portion of the completed landfill will require a final cap at any given point during operation. Cap material will be placed to not exceed final design contours and will promote proper drainage. All modified portions of the Class I areas will be covered with a minimum of 6 inches of compacted daily cover, overlain by an additional 24 inches of compacted clay, overlain by 12 inches of cherty clay, overlain by 6 inches soil capable of supporting vegetation for a total cap of 4 feet.

The clay portion of the cap material will be stockpiled and tested as specified by the modification conditions established by the ADPC&E. The soils used must have a coefficient of permeability of 1×10^{-6} cm/sec or less to be used for the compacted clay portion of the final cap. Materials will be obtained from the borrow areas designated on the site drawings.

The top slope of the final cover will be a minimum of 5 percent. The side slopes will be graded such that no slope is greater than 4:1. Drainage benches will be placed down the side slopes such that water running down the 4:1 slope will not travel farther than approximately 90 feet.

The type of equipment currently used at the landfill will also be used for placement of final cover.

Seeding and Mulching

The site will be fertilized, seeded, and mulched to establish dense vegetative growth. Fertilizer rates will be established by recommendations from the soil analysis. To vegetate the site, the operator will use KY-31 fescue and sweet clover at a combined rate of 75 pounds per acre. Mulch will be applied on the slopes and drainage ways, as needed, to provide protection to the seeded areas.

Planting will begin upon a completed area or intermediate area as soon as is practical.

Borrow Area--

The borrow areas shown on the plan sheets will be reclaimed by the operator in an on-going manner. The reclamation will include final grading to promote adequate drainage and establishing vegetation to deter erosion. The seeding rate for this area should be at least 35 pounds per acre of a grass/legume mix.

Closure Financial Assurance Instrument (FAI)

The closure FAI required by the ADPC&E for Site 3 and Site 4 is $61,500 and $76,500, respectively, for a combined total of $138,000.

POST-CLOSURE PLAN

Schedule

The post-closure period will begin upon completion of closure for a given area and will continue for 10 years. The owner/operator will inspect the site on a quarterly basis to evaluate the need for maintenance.

Cap Maintenance

Surface depressions resulting from waste settlement will be filled, re-seeded, and re-mulched as soon as is practical. Areas which are eroded, or where the vegetation is scarce will be restored as soon as is practical. Through the use of the Universal Soil Loss Equation, it is estimated that 0.39 inches of soil will be lost each year due to erosion. The equation is as follows:

$A = (R)(K)(L)(S)(C)(P)$, where:

A = Tons of soil lost per acre per year = 76.587
R = Rainfall and runoff factor = 275
K = Soil erodibility factor = 0.25
L = Slope length factor = 1.11
S = Slope steepness factor = 5.018
C = Cover management factor = 0.20
P = Support practices factor = 1.0

Average soil density was assumed to be 107.5 pounds per cubic foot. It is assumed that 10 percent of the landfill area will be re-seeded annually. This amounts to re-seeding the entire landfill during the 10 year post-closure period.

Groundwater Monitoring

Groundwater monitoring will continue as currently required. Quarterly and annual samples will be taken and the analytical results forwarded to the ADPC&E.

Leachate Management

Leachate will continue to be disposed in the manner currently permitted. Leachate will be sampled and tested quarterly in accordance with Federal and state requirements. The analytical results will be available to the ADPC&E upon written request.

Gas Monitoring

Monitoring for landfill gas (LFG) will be performed on a quarterly basis throughout the post-closure period to ensure that decomposition gases do not concentrate in buildings on the sanitary landfill property or at the property boundaries. Monitoring will be by means of a portable methane detection unit. In the unlikely event that methane gas is detected at unacceptable levels, the monitoring frequency will be revised to monthly and a contingency plan will be devised and implemented.

Record Keeping

Records will be maintained regarding quarterly site inspections noting dates and inspection results. Records concerning maintenance work, corrective measures, leachate management, gas monitoring, and sampling and analysis of the groundwater and leachate will also be maintained. These records will be made available to ADPC&E personnel upon request.

TABLE 1

SUMMARY OF LABORATORY GEOTECHNICAL ANALYSES

		BORING NO./SAMPLE NO.						
PARAMETER	UNITS	TP-3-2	TP-3-5	TP-3-6	TP-3-12	TP-4-5	TP-4-7	TP-4-9
Depth taken	feet	0-3'	3-5'	2-4'	0-2'	3-4'	1-3'	2-3.5'
Natural moisture	percent	37	29.5	24.5	19.1	25.4	31.8	33.9
Dry unit wt.	pcf	NT	NT	NT	NT	NT	NT	NT
Liquid limit	percent	84	82	79	84	84	61	76
Plastic limit	percent	37	31	48	38	37	20	36
P. Index	percent	47	51	31	46	47	41	40
USCS class.	NA	SM	GC	GM	GM	GM	GC	SM
% Pass. No. 200	percent	42	29.3	18.8	20.7	27.3	35.7	40.6
Opt. moisture	percent	NT	NT	NT	NT	NT	NT	NT
Max. dry density	pcf	NT	NT	NT	NT	NT	NT	NT
Coef. Perm. (k)	cm/sec	NT	NT	NT	NT	NT	NT	NT
k-corrected	cm/sec	NT	NT	NT	NT	NT	NT	NT

Notes:
1. The "k-corrected" is the coefficient of permeability corrected to 20 degrees C.
2. "NA" indicates Not Applicable.
3. "NT" indicates Not Tested.

TABLE 1 - CONTINUED

SUMMARY OF LABORATORY GEOTECHNICAL ANALYSES

		BORING NO./SAMPLE NO.						
PARAMETER	UNITS	TP-4-12	TP-4-13	TP-4-22	TP-4-25	TP-3-8-1	TP-3-9-1	TP-3-11-1
Depth taken	feet	1-3'	0.5-2'	8-10'	4-6'	6'	4.5'	4'
Natural moisture	percent	31.7	23.3	17.8	32	22.2	13.5	21.3
Dry unit wt.	pcf	NT	NT	NT	NT	NT	NT	NT
Liquid limit	percent	82	73	54	87	85	28	31
Plastic limit	percent	30	24	17	36	43	18	16
P. Index	percent	52	49	37	51	42	10	15
USCS class.	NA	GC	GC	GC	GC	GC	GM	GM
% Pass. No. 200	percent	37.3	26.7	25.5	53	31.5	17.3	17.6
Opt. moisture	percent	NT	NT	NT	NT	35	22	22
Max. dry density	pcf	NT	NT	NT	NT	83	103.5	99.5
Coef. Perm. (k)	cm/sec	NT	NT	NT	NT	3.10E-6	5.47E-8	5.63E-7
k-corrected	cm/sec	NT	NT	NT	NT	2.70E-6	4.96E-8	4.90E-7

Notes:
1. The "k-corrected" is the coefficient of permeability corrected to 20 degrees C.
2. "NA" indicates Not Applicable.
3. "NT" indicates Not Tested

TABLE 1 - CONTINUED

SUMMARY OF LABORATORY GEOTECHNICAL ANALYSES

		BORING NO./SAMPLE NO.						
PARAMETER	UNITS	TP-4-1-1	TP-4-3-1	TP-4-6-1	TP-4-6-2	TP-4-17-1	TP-4-17-2	TP-4-19-1
Depth taken	feet	5.5-6.5'	10.5'	4'	4'	4'	4'	8'
Natural moisture	percent	22.6	29.7	29.9	31.7	32.8	45.8	23.3
Dry unit wt.	pcf	NT	NT	NT	NT	NT	84	NT
Liquid limit	percent	82	71	69	NT	82	NT	99
Plastic limit	percent	34	33	33	NT	34	NT	40
P. Index	percent	48	38	36	NT	48	NT	59
USCS class.	NA	GC	GC	GC	NT	GC	NT	GC
% Pass. No. 200	percent	24.7	32.4	27.7	NT	38.6	NT	24.2
Opt. moisture	percent	25.5	32.5	36	NT	38	NT	35
Max. dry density	pcf	93	85	81	NT	78.5	NT	80.5
Coef. Perm. (k)	cm/sec	7.38E-7	9.23E-6	4.92E-6	NT	5.98E-7	NT	1.71E-6
k-corrected	cm/sec	6.56E-7	8.12E-6	4.46E-6	NT	5.42E-7	NT	1.52E-6

Notes:
1. The "k-corrected" is the coefficient of permeability corrected to 20 degrees C.
2. "NA" indicates Not Applicable.
3. "NT" indicates Not Tested

TABLE 1 - CONTINUED

SUMMARY OF LABORATORY GEOTECHNICAL ANALYSES

		BORING NO./SAMPLE NO.				
PARAMETER	UNITS	B-100-2	B-200-1	B-300-1	B-300A-2	B-400-2
Depth taken	feet	4.5'	11'	2.5'	8'	7'
Natural moisture	percent	31	26.1	50.3	21.2	20.9
Dry unit wt.	pcf	NT	NT	NT	NT	NT
Liquid limit	percent	74	61	100	58	66
Plastic limit	percent	21	20	45	16	20
P. Index	percent	53	41	55	42	46
USCS class.	NA	SC	CH	MH	SC	SC
% Pass. No. 200	percent	39	55.7	93.6	43.5	42.5
Opt. moisture	percent	NT	NT	NT	NT	NT
Max. dry density	pcf	NT	NT	NT	NT	NT
Coef. Perm. (k)	cm/sec	NT	NT	NT	NT	NT
k-corrected	cm/sec	NT	NT	NT	NT	NT

Notes:
1. The "k-corrected" is the coefficient of permeability corrected to 20 degrees C.
2. "NA" indicates Not Applicable.
3. "NT" indicates Not Tested

Central Mfg., Inc.

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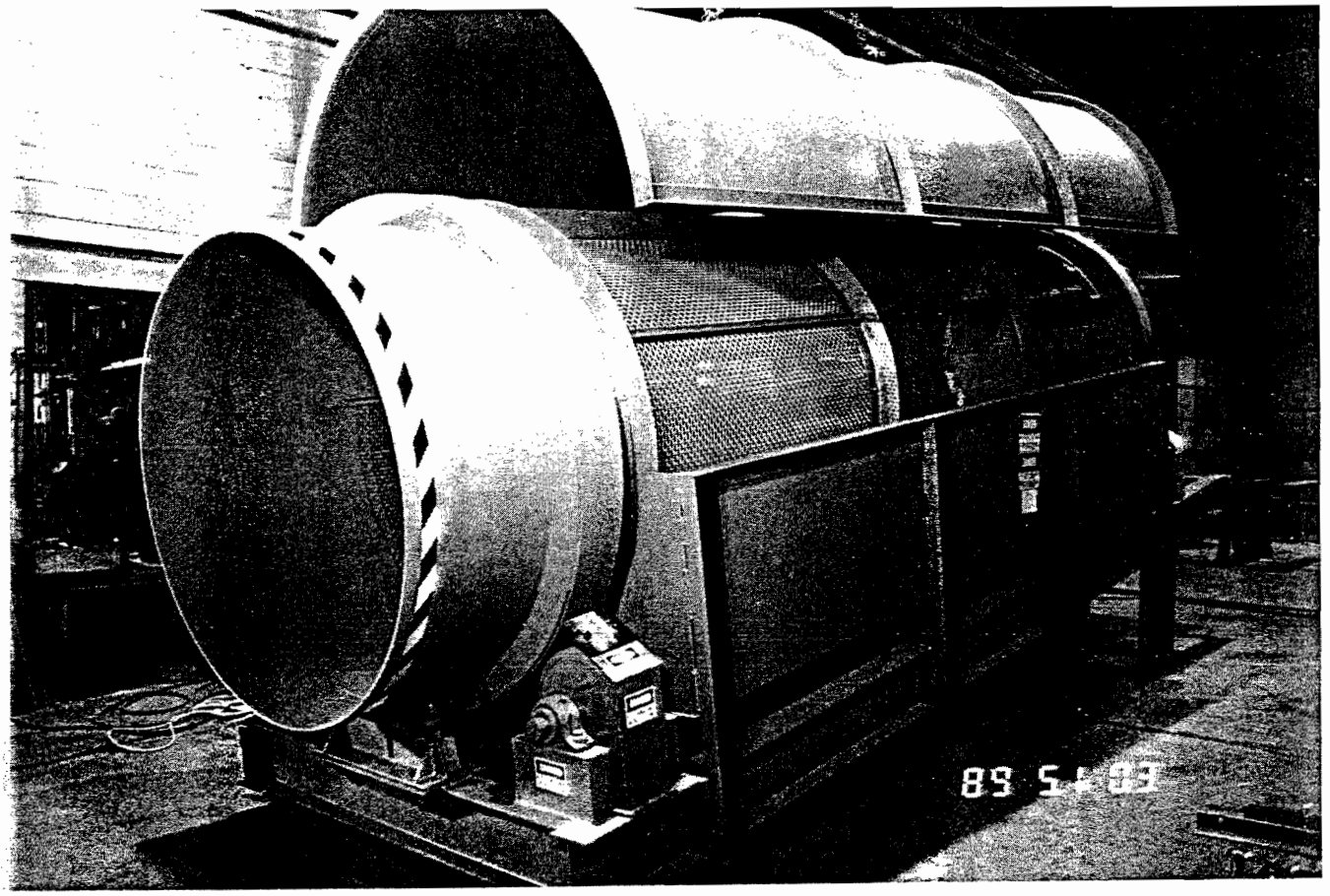

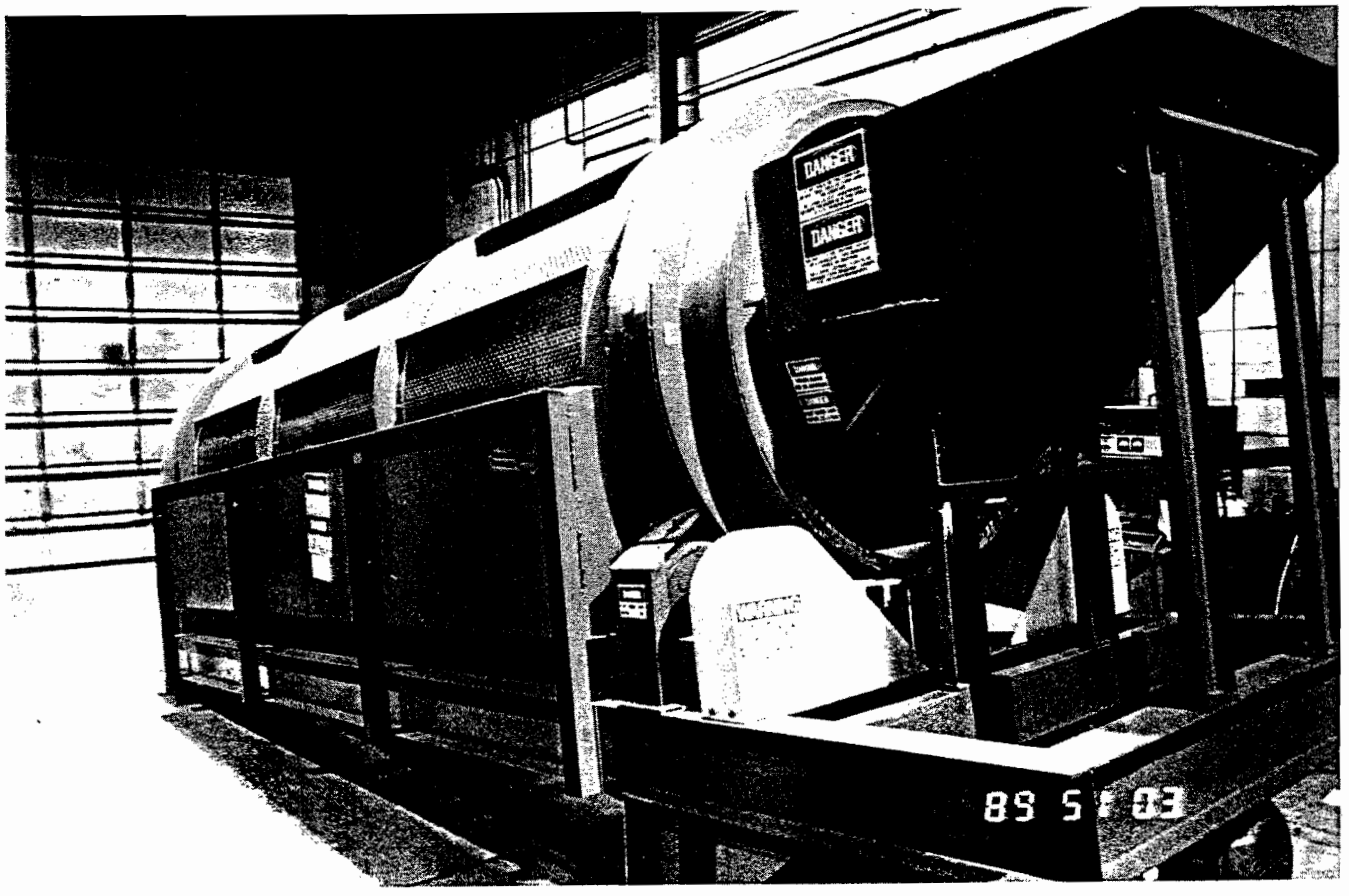

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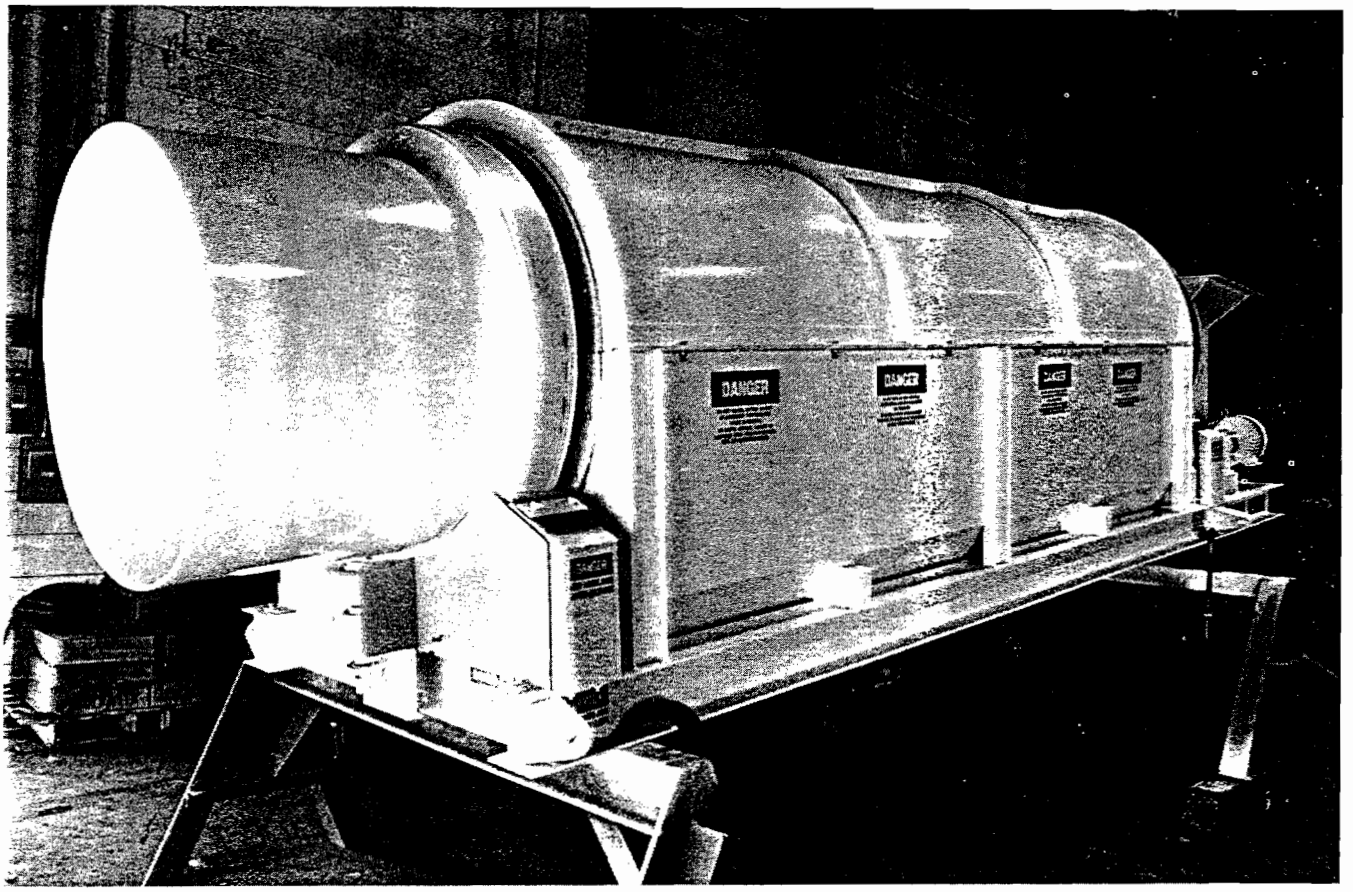

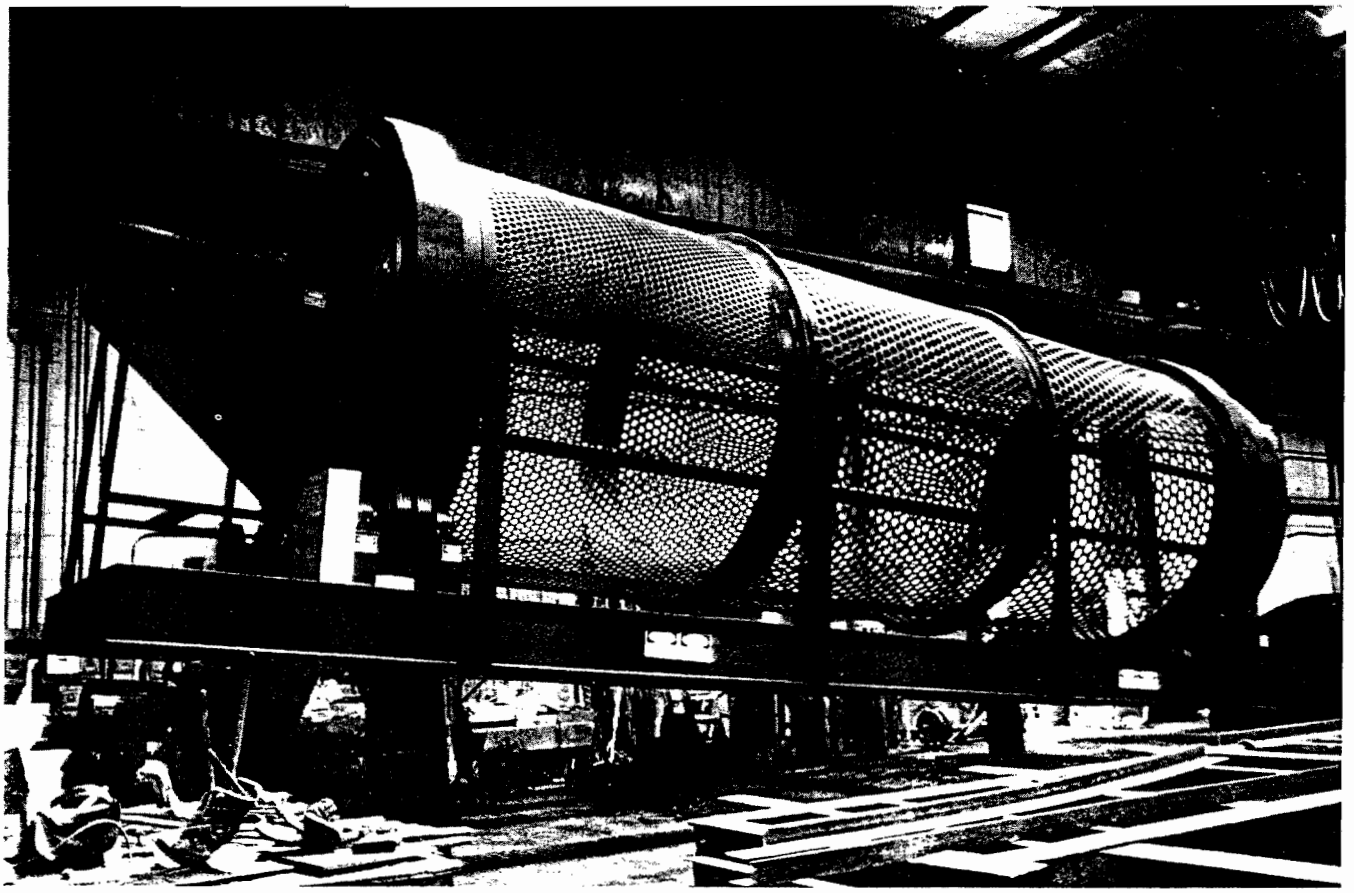

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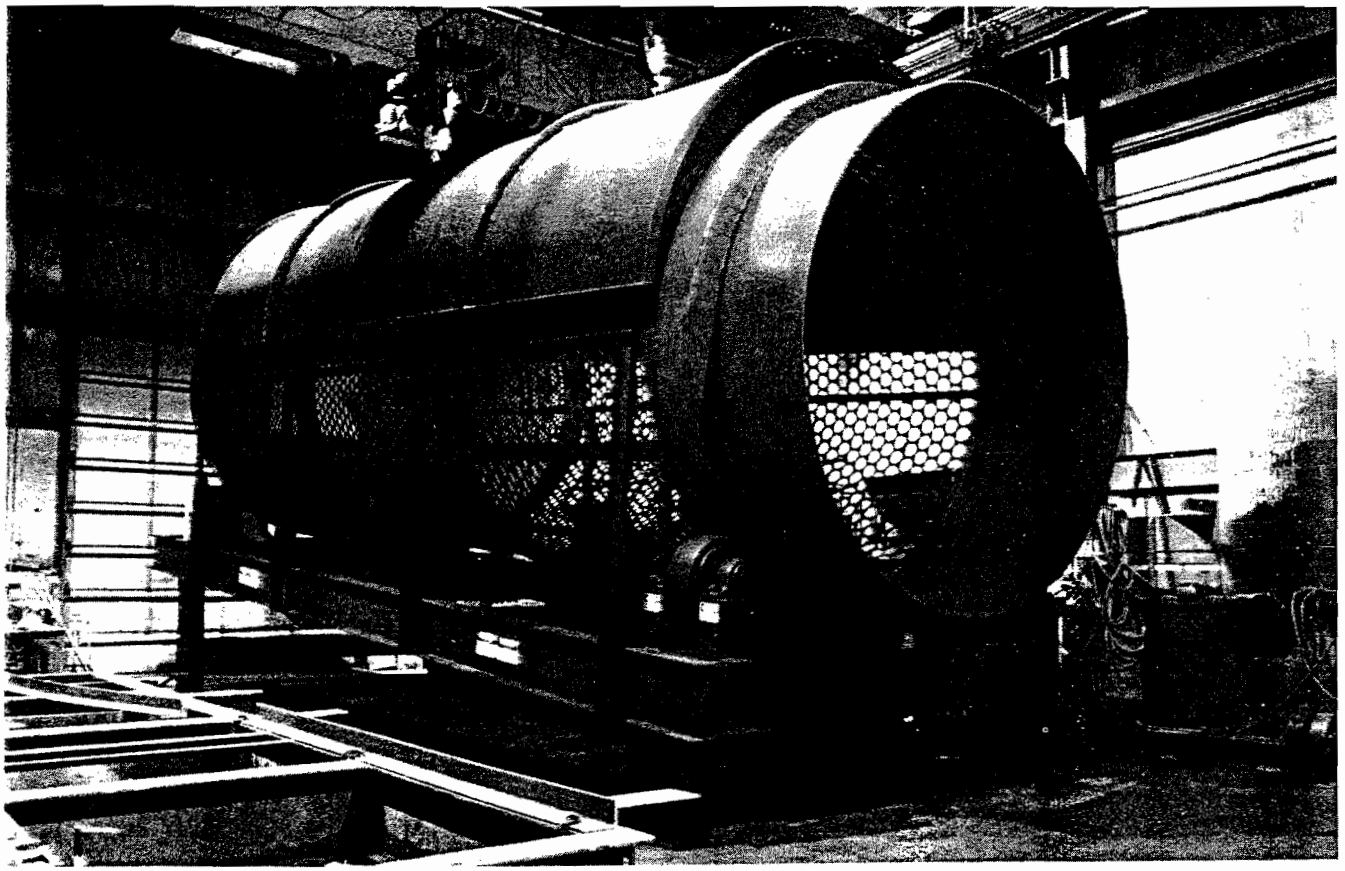

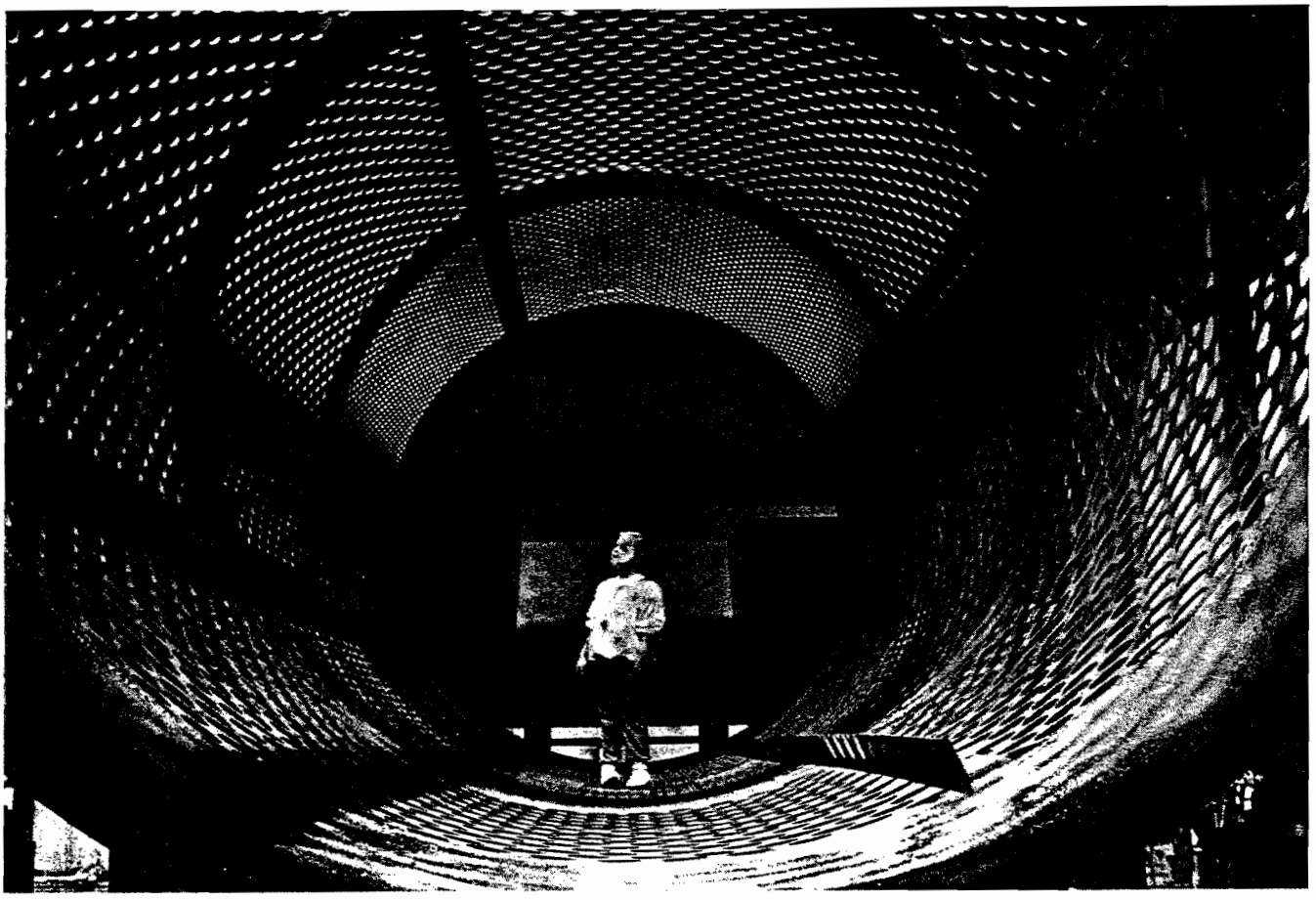

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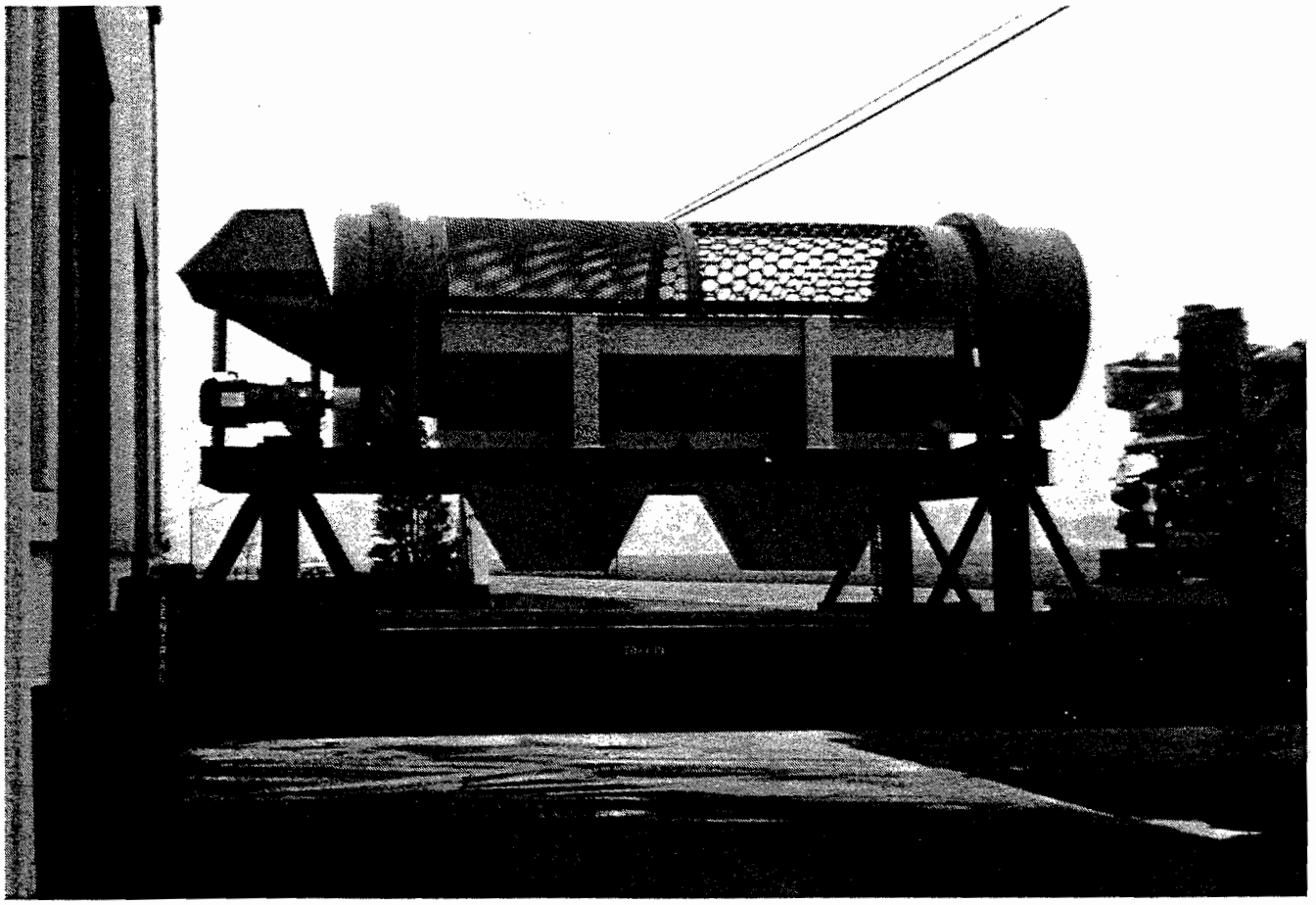

