4942 4942

CONSTRUCTION QUALITY ASSURANCE

FINAL REPORT

PHASE IV - CELLS 4 AND 5 CONSTRUCTION
ON-SITE DISPOSAL FACILITY

United States Department of Energy
Fernald Environmental Management Project
Fernald, Ohio

prepared by

GEOSYNTEC CONSULTANTS

Fernald Field Office
7400 Willey Road, MS:38
Hamilton, Ohio 45013

under

Fluor Fernald, Inc.
Contract No. 95RS005028

DEPARTMENT OF ENERGY · UNITED STATES OF AMERICA

REVISION 0
JUNE 2000
VO

APPENDIX F (continued)

Manufacturer's Quality Control Documentation

HDPE Pipe

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PH IV-02605-001	REV.: 0	DATE: 7/30/02	Page 1 of 7

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature] 8/02/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

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QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PH.IV-02605-001	0						X			SHOP DRAWINGS OF HDPE PIPES, SUPPORTS CENTRALIZERS, ELECTROFUSION COUPLINGS & APPURTENANCES.		X		2605-1.04	X		

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SUBMITTAL ACTION CODE: (BY FDF)
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C - Revise and Resubmit (SEE COMMENTS)

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FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

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0 1 2 3 4 5 6 7 8

6" SDR 11 X 10" SDR 11
DUAL CONTAINMENT HDPE
PIPE 40' LONG 11
D.C. SPACERS PER 40FT
JOINT OF PIPE

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment Incorporate and Resubmit
[ ] C-Revise and Resubmit
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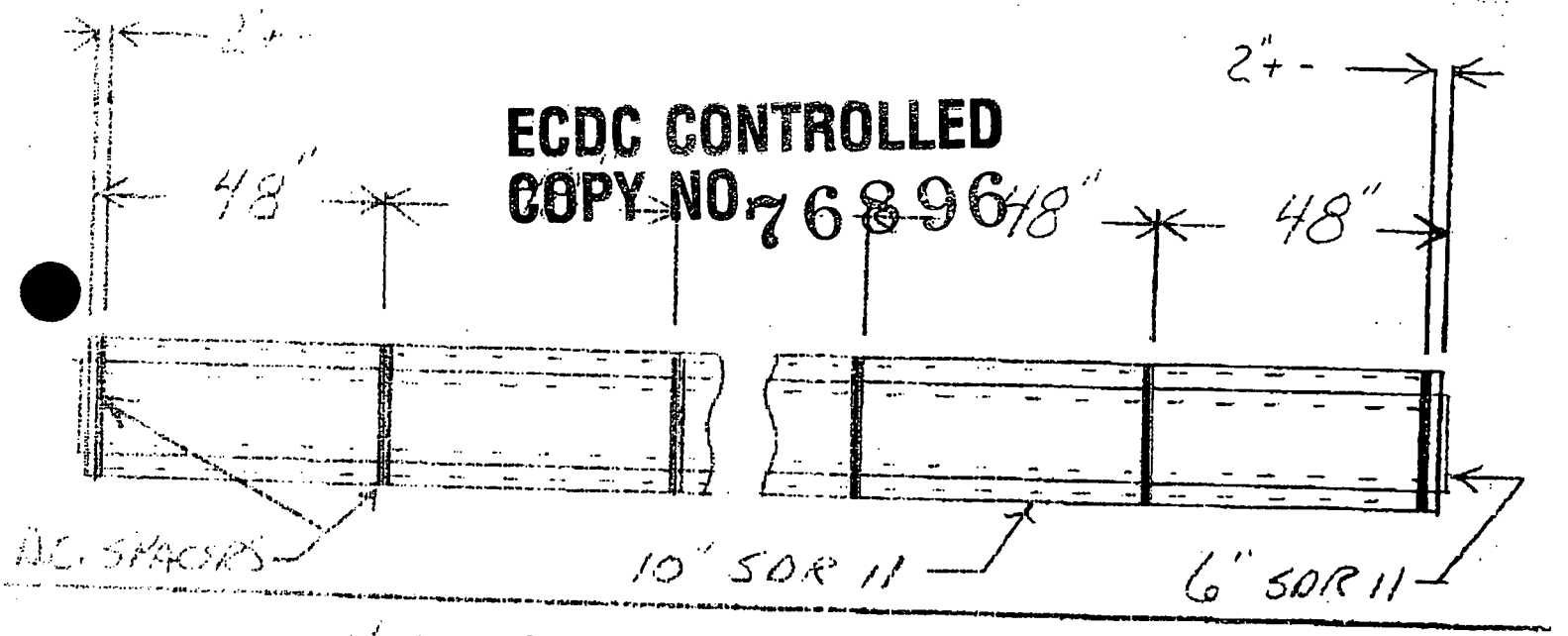
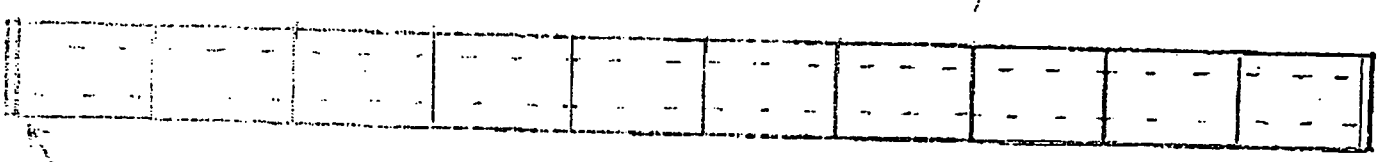


11 D.C. SPACERS TOTAL IN EVERY 40'



1 D.C. SPACER AT EACH END

9 D.C. SPACERS EVERY 4' EQUALS
11 D.C. SPACERS PER 40' OF PIPE

DATE 7-30-02
PROJECT NAME DUAL D.C. PIPE

TECHNICIAN B. SZZAWICH
COMPANY 000005
APPROVED BY

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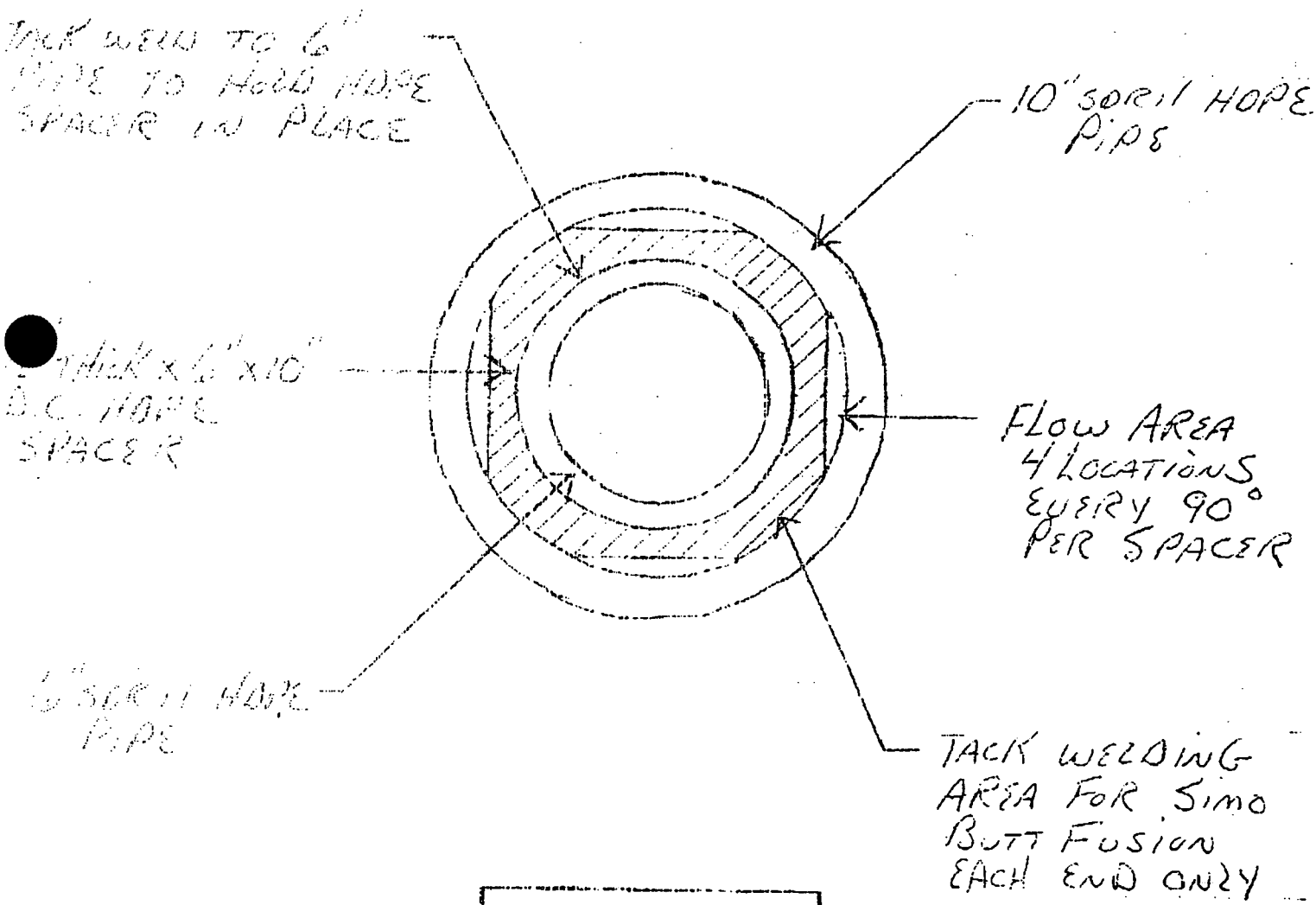
0 1 2 3 4 5 6 7 8

6" SDR 11 x 10" SDR 11
DUAL CONTAINMENT HDPE
PIPE SPACER DETAIL



FRONT VIEW

7-30-02
PROJECT NAME 6 x 10" D.C. SPACER DETAIL

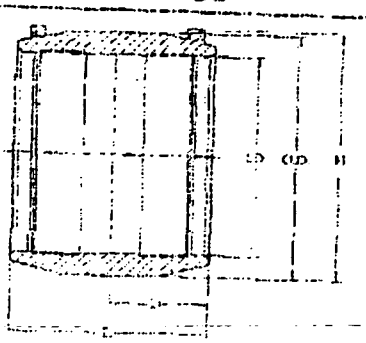
TECHNICIAN B. Szczawich
COMPANY
APPROVED BY

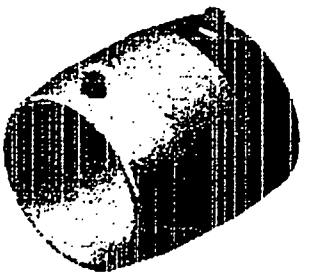
000006

ELECTROFUSION FITTINGS

FULL COUPLINGS 4942

ASTM F1055 IPS & CTS



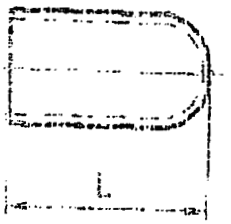


NOMINAL SIZE	INSIDE DIA (MAXIMUM) I.D	INSIDE DIA (MINIMUM) I.D	OUTSIDE DIA (NOMINAL) O.D	STAB DEPTH (NOMINAL) "D"	OVERALL HEIGHT (NOMINAL) "H"	OVERALL LENGTH (NOMINAL) "L"
1/2" CTS	0.633	0.619	[illegible]	1.36	1.87	2.86
	16.08 mm	15.62 mm	28.[illegible] mm	34.5 mm	47.5 mm	72.6 mm
1/2" IPS	0.834	0.834	1.38	1.42	2.15	2.98
	21.69 mm	21.18 mm	35.[illegible] mm	36.1 mm	54.6 mm	75.7 mm
3/4" CTS	0.890	0.875	1.38	1.42	2.15	2.98
	22.61 mm	22.13 mm	35.[illegible] mm	36.1 mm	54.6 mm	75.7 mm
3/4" IPS	1.075	1.065	1.73	1.36	2.32	2.84
	27.25 mm	27.05 mm	43.7 mm	34.5 mm	58.9 mm	72.1 mm
1" CTS	1.142	1.132	1.72	1.36	2.32	2.84
	29.01 mm	28.75 mm	43.7 mm	34.5 mm	58.9 mm	72.1 mm
1" IPS	1.331	1.321	1.84	1.57	2.56	3.30
	33.81 mm	33.55 mm	47.8 mm	39.9 mm	65.0 mm	83.8 mm
1 1/4" CTS (CONN)	1.504	1.492	2.27	1.82	3.00	3.70
	38.46 mm	37.90 mm	57.7 mm	46.2 mm	76.2 mm	94.0 mm
1 1/4" SIDR 9 CON	1.655	1.620	2.27	1.82	3.00	3.70
	42.[illegible] mm	41.15 mm	57.7 mm	46.2 mm	76.2 mm	94.0 mm
1 1/4" IPS	1.693	1.675	2.27	1.82	3.00	3.70
	42.99 mm	42.55 mm	57.7 mm	46.2 mm	76.2 mm	94.0 mm
1 1/2" IPS	1.907	1.907	2.46	1.89	3.27	3.90
	48.69 mm	48.44 mm	66.0 mm	48.0 mm	83.1 mm	99.1 mm
2" IPS	2.420	2.395	3.[illegible]	2.09	3.82	4.31
	61.47 mm	60.83 mm	80.[illegible] mm	53.1 mm	97.0 mm	109.5 mm
2" IPS CONDUIT	2.420	2.400	2.82	2.09	3.55	4.31
	61.47 mm	60.96 mm	71.6 mm	53.1 mm	90.2 mm	109.5 mm
2" 1/2" CONDUIT	2.956	2.894	3.50	2.09	4.17	4.25
	75.08 mm	73.51 mm	88.9 mm	53.3 mm	105.9 mm	108.0 mm
3" IPS	3.660	3.645	4.54	2.72	5.16	5.59
	93.02 mm	92.64 mm	115.3 mm	69.1 mm	131.6 mm	142.0 mm
4" IPS	4.545	4.510	5.57	3.00	6.51	6.14
	115.44 mm	114.55 mm	141.5 mm	76.2 mm	165.4 mm	156.0 mm
6" IPS	6.547	6.524	6.91	3.54	7.56	7.17
150mm PLASTICON	148.99 mm	148.41 mm	175.6 mm	89.9 mm	192.0 mm	182.1 mm
8" IPS	8.600	8.565	8.1[illegible]	4.10	8.70	8.35
	169.93 mm	169.04 mm	207.5 mm	104.1 mm	221.0 mm	212.1 mm
10" IPS	7.155	7.105	8.4[illegible]	4.09	8.94	7.19
	181.[illegible] mm	181.4[illegible] mm	222.0 mm	104.0 mm	227.0 mm	182.6 mm
12" IPS	8.700	8.655	10.63	4.70	11.20	9.43
	220.98 mm	219.83 mm	270.0 mm	119.4 mm	284.5 mm	240.8 mm
14" IPS	9.801	10.759	13.21	5.00	13.41	10.50
	274.[illegible] mm	273.[illegible] mm	336.5 mm	127.0 mm	340.6 mm	266.7 mm
16" IPS	12.125	12.725	15.71	5.50	15.84	11.50
	324.09 mm	323.[illegible] mm	398.9 mm	139.7 mm	402.3 mm	292.1 mm

CPChem
PERFORMANCE PIPE

-4942

www.performancepipe.com



BUTT END CAP

ALL PE3408 ENDS CAPS 2" AND LARGER NOW PRODUCED TO AWWA C906-99 AT NO ADDITIONAL COST

Butt End Cap	DR/Wall	Dimension-L (in)	Package Weight (lbs.)	CSA[1]	IAPMO[1]	FM 150	FM 200	Reference Number
1/2" CTS	0.090	2.00	0.2	x				"M005"CPST"
3/4" CTS	0.090	2.30	0.2					"M006"CPST"
1" CTS	0.102 0.125	2.30	0.3					"M011"CPST"
1/2" IPS	DR 9.3	2.20	0.2	x				"M004"CPST"
3/4" IPS	DR 9	2.30	0.3	(x)				"M006"CPST"
1" IPS	DR 9 DR 11	2.40	0.5	x	x			"M010"CPST"
1 1/4" IPS	DR 9	3.31	1.2					
	DR 10	3.94		x				"M012"CPST"
	DR 11			x				
1 1/2" IPS	DR 11	3.70	1.3	(x)				"M014"CPST"
2" IPS	DR 7	4.25	3.2					
	DR 9		2.6		x		x	"M020"CPST"
	DR 11			x		x		
3" IPS	DR 7	4.80	10.0					
	DR 9		8.1				x	
	DR 11/DR 11.5	3.94	5.6	x	x	x		"M030"CPST"
	DR 12.5			x				
	DR 17							
4" IPS	DR 7	8.50	23.7					
	DR 9						x	
	DR 11/11.5	4.25	9.0	x	x	x		"M040"CPST"
	DR 12.5			x				
	DR 17							
6" IPS	DR 7	9.88	27.9					
	DR 9						x	
	DR 11/11.5	5.20	14.1	x	x	x		"M060"CPST"
	DR 12.5			x				
	DR 17							
8" IPS	DR 7	8.00	5.6					
	DR 9						x	
	DR 11		4.3	x		x		"M080"CPST"
	DR 11.5			x				
	DR 17							

[1] CSA and IAPMO are available in Diameter [illegible] PE3408 material only
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]
[illegible]