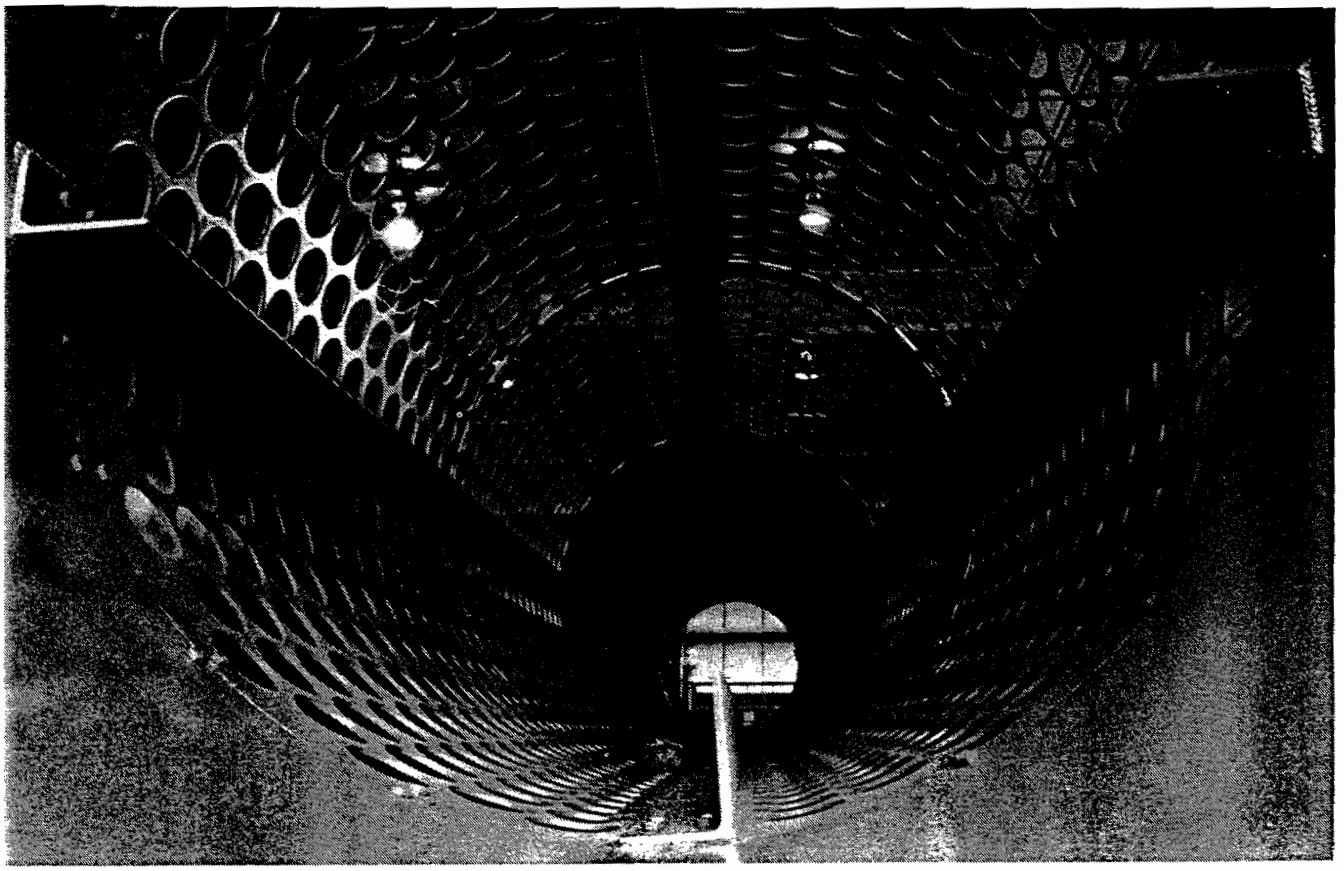

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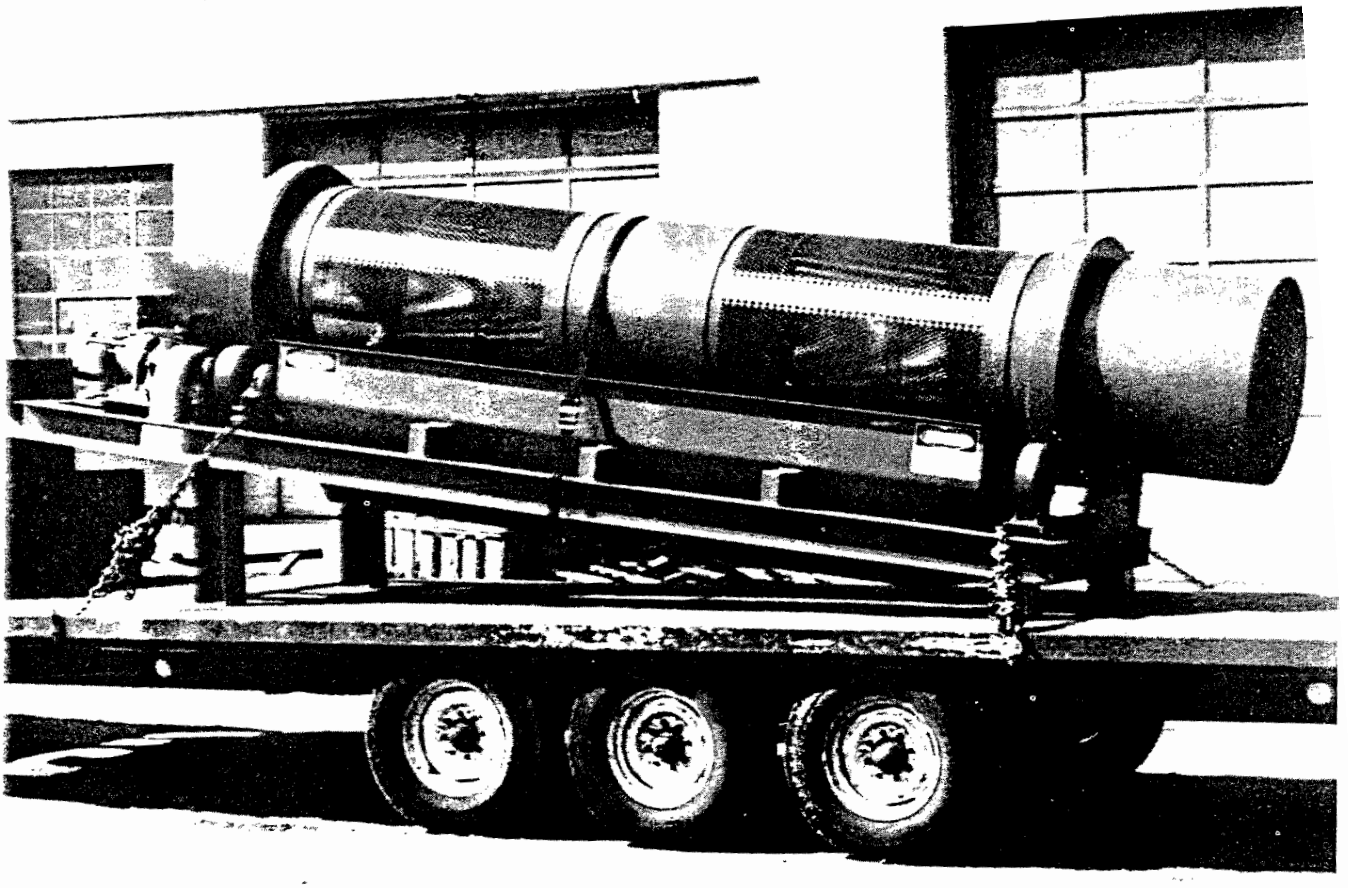
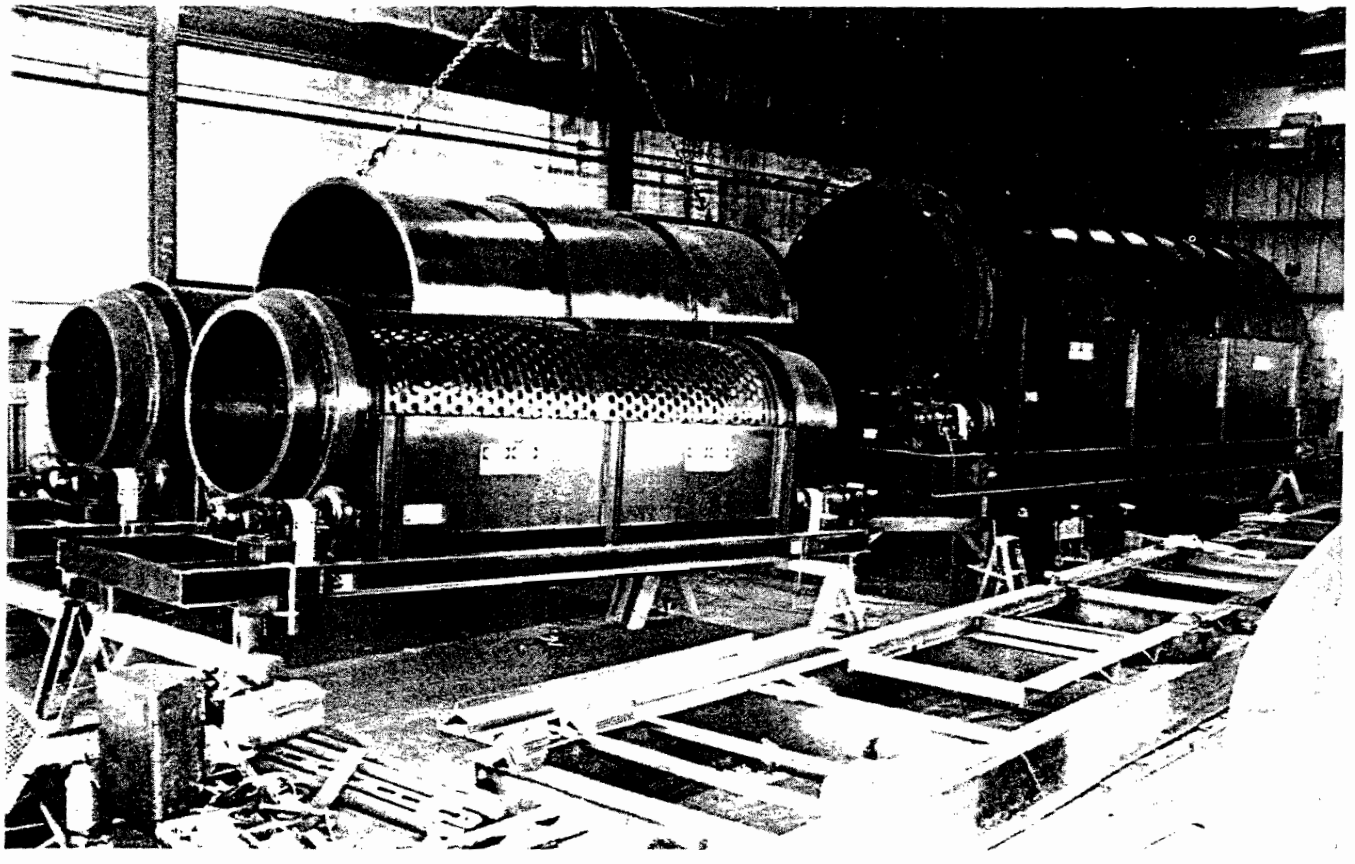




Central Mfg., Inc.

Peoria, Illinois
Fax Number: (309) 387-6941
Phone Number: (309) 387-6591

Fax

FROM

Date 1/30/92 Total Number of Pages _____
(Including cover sheet)

Name William F. Clark Department _____

TO:

Company SCS Engineering

Fax Number (816)941-8025

Name Travis Kiefer

Title or Department _____

COMMENTS

RE: proposal 1912 - 72" x 29'-0" trommel

Central Mfg., Inc.

P.O.Box 1900
Peoria, IL. 61656
309 387-6591

Material Handling Systems

PROPOSAL SCS92-TRM-1912

January 30, 1992

SCS Engineering
10401 Holmes Rd., Suite 400
Kansas City, MO 64131

ATTN: Mr. Travis Keifer

Sir,

We are pleased to submit our proposal for the following:

One (1) *TWO STAGE TROMMEL*

72" diameter x 29'-0" overall barrel length

Construction: 3/8" A36 steel plate, punched and rolled as noted.

1st screen: 1" diameter holes x 15'-0" lg. section with 48% openings and a capacity of 45.5 TPH

2nd screen: 3" diameter holes x 6'-0" lg. section with 51% openings and a capacity of 45.2 TPH

Total capacities:

flow	*97.7 TPH*
volume	*40.7 CFM*
flow speed	*9.8 FPM*

All figures based on a combined weight of 80 lb/cu.ft.

Our proposal includes:

(1) *29'-0" barrel as noted*
(2) *Solid steel tires rolled to barrel diameter*
(4) *18" x 9" trunnions mounted in roller bearings*
(2) *10 HP drives thru SMCYCLO reducers*
(2) *5'-0" lg. slave driven external cleaning brushes*

All mounted on a structural steel base

PRICE: $45,989.00 F.O.B. FACTORY.

OPTIONS:

Infeed chute	ADD:	$1,171.00
Two stage "unders" hopper	ADD:	$5,080.00
Internal lifters	ADD:	$ 915.00
Structural support to elevate discharge point of barrel to 96"	ADD:	$2,833.00
Bolted flange pairs for each section	ADD:	$1,641.00

Any applicable tax to the sale and/or purchase of this equipment is not included in the price stated herein, and if and when any such tax shall be due, it shall be paid by the purchaser without cost or charge to the seller.

Prices subject to review after 30 days.

ALL UNITS ARE FULLY ASSEMBLED AND TEST RUN AT OUR FACILITY AND SHALL BE KNOCKED DOWN ONLY TO MEET SHIPPING REQUIREMENTS.

TERMS: 30% Deposit with purchase order

60% Upon notification of delivery (prior to shipment)

10% After receipt of equipment

Screening efficiency can be affected by surges, and changes in the material characteristics such as moisture, contaminants, and percentage of blinding (build up and clogging of hole pattern). Any percentage of contaminants with equal or less cut point (hole) size may report to the undersized.

Periodic cleaning will be necessary.

The equipment purchaser should decide the safety features to be furnished in order to comply with the state and federal rules and regulations pertaining to the safety, health, and welfare of the worker before a contract with the supplier is signed.

In the end, however, equipment users must supply safeguards that manufacturers cannot supply, and they must also supply safety devices for existing installations to comply with state and federal regulations.

CAUTION: The equipment is proposed for transfer and stockpiling of product only. Sorting or policing flow by personnel is not recommended.

We reserve the right to correct any stenographic errors.

SUBMITTED BY:

Central Manufacturing, Inc.
(An Illinois Corporation)
Peoria, Illinois

_____
(William F. Clark)

Date January 30, 1992

WFC:sh

TO: Central Manufacturing Co., Inc.
P.O. Box 1900
Peoria, IL 61656

DATE:_____

The undersigned manufacture, processor, contractor or agent for a manufacture or processor, hereby certifies to the above Vendor, that the machinery being purchased on this order is deemed to be within the protection of the Commerce Clause of the Constitution of the United States and is not subject to payment of a Sales or Use Tax to the Vendor.

The purchaser understands that it is his liability for any Sales or Use Tax which may accrue as a result of the purchase of this order without paying the Sales or Use Tax to the Vendor.

COMPANY: _____ Sales or Use Tax No._____

Address _____

_____

Signed_____

Central Mfg., Inc.

Peoria, Illinois
Fax Number: (309) 387-6941
Phone Number: (309) 387-6591

Fax

FROM

Date 1-29-92 Total Number of Pages 2 (Including cover sheet)

Name Ron Chandler Department

TO:

Company SCS Engineering

Fax Number 816-941-8025

Name Travis Kiefer

Title or Department

COMMENTS

Requested Trommel Specifications, Per our phone Conversation. Note Price for this unit is: $47,291.00 F.O.B Peoria, IL.

Capacity: 97.7 TPH @ 80#/FT. this would be MAX. Capacity Based on an Even Flow - Deduct 40% for End Loader feeding.

Ron

COMPUTED HORSEPWR:	12.2		REQ'D DRIVE RATIO:	43.0	:1
SELECTED HORSEPWR:	7.5	(2)	SELECTED REDUCER OUT:	40.7	(RPM)
REDUCER TORQUE:	11609	in/#	FINAL DRIVE OUTPUT:	40.7	(RPM)
#1 SECT.CAP:	45.5	(TPH)	ACT. DR. WHEEL SPEED:	40.7	(RPM)
#2 SECT.CAP:	0.0	(TPH)	ACT. TUBE SPEED:	9.3	(RPM)
#3 SECT.CAP:	0.0	(TPH)	SEL. ROTATION SPEED:	9.3	(RPM)
TOTAL FLOW CAP:	97.7	(TPH)	NORM. ROTATION SPEED:	9.3	(RPM)
MAX VOLUME:	40.7	(CFM)	MAX. ROTATION SPEED:	12.5	(RPM)
FLOW RATE:	9.8	(FPM)	TUBE ROTATION SPEED:	175.9	(FPM)
EMPTY WHEEL LOAD:	1879	lbs.			
LOADED WHEEL LOAD:	4462	lbs.	NOSE HT:	96	in
MAX WHEEL LOAD:	5622	lbs.	UNFINISHED TUBE WT:	4253	lbs.
DRIVE WHEEL DIA:	18	in.	84 D. TUBE MAT'L:	0.375	inches

****

i-17-92 tym5 CENTRAL MFG., INC. 29-Jan-92
P. O. Box 1900 ROTARY TROMMEL B/M Peoria, IL 61656

Customer # Machine No: A
SCS ENGINEERING Type: TRM
Color: STD
Drive: RIGHT HAND
TOT WT: 13662

LENGTH:	22 feet	#1 SECT. LNG:	15 feet			
DIAMETER:	72 inches	#1 SECT.OP'NG:	1 inches	1.375		48.0%
SLOPE:	5 degrees	#2 SECT. LNG:	feet			
COMB.WT:	80 lb/cu.ft.	#2 SECT.OP'NG:	inches	0.000		100.0%
#1 SECT.WT:	80 lb/cu.ft.	#3 SECT. LNG:	feet			
#2 SECT.WT:	lb/cu.ft.	#3 SECT.OP'NG:	inches	0.000		100.0%
#3 SECT.WT:	lb/cu.ft.	MAX LUMP SIZE:	6 inches			

Central Mfg., Inc.

Material Handling Systems

P.O.Box 1900
Peoria, IL. 61656
309 387-6591

1-15-92

SCS Engineering, Inc
10401 Holmes Rd., Suite 400
Kansas City, MO 64131

Attn: Travis Keefer

Travis,

Per our phone conversation today, I have run a specification check for a single stage trommel meeting the same flow requirements as discussed earlier.

This unit will be 84" x 22'-0" lg, with 15'-0" of 1" dia. holes. Drive size will be (2) 7 1/2 hp gearmotor drives. Price includes feed chute, discharge hopper, cleaning brush (10'-0"), and support system for 8'-0" discharge height. No motor controls are included.

Price is $56,607.00 F.O.B. Peoria, IL.

Sincerely,

Ron Chandler

Ron chandler

Central Mfg., Inc.

P.O.Box 1900
Peoria, IL. 61656
309 387-6591

PROPOSAL SCS92-1903

January 14, 1992

SCS Engineering, Inc.
10401 Holmes Rd., Suite 400
Kansas City, MO 64131

ATTN: Mr. Travis Keeker

Sir,

We are pleased to quote the following machinery for a soil separation system as follows and as shown on the enclosed arrangement print.

Item A One (1) 36" TROUGHING CONVEYOR
with wheel supports for feeding material to trommel

Item B One (1) 84" TWO STAGE TROMMEL
with support frame and wheels

Item C One (1) 36" TROUGHING CONVEYOR
with wheel support to stockpile "over" material

Item D One (1) 36" TROUGHING CONVEYOR
to transport "unders" material

Item E Two (2) 36" TROUGHING CONVEYORS
to transport under material to stockpile

All miscellaneous hoppers, chutes and supports as shown.

PRICE FOR SYSTEM: $131,000.00 F.O.B. FACTORY.

OPTION (for trommel only)
Two (2) SLAVE DRIVEN CLEANING BRUSHES each 5'-0" lg.
ADD: $5,000.00

Prices subject to review after 60 days.

Any applicable tax to the sale and/or purchase of this equipment is not included in the price stated herein, and if and when any such tax shall be due, it shall be paid by the purchaser without cost or charge to the seller.

TERMS: 30% Deposit with purchase order

60% Upon notification of delivery (prior to shipment)

10% After receipt of equipment

AVAILABILITY: 10 to 12 weeks after receipt of order and approved plans.

The equipment purchaser should decide the safety features to be furnished in order to comply with the state and federal rules and regulations pertaining to the safety, health, and welfare of the worker before a contract with the supplier is signed.

In the end, however, equipment users must supply safeguards that manufacturers cannot supply, and they must also supply safety devices for existing installations to comply with state and federal regulations.

Screening efficiency can be affected by surges, and changes in the material characteristics such as moisture, contaminants, and percentage of blinding (build up and clogging of hole pattern). Any percentage of contaminants with equal or less cut point (hole) size may report to the undersized. Periodic cleaning will be necessary.

ALL CONVEYORS ARE FULLY ASSEMBLED AND TEST RUN AT OUR FACILITY AND SHALL BE KNOCKED DOWN ONLY TO MEET LEGAL SHIPPING REQUIREMENTS.

CONVEYOR SPECIFICATIONS

Conveyor A One required
- Dimensions: 36" width x 36'-0" overall length
- Speed: 100 FPM
- HP: 7.5
- Capacity: 600 TPH

Conveyor C One required
- Dimensions: 36" width x 21'-0" overall length
- Speed: 60 FPM
- HP 3.0
- Capacity: 360 TPH

Conveyor D One required
- Dimensions: 36" width x 16'-0" overall length
- Speed: 67 FPM
- HP 2.0
- Capacity: 360 TPH

Conveyor E Two required
- Dimensions: 36" width x 25'-0" overall length
- Speed: 67 FPM
- HP 5.0
- Capacity: 360 TPH

TROMMEL SPECIFICATION

One TWO STAGE TROMMEL
84" diameter x 29'-0" overall barrel length

Construction: 1/2" A36 steel plate, punched and rolled as follows.

1st screen: 1" diameter holes x 15'-0" lg. section with 48% openings, having a capacity of 70.8 TPH

2nd screen: 3" diameter holes x 6'-0" lg. section with 51% openings, having a capaicty of 70.3 TPH

(Trommel specifications cont.)

Total capacities:

flow	168.2 TPH
volume	56.1 CFM
flow speed	9.9 FPM

All figures based on a combined weight of 100 lbs/cu.ft.

Our proposal includes:

(1) two stage barrel as noted
(2) solid steel rolled tires
(4) 18" x 9" trunnions, mounted in roller bearings
(2) 10 HP drives thru SMCYCLO reducers
All mounted on a structural steel frame as shown.

We reserve the right to correct any stenographic errors.

SUBMITTED BY:

Central Manufacturing, Inc.
(An Illinois Corporation)
Peoria, Illinois

William F. Clark
(William F. Clark)

Date January 14, 1992

TO: Central Manufacturing Co., Inc.
P.O. Box 1900
Peoria, IL 61656

DATE:_____

The undersigned manufacture, processor, contractor or agent for a manufacture or processor, hereby certifies to the above Vendor, that the machinery being purchased on this order is deemed to be within the protection of the Commerce Clause of the Constitution of the United States and is not subject to payment of a Sales or Use Tax to the Vendor.

The purchaser understands that it is his liability for any Sales or Use Tax which may accrue as a result of the purchase of this order without paying the Sales or Use Tax to the Vendor.

COMPANY: _____ Sales or Use Tax No._____

_____

Address _____

_____

Signed_____

Central Mfg., Inc.
P.O.Box 1900
Peoria, IL. 61656
309 387-6591

PROPOSAL SCS92-1903

January 14, 1992

SCS Engineering, Inc.
10401 Holmes Rd., Suite 400
Kansas City, MO 64131

ATTN: Mr. Travis Keeker

Sir,

We are pleased to quote the following machinery for a soil separation system as follows and as shown on the enclosed arrangement print..

Item A One (1) 36" TROUGHING CONVEYOR
with wheel supports for feeding material to trommel

Item B One (1) 84" TWO STAGE TROMMEL
with support frame and wheels

Item C One (1) 36" TROUGHING CONVEYOR
with wheel support to stockpile "over" material

Item D One (1) 36" TROUGHING CONVEYOR
to transport "unders" material

Item E Two (2) 36" TROUGHING CONVEYORS
to transport under material to stockpile

All miscellaneous hoppers, chutes and supports as shown.

PRICE FOR SYSTEM: $131,000.00 F.O.B. FACTORY.

OPTION (for trommel only)
Two (2) SLAVE DRIVEN CLEANING BRUSHES each 5' 0" lg.
ADD: $5,000.00

Prices subject to review after 60 days.

APPENDIX B

SAMPLE DRAINAGE CALCULATIONS

Runoff Calculations

Using the Rational Method:

$Q = CiA$

Where: Q = Flow Rate in cubic feet per second.
C = Runoff Coefficient (dimensionless).
i = Rainfall Intensity in inches per hour.
A = Drainage Area in acres.

All values used for runoff coefficients and intensities for the ditch and let-down calculations, unless otherwise indicated, are from the Arkansas Highway and Transportation Department Design Manual. Precipitation values were obtained from Technical Bulletin #40, United States Weather Bureau, for the siltation basin calculations.

C = C (for 25 year storm, bare ground) = 0.80

i = rainfall intensity (for peak flow use T_c = 5 min.) = 9.30 in/hr

A = 9.1 acres for Site 3 East side drainage ditch (3ESDD)
6.0 acres for Site 3 East side let-down ditch (3ESLD)
13.5 acres for Site 3 West side drainage ditch (3WSDD)
5.7 acres for Site 3 West side let-down ditch (3WSLD)
23.0 acres for Site 4 North side drainage ditch (4NSDD)
7.2 acres for Site 4 Northeast let-down ditch (4NELD)
8.6 acres for Site 4 Southeast drainage ditch (4SEDD)
7.7 acres for Site 4 Southeast let-down ditch (4SELD)
9.6 acres for Site 4 Southwest drainage ditch (4SWDD)
5.2 acres for Site 4 Southwest let-down ditch (4SWLD)
10.0 acres for Site 4 Northwest drainage ditch (4NWDD)
2.8 acres for Site 4 Northwest let-down ditch (4NWLD)

Q = 0.80 x 9.30 in/hr x --- acres =
67.7 cubic feet/second (cfs) for 3ESDD
44.6 cfs for 3ESLD
100.4 cfs for 3WSDD
42.4 cfs for 3WSLD
171.1 cfs for 4NSDD
53.6 cfs for 4NELD
64.0 cfs for 4SEDD
57.3 cfs for 4SELD
71.4 cfs for 4SWDD
38.7 cfs for 4SWLD
74.4 cfs for 4NWDD
20.8 cfs for 4NWLD

Sizing Calculations for Ditches

Typical detail of a drainage ditch is shown on Drawing 7 of 15 of the engineering drawings. As can be seen from the FLOWMASTER output, the 8 feet wide, flat bottom ditches will be adequate for use throughout the site.

Sizing Calculations for Siltation Basins

Using the Rational Method:

$Q = CiA$

Where: Q = Flow Rate in cubic feet per second.
C = Runoff Coefficient (dimensionless).
i = Rainfall Intensity in inches per hour.
A = Drainage Area in acres.

C = C (for 25 year storm, average vegetation) = 0.60

i = rainfall intensity (from Technical Bulletin #40, United States Weather Bureau) for 25-year 24-hour rainfall
= 7 inches/ 24-hours = 7 in./day

A = 39 acres for Site 4 East Basin (4EB)
26 acres for Site 4 South Basin (4SB)
49 acres for Site 3 South Basin (3SB)

Q = 0.60 x 7 in./day. x -- acres =
168.5 acre-inches for 4EB
112.3 acre-inches for 4SB
211.7 acre-inches for 3SB

Spillway elevation needed to accommodate the volume from a 25 year 24 hour storm:

4EB Elevation = 1218.95 feet.

4SB Elevation = 1175.00 feet.

3SB Elevation = 1198.00 feet.

Since the drainage area for the Site 4 Northeast Siltation Basin (4NESB) natural or undisturbed, a runoff coefficient of 0.40 was used:

C = C (for 25 year storm, better vegetation) = 0.40

i = rainfall intensity (from Technical Bulletin #40, United States Weather Bureau) for 10-year 24-hour rainfall
= 7 inches/ 24-hours = 7 in./day

A = 18.25 acres for 4NESB

Q = 0.40 x 7 x 18.25 = 51.10 acre-in/day = 2.15 cfs

The pond must contain 51.10 acre-in. The discharge pipe must be able to handle 2.15 cfs. The 25-year 24-hour storm elevation is 1213.07 feet. The discharge pipe inlet elevation will be set at 1213.10 feet.

A corrugated steel pipe (CSP) will be used for the discharge pipe. An 18-inch diameter CSP will be put into service as a discharge pipe since a spillway for this pond would be impracticle. The 18-inch diameter CSP will have a gate valve at the discharge end to control outflow and to ensure sufficient settling of silt and clay particles occur prior to discharge.

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4NSDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0875 ft/ft
Discharge.....	171.10 cfs

Computed Results:

Depth.....	1.22 ft
Velocity.....	12.08 fps
Flow Area.....	14.17 sf
Flow Top Width...	15.30 ft
Wetted Perimeter.	15.69 ft
Critical Depth...	1.90 ft
Critical Slope...	0.0159 ft/ft
Froude Number....	2.21 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4NWLD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1970 ft/ft
Discharge.....	20.80 cfs

Computed Results:

Depth.....	0.29 ft
Velocity.....	7.99 fps
Flow Area.....	2.60 sf
Flow Top Width...	9.76 ft
Wetted Perimeter.	9.85 ft
Critical Depth...	0.55 ft
Critical Slope...	0.0221 ft/ft
Froude Number....	2.73 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4NWDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0200 ft/ft
Discharge.....	74.40 cfs

Computed Results:

Depth.....	1.16 ft
Velocity.....	5.61 fps
Flow Area.....	13.25 sf
Flow Top Width...	14.93 ft
Wetted Perimeter.	15.31 ft
Critical Depth...	1.19 ft
Critical Slope...	0.0180 ft/ft
Froude Number....	1.05 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4SWLD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1650 ft/ft
Discharge.....	38.70 cfs

Computed Results:

Depth.....	0.44 ft
Velocity.....	9.36 fps
Flow Area.....	4.14 sf
Flow Top Width...	10.66 ft
Wetted Perimeter.	10.80 ft
Critical Depth...	0.81 ft
Critical Slope...	0.0199 ft/ft
Froude Number....	2.65 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4SWDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0640 ft/ft
Discharge.....	71.40 cfs

Computed Results:

Depth.....	0.82 ft
Velocity.....	8.31 fps
Flow Area.....	8.59 sf
Flow Top Width...	12.93 ft
Wetted Perimeter.	13.19 ft
Critical Depth...	1.16 ft
Critical Slope...	0.0181 ft/ft
Froude Number....	1.80 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4SELD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1730 ft/ft
Discharge.....	57.30 cfs

Computed Results:

Depth.....	0.55 ft
Velocity.....	10.85 fps
Flow Area.....	5.28 sf
Flow Top Width...	11.29 ft
Wetted Perimeter.	11.46 ft
Critical Depth...	1.02 ft
Critical Slope...	0.0187 ft/ft
Froude Number....	2.79 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4SEDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0590 ft/ft
Discharge.....	64.00 cfs

Computed Results:

Depth.....	0.79 ft
Velocity.....	7.81 fps
Flow Area.....	8.20 sf
Flow Top Width...	12.74 ft
Wetted Perimeter.	13.00 ft
Critical Depth...	1.09 ft
Critical Slope...	0.0184 ft/ft
Froude Number....	1.72 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 4NELD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1670 ft/ft
Discharge.....	53.60 cfs

Computed Results:

Depth.....	0.53 ft
Velocity.....	10.48 fps
Flow Area.....	5.11 sf
Flow Top Width...	11.20 ft
Wetted Perimeter.	11.37 ft
Critical Depth...	0.98 ft
Critical Slope...	0.0189 ft/ft
Froude Number....	2.73 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 3WSLD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1560 ft/ft
Discharge.....	42.40 cfs

Computed Results:

Depth.....	0.47 ft
Velocity.....	9.48 fps
Flow Area.....	4.47 sf
Flow Top Width...	10.85 ft
Wetted Perimeter.	11.00 ft
Critical Depth...	0.85 ft
Critical Slope...	0.0196 ft/ft
Froude Number....	2.60 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 3WSDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0670 ft/ft
Discharge.....	100.40 cfs

Computed Results:

Depth.....	0.98 ft
Velocity.....	9.38 fps
Flow Area.....	10.71 sf
Flow Top Width...	13.87 ft
Wetted Perimeter.	14.19 ft
Critical Depth...	1.41 ft
Critical Slope...	0.0172 ft/ft
Froude Number....	1.88 (flow is Supercritical)

Open Channel Flow Module, Version 3.16 (c) 1990
Haestad Methods, Inc. * 37 Brookside Rd * Waterbury, Ct 06708

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 3ESDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0860 ft/ft
Discharge.....	67.70 cfs

Computed Results:

Depth.....	0.73 ft
Velocity.....	9.04 fps
Flow Area.....	7.49 sf
Flow Top Width...	12.40 ft
Wetted Perimeter.	12.64 ft
Critical Depth...	1.13 ft
Critical Slope...	0.0183 ft/ft
Froude Number....	2.05 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 3ESLD

Comment: 3ESLD

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.1160 ft/ft
Discharge.....	44.60 cfs

Computed Results:

Depth.....	0.53 ft
Velocity.....	8.73 fps
Flow Area.....	5.11 sf
Flow Top Width...	11.19 ft
Wetted Perimeter.	11.37 ft
Critical Depth...	0.88 ft
Critical Slope...	0.0195 ft/ft
Froude Number....	2.28 (flow is Supercritical)

Trapezoidal Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: 3ESDD

Comment: SUNRAY

Solve For Depth

Given Input Data:

Bottom Width.....	8.00 ft
Left Side Slope..	3.00:1 (H:V)
Right Side Slope.	3.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0860 ft/ft
Discharge.....	67.70 cfs

Computed Results:

Depth.....	0.73 ft
Velocity.....	9.04 fps
Flow Area.....	7.49 sf
Flow Top Width...	12.40 ft
Wetted Perimeter.	12.64 ft
Critical Depth...	1.13 ft
Critical Slope...	0.0183 ft/ft
Froude Number....	2.05 (flow is Supercritical)

Triangular Channel Analysis & Design
Open Channel - Uniform flow

Worksheet Name: BENCHES

Comment: SUNRAY

Solve For Depth

Given Input Data:

Left Side Slope..	4.00:1 (H:V)
Right Side Slope.	6.00:1 (H:V)
Manning's n.....	0.034
Channel Slope....	0.0150 ft/ft
Discharge.....	15.00 cfs

Computed Results:

Depth.....	0.96 ft
Velocity.....	3.24 fps
Flow Area.....	4.63 sf
Flow Top Width...	9.62 ft
Wetted Perimeter.	9.82 ft
Critical Depth...	0.89 ft
Critical Slope...	0.0227 ft/ft
Froude Number....	0.82 (flow is Subcritical)

APPENDIX C

SOIL BALANCE VOLUME SHEET

SITE 3 FILL VOLUME

STATION	AREA	SUM	K	VOLUME
0+30	0			
		1,081	1.2963	1,401
1+00	1,081			
		3,483	1.8519	6,450
2+00	2,402			
		6,408	1.8519	11,867
3+00	4,006			
		9,792	1.8519	18,134
4+00	5,786			
		15,366	1.8519	28,456
5+00	9,580			
		22,613	1.8519	41,877
6+00	13,033			
		28,040	1.8519	51,927
7+00	15,007			
		30,379	1.8519	56,259
8+00	15,372			
		30,087	1.8519	55,718
9+00	14,715			
		28,640	1.8519	53,038
10+00	13,925			
		24,794	1.8519	45,916
11+00	10,869			
		11,937	1.8519	22,106
12+00	1,068			
		1,068	0.5556	593
12+30	0			
SITE 3 FILL VOLUME				393,744

SITE 4 FILL VOLUME

STATION	AREA	SUM	K	VOLUME
-0+22	0			
		916	0.4074	373
0+00	916			
		3,202	1.2963	4,151
1+00	2,286			
		6,699	1.8519	12,406
2+00	4,413			
		14,471	1.8519	26,799
3+00	10,058			
		26,898	1.8519	49,812
4+00	16,840			
		37,649	1.8519	69,722
5+00	20,809			
		42,607	1.8519	78,904
6+00	21,798			
		43,965	1.8519	81,419
7+00	22,167			
		45,103	1.8519	83,526
8+00	22,936			
		49,948	1.8519	92,499
9+00	27,012			
		56,484	1.8519	104,603
10+00	29,472			
		52,452	1.8519	97,136
11+00	22,980			
		43,342	1.8519	80,265
12+00	20,362			
		38,645	1.8519	71,567
13+00	18,283			
		33,711	1.8519	62,429

14+00	15,428			
		27,753	1.8519	51,396
15+00	12,325			
		18,082	1.8519	33,486
16+00	5,757			
		7,305	1.8519	13,528
17+00	1,548			
		1,548	0.3148	487
17+17	0			
SITE 4 FILL VOLUME				1,014,508

STATION	AREA	SUM	K	VOLUME
16+30	0			
		4,276	0.8333	3,563
17+00	4,276			
		18,435	1.8519	34,140
18+00	14,159			
		29,333	1.8519	54,322
19+00	15,174			
		29,170	1.8519	54,020
20+00	13,996			
		25,104	1.8519	46,490
21+00	11,108			
		18,397	1.8519	34,069
22+00	7,289			
		13,075	1.8519	24,214
23+00	5,786			
		12,117	1.8519	22,439
24+00	6,331			
		16,998	1.8519	31,479
25+00	10,667			
		20,416	1.8519	37,808
26+00	9,749			
		15,441	1.8519	28,595
27+00	5,692			
		6,103	1.8519	11,302
28+00	411			
		411	0.2222	91
28+12	0			
SITE 4 CLASS IV EXCAVATION				382,533

STATION	AREA	SUM	K	VOLUME
16+45	0			
		2,637	0.8333	2,197
17+00	2,637			
		15,758	1.8519	29,182
18+00	13,121			
		29,095	1.8519	53,881
19+00	15,974			
		30,682	1.8519	56,820
20+00	14,708			
		29,442	1.8519	54,524
21+00	14,734			
		25,884	1.8519	47,935
22+00	11,150			
		17,776	1.8519	32,919
23+00	6,626			
		7,189	1.8519	13,313
24+00	563			
		563	1.8519	1,043
25+00	0			
SITE 4 CLASS IV FILL VOLUME				291,814

STATION	AREA	SUM	K	VOLUME
0+00	0			
		1,744	1.2963	2,261
1+00	1,744			
		4,825	1.8519	8,935
2+00	3,081			
		6,674	1.8519	12,360
3+00	3,593			
		6,567	1.8519	12,161
4+00	2,974			
		5,584	1.8519	10,341
5+00	2,610			
		4,938	1.8519	9,145
6+00	2,328			
		4,749	1.8519	8,795
7+00	2,421			
		3,996	1.8519	7,400
8+00	1,575			
		2,602	1.8519	4,819
9+00	1,027			
		1,505	1.8519	2,787
10+00	478			
		478	1.8519	885
11+00	0			
SITE 3 BORROW AREA				79,889

SITE 4 NORTH BORROW AREA

STATION	AREA	SUM	K	VOLUME
-8+42	0			
		316	0.7778	246
-8+00	316			
		4,606	1.8519	8,530
-7+00	4,290			
		12,607	1.8519	23,347
-6+00	8,317			
		20,228	1.8519	37,460
-5+00	11,911			
		27,562	1.8519	51,042
-4+00	15,651			
		33,729	1.8519	62,463
-3+00	18,078			
		37,894	1.8519	70,176
-2+00	19,816			
		40,528	1.8519	75,054
-1+00	20,712			
		41,907	1.8519	77,608
0+00	21,195			
		42,032	1.8519	77,839
1+00	20,837			
		42,373	1.8519	78,471
2+00	21,536			
		42,661	1.8519	79,004
3+00	21,125			

		41,328	1.8519	76,535
4+00	20,203			
		35,251	1.8519	65,281
5+00	15,048			
		21,282	1.8519	39,412
6+00	6,234			
		6,234	1.7778	11,083
6+96	0			
SITE 4 NORTH BORROW AREA				833,550

APPENDIX D

ENGINEERING DRAWINGS
(Bound Separately)

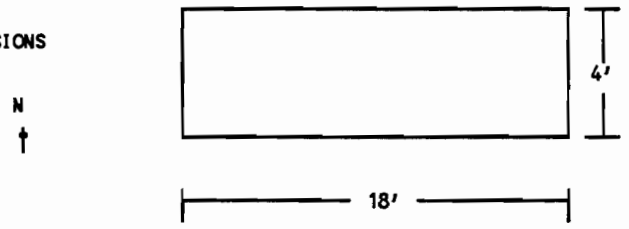
APPENDIX E

TEST PIT LOGS

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-1	ELEVATION: 1237.89	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/8/91	DATE FINISHED: 11/8/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 10.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

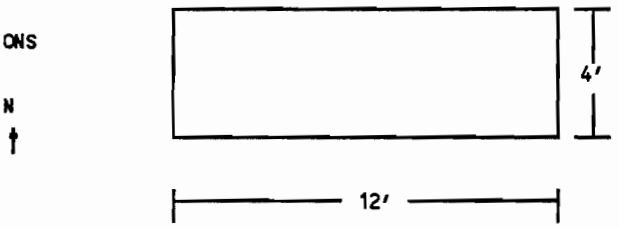
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic CLAY with small amount of cobble size Cherty LIMESTONE					
2		Gray, slightly silty, highly plastic CLAY, intermixed with white, weathered Cherty LIMESTONE (Approx. 50% Clay, 50% Limestone)	2				
4			4				
6		White, weathered, Cherty LIMESTONE intermixed with red, highly plastic red CLAY. Predominantly LIMESTONE	6				
8			8				
10		Bottom of Test Pit at 10.5′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-2	ELEVATION: 1224.60	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/8/91	DATE FINISHED: 11/8/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

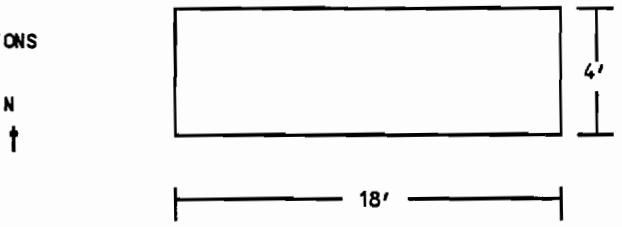
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic CLAY intermixed with white, weathered, Cherty LIMESTONE Predominantly CLAY	0				
2			2				
4		White, Cherty LIMESTONE intermixed with red, highly plastic CLAY. Predominantly LIMESTONE	4				
6		White, weathered Cherty LIMESTONE intermixed with white low plastic CLAY and red high plastic CLAY. Predom. LS	6				
8		Bottom of Test Pit at 8′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-3	ELEVATION: 1234.56	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.0′	ROCK DEPTH:

PLAN DIMENSIONS



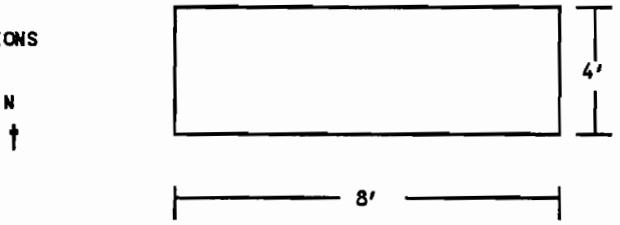
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown, Silty CLAY intermixed with small amount of whithe, weathered Cherty LIMESTONE.					
2		Reddish brown, highly plastic CLAY intermixed with pebble and cobble size White weathered Cherty LIMESTONE pieces	2				
4		Light Tan, dessicated CLAY intermixed with much white, weathered Cherty L.S.	4				
6		White, weathered Cherty LIMESTONE	6				
8		Cobble and Boulder size white weathered Cherty LIMESTONE, intermixed with red high plastic CLAY. Predominantly L.S.	8				
10			10				
12		Bottom of test pit at 12′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-4	ELEVATION: 1221.76	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 2.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

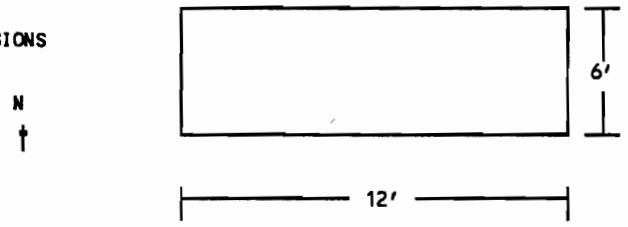
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		White, Cherty L.S. intermixed with small amount of red high plastic CLAY. Predomiantly LIMESTONE					
2		Bottom of test pit at 2′	2				
4			4				
6			6				
8			8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-5	ELEVATION: 1251.66	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8.0′	ROCK DEPTH:

PLAN DIMENSIONS



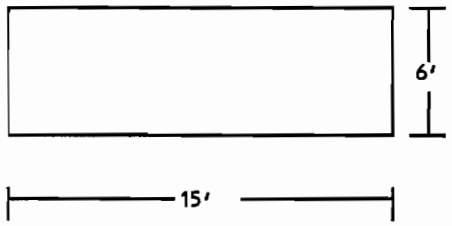
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Med. Brown highly plastic Silty CLAY small amount of white Cherty L.S.					
2		Red, highly plastic CLAY intermixed with L.S.: white/gray, weathered Cherty	2				
4			4				
6			6				
8		LIMESTONE: Gray, Cherty Bottom of test pit at 8′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-6	ELEVATION: 1229.06	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/08/91	DATE FINISHED: 11/08/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 11′	ROCK DEPTH:

PLAN DIMENSIONS



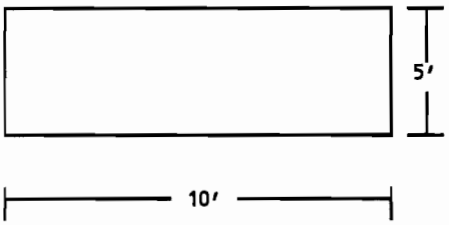
NO. SMPLS	DIST.		
WATER	FIRST		

PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic CLAY intermixed with LIMESTONE: pebble, cobble and boulder sized, white, weathered. Boulders up to 24"					
2			2				
4			4				
6		LIMESTONE: White, weathered, Cherty	6				
		Red, highly plastic CLAY intermixed with LIMESTONE: weathered, Cherty					
8		LIMESTONE: White, weathered, Cherty	8				
		Red, highly plastic CLAY intermixed with LIMESTONE: weathered, Cherty					
10			10				
		Bottom of test pit at 11′					
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-7	ELEVATION: 1219.13	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 5.0'	ROCK DEPTH:
PLAN DIMENSIONS		NO. SMPLS / DIST.	WATER / FIRST
		PERSONNEL Joe Hoffmeister	

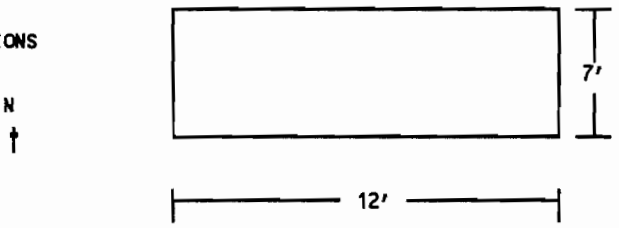


DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, high plastic CLAY intermixed w/ L.S.: white, weathered, Cherty					
2		Medium brown, slightly silty, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. L.S. pieces are pebble to cobble size with pieces occasionally as large as 6"	2				
4			4				
6		Bottom of test pit at 5'	6				
8			8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-8	ELEVATION: 1252.50	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 10.0'	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

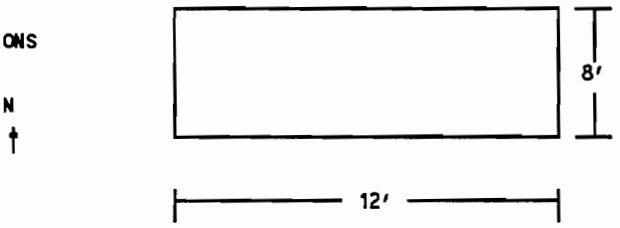
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, slightly silty, high plastic CLAY, intermixed with a small amount of LIMESTONE: white, Cherty					
2		LIMESTONE: White/gray, Cherty, pebble, cobble, and boulder sized pieces intermixed with red, highly plastic CLAY. Predominantly LIMESTONE.	2				
4			4				
6			6		Grab		#TP-3-8-1; (2) 5-gallon buckets
8			8				
10		Bottom of test pit at 10'	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-9	ELEVATION: 1215.03	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 7.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

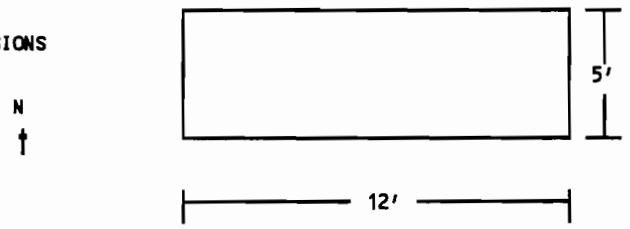
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic, CLAY intermixed with LIMESTONE: White, weathered, Cherty. Predominantly CLAY					
2		Brown, slightly silty, highly plastic CLAY intermixed with LIMESTONE: White weathered, Cherty.	2				
4			4		Grab		#TP-3-9-1 (2) 5-gallon buckets
6			6				
8		LIMESTONE: White, weathered, Cherty Bottom of test pit at 7.5′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-10	ELEVATION: 1224.44	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 5.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

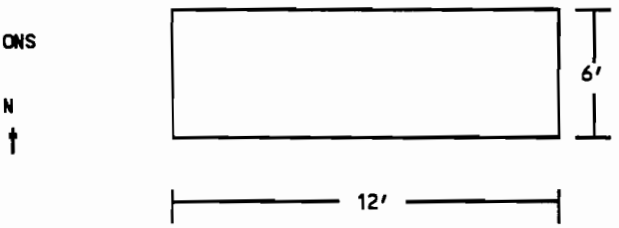
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown Silty CLAY intermixed with a small amount of LIMESTONE: white, weathered, Cherty	0				
2			2				
4		LIMESTONE: white, weathered, Cherty	4				
6		Bottom of test pit at 5.5′	6				
8			8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-11	ELEVATION: 1206.72	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 7.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

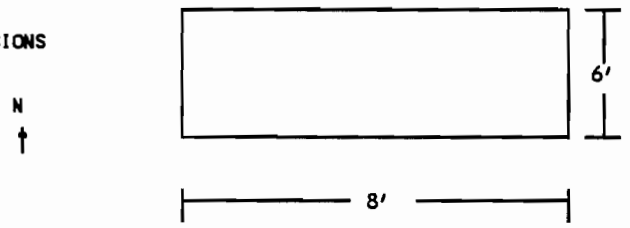
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red/Gray high plastic Silty CLAY intermixed with LIMESTONE: weathered, cherty					
2		Reddish brown, highly plastic CLAY, intermixed with LIMESTONE: white, weathered, cherty. L.S. pieces are pebble, cobble, and boulder sized.	2				
4			4		Grab		#TP-3-11-1 (2) 5-gallon buckets
6			6				
		LIMESTONE: white, weathered, Cherty					
8		Bottom of test pit at 7′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-3-12	ELEVATION: 1232.95	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/11/91	DATE FINISHED: 11/11/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 5.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

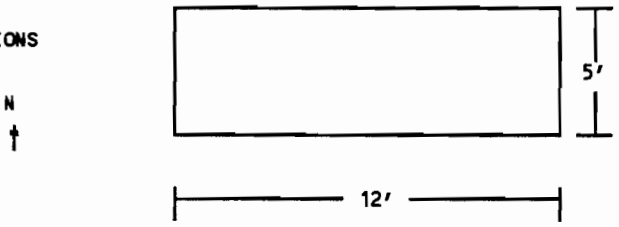
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown, high plastic, Silty CLAY, intermixed with a small amount of LIMESTONE: Cherty					
2		LIMESTONE: white, weathered, Cherty intermixed with med. brown, slightly silty high plastic CLAY. Predom. L.S.	2				
4		Red, highly plastic CLAY intermixed with LIMESTONE: weathered, Cherty	4				
6		LIMESTONE: Gray, non-weathered, Chert	6				
8			8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-1	ELEVATION: 1226.90	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 9.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

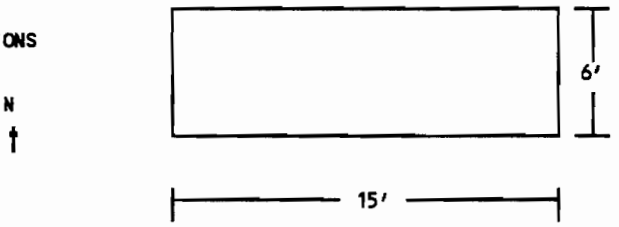
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown Silty CLAY					
		Medium brown Silty CLAY					
2			2				
4		Medium brown Silty CLAY intermixed with LIMESTONE: white, weathered, Cherty	4				
6		Red highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY	6		Grab		#TP-4-1-1 (2) 5-gallon buckets
8		Red, highly plastic, CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% L.S.	8				
10		Bottom of test pit at 9′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-2	ELEVATION: 1263.25	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 11.0'	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

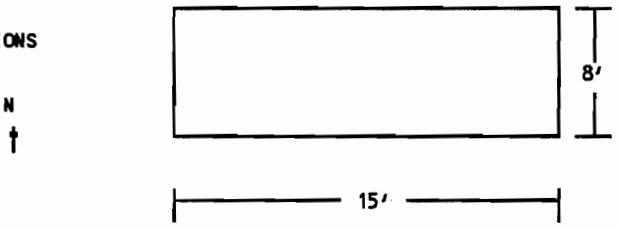
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY with small amount of LIMESTONE: Cherty					
2		Red, highly plastic CLAY intermixed w/ LIMESTONE: white, weathered, Cherty. Predominantly CLAY.	2				
4		LIMESTONE: white, weathered, cherty intermixed with red, highly plastic CLAY. Predominantly LIMESTONE. Limestone pieces are pebble, cobble, and boulder sized with pieces up to 12-15".	4				
6			6				
8			8				
10			10				
12		Bottom of test pit at 11'	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-3	ELEVATION: 1247.58	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 13.5′	ROCK DEPTH:

PLAN DIMENSIONS



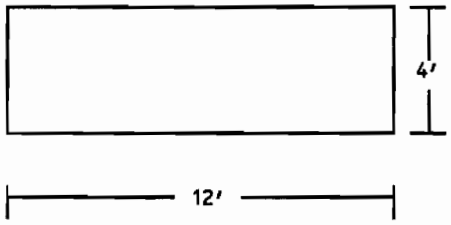
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown Silty CLAY					
		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY. L.S. pieces are pebble, cobble, and boulder sized with boulders up to 12"					
2			2				
4			4				
6			6				
8			8				
10			10		Grab		#TP-4-3-1 (2) 5-gallon buckets
12			12				
14		Bottom of test pit at 13.5′	14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-4	ELEVATION: 1239.25	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 10.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

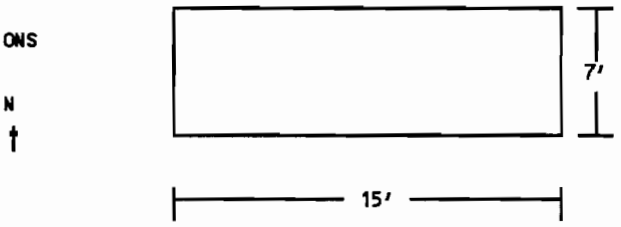
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		LIMESTONE: white, weathered, Cherty intermixed with red, highly plastic CLAY. Predominantly LIMESTONE. Limestone pieces are pebble, cobble, and boulder sized with boulders up to 15"	2				
4			4				
6			6				
8			8				
10			10				
12		Bottom of test pit at 10.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-5	ELEVATION: 1258.27	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 11.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

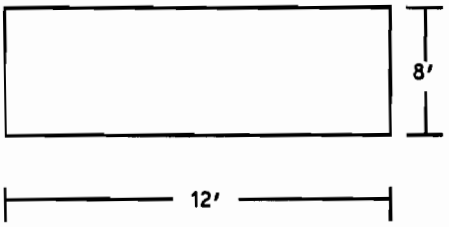
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown Silty CLAY					
2		LIMESTONE: white, weathered, Cherty	2				
4		Red, highly plastic CLAY intermixed with a small amount of weathered L.S	4				
6		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Appears to be interbedded. Approximately 50% CLAY, 50% L.S.	6				
8			8				
10			10				
12		Bottom of test pit at 11.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-6	ELEVATION: 1256.43	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.0'	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

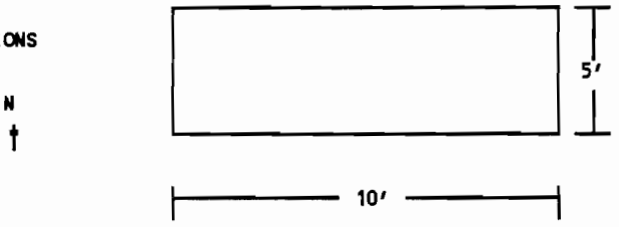
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY.	2				
4			4		Grab/ Shelby		#TP-4-6-1 (2) 5-gal buckets #TP-4-6-2 Shelby Tube
6		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% L.S.	6				
8			8				
10			10				
12		Bottom of test pit at 12'	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-7	ELEVATION: 1229.03	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 9.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

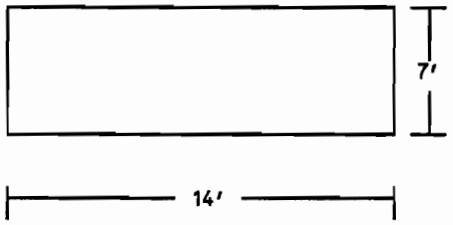
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown Silty CLAY					
2		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty	2				
4		LIMESTONE: white, weathered, Cherty intermixed with reddish tan, dessicated, CLAY. Predom. L.S. with pebble, cobble, and boulder sized pieces.					
6			6				
8			8				
10		Bottom of test pit at 9′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-8	ELEVATION: 1242.22	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 10.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

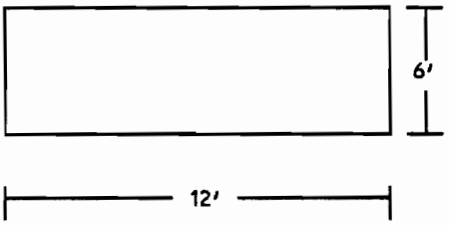
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY	2				
4		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Appears interbedded, approx. 50% CLAY, 50% L.S.	4				
6			6				
8			8				
10		Bottom of test pit at 10.5′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-9	ELEVATION: 1248.90	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 2.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

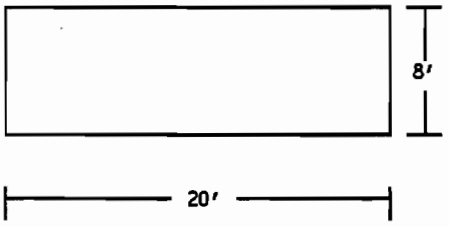
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY	2				
4		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% L.S.	4				
6			6				
8			8				
10		LIMESTONE: white/gray, Cherty	10				
12		Bottom of test pit at 10.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-10	ELEVATION: 1236.21	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 9.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

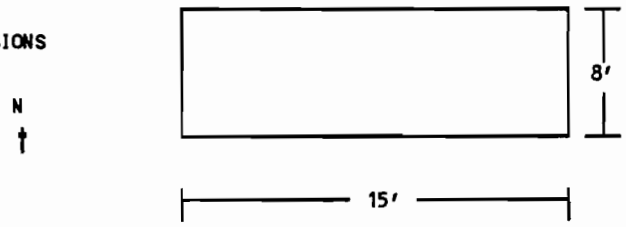
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		Red, highly plastic, CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty.	2				
4			4				
6			6				
8			8				
10		LIMESTONE: Competent, Cherty	10				
		Bottom of test pit at 9.5′					
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-11	ELEVATION: 1234.80	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

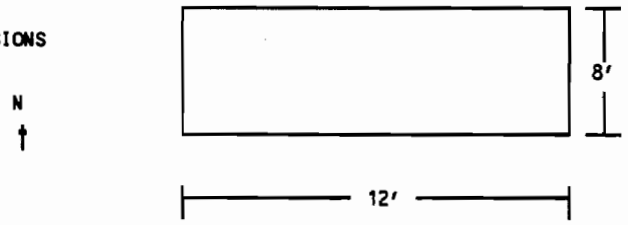
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		Dark red, highly plastic, CLAY intermixed with LIMESTONE: white, Cherty.	2				
4		LIMESTONE: white, weathered, Cherty	4				
6		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty	6				
8			8				
10			10				
12		Bottom of test pit at 12′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-12	ELEVATION: 1233.75	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 7.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

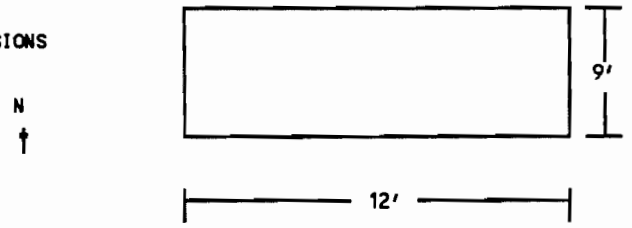
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Tan, Silty CLAY					
2		Red, highly plastic CLAY intermixed with a small amount of LIMESTONE: white, Cherty	2				
4		LIMESTONE: white, weathered, Cherty, intermixed/interbedded with red highly plastic CLAY. Predominantly LIMESTONE Clay layers have limestone cobble intermixed.	4				
6			6				
8		LIMESTONE: Competent, Cherty Bottom of test pit at 7′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-13	ELEVATION: 1217.11	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/12/91	DATE FINISHED: 11/12/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

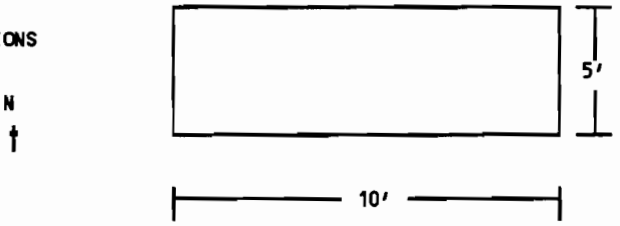
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown Silty CLAY					
2		Red, high plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Predominantly CLAY	2				
4		Red, highly plastic CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty.	4				
6			6				
8			8				
10			10				
12		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. L.S. pieces up to 9" in size.	12				
		Bottom of test pit at 12′					
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-14	ELEVATION: 1200.86	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

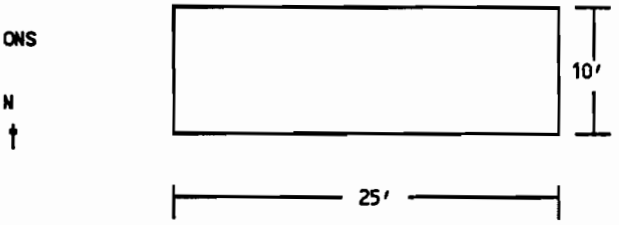
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown, Silty CLAY					
		Medium brown Silty CLAY					
2			2				
4			4				
6		LIMESTONE: white, weathered, Cherty, intermixed with a small amount of red, high plastic CLAY. Predominantly L.S.	6				
8		Bottom of test pit at 8′	8				Small amount of water entering at the bottom of the test pit.
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-15	ELEVATION: 1228.81	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 13.0′	ROCK DEPTH:

PLAN DIMENSIONS



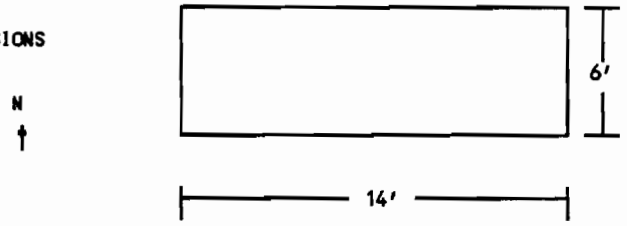
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY with a small amount of solid waste intermixed					Solid waste encountered at south end of test pit from 0-2′.
2		Red, highly plastic CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty.	2				
4			4				
6			6				
8			8				
10			10				
12			12				
14		Bottom of Pit at 13′	14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-16	ELEVATION: 1227.87	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/14/91	DATE FINISHED: 11/14/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 10.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

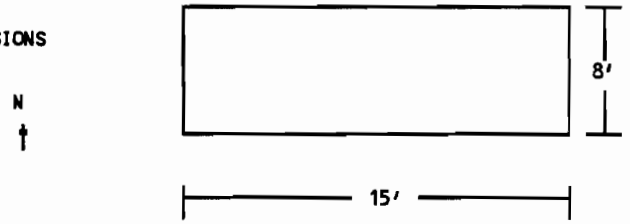
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic, CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% L.S.	0				
2			2				
4			4				
6			6				
8			8				
10		Tan, dessicated, highly plastic CLAY, intermixed with LIMESTONE: white, weathered, Cherty.	10				
12		Bottom of test pit at 10.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-17	ELEVATION: 1235.15	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.25'	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

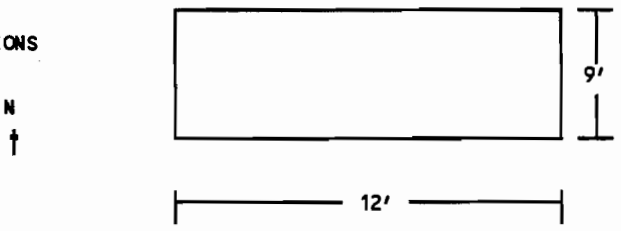
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2			2				
		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% L.S.					
4			4		Grab/ Shelby		#TP-4-17-1 (2) 5 gal.buckets #TP-4-17-2 Shelby Tube
6			6				
8			8				
10			10				
12		Bottom of test pit at 12.25'	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-18	ELEVATION: 1224.10	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8.5′	ROCK DEPTH:

PLAN DIMENSIONS



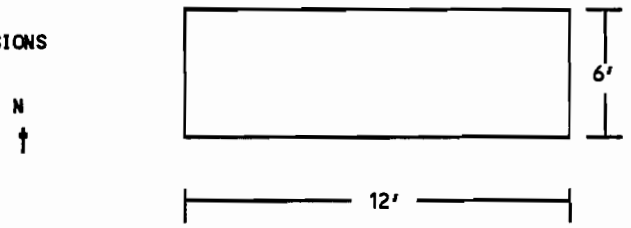
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Medium brown, Silty CLAY					
2		LIMESTONE: white/gray, Cherty inter-mixed/interbedded with red, high plastic CLAY. Predominantly L.S. with L.S. layers approx. 6-9" thick and hard. Clay layers have L.S. cobble intermixed.	2				
4			4				
6			6				
8			8				
		LIMESTONE: Competent, white/gray Cherty					
10		Bottom of test pit at 8.5′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-19	ELEVATION: 1207.89	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/14/91	DATE FINISHED: 11/14/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 11.5′	ROCK DEPTH:

PLAN DIMENSIONS



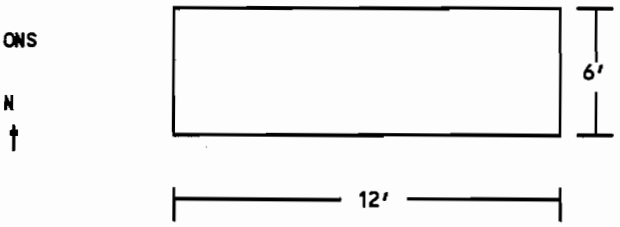
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty. Approx. 50% CLAY, 50% LIMESTONE.	0				
2			2				
4			4				
6			6				
8			8				#TP-4-19-1 (2) 5-gallon buckets
10			10				
12		Bottom of test pit at 11.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-20	ELEVATION: 1200.17	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/14/91	DATE FINISHED: 11/14/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

PERSONNEL Joe Hoffmeister

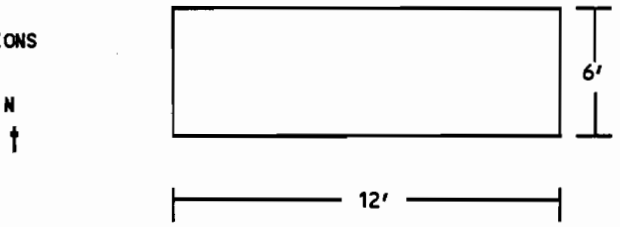
DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Dark brown, Silty CLAY					
2		Medium brown, Silty CLAY with small amount of LIMESTONE: white, weathered Cherty.	2				
4		Tan, dessicated, Silty CLAY intermixed with LIMESTONE: Cherty. Predominantly CLAY.	4				
6		Red, highly plastic, CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approximately 50% CLAY, 50% LIMESTONE.	6				
8			8				
10			10				
12			12				
		Bottom of test pit at 12.5′					
14			14				
16			16				

SCS ENGINEERS

TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-21	ELEVATION: 1197.45	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 11.5′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

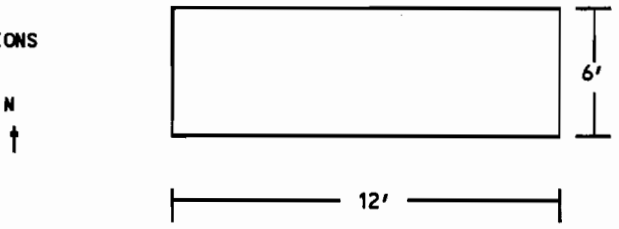
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic, CLAY intermixed with LIMESTONE: white, weathered, Cherty. Trace amounts of yellow, highly plastic CLAY. Approximately 50% CLAY, 50% LIMESTONE. Limestone pieces up to 9" in size.	0				
2			2				
4			4				
6			6				
8			8				
10		LIMESTONE: yellowish white, very weathered.	10				
12		Bottom of test pit at 11.5′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-22	ELEVATION: 1204.22	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 12.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		

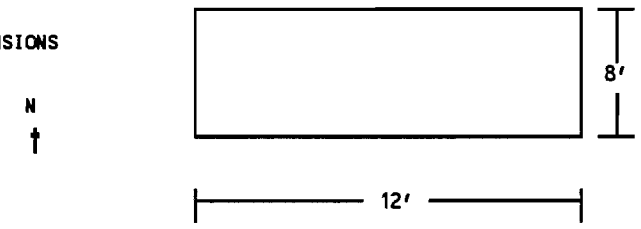
PERSONNEL Joe Hoffmeister

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Tan, dessicated, Silty CLAY, intermixed with a small amount of LIMESTONE: white, weathered, Cherty.	0				
2		Red, highly plastic CLAY intermixed with LIMESTONE: white, weathered, Cherty. Approximately 50% CLAY, 50% LIMESTONE.	2				
4			4				
6			6				
8			8				
10			10				
12		Bottom of test pit at 12′	12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-23	ELEVATION: 1187.71	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8.5′	ROCK DEPTH:

PLAN DIMENSIONS



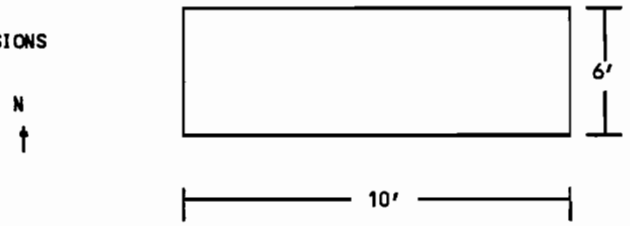
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty. Approximately 50% CLAY, 50% LIMESTONE. Limestone beds approximately 6" thick.	0				
2			2				
4			4				
6			6				
8		LIMESTONE: white, weathered, Cherty	8				
10		Bottom of test pit at 8.5′	10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-24	ELEVATION: 1207.76	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/14/91	DATE FINISHED: 11/14/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 8.0′	ROCK DEPTH:

PLAN DIMENSIONS



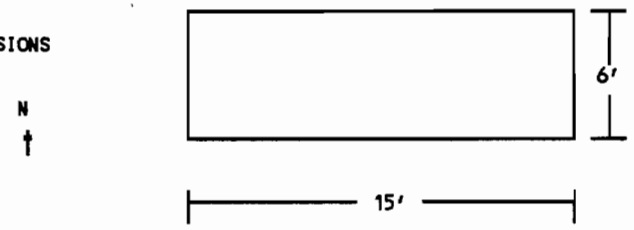
NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		LIMESTONE: white, weathered, Cherty intermixed with red, highly plastic CLAY. Predomiantly LIMESTONE					
2			2				
4			4				
6			6				
8		Bottom of test pit at 8′	8				
10			10				
12			12				
14			14				
16			16				

SCS ENGINEERS
TEST PIT LOG

PROJECT NAME: Sunray Services, Inc.		PROJECT NO: 0889015.06	SHEET 1 OF 1
LOCATION: Tontitown, Arkansas	STATION: TP-4-25	ELEVATION: 1196.12	DATUM: MSL
EXCAVATING CONTRACTOR: Sunray Services, Inc.		DATE STARTED: 11/13/91	DATE FINISHED: 11/13/91
EXCAVATING EQUIPMENT: Caterpillar 426 Backhoe		COMPLETION DEPTH: 9.0′	ROCK DEPTH:

PLAN DIMENSIONS



NO. SMPLS	DIST.		
WATER	FIRST		
PERSONNEL Joe Hoffmeister			

DEPTH SCALE	ELEV.	DESCRIPTION	DEPTH SCALE	SAMPLES # LOC	SAMPLES TYPE	SAMPLES USC/ROCK	REMARKS
0		Red, highly plastic, CLAY intermixed with a small amount of LIMESTONE: white, weathered, Cherty. Predominantly CLAY.					
2		Red, highly plastic, CLAY intermixed/ interbedded with LIMESTONE: white, weathered, Cherty. Approximately 50% CLAY, 50% LIMESTONE. Limestone beds are approximately 6-9" thick.	2				
4			4				
6			6				
8		LIMESTONE: Competent, white, Cherty	8				
10		Bottom of test pit at 9′	10				
12			12				
14			14				
16			16				

APPENDIX F

BORING LOGS

BORING LOG

BORING: B100

PROJECT NAME: Sunray: Tontitown | LOCATION: Tontitown, AR | PROJECT NUMBER: 0889015.06

LOGGED BY: Joe Hoffmeister | DATE STARTED: 11/5/91 | DATE COMPLETED: 11/5/91

DRILLED BY: Layne-Western: Tom Atherton | BORING METHOD: 6" Hollow Stem Auger with continuous sampler | RIG: CME 75

HAMMER DATA: WT. LBS; DROP INCHES; BLOW COUNT INTERVAL INCHES.