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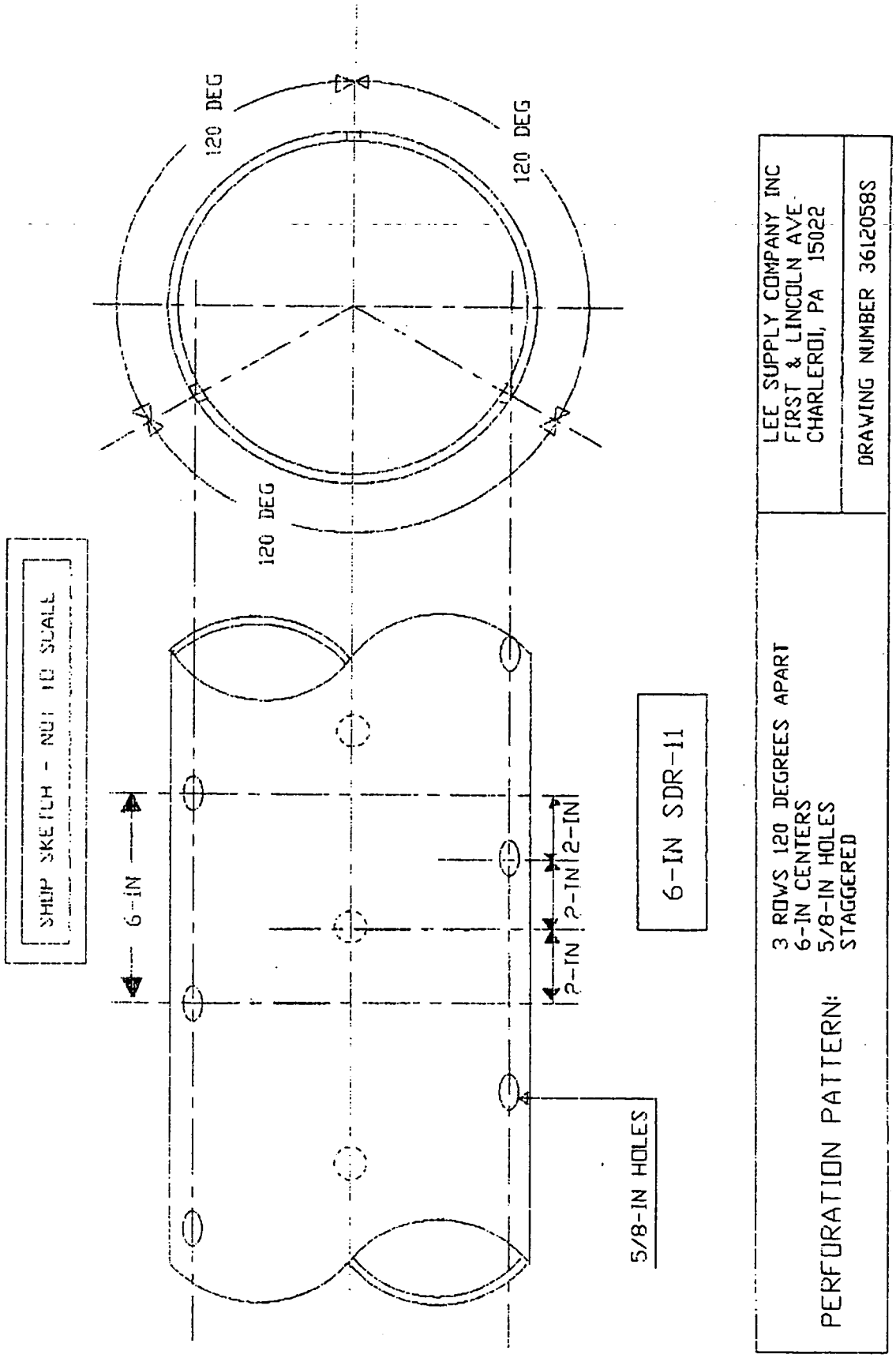
120 DEG
120 DEG
120 DEG
SHEET SKETCH - NOT TO SCALE
6-IN
2-IN
2-IN
2-IN
6-IN SDR-11
5/8-IN HOLES
LEE SUPPLY COMPANY INC
FIRST & LINCOLN AVE
CHARLEROI, PA 15022
DRAWING NUMBER 3612058S
PERFORATION PATTERN:
3 ROWS 120 DEGREES APART
6-IN CENTERS
5/8-IN HOLES
STAGGERED

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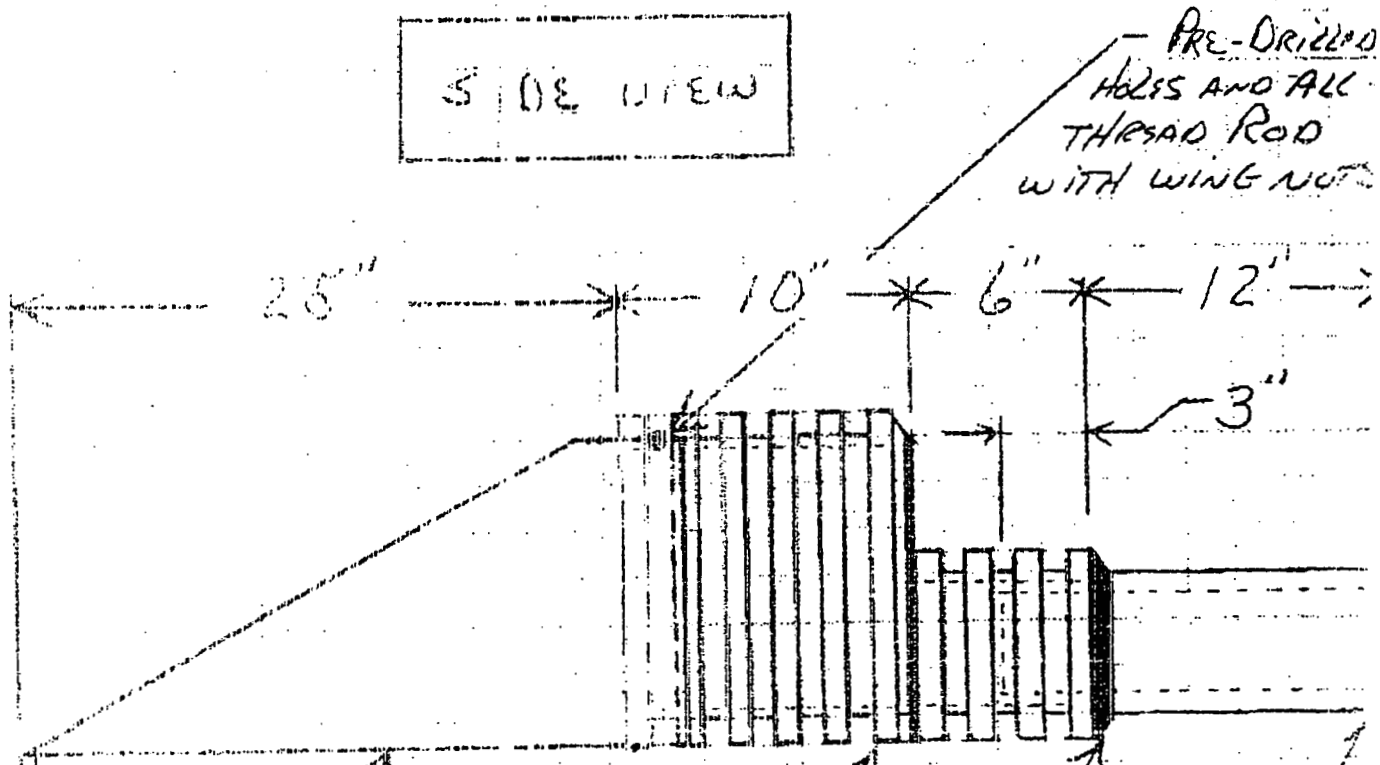
1 2 3 4 5 6 7 8

6" SCRIP HDPE PIPE X 12" ADS FLARED END SECTION FABRICATED

SIDE VIEW



DATE 7-23-07

PROJECT NAME 6"X12" HDPE END SECTION

TECHNICIAN B. SEZAWICK

COMPANY 000010

APPROVED BY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-003	REV.: 0	DATE: 7/30/02	Page 1 of 6

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	PHIV-02605-003								X		PROCEDURES FOR		X		2605-1.04	X		
											HYDROSTATIC TESTING							
											& PNEUMATIC TESTING							
											DUAL CONTAINMENT							
											PIPE.							

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B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

PRELIMINARY PNEUMATIC TEST FOR HDPE PIPE

- The test gauge used for pneumatic testing HDPE pipe shall be calibrated within 1 year of use. Calibration shall be taceable to national or industry standards where possible.
- A safety relief valve shall be installed so that it can not be isolated and valved off from the pressurized system. This pressure relief valve shall be set to release pressure when the system pressure exceeds 15 psi.
- Access shall be limited to the pressurized system. It is suggested that test gauges and the pressure source are located at a remote location from the pressurized system.
- Slowly pressurize the pipe and gradually increase the pressure to one-half the full pneumatic test pressure (app. 7 psi). Pause for 15 minutes to allow the pipe strain to become equalized.
- Check the pipe for leaks by soaping the joints and other areas of the pipe and also checking the test gauge.
- If there are no leaks detected, gradually increase the pressure to the full pneumatic test pressure (15 psi) and hold for 15 minutes.
- If the gauge pressure does not drop below the full pneumatic test pressure, and no leaks are detected during the 15 minute test period, the pipe shall be considered to have passed the pressure/ leak test.

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Date: 8/8/02

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HYDROSTATIC TEST PROCEDURE FOR 10-INCH CONTAINMENT PIPE

- The test gauge used for hydrostatic testing HDPE pipe shall be calibrated within 1 year of use. Calibration shall be taceable to national or industry standards where possible.
- Pressure test installed HDPE solid wall, containment pipe with a minimum 6 inches of initial backfill placed over the containment pipe. Leave joints, fittings, and flanged connections of containment pipe uncovered so that they can visually inspected for any leak.
- The 10-inch containment pipe shall not be tested until the 6-inch carrier has been successfully tested.
- The 6-inch carrier pipe shall be at atmospheric pressure prior to testing the 10-inch containment pipe.
- The test gauge and location of the tap that will be used for filling the pipe with water shall be located at the low point of the piping system.
- The high point of the piping system shall be equipped with a high point vent.
- Slowly fill the pipe at the low point location and allow the air to escape through the high point vent.
- When air bubbles are not visible at the high point vent location, the high point vent valve shall be closed.
- Increase the pressure in the pipe to 25-psi internal pressure and start the expansion phase of the test.
- Add sufficient make-water to the pipe four times at one-hour intervals to return to the test pressure. Stabilization is achieved if there is no further change in pressure over a one-hour period or make-up water volume does not exceed the quantity listed in Table 02605-3. The initial expansion phase shall not exceed 4 hours.
- Drop pressure down to 15-psi. The pressure shall remain steady (i.e., within 5% of the target value) for 1 hour and there shall be no visible leaks.
- If leaks are observed, remove water, and make repairs to the pipe. Retest the pipe until passing results are achieved.

TABLE 02605-3

ALLOWANCE* FOR EXPANSION UNDER TEST PRESSURE FOR AMBIENT CONDITIONS+

Allowance for Expansion
(U.S. Gallons / 100 Feet of Pipe)

Nominal Pipe Size (Inches)	1 Hour Test	2 Hour Test	3 Hour Test
3	0.10	0.15	0.25
4	0.13	0.25	0.40
6	0.30	0.60	0.90
8	0.50	1.0	1.5
10	0.75	1.30	2.10
11	1.0	2.0	3.0
12	1.1	2.3	3.4
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.2	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
28	5.5	11.1	16.8
32	7.0	14.3	21.5
36	9.0	18.0	27.0
40	11.0	22.0	33.0
48	15.0	27.0	43.0

*These allowances only apply to the actual test phase and not to the initial expansion phase. They also assume pipe is being tested at a maximum design pressure equal to 1.5 times the pressure rating. If the pipe is being tested at a lower system design pressure, the allowance should be reduced by the ratio of the system design pressure to the maximum design pressure.

+When testing at temperatures below ambient (approximately 75°F), less pipe expansion takes place, resulting in lower requirements for make-up water. For a test temperature of about 68°F, the values in this table should be multiplied by a reduction factor of 0.75. For 50°F, this factor is 0.50.

The above footnotes are in accordance with the recommendation of AWWA [1999].

[END OF SECTION]

HYDROSTATIC TEST PROCEDURE FOR 6-INCH CARRIER PIPE

- The test gauge used for hydrostatic testing HDPE pipe shall be calibrated within 1 year of use. Calibration shall be taceable to national or industry standards where possible.
- Pressure test installed HDPE solid wall, carrier pipe with a minimum 6 inches of initial backfill placed over the containment pipe.
- The 10-inch containment pipe shall be at atmospheric pressure prior to testing the 6-inch carrier pipe.
- The test gauge and location of the tap that will be used for filling the pipe with water, shall be located at the low point of the piping system.
- The high point of the piping system shall be equipped with a high point vent.
- Slowly fill the pipe at the low point location and allow the air to escape through the high point vent.
- When air bubbles are not visible at the high point vent location, the high point vent valve shall be closed.
- Increase the pressure in the pipe to 70-psi internal pressure and start the expansion phase of the test.
- Add sufficient make-water to the pipe four times at one-hour intervals to return to the test pressure. Stabilization is achieved if there is no further change in pressure over a one-hour period or make-up water volume does not exceed the quantity listed in Table 02605-3. The initial expansion phase shall not exceed 4 hours.
- Drop pressure down to 60-psi. The pressure shall remain steady (i.e., within 5% of the target value) for 1 hour and there shall be no visible leaks.
- If the hydrostatic test passes, release the pressure from the tested pipe and verify the test gauge drops to zero pressure.
- If leaks are observed, remove water, and make repairs to the pipe. Retest the pipe until passing results are achieved.

TABLE 02605-3

ALLOWANCE* FOR EXPANSION UNDER TEST PRESSURE FOR AMBIENT CONDITIONS+

Allowance for Expansion
(U.S. Gallons / 100 Feet of Pipe)

Nominal Pipe Size (Inches)	1 Hour Test	2 Hour Test	3 Hour Test
3	0.10	0.15	0.25
4	0.13	0.25	0.40
6	0.30	0.60	0.90
8	0.50	1.0	1.5
10	0.75	1.30	2.10
11	1.0	2.0	3.0
12	1.1	2.3	3.4
14	1.4	2.8	4.2
16	1.7	3.3	5.0
18	2.2	4.3	6.5
20	2.8	5.5	8.0
22	3.5	7.0	10.5
24	4.5	8.9	13.3
28	5.5	11.1	16.8
32	7.0	14.3	21.5
36	9.0	18.0	27.0
40	11.0	22.0	33.0
48	15.0	27.0	43.0

*These allowances only apply to the actual test phase and not to the initial expansion phase. They also assume pipe is being tested at a maximum design pressure equal to 1.5 times the pressure rating. If the pipe is being tested at a lower system design pressure, the allowance should be reduced by the ratio of the system design pressure to the maximum design pressure.

+When testing at temperatures below ambient (approximately 75°F), less pipe expansion takes place, resulting in lower requirements for make-up water. For a test temperature of about 68°F, the values in this table should be multiplied by a reduction factor of 0.75. For 50°F, this factor is 0.50.

The above footnotes are in accordance with the recommendation of AWWA [1999].

[END OF SECTION]

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-004	REV.: 0	DATE: 12/8/02	Page 1 of 3

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W. Yoder

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Jeannie Rossen DATE: 12-10-02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02605-004	0							X		ORIGIN + IDENTIFICATION		X		02605-1.04A	X		
											OF POLYETHYLENE				AF			
											RESIN.							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VAN ARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODISER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

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RECEIVED BY: Michael W. Yoder DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
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SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

May 29, 2002

PSN# 12383-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

		Specifications	
Type:	HHM TR-480X	Min	Max
Lot Number:	8220660		
P.O. Number:	REL 74		
Date Shipped:	05/29/02		
Package:	PSPX 2530		
Quantity:	181300 LBS.		
HLMI Flow Rate, ASTM D1238:	12.7 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.34 WT%	0.26	0.39
Pellet Count:	45. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: Date: 12/13/02

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

INFORMATION ONLY

Robert Caldwell
FAX: 972-599-7346

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

June 14, 2002

PSN# 13767-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

Type:	HHM TR-480X	Specifications	
Lot Number:	8220650	Min	Max
P.O. Number:	REL 87		
Date Shipped:	06/14/02		
Package:	PSPX 2397		
Quantity:	186000 LBS.		
HLMI Flow Rate,ASTM D1238:	13.0 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.33 WT%	0.26	0.39
Pellet Count:	39. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

Robert Caldwell
FAX: 972-599-7346

000019

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-005	REV.: 0	DATE: 7/30/02	Page 1 of 4

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature] 8/1/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 8/8/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-005								X		MINIMUM MANUFACTURERS					X		
											CERTIFIABLE VALUES		X		2605-1.04			
											AND CORRESPONDING							
											TEST PROCEDURES							
											FOR HDPE MATERIAL							

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NAME	MS	NAME	MS	NAME	MS
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NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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RECEIVED BY: [signature] DATE: 8/8/02
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SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

DRISCOPLEX™ PE 3408 HDPE
Data Sheet

Typical Material Physical Properties of DRISCOPLEX™ HDPE High Density Polyethylene Material

Property		Units	Standard	Typical Value
Material Designation		–	ASTM F 412	PE 3408
Cell Classification		–	ASTM D 3350	345464C (black) 345464E (color)
Density	[3]	gm/cm³	ASTM D 1505	0.955 (black) 0.947 (color)
Melt Index	[4]	g/10 minutes	ASTM D 1238	0.1
Flexural Modulus	[5]	lb/in²	ASTM D 790	>130,000
Tensile Strength	[4]	lb/in²	ASTM D 638	3200
SCG (PENT)	[6]	hours	ASTM F 1473	>100
HDB at 73°F (23°C)	[4]	lb/in²	ASTM D 2837	1600
Color - UV Stabilizer	[C] [E]	– –	ASTM D 3350	Black with minimum 2% carbon black Color with UV stabilizer
Linear Thermal Expansion		inch/inch/°F	ASTM D 696	9×10^{-5}
Elastic Modulus		lb/in²	ASTM D 638	110,000
Brittleness Temperature		°F (°C)	ASTM D 746	<-180°F (-118°C)
Hardness		Shore D	ASTM D 2240	65

NOTICE. This data sheet provides typical physical property information for polyethylene resins used to manufacture PERFORMANCE PIPE™ polyethylene piping products. It is intended for comparing polyethylene piping resins. It is not a product specification, and it does not establish minimum or maximum values or manufacturing tolerances for resins or for piping products. These typical physical property values were determined using compression-molded plaques prepared from resin. Values obtained from tests of specimens taken from piping products can vary from these typical values. Performance Pipe has made every reasonable effort to ensure the accuracy of this data sheet, but this data sheet may not provide all necessary information, particularly with respect to special or unusual applications. This data sheet may be changed from time to time without notice. Contact Performance Pipe to determine if you have the most recent edition.

ECDC CONTROLLED COPY NO. 76896

PLASTICS PIPE INSTITUTE

LEE SUPPLY CO. INC.
• DIVERSIFIED PIPE & PUMP SYSTEMS
• INDUSTRIAL • MINING • ENVIRONMENTAL PRODUCTS
• MUNICIPAL PRODUCTS
P.O. Box 35 Charleroi, PA 15022
Phone: 724-483-3543 FAX: 724-483-0577

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Michael Moffley Date: 8/8/02

Feb. 2002 Supersedes all previous publications
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DRISCOPLEX™ PE 3408 HDPE Data Sheet

4942

Municipal and Industrial Applications & Standards

Typical Markets for Pipe and Fittings	DRISCOPLEX™ Series	Typical Features
FMR Approved Underground Fire Main	DRISCOPLEX™ 1500	2, 8, 10
		2, 8, 17
	DRISCOPLEX™ 1600	6, 10, 18
		6, 17, 18
Mining	DRISCOPLEX™ 1700	1, 3
Perforated Pipe	DRISCOPLEX™ 1900	1, 4
Water Distribution	DRISCOPLEX™ 4000	5, 6, 7
Municipal & Industrial, Water Distribution	* DRISCOPLEX™ 4100	1, 8, 19, 20
Sanitary Sewer	DRISCOPLEX™ 4200	8, 9
	DRISCOPLEX™ 4300	5, 6, 9
Treated/Reclaimed Water	DRISCOPLEX™ 4400	8, 11
	DRISCOPLEX™ 4500	5, 6, 11
Sliplining	DRISCOPLEX™ 4600	1, 12
	DRISCOPLEX™ 4700	5, 6, 12, 15
	DRISCOPLEX™ 1200	1, 13
	DRISCOPLEX™ 1400	5, 13
Dual Containment	DRISCOPLEX™ 2400	1, 14
Industrial Specialty	DRISCOPLEX™ 1000	1, 16

NOTICE: Capabilities vary from manufacturing plant to manufacturing plant. Contact Performance Pipe to determine the availability of specific products and the availability of particular stripe or shell colors, striping patterns, and IPS or DIPS sizing.