TOTAL BORING DEPTH: 69.5' | WELL OR BACKFILL: Backfill | DEPTH:

SCREEN TYPE: | SCREEN DEPTH:

GROUT: SEAL: PACK:

COORDINATES:

ELEVATION: 1267.33 | DATUM:

PHYSICAL ANALYSES:

CHEMICAL ANALYSES:

GROUND WATER DEPTH	DATE	TIME

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
0						Dark brown SILT	Wet
1						Medium brown, Silty CLAY intermixed with much CHERT cobble	
2							
3						Red, highly plastic CLAY, marbled with gray, slightly sandy, low plastic CLAY	
4							
5	Grab	B100-1					
						CHERT: 3" seam, weathered, gray	
						LIMESTONE: intermixed gray, weathered, fossiliferous with orange, low plastic CLAY. Predominately	
10						LIMESTONE.	
						Intermixed orange, highly plastic CLAY and CHERT: gray, weathered pebbles.	
15		B100-2					
						CHERT: gray, weathered	
						Orange, highly plastic CLAY and CHERT: gray, weathered	
						CHERT: gray, weathered	
						Orange, highly plastic CLAY intermixed with a small amount CHERT: gray	
20							
						CHERT: gray, weathered	
						Orange, highly plastic CLAY, intermixed with a small amount of CHERT: gray, weathered; pebbles, cobble sized	Damp cuttings
25							

BORING B100

PROJECT NAME: Sunray LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 2 OF 3

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
25						As Above: Orange, highly plastic CLAY, intermixed with with a small amount of CHERT: gray, weathered	
						CHERT: gray, weathered	
						Orange, highly plastic CLAY with small amount of CHERT: gray, weathered (≈1")	Wet cuttings
30							
						CHERT: gray, weathered	Hard Drill
						CHERT: predominately weathered, orange/gray with small amount of orange, highly plastic CLAY.	
35						CHERT: becoming white LIMESTONE Trace amount of black SILT	
						LIMESTONE: Cherty, gray/white	Hard Drill
						Orange, highly plastic CLAY with ≈1" LIMESTONE: Cherty, white.	
						LIMESTONE: Cherty, gray/white	Hard Drill
						Orange, highly plastic CLAY with ≈1" LIMESTONE: Cherty, white particles.	
40							
	Grab	B100-3					
						LIMESTONE: white, cherty	
						Orange, highly plastic CLAY with 1-2" pieces of LIMESTONE: white, cherty	
45							
		B100-4					
						LIMESTONE: white, cherty	
50						Orange, highly plastic CLAY intermixed with LIMESTONE: white, cherty	
						LIMESTONE: white, cherty	
						Orange, highly plastic CLAY intermixed with LIMESTONE: white, cherty	
						LIMESTONE: white, cherty	
55							
						Orange, highly plastic, slightly Sandy CLAY intermixed with 1" particles of LIMESTONE: white cherty	Water Entering
						LIMESTONE: white, cherty	
						Orange, highly plastic CLAY intermixed with LIMESTONE white, cherty.	
60						LIMESTONE: white, cherty	

BORING B100

PROJECT NAME: Sunray LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 3 OF 3

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
60						Orange, slightly sandy, highly platic CLAY intermixed with LIMESTONE: white, cherty pebbles	
						LIMESTONE: white, cherty	
65						Orange, slightly sandy, highly plastic CLAY intermixed with white Cherty CLAY particles	
						LIMESTONE: 4" seam, white, cherty	
						Orange, slightly sandy, highly plastic CLAY intermixed with LIMESTONE: white, cherty	
						LIMESTONE: white, cherty	Hard Drill
		B100-5					
70						Bottom of Hole at 69.5'	Stopped 11:25 a.m.

BORING LOG

BORING: B200

PROJECT NAME: Sunray: Tontitown | LOCATION: Tontitown, AR | PROJECT NUMBER: 0889015.06

LOGGED BY: Joe Hoffmeister | DATE STARTED: 11/5/91 | DATE COMPLETED: 11/6/91

DRILLED BY: Layne-Western: Tom Atherton | BORING METHOD: 6" Hollow Stem Auger with continuous sampler | RIG: CME 75

HAMMER DATA: WT. LBS; DROP INCHES; BLOW COUNT INTERVAL INCHES.

TOTAL BORING DEPTH: | WELL OR BACKFILL: Backfill | DEPTH:

SCREEN TYPE: | SCREEN DEPTH:

GROUT: SEAL: PACK:

COORDINATES:

ELEVATION: 1226.54 | DATUM:

PHYSICAL ANALYSES:

CHEMICAL ANALYSES:

GROUND WATER DEPTH	DATE	TIME

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
0						Medium brown, Clayey SILT	
1							
2						Orange, highly plastic CLAY intermixed with LIMESTONE: white, fossiliferous, weathered, cherty	
3							
4							
5						LIMESTONE: white, cherty	
						Intermixed orange, slightly Sandy CLAY, dark red highly plastic CLAY and LIMESTONE: white, weathered fossiliferous, cherty	
10		B200-1				LIMESTONE: white, weathered, cherty, fossiliferous - - Intermixed orange, highly plastic CLAY and LIMESTONE: white, weathered, fossiliferous, cherty	
15						LIMESTONE particles ≈ 1" predominately CLAY	
						Some LIMESTONE particles 2" in size	
20							
25							

BORING B200

PROJECT NAME: Sunray; Borrow Invest. LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 2 OF 3

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
25						As Above: Intermixed orange, highly platic CLAY and CHERTY LIMESTONE: white, weathered, fossiliferous, predominantly CLAY. CHERT particles are approx. 1" in size with occaional 2" pieces.	
		B200-2					
30						Red, highly plastic CLAY intermixed with LIMESTONE: fossiliferous, white. LIMESTONE predominantly with particle size ranging from 1-2" and less weathered orange, slightly finely grained Sandy CLAY also intermixed	
35							
		B200-3				Dark red, highly plastic CLAY	
40						CHERTY LIMESTONE: white, weathered, fossiliferous	
45							Very Hard Drill
50						Orange, highly plastic CLAY	
						CHERTY LIMESTONE: white, weathered, fossiliferous	
						Orange, highly plastic CLAY intermixed with CHERTY LIMESTONE: white, weathered, fossiliferous	
55						CHERTY LIMESTONE: white, weathered, fossiliferous	
60							

BORING B200

PROJECT NAME: Sunray; Borrow Invest. LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 3 OF 3

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
60						As Above: CHERTY LIMESTONE: white, weathered, fossiliferous.	
65						4" seam of dark red, highly plastic CLAY	
70							
75							
80						Bottom of Hole at 79.5' No Bedrock	Stop 11/5

BORING LOG

BORING: B300

PROJECT NAME: Sunray: Tontitown | LOCATION: Tontitown, AR | PROJECT NUMBER: 0889015.06

LOGGED BY: Joe Hoffmeister | DATE STARTED: 11/6/91 | DATE COMPLETED: 11/6/91

DRILLED BY: Layne-Western: Tom Atherton | BORING METHOD: 6" Hollow Stem Auger with continuous sampler | RIG: CME 75

HAMMER DATA: WT. LBS; DROP INCHES; BLOW COUNT INTERVAL INCHES.

TOTAL BORING DEPTH: | WELL OR BACKFILL: Backfill | DEPTH:

SCREEN TYPE: | SCREEN DEPTH:

GROUT: SEAL: PACK:

COORDINATES:

ELEVATION: 1224.28 | DATUM:

PHYSICAL ANALYSES:

CHEMICAL ANALYSES:

GROUND WATER DEPTH	DATE	TIME

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
0						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered, fossiliferous - - - - - Dark red, highly plastic CLAY	
2		B300-1					
4						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered, fossiliferous, predominantly CLAY with CHERT particles ≈ 1" and less in size.	
8						CHERTY LIMESTONE: white, weathered, fossiliferous - - CHERTY LIMETONE: intermixed, white, weathered fossiliferous and red, highly plastic CLAY predominantly LIMESTONE.	
10						CHERTY LIMESTONE: white, weathered, fossiliferous - - CHERTY LIMESTONE: intermixed, white, weathered fossiliferous and red, highly plastic CLAY predominantly LIMESTONE with particle size 1-3"	
14						- CHERTY LIMESTONE: white, weathered, fossiliferous	
15						- Bottom of Hole at 15' - Auger refusal	
25							

BORING LOG

BORING: B300 A

PROJECT NAME: Sunray: Tontitown | LOCATION: Tontitown, AR | PROJECT NUMBER: 0889015.06

LOGGED BY: Joe Hoffmeister | DATE STARTED: 11/6/91 | DATE COMPLETED: 11/6/91

DRILLED BY: Layne-Western: Tom Atherton | BORING METHOD: 6" Hollow Stem Auger with continuous sampler | RIG: CME 75

HAMMER DATA: WT. LBS; DROP INCHES; BLOW COUNT INTERVAL INCHES.

TOTAL BORING DEPTH: | WELL OR BACKFILL: Backfill | DEPTH:

SCREEN TYPE: | SCREEN DEPTH:

GROUT: SEAL: PACK:

COORDINATES:

ELEVATION: 1227.10 | DATUM:

PHYSICAL ANALYSES:

CHEMICAL ANALYSES:

GROUND WATER DEPTH	DATE	TIME

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
0							
1		B300A-1				Dark red, highly plastic CLAY intermixed with CHERTY LIMESTONE: white, weathered, fossiliferous. Predominantly CLAY	
2							
3						CHERTY LIMESTONE: white, weathered, fossiliferous	
4							
5						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY	
						CHERTY LIMESTONE: white	
						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY, CHERTY	
		B300A-2				LIMESTONE less than 1"	
						CHERTY LIMESTONE: white	
10						Intermixed red, highly platic CLAY and CHERTY LIMESTONE: white, predomantly CLAY, LIMESTONE particles less than 1"	
		B300A-3					
						CHERTY LIMESTONE: white	
15						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY	
						CHERTY LIMESTONE: white	
						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered, predominantly CLAY	
						CHERTY LIMESTONE: white, weathered	
20						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY	
						CHERTY LIMESTONE: white	
25							

BORING B300 A

PROJECT NAME: Sunray; Borrow Invest. LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 2 OF 2

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
25						As Above; CHERTY LIMESTONE: white, weathered	
						Red, highly plastic CLAY intermixed with CHERTY LIMESTONE: white, weathered, predominantly CLAY - - -	Very Hard
						CHERTY LIMESTONE: white, weathered	
30							Very Hard
						Red, highly plastic CLAY intermixed with CHERTY LIMESTONE: white, weathered, predominantly CLAY	
						CHERTY LIMESTONE: white, weathered	
35		B300A-4				Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY - - - - - - - -	
						CHERTY LIMESTONE: white, weathered	
							Damp cuttings
40						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered, predominantly CLAY	
						CHERTY LIMESTONE: white, weathered	
45							
						Red, highly plastic CLAY	
						CHERTY LIMESTONE: white, weathered	Very hard Stopped at 5:40 p.m.
						Bottom of Hole at 46.5'	
50						Water level at 6:10 p.m. 11/6/91: 40.5' from G.L.	
55							

BORING LOG

BORING: B400

PROJECT NAME: Sunray: Tontitown | LOCATION: Tontitown, AR | PROJECT NUMBER: 0889015.06

LOGGED BY: Joe Hoffmeister | DATE STARTED: 11/6/91 | DATE COMPLETED: 11/6/91

DRILLED BY: Layne-Western: Tom Atherton | BORING METHOD: 6" Hollow Stem Auger with continuous sampler | RIG: CME 75

HAMMER DATA: WT. LBS; DROP INCHES; BLOW COUNT INTERVAL INCHES.

TOTAL BORING DEPTH: | WELL OR BACKFILL: Backfill | DEPTH:

SCREEN TYPE: | SCREEN DEPTH:

GROUT: SEAL: PACK:

COORDINATES:

ELEVATION: 1251.19 | DATUM:

PHYSICAL ANALYSES:

CHEMICAL ANALYSES:

GROUND WATER DEPTH	DATE	TIME

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
0						Dark brown SILT with roots - - - - - - - - - - - - - - -	
1						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered, predominanty CLAY	
2		B400-1				- -	
3						CHERTY LIMESTONE: white, weathered, fossiliferous	
4							
5						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white -	
						CHERTY LIMESTONE: white, weathered, fossiliferous	
						- -	
		B400-2				Intermixed red, highly platic CLAY and CHERTY LIMESTONE: white (particles ≈ 1") predominantly CLAY	
						- -	
						CHERTY LIMESTONE: white, weathered, fossiliferous - -	
						Red, highly plasitic CLAY intermixed with LIMESTONE: white -	
10						CHERTY LIMESTONE: white, weathered, fossiliferous	
						- -	
		B400-3				Red, highly plastic CLAY intermixed with CHERTY LIMESTONE: white, weathered, fossiliferous, predominantly CLAY, LIMESTONE size ≈ 1" - - - - - - - -	
						CHERTY LIMESTONE: white, weathered, fossiliferous - -	
						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, predominantly CLAY, LIMESTONE particles ≈ 1"	
15							
						CHERT: gray -	
						- -	
						Red highly plastic CLAY intermixed with LIMESTONE: white, weathered, fossiliferous, predominantly CLAY with LIMESTONE particles ≈ 1"	
20							
						LIMESTONE: some particles ≈ 3" in size	
25							

BORING B400

PROJECT NAME: Sunray; Borrow Invest. LOCATION: Tontitown, AR PROJECT NUMBER: 0889015.06 PAGE 2 OF 2

DEPTH	SAMPLE TYPE	SAMPLE NUMB	SAMPLE RECOV	SAMPLE RESIST	USC	DESCRIPTION	SPECIAL NOTES OBSERVATIONS
25						CHERTY LIMESTONE: white, weathered, fossiliferous	
		B400-4				CHERTY LIMESTONE: intermixed white, fossiliferous weathered and red, highly plastic CLAY. Predominantly LIMESTONE with particles up to 3"	
30						CHERTY LIMESTONE: white, weathered, fossiliferous	
						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white CHERTY LIMESTONE: white weathered, fossiliferous - - -	
35						Intermixed red, highly plastic CLAY and CHERTY LIMESTONE: white, weathered with LIMESTONE particles ≈ 1" with some particles ≈ 3" Predominantly CLAY	
						CHERTY LIMESTONE: white, weathered	
40						Red, highly plastic CLAY with CHERT LIMESTONE - - - - CHERTY LIMESTONE: white, weathered, fossiliferous - -	Very Hard Drill
						Red, Highly Plastic CLAY with CHERTY LIMESTONE	
						CHERTY LIMESTONE: white, weathered, fossiliferous	
45						Red, highly plastic CLAY with CHERTY LIMESTONE - - - - CHERTY LIMESTONE: white, weathered, fossiliferous	
						Red, highly plastic CLAY with CHERTY LIMESTONE: white, weathered, fossiliferous, LIMESTONE predominantly CLAY, LIMESTONE particles ≈ 2" - - - -	
50						CHERTY LIMESTONE: white, weathered, fossiliferous	Very Hard Drill
						Bottom of Hole at 53'	Stopped at 3:40 p.m.
55							

APPENDIX G

GEOTECHNICAL LABORATORY TESTING RESULTS

SUMMARY OF LABORATORY TESTING

PROJECT NAME Tontitown Testing

PROJECT NUMBER 91-425T

PROJECT LOCATION Tontitown, Arkansas

DATE 12/11/91

Boring No.	Sample Number	Depth or Elev.	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%e	% Swell	Remarks
	TP-3-8-1		Dark red clayey gravel w/sand	22.2		85	43	42	GC	31.5				*
	TP-3-9-1		Brown silty gravel w/sand	13.5		28	18	10	GM	17.3				*
	TP-3-11-1		Brown silty gravel w/sand	21.3		31	16	15	GM	17.6				*
	TP-4-1-1		Brownish-red clayey gravel w/sand	22.6		82	34	48	GC	24.7				*
	TP-4-3-1		Red clayey gravel w/sand	29.7		71	33	38	GC	32.4				*
	TP-4-6-1		Dark red clayey gravel w/sand	29.9		69	33	36	GC	27.7				*
	TP-4-6-2		Reddish-brown weathered SHALE w/trace of coarse gravel	31.7										
	TP-4-17-1		Red clayey gravel w/sand	32.8		82	34	48	GC	38.6				*
	TP-4-17-2		Dark reddish-brown LEAN CLAY w/trace of weathered SHALE	45.8	84.0									
	TP-4-19-1		Red clayey gravel w/sand	23.3		99	40	59	GC	24.2				*

*See compaction and permeability reports.

SUMMARY OF LABORATORY TESTING

PROJECT NAME Tontitown Testing

PROJECT NUMBER 91-425T

PROJECT LOCATION Tontitown, Arkansas

DATE 12/11/91

Boring No.	Sample Number	Depth or Elev.	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%e	% Swell	Remarks
	B-100-2		Light red silty or clayey sand w/gravel	31.0		74	21	53	SC	39.0				
	B-200-1		Light red silt or clay w/ sand & gravel	26.1		61	20	41	CH	55.7				
	B-300-1		Dark reddish-brown clay	50.3		100	45	55	MH	93.6				
	B-300A-2		Reddish-brown silty or clayey sand w/gravel	21.2		58	16	42	SC	43.5				
	B-400-2		Reddish-brown silty or clayey sand w/gravel	20.9		66	20	46	SC	42.5				

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-3-8-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	24.3	75.7
1	46.8	53.3
.5	56.7	43.3
4	63.1	36.9
8	65.2	34.8
20	66.7	33.3
40	67.8	32.2
70	68.2	31.8
100	68.4	31.6
200	68.5	31.5

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-3-9-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	23.5	76.5
1	40.1	59.9
.5	53.0	47.0
4	65.9	34.2
8	72.8	27.2
20	78.6	21.4
40	80.6	19.4
80	82.2	17.8
100	82.7	17.3

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-3-11-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	20.1	79.9
1	30.6	69.4
.5	43.8	56.2
4	60.4	39.6
8	68.6	31.4
20	77.5	22.5
40	80.6	19.4
70	81.7	18.3
100	82.1	17.9
200	82.4	17.6

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-1-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	16.8	83.2
1	41.4	58.6
.5	53.5	46.6
4	65.3	34.8
8	70.4	29.6
20	73.7	26.3
40	74.6	25.4
70	75.0	25.0
100	75.1	24.9
200	75.4	24.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-3-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	10.1	89.9
1	27.4	72.6
.5	43.7	56.3
4	55.8	44.3
8	60.4	39.6
20	64.0	36.1
40	65.2	34.8
70	66.0	34.1
100	66.6	33.4
200	67.6	32.4

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-6-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
1	23.8	76.3
.5	46.4	53.6
4	59.8	40.2
8	64.7	35.3
20	69.0	31.0
40	71.0	29.0
80	71.8	28.2
100	72.0	28.0
200	72.3	27.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-17-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	20.9	79.1
1	36.9	63.1
.5	45.8	54.3
4	53.4	46.6
8	56.5	43.5
20	58.7	41.3
40	59.5	40.5
70	60.2	39.8
100	60.7	39.3
200	61.4	38.6

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-19-1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	25.6	74.5
1	50.4	49.6
.5	62.4	37.6
4	69.3	30.7
8	72.0	28.0
20	73.9	26.1
40	74.7	25.3
70	75.2	24.8
100	75.5	24.5
200	75.9	24.2

SIEVE ANALYSIS FOR TONTITOWN TESTING' JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: B-100-2 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
1	5.3	94.7
.5	20.7	79.3
4	41.7	58.3
10	53.3	46.7
20	58.6	41.4
30	59.4	40.6
40	60.1	39.9
50	60.4	39.6
100	61.0	39.0

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: B-200
SAMPLE NO.: 1 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
1	8.4	91.6
.5	22.2	77.8
4	31.7	68.3
10	37.8	62.2
20	41.5	58.5
30	42.4	57.6
40	43.2	56.8
50	43.6	56.4
100	44.4	55.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: B-300
SAMPLE NO.: 1 DEPTH: 2.5'

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
4	1.1	98.9
10	2.7	97.3
20	4.4	95.6
50	6.0	94.0
70	6.4	93.6

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

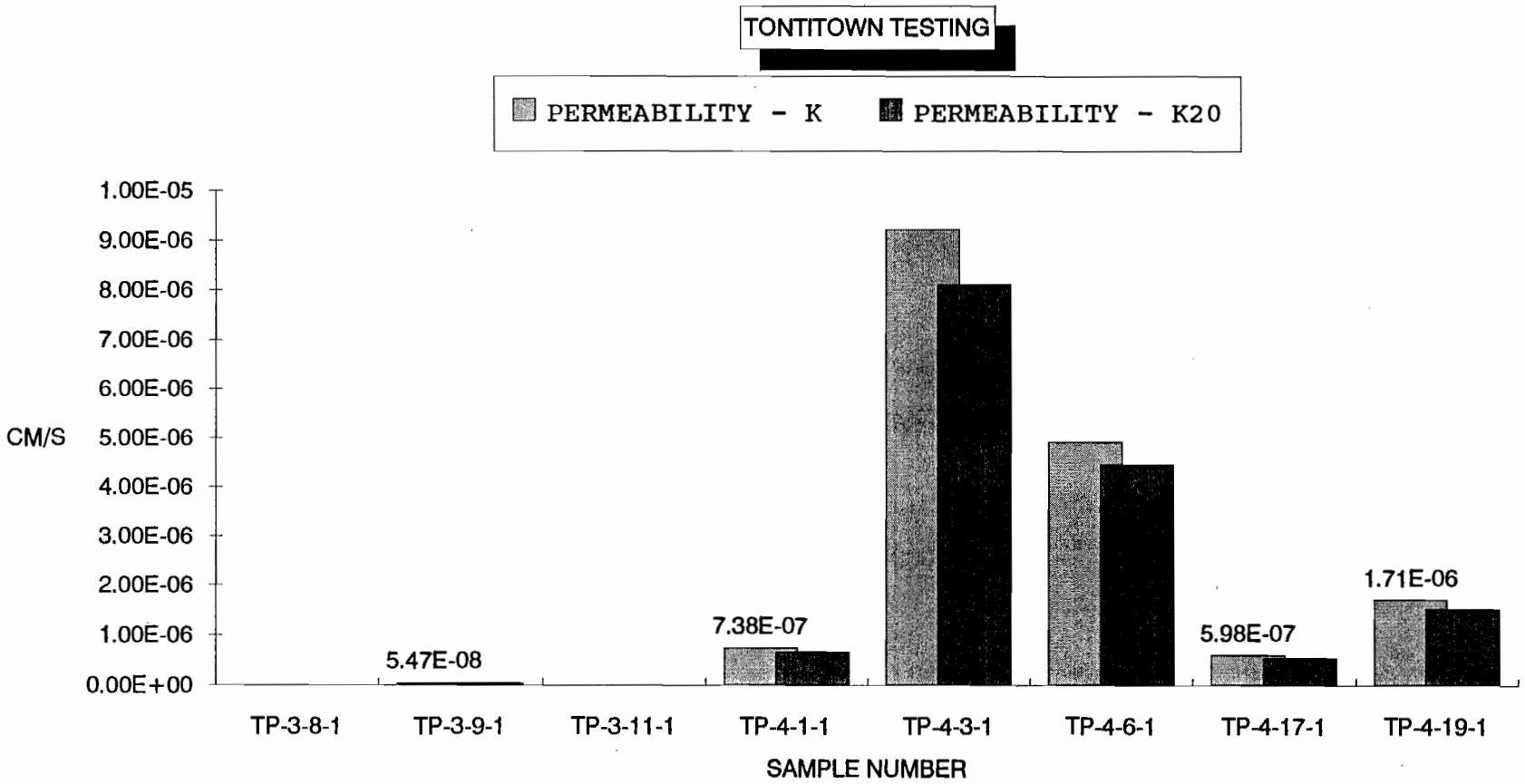
BORING NO.: SAMPLE NO.: B-300 A-2 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
.75	3.2	96.8
.5	7.0	93.0
.375	11.9	88.1
4	21.7	78.3
10	35.2	64.8
20	45.1	54.9
40	50.7	49.3
70	54.6	45.4
100	56.5	43.5

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: B-400-2 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
.75	11.3	88.7
.5	21.7	78.3
.375	25.9	74.1
4	36.4	63.6
10	44.8	55.2
20	50.6	49.4
40	53.8	46.2
70	56.2	43.8
100	57.5	42.5


TONTITOWN TESTING
PERMEABILITY - K
PERMEABILITY - K20
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5.00E-06
4.00E-06
3.00E-06
2.00E-06
1.00E-06
0.00E+00
CM/S
5.47E-08
7.38E-07
5.98E-07
1.71E-06
TP-3-8-1
TP-3-9-1
TP-3-11-1
TP-4-1-1
TP-4-3-1
TP-4-6-1
TP-4-17-1
TP-4-19-1
SAMPLE NUMBER

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-21-1991

SAMPLE No.: TP-3-8-1

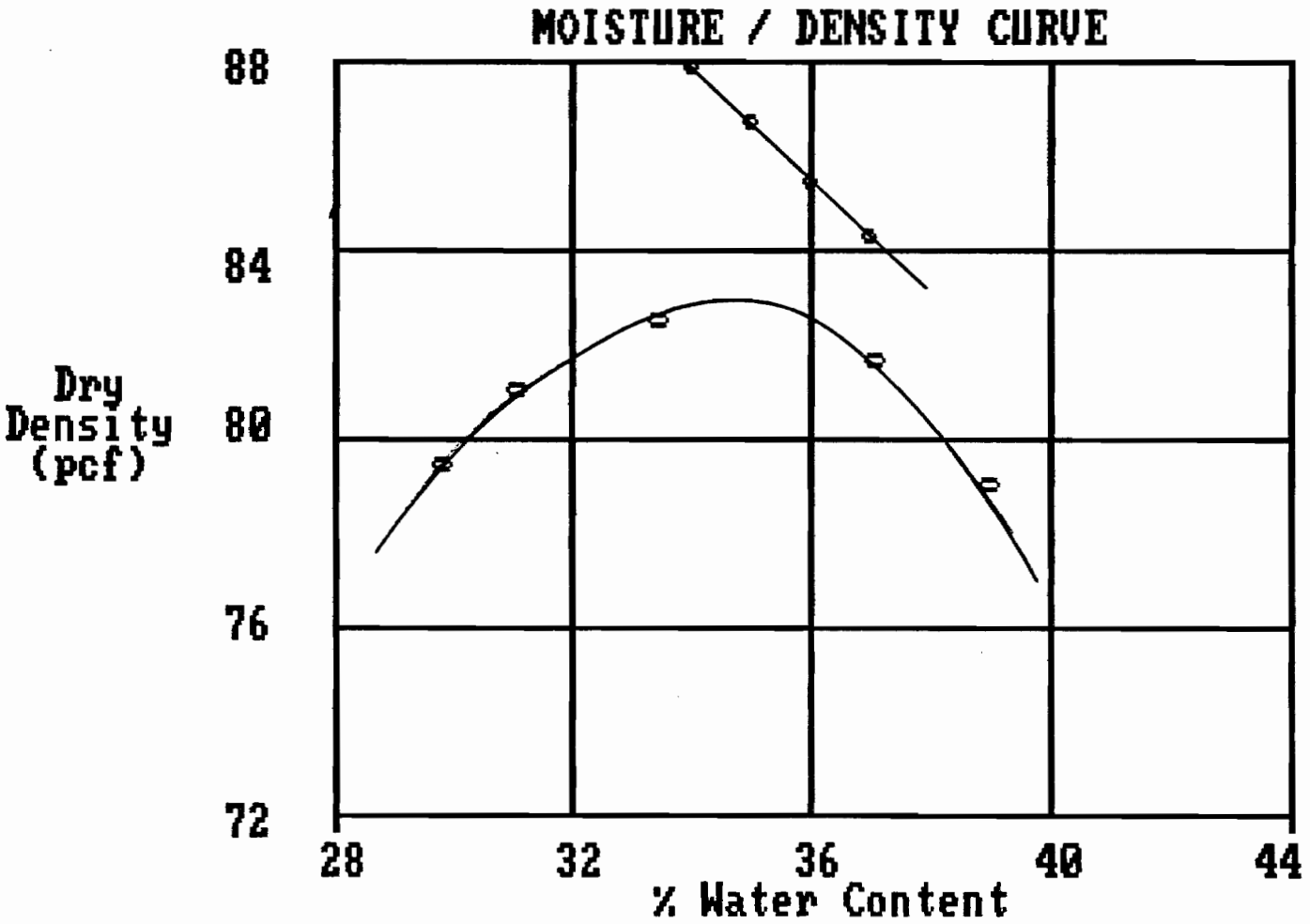
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	85
OPTIMUM WATER CONTENT:	35.0	%	PLASTIC LIMIT:	43
MAXIMUM DRY DENSITY:	83.0	pcf	PLASTICITY INDEX:	42

DESCRIPTION: Dark red CLAYEY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-22-1991

SAMPLE No.: TP-3-9-1

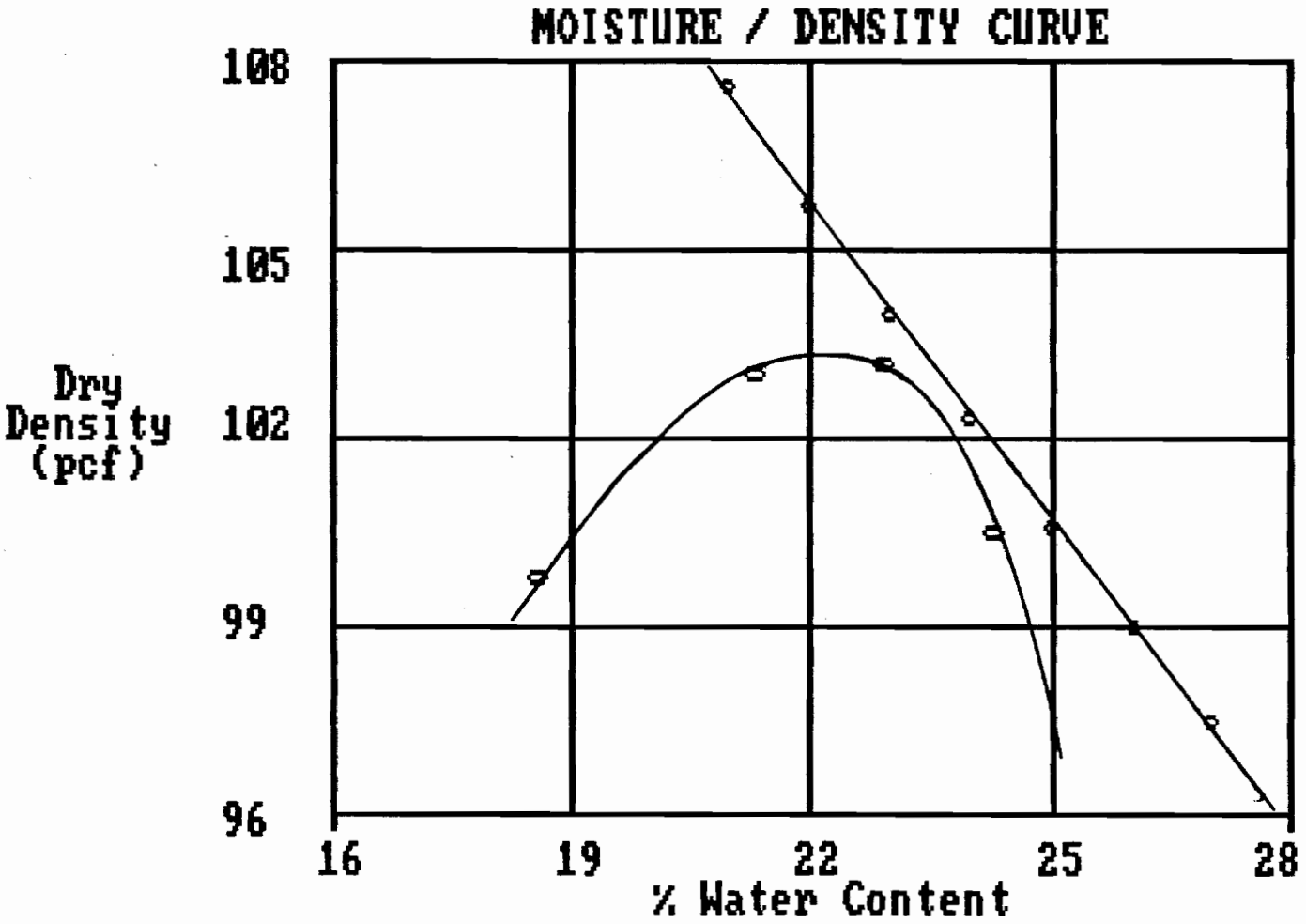
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	28
OPTIMUM WATER CONTENT:	22.0	%	PLASTIC LIMIT:	18
MAXIMUM DRY DENSITY:	103.5	pcf	PLASTICITY INDEX:	10

DESCRIPTION: Brown SILTY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-26-1991

SAMPLE No.: TP-3-11-1

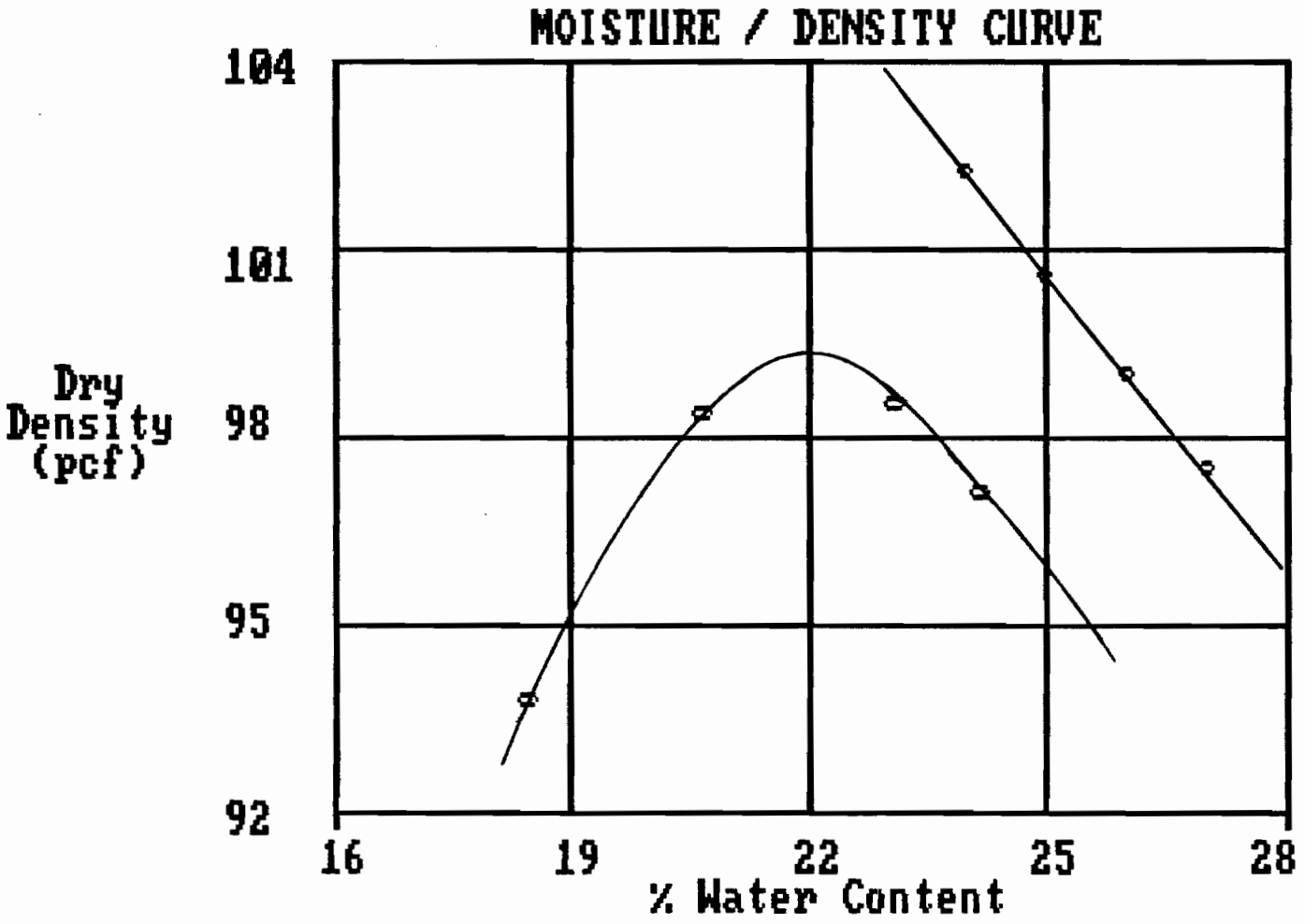
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	31
OPTIMUM WATER CONTENT:	22.0	%	PLASTIC LIMIT:	16
MAXIMUM DRY DENSITY:	99.5	pcf	PLASTICITY INDEX:	15

DESCRIPTION: Brown SILTY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-22-1991

SAMPLE No.: TP-4-1-1

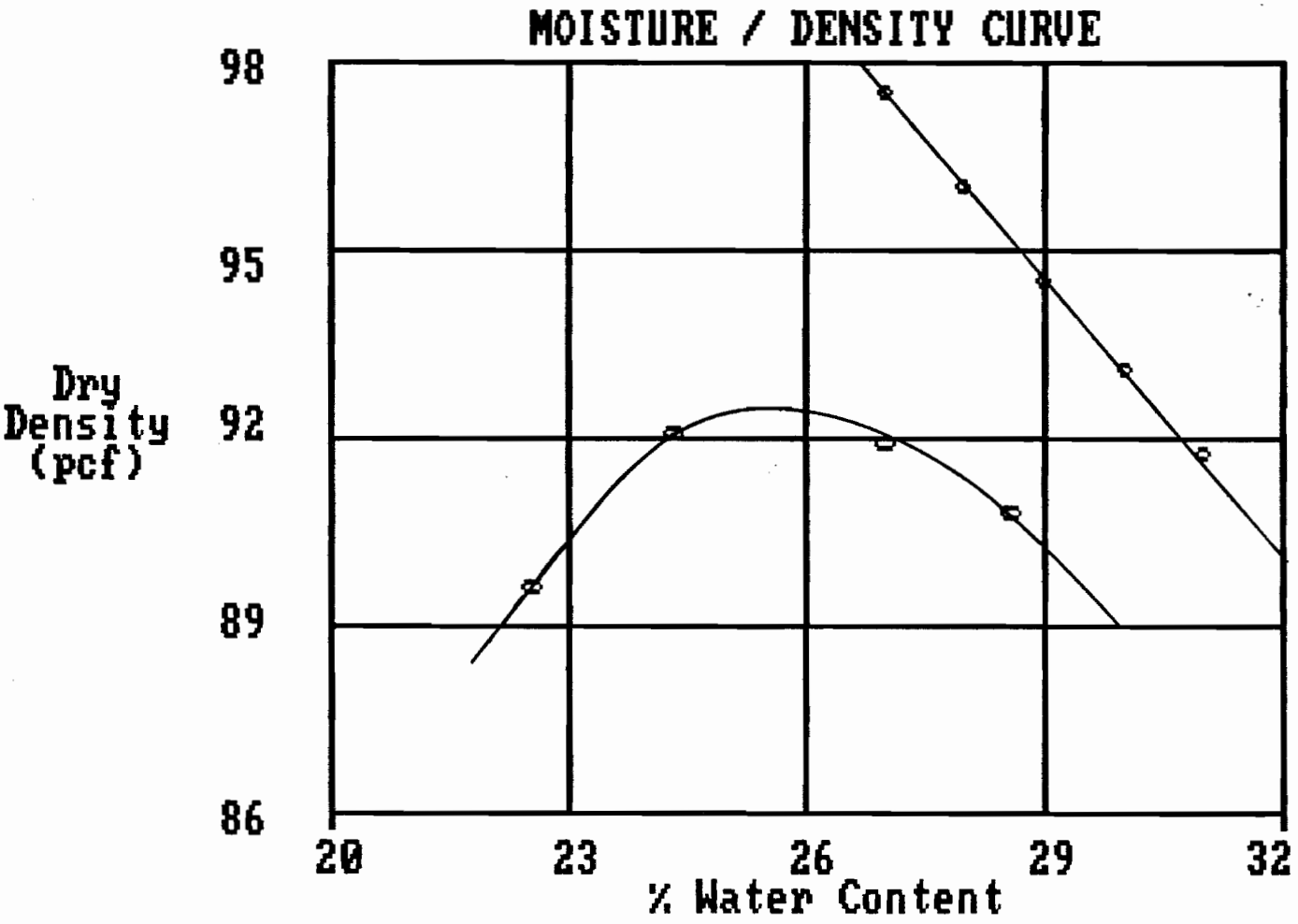
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	82
OPTIMUM WATER CONTENT:	25.5	%	PLASTIC LIMIT:	34
MAXIMUM DRY DENSITY:	93.0	pcf	PLASTICITY INDEX:	48

DESCRIPTION: Brownish-red CLAYEY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING

PROJECT No.: 91-425T

DATE: 11-22-1991

SAMPLE No.: TP-4-3-1

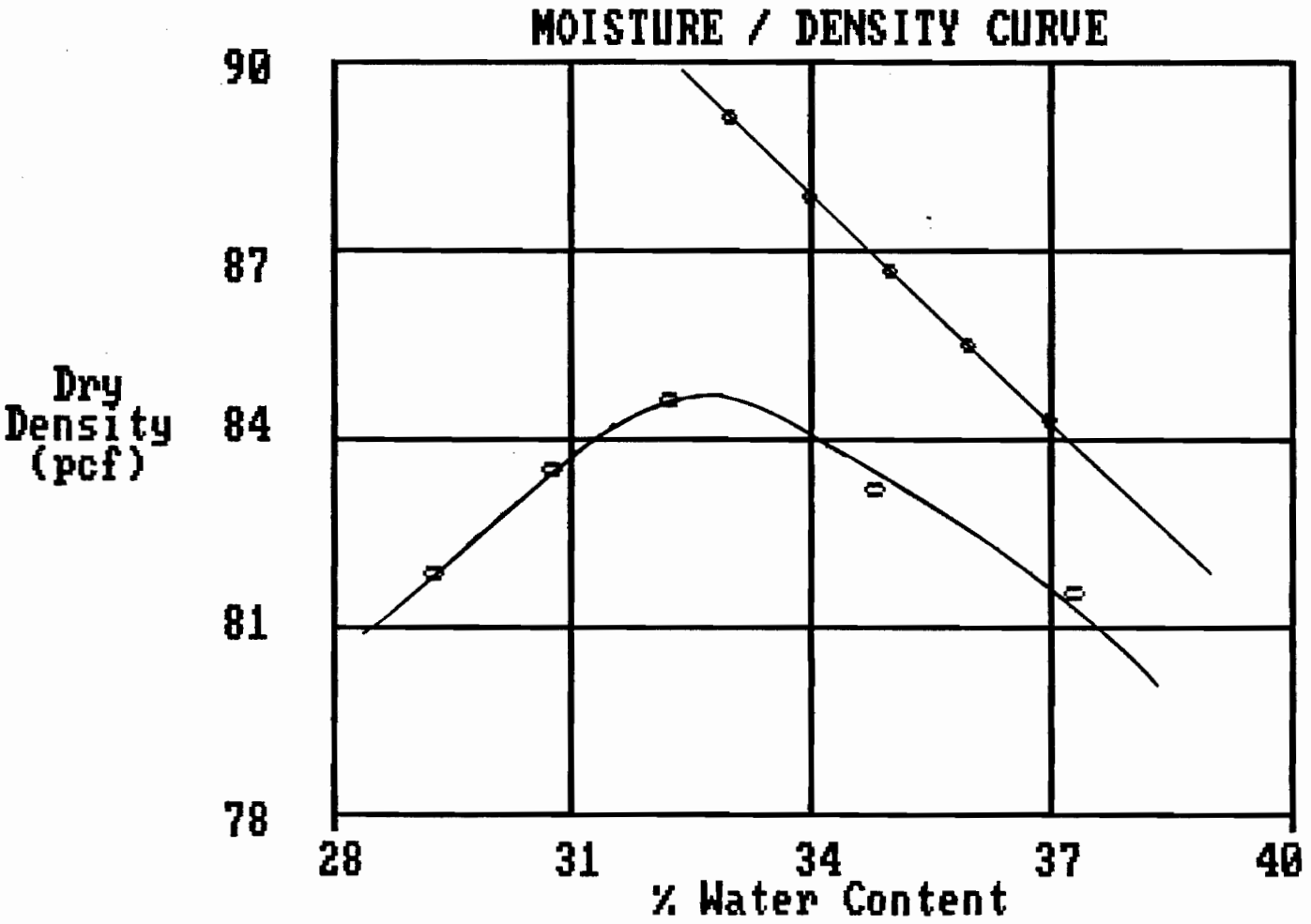
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	71
OPTIMUM WATER CONTENT:	32.5	%	PLASTIC LIMIT:	33
MAXIMUM DRY DENSITY:	85.0	pcf	PLASTICITY INDEX:	38

DESCRIPTION: Red CLAYEY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-21-1991

SAMPLE No.: TP-4-6-1

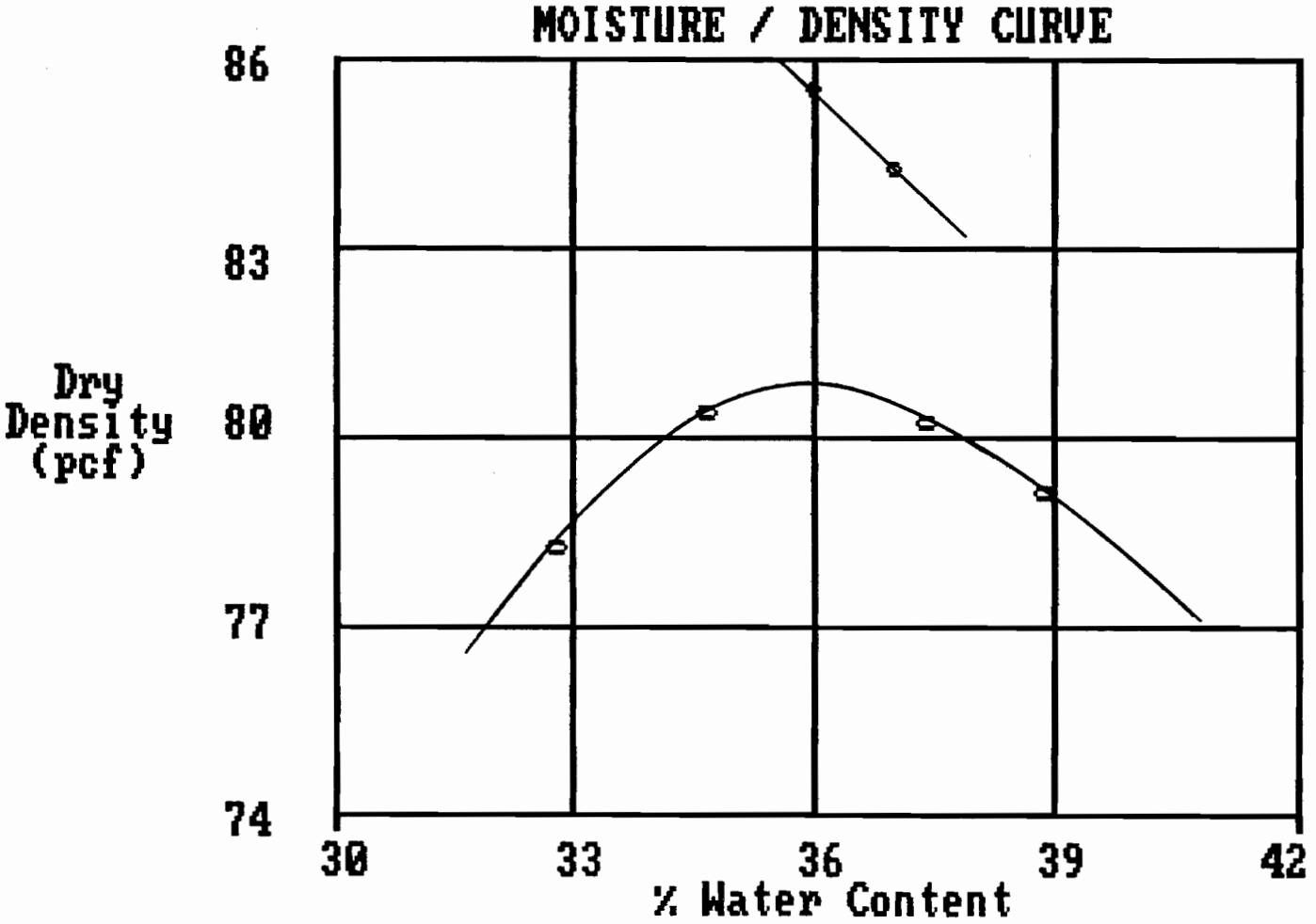
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

			LIQUID LIMIT:	69
OPTIMUM WATER CONTENT:	36.0	%	PLASTIC LIMIT:	33
MAXIMUM DRY DENSITY:	81.0	pcf	PLASTICITY INDEX:	36

DESCRIPTION: Dark red CLAYEY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 11-20-1991

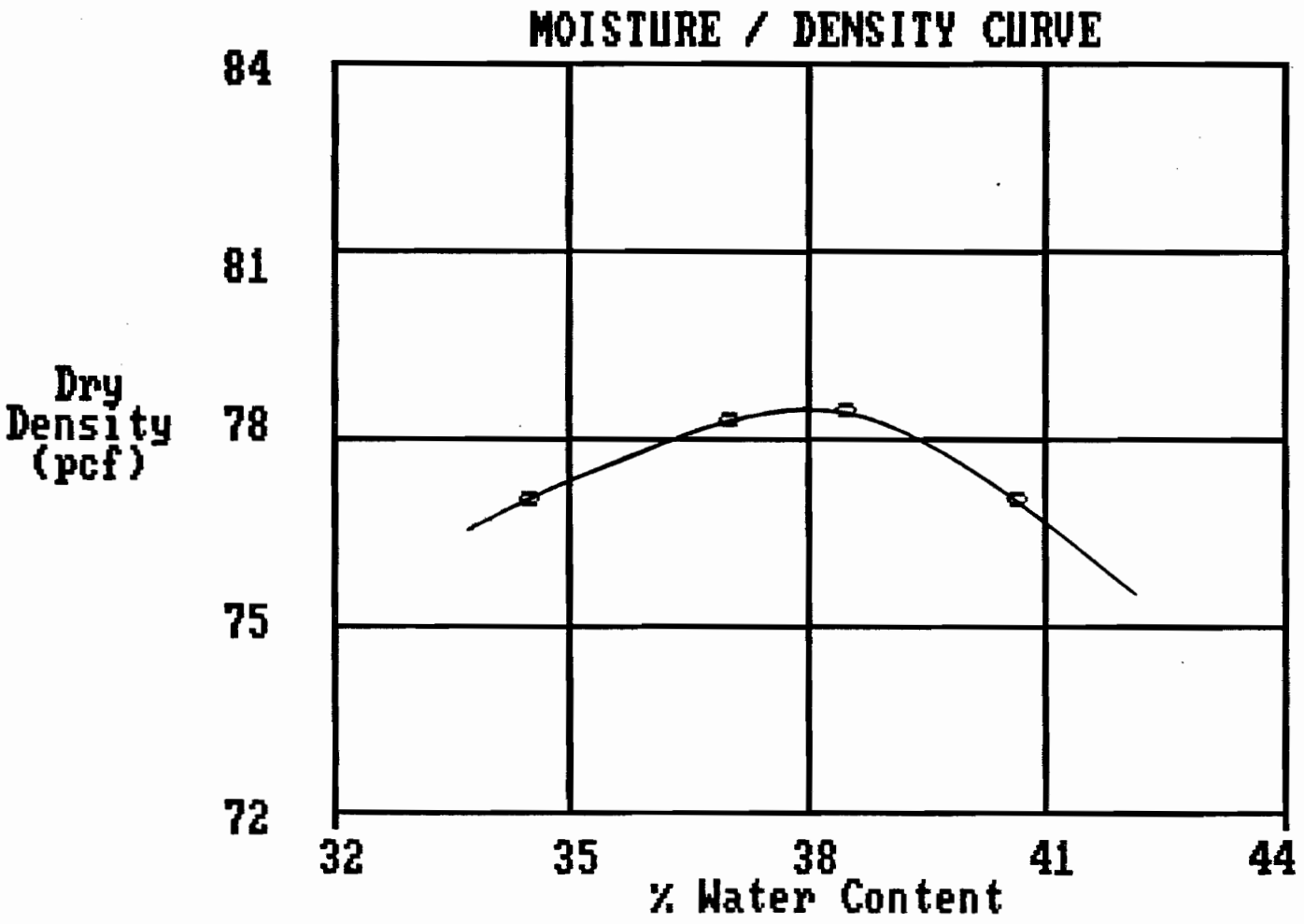
SAMPLE No.: TP-4-17-1

TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

		LIQUID LIMIT:	82
OPTIMUM WATER CONTENT:	38.0 %	PLASTIC LIMIT:	34
MAXIMUM DRY DENSITY:	78.5 pcf	PLASTICITY INDEX:	48

DESCRIPTION: Red CLAYEY GRAVEL w/sand
Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

COMPACTION TEST REPORT

PROJECT: TONTITOWN TESTING **PROJECT No.:** 91-425T

DATE: 12-02-1991

SAMPLE No.: TP-4-19-1

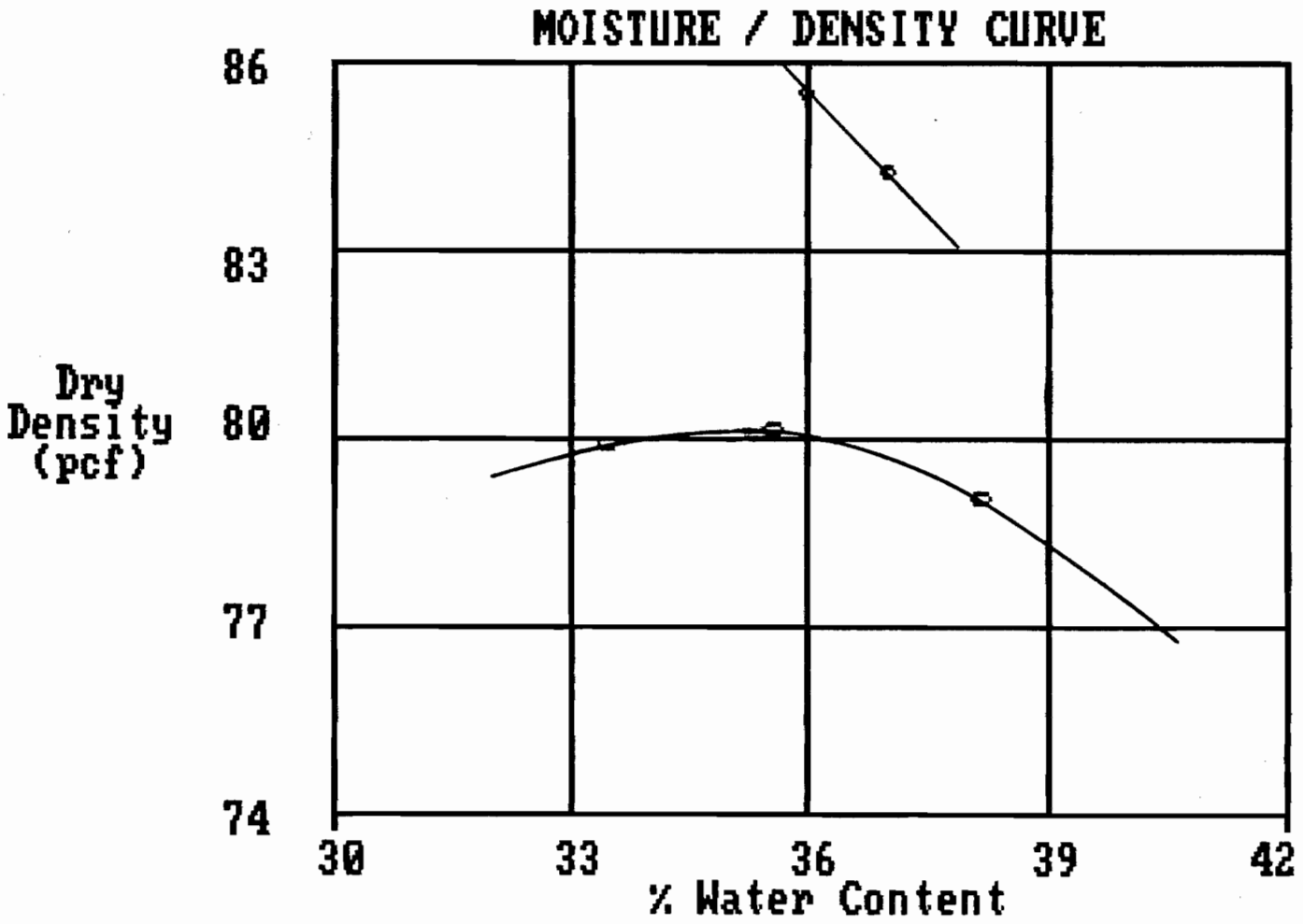
TEST No. ASTM D-698 Method C

56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold.

		LIQUID LIMIT:	99
OPTIMUM WATER CONTENT:	35.0 %	PLASTIC LIMIT:	40
MAXIMUM DRY DENSITY:	80.5 pcf	PLASTICITY INDEX:	59

DESCRIPTION: Red CLAYEY GRAVEL w/sand

Over 30% retained on the 3/4" sieve. This material was discarded and Method "C" Proctor was performed.



Alpha-Omega Geotech, Inc.

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP SAMPLE # 3-8-1 DEPTH --

SAMPLE TYPE Remolded % COMPACTION 95.0%

INITIAL MOISTURE 37.9% INITIAL DRY UNIT WEIGHT 79.0 PCF

INITIAL VOID RATIO 1.13 INITIAL SATURATION 90.4%

FINAL MOISTURE 39.6% FINAL SATURATION 97.7%

SAMPLE DESCRIPTION Dark red clayey gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/16	1	7200	189.92	26	.2
12/16	2	6000	189.92	26	.15
12/16	3	7200	189.92	26	.2
12/16	4	6600	189.92	26	.15
AVERAGE		6750	189.92	26	.17

k_T = 3.10E-6 cm/s n_T/n_{20} = .8694

k_{20} = 2.70E-6 cm/s

ALPHA-OMEGA GEOTECH

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-3-9-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.4%

INITIAL MOISTURE 24.6% INITIAL DRY UNIT WEIGHT 96.6 PCF

INITIAL VOID RATIO .71 INITIAL SATURATION 91.5%

FINAL MOISTURE 21.4% FINAL SATURATION 96.0%

SAMPLE DESCRIPTION Brown silty gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_s cm^3
AVERAGE					

k = _____ cm/s n /n_{20} = _____

k_{20} = _____ cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP SAMPLE # 3-11-1 DEPTH --

SAMPLE TYPE Remolded % COMPACTION 94.0%

INITIAL MOISTURE 24.4% INITIAL DRY UNIT WEIGHT 92.8 PCF

INITIAL VOID RATIO .81 INITIAL SATURATION 80.7%

FINAL MOISTURE 23.7% FINAL SATURATION 98.0%

SAMPLE DESCRIPTION Brown silty gravel w/sand (material passing 3/8" sieve only).

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/13	1	7200	189.92	26	2.2
12/13	2	3600	189.92	26	1.2
12/13	3	3600	189.92	26	.6
12/13	4	3600	189.92	26	1.1
AVERAGE		4500	189.92	26	1.3

k = 5.63E-7 cm/s n / n_{20} = .8694

k_{20} = 4.90E-7 cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-4-1-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.2%

INITIAL MOISTURE 28.8% INITIAL DRY UNIT WEIGHT 86.7 PCF

INITIAL VOID RATIO .73 INITIAL SATURATION 94.9%

FINAL MOISTURE 29.5% FINAL SATURATION 97.2%

SAMPLE DESCRIPTION Brownish-red clayey gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/4	1	4200	70.34	25	.4
12/4	2	3600	70.34	25	.5
12/4	3	3600	70.34	25	.5
12/4	4	3600	70.34	25	.6
AVERAGE		3750	70.34	25.0	.5

k = 7.38E-7 cm/s n / n_{20} = .8893

k_{20} = 6.56E-7 cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-4-3-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.7%

INITIAL MOISTURE 34.3% INITIAL DRY UNIT WEIGHT 79.6 PCF

INITIAL VOID RATIO .96 INITIAL SATURATION 89.3%

FINAL MOISTURE 38.5% FINAL SATURATION 100.2%

SAMPLE DESCRIPTION Red clayey gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/5	1	1800	70.34	25	7.5
12/5	2	3600	70.34	25	8.4
12/5	3	5400	70.34	26	7.9
12/5	4	7200	70.34	26	6.8
AVERAGE		4500	70.34	25.5	7.6

k = 9.23E-6 cm/s n / n_{20} = .8794

k_{20} = 8.12E-6 cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tontitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-4-6-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.4%

INITIAL MOISTURE 39.4% INITIAL DRY UNIT WEIGHT 75.7 PCF

INITIAL VOID RATIO 1.10 INITIAL SATURATION 91.0%

FINAL MOISTURE 41.6% FINAL SATURATION 96.2%

SAMPLE DESCRIPTION Dark red clayey gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/3	1	2100	70.34	25	1.6
12/3	2	2400	70.34	24	2.1
12/3	3	2400	70.34	24	2.4
12/3	4	2400	70.34	24	2.3
AVERAGE		2325	70.34	24.2	2.1

k = 4.92E-6 cm/s n / n_{20} = .9056

k_{20} = 4.46E-6 cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Towntitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-4-17-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.4%

INITIAL MOISTURE 41.4% INITIAL DRY UNIT WEIGHT 73.3 PCF

INITIAL VOID RATIO 1.17 INITIAL SATURATION 90.2%

FINAL MOISTURE 44.0% FINAL SATURATION 96.0%

SAMPLE DESCRIPTION Red clayey gravel w/sand

Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/3	1	2400	70.34	25	.4
12/3	2	2400	70.34	24	.2
12/3	3	2400	70.34	24	.25
12/3	4	2400	70.34	24	.2
AVERAGE		2400	70.34	24.2	.3

k = 5.98E-7 cm/s n / n_{20} = .9056

k_{20} = 5.42E-7 cm/s

CONSTANT HEAD PERMEABILITY REPORT

PROJECT NAME Tonttitown Testing PROJECT NO. 91-425T

LOCATION Arkansas

BORING # TP-4-19-1 SAMPLE # -- DEPTH --

SAMPLE TYPE Remolded % COMPACTION 93.3%

INITIAL MOISTURE 39.1% INITIAL DRY UNIT WEIGHT 75.1 PCF

INITIAL VOID RATIO .99 INITIAL SATURATION 94.3%

FINAL MOISTURE 40.0% FINAL SATURATION 96.7%

SAMPLE DESCRIPTION Red clayey gravel w/sand
Material passing a 3/8" sieve only.

TEST DATA

DATE	TEST NO.	TIME (sec.)	HEAD PRESSURE (cm)	TEMP. ^{o}C	Q_3 cm^3
12/6	1	3600	70.34	25	1.5
12/6	2	4800	70.34	25	1.35
12/6	3	3600	70.34	25	1.0
12/6	4	3600	70.34	25	1.0
AVERAGE		3900	70.34	25.0	1.2

k = 1.71E-6 cm/s n / n_{20} = .8893

k_{20} = 1.52E-6 cm/s

SUMMARY OF LABORATORY TESTING

PROJECT NAME Tontitown Testing Addendum I

PROJECT NUMBER 91-425T

PROJECT LOCATION Tontitown, Arkansas

DATE 12/23/91

Boring No.	Sample Number	Depth or Elev.	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%e	% Swell	Remarks
TP	3-2		Dark reddish-brown FAT CLAY	37.0		84	37	47	SM	42.0				
TP	3-5		Dark reddish-brown clayey gravel w/sand	29.5		82	31	51	GC	29.3				
TP	3-6		Dark reddish-brown silty gravel w/sand	24.5		79	48	31	GM	18.8				*
TP	3-12		Dark reddish-brown silty gravel w/sand	19.1		84	38	46	GM	20.7				*
TP	4-5		Red silty gravel w/ sand	25.4		84	37	47	GM	27.3				*
TP	4-7		Red clayey gravel w/ sand	31.8		61	20	41	GC	35.7				
TP	4-9		Red silty sand w/some gravel	33.9		76	36	40	SM	40.6				*
TP	4-12		Red clayey gravel w/ sand	31.7		82	30	52	GC	37.3				
TP	4-13		Red clayey gravel w/sand	23.3		73	24	49	GC	26.7				
TP	4-22		Red clayey gravel w/sand	17.8		54	17	37	GC	25.5				

*Authorized re-test

SUMMARY OF LABORATORY TESTING

PROJECT NAME Tontitown Testing Addendum I

PROJECT NUMBER 91-425T

PROJECT LOCATION Tontitown, Arkansas

DATE 12/23/91

Boring No.	Sample Number	Depth or Elev.	Description	Natural Moisture (%)	Dry Unit Weight (pcf)	Atterberg Limits LL	PL	PI	USCS Class.	% Passing No. 200	Unconfined Compression PSF	%e	% Swell	Remarks
TP	4-25		Red clayey gravel w/sand	32.0		87	36	51	GC	53.0				
TP	3-6		Re-test, limits only											
TP	3-12		Re-test, limits only											
TP	4-5		Re-test, limits only											
TP	4-9		Re-test, limits only											

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T
Addendum I

BORING NO.: SAMPLE NO.: TP-3-2 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	24.9	75.1
1	33.8	66.2
.75	37.3	62.7
.5	41.6	58.4
.375	44.1	55.9
4	49.6	50.4
8	53.0	47.0
16	55.1	44.9
20	55.7	44.3
30	56.3	43.7
40	56.7	43.3
50	57.0	43.0
80	57.4	42.6
200	58.0	42.0

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

Addendum I

BORING NO.: SAMPLE NO.: TP-3-5 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	12.9	87.1
1	32.1	67.9
.75	39.6	60.4
.5	45.3	54.7
.375	49.2	50.8
4	56.6	43.5
8	60.8	39.2
16	63.5	36.5
20	64.4	35.7
30	65.2	34.8
40	66.4	33.6
50	67.4	32.6
80	68.9	31.1
200	70.7	29.3

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T
Addendum I

BORING NO.: SAMPLE NO.: TP-3-6 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	11.9	88.1
1	31.7	68.3
.75	35.6	64.4
.5	44.9	55.1
.375	51.0	49.0
4	62.4	37.6
8	69.3	30.8
16	72.9	27.2
20	74.0	26.0
30	75.0	25.0
40	76.2	23.8
50	77.6	22.4
80	79.5	20.5
200	81.2	18.8

SIEVE ANALYSIS FOR TONTITOWN TESTING
Addendum I

JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-3-12 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	19.4	80.6
1	46.7	53.3
.75	54.0	46.0
.5	59.6	40.4
.375	62.1	37.9
4	66.0	34.0
8	68.2	31.8
16	69.7	30.3
20	70.9	29.1
30	72.4	27.6
40	74.2	25.8
50	75.7	24.3
80	77.6	22.4
200	79.3	20.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

Addendum I

BORING NO.: SAMPLE NO.: TP-4-5 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	13.0	87.0
1	45.6	54.4
.75	52.7	47.3
.5	59.7	40.3
.375	62.3	37.7
4	67.6	32.4
8	69.9	30.1
16	70.9	29.1
20	71.2	28.8
30	71.5	28.5
40	71.8	28.3
50	72.1	27.9
80	72.4	27.6
200	72.7	27.3

SIEVE ANALYSIS FOR TONTITOWN TESTING
Addendum I

JOB NUMBER: 91-425T

BORING NO.: SAMPLE NO.: TP-4-7 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	21.3	78.7
1	35.1	64.9
.75	39.0	61.0
.5	45.1	54.9
.375	48.4	51.6
4	55.1	44.9
8	58.9	41.1
16	61.2	38.8
20	62.0	38.0
30	62.7	37.3
40	63.1	36.9
50	63.5	36.5
80	63.9	36.2
200	64.3	35.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T
Addendum I

BORING NO.: SAMPLE NO.: TP-4-9 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	21.5	78.5
1	31.1	68.9
.75	37.4	62.6
.5	41.6	58.4
.375	45.0	55.0
4	49.7	50.3
8	53.0	47.1
16	55.5	44.6
20	56.4	43.6
30	57.2	42.8
40	58.0	42.1
50	58.6	41.4
80	59.1	41.0
200	59.4	40.6