Legend for Typical Features:

1. IPS sizing system.
2. FMR Approved Class 150 or Class 200 in 2" – 24" IPS pipe sizes.
3. A single longitudinal color stripe is extruded into the pipe OD to identify DR.
4. Various perforation patterns are available.
5. DIPS sizing system.
6. The DIPS longitudinal color stripe pattern is three equally spaced pairs of color stripes extruded into the pipe OD.
7. Blue color stripes are standard. A blue color shell is available on special order.
8. The IPS longitudinal color stripe pattern is four equally spaced single color stripes extruded into the pipe OD.
9. Green color stripes are standard. A green color shell is available on special order.
10. Red color stripes standard.
11. Purple color stripes are standard. A lavender color shell is available on special order.
12. Solid light gray color.
13. Light gray color lining extruded into pipe ID.
14. Factory assembled casing and carrier.
15. Green color stripes are standard.
16. 1-1/2" IPS and smaller sizes only. Black is standard.
17. FMR & NSF Approved Class 150 or Class 200. Blue color stripes standard.
18. FMR Approved Class 150 or Class 200 in 4" – 24" DIPS pipe sizes.
19. Black is standard. Blue color stripes or blue color shell available on special order.
20. 2" IPS and 3" IPS made to ASTM D 3035, AWWA C901 and NSF 61. 4" IPS and larger made to ASTM F 714, AWWA C906 and NSF 61.

PERFORMANCE PIPE, a division of Chevron Phillips Chemical Company LP
5085 W. Park Blvd., Suite 500 (75093), P.O. Box 296006, Plano, TX 75026-9006
Phone: 1-800-527-0662 / Fax: 972-599-7348 / www.performancepipe.com

LEE SUPPLY CO. INC.
• DIVERSIFIED PIPE & PUMP SYSTEMS
• INDUSTRIAL • MINING • ENVIRONMENTAL PRODUCTS
• MUNICIPAL PRODUCTS
P.O. Box 35 Charleroi, PA 15022
Phone: 724-483-3543 FAX: 724-483-0577

- Feb. 2002 Supersedes all previous publications
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Chevron Phillips Chemical Company LP

Performance Pipe / a division of Chevron Phillips Chemical Company LP
5085 W Park Blvd, Ste 500 / Plano, TX 75093
Phone: 972.599.6666 / Fax: 972.599.7346 / E-mail: petrolj@cpchem.com

4942

August 2, 2002

Mr. John H. Eckford, Jr.
Fluor Fernald, Inc.
P.O. Box 538704
Cincinnati, OH 45253

RE: DriscoPlex™ Data Sheet

Dear Mr. Eckford:

On July 1, 2000, Chevron Chemical Company and Phillips Chemical Company joined forces to form Chevron Phillips Chemical Company LP. Performance Pipe was established as a division of Chevron Phillips Chemical Company LP to succeed Plexco and Driscopipe. Performance Pipe now manufactures DriscoPlex™ piping. The resin used to manufacture DriscoPlex™ municipal and industrial piping has a cell classification of 345464C per ASTM D3350, "Standard Specification for Polyethylene Plastics Pipe and Fittings Material". Previous data sheets provided by Driscopipe and Plexco have listed the cell class as 345434C. The change in the cell class reflects improvements in Industry standards. You will notice that the cell classes differ in only the fifth digit which represents the cell for Slow Crack Growth Resistance (SCGR). ASTM added the cell class "6" to D3350 in the nineteen-nineties to allow the use of a more stringent test for SCGR called the PENT test. PENT differs significantly from D1693 in that test specimens are kept under constant stress throughout the test. The test is so rigorous that the Gas Industry promoted a change in ASTM D2513, "Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings", to allow use of only materials meeting the PENT test requirement of "6" Materials meeting a cell class of 345464C not only meet the cell class 345434C but they exceed it. ASTM D3350 includes all properties needed for specifying pipe material. You will find that ASTM D1603, "Test Method for Carbon Black in Olefin Plastics", is also referenced in ASTM D3350.

If I can be of further assistance, please call.

Sincerely,

Larry J. Petroff
Technical Service Supervisor, M&I

For Po. 02F70992

000023

TOTAL P.02

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHASE IV

SUBMITTAL NO.: 20104-PHIV-02605-006

REV.: 0

DATE: 12/8/02

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W Galley

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Jannie Rose DATE: 12-10-00

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-006	0							X		VALUES SPECIFIC TO		X		02605-1.04	X		
											RESIN USED IN MANUFACTURE				A5			

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VAN ARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODISER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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RECEIVED BY: Michael W Galley DATE: 12/13/02
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CFC - CERTIFIED FOR CONSTRUCTION
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SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4956
REV. 3: 05/14/1999, CT-2.4.2

4942

Chevron Phillips Chemical Company LLP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

May 29, 2002

PSN# 12383-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

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Package:	PSPX 2530		
Quantity:	181300 LBS.		
HLMI Flow Rate,ASTM D1238:	12.7 G/10 MIN	8.0	14.0
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Additive Blend:	.34 WT%	0.26	0.39
Pellet Count:	45. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

INFORMATION ONLY

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: Date: 12/13/02

Robert Caldwell
FAX: 972 599-7346

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

June 14, 2002

PSN# 13767-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

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Paul S. Newbold
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

Robert Caldwell
FAX: 972 599-7346

000026

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-007	REV.: 0	DATE: 7/30/02	Page 1 of 12

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature] 8/02/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 8/6/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-007								X		PIPE JOINING EQUIPMENT				2605-1.04	X		
											IDENTIFICATION AND		X					
											PROCEDURE FOR							
											BUTT FUSION WELDING							
											+ ELECTROFUSION							
											COUPLINGS.							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
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BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBPAH	38				
DON PFISTER	~~55~~ 45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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RECEIVED BY: MWG ORIGINAL SIGNATURE DATE: 8/8/02
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ON ATTACHED APPROVAL PAGE SAL

SUBMITTAL TYPE: (BY SUPPLIER)
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FS-F-4955
REV. 3: 05/14/1999 CT-2.4.2

SIMULTANEOUS BUTT FUSION METHOD
(SDR 11 6/10 INCH DUAL CONTAINMENT HDPE PIPE)

1. REQUIRED EQUIPMENT FOR BUTT FUSION

- McElroy 412 machine

2. ACCEPTABLE WEATHER CONDITIONS

- Do not join HDPE pipes and fittings at ambient temperatures below 40°F or above 104°F, unless authorized in writing by the Construction Manager. For cold (below 40°F) or hot (above 104°F) weather joining, use the authorized methods authorized in writing by the Construction Manager.
- Do not join HDPE pipe and fittings during any precipitation, in the presence of heavy fog, dew, or areas of ponded water.

3. TRIAL FUSION WELD METHOD

- Make trial butt-fusion joints on spool pieces of HDPE pipe to verify that joining conditions are adequate.
- The spool pieces shall be centralized and hot air welded into place to a assure there is no movement of the 6 inch pipe within the 10 inch pipe.
- Conduct trial joints on the same material to be installed and under similar field conditions as production joints.
- Conduct trial joints at the beginning of each day and at least once each day for each fusion apparatus used that day.
- Conduct trial joining under the same conditions as the actual joining.
- Prepare the trial joint that is at least 2 feet long with the joint centered.
- A field-performed "Bent Strap" Test is to be performed as in the following manner:
  1. The bent strap specimen is prepared from the trial butt fusion spool after it has been allowed to cool to ambient temperatures;
  2. A test strap that is at least 6 inches or 15 pipe wall thicknesses long on each side of the fusion and about 1 inch or 1.5 wall thicknesses wide is cut out of the trial fusion pipe.
  3. The strap is bent in the direction to the pipe exterior till the pipe ends touch. Any disbondment at the fusion is unacceptable, and indicates poor fusion quality.
  4. If failure occurs, fusion procedures and or machine set-up shall be changed, and new trial fusion and bent strap test specimen shall be prepared and tested. Field fusion shall not proceed until a trial test joint has passed the bent strap test.

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Date: 8/28/02

ECDC CONTROLLED
COPY NO. 768967

4. FUSION WELD PROCEDURE

- Insert centralizers into the space between the 6" carrier pipe and 10" containment pipe. The centralizer flow area shall be aligned with the flow areas of existing centralizers. The centralizers shall be welded to the 10" containment pipe and 6" carrier pipe using a hot air gun with hand fed HDPE rod.
  Note: The pipe may be ordered with the centralizer inserts already welded into place.
- Clean each pipe end with a clean oil free cloth. Cleaning shall extend approximately one inch beyond the face of the pipe. The joint shall be free of moisture, dust, and debris of any kind.
- Face the dual containment pipe using a wheeler pressure of approximately 100 psi. The inner carrier pipe shall not move within the containment during facing. If there is movement the inserted centralizer is required to be rewelded. Facing is complete when the following requirements are met:
  1. The gap between the pipe ends is less than or equal to 1/64";
  2. Misalignment is less than 10% of the pipe wall thickness;
  3. Five full ribbons appear during facing;
  4. and the 6 inch pipe surface visually indicates that has been fully faced.
- Remove all shavings from the face of the pipe. The operator shall use clean gloves when removing the shavings.
- The pipe shall be checked for proper alignment prior to joining. The jaw can be adjusted to obtain the proper alignment. **Note: If there is realignment after facing the pipe shall be refaced.**
- The temperature of the heater plate shall be 400°F to 425°F when measuring the temperature with a temperature stick or other means.
- Wipe the surface of the heater plate with a clean oil free rag.
- Insert the heater plate between the pipe ends and bring the ends into firm contact with the plate. After the ends are in contact with the plate, the fusion machine shall be placed in neutral so that there is zero pressure on the pipe ends. With no pressure on the pipe ends, the heat is allowed to soak into the HDPE without squeezing out the melt.
- During the heat soak period the HDPE pipe ends will expand to form a melt bead at the pipe end / plate contact point. When the melt bead increases in height to approximately 3/16 inches the heat soak period is complete.
- The pipe ends shall be pulled back from the heat plate. The inner pipe shall quickly be inspected for uniform and proper size melt bead and after inspection, the pipe ends shall rapidly be brought together.
- The fusion pressure for 6/10 inch dual containment pipe is 218 psi which is equal to the fusion pressure for the 10 inch pipe. As the two

pipes are brought together, the pipe joint will have a double roll back bead. A proper double roll back bead is considered compete when each side of the bead is rolled over until it just touches the pipe surface. The bead shall also be uniform along the circumference of the pipe.

- The butt fusion joint shall remain under pressure till the bottom of the joint is cool to the touch. The approximate cool time is 20 minutes for 6/10 inch SDR 11 dual containment pipe.

FUSION PRESSURES
412-618 STANDARD FUSION UNIT
(11.775 PISTON AREA)

DRISCOPIPE 1000 (75 PSI INTERFACE) (400 DEG HTR)

	SDR	32.5	26	21	17	15.5	13.5	11	9	7
	4"	42	45	48	52	54	57	63	69	79
IPS	6"	56	62	69	78	82	89	101	115	136
PIPE	8"	74	84	96	111	118	130	151	174	209
SIZE	10"	98	114	133	156	167	186	218	254	308
	12"	125	148	175	207	223	249	294	345	421
	14"	145	172	205	243	262	294	348	410	501
	16"	180	216	258	308	333	375	445	526	645
	18"	220	265	319	382	414	466	556	658	809

FUSION UNITS ARE SET AT 1200 PSI (PUMP PRESSURE).

ABOVE PRESSURES ARE FOR GUIDELINES ONLY, CONDITIONS MAY WARRANT CHANGES IN PRESSURES OR TEMPERATURE.

BUTT FUSION METHOD
(SDR 11 6 INCH HDPE PIPE)

1. EQUIPMENT USED FOR BUTT FUSION

- McElroy 412 Machine

2. ACCEPTABLE WEATHER CONDITIONS

- Do not join HDPE pipes and fittings at ambient temperatures below 40°F or above 104°F, unless authorized in writing by the Construction Manager. For cold (below 40°F) or hot (above 104°F) weather joining, use the authorized methods authorized in writing by the Construction Manager.
- Do not join HDPE pipe and fittings during any precipitation, in the presence of heavy fog, dew, or areas of ponded water.

3. TRIAL WELD REQUIREMENTS

- Make trial butt-fusion joints on spool pieces of HDPE pipe to verify that joining conditions are adequate.
- Conduct trial joints on the same material to be installed and under similar field conditions as production joints.
- Conduct trial joints at the beginning of each day and at least once each day for each fusion apparatus used that day.
- Conduct trial joining under the same conditions as the actual joining.
- Prepare the trial joint that is at least 2 feet long with the joint centered.
- A field-performed "Bent Strap" Test is to be performed as follows:
    1. The bent strap specimen is prepared from the trial butt fusion spool after it has been allowed to cool to ambient temperatures;
    2. A test strap that is at least 6 inches or 15 pipe wall thicknesses long on each side of the fusion and about 1 inch or 1.5 wall thicknesses wide is cut out of the trial fusion pipe.
    3. The strap is bent in the direction to the pipe exterior till the pipe ends touch. Any disbondment at the fusion is unacceptable, and indicates poor fusion quality.
    4. If failure occurs, fusion procedures and or machine set-up shall be changed, and new trial fusion and bent strap test specimen shall be prepared and tested. Field fusion shall not proceed until a trial test joint has passed the bent strap test.

4. WELD PROCEDURES

- Clean the pipe end with a clean oil free cloth. Cleaning shall extend approximately one inch beyond the face of the pipe. The joint shall be free of moisture, dust, and debris of any kind.
- Face the 6 inch pipe using a wheel pressure of approximately 85 psi. Facing is complete when the following requirements are met:
    1. The gap between the pipe ends is less than or equal to 1/64";

2. Misalignment is less than 10% of the pipe wall thickness;
3. Five full ribbons appear during facing;

- Remove all shavings from the face of the pipe. The operator shall use clean gloves when removing the shavings.
- The pipe shall be checked for proper alignment prior to joining. The jaw can be adjusted to obtain proper alignment. **Note: If there is realignment after facing, the pipe shall be refaced.**
- The temperature of the heater plate shall be 400°F to 425°F when measuring the temperature with a temperature stick or other means.
- Wipe the surface of the heater plate with a clean oil free rag.
- Insert the heater plate between the pipe ends and bring the ends into firm contact with the plate. After the ends are in contact with the plate, the fusion machine shall be placed in neutral so that there is **zero** pressure on the pipe ends. With no pressure on the pipe ends, the heat is allowed to soak into the HDPE without squeezing out the melt.
- During the heat soak period, the HDPE pipe ends will expand to form a melt bead at the pipe end and heater plate contact point. When the melt bead increases in height to approximately 3/16 inches, the heat soak period is complete.
- The pipe ends shall be pulled back from the heat plate, and the pipe ends shall rapidly be brought together.
- The fusion pressure for 6 inch pipe is 101 psi. As the two pipes are brought together, the pipe joint will have a double roll back bead. A proper double roll back bead is considered compete when each side of the bead is rolled over until it just touches the pipe surface. The bead shall also be uniform along the circumference of the pipe.
- The butt fusion joint shall remain under pressure till the bottom of the joint is cool to the touch.

FUSION PRESSURES
412-618 STANDARD FUSION UNIT
(11.775 PISTON AREA)

DRISCOPIPE 1000 (75 PSI INTERFACE) (400 DEG HTR)

	SDR	32.5	26	21	17	15.5	13.5	11	9	7
	4"	42	45	48	52	54	57	63	69	79
IPS	6"	56	62	69	78	82	89	101	115	136
PIPE	8"	74	84	96	111	118	130	151	174	209
SIZE	10"	98	114	133	156	167	186	218	254	308
	12"	125	148	175	207	223	249	294	345	421
	14"	145	172	205	243	262	294	348	410	501
	16"	180	216	258	308	333	375	445	526	645
	18"	220	265	319	382	414	466	556	658	809

FUSION UNITS ARE SET AT 1200 PSI (PUMP PRESSURE).

ABOVE PRESSURES ARE FOR GUIDELINES ONLY, CONDITIONS MAY WARRANT CHANGES IN PRESSURES OR TEMPERATURE.

DRISCOPIPE

1000 PE3408

Butt Fusion Procedure for Pipe and Fittings

1. Clean each pipe with clean cotton cloth.*
2. Square (face) end of each pipe to be fused.
3. Check line-up of pipe ends. Adjust high-low. Check heater plate for proper temperature, and wipe header surface clean. **Thermometer** reading:
   400°F – 425°F . . . coated plates
   375°F – 400°F . . . uncoated plates
4. Insert heater plate between aligned ends and bring ends firmly in contact with plate, but **DO NOT APPLY PRESSURE** while achieving melt pattern. Watch for proper melt.
5. Remove heater plate after achieving proper melt bead.
6. Bring melted ends together rapidly. **Do not slam. Apply enough pressure to form a double roll-back bead.**
7. Allow the butt fusion joint to cool properly (until finger can remain comfortably on bead).

Remember

A quality butt-fusion joint has a double bead rolled back to the body of the pipe.
Heater plates should be double checked with a tempilstik or pyrometer for correct **surface** temperature (375°F – 400°F).
**Avoid polyester type materials which melt and stick to heater plates.*

Phillips Driscopipe, Inc.
A Subsidiary of Phillips Pertroleum Company

22-92 02

PROCEDURE FOR INSTALLING ELECTROFUSION COUPLINGS

1. QUALIFICATION PROCEDURE

- The recommended joining procedures for the Electrofusion System has been qualified in accordance with D.O.T. 192.283.

2. CERTIFICATION REQUIREMENTS

- Persons responsible for the joining of polyethylene pipe by fusion methods must qualify according to the requirements of Title 49 of the code of Federal Regulations, Section 192.285.
- The regulations require that each operator performing fusion joining be qualified in the use of the recommended fusion procedure by the following:
    1. Appropriate training or experience in the use of the applicable fusion procedures: and
    2. Making a sample joint according to the said procedure that passes the following inspection criteria:
        a. The joint shall be visually examined during and after joining and found to have the same appearance as a photograph or sample of an acceptable joint that was joined in accordance with the applicable procedure;
        b. The joint must be tested or examined by an authorized instructor by using the pressure and tensile test as described in 49 CFR 192.283 or cutting the sample into 3 longitude straps and visually examining the specimen for unbounded areas and deform the specimen by bending or torqueing and visually inspecting for failure.
        c. A person must be requalified under an applicable procedure if, during any twelve month period, he does not make any joints under the applicable procedures or has three joints or three percent of the joints he has made whichever is greater, that are found unacceptable by tesing under 40 CFR 192.513.

3. STANDARD JOINING PROCEDURE

- The pipe shall have a square even cut.
- Remove any burrs or shavings from the pipe ends tha may have developed during the cutting process.
- Clean pipe ends inside and out with a clean cloth to remove any dirt or contaminates. Pipe preparation and contamination are very important considerations in the electrofusion process. Therefore, careful attention shall be given to proper scraping and cleaning procedures.