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

Addendum I

BORING NO.: SAMPLE NO.: TP-4-12 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	25.0	75.0
1	34.6	65.4
.75	38.1	61.9
.5	41.9	58.1
.375	44.6	55.4
4	50.2	49.8
8	53.9	46.1
16	56.6	43.4
20	57.8	42.2
30	59.0	41.0
40	60.1	39.9
50	61.0	39.0
80	61.7	38.3
200	62.7	37.3

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T
Addendum I

BORING NO.: SAMPLE NO.: TP-4-13 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	11.4	88.6
1	34.5	65.5
.75	39.0	61.0
.5	49.8	50.2
.375	54.3	45.7
4	63.2	36.8
8	68.1	31.9
16	70.7	29.3
20	71.3	28.7
30	71.8	28.2
40	72.2	27.8
50	72.6	27.4
80	73.0	27.0
200	73.3	26.7

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T
Addendum I

BORING NO.: SAMPLE NO.: TP-4-22 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	24.8	75.2
1	35.1	65.0
.75	43.6	56.4
.5	52.6	47.5
.375	57.9	42.1
4	65.5	34.5
8	69.7	30.3
16	71.6	28.4
20	72.2	27.8
30	72.7	27.3
40	73.1	26.9
50	73.5	26.5
80	73.9	26.1
200	74.5	25.5

SIEVE ANALYSIS FOR TONTITOWN TESTING JOB NUMBER: 91-425T

Addendum I

BORING NO.: SAMPLE NO.: TP-4-25 DEPTH:

SIEVE SIZE	TOTAL % RETAINED	TOTAL % PASSING
2	17.0	83.0
1	29.9	70.1
.75	32.9	67.1
.5	38.0	62.0
.375	39.2	60.8
4	41.7	58.3
8	43.3	56.7
16	44.3	55.7
20	44.7	55.3
30	45.2	54.9
40	45.8	54.2
50	46.4	53.7
80	46.7	53.3
200	47.1	53.0

CHAIN OF CUSTODY RECORD REQUEST FOR ANALYSIS

SCS ANALYTICAL LABORATORY

COMPANY NAME: SCS ENGINEERS	CARRIER:	TURNAROUND TIME REQUIRED: ☐ NORMAL ☐ 5-DAY ☐ 3-DAY ☐ 24-HOUR ☐ IMMEDIATE ATTENTION
ADDRESS: 1901 HARRISON AVE	SHIPMENT DATE:	
PHONE NUMBER: (810) 741-7210	SHIPPING NUMBER:	
P.O. NUMBER:	NUMBER OF SAMPLES:	PAGE OF

PROJECT NAME: SUNRAY - JONITTOWN
PROJECT ADDRESS: JONITTOWN, AR
PROJECT NUMBER: 08890015.06
SAMPLER NAME AND SIGNATURE: Art Hoffmaster
REPORTS TO BE SENT TO: JOHN BUCKLEY

SAMPLE I.D. NUMBER	SAMPLE DESCRIPTION	SAMPLE MATRIX	SAMPLE PRESERVATIVE(S)	CONTAINER SIZE / TYPE	DATE / TIME COLLECTED	FIELD TEMP.	FIELD pH	FIELD EC	SPECIAL PROGRAM REQUIREMENTS OR EPA - SOP & QAM REF	ANALYSES REQUIRED: MOISTURE CONTENT	SIEVE ANALYSIS	ATTERBERG	LAB ONLY: SAMPLE CONDITION UPON RECEIPT
TP-3-2		Soil		(1) 5-GAL BUCKET	11/20/91					X	X	X	
TP-3-5		"		"	"					X	X	X	
TP-3-6		"		"	"					X	X	X	
TP-3-12		"		"	"					X	X	X	
TP-4-5		"		"	"					X	X	X	
TP-4-7		"		"	"					X	X	X	
TP-4-9		"		"	"					X	X	X	
TP-4-12		"		"	"					X	X	X	
TP-4-13		"		"	"					X	X	X	
TP-4-77		"		"	"					X	X	X	

SPECIAL INSTRUCTIONS / COMMENTS:

RELINQUISHED BY / (Signature)	DATE:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)
Art Hoffmaster	11/20/91				
COMPANY: SCS ENGINEERS	TIME:	COMPANY:	COMPANY:	TIME:	COMPANY:

CHAIN OF CUSTODY RECORD REQUEST FOR ANALYSIS

SCS ANALYTICAL LABORATORY

COMPANY NAME: SCS ENGINEERS	CARRIER:	TURNAROUND TIME REQUIRED: ☐ NORMAL ☐ 5-DAY ☐ 3-DAY ☐ 24-HOUR ☐ IMMEDIATE ATTENTION
ADDRESS: 10401 HOLMES RD	SHIPMENT DATE:	
PHONE NUMBER: (816) 941-7510	SHIPPING NUMBER:	
P.O. NUMBER:	NUMBER OF SAMPLES:	PAGE OF
PROJECT NAME: SUNRAY SERVICES		
PROJECT ADDRESS: TONTITOWN, AR		
PROJECT NUMBER: 08890015.06		
SAMPLER NAME AND SIGNATURE: Joseph T Hoffmeister		
REPORTS TO BE SENT TO: JOHN BUCKLEY		

SAMPLE I.D. NUMBER	SAMPLE DESCRIPTION	SAMPLE MATRIX	SAMPLE PRESERVATIVE(S)	CONTAINER SIZE / TYPE	DATE / TIME COLLECTED	FIELD TEMP.	FIELD pH	FIELD EC	SPECIAL PROGRAM REQUIREMENTS OR EPA - SOP & QAM REF	ANALYSES REQUIRED: STANDARD PROCTOR	MOISTURE CONTENT	SIEVE ANALYSIS	DENSITY			ATTERBERG			LAB ONLY: SAMPLE CONDITION UPON RECEIPT
TP-3-8-1		SOIL	--	(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-3-9-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-3-11-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-4-1-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-4-3-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-4-6-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-4-6-2		SOIL		SHELBY TUBE							✓		✓						
TP-4-17-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			
TP-4-17-2		SOIL		SHELBY TUBE									✓						
TP-4-17-1		SOIL		(2) 5-GAL BUCKETS						✓	✓	✓				✓			

SPECIAL INSTRUCTIONS / COMMENTS: ANTICIPATED COMPLETION BY THE WEEK OF DEC. 9, 1991

RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)
Joseph T Hoffmeister	11/15/91	Frank Comer			
COMPANY:	TIME:	COMPANY:	COMPANY:	TIME:	COMPANY:

CHAIN OF CUSTODY RECORD REQUEST FOR ANALYSIS

SCS ANALYTICAL LABORATORY

COMPANY NAME: SCS ENGINEERS	CARRIER:	TURNAROUND TIME REQUIRED: ☐ NORMAL ☐ 5-DAY ☐ 3-DAY ☐ 24-HOUR ☐ IMMEDIATE ATTENTION
ADDRESS: 10401 Holmes Rd	SHIPMENT DATE:	
PHONE NUMBER: (816) 941-7510	SHIPPING NUMBER:	
P.O. NUMBER:	NUMBER OF SAMPLES:	PAGE OF
PROJECT NAME: SUNRAY - TONTITOWN		
PROJECT ADDRESS: TONTITOWN, AR		
PROJECT NUMBER: 08890151.06		
SAMPLER NAME AND SIGNATURE: Joe Hoffmeister		
REPORTS TO BE SENT TO: JOHN BUCKLEY		

SAMPLE I.D. NUMBER	SAMPLE DESCRIPTION	SAMPLE MATRIX	SAMPLE PRESERVATIVE(S)	CONTAINER SIZE / TYPE	DATE / TIME COLLECTED	FIELD TEMP.	FIELD pH	FIELD EC	SPECIAL PROGRAM REQUIREMENTS OR EPA - SOP & QAM REF	ANALYSES REQUIRED: MOISTURE CONTENT	ANALYSES REQUIRED: SIEVE ANALYSIS	ANALYSES REQUIRED: ATTERBERG	LAB ONLY: SAMPLE CONDITION UPON RECEIPT
TT-4-25		Soil		5-GAL BUCKET	11/20/91					X	X	X	

SPECIAL INSTRUCTIONS / COMMENTS:

RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)
Joseph Hoffmeister	11/25/91	Frank Comer			
COMPANY: SCS ENGINEERS	TIME:	COMPANY:	COMPANY:	TIME:	COMPANY:

CHAIN OF CUSTODY RECORD REQUEST FOR ANALYSIS

SCS ANALYTICAL LABORATORY

COMPANY NAME: SCS ENGINEERS	CARRIER:	TURNAROUND TIME REQUIRED: ☐ NORMAL ☐ 5-DAY ☐ 3-DAY ☐ 24-HOUR ☐ IMMEDIATE ATTENTION
ADDRESS: 10701 HOLMES RD	SHIPMENT DATE:	
PHONE NUMBER: (816) 941-7510	SHIPPING NUMBER:	
P.O. NUMBER:	NUMBER OF SAMPLES:	PAGE OF
PROJECT NAME: SUNRAY SERVICES		
PROJECT ADDRESS: TONTITOWN, AR		
PROJECT NUMBER: 0689015.06		
SAMPLER NAME AND SIGNATURE: Joseph T Hoffmeister		
REPORTS TO BE SENT TO: JOHN BUCKLEY		

SAMPLE I.D. NUMBER	SAMPLE DESCRIPTION	SAMPLE MATRIX	SAMPLE PRESERVATIVE(S)	CONTAINER SIZE / TYPE	DATE / TIME COLLECTED	FIELD TEMP.	FIELD pH	FIELD EC	SPECIAL PROGRAM REQUIREMENTS OR EPA - SOP & QAM REF	ANALYSES REQUIRED: MOISTURE	SIEVE ANALYSIS	ATTERBERG	LAB ONLY: SAMPLE CONDITION UPON RECEIPT
B100-2		SOIL								✓	✓	✓	
B200-1		SOIL								✓	✓	✓	
B300-1		SOIL								✓	✓	✓	
B300A-2		SOIL								✓	✓	✓	
B400-2		SOIL								✓	✓	✓	

SPECIAL INSTRUCTIONS / COMMENTS: ANTICIPATED COMPLETION BY THE WEEK OF DEC. 9, 1991

RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)	RELINQUISHED BY: (Signature)	DATE:	RECEIVED BY: (Signature)
Joseph T Hoffmeister	11/15/91				
COMPANY:	TIME:	COMPANY:	COMPANY:	TIME:	COMPANY:

02/91 SCS ANALYTICAL LABORATORY

SUNRAY SERVICES INC.

FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2

SYMBOLS & ABBREVIATIONS

▭	EXISTING BUILDING
——— ℄ ———	PROPERTY LINE
——→	DITCH / BENCH FLOW
➡	FLOW DIRECTION
38	EXISTING CONTOUR
36	NEW CONTOUR
×—×—×	FENCE LINE
⊙	POWER POLE
MW-6	MONITORING WELL
3:1	SLOPE INDICATOR
▒▒▒	RIP-RAP
M	MEASURED DISTANCE
LCS	LEACHATE COLLECTION SYSTEM
CMP	CORREGATED METAL PIPE
RPCC	REINFORCED PORTLAND CEMENT CONCRETE
PCC	PORTLAND CEMENT CONCRETE
EL	ELEVATION
HDPE	HIGH DENSITY POLYETHYLENE
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
OC	ON CENTER
R-O-W	RIGHT OF WAY

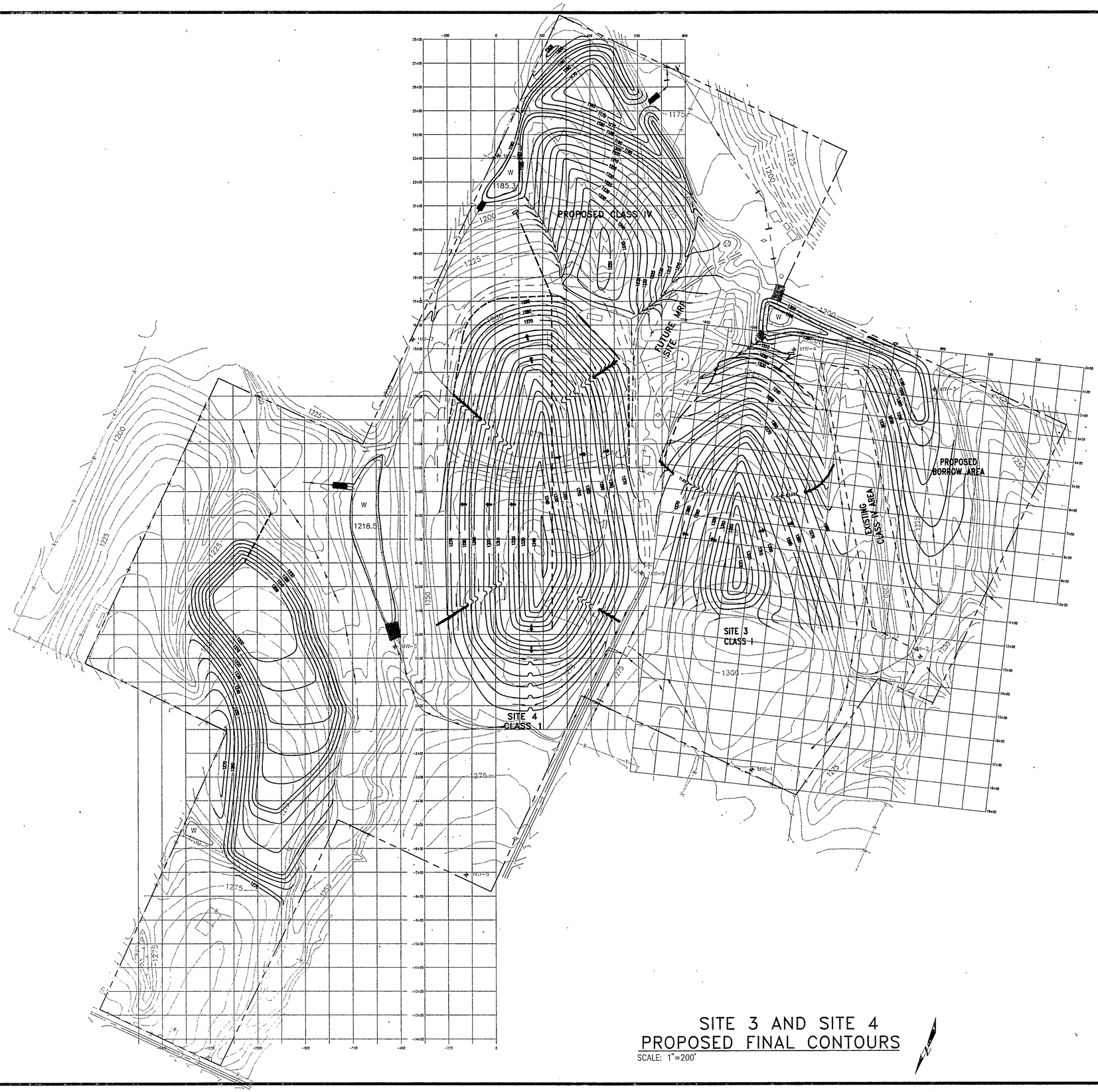
SHEET INDEX

Feb 92

Feb 92

SCS ENGINEERS
CONSULTING ENGINEERS
10401 HOLMES ROAD, SUITE 400
KANSAS CITY, MISSOURI 64131
PH. (816) 941-7510
FAX NO. (816) 941-8025

ADEQ Solid Waste Division
Date Rec'd _____ Drawing # 22 of 27
Permit # _____ CSN 72-01 14
Name _____ Geol _____
☐ Design Drawing ☐ Permit Plan
☐ GWM Plan ☐ Construction
☐ Other _____
Supersedes Drawing # _____
☐ Superseded by Drawing # _____
Superseded on Date _____



SITE 3 AND SITE 4
PROPOSED FINAL CONTOURS

SCALE: 1"=200'

3SUN01 1=200 2-19-92

REV.	DATE	DESCRIPTION	CK. BY
1	1-27-92	CHANGED GRD. ADDED BORROW AREA	LDL
2		CONTOURS AND PUT ON DISCHARGED PIPE	
3			
4			
5			

SHEET TITLE
SITE 3 AND SITE 4
PROPOSED FINAL CONTOURS

PROJECT TITLE
FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
TONTITOWN ARKANSAS

CLIENT
SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
9401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7510 FAX NO. (816) 941-8025

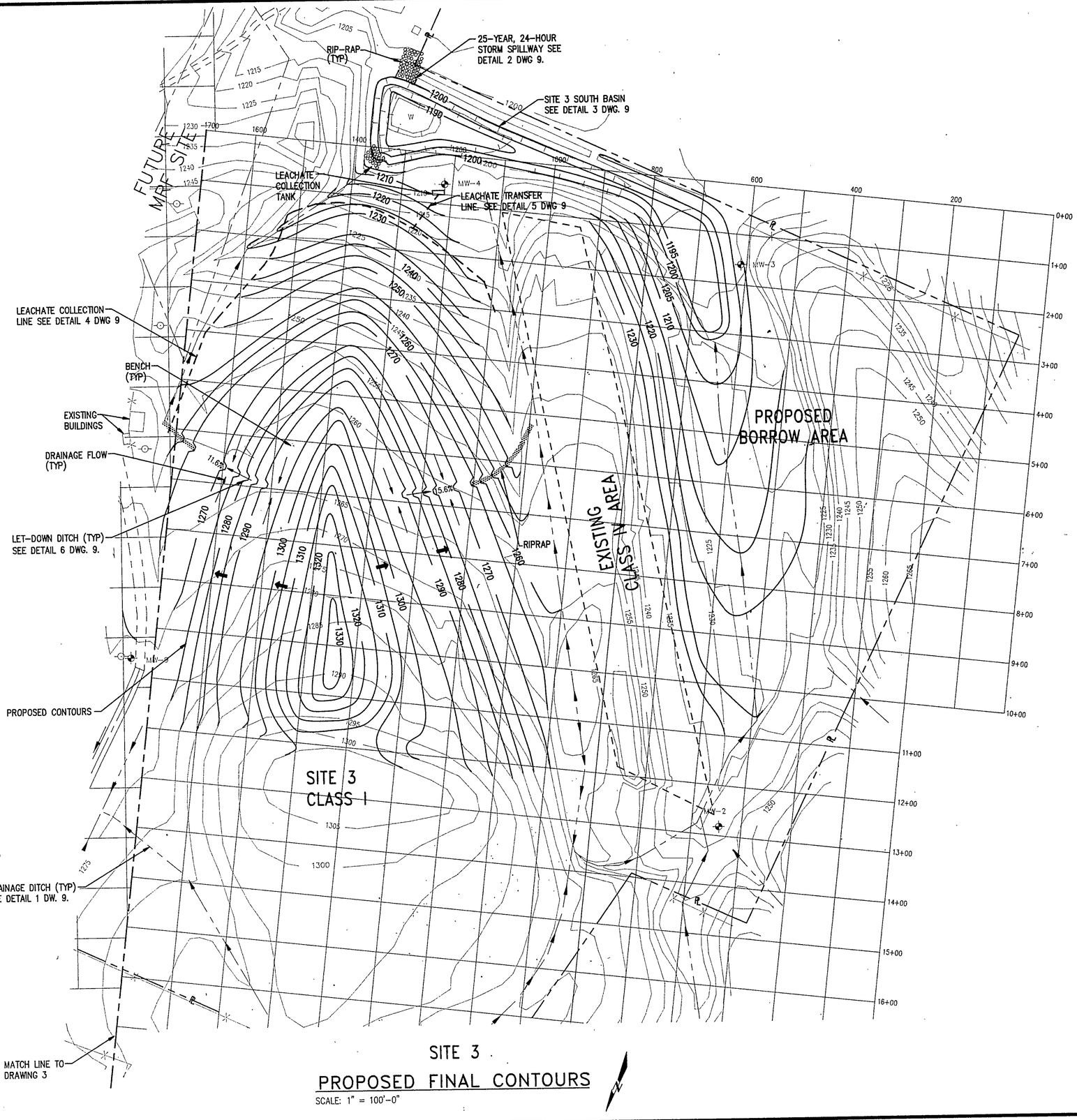
PROJ. NO. 08-89015.06
DSN. BY: JTWK
DWN. BY: CAN
CHK. BY: SKC\LDL
QA/CK'D BY: JDW
APP. BY:

CADD FILE: 3SUN01

DATE: FEBRUARY 1992

SCALE: 1"=200'-0"

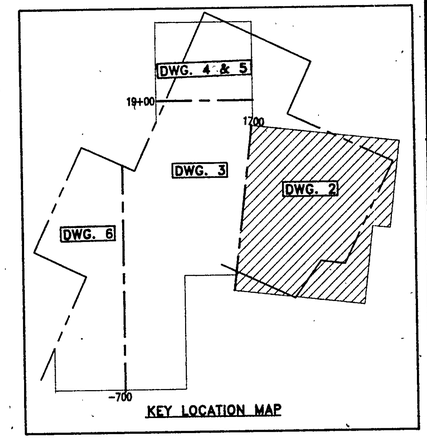
DRAWING NO. 1 of 15



SITE 3

PROPOSED FINAL CONTOURS

SCALE: 1" = 100'-0"



KEY LOCATION MAP

NOTE:
SIDE SLOPES ARE TYPICALLY 4:(HORIZONTAL) 1:(VERTICAL) BETWEEN BENCHES.

REV.	DATE	DESCRIPTION	CK BY
1	2-18-92	RE-ORIENTED SITE CHANGE CONTOURS	LDL

SHEET TITLE
SITE 3
PROPOSED FINAL CONTOURS

PROJECT TITLE
FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
TONTITOWN ARKANSAS

CLIENT
SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
9401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7700 FAX NO. (816) 941-8025

PROJ. NO.	DSN. BY:	Q/A DWG BY:
02-F89015.06	GAN	JDW
DSN. BY:	CHK. BY:	APP. BY:
TWK	SKE\LDL	

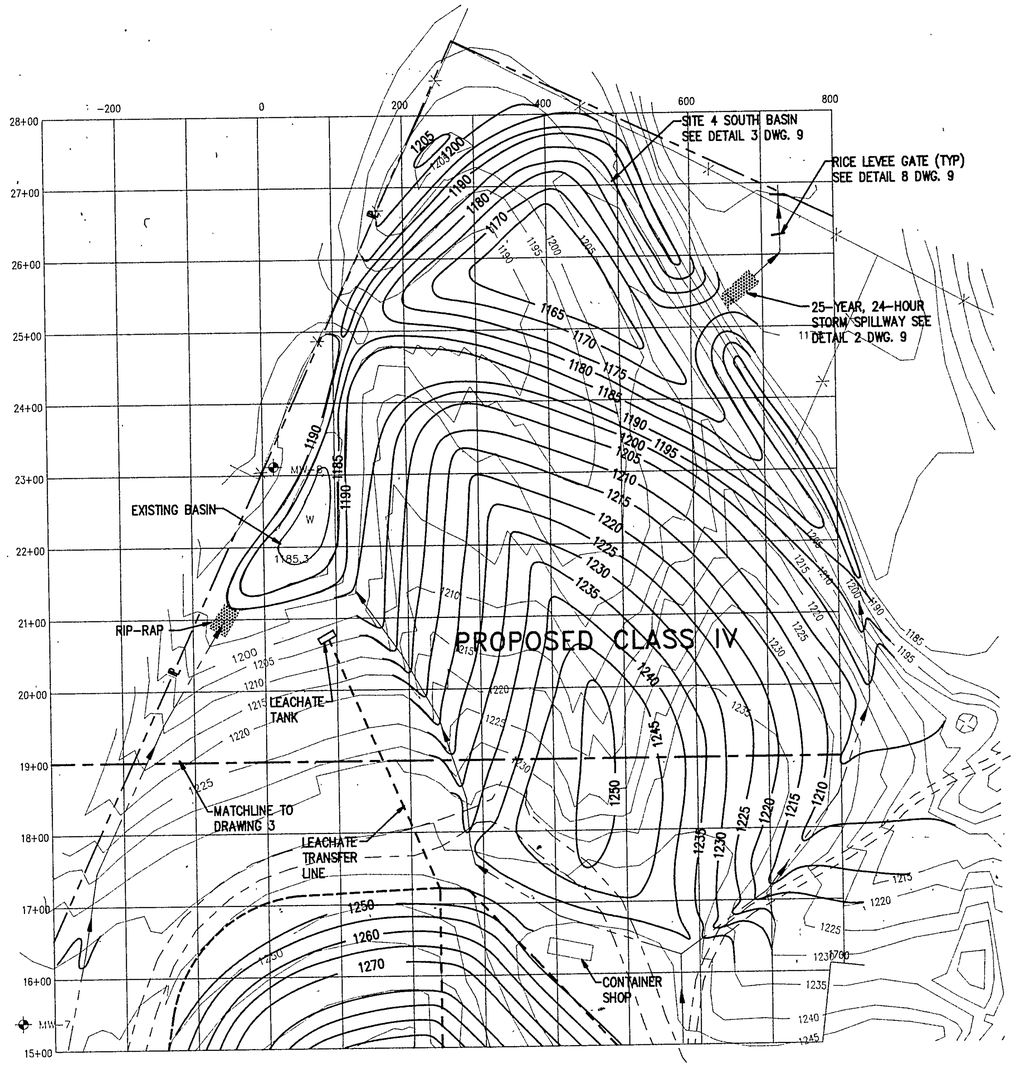
CADD FILE: 3SUN02

DATE: FEBRUARY 1992

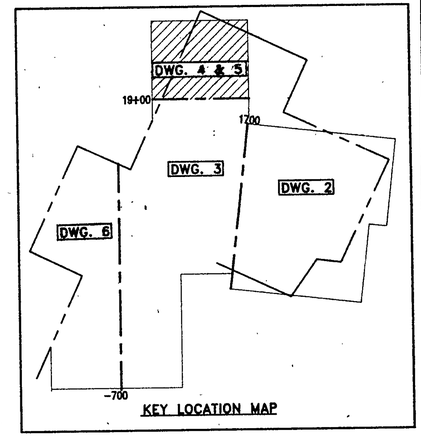
SCALE: 1"=100'-0"

DRAWING NO. 2 of 15

3SUN02 1=100 2-19-92



SITE 4, CLASS IV
PROPOSED FINAL CONTOURS
SCALE: 1" = 100'=0"



KEY LOCATION MAP

REV.	DATE	DESCRIPTION	CK. BY
1	1-24-92	CHANGED GRID	LDL
2	2-18-92	RE-ORIENTED SITE CHANGED FINAL	LDL

SHEET TITLE: SITE 4, CLASS IV
PROPOSED FINAL CONTOURS

PROJECT TITLE
FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
TONTITOWN ARKANSAS

CLIENT
SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
10401 VIKING ROAD, SUITE 400, KANSAS CITY, MISSOURI 64151
PH. (816) 741-7300 FAX NO. (816) 741-8225

PROJ. NO. 02015.06
DSN. BY: TWK
DWN. BY: GAN
CHK. BY: SKE\LDL
Q/A RVW BY: JDW
APP. BY:

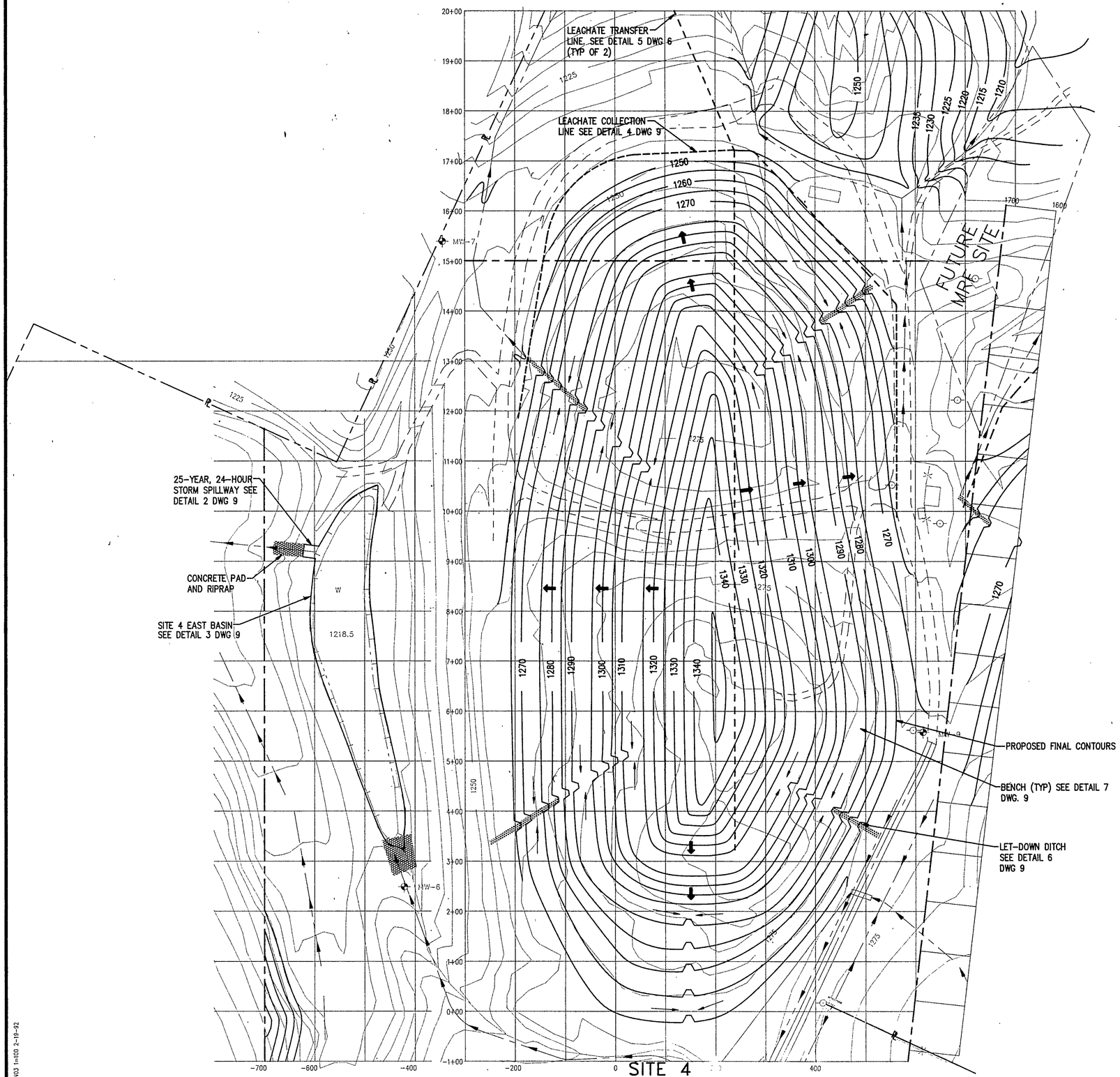
CADD FILE: 3SUN04

DATE: FEBRUARY 1992

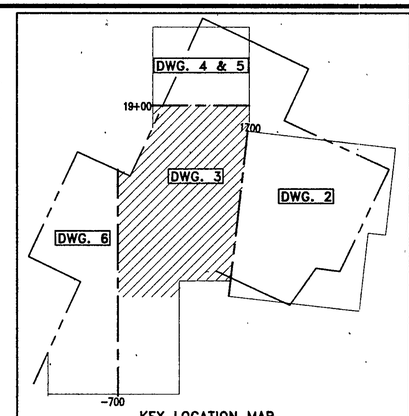
SCALE: 1"=100'-0"

DRAWING NO. 4 of 15

3SUN04 1=100 2-19-92



SITE 4
CLASS I



KEY LOCATION MAP

NOTE:
SIDE SLOPES FOR CLASS I ARE TYPICALLY 4:(HORIZONTAL) 1:(VERTICAL) BETWEEN BENCHES.

SITE 4, CLASS 1
PROPOSED FINAL CONTOURS
SCALE: 1" = 100'-0"

REV	DATE	DESCRIPTION	CK. BY
1	1-24-92	CHANGED GRID	LDL
2	2-18-92	RE-ORIENTED SITE, CHANGED CONTOURS	LDL

SHEET TITLE
SITE 4, CLASS 1
PROPOSED FINAL CONTOURS

PROJECT TITLE
FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
TONTITOWN ARKANSAS

CLIENT
SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
10401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7510 FAX NO. (816) 941-8025

PROJ. NO. 08-89015.06
DSN. BY: GAN
CHK. BY: SKE
DSC. BY: TWK
QA/A. RVW. BY: JDW
APP. BY:

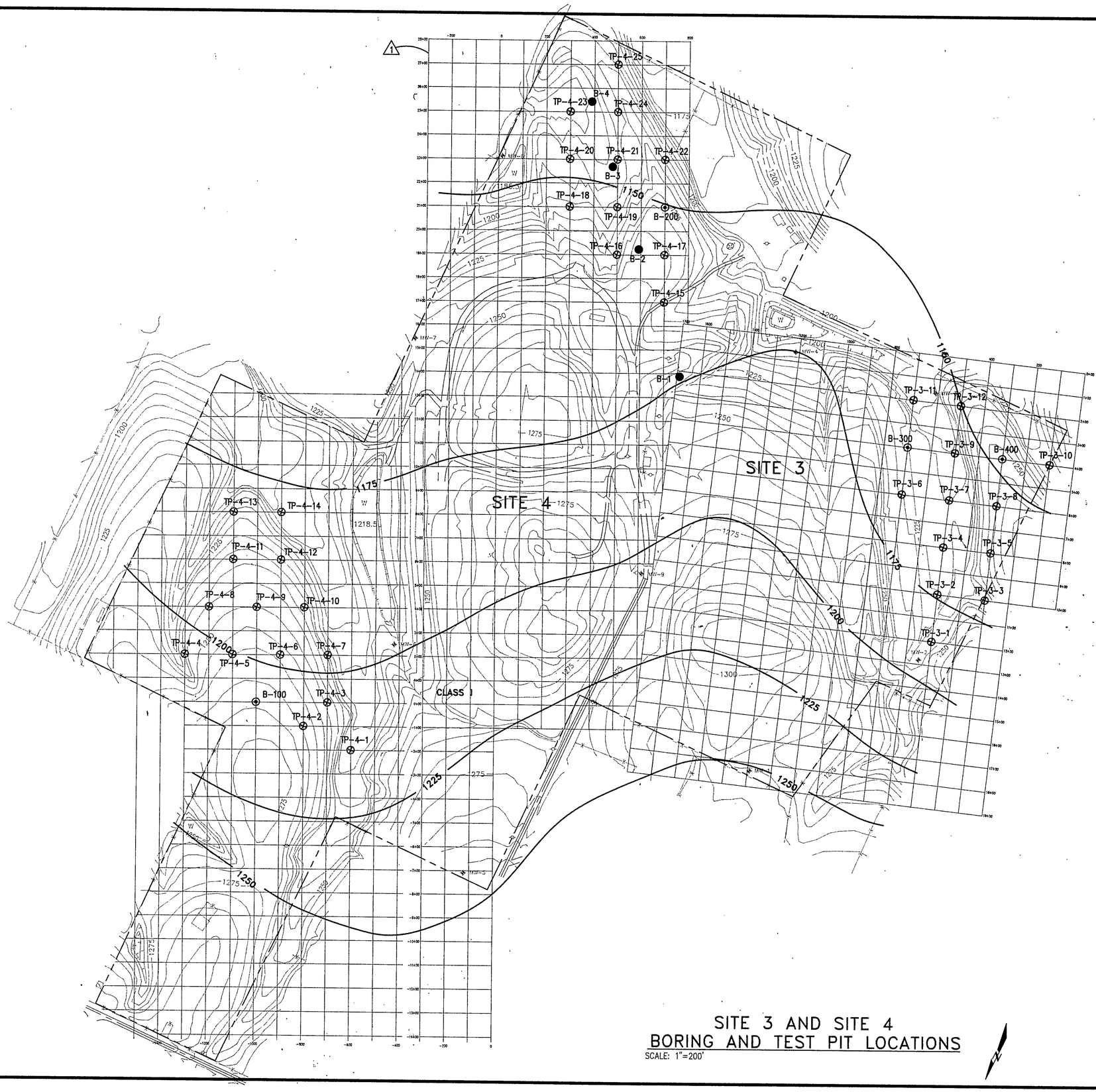
CADD FILE: 3SUN03

DATE: FEBRUARY 1992

SCALE: 1"=100'-0"

DRAWING NO. 3 of 15

3SUN03 1=100 2-19-92



LEGEND

- ⊕ TEST PITS
- ⊙ DEEP BORINGS
- B-2 ● ANDERSON ENGINEERING BORINGS 1988
- 1225 TOP OF LIMESTONE ELEVATIONS (PREPARED BY: GERAGHTY & MILLER, INC. SEPTEMBER 2, 1987)

SITE 3 AND SITE 4
BORING AND TEST PIT LOCATIONS
SCALE: 1"=200'

3SUN07 1=200 2-19-92

REV.	DATE	DESCRIPTION	CK. BY
1	2-18-92	RE-ORIENTED SITE AND GRID	LDL

SHEET TITLE
SITE 3 AND SITE 4
BORING AND TEST PIT LOCATIONS

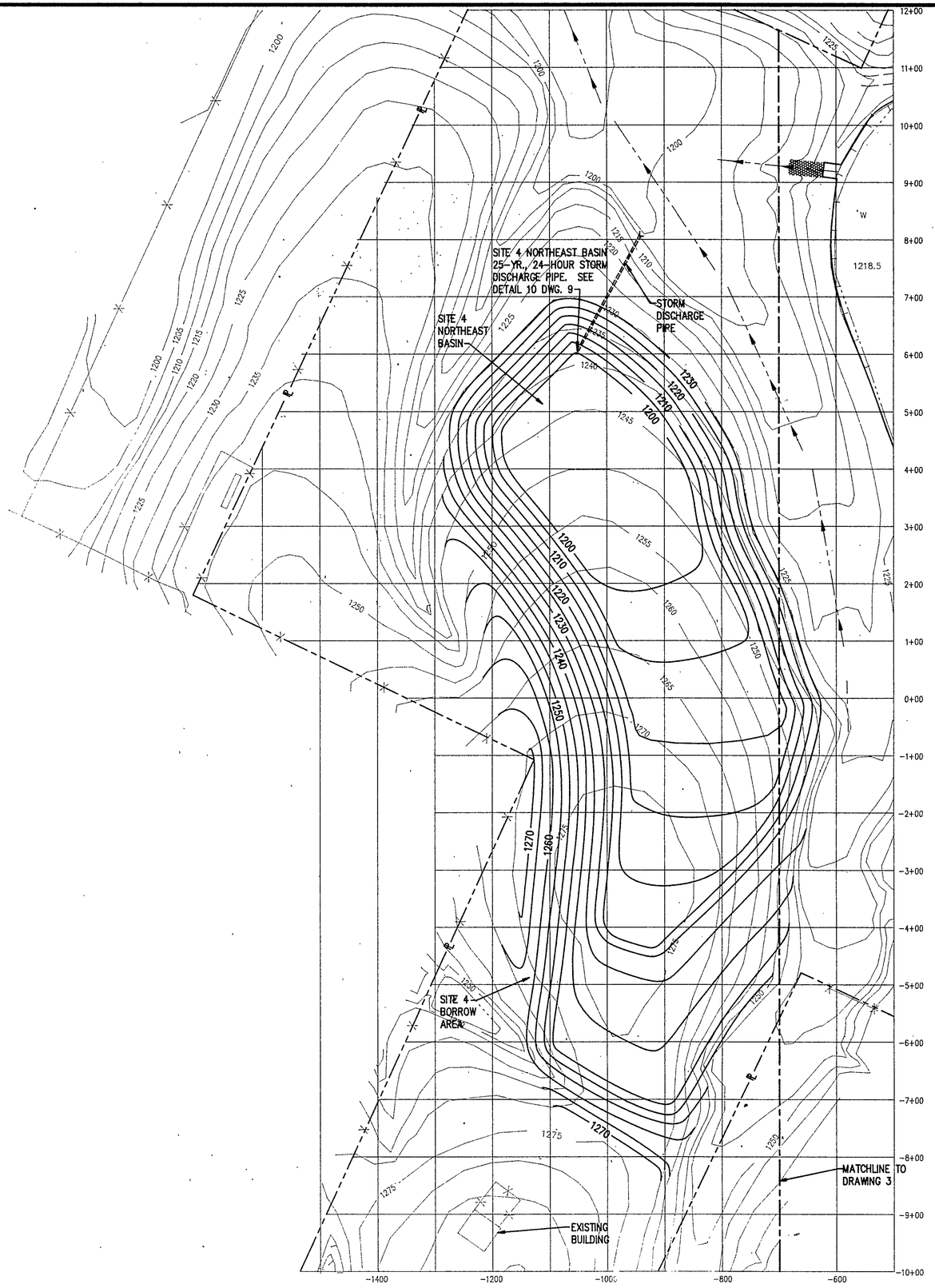
PROJECT TITLE
FINAL CLOSURE MODIFICATIONS
SITES 3 AND 4
PERMIT NUMBERS 123SR2, 162SR2
ARKANSAS
TONTITOWN

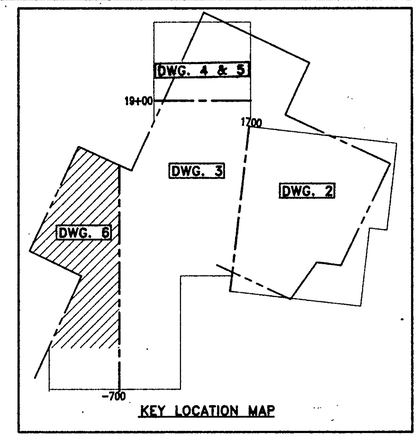
CLIENT
SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
9400 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7100 FAX NO. (816) 941-0625

PROJ. NO. 25-39015.06
DSN. BY: TWK
DWN. BY: GAN
CHK. BY: SKE\LDL
Q/A REVW BY: JDW
APP. BY:

CADD FILE: 3SUN07
DATE: FEBRUARY 1992
SCALE: 1"=200'-0"
DRAWING NO. 7 of 15





SITE 4 BORROW AREA
SCALE: 1"=100'

REV.	DATE	DESCRIPTION	CK. BY
1	1-24-92	NEW DRAWING OF BORROW AREA	LDL
2	2-17-92	CHANGED BORROW AREA, ORIENTATED SITE	LDL

SHEET TITLE: SITE 4 BORROW AREA

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

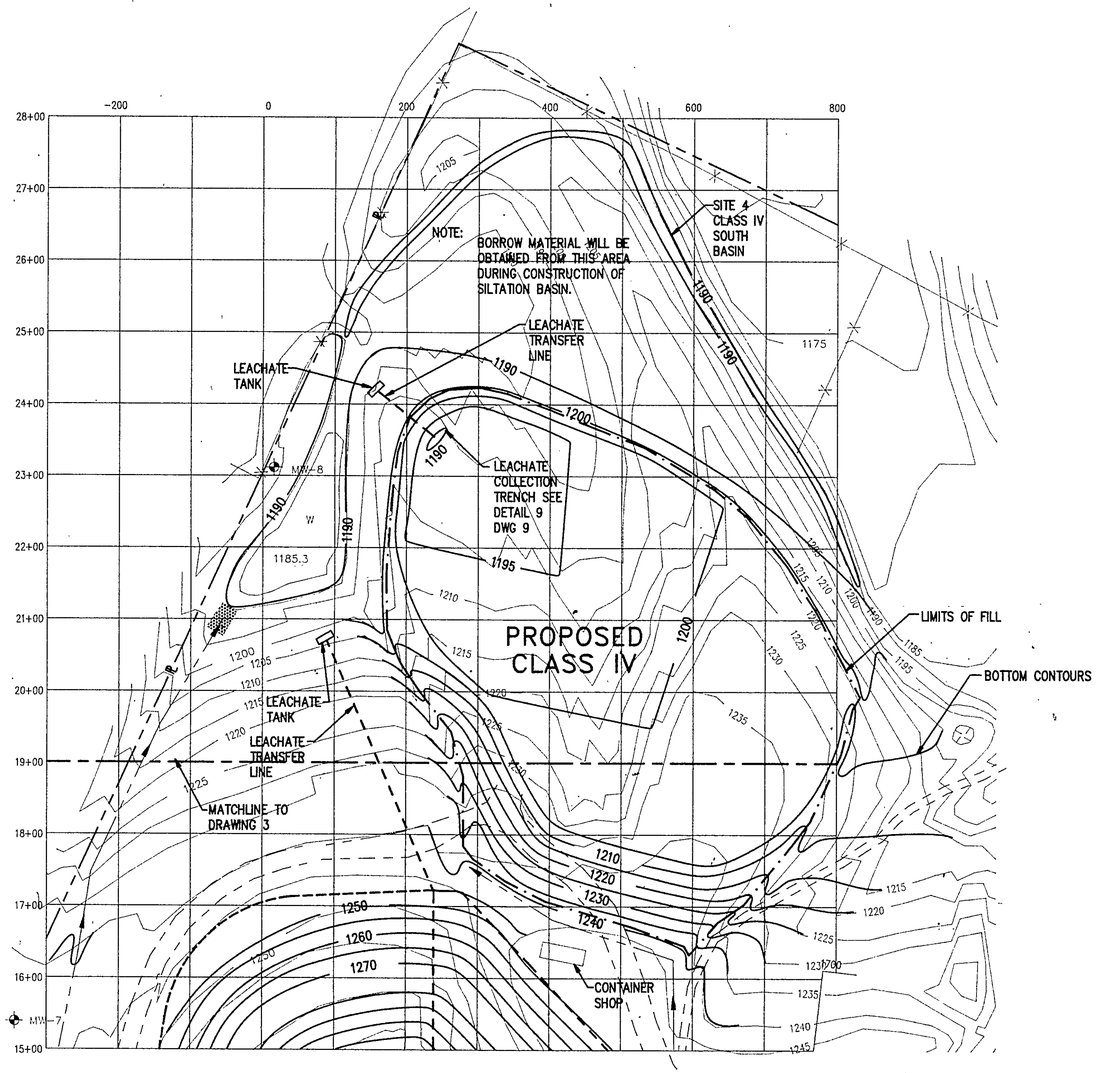
CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
10401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7080 FAX NO. (816) 941-8025

PROJ. NO. 08-89015.06
DSN. BY: GAN
CHK. BY: SKC/LDL
QA/QC BY: JDW
APP. BY:
DSN. BY: TMK

CADD FILE: 3SUN06
DATE: FEBRUARY 1992
SCALE: 1"=100'-0"
DRAWING NO. 6 of 15

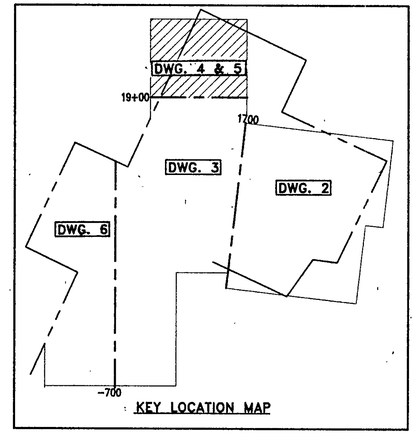
3SUN06 1=100 2-19-92



SITE 4, CLASS IV

BORROW AREA AND BOTTOM CONTOURS

SCALE: 1" = 100'-0"



REV.	DATE	DESCRIPTION	CK. BY
1	2-18-92	NEW BOTTOM CONTOURS AND POND	LDL

SHEET TITLE: SITE 4, CLASS IV BORROW AREA AND BOTTOM CONTOURS

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
8401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7930 FAX NO. (816) 941-0625

PROJ. NO. 08-89015.06 | DWN. BY: GAN | O/A RVW BY: JDW | APP. BY:
DSN. BY: TWK | CHK. BY: SKE\LDL

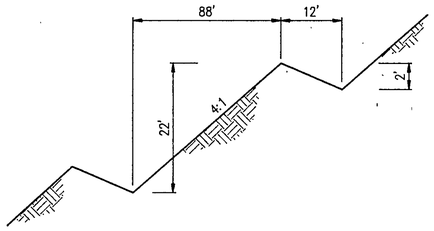
CADD FILE: 3SUN05

DATE: FEBRUARY 1992

SCALE: 1"=100'-0"

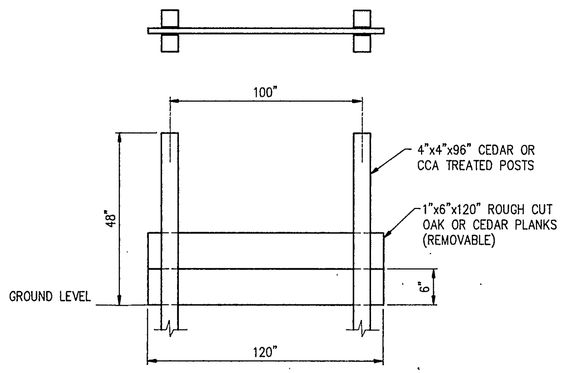
DRAWING NO. 5 of 15

3SUN05 1=100 2-19-92



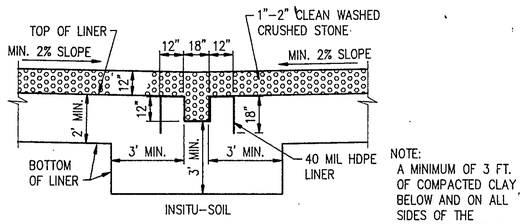
DETAIL NO. 7
TYPICAL BENCH DRAINS

NOT TO SCALE



DETAIL NO. 8
TYPICAL RICE LEVEE GATE

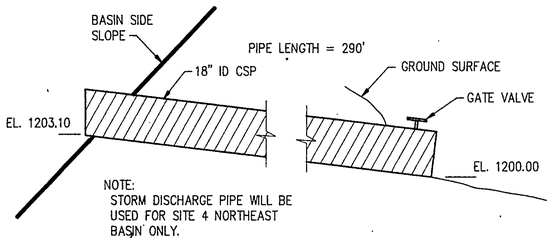
NOT TO SCALE



NOTE:
A MINIMUM OF 3 FT. OF COMPACTED CLAY BELOW AND ON ALL SIDES OF THE COLLECTION TRENCH.

DETAIL NO. 9
LEACHATE COLLECTION TRENCH

NOT TO SCALE

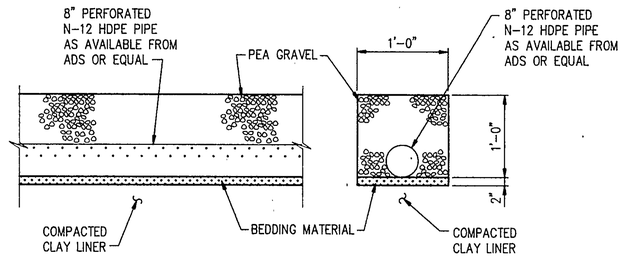


NOTE:
STORM DISCHARGE PIPE WILL BE USED FOR SITE 4 NORTHEAST BASIN ONLY.

DETAIL NO. 10
SILTATION BASIN 10 YEAR STORM DISCHARGE PIPE

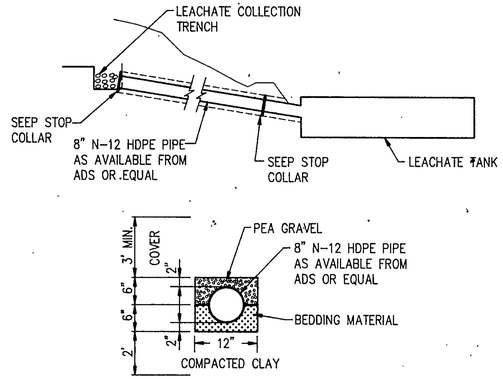
NOT TO SCALE

3SUN09 1=1 2-19-92



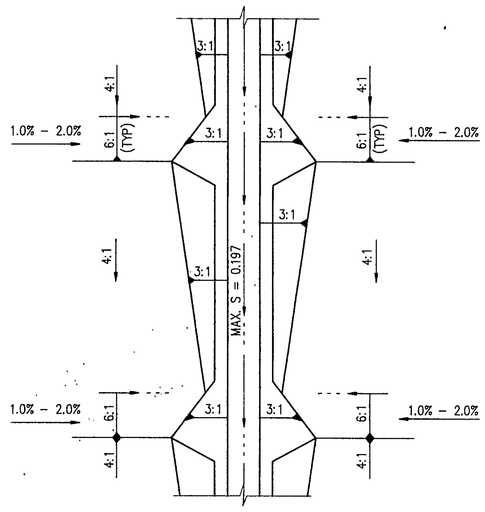
DETAIL NO. 4
LEACHATE COLLECTION LINE

NOT TO SCALE



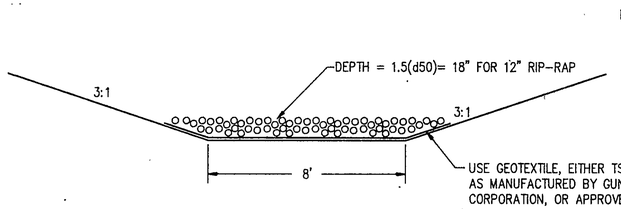
DETAIL NO. 5
LEACHATE TRANSFER LINE

NOT TO SCALE



DETAIL NO. 6
TYPICAL GRADING OF BENCH DRAINS LET-DOWN DITCH INTERFACE

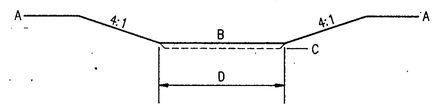
NOT TO SCALE



NOTE:
GRASS CHANNEL HAS SAME TYPICAL SECTION WITHOUT THE RIP-RAP AND GEOTEXTILE. K-31 FESCUE WILL BE SOWN AT THE RATE OF 75lbs/ACRE. THE CHANNELS MUST BE MOWED ANNUALLY.

DETAIL NO. 1
RIP-RAP SURFACE WATER DRAINAGE DITCH

NOT TO SCALE

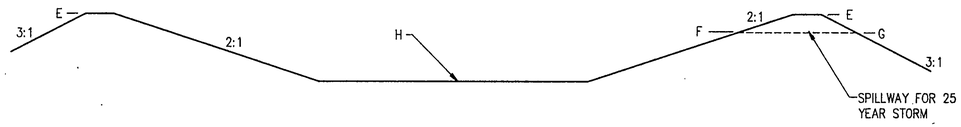


DETAIL NO. 2
25-YR., 24-HOUR STORM SPILLWAY FOR THE SILTATION BASIN

NOT TO SCALE

DETAIL 2 CHART			
	SITE 4 EAST BASIN	SITE 4 SOUTH BASIN	SITE 3 SOUTH BASIN
A	EL. 1220.00	EL. 1190.00	EL. 1200.00
B	EL. 1218.95	EL. 1175.00	EL. 1198.00
C	EL. 1218.00	EL. 1174.50	EL. 1197.00
D	25'	30'	40'

2



DETAIL NO. 3
SILTATION BASINS

NOT TO SCALE

DETAIL 3 CHART				
	SITE 4 NORTHEAST BASIN	SITE 4 EAST BASIN	SITE 4 SOUTH BASIN	SITE 3 SOUTH BASIN
E	EL. 1230.00	EL. 1220.00	EL. 1190.00	EL. 1200.00
F	N.A.	EL. 1218.95	EL. 1175.00	EL. 1198.00
G	N.A.	EL. 1218.00	EL. 1174.50	EL. 1197.00
H	EL. 1200.00	EL. 1195.00	EL. 1165.00	EL. 1180.00

2

REV.	DATE	DESCRIPTION	CK. BY
1	1-28-92	ADDED STORM DISCHARGE PIPE AND NORTHEAST BASIN NOTES TO CHARTS.	LDL
2	2-19-92	REVISED DETAIL NO's. 2, 3, 9, AND 10.	LDL

SHEET TITLE: MISCELLANEOUS DETAILS

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
10401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7500 FAX NO. (816) 941-0025

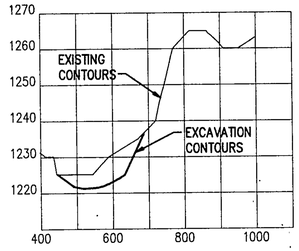
PROJ. NO. 09-89015.06
DSN. BY: TWK
DWN. BY: GAN
CHK. BY: SKE\LDL
O/A RVW. BY: JDW
APP. BY:

CADD FILE: 3SUN09

DATE: FEBRUARY 1992

SCALE: AS NOTED

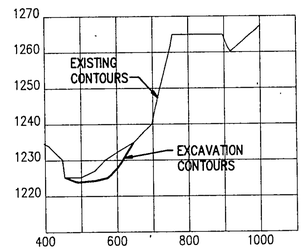
DRAWING NO. 9 of 15



CROSS SECTION 9+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

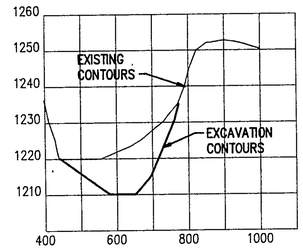
FILL AREA = 1027 SQ. FT.



CROSS SECTION 10+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

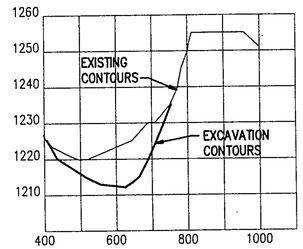
FILL AREA = 478 SQ. FT.



CROSS SECTION 5+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 2610 SQ. FT.



CROSS SECTION 6+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 2328 SQ. FT.

CROSS SECTION 7+00

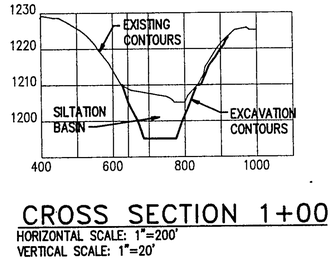
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 2421 SQ. FT.

CROSS SECTION 8+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

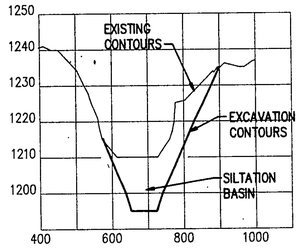
FILL AREA = 1575 SQ. FT.



CROSS SECTION 1+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

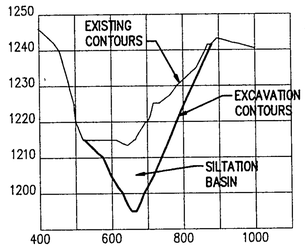
FILL AREA = 1744 SQ. FT.



CROSS SECTION 2+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

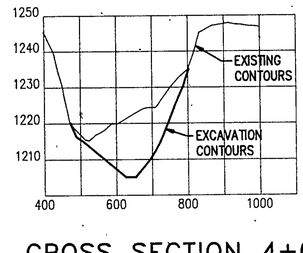
FILL AREA = 3081 SQ. FT.



CROSS SECTION 3+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 3593 SQ. FT.



CROSS SECTION 4+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 2974 SQ. FT.

REV.	DATE	DESCRIPTION	CK. BY
1	2-18-92	CUT NEW CROSS SECTIONS	LDL

SHEET TITLE: CROSS SECTIONS SITE 3 PROPOSED BORROW AREA

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
8401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7030 FAX. (816) 941-8025

PROJ. NO. 08-89015.06
DSN. BY: TWK
DRWN. BY: GAN
CHK. BY: SKE\LDL
Q/A REVIEW BY: JDH
APP'R. BY:

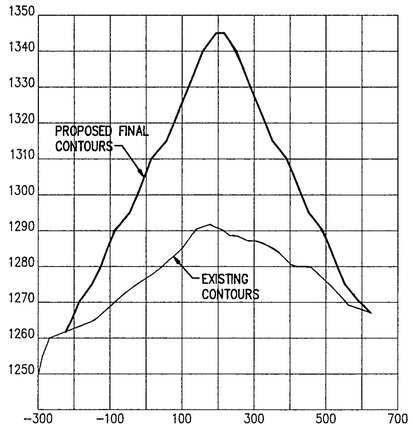
CADD FILE: 3SUN11

DATE: FEBRUARY 1992

SCALE: 1"=200'-0"

DRAWING NO. 11 of 15

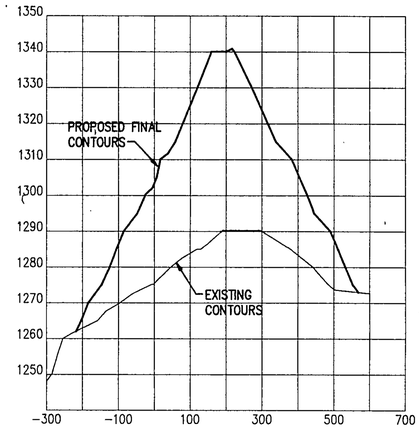
3SUN11 11:02:00 2-18-92



CROSS SECTION 7+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

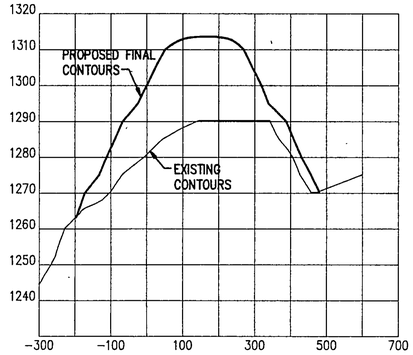
FILL AREA = 22,167 SQ. FT.



CROSS SECTION 5+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

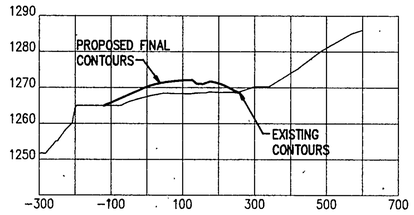
FILL AREA = 20,809 SQ. FT.



CROSS SECTION 3+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 10,058 SQ. FT.



CROSS SECTION 0+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 916 SQ. FT.

CROSS SECTION 8+00

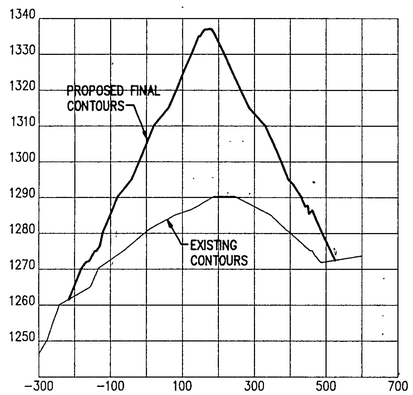
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 22,936 SQ. FT.

CROSS SECTION 6+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

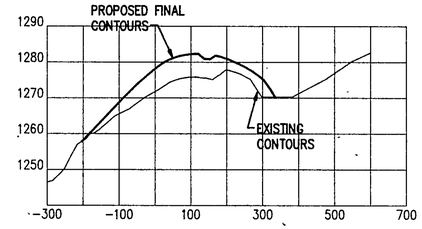
FILL AREA = 21,798 SQ. FT.



CROSS SECTION 4+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

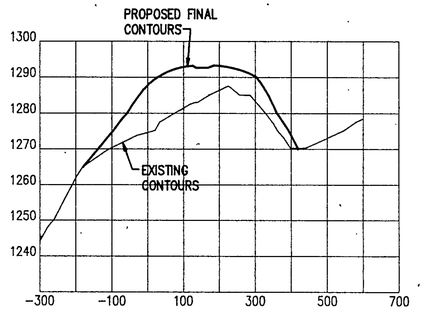
FILL AREA = 16,840 SQ. FT.



CROSS SECTION 1+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 2286 SQ. FT.



CROSS SECTION 2+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 4413 SQ. FT.

3SUN12 1=200 2-18-92

REV	DATE	DESCRIPTION	CK BY
4	2-18-92	CUT NEW CROSS SECTIONS	LDL

SHEET TITLE: CROSS SECTIONS SITE 4 CLASS 1

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
8401 WESLEY SUITE 400, KANSAS CITY, MISSOURI 64131
PH: (816) 941-7500 FAX NO. (816) 941-0555

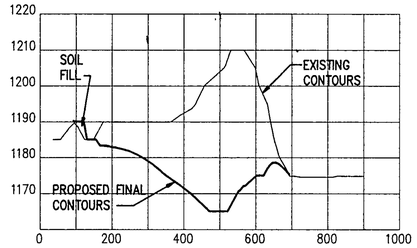
PROJ. NO. 03-89015.06
DES. BY: TWK
DWN. BY: CAN
CHK. BY: SKE \ LDL
S/A RVW BY: JDW
APP. BY:

CADD FILE: 3SUN12

DATE: FEBRUARY 1992

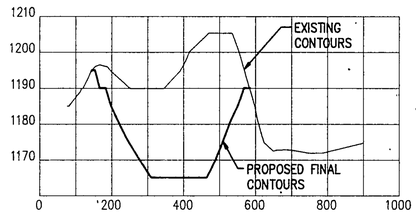
SCALE: 1"=200'-0"

DRAWING NO. 12 of 15



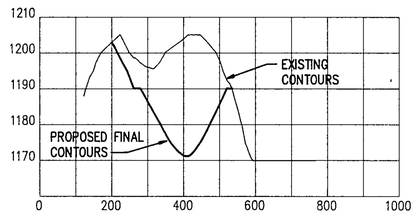
CROSS SECTION 25+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 0 SQ. FT. SOIL FILL AREA = 73 SQ. FT.
EXCAVATED AREA = 10,667 SQ. FT.



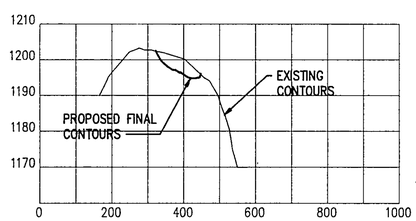
CROSS SECTION 26+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 0 SQ. FT.
EXCAVATED AREA = 9749 SQ. FT.



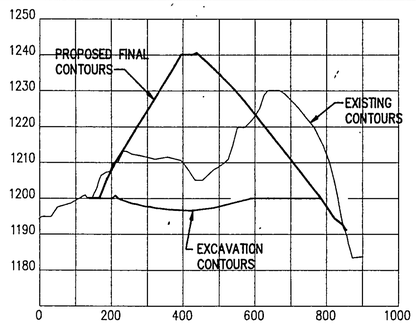
CROSS SECTION 27+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 0 SQ. FT.
EXCAVATED AREA = 5692 SQ. FT.



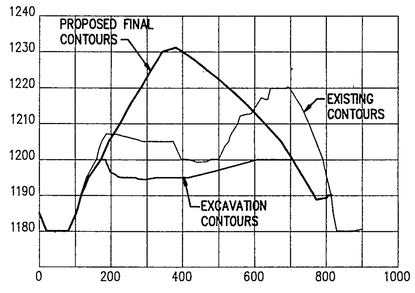
CROSS SECTION 28+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 0 SQ. FT.
EXCAVATED AREA = 411 SQ. FT.



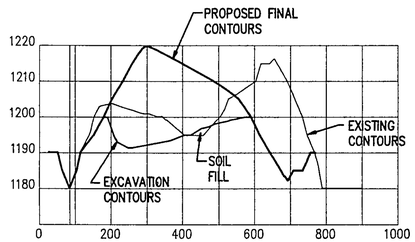
CROSS SECTION 21+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 14,734 SQ. FT.
EXCAVATED AREA = 11,108 SQ. FT.



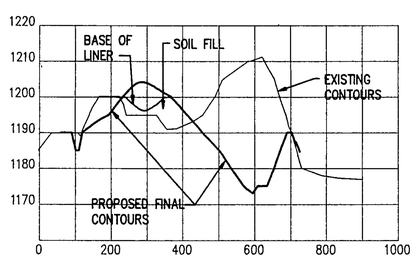
CROSS SECTION 22+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 11,150 SQ. FT.
EXCAVATED AREA = 7289 SQ. FT.



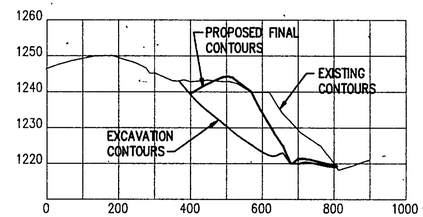
CROSS SECTION 23+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 6626 SQ. FT. SOIL FILL AREA = 67 SQ. FT.
EXCAVATED AREA = 5786 SQ. FT.



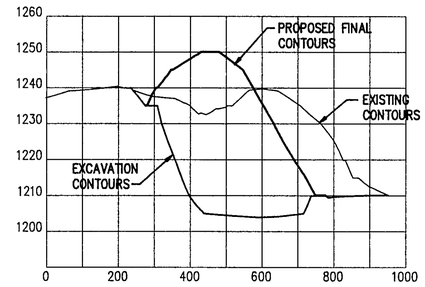
CROSS SECTION 24+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 563 SQ. FT. SOIL FILL AREA = 808 SQ. FT.
EXCAVATED AREA = 6331 SQ. FT.



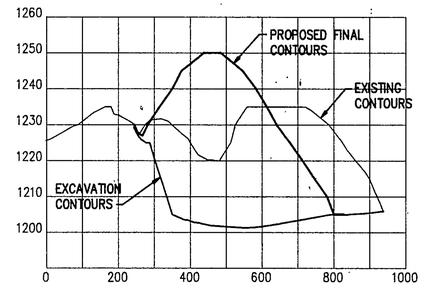
CROSS SECTION 17+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 2637 SQ. FT.
EXCAVATED AREA = 4276 SQ. FT.



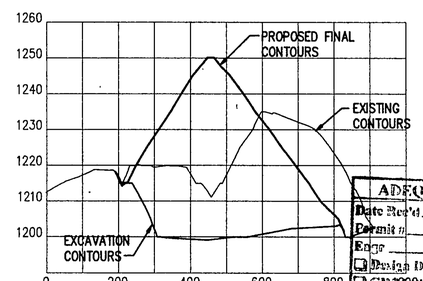
CROSS SECTION 18+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 13,121 SQ. FT.
EXCAVATED AREA = 14,159 SQ. FT.



CROSS SECTION 19+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 15,974 SQ. FT.
EXCAVATED AREA = 15,174 SQ. FT.



CROSS SECTION 20+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'
FILL AREA = 14,708 SQ. FT.
EXCAVATED AREA = 13,996 SQ. FT.