- Scrape the pipe ends to remove any oxidation or surface contamination. For best results, secure tool on pipe and make two revolutions. Do not grind on the pipe, since contamination can be transmitted to the pipe from the grinding wheel.
- Remove the scraping tools and clean blade area with a clean, dry, cloth. Repeat this procedure several times during the scraping operation to remove build-up of material.
- Continue scraping until only virgin surface remains. **Caution: Avoid all possible recontamination of the prepared surface. Do not touch indied of fitting or scraped pipe surfaces with your hands as perspiration and body oils could contaminate jointing areas and affect joint performance.**
- To determine stab depth, measure half the length of the coupin and mark the pipe ends an equivalent length. For ease of installation, stab depth indicator and internal fitting stops are a molded part of Central Electrofusion couplings and reducers.
- Slide fitting onto pipe until pipe ends meet with the stops in the I.D. of the fitting. Check measurement mark for proper stab depth.
- Maintain stab depth and place into the proper clamping tool to secure the pipe from movement during the fusion cycle. For best results, alignment clamps should be placed as close to the fitting as possible.
- The sequence processor should be connected to an adequate AC power source (110 volt). **Note: If utilizing a generator, the generator should be engaged before plugging the sequence processor in.**
- The sequence processor will automatically run a quick diagnostic check of its operational functions (voltage input/output, etc.). When diagnostic check is complete "Attach fitting" will appear on the visual display.
- Attach the leads from the sequence processor to the fitting terminals. When proper connection is made, the required "fusion Cycle Time " will appear on the visual display.
- Press "start" button to begin fusion cycle. Fusion Cycle time will countdown on the visual display. Proper voltage readout should remain between 39.8 and 40.2 volts.
- When the fusion cycle is complete, "Fusion Complete and Recommended Cooling Time" will appear on the visual display.
- Disconnect leads from fitting. Clamping device should remain in place to secure pipe and fitting during the recommended cooling time. After removing clamp, additional cooling time should be allowed before subjecting the joint to bending, burying, pressure testing, or similar handling and backfill stress. Refer to the Electrofusion manual for recommended cooling times. **Note: In the event of out-of-round pipe, it is important to assure an adequate and even scrape is achieved around the entire circumference of the pipe. A rubber pipe stopper can be placed in the end of te pipe to aid in rounding the area to to be scraped.**

Performance:

Central Electrofusion Fittings typically achieve the following performance test results.

Temperature	Internal Pressure	Hours to Failure
176°F (80°C)	130 PSI	1000 +
68°F (20°C)	275 PSI	2500 +

Saddle Impact: Falling Weight 10 lb. from 7 ft.

Safe Operating Temperature: −10°F to 120°F (−23°C to 49°C)

Safe Operating Pressure: 125 PSI

Compliance With Standards: Central Electrofusion Fittings meet the requirements of ASTM F1055.

Electrical Requirements and Cooling Times

Fitting	Fusion time in seconds	Clamped time in minutes	Total cooling time	KVA	Generator Breaker minimum	Extension cord size 25 ft.	Extension cord size 50 ft.
COUPLINGS:							
1/2 CTS	20	5	30	1.0	10	#12/3	#10/3
1/2 IPS	20	5	30	1.0	10	#12/3	#10/3
3/4 IPS	25	5	30	1.0	10	#12/3	#10/3
1 CTS	25	5	30	1.0	10	#12/3	10
1 IPS	40	5	30	1.0	10	#12/3	10
1 1/4 IPS	45	10	30	1.5	10	#12/3	#10/3
2 IPS	45	10	30	2.5	20	#10/3	# 8/3
3 IPS	90	10	30	2.5	20	#10/3	# 8/3
4 IPS	120	10	45	2.5	20	#10/3	# 8/3
6 IPS	500	15	1 hour	2.5	20	#10/3	# 8/3
REDUCERS:							
3/4 x 1/2 CTS	20	5	30	1.0	10	#12/3	#10/3
1 IPS x 1/2 CTS	25	5	30	1.0	10	#12/3	10
1 IPS x 1/2 IPS	30	5	30	1.0	10	#12/3	#10/3
1 IPS x 3/4 IPS	30	5	30	1.0	10	#12/3	#10/3
1 IPS x 1 CTS	30	5	30	1.0	10	#12/3	#10/3
TAPPING TEES:							
1 1/4 x 1	45	10	30	1.0	10	#12/3	#10/3
2 x 1	90	10	30	1.0	10	#12/3	#10/3
3 x 1	90	10	30	1.0	10	#12/3	#10/3
4 x 1	90	10	30	1.0	10	#12/3	#10/3
6 x 1	90	10	30	1.0	10	#12/3	#10/3
VOLTAGES:	90 Volt Minimum		150 Volt Maximum				
FREQUENCY:	45 to 75 Hertz						
INVERTERS:	Yes.						

WARNING: A.C. current only. D.C. current can result in damage to processor.

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-008	REV.: 0	DATE: 7/30/02	Page 1 of 8

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature] 7/31/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 8/6/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02605-008								X		TRAINING PLANS FOR BUTT FUSION.		X		2605-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
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MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

000039

RECEIVED BY: [signature] DATE: 8/08/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

BUTT FUSION PROCEDURES (HDPE)

- Clean each pipe end with clean cloth before facing is to done. This is done before placing the pipes and or fittings in the fusion jig.
- Square (face) the ends of each pipe and or fitting to be fused. Face down to the stops.
  - Should not be a gap greater than .005" (1/64") between pipe ends.
  - Adjust high-low. No misalignment greater than 10% of the pipe wall thickness.
  - Face pipe ends until a long curl of plastic shaving is completely visible around both pipe ends.
  - Do not wipe the facer surface of the pipe, as it is as clean as it can be. If present, remove any shaving from inside the pipe.
- Check heater plate for proper temperature and wipe the heater surfaces clean, before and after each butt fusion weld.

<u>Thermometer readings</u>

1000 Series	400-425 Degrees F... Coated Plates

- Insert heater plate between aligned pipe ends and bring ends firmly in contact with heater plate, but <u>Use Very Little or No Pressure</u> while achieving melt patter. The important key here is to do what is necessary to have full contact between pipe end and heater plate. Be looking for a bead of molten plastic to appear around the entire circumference of both ends. This bead is the signal that the full surface contact has been achieved. A melt bead of 1/16" to 1/8/" is sufficient for 2" pipe. Smaller pipe sizes require less melted material for proper fusion, while larger sizes may benefit from slightly more melt. (Refer to note #1 on the next page for other approximate melt beads)
- Remove heater plate after achieving proper melt bead. The heater plate may stick to one side, so snap it off that side quickly. Use care so that upon removal, the heating plate is not bumped into the other pipe.
- Bring melted ends together rapidly. DO NOT SLAM them together as this might cause excessive displacement of the molten material. As the two pipe ends are brought together, sufficient force should be applied to form a double rollback bead. A proper double rollback

ECDC CONTROLLED
COPY NO. 76896

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [illegible] Date: 8/08/02

bead is considered completed when each side of the double bead is rolled over until it just touched the pipe surface. Care must also be taken with not slamming together, and not giving so much pressure as to force all the molten material out of the fusion zone and causing what is to be considered a cold weld.

- Allow the butt fusion joint to cool properly (until your finger can remain comfortably on the bead and or the proper time has elapsed using the charts supplied by the pipe manufacturer). Pressure remains applied during the cool down time. Refer to Phillips Chart for Fusion Joint Cooling Time.

Remember: Install the proper inserts in the fusion unit for the pipe or fitting being joined. A quality butt fusion joint is well aligned, has a complete double rollback bead, and is made in accordance with this procedure.

- Heater plates should be double checked with a tempil stick or pyrometer for correct surface temperature.

Note #1:

Pipe Size	Approximate Melt Bead
2" and Below	1/16"
3"-5"	1/8"
6"- 12"	3/16"
12"-22"	¼"-5/16"
24"-54"	5/16"-7/16"

FUSION PRESSURES
412-618 STANDARD FUSION UNIT
(11.775 PISTON AREA)

DRISCOPIPE 1000 (75 PSI INTERFACE) (400 DEG HTR)

	SDR	32.5	26	21	17	15.5	13.5	11	9	7
	4"	42	45	48	52	54	57	63	69	79
IPS	6"	56	62	69	78	82	89	101	115	136
PIPE	8"	74	84	96	111	118	130	151	174	209
SIZE	10"	98	114	133	156	167	186	218	254	308
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	14"	145	172	205	243	262	294	348	410	501
	16"	180	216	258	308	333	375	445	526	645
	18"	220	265	319	382	414	466	556	658	809

FUSION UNITS ARE SET AT 1200 PSI (PUMP PRESSURE).

ABOVE PRESSURES ARE FOR GUIDELINES ONLY, CONDITIONS MAY WARRANT CHANGES IN PRESSURES OR TEMPERATURE.

Name		Signature	Badge	Supervisor/Co.	Date
[redacted]	(*Trainee)	[redacted]	5712	Phil Thompson	7-11-02
			8505	Mike Gaeba	7-11-02
			6973	Collin Sukow	7-11-02
			812	DAVE CAPELLE	7/11/02
			145	Mike Barber/FF	7-11-02
	(Trainer)		4721		7-11-02
				Isco	
	(Trainee)		78696	WISE Phil	7-11-02

000043

-4942

Isopropyl Alchol
[illegible]% - clean pipe

QUALITY EVALUATION PLAN

QEP No. _____ Rev. _____

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF THERMAL BUTT FUSION WELDING- TRIAL JOINING

3. Project/Task: OSDF PHASE III		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: FRANK THOMPSON	Date:	6. Reviewed By: MIKE GODBER	Date:
7. NDE Level III: (When Required)	Date:	8. Approved By: (When Required)	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	PIPE SIZE: Dual 10" / 6" SDR#: 11 NAME OF JOINER: Jim Sullivan FUSION MACHINE #: 1241 (Standard Machine) AMBIENT TEMPERATURE: DNV Approx. 80°F WEATHER CONDITIONS: FOG: [ ] yes [X] no PRECIPITATION: [ ] yes [X] no Facing 100 psi 218 psi Watch for ~~Fusion~~ - slippage of jaws			**ACCEPTABLE WEATHER CONDITIONS** • Do not join HDPE pipe at ambient temperatures below 40° F or above 104° F unless authorized in writing by the Construction Manager; • Do not join HDPE pipe during period of precipitation, in the presence of heavy fog, dew, or areas of ponded water.
1.	Verify there are no obstructions inside the pipe.	✓		TIME OF TRAIL JOINT: ~~[illegible]~~ 1120 35 No obstructions
2.	Verify the pipe is cleaned with a clean oil free rag prior to facing. Cleaning should extend approximately one inch beyond the face of the pipe. The joint shall be free of moisture, dust, and debris of any kind.	✓		

13. QA Team Member (Printed Name)	(Signature)	Date: 7-11-02
14. QA Team Coach (Completed QEP):		Date:

000044

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. _____ Rev. _____

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status		12. General Remarks
		SAT	UNSAT	
9.	Verify the pipe is joined at the required fusion pressure and allowed to cool. 10 INCH SDR 11 FUSION PRESSURE: ~~435~~ psi 218 psi 6 INCH SDR 11 FUSION PRESSURE: ~~165~~ psi 101 psi STANDARD 4/12	✓		FUSION PRESSURE: 218 psi
10.	Verify the weld is allowed to cool prior to removing the clamps. **NOTE:** The required cooling time is achieved when the joint is cool to the touch.			
11.	Verify a test strap is prepared (cut out) from the trial butt fusion spool. The test strap shall be at least 6 inches or 15 pipe wall thicknesses long on each side of the fusion and about 1 inch or 1.5 wall thicknesses wide.			
12.	Verify that the test strap is bent such that the ends of the strap touch.			
13.	Verify that there is no disbondment at the fusion. Any disbondment is unacceptable.			

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. _____ Rev. _____

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the pipe is faced. The wheel pressure shall be approximately _____ psi. Facing is considered complete when approximately 5 ribbons have been cut from the pipe. After 5 full ribbons have been cut the wheel pressure should be dropped to 0 psi and the cutting wheel shall continue to rotate to cut the ribbons from the pipe face. **NOTE:** After the pipe has been faced there shall be no further alignment. If there is realignment the pipe shall be refaced.	✓		FACING PRESSURE: 100 psi
4.	Verify all shavings are removed from the facing and the pipe to assure that the shavings are not part of the joint. The operator shall use clean gloves when removing the shavings.	✓		
5.	Verify the pipe is checked for proper alignment prior to joining. The jaw can be adjusted to obtain proper alignment. **NOTE:** If there is realignment the pipe shall be refaced.	✓		
6.	Verify the heater plate is between ~~375°F and 425°F~~. 400 - 425 °F **NOTE:** The heater plate shall be cleaned with a clean oil free cloth. The plate temperature is not to exceed 500 °F.			PLATE TEMPERATURE: ~~400/425~~ 420°
7.	Verify the heater plate is inserted into the machine and the pipe ends are brought into firm contact with the plate. The pipe shall be under zero pressure when being heated.	✓		HEAT SOAK PRESSURE: 0
8.	Verify the melt bead is approximately ~~1/8~~ inch to ~~1/4~~ inch in height prior to removing the heat plate. 3/16 - 1/4" Pipe **NOTE:** The heat time is dependent on pipe diameter and SDR#. NO SHAVINGS	✓		

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-009	REV.: 0	DATE: 7/30/02	Page ___ of ___

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 8/22/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
	PHIV-02605-009	0		X							MATERIAL SAFETY		X		2605.1.04			
											DATA SHEET							
											FOR HDPE							

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BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH	38				
DON PEISTER	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS) ✓

No Barcoding is Required

ORIGINAL

000047

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RECEIVED BY: [signature] DATE: 9/9/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955

Material Safety Data Sheet

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PE3408 (HDPE) Pipe & Fittings (Various Colors)

COMPANY IDENTIFICATION

Performance Pipe, a Division of
Chevron Phillips Chemical Company LP
2929 North Central Expressway #300
Richardson, TX. 75080

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Emergency Information Centers
are located in U.S.A.
Int'l collect calls accepted

PRODUCT INFORMATION: (972) 705-6543

2. COMPOSITION/INFORMATION ON INGREDIENTS

100.0 % PE3408 (HDPE) Pipe & Fittings (Various Colors)

CONTAINING

COMPONENTS	AMOUNT	LIMIT/QTY	AGENCY/TYPE
POLYETHYLENE Chemical Name: ETHENE, HOMOPOLYMER CAS9002884	> 96.00%	NONE	NA
OR			
POLYETHYLENE-BUTENE COPOLYMER Chemical Name: 1-BUTENE, POLYMER WITH ETHENE CAS25087347	> 96.00%	NONE	NA
OR			

INFORMATION ONLY

Revision Number: 3 **Revision Date: 11/28/00** **MSDS Number: 005873**

[✓] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [signature] Date: 9/9/02

POLYETHYLENE-HEXENE COPOLYMER
Chemical Name: 1-HEXENE, POLYMER WITH ETHENE

CAS25213029	> 96.00%	NONE	NA

ADDITIVES INCLUDING THE FOLLOWING

LEAD CHROMATE PIGMENT
Chemical Name: C.I. PIGMENT YELLOW 34

CAS1344372	< 1.00%	NONE	NA

CARBON-BLACK
Chemical Name: CARBON-BLACK

CAS1333864	< 4.00%	3.5 mg/m3	ACGIH TWA
		3.5 mg/m3	OSHA PEL

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

3. HAZARDS IDENTIFICATION

********** **EMERGENCY OVERVIEW** **********

Colored plastic (red, white, blue, grey, black, orange)
****

IMMEDIATE HEALTH EFFECTS
EYE:
Not expected to cause prolonged or significant eye irritation. If this material is heated, thermal burns may result from eye contact.
SKIN:
Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin. If this material is heated, thermal burns may result from skin contact.
INGESTION:
Not expected to be harmful if swallowed.
INHALATION:
Not expected to be harmful if inhaled. If this material is heated, fumes may be unpleasant and produce nausea and irritation of the upper respiratory tract.
SIGNS AND SYMPTOMS OF EXPOSURE:
Thermal burns to the eye: may include pain, tearing, reddening, swelling, and impaired vision. Thermal burns to the skin: may include pain or feeling of heat, discoloration, swelling, and blistering. Respiratory irritation: may include coughing and difficulty breathing.

4. FIRST AID MEASURES

EYE:

If heated material should splash into eyes, flush eyes immediately with fresh water for 15 minutes while holding the eyelids open. Remove contact lenses, if worn. Get immediate medical attention.

SKIN:

If the hot material gets on skin, quickly cool in water. See a doctor for extensive burns. Do not try to peel the solidified material from the skin or use solvents or thinners to dissolve it. The use of vegetable oil or mineral oil is recommended for removal of this material from the skin.

INGESTION:

No specific first aid measures are required because this material is not expected to be harmful if swallowed.

INHALATION:

Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.

5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:

Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.

FLAMMABLE PROPERTIES:

FLASH POINT: NA

AUTOIGNITION: NA

FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA

EXTINGUISHING MEDIA:

C02, dry chemical, foam and water fog

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0.

FIRE FIGHTING INSTRUCTIONS:

This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.

If possible, water should be applied as a spray from a fogging nozzle since this is a surface burning material. The application of high velocity water will spread the burning surface layer.

COMBUSTION PRODUCTS:

Normal combustion forms carbon dioxide, water vapor and may produce carbon monoxide, original monomer, other hydrocarbons and hydrocarbon oxidation products, depending on temperature and air availability.

6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887

International Collect Calls Accepted

ACCIDENTAL RELEASE MEASURES:

Not applicable.

7. HANDLING AND STORAGE

Avoid contact of heated material with eyes, skin, and clothing. Avoid breathing vapor or fumes from heated material.

Improper or careless handling of these products can result in serious personal injury or possibly death, especially during loading, unloading, movement or installation. Please take all necessary precautions and follow manufacturer's published procedures f0r safely handling these products,

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
Use in a well-ventilated area. If heated material generates vapor, or fumes, use process enclosures, local exhaust ventilation, or other engineering controls to control exposure. Ventilation requirements must be locally determined. If handling results in dust generation, special ventilation may be needed to ensure that dust exposure does not exceed the OSHA PEL for nuisance dust.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. If this material is heated, wear chemical goggles and a face shield if engineering controls or work practices are not adequate to prevent eye contact.
SKIN PROTECTION:
No special protective clothing is normally necessary. If this material is heated, wear insulated clothing to prevent skin contact if engineering controls or work practices are not adequate to prevent skin contact.
RESPIRATORY PROTECTION:
No respiratory protection is normally required. If heated material generates vapor or fumes that are not adequately controlled by ventilation, wear a NIOSH approved respirator. Use the following

respirators: Organic Vapor.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Colored plastic (red, white, blue, grey, black, orange)

pH:	NA
VAPOR PRESSURE:	NA
VAPOR DENSITY (AIR=1):	NA
BOILING POINT:	NA
MELTING POINT:	122C (252F)
SOLUBILITY:	Insoluble in water
SPECIFIC GRAVITY:	0.95
DENSITY:	0.95 g/cm3
EVAPORATION RATE:	0
PERCENT VOLATILE (VOL):	0%

10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
Low molecular weight hydrocarbons, alcohols, aldehydes, acids and ketones can be formed during thermal processing.
CHEMICAL STABILITY:
Stable.
CONDITIONS TO AVOID:
Do not heat without adequate ventilation.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc. Avoid contact with organic solvents. May react with free halogens.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
The eye irritation hazard is based on data for a similar material.
SKIN EFFECTS:
The skin irritation hazard is based on data for a similar material. The acute dermal toxicity is based on data for a similar material.
ACUTE ORAL EFFECTS:

The acute oral toxicity is based on data for a similar material.
ACUTE INHALATION EFFECTS:
The acute respiratory toxicity is based on data for a similar material.
ADDITIONAL TOXICOLOGY INFORMATION:
This product contains polymerized ethylene. During thermal processing, this polymer can degrade. The three variables which control its degradation are the temperature, the length of time at that temperature, and the amount of oxygen available. Depending on the local processing conditions, a variety of low molecular weight hydrocarbons, alcohols, aldehydes, acids, and ketones can be formed. These materials are respiratory irritants. Prolonged and repeated breathing of fume

components has been shown to cause other adverse health effects. Exposure to processing emissions should be minimized by following all recommendations in this MSDS.