ADEQ Solid Waste Division
Date Rec'd _____ Drawing # _____
Permit # _____ CSN 72-0144
Engr _____ Geol _____
☐ Design Drawing ☐ Permit Plan
☐ GW Plan ☐ Construction
☐ Other _____
☐ Supercedes Drawing # _____
☐ _____
☐ Superceded by Drawing # _____
Superceded on Date _____

REV	DATE	DESCRIPTION	CK. BY
1	2-18-92	CUT NEW CROSS SECTIONS	LDL

SHEET TITLE: CROSS SECTIONS SITE 4 PROPOSED CLASS IV

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

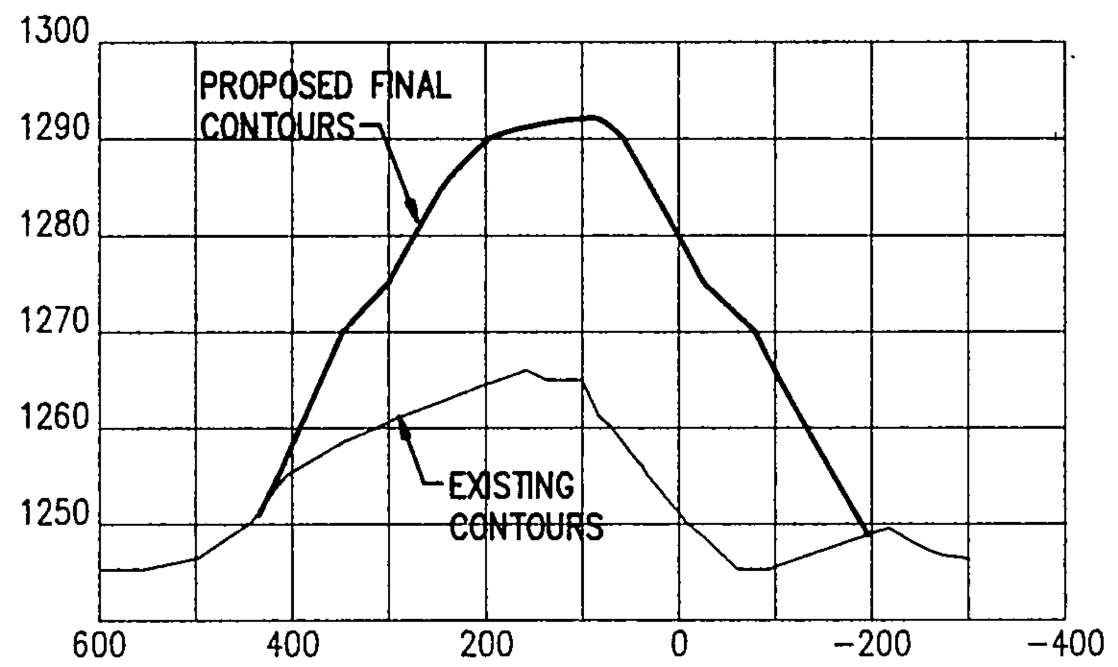
CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
9401 HOLMES ROAD, SUITE 400, KANSAS CITY, MISSOURI 64131
PH. (816) 941-7755 FAX NO. (816) 941-8225

PROJ. NO.	DRWN. BY:	QA/A RVW BY:	APP. BY:
08-89015.06	GAN	JDW	
DSN. BY: TWK	CHK. BY: SKE\LDL		

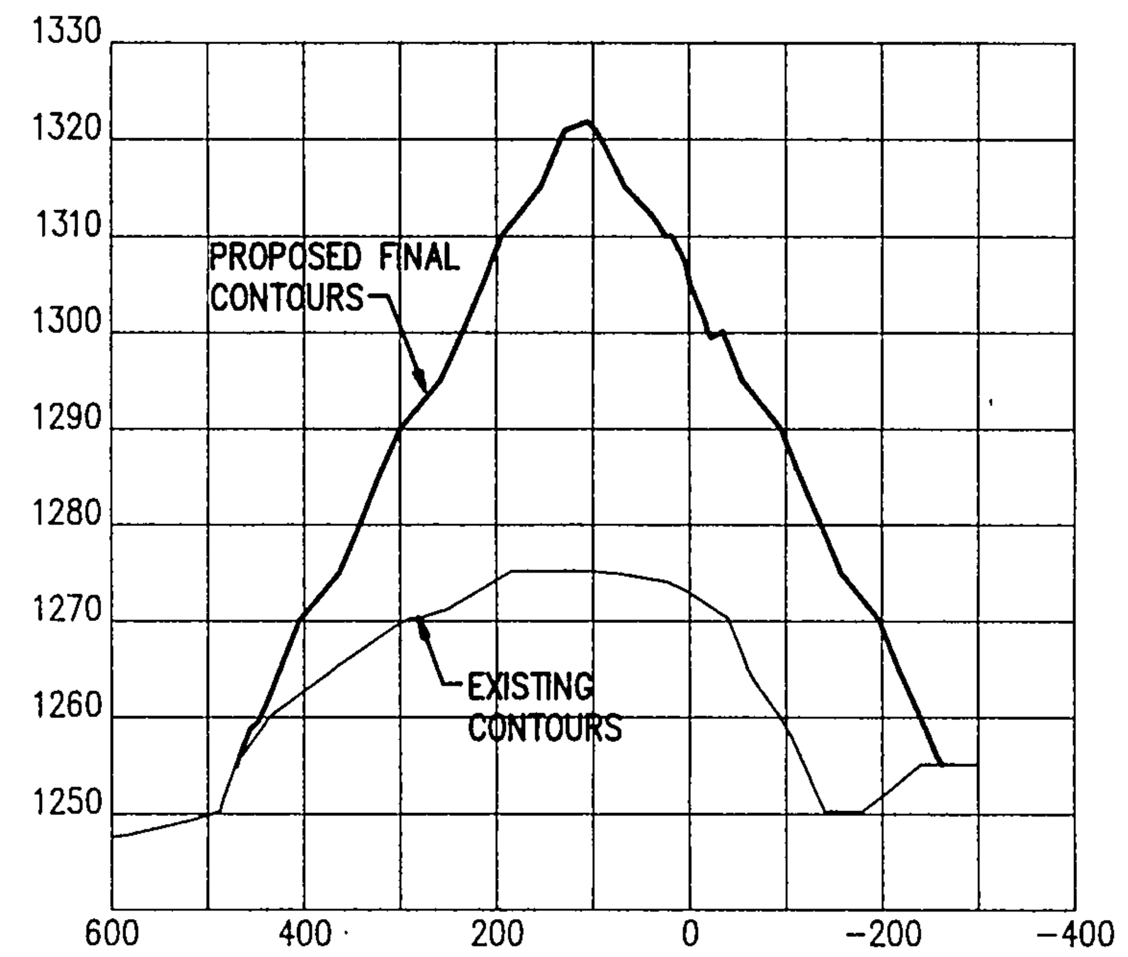
CADD FILE: 3SUN14
DATE: FEBRUARY 1992
SCALE: 1"=200'-0"
DRAWING NO. 14 of 15

3SUN14 1=200 2-19-92



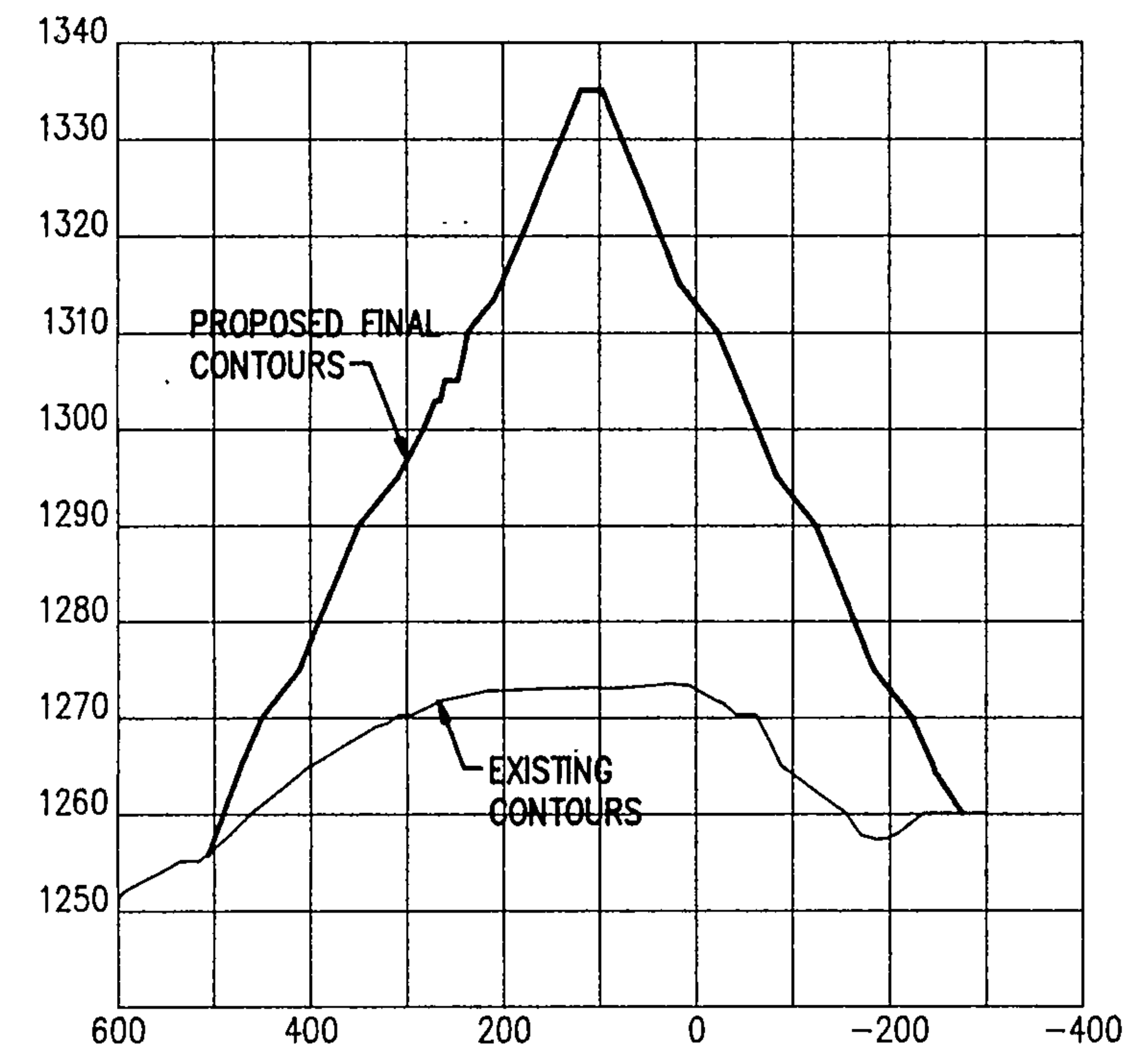
CROSS SECTION 15+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 12,325 SQ. FT.



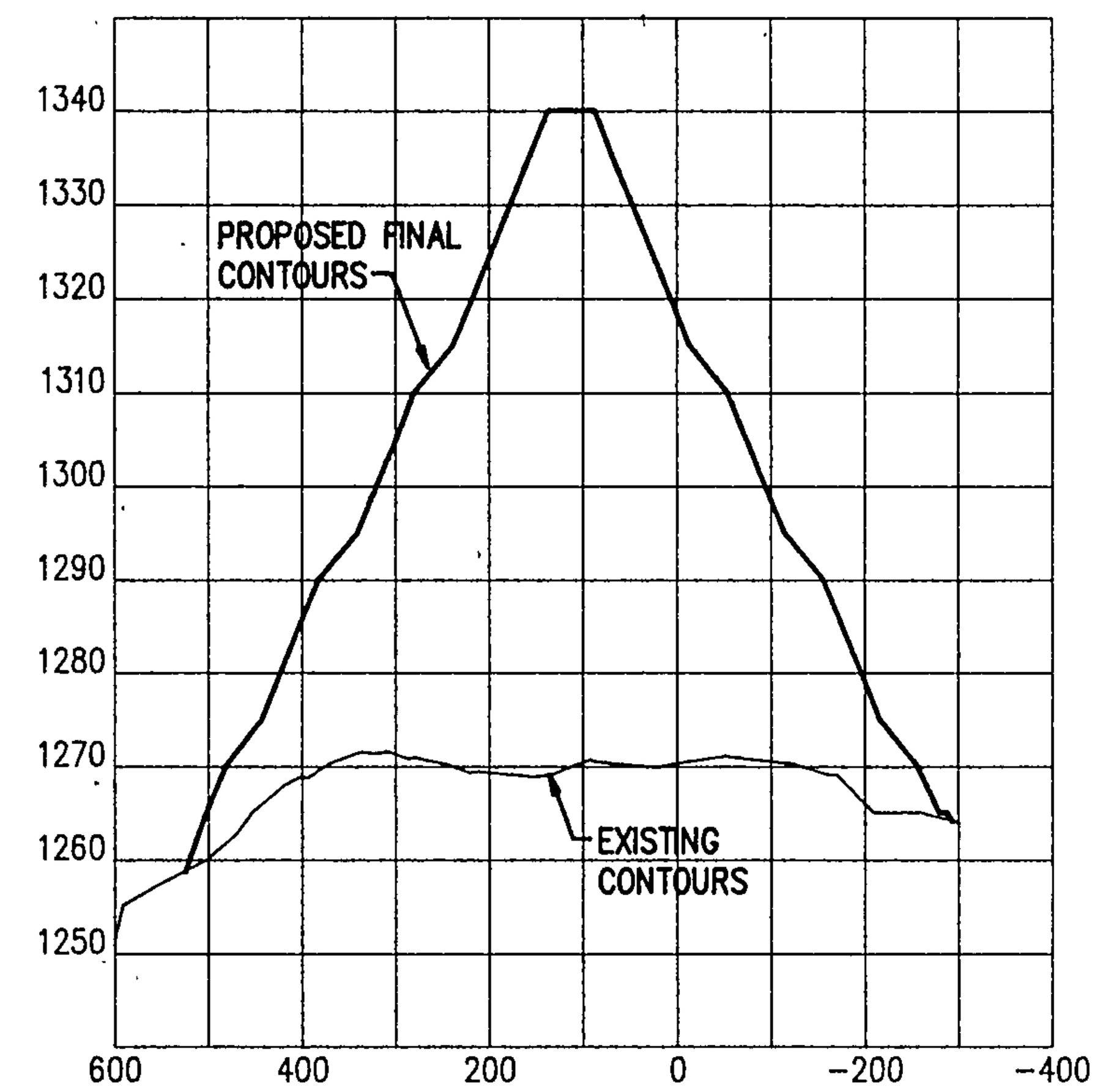
CROSS SECTION 13+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 18,283 SQ. FT.



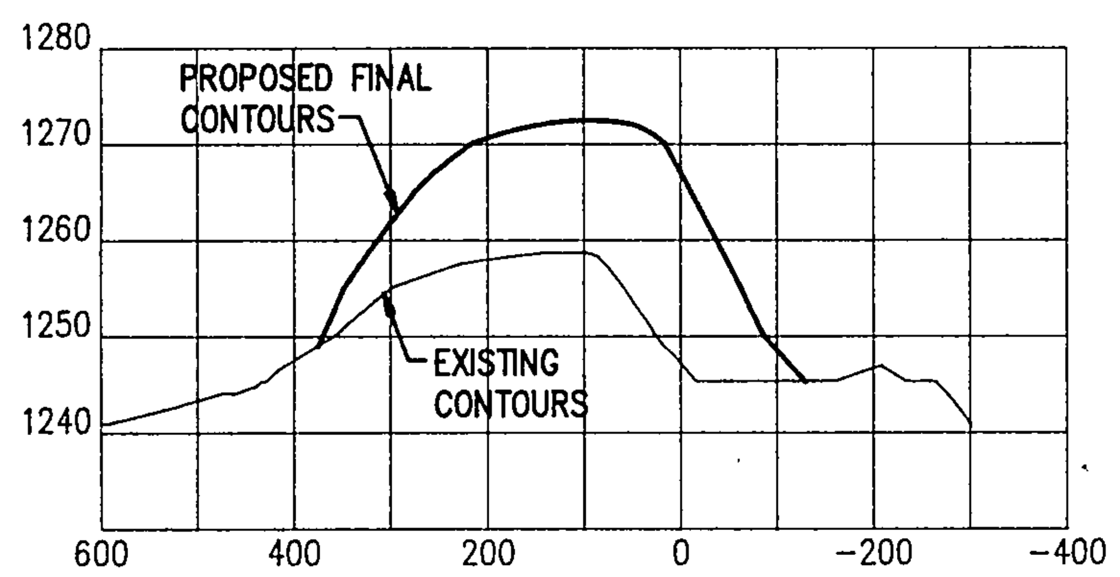
CROSS SECTION 11+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 22,980 SQ. FT.



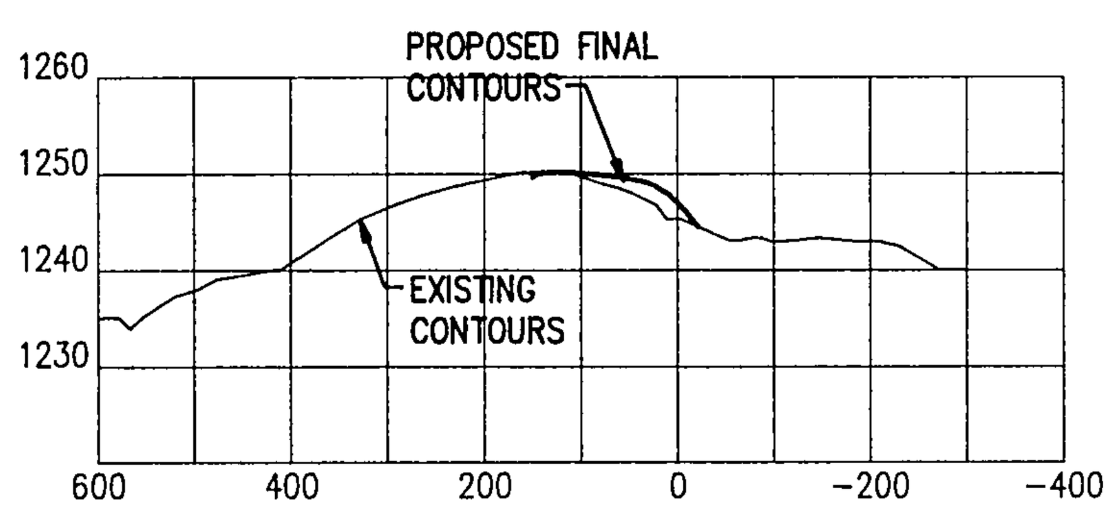
CROSS SECTION 9+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 27,012 SQ. FT.



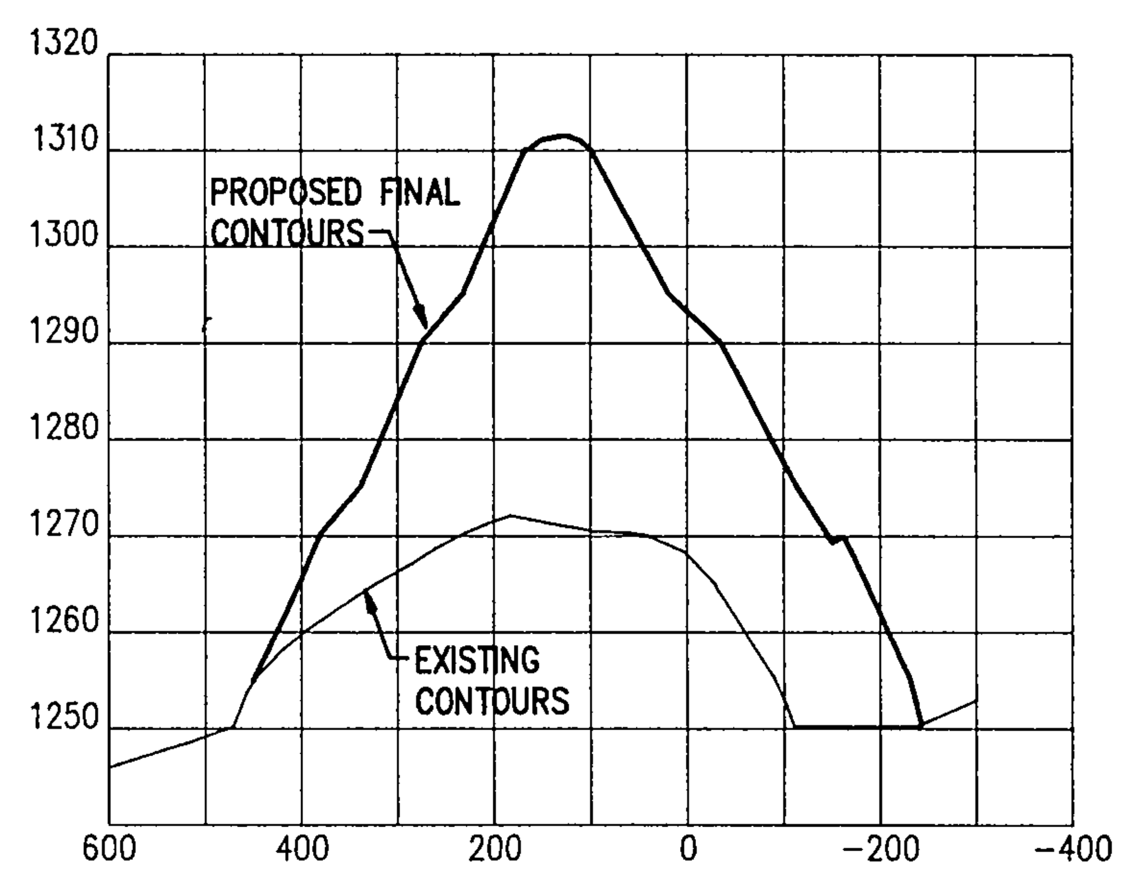
CROSS SECTION 16+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 5,757 SQ. FT.



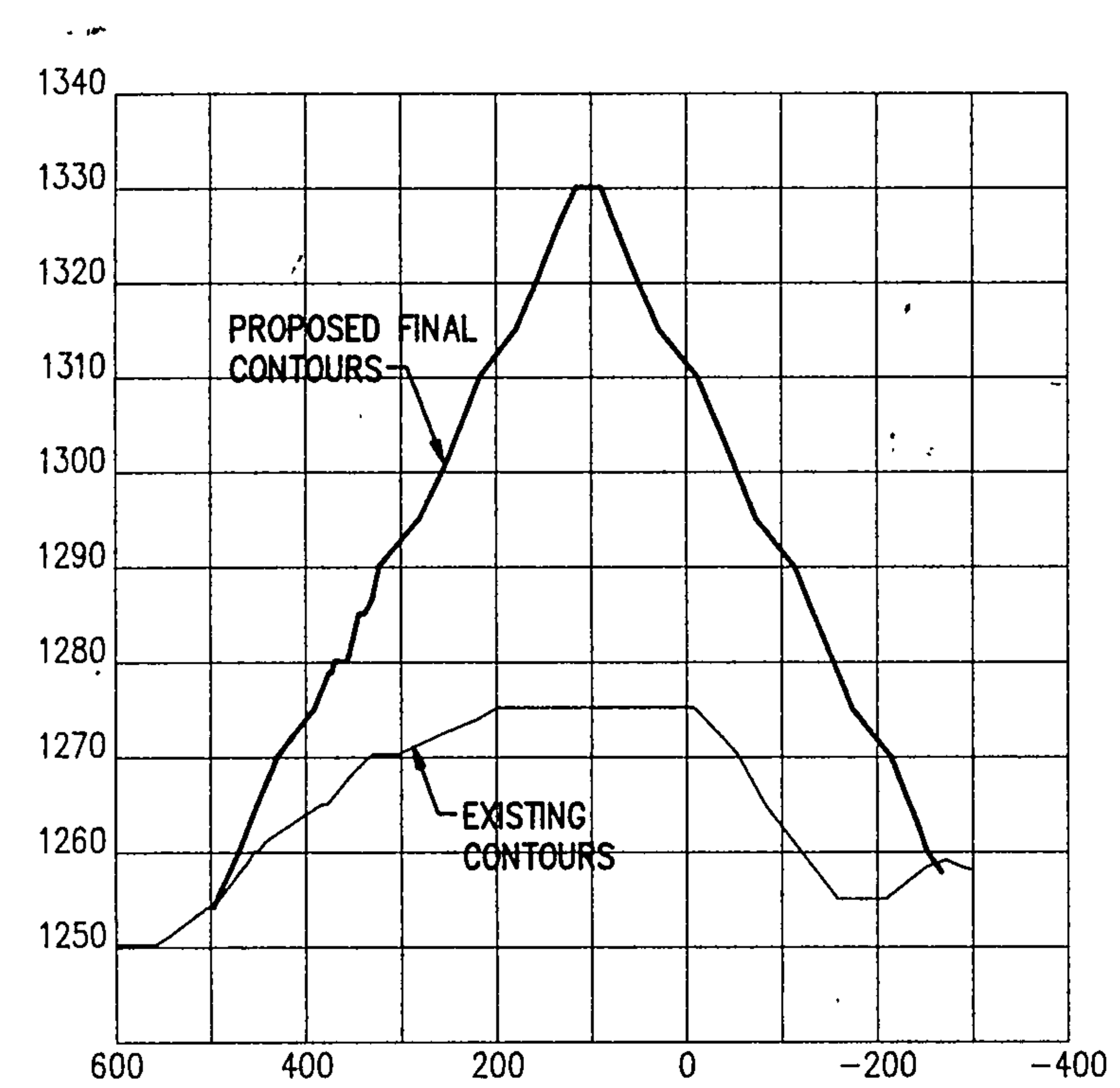
CROSS SECTION 17+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 1648 SQ. FT.



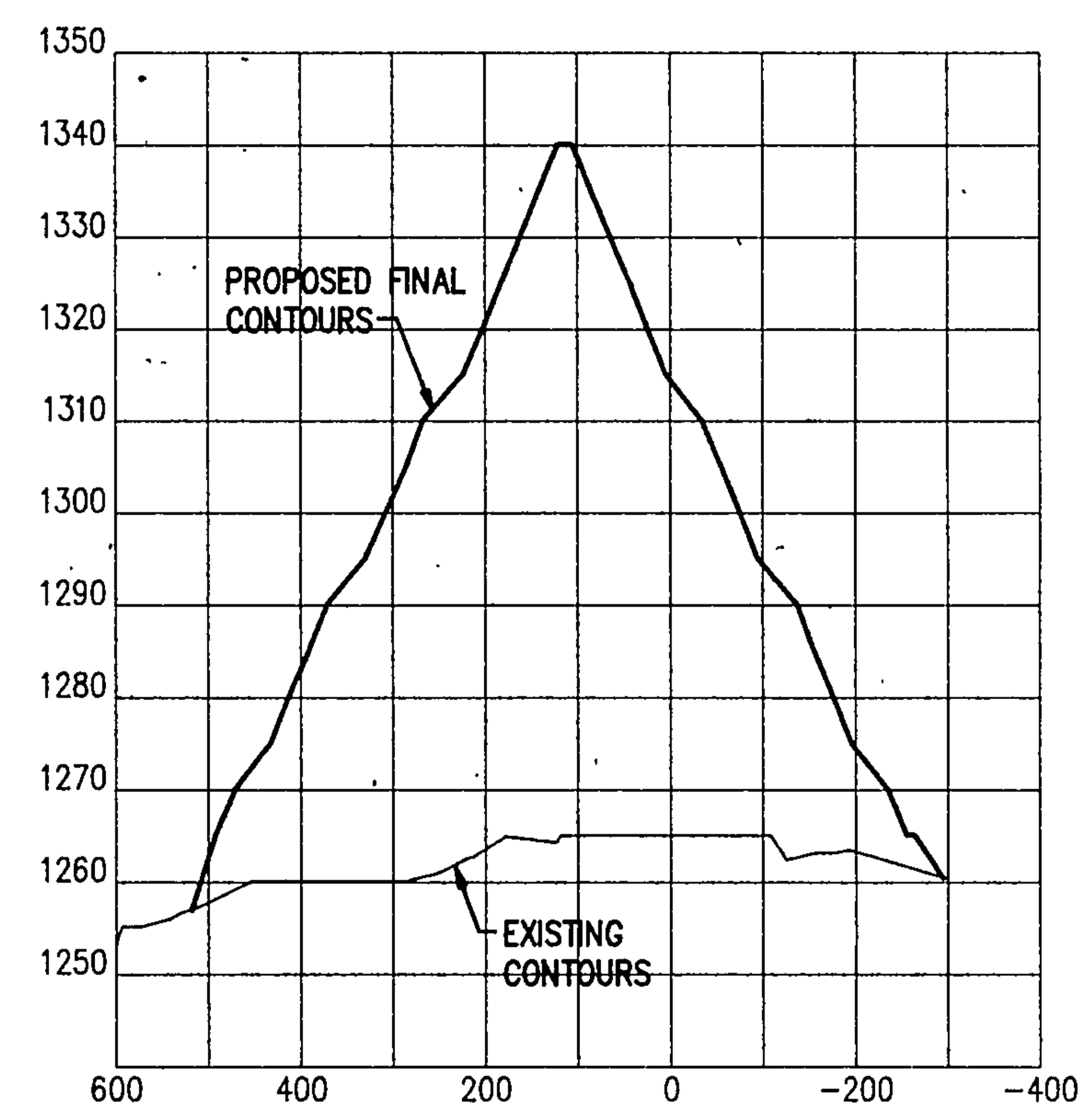
CROSS SECTION 14+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 15,428 SQ. FT.



CROSS SECTION 12+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 20,362 SQ. FT.



CROSS SECTION 10+00
HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 29,472 SQ. FT.

3SUN13 1=200 2-18-92

REV.	DATE	DESCRIPTION	CK. BY:
1	2-18-92	CUT NEW CROSS SECTIONS	LDL

SHEET TITLE: CROSS SECTIONS SITE 4 CLASS 1

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 TONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC.
105 OLD MISSOURI ROAD
SPRINGDALE, ARKANSAS 72765
(501) 361-2926

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS

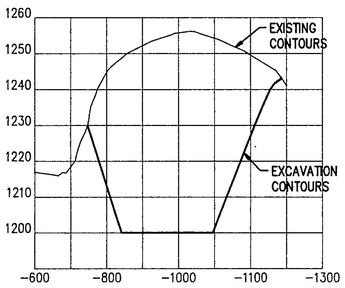
PROJ. NO. 08-89015.06 | DSN. BY: TWK | DWN. BY: GAN | CHK. BY: SKE LDL | Q/A RVW BY: JDW

CADD FILE: 3SUN13

DATE: FEBRUARY 1992

SCALE: 1"=200'-0"

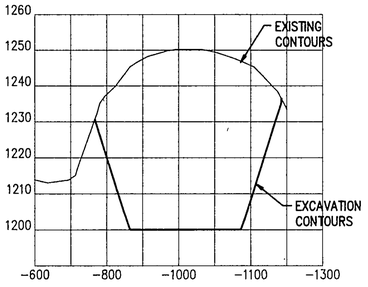
DRAWING NO. 13 of 15



CROSS SECTION 3+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

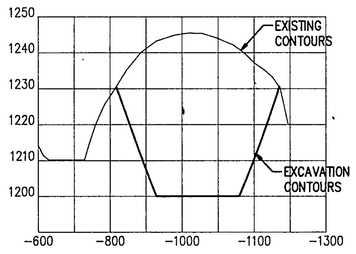
FILL AREA = 21,125 SQ. FT.



CROSS SECTION 4+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

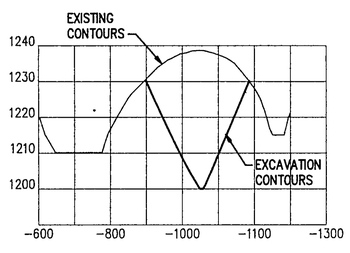
FILL AREA = 20,203 SQ. FT.



CROSS SECTION 5+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

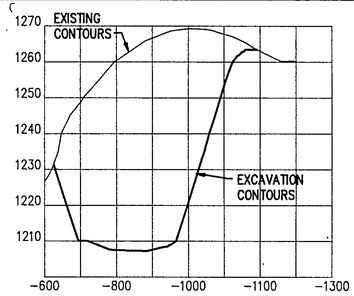
FILL AREA = 15,048 SQ. FT.



CROSS SECTION 6+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

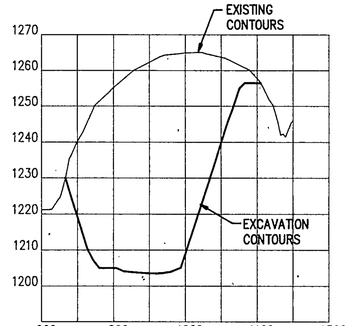
FILL AREA = 6234 SQ. FT.



CROSS SECTION 0+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

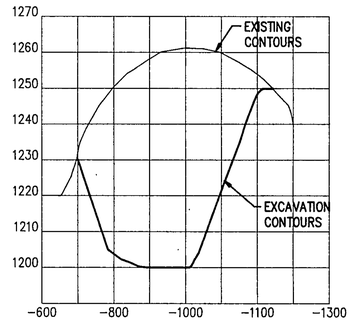
FILL AREA = 21,195 SQ. FT.



CROSS SECTION 1+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

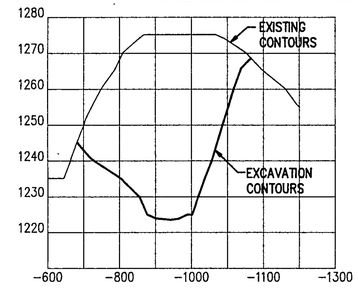
FILL AREA = 20,837 SQ. FT.



CROSS SECTION 2+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

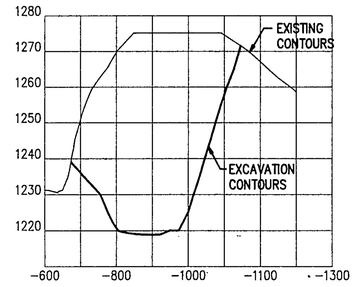
FILL AREA = 21,536 SQ. FT.



CROSS SECTION -4+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

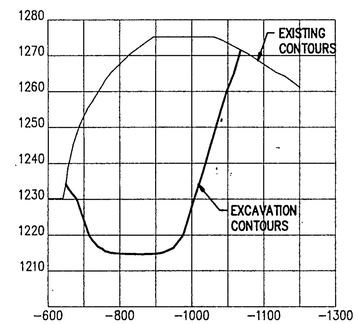
FILL AREA = 15,651 SQ. FT.



CROSS SECTION -3+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

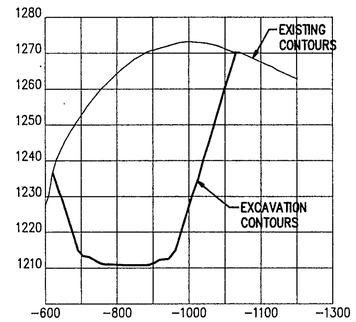
FILL AREA = 18,078 SQ. FT.



CROSS SECTION -2+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

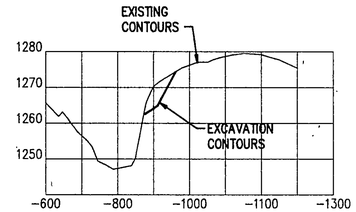
FILL AREA = 19,816 SQ. FT.



CROSS SECTION -1+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

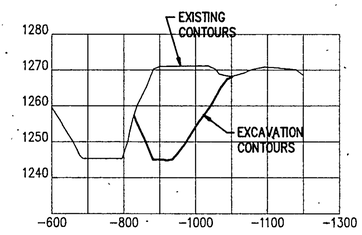
FILL AREA = 20,712 SQ. FT.



CROSS SECTION -8+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

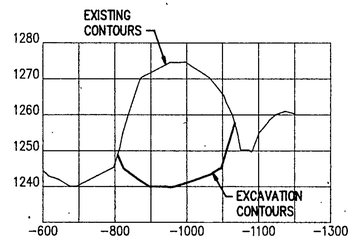
FILL AREA = 316 SQ. FT.



CROSS SECTION -7+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

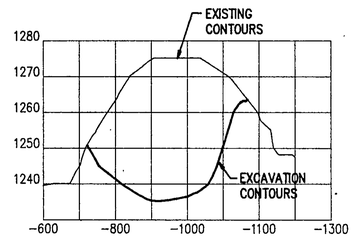
FILL AREA = 4290 SQ. FT.



CROSS SECTION -6+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 8317 SQ. FT.



CROSS SECTION -5+00

HORIZONTAL SCALE: 1"=200'
VERTICAL SCALE: 1"=20'

FILL AREA = 11,911 SQ. FT.

3SUN15 1=200 2-18-92

REV.	DATE	DESCRIPTION	OK BY
1	2-18-92	CUT NEW CROSS SECTIONS	LDL

SHEET TITLE: CROSS SECTIONS BORROW AREA

PROJECT TITLE: FINAL CLOSURE MODIFICATIONS SITES 3 AND 4 PERMIT NUMBERS 123SR2, 162SR2 ONTITOWN ARKANSAS

CLIENT: SUNRAY SERVICES, INC. 105 OLD MISSOURI ROAD SPRINGDALE, ARKANSAS 72765 (501) 361-2926

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PH. (816) 941-7700 FAX NO. (816) 941-8025

PROJ. NO. 92-9015.06
DSN. BY: TWK
DWN. BY: GAN
CHK. BY: SKE\LDL
S/A RVW BY:
APP. BY:

CADD FILE: 3SUN15.

DATE: FEBRUARY 1992

SCALE: 1"=200'-0"

DRAWING NO. 15 of 15