Pigments containing carbon black, lead chromate, nickel, antimony, or titanium compounds may have been incorporated into this product. The International Agency for Research on Cancer (IARC) has classified carbon black as a Group 2B carcinogen (possibly carcinogenic to humans) based on "sufficient evidence" in animals and "inadequate evidence" in humans. However, the pigments in this product are bound in a polymer matrix which severely limits its extractability, bioavailability and toxicity. The lead chromate pigment is also silica-encapsulated as well as bound in the polymer matrix. None of these pigments is likely to cause adverse health effects under recommended conditions of use.

12. ECOLOGICAL INFORMATION

ECOTOXICITY:
This material is not expected to be harmful to aquatic organisms.
ENVIRONMENTAL FATE:
This material is not expected to be readily biodegradable.

13. DISPOSAL CONSIDERATIONS

Contact local environmental or health authorities for approved disposal of this material.

14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: NOT DESIGNATED AS A HAZARDOUS MATERIAL BY THE FEDERAL DOT
DOT HAZARD CLASS: NOT APPLICABLE

DOT IDENTIFICATION NUMBER: NOT APPLICABLE
DOT PACKING GROUP: NOT APPLICABLE

15. REGULATORY INFORMATION

SARA 311 CATEGORIES:
1. Immediate (Acute) Health Effects: NO
2. Delayed (Chronic) Health Effects: NO
3. Fire Hazard: NO
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

Revision Number: 3 **Revision Date: 11/28/00** **MSDS Number: 005873**

REGULATORY LISTS SEARCHED:

01=SARA 313	11=NJ RTK	22=TSCA Sect 5(a)(2)
02=MASS RTK	12=CERCLA 302.4	23=TSCA Sect 6
03=NTP Carcinogen	13=MN RTK	24=TSCA Sect 12(b)
04=CA Prop 65-Carcin	14=ACGIH TWA	25=TSCA Sect 8(a)
05=CA Prop 65-Repro Tox	15=ACGIH STEL	26=TSCA Sect 8(d)
06=IARC Group 1	16=ACGIH Calc TLV	27=TSCA Sect 4(a)
07=IARC Group 2A	17=OSHA PEL	28=Canadian WHMIS
08=IARC Group 2B	18=DOT Marine Pollutant	29=OSHA CEILING
09=SARA 302/304	19=Chevron TWA	30=Chevron STEL
10=PA RTK	20=EPA Carcinogen	

The following components of this material are found on the regulatory lists indicated.

CARBON-BLACK
is found on lists: 02,08,10,11,13,14,17,28,
C.I. PIGMENT YELLOW 34
is found on lists: 01,03,04,05,10,11,28,

16. OTHER INFORMATION

NFPA RATINGS: Health 0; Flammability 1; Reactivity 0;
HMIS RATINGS: Health 0; Flammability 1; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Sections 1 and 3.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:
TLV - Threshold Limit Value TWA - Time Weighted Average

STEL - Short-term Exposure Limit	TPQ - Threshold Planning Quantity
RQ - Reportable Quantity	PEL - Permissible Exposure Limit
C - Ceiling Limit	CAS - Chemical Abstract Service Number
A1-5 - Appendix A Categories	() - Change Has Been Proposed
NDA - No Data Available	NA - Not Applicable

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

****

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may

be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

****

THIS IS THE LAST PAGE OF THIS MSDS

****

Revision Number: 3 Revision Date: 11/28/00 MSDS Number: 005873

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHASE IV

SUBMITTAL NO.: 20104-PHIV-02605-010

REV.: 0

DATE: 12/8/02

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W. Yoder

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Jeannie Rosa DATE: 12/10

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-010	0							X		RESIN SUPPLIER QUALITY CONTROL CERTIFICATIONS		X		02605-1.04 B1	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

0000057

4942

RECEIVED BY: Michael W. Yoder DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

4942

Chevron Phillips Chemical Company LLP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

May 29, 2002

PSN# 12383-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

		Specifications	
Type:	HHM TR-480X	Min	Max
Lot Number:	8220660		
P.O. Number:	REL 74		
Date Shipped:	05/29/02		
Package:	PSPX 2530		
Quantity:	181300 LBS.		
HLMI Flow Rate, ASTM D1238:	12.7 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.34 WT%	0.26	0.39
Pellet Count:	45. PELLET/GM	35.	65.

INFORMATION ONLY

Paul S. Newbold
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: Date: 12/13/02

Robert Caldwell
FAX: 972-599-7346

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

June 14, 2002

PSN# 13767-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

		Specifications	
Type:	HHM TR-480X	Min	Max
Lot Number:	8220650		
P.O. Number:	REL 87		
Date Shipped:	06/14/02		
Package:	PSPX 2397		
Quantity:	186000 LBS.		
HLMI Flow Rate,ASTM D1238:	13.0 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.33 WT%	0.26	0.39
Pellet Count:	39. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

Robert Caldwell
FAX: 972-599-7346

000059

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02605-011	REV.: 0	DATE: 12/8/02	Page ___ of ___

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W. Goodlee

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Perry D. [illegible] DATE: 12/10/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-011	0						X			MANUFACTURER TEST		X		02605-1.04	X		
											RESULTS VERIFYING				82			
											QUALITY OF RESIN							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
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GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GOODSER	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

~~Results of tests for HDPE Flat Stock Properties (other than Density)~~
~~to missing~~ CV

ORIGINAL

000060

4942

RECEIVED BY: Alan C. Van Arsdale DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
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DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

June 14, 2002

PSN# 13767-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

		Specifications	
Type:	HHM TR-480X	Min	Max
Lot Number:	8220650		
P.O. Number:	REL 87		
Date Shipped:	06/14/02		
Package:	PSPX 2397		
Quantity:	186000 LBS.		
HLMI Flow Rate, ASTM D1238:	13.0 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.33 WT%	0.26	0.39
Pellet Count:	39. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

INFORMATION ONLY

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [signature] Date: 12/13/02

Robert Caldwell
FAX: 972-599-7346

000061

4942

Chevron Phillips Chemical Company LP

Houston Chemical Complex
P.O. Box 792, Pasadena, TX 77501

May 29, 2002

PSN# 12383-02

FAX: 301-582-6628

Performance Pipe
11711 Hopewell Road
Hagerstown, MD 21741

Sheri Eckles

This letter will certify that the Marlex* resin shown below, as supplied by Chevron Phillips Chemical Company, conforms to our manufacturing specification.

This is to confirm that HHM TR-480X, when used with the proper color concentrate, meets or exceeds the requirements of cell classification 345464C in accordance with ASTM D3350. This resin is a PE34 grade material.

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Lot Number:	8220660		
P.O. Number:	REL 74		
Date Shipped:	05/29/02		
Package:	PSPX 2530		
Quantity:	181300 LBS.		
HLMI Flow Rate,ASTM D1238:	12.7 G/10 MIN	8.0	14.0
Density, ASTM D1505:	.944 G/CC	.942	.945
Additive Blend:	.34 WT%	0.26	0.39
Pellet Count:	45. PELLET/GM	35.	65.

Paul S. Newbold
Sr. Certification Systems Specialist

For COA questions call Carol Meza, 713-475-3625

* Reg. U.S. Pat. Off.

cc: QA-File-RC

Robert Caldwell
FAX: 972-599-7346

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHASE IV

SUBMITTAL NO.: 20104-PHIV-RCP5-012

REV.:

DATE: 12/8/02

Page ___ of ___

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W. Moeller

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Penny Dragoo

DATE: 12-10-02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-RCP5-012	0							X		MANUFACTURER WRITTEN CERTIFICATION OF COMPLIANCE & FINAL INSPECTION.		X			X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000063

ORIGINAL

RECEIVED BY: Michael W. Moeller DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

S-F-4955
REV. 3: 05/14/1999, CT-2.4.2

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP

11711 Hopewell Rd
Hagerstown MD 21740

July 31, 2002

DriscoPlex™ 4100 PRODUCT QUALITY CERTIFICATION

CUSTOMER: Lee Supply Company
PO Box 35
Charleroi PA 15022

ATTENTION: Jerry Biagini

CUSTOMER ORDER NO: 4000
PERFORMANCE PIPE ORDER NO: 5574148
SHIPPING DATE: 07/19/02
QUANTITY: 7,280 ft
EXTRUSION DATE(S): 06/02

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: Michael Wapolet Date: 12/3/02

PRODUCT: 6'' dr 11 4100

This letter is being written at your request concerning DriscoPlex™ 4100 series pipe. DriscoPlex™ 4100 series pipe is manufactured from a PE Resin having a cell class of 345464 according to ASTM D3350. This is a high density, high molecular weight polyethylene resin which meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. DriscoPlex™ 4100 pipe, has a Plastic Pipe Institute recommended hydrostatic design basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from a stress regression analysis per ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of DriscoPlex™ 4100 are established in accordance with the guidelines set forth in ASTM F714. Along with ASTM standards, DriscoPlex™ 4100 series meets NSF standards 14 and/or 61 requirements for potable water piping systems, and AWWA C901 and/or C906 requirements for water distribution. The applicable standard is referenced in the print line, and repeated every two feet along the entire length of pipe. While we are making effort to convert to product printed "DRISCOPLEX™", you may receive product printed with either DRISCOPIPE or PLEXCO. Please be assured this product is certified as stated above.

Sincerely,

Sheri Eckles-Petrucci
QA Supervisor

INFORMATION ONLY

CHEVRON PHILLIPS FORMANCE PIPE

PLANT Ha own Product Description: 41P 06.00" SDR 11.00 0040'JT BLK I 61
PRODUCTION ORDER NUMBER 100216809
Start Date 6/23/2002

PRINT OUT DATE: 07/31/2002

End Date 6/26/2002

Minimum Wall (IN):	0.609	Minimum Toe-In (%):	0.257
Maximum Wall (IN):	0.664	Maximum Toe-In (%):	0.499
Minimum OD (IN):	6.600	Minimum Hoop Stress (PSI):	3107
Maximum OD (IN):	6.632	Maximum Hoop Stress (PSI):	3248
Minimum ID (IN):	5.286	Minimum Density:	0.952
Maximum ID (IN):	5.393	Maximum Density:	0.952
Minimum Eccentricity (%):	1.270	Minimum Carbon Black (%):	2.380
Maximum Eccentricity (%):	5.775	Maximum Carbon Black (%):	2.830
Minimum Out of Round (IN):	0.058	Minimum Melt Index:	0.110
Maximum Out of Round (IN):	0.069	Maximum Melt Index:	0.130
Minimum Ovality (%):	0.875	Resin	TR480X
Maximum Ovality (%):	1.043	Lot	8220660
Number of Samples:	94		

Ash is recorded under Carbon Black when Carbon Black is not present

000065

4942

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP

11711 Hopewell Rd
Hagerstown MD 21740

July 31, 2002

DriscoPlex™ 4100 PRODUCT QUALITY CERTIFICATION

CUSTOMER: Lee Supply Company
PO Box 35
Charleroi PA 15022

ATTENTION: Jerry Biagini

CUSTOMER ORDER NO: 4000
PERFORMANCE PIPE ORDER NO: 5574148
SHIPPING DATE: 07/30/02
QUANTITY: 2,880 ft
EXTRUSION DATE(S): 07/02

PRODUCT: 10'' dr 11 4100

This letter is being written at your request concerning DriscoPlex™ 4100 series pipe. DriscoPlex™ 4100 series pipe is manufactured from a PE Resin having a cell class of 345464 according to ASTM D3350. This is a high density, high molecular weight polyethylene resin which meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. DriscoPlex™ 4100 pipe, has a Plastic Pipe Institute recommended hydrostatic design basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from a stress regression analysis per ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of DriscoPlex™ 4100 are established in accordance with the guidelines set forth in ASTM F714. Along with ASTM standards, DriscoPlex™ 4100 series meets NSF standards 14 and/or 61 requirements for potable water piping systems, and AWWA C901 and/or C906 requirements for water distribution. The applicable standard is referenced in the print line, and repeated every two feet along the entire length of pipe. While we are making effort to convert to product printed "DRISCOPLEX™", you may receive product printed with either DRISCOPIPE or PLEXCO. Please be assured this product is certified as stated above.

Sincerely,

Sheri Eckles-Petrucci
QA Supervisor

CHEVRON PHILLIPS PERFORMANCE PIPE

PLANT Hagerstown Product Description: 41P 10.00" SDR 11.00 0040'JT BLK I 61
PRODUCTION ORDER NUMBER 100224697
Start Date 7/11/2002

Minimum Wall (IN):	0.985	Minimum Toe-In (%):	0.632
Maximum Wall (IN):	1.080	Maximum Toe-In (%):	0.845
Minimum OD (IN):	10.738	Minimum Hoop Stress (PSI):	3210
Maximum OD (IN):	10.775	Maximum Hoop Stress (PSI):	3349
Minimum ID (IN):	8.639	Minimum Density:	0.951
Maximum ID (IN):	8.748	Maximum Density:	0.953
Minimum Eccentricity (%):	2.682	Minimum Carbon Black (%):	2.300
Maximum Eccentricity (%):	5.534	Maximum Carbon Black (%):	2.620
Minimum Out of Round (IN):	0.295	Minimum Melt Index:	0.100
Maximum Out of Round (IN):	0.345	Maximum Melt Index:	0.120
Minimum Ovality (%):	2.744	Resin	TR480X
Maximum Ovality (%):	3.209	Lot	8220650

Number of Samples: 110

Ash is recorded under Carbon Black when Carbon Black is not present

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHASE IV

SUBMITTAL NO.: 20104-PHIV-02605-013

REV.: 0

DATE: 7/31/02

FROM: LEE'S SUPPLY COMPANY
BOX 35 CHARLEROI, PA. 15022

SIGNATURE: [signature] 7/31/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 8/6/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02605-013						X				DOCUMENTATION OF TRAINING + CERTIFICATION OF PERSONNEL QUALIFIED FOR HDPE PIPE JOINING		X		2605-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK (APPROVER)	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH	38				
DON PEISTER	45				

RECEIVED
AUG 08 2002

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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RECEIVED BY: [signature] DATE: 8/8/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955

ISCO INDUSTRIES

4942

ISCO Daily Fusion Log

Date: 7/11/02

Customer Name: FLOOR Fernald

Pick Ticket Number: 56297

	Travel Time		Field Work		Shop Time	
Morning	Start Time:	630	Start Time:	700	Start Time:	
	Stop Time:	700	Stop Time:		Stop Time:	
Lunch	Start Time:		Start Time:		Start Time:	
	Stop Time:		Stop Time:		Stop Time:	
Afternoon	Start Time:		Start Time:		Start Time:	
	Stop Time:		Stop Time:	500	Stop Time:	
	Total Time		Total Time		Total Time	

Odometer In:	
Odometer Out:	
Total Miles:	
Type of Truck	3/4

Description of work performed: Trained on singlewall pipe fusion, and symotrous DK pipe fusion, watched film and went over paperwork, also trained on prepping pipe and Hot Air welding centralizers.

Explanation of down time (list exact time), problems, or comments:

List of machines used and work accomplished with each machine: 4-12 MAC, pipe fusion
Hot Air gun - welding centralizers

Estimate Job Completion Date:

ISCO Technician Signature

Customer Signature

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ISCO INDUSTRIES

HEAT FUSION EVALUATION FORM

NAME: James Sullivan

COMPANY: WISE

LOCATION OF FUSION: Fernald

MAILING ADDRESS: FLUOR FERNALD
PO. BOX 538704
CINCINNATI, OH. 45253-8704 ATT: MIKE GODBER

PRODUCT FUSED TRAINING: 6" DR 11 HDPE PIPE MS. 69

EQUIPMENT USED: 4-12 MAC

PURPOSE: As part of our fusion evaluation, a level of understanding must be determined. The demonstrator will indicate the heat fusion principles demonstrated.

1. Was videotape used? Was literature provided? ✓
2. Was discussion of fusion procedures provided? ✓
3. Does participant understand weather limits? (NO welding in rain or snow without covered area for equipment.) ✓
4. Were cleaning procedures discussed? ✓
5. Did participant place pipe in machine, prep/face pipe and check alignment? ✓
6. Did participant learn about proper temperature and pressure to fuse pipe? ✓
7. Did participant observe the bead forming on the pipe? ✓
8. Was the heating pressure observed? Temperature range? ✓
9. Was the joining of the pipe discussed and the proper bead shape and size discussed? Cooling time required? ✓
10. Did participant make weld? ✓

Comments: _____

The below participant has participated in the above fusion practices. By signing this form the participant understands his/her fusion capabilities & limitations and understands that he/she should not attempt to exceed them without further understanding. The undersigned participant releases ISCO Industries, LLC from any and all liabilities.

Participant Signature	Print Name	Date
James P. Sullivan	James P. Sullivan	7-11-02

Trainer Signature	Print Name	Date
Jack Olson	Jack Olson	7/11/02

ISCO INDUSTRIES

4942

HEAT FUSION EVALUATION FORM

NAME: Jerome Geiger

COMPANY: WISE

LOCATION OF FUSION: FERNALD

MAILING ADDRESS: FLUOR FERNALD
PO Box 538704
CINCINNATI, OH 45253-8704 ATT MIKE BODBETC

PRODUCT FUSED TRAINING: 6" DR 11 POLY PIPE MS-64

EQUIPMENT USED: 4-12 Mac

PURPOSE: As part of our fusion evaluation, a level of understanding must be determined. The demonstrator will indicate the heat fusion principles demonstrated.

1. Was videotape used? Was literature provided? ✓
2. Was discussion of fusion procedures provided? ✓
3. Does participant understand weather limits? ✓
   (NO welding in rain or snow without covered area for equipment.)
4. Were cleaning procedures discussed? ✓
5. Did participant place pipe in machine, prep/face pipe and check alignment? ✓
6. Did participant learn about proper temperature and pressure to fuse pipe? ✓
7. Did participant observe the bead forming on the pipe? ✓
8. Was the heating pressure observed? Temperature range? ✓
9. Was the joining of the pipe discussed and the proper bead shape and size discussed? Cooling time required? ✓
10. Did participant make weld? ✓

Comments: _____

The below participant has participated in the above fusion practices. By signing this form the participant understands his/her fusion capabilities & limitations and understands that he/she should not attempt to exceed them without further understanding. The undersigned participant releases ISCO Industries, LLC from any and all liabilities.

Participant Signature	Print Name	Date
Jerome R. Geiger	Jerome R Geiger	7-11-02

Trainer Signature	Print Name	Date
Jack Olsen	Jack Olsen	7/11/02

James P. Sullivan

With

WISE

has attended a Heat Fusion Demonstration and has demonstrated proper Heat Fusion Principles and Fundamentals of High Density Polyethylene Pipe and Fittings. Fusion procedures covered include:

Butt Fusion
while using:

McElroy 412 Machine

Fusion Technician

Jack Olsen

ISCO INDUSTRIES

Director of Fusion Services

Mike Montgomery

ISCO Industries, LLC recommends renewal July 31, 2003

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Jerome R. Geiger

With

WISE

has attended a Heat Fusion Demonstration and has demonstrated proper Heat Fusion Principles and Fundamentals of High Density Polyethylene Pipe and Fittings. Fusion procedures covered include:

Butt Fusion
while using:

McElroy 412 Machine

Fusion Technician

Jack Olsen

ISCO INDUSTRIES

Director of Fusion Services

Mike Montgomery

ISCO Industries, LLC recommends renewal July 31, 2003

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIV-02G05-014	REV.: 0	DATE: 12/8/02	Page ___ of ___

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 12-10-02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02G05-014	0						X			RESULTS OF TESTS CONDUCTED ON PIPE		X		02605-1.04 A3	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VAN ARSDALE (APPROVED)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GOODBER	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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ORIGINAL

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RECEIVED BY: [signature] DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

QUALITY EVALUATION PLAN

QEP No. 62013928 Rev. 0

1. Source [ ] Receiving [ ] Const./Remediation X Maint./Operations [ ] Waste [ ] Other [ ]

2. Item/Title/Description:

HAS BEEN SCANNED

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104

4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

RECORD

5. Prepared By: MURIEL VIGUS	Date: 7-31-02	6. Reviewed By: MIKE GODBER (FOR)	Date:
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [X] 6 INCH LDS CARRIER [ ] 6 INCH LCS CARRIER [ ] 6 INCH LCS REDUNDANT CARRIER [X] A - Conforms to the Subcontract Requirements [ ] B - Minor Comment - Incorporate and Resubmit [ ] C - Revise and Resubmit Sig: [signature] Date: 12/13/02 FROM: VH-4 LDS Line TO: Penetration Box (LDS Cell) TEST GAUGE ID#: RE-6 CALIBRATION DATE: 10-24-01 / 10-24-02			CELL#: 4 [ ] CAP [ ] LINER CALIBRATION DUE DATE MG 12/9/02
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MGV 7-31-02		Verified
2.	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	X MGV 7-31-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date
Muriel Vigus	[signature]	7-31-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	[signature]	8/06/02

INFORMATION ONLY

FS-F-4400
REV 2: 01/02/01, QP-07.08

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QUALITY E[illegible]UATION PLAN
(Continuation Sheet)

QEP No. 2013928 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at 10 psi over the test pressure of 60 psi. The expansion phase pressure shall be 70 psi and shall be maintained for a period of 4 hours.	X MKW 7-31-02		Verified.
4.	Verify following the expansion phase, the pressure is reduced by 10 psi to the actual test pressure of 60 psi.	X MKW 7-31-02		Pressure reduced to 60 psi
5.	Verify the test pressure remains steady (within 5 percent of test pressure) for a period of one hour and verify there is no visible leakage.	X MKW 7-31-02		Pipe maintained this pressure of 60 psi.

Filling 6" LDS Line started @ 0833 finished @ 0904
0915 - used a pump to increase pressure, to get it up to required.
0931 - Press. @ 78 psi
0946 - 72 psi
1015 - 66 psi
1030 - 62 psi
1145 - repressurized - 70 psi
1315 MKW - repressurized - 72 psi - restart
1330 - 71 psi
1346 ~~1340~~ MKW - 70 psi
1400 - 70 psi
requested permission to start the test - dropped pressure
1410 - 60 psi
1425 - 60 psi
1440 - 60 psi
1455 - 60 psi
1510 - 60 psi

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QUALITY EVALUATION PLAN

QEP No. 2013927 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

HAS BEEN SCANNED

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104

4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

RECORD

5. Prepared By: MURIEL VIGUS	Date: 7-30-02	6. Reviewed By: MIKE GODBER	Date: 8-15-2
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [X] 10 INCH LDS CONTAINMENT [ ] 10 INCH LCS CONTAINMENT [ ] 10 INCH LCS REDUNDANT CONTAINMENT FROM: Inside VH-4 (Cell 4) DS Line TO: Penetration Box (LDS) Cell 4 TEST GAUGE ID#: RE-6 CALIBRATION DATE: 10-24-02			CELL#: 4 [ ] CAP [ ] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MG 8-1-02		CALIBRATION DUE DATE 12/09/02 MG Verified
2.	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	X MG 8-1-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus	Muriel Vigus	8-1-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	Michael Godber	8/6/02

FS-F-4400
REV 2: 01/02/01, QP-07.06

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. № 2013927 Rev. Ø

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at 10 psi over the test pressure of 15 psi. The expansion phase pressure shall be 25 psi and shall be maintained for a period of 4 hours.	X NKV 8-1-02		Met. Pipe Stabilized @ 25 psi
4.	Verify following the expansion phase, the pressure is reduced by 10 psi to the actual test pressure of ~~25~~ psi. 15 NKV. 8-1-02	X NKV 8-1-02		Reduced the pressure to 15 psi
5.	Verify the test pressure remains steady (within 5 percent of test pressure) for a period of one hour and verify there is no visible leakage.	X NKV 8-1-02		Tested @ 15 psi and pipe Maintained that pressure NKV.
	Attached: Test Summary Filled 10" containment @ 11:25 11:35 - Started Stabilization @ 25 psi 11:50 - no change - 25 psi 12:05 - no change - 25 psi 12:20 - no change - 25 psi 12:35 - no change - 25 psi 12:50 - 25 psi 13:05 - will drop press to 15 psi. 13:20 - 15 psi 13:35 - 15 psi 13:50 - 15 psi 14:05 - 15 psi - Pass			Test passed @ 15 psi.

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QUALITY EVALUATION PLAN

QEP No. 2015679 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 9-18-02	6. Reviewed By: MIKE GODBER	Date: 9/18/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
2.	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [ ] 6 INCH LDS CARRIER [X] 6 INCH LCS CARRIER [ ] 6 INCH LCS REDUNDANT CARRIER FROM: V-H 4 TO: Penetration Box (LCS) TEST GAUGE ID#: RE-8 CALIBRATION DATE: 12-12-02 DUE MG 12/09/02 Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MKV 9-18-02		CELL#: 4 [ ] CAP [ ] LINER Verified
	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	X MKV 9-18-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus	Muriel Vigus	9-18-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	Michael W. Godber	9/18/02

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015679 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **60 psi**. The expansion phase pressure shall be **70 psi** and shall be maintained for a period of 4 hours.	X MKU 9-18-07		Sat.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **60 psi**.	X MKU 9-18-07		Sat.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage. 10:40 - 70 psi Stabilization Period. 10:50 - 70 psi 1115 - 70 psi 1130 - 70 psi Pass 1150 - 70 psi 1151 - 60 psi Test 1251 - 60 psi Pass	X MKU 9-18-07		Sat.

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QUALITY EVALUATION PLAN

QEP No. 2015680 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 9-18-02	6. Reviewed By: MIKE GODBER	Date: 9/18/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [ ] 10 INCH LDS CONTAINMENT [X] 10 INCH LCS CONTAINMENT [ ] 10 INCH LCS REDUNDANT CONTAINMENT FROM: V-H 4 TO: Penetration Box (LCS) TEST GAUGE ID#: RE-8 CALIBRATION DATE: 12-12-02 DUE MG 12/09/02			CELL#: 4 [ ] CAP [ ] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MGV 9-18-02		Verified
2.	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	X MGV 9-18-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus	Muriel Vigus	9-18-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	Michael W Godber	9/18/02

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015680 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **15 psi**. The expansion phase pressure shall be **25 psi** and shall be maintained for a period of 4 hours.	X MKW 9-18-07		Sat.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **25 psi.**	X MKW 9-18-07		Sat.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage. Attached: Test Summary Stabilization 1330 - 25 psi Pass 1345 - 25 psi 1400 - 25 psi 1415 - 25 psi 1430 - 25 psi 1431 - 15 psi Down to 15 psi 1432 - 15 psi start test 1447 - 15 psi - 1502 - 15 psi 1532 - 15 psi Pass	X MKW 9-18-07		Sat.

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QUALITY EVALUATION PLAN

QEP No. 2015677 Rev. 8

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 9-19-02	6. Reviewed By: MIKE GODBER	Date: 9/19/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [ ] 6 INCH LDS CARRIER [ ] 6 INCH LCS CARRIER [X] 6 INCH LCS REDUNDANT CARRIER FROM: V-H 4 TO: RLCS Penetration Box TEST GAUGE ID#: RE-8 CALIBRATION DATE: 12-12-02 DUE MS 12/09/02			CELL#: 4 [ ] CAP [ ] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MKG 9-19-02		Verified
2.	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	X MKG 9-19-02		Met

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus		9-19-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER		9/19/02

FS-F-4400
REV 2: 01/02/01, QP-07.06

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015677 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **60 psi**. The expansion phase pressure shall be **70 psi** and shall be maintained for a period of 4 hours.	X MW 9-19-07		Sat.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **60 psi**.	X MW 9-19-07		Sat.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage.	X MW 9-19-07		Sat.
	Stabilization Period 1100 70 psi 1110 70 psi 1120 70 psi Stable/Pass 1130 70 psi 1145 70 psi 1200 70 psi 1205 60 psi Test 1220 60 psi 1235 60 psi 1250 60 psi 1305 60 psi Pass			

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QUALITY EVALUATION PLAN

QEP No. 2015678 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104

4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

5. Prepared By: MURIEL VIGUS — Date: 9-19-02

6. Reviewed By: MIKE GODBER — Date: 9/19/02

7. NDE Level III: (When Required) N/A — Date:

8. Approved By: (When Required) N/A — Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
1.	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [X] CELL NUMBER 4 [ ] CELL NUMBER 5 [ ] 10 INCH LDS CONTAINMENT [ ] 10 INCH LCS CONTAINMENT [X] 10 INCH LCS REDUNDANT CONTAINMENT FROM: V-H 4 TO: RLCS Penetration Box TEST GAUGE ID#: RE-.8 CALIBRATION DATE: 12-12-02 DUE MG 12/09/02			CELL#: 4 [ ] CAP [ ] LINER
2.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MKG 9-19-02		Verified
	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	X MKG 9-19-02		Met.

580000

13. QA Team Member (Printed Name) Muriel Vigus (Signature) Muriel Vigus — Date: 9-19-02

14. QA Team Coach (Completed QEP): MIKE GODBER (Signature) Michael W Godber — Date: 9/19/02

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FS-F-4400
REV 2: 01/02/01, QP-07.06

QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015678 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **15 psi**. The expansion phase pressure shall be **25 psi** and shall be maintained for a period of 4 hours.	X MKV 9-19-02		Sat.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **25 psi**.	X MKV 9-19-02		Sat.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage.	X MKV 9-19-02		Sat.
	Attached: Test Summary Stabilization Period ~~1353 - 25 psi MKV~~ 9-19-02 Tightened valve 1410 - 25 psi 1416 - 25 psi Stabilized 1431 - 25 psi Pass 1441 - 25 psi 1451 - 25 psi 1511 - 25 psi 1512 - 15 psi Test 1530 - 15 psi 1545 - 15 psi 1600 - 15 psi 1612 - 15 psi Pass			

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QUALITY EVALUATION PLAN

QEP No. № 2014197 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 8-13-02	6. Reviewed By: MIKE GODBER	Date: 9/04/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 ⋈ CELL NUMBER 5 ⋈ 6 INCH LDS CARRIER [ ] 6 INCH LCS CARRIER [ ] 6 INCH LCS REDUNDANT CARRIER FROM: VH-5 LDS Through the West Bermito LDS Penetration Box TEST GAUGE ID#: RE-66 CALIBRATION DATE: 10-24-01/10-24-02			CELL#: 5 [ ] CAP [ ] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MVG 8-13-02		Verified Calibration
2.	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	X MVG 8-13-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus		8-13-02
14. QA Team Coach (Completed QEP): MIKE GODBER	RECORD PAGE 1 OF 2	Date: 9/04/02

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REV 2: 01/02/01, QP-07.06

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. № 2014197 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **60 psi**. The expansion phase pressure shall be **70 psi** and shall be maintained for a period of 4 hours.	X MKV 8-13-02		Stabilization Started @ 70 psi We used the Alternate method.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **60 psi**.	X MKV 8-13-02		Verified
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage. 6" Carrier LDS 1400 - 70 psi 1415 - 66 psi 1430 - 66 psi 1431 - 65 psi 1432 - repressurizing to 70 psi 1433 - 71 psi 1453 - 68 psi 1510 - 68 psi 1523 - 68 psi stabilization passes 1533 - 68 psi 1553 - 68 psi - dropping pressure for the test 1554 - 62 psi 1624 - 62 psi 1654 - 62 psi - Pass	X MKV 8-13-02		Sat.

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FS-F-4400
REV 2: 01/02/01, QP-07.06

QUALITY EVALUATION PLAN

QEP No. 2014198 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104	4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

5. Prepared By: MURIEL VIGUS	Date: 8-14-02	6. Reviewed By: MIKE GODBER	Date: 9/04/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 [X] CELL NUMBER 5 [X] 10 INCH LDS CONTAINMENT [ ] 10 INCH LCS CONTAINMENT [ ] 10 INCH LCS REDUNDANT CONTAINMENT FROM: VH-5 LDS, Through the West Box to Berm to LDS Penetration TEST GAUGE ID#: RE-6 CALIBRATION DATE: 10-24-01/10-24-02			CELL#: 5 [ ] CAP [ ] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MKV 8-14-02		Verified
2.	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	X MKV 8-14-02		Carrier has water in it

13. QA Team Member (Printed Name) Muriel Vigus	(Signature)	Date: 8-14-02
14. QA Team Coach (Completed QEP): MIKE GODBER	RECORD PAGE 1 OF 2	Date: 9/04/02

FS-F-4400
REV 2: 01/02/01, QP-07.08

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2014198 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **15 psi**. The expansion phase pressure shall be **25 psi** and shall be maintained for a period of 4 hours.	X NKW 8-14-02		Line was filled to 25 psi for the Stabilization Process. Alternate Method
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of ~~25 psi~~ NKW. 15 psi	X NKW 8-14-02		Met.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage.	X NKW 8-14-02		This is satisfactory

Attached: Test Summary

1030 - 25 psi
1045 - 25 psi
1115 - 25 psi
1130 - 25 psi

Stabilization Passed.

Dropped 10 psi for final Test

1132 - 15 psi
1147 - 15 psi
1202 - 15 psi
1217 - 15 psi
1232 - 15 psi

Test Passed

RECORD
PAGE 2 OF 2

FS-F-4400
REV 2: 01/02/01, QP-07.08

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QUALITY EVALUATION PLAN

QEP No. 2015675 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 9-24-02	6. Reviewed By: MIKE GODBER	Date: 9/24/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
1.	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 [X] CELL NUMBER 5 [ ] 6 INCH LDS CARRIER [X] 6 INCH LCS CARRIER [ ] 6 INCH LCS REDUNDANT CARRIER FROM: V-H 5 TO: LCS Penetration Box TEST GAUGE ID#: RE-8 CALIBRATION DATE: 12-12-02 DUE MG 12/09/02 Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X MKV 9-24-02		CELL#: 5 [ ] CAP [ ] LINER Verified
2.	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	X MKV 9-24-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus	Muriel Vigus	9-24-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	Michael W. Godber	9/24/02

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015695 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **60 psi**. The expansion phase pressure shall be **70 psi** and shall be maintained for a period of 4 hours.	X MCC 9-24-02		Sat.
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **60 psi**.	X MCC 9-24-02		Sat.
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage. Stabilization 0909 - 70 psi 0920 - 70 psi 0940 - 70 psi 0955 - 70 psi 1010 - 70 psi Pass 1019 - 60 psi - Test 1030 - 60 psi 1045 - 60 psi 1100 - 60 psi 1120 - 60 psi Pass	X MCC 9-24-02		Sat.

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QUALITY EVALUATION PLAN

QEP No. 2015676 Rev. 8

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104		4. Specification/Drawing/PO/Req.: SPEC SECTION 2605	
5. Prepared By: MURIEL VIGUS	Date: 9-24-02	6. Reviewed By: MIKE GODBER	Date: 9/24/02
7. NDE Level III: (When Required) N/A	Date:	8. Approved By: (When Required) N/A	Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
2.	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 [X] CELL NUMBER 5 [ ] 10 INCH LDS CONTAINMENT [X] 10 INCH LCS CONTAINMENT [ ] 10 INCH LCS REDUNDANT CONTAINMENT FROM: VH-5 TO: LCS Penetration Box TEST GAUGE ID#: RE-8 CALIBRATION DATE: 12-12-02 DUE MG 12/09/02			CELL#: 5 [ ] CAP [ ] LINER
	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	X. MKG 9-24-02		Verified
	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	X. MKG 9-24-02		Met.

13. QA Team Member (Printed Name)	(Signature)	Date:
Muriel Vigus	Muriel Vigus	9-24-02
14. QA Team Coach (Completed QEP):		**Date:**
MIKE GODBER	Michael K. Godber	9/24/02

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2015676 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **15 psi**. The expansion phase pressure shall be **25 psi** and shall be maintained for a period of 4 hours.	X MKV 9-24-02		Sat
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **25 psi.**	X MKV 9-24-02		Sat
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage.	X MKV 9-24-02		Sat.
	Attached: Test Summary			
	Stabilization 1315 - 25 psi 1320 - 25 psi 1340 - 25 psi 1350 - 25 psi 1410 - 25 psi Pass 1420 - 25 psi 1420 - 15 psi Lowered started test 1435 - 15 psi 1450 - 15 psi 1505 - 15 psi 1520 - 15 psi Pass			

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QUALITY EVALUATION PLAN

QEP No. № 2014755 Rev. 0

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 6 INCH CARRIER PIPE (ALTERNATE METHOD) 60 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104

4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

5. Prepared By: MURIEL VIGUS — Date: 9-17-02

6. Reviewed By: MIKE GODBER — Date: 9/05/02

7. NDE Level III: (When Required) N/A — Date:

8. Approved By: (When Required) N/A — Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 [✓] CELL NUMBER 5 [ ] 6 INCH LDS CARRIER [ ] 6 INCH LCS CARRIER [✓] 6 INCH LCS REDUNDANT CARRIER FROM: valve house TO: inlet end of primary penet. box TEST GAUGE ID#: 00-0A353-PI CALIBRATION DATE: 12/12/01 ~~DUE 12/10/02~~			CELL#: 5 [ ] CAP [✓] LINER
1.	Verify the test gauge has been calibrated within ~~(1) year~~ of date of testing. Calibration shall be traceable to national or industry standards.	NIG 12/09/02 RJS 9-25-02		
2.	Verify the containment pipe is at atmospheric pressure during the testing of the carrier pipe.	✓RJS 9-25-02		

13. QA Team Member (Printed Name) RICHARD J. SCHEPER (Signature) — Date: 9-25-02

14. QA Team Coach (Completed QEP): MIKE GODBER — Date: 9/05/02

FS-F-4400
REV 2: 01/02/01, QP-07.06

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. № 2014755 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at **10 psi** over the test pressure of **60 psi**. The expansion phase pressure shall be **70 psi** and shall be maintained for a period of 4 hours (max) RJS 9-25-02	✓RJS 9-25-02		3. Stabilized for 1 hr Cloudy 60°-62°F
4.	Verify following the expansion phase, the pressure is reduced by **10 psi** to the actual test pressure of **60 psi.**	✓RJS 9-25-02		
5.	Verify the test pressure remains steady (within **5 percent** of test pressure) for a period of one hour and verify there is no visible leakage.	✓RJS 9-25-02		

Expansion/Stabilization

70 psi @ 0900
67.0 @ 0910 - repress to 70
70.0 @ 0915
68.0 @ 0930
67.0 @ 0945
66.5 @ 1000
67.0 @ 1010

Test

62 psi @ 1010
62.0 @ 1025
61.0 @ 1040
60.5 @ 1055
60.0 @ 1110

4942

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QUALITY EVALUATION PLAN

QEP No. #2014761 Rev. 8

1. Source ☐ Receiving ☐ Const./Remediation X Maint./Operations ☐ Waste ☐ Other ☐

2. Item/Title/Description:

VERIFICATION OF HDPE PIPE AND FITTINGS HYDROSTATIC TESTING 10 INCH CONTAINMENT PIPE (ALTERNATE METHOD) 15 PSI TEST

3. Project/Task: OSDF PHASE IV, 20104

4. Specification/Drawing/PO/Req.: SPEC SECTION 2605

5. Prepared By: MURIEL VIGUS — Date: 9-17-02

6. Reviewed By: MIKE GODBER — Date:

7. NDE Level III: (When Required) N/A — Date:

8. Approved By: (When Required) N/A — Date:

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	IDENTIFICATION OF PIPE THAT IS BEING TESTED: [ ] CELL NUMBER 4 [✓] CELL NUMBER 5 [ ] 10 INCH LDS CONTAINMENT [ ] 10 INCH LCS CONTAINMENT [✓] 10 INCH LCS REDUNDANT CONTAINMENT FROM: Valve house TO: primary penet. box inlet TEST GAUGE ID#: 00-OA353-PI CALIBRATION DATE: 12/12/01			CELL#: 5 [ ] CAP [✓] LINER
1.	Verify the test gauge has been calibrated within (1) year of date of testing. Calibration shall be traceable to national or industry standards.	✓ RJS 9-25-02		
2.	Verify the carrier pipe is at atmospheric pressure during the testing of the containment pipe.	✓ RJS 9-25-02		

13. QA Team Member (Printed Name) RICHARD J. SCHEPER (Signature) R J Scheper — Date: 9-25-02

14. QA Team Coach (Completed QEP): MIKE GODBER (Signature) Michael H Godber — Date: 9/25/02

FS-F-4400
REV 2: 01/02/01, QP-07.06

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. M 2 0 1 4 7 6 1 Rev. 0

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Verify the initial expansion phase test is performed at 10 psi over the test pressure of 15 psi. The expansion phase pressure shall be 25 psi and shall be maintained for a period of 4 hours. (max) RJS 9/25/02	✓ RJS 9-25-02		3. Stabilized for 1 hr
4.	Verify following the expansion phase, the pressure is reduced by 10 psi to the actual test pressure of ~~25~~ 15 psi. RJS 9-25-02	✓ RJS 9-25-02		
5.	Verify the test pressure remains steady (within 5 percent of test pressure) for a period of one hour and verify there is no visible leakage. RJS 9-25-02 ~~Attached~~: Test Summary (see below)	✓ RJS 9-25-02		5. Unit full and pressure to 25 psi @ 1215; repressurize after drop to 22 psi @ 1245.

Expansion

25 psi @ 1245
25.0 @ 1300
24.5 @ 1315
24.0 @ 1330
24.0 @ 1345

Test

15 psi @ 1345
15 psi @ 1400
15 psi @ 1415
15 psi @ 1430
15 psi @ 1445

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4942

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHASE IV	SUBMITTAL NO.: 20104-PHIII-QCQS-15	REV.: 0	DATE: 12/8/02	Page ___ of ___

FROM: LEE'S SUPPLY COMPANY
BOX 35
CHARLEROI, PA. 15022

SIGNATURE: Michael W. Geller

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Perry Drages DATE: 12-10-02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIII-QCQS-015	0							X		CERTIFICATION OF COMPLIANCE FOR TEST GAUGES		X		QCQS-1.04 G	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	MS52-7				
CHUCK VAN ARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODISER (APPROVER)	64				
KWASI BADU-TWENEBOAH	38				
DON PFISTER	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

660099

RECEIVED BY: Michael W. Geller DATE: 12/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

FS-F-4955
REV. 3: 05/14/1999, CT-2.4.2

RECORD

☐ TRANSFER STANDARDS CALIBRATION- RECORD ☐ INSTRUMENT PM CHECK- RECORD

☒ CALIBRATED EQUIPMENT- CALIBRATION RECORD

4942

Equipment #	Manufacturer	Model #	Serial No.:
00-0A352-PI	ASHCROFT	N/A	RE-6

Location		W/O #
M&T.E. SHOP	Portable [x] Stationary [ ]	PM 87668

Instrument Range	Tolerance	Procedure #
200 PSI	1 DIVISION	IPG001

Calibration Equipment I.D.	Calibration Equipment Description	Cal Due Date
12-AMO-TST	DEADWEIGHT TESTER	7-30-02
Calibration Equipment	Calibration Equipment Description	Cal Due Date
N/A	N/A	N/A

Ambient Conditions	Correction Used (if any)
72°F 50% R.H.	N/A

INPUT	LOW LIMIT	HIGH LIMIT	AS FOUND	AS LEFT
0 PSI	0 PSI	0 PSI	0 PSI	0 PSI
50 PSI	48 PSI	52 PSI	50 PSI	50 PSI
100 PSI	98 PSI	102 PSI	102 PSI	102 PSI
150 PSI	148 PSI	152 PSI	152 PSI	152 PSI
190 PSI	188 PSI	192 PSI	190 PSI	190 PSI
		N		
		A		

GENERAL COMMENTS:

NEXT
P.M.
IS
DUE: 10-24-02

INFORMATION ONLY

Work performed by Ron Fischer

Date: 10-24-01

Copy #	Distribution
1	Return with Work Package

INFORMATION COPY ONLY

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: Michael [illegible] Date: 12/13/02

FS-F-4339
REV. 2: 10/15/99

000100

RECORD

[redacted] CORD

☐ TRANSFER STANDARDS CALIBRATION- RECORD ☐ INSTRUMENT PM CHECK- RECORD

☒ CALIBRATED EQUIPMENT- CALIBRATION RECORD

4942

Equipment #	Manufacturer	Model #	Serial No.:
00-0A353-PI	ACRAGAGE	N/A	RE-8
Location: M&TE SHOP		Portable [X] Stationary [ ]	W/O # PM88127
Instrument Range: 0-100 PSI	Tolerance: 1 DIVISION	Procedure # IPG001	
Calibration Equipment ID: 00-A488-TST	Calibration Equipment Description: AMETEK DEADWEIGHT TESTER		Cal Due Date: 11/28/02
Calibration Equipment: N/A	Calibration Equipment Description: N/A		Cal Due Date: N/A
Ambient Conditions: 72°F		Correction Used (if any): N/A	

INPUT	LOW LIMIT	HIGH LIMIT	AS FOUND	AS LEFT
0 PSI	0 PSI	0 PSI	0 PSI	0 PSI
25 PSI	24 PSI	26 PSI	25 " "	25 " "
50 PSI	49PSI	51 PSI	50 " "	50 " "
75 PSI	74 PSI	76 PSI	75 " "	75 " "
95 PSI	94 PSI	96 PSI	95 " "	95 " "
		N		
		A		

GENERAL COMMENTS:

NEXT P.M. IS DUE: 12-12-02

Work performed by	Date
Ron Fisher	12-12-01

Copy #	Distribution
1	Return with Work Package

000101

Liner Penetration Boxes

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-001	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Hunt

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RECEIVED BY: Teresa Schwab DATE: 4/24/02

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7	PHIV-13005-001	0						X			Name and Qualifications of Fabricator of liner penetration boxes		X		13005-1.04	X	

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FS-F-4955

ORIGINAL

Plastic Fusion Fabricators, Inc.
Corporate Profile

Introduction

Plastic Fusion Fabricators, Inc. (PFF) is a corporation formed in 1981 by Mr. Terry Ragsdale. It is a privately held corporation and is headquartered in Huntsville, Alabama. Regional sales offices are located in Atlanta, Georgia, Houston, Texas and Mobile, Alabama.

PFF has a long history in the geomembrane industry. PFF pioneered the "Total" approach to containment with High Density Polyethylene (HDPE) lining systems in combination with custom fabricated pipe systems and structures. All systems are designed and installed for the prevention of groundwater contamination.

Today, PFF is the largest independent installer for GSE Lining Technology, Inc., the world's largest manufacturer of geomembranes.

PFF fabricates and installs a variety of containment systems and associated materials primarily for the containment of wastes, liquids (potable, sanitary or hazardous) and industrial products in ponds, pits and lagoons. The materials used meet the highest design criteria in the industry.

Products & Services

PFF provides a wide variety of products which are described here. PFF offers design assistance, consulting, fabrication and installation services for all systems.

Products

Geomembrane Liners
Used for ponds, landfills, tanks, ditches and floating covers. These liners are available in seamless widths from approximately 16 to 34.5 feet and thicknesses ranging from 20 to 240 mils. Materials include High Density Polyethylene (HDPE) and polypropylene (PP) and liners are available with a smooth or textured surface.

Other Geosynthetics
PFF installs geosynthetic clay liners (GCL), geonets and geocomposites in combination with the geomembranes to provide extra leak protection, drainage systems, leak detection systems, leachate collection systems and liner protection (cushion).

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High Density Polyethylene Fabricated Structures
Applications include manholes, junction boxes, tanks, sumps, u-drains, lift stations and trenches.

Polypropylene Fabricated Structures
For applications that require materials with advanced chemical resistance features, PFF offers polypropylene structures for a variety of custom solutions. Applications include manholes, junction boxes, tanks, sumps, u-drains, lift stations and trenches.

High Density Polyethylene Piping Systems
PFF fabricates and installs both single and dual wall containment piping systems for chemical & process sewers, methane gas collection and leachate collection. Materials used include HDPE and Polypropylene.

Concrete Protective Liners
A unique plastic lining system for concrete structures. A patented anchoring system insures secure containment and corrosion protection. Material is used to line catch basins, tanks, trenches, manholes, clarifiers and other structures which require protection.

Services

In addition to the fabrication and installation services offered with our products, PFF also offers the following to complete the containment solution:

Design Assistance & Consulting
Services include computer aided design, technical assistance, research & development, cost feasibility and project consulting.

Field Services & Quality Control
PFF offers destructive and non-destructive testing, application assistance, inspections, on-site testing, fusion technicians and field/shop repair.

Equipment Rental
Equipment available for rent includes electrofusion equipment, pipe fusion machines, extrusion welders and hot air welders. PFF also offers some equipment for sale including pipe fusion machines and electrofusion equipment.

Fabrication Capabilities

PFF operates fabrication facilities at the corporate headquarters in Huntsville, Alabama. Fabrication work space totals 35,000 square feet.

Installation Capabilities

PFF offers comprehensive installation services for all of the products described. Each PFF installation team is comprised of experienced and well trained supervisors and welding technicians.

4942

GSE

GSE Lining Technology, Inc.

May 10, 2000

To Whom it May Concern:

This authorizes that Plastic-Fusion Fabricators and their employees are authorized to install GSE Lining Technology, Inc. products.

Sincerely,

David Leggett

David Leggett
Manager - Dealer Accounts

/tms

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-002	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanine M Yant

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

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~~3 to 4 weeks after receipt of approved submittals & drawings.~~ CV

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ORIGINAL

FS-F-4955
Rev. 3: 05/14/1999 CT-2.4.2

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PLASTIC FUSION FABRICATORS, INC.
THERMOPLASTIC CONSULTING FABRICATION INSTALLATION
3455 STANWOOD BLVD.
HUNTSVILLE, AL 35811
256/852/0378 BUS
256/852/0388 FAX

March 30, 2001

Fluor Fernald, Inc.
7400 Willey Road
Hamilton, OH 45253-8704

Attention: Mr. Chuck Van Arsdale

Ref: HDPE Liner Penetration Boxes

Plastic Fusion can ship 3-4 weeks after receipt of approved submittals and shop drawings. This is for submittal # 20104-PHIV-13005-002 for the fabrication date for the liner penetration boxes.

Respectfully,

Jeanice

Jeanice Yant
Sales / Estimating
800-356-1480 ex: 237
E-mail: jmyant@pffinc.com

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for Bill Zebick

VISIT OUR WEB SITE: www.pffinc.com

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHIV

SUBMITTAL NO. 20104-PHIV--13005-003

REV.: 0

4/22/2002

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Yant

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7	PHIV-13005-003	0						X			Qualification procedure for Fabricator's welder(s)		X		13005-1.04	X	

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ORIGINAL

DVS – DEUTSCHER VERBAND FÜR SCHWEISSEN UND VERWANDTE VERFAHREN E.V.	Welding of Thermoplastics Extrusion Welding Panels and Pipes	Direction DVS 2207-4 (July 1993)	DVS

Contents:

1 Scope
2 Materials
3 General process description
4 Welding processes
5 Applications
6 Welding equipment
7 Hot-air nozzles
8 Preheating of the base material
9 Welding tools
9.1 Welding shoes
9.2 Auxiliary tools
10 Initial operation of the welding equipment
11 Weld preparation
12 Welding filler
13 Forms of weld and weld structure
14 Execution of welds
15 After-machining of the welds
16 Testing of welded joints
17 Welding factor
18 Requirements for welders
19 Standards, directions and regulations
Appendix: Welding record

1 Scope

This Direction covers the extrusion welding of pipes and panels. Based on Direction DVS 2209 Part 1, it supplements it by providing details on practical application in tank, apparatus and pipeline construction. The welding of large-area waterproofing courses (for example for land-fills) is not covered by this Direction and is dealt with in DVS 2225 Part 1. The welding parameters for the various materials are specified in a supplement to this Direction.

2 Materials

For high-quality welds which meet the requirements of DVS 2203 Part 1 it is essential to use a welding filler of the same type (the same type of molding composition) or at least of a similar type. Important characteristics for weldability are density and melt flow index. Accordingly, these aspects must be included in the designation of semifinished products and welding filler. If works certificates are required, the characteristics and properties named in the relevant standards, directions, approvals etc. shall be specified along with the type designation.

3 General process description

Extrusion welding is a manual or semi-mechanized welding process for the joining of predominantly thick-walled parts. It is characterized by the following features:

1. Welding is performed with welding filler (granules or wire) which is usually extruded as a cord from a plasticizing aggregate directly into the welding groove.
2. The filler is homogeneous and completely plasticized.
3. The faces to be joined are heated to welding temperature by hot gas or heat radiation.
4. The required welding pressure is applied via the plasticized filler.

In extrusion welding, weld quality depends upon proper weld preparation, cleanliness during handling, heating of filler and faces to be joined which is appropriate for the materials, proper design of the welding shoe or auxiliary tool as well as extensive training and practice on the part of the welder executing the weld.

4 Welding processes

In practical extrusion welding - within the scope of this Direction - four process variants are used. They are described in Direction DVS 2209 Part 1.

- Process variant I
  Discontinuous process with manual transfer of the welding filler into the preheated welding groove.
- Process variant II
  Continuous process with manual equipment (screw).
- Process variant III
  Continuous process with filler transfer hose between extruder and welding head.
- Process variant V
  Continuous process with manual equipment (ram).

5 Applications

Applications for extrusion welding include the following:

- Tank and apparatus construction, in which predominantly thick walled parts are to be joined to one another, for example when welding the tank wall to the tank bottom or top, welding together flat sections of plate to form large sections as well as for the welding on and welding in of pipe sockets, loose flanges, bracings, reinforcements and the like.
- Pipeline and channel construction in cases where pipe dimensions or site conditions prevent heated-tool butt welding, for example for the joining of pipeline conduits, producing of pipe bends from segments, welding in of soil pipes, producing of sewer shafts and function chambers as well as the welding of facings, wall shrouds and the like, or for the joining of enclosing tubes and couplings in the case of insulated power pipelines or the like.

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6 Welding equipment

The welding equipment comprises a plasticizing aggregate (extruder) for the welding filler (granules or wire), a preheating means (hot-air appliance) for heating the faces to be joined and a means for applying the welding pressure (welding shoe or auxiliary tool). For the various process variants, they can be fitted with welding shoes appropriately designed for the different forms

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DVS, Technical Committee, Working Group "Plastics, Welding and Bonding"

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of weld. In the case of process variant I, the outlet opening is varied for different weld geometries.

For preheating the welding groove, hot-air appliances are used, which generally form a unit with the welding extruder or the welding tool.

The rate of throughput depends on the material and the type and size of extruder.

7 Hot-air nozzles

Nozzles must be of an appropriate design for the form and width of the weld. In addition, they must be designed in such a way that a substantially even temperature over the entire cross-section is achieved at the nozzle outlet (if need be swirling aids shall be fitted). Altogether, the shape of the nozzle together with the direction of outflow must achieve a sufficiently uniform plasticizing of the faces to be joined from the root to over the edges of the weld.

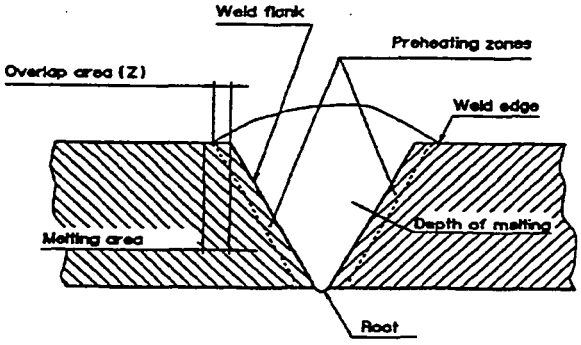


Figure 1. Areas and depths of melting at the single-V butt weld (principle).

8 Preheating of the base material

Preheating of the base material is performed with hot air (free from water, dust and oil), in exceptional cases also by means of heat radiation. This preheating has the effect of bringing the areas of the base material to be welded into a thermoplastic state down to a depth of at least 0.5 mm. In order to achieve satisfactory welding right into the edges of the welded seam, it is necessary for preheating to be carried out over a width greater than the width of the seam. The areas and depths of melting thereby achieved are shown in Figure 1 in the example of a single-V butt weld.

The depth of melting can be checked by inserting a thin blunt implement immediately in front of the welding shoe. In the case of process variant I, this must take place immediately before the filler cord is laid in place. In comparison with radiation heating, preheating with air produces a relatively "gentle" heating of the base material, with a desirable slow drop in temperature towards the marginal zones.

The amount of hot air required depends on the shape and position of the nozzle, the geometry of the welded seam and the welding speed.

9 Welding tools

Various tools are required for the different process variants for applying welding pressure.

9.1 Welding shoes

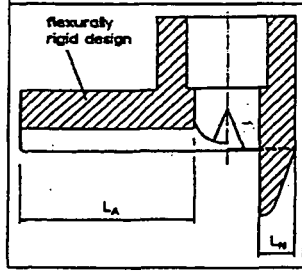
The plasticized filler is introduced into the welding groove by means of the welding shoe. The welding shoes shall be of a design appropriate for the respective weld geometry. They must consist of suitable materials, primarily PTFE.

With the welding shoe, the welding pressure necessary for welding is applied to the faces to be joined via the welding filler. At the same time, it shapes and smooths the surface of the seam.

The contact zone of the welding shoes must conform to the minimum lengths given in Table 1. These are to ensure that the welding pressure acts for a minimum time, in order that the joint can be produced in the entire area to be joined (in particular the root and edges of the seam). The "nose" on the front part of the welding shoe is essential to ensure that the material pressure can be produced in the welding filler. The material pressure against the "nose" causes the welding head to move in the welding direction. This "nose" must be adapted to the form of weld in such a way that there is no contact during welding with the already melted faces to be joined.

The welding shoe has two lateral bearing faces, which prevent the melt escaping to the sides. In the area of overlap the welding shoe likewise must not come into contact with the melted edge areas. For this purpose, this area of the welding shoe is provided with an undercut of a height of about 0.5 mm, which widens towards the front in the area of the nose. The front edges of the sliding surfaces and of the "nose" must be well-rounded. Figures 2 and 3 show the example of a welding shoe design.

Table 1. Specifications for minimum dimensions at welding shoes.

Linear dimensions Pressure – applying L_A = length L_N = length of shoe nose	Thickness a of single – v butt welds s (mm)	Lengths (mm) L_A ≥	L_N
	up to 15	35	10
	> 15 to 20	45	15
	> 20 to 30	55	20

Before beginning the welding operation, the welding shoe must be warmed up, since a rough and uneven surface of the welded seam is obtained if welding is carried out with a cold welding shoe. The warm air already available or the warm extrudate are suitable for warming up.

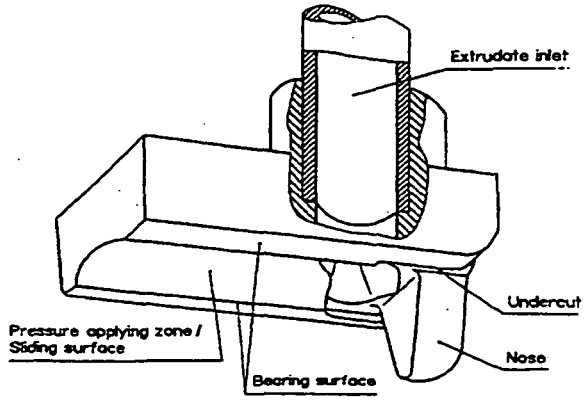


Figure 2. Perspective representation of a welding shoe design for single-V butt welds.

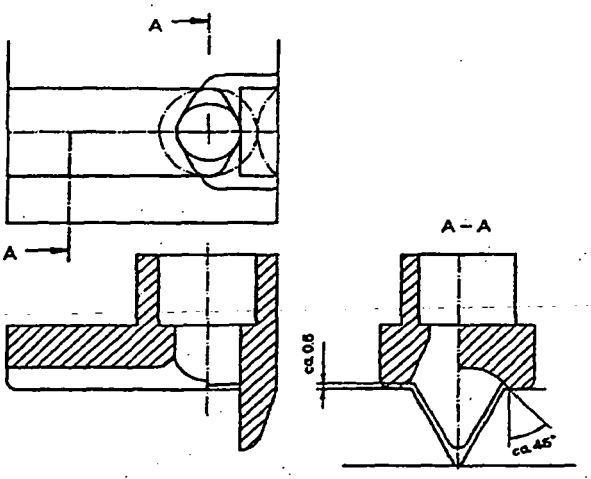


Figure 3. Technical representation of the welding shoe from fig. 2 (principle).

9.2 Auxiliary tools

When process variant I is used, in special cases also when other process variants are used for welds in places where access is difficult (for example in corners), a separate auxiliary tool is used for applying the welding pressure. With this tool, the plasticized welding filler cord is pushed into the likewise plasticized welding groove.

The auxiliary tool must be adapted to the form of weld. It is primarily produced in a curved form from PTFE (see Figure 4). In order to ensure properly executed welds, the welding pressure must be applied by careful pressing over all the cross-sectional areas (middle and edge areas) in several operations.

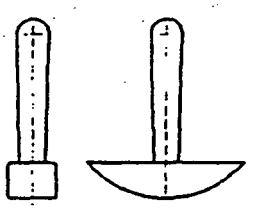


Figure 4. Auxiliary tool (principle).

10 Initial operation of the welding equipment

For initial operation of the extrusion welding equipment, first of all the heating units are switched on, as provided in the operating instructions. To avoid damage to the equipment during this phase, it shall be ensured in particular that, before switching on the drive, there are no longer any cold spots (for example at the tip, at the welding head, at the extrudate outlet opening etc.). Welding can only be commenced when the temperature of the material has settled to the temperature necessary for welding.

The temperature of the material is checked directly at the material outlet by means of a penetration sensor of a fast-indicating temperature measuring instrument. The permanently installed temperature indicators serve only to detect major undesirable temperature changes (for example a drop in temperature due to failure of the heating units during welding). Thermal damage to the welding filler can be caused if it is subjected to too high a temperature or if it remains in the extruder for too long. It must then not be used for welding and must be extruded out before welding commences.

If the material is changed (for example from HDPE to PP), it must be ensured that all the material in the welding extruder is exchanged, by cleaning, or by running out. Any remaining foreign material has an adverse effect on the quality of the joint. The nozzles may have to be changed, in the case of process variant III the material hose always has to be changed.

11 Weld preparation

Weld preparation comprises preparing a suitable welding groove and cleaning the entire welding zone. The quality of the welded seam depends decisively on the material at the faces to be joined being clean and unoxidized (take particular care with materials which oxidize readily such as for example PP). Therefore, immediately before welding, these and the adjoining areas must be machined. When carrying out repairs on parts subjected to the effects of chemicals, these preparations are particularly important. In such cases, the material has to be worked down to undamaged zones. This is illustrated in Figure 5 in the example of a single-V butt weld and a double-bevel butt weld.

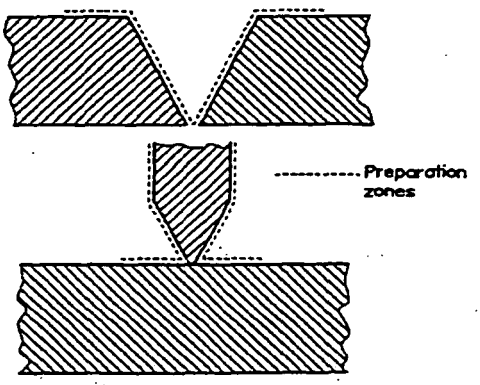


Figure 5. Surfaces to be machined in the case of single-V and double-bevel butt welds.

12 Welding filler

Granules or wire are used as welding filler. The quality of the welding filler has a crucial influence on the quality of the welded seam (see Clause 2 in this respect). If granules are used, only virgin material identified by the name of the manufacturer as well as the type number and batch number may be processed. The mixing in of regrind is not permissible. Granules must be clean and dry. Since even slight precipitation of moisture on the filler causes flaws in the material being welded, the welding extruder should be charged only with dried warm material (for example from a drying cabinet).

If wire is used, it must conform to Data Sheet DVS 2211, and be designated as such. Consequently, the wire must be free from bubbles since they otherwise appear in the extrusion seam. As far as drying and preheating are concerned, the same applies analogously as in the case of granules.

13 Forms of welds and weld structure

Extrusion-welded seams are predominantly produced by a single pass, the reasons being the cost-effectiveness and high quality of this process. For the scope of this Direction, the forms of weld and examples of design given in Data Sheet DVS 2205 Part 3 apply. To reduce the volume of the weld and for reasons of stress symmetry, the double-V butt weld shall be preferred over the single-V butt weld in the case of relatively thick semi-finished products. The same applies analogously for T-butt joints.

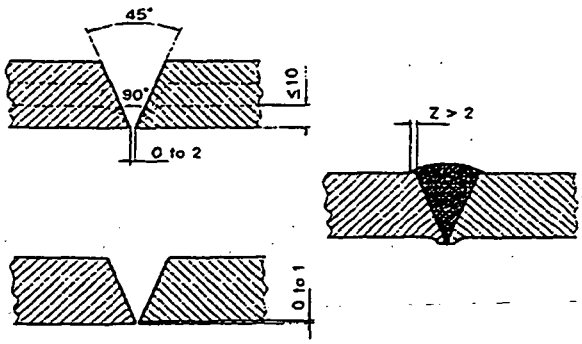


Figure 6. Groove joint preparation and weld execution for a single-V butt weld.

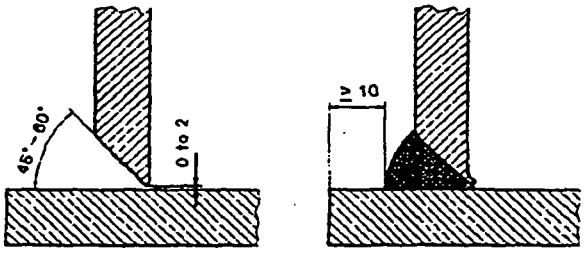


Figure 7. Groove joint preparation and weld execution for a T joint with single-bevel butt weld.

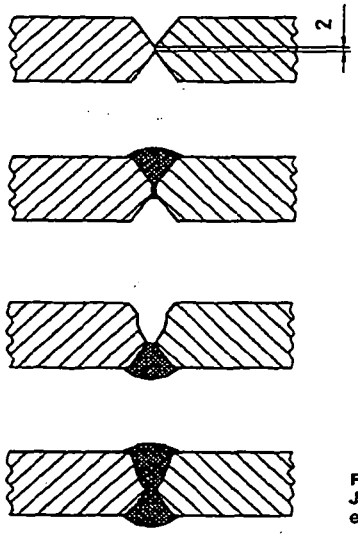


Figure 8.
Joint preparation and weld execution for a double-V butt

Figures 6 to 8 show preparation of the groove joint and execution of single-V and double-V butt welds as well as of single-bevel butt weld with fillet. Where wall thicknesses are relatively great, a smaller opening angle shall be chosen on account of the greater volume of melt and the resultant higher welding stresses. When welding, a minimal root gap shall be the aim. Correct selection of the welding parameters can in this case ensure a through-welded root.

The technical circumstances of the particular job may mean that it is convenient for carrying out the work to leave the groove joint edges with a web of about 1 mm on the root side.

Deviations from the specified weld geometry required for design reasons (for example in the case of segment bends and branches) are permissible and call for particularly careful execution of welding work.

If the welding groove cannot be filled in a single operation because the volume of the weld is too great, the welding extruder output too low or the required welding force too high, welding must be carried out in more than one pass. In such cases, it is necessary after each pass to remove any unwelded edges there may be on the seam by machining. Alternating welding allows the amount of distortion to be kept down in the case of multi-pass double-sided welded joints.

14 Execution of welds

In extrusion welding, the quality of the joint is determined to a considerable extent by the manual skill of the welder.

The welding speed is dictated by the material discharge from the extruder and the size of the volume of the weld. The welder must adjust the preheating conditions and the advancing of the appliance to this welding speed.

The welding pressure applied by the welder via the welding head acts in concert with the welding speed. Adequate welding pressure must be applied in order for the necessary material pressure to be produced in the material being welded both in the root and in the edge areas. If too great a pressure is exerted, there is excessive overfill behind the welding shoe or excessive root expulsion.

Before commencing welding, the temperature of the extrudate and of the hot air must be measured and the welding equipment set to the desired values. Fast-indicating electronic temperature measuring instruments with suitable temperature sensors shall be used for this purpose. When measuring the hot air, the highest temperature in the nozzle cross-section between the plane of the nozzle outlet and at a depth of 5 mm shall be established. When measuring the temperature of the extrudate, the measuring sensor in the welding shoe must be inserted in the middle of the cord. The welder must observe the welding operation with great attention in order to be able to recognize immediately and respond to disturbances in preheating and in the plasticizing of the welding filler.

The correct attitude of the welding head with respect to the form and direction of the path of the weld is particularly important. The welding head must be aligned centrally with the weld and must not come into contact with the weld edges around its "nose". There must be no possibility of the material which is beginning to melt being scraped away.

When welding parts of considerable size, the assistance of a second person is necessary. The second person must ensure that the welding head is always in the optimum position with respect to the workpiece (for example by turning the workpiece, regularly following along with the material hose or the welding filler from the roll magazine).

15 After-machining of the welds

After-machining of the welds is generally not necessary, since the individual welding processes allow uniformly smooth surfaces with marginal zones welded without notches. However, depending on the design of the welding shoe, the form of the weld and any geometrical irregularities of the parts to be welded, it is not always possible to avoid extrudate being pushed underneath the sealing faces of the welding shoe and escaping at the sides. This produces "flash" with expulsion beads. These are unconnected with the base material and must be removed. Whilst this material is in a moderately warm state, a scraper shall be used to draw it away to the welded areas of the marginal zones (see Figure 9).

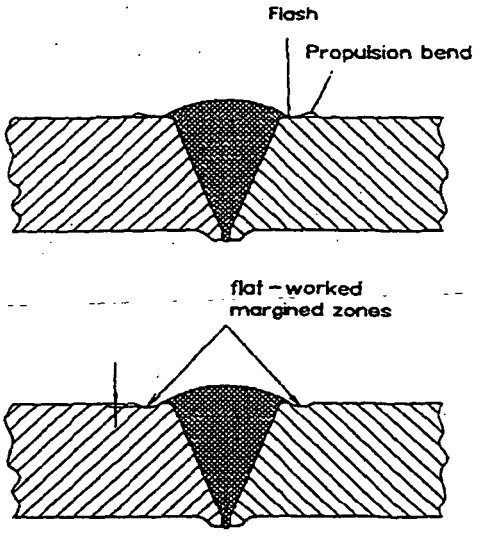


Figure 9. Single-V butt weld with propulsion before and after weld working.

If it is necessary to remove the entire overfill from the weld (for example in the case of sealing faces), this shall only be permissible once any testing of the welded seam has been carried out.

16 Testing of welded joints

Welded joints shall be inspected visually for such things as the form of the weld, the absence of cracks and notches in the surface and marginal zones, optimum seam filling, through-welding on the root side and tolerable offset of the joined parts.

Ultrasonic and -ray examination allow non-destructive detecting of flaws within the weld. On their own, they do not provide sufficient information on the quality of the welded joint. Data Sheet DVS 2206 provides information on this type of examination.

Examples of destructive tests which can be carried out are the short-time tensile test, the technological bending test, and the tensile creep test. Information on preparation of the specimens and implementation of the tests together with requirements are given by Directions DVS 2201 Parts 1 and 2, DVS 2203 Parts 1, 2, 4 and 5, and DVS 2206.

For terms describing welding defects, you are referred to DIN 32502 and for the assessment of defects to DVS 2202 Part 1.

17 Welding factor

If a qualified welder performs his work by following the process variants described in this Direction, uses equipment fit for the purpose and materials suitable for welding, the following welding factors - based on the requirements for welding factors defined in Direction DVS 2203 Part 1 - will be achieved at the least:

- Short-time welding factor f_z for HDPE
  All process variants: 0.8
- Long-time welding factors f_S for HDPE
  Process variant I: 0.4
  Process variants II and III: 0.6

determined at a test stress of 3 N/mm^2 and a test temperature of 95 °C in 2 % strength wetting agent solution. Further details on implementation of the test are contained in Directions DVS 2203 Part 2 and Part 4.

18 Requirements for welders

Extrusion welders must be versed with the necessary knowledge and have the necessary skills for the processes to be adopted with the materials used. This generally means they must have completed training as a fitter for work with plastics or have experience in a related trade with appropriate additional training. The manual skills are acquired by training and practical experience. In order to qualify for practical work, welders must remain constantly in practice. If evidence of qualification as a welder is required, welder examinations as specified in DVS 2212 Part 2 can be taken.

19 Standards, directions and regulations

DIN standards

DIN 32 502Imperfections in plastic welded joints, classification, terminology, explanations

DVS directions and data sheets

DVS 2201 Part 1	Testing of semi-finished products of thermoplastics, asic principles - notes
Part 2	welding suitability, test methods - requirements
DVS 2202 Part 1	Imperfections in welded joints of thermoplastics, characteristics, description, evaluation
DVS 2203 Part 1	Testing of welded joints of thermoplastics, test methods - requirements
Part 2	tensile test
Part 4	tensile creep test
Part 5	technological bending test
DVS 2205 Part 3	Calculation of containers and apparatuses of thermoplastics, welded joints
DVS 2206	Testing of building components and structures of thermoplastics, extrusion welding, procedures - characteristics
DVS 2225 Part 1	Joining of waterproofing courses of polymeric materials in earthworks and civil engineering hydraulics, welding, adhesive bonding, vulcanizing
DVS 2209 Part 1	Welding of thermoplastics, extrusion welding, procedures, characteristics
DVS 2211	Welding fillers for thermoplastics, scope, designation, requirement, testing
DVS 2212 Part 2	Examination of plastics welders, examination group II, hot-gas extrusion welding

Appendix:

Welding record
for the extrusion welding of panels and pipe

General Details:

Order No.: _____ Drawing No.: _____

Company carrying out the work: _____

Welder (Name/Initials): _____

Process/Equipment:

Process variant: _____ Welding Shoe No.: _____

Weldingequipment, make: _____

Form of weld (e.g. DVS 2205): _____

Material:

Material to be welded: _____

Form, thickness (mm) of semi-finished product: _____

Welding filler: _____

Welding conditions

Hot air temperature (°C): _____ Air rate (l/min): _____

Barrel heating (°C): _____ Material temperature (°C): _____

Hose heating: _____ Welding speed(mm/min): _____

Comments: _____

_____

_____

_____ _____

Welder (Date/Signature) (Welding Supervisor (Date/Signatur)

DVS – DEUTSCHER VERBAND FÜR SCHWEISSEN UND VERWANDTE VERFAHREN E.V.

Welding of Thermoplastics, Extrusion Welding

Panels and Pipes, Welding Parameters for HDPE and PP

Direction DVS 2207-4 Supplement (July 1993)

This supplement provides guideline values for the extrusion welding of HDPE and PP.

	Material thickness[1] (for single-pass welding) mm	Material temperature[2] °C	Hot air temperature[3] °C	Air rate[4] l/min	Welding filler rate kg/h
Continuous process with manual equipment (screw) Process variant II	0 ... 15	200 ... 300	250 ... 300	≥ 300	0 ... 2
Continuous process with welding filler transfer hose between extruder and welding head Process variant III	0 ... 15	200 ... 230	250 ... 300	≥ 300	0 ... 4
	15 ... 30	200 ... 230	250 ... 300	≥ 400	0 ... 6
Continuous process with manual equipment (ram) Process variant V	0 ... 15	Figures still to be released			
Discontinuous process with manual transfer of the welding filler into the preheated welding groove Process variant I	0 ... 15	200 ... 230	250 ... 300	≥ 300	0 ... 4

The parameters of hot air temperature, air rate and welding speed must be coordinated in such a way that the minimum depth of melting required in Clause 8 of 0.5 mm is definitely ensured.

1) If thicker material is to be welded, weld with more than one pass.

2) Measured with a penetration thermometer at the extrudate outlet of the welding extruder.

3) Measured between the plane of nozzle outlet and 5 mm inside the nozzle.

4) Cold air taken in at about 20°C and atmospheric pressure in the operational state. If air is supplied from pressurized air systems, the air pressure shall be measured downstream of the air meter and allowance made for this by a pressure or rate conversion.

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DVS, Technical Committee, Working Group "Plastics, Welding and Bonding"

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SUBMITTAL NO. 20104-PHIV--13005-004 | REV.: 0 | 4/22/2002 | Page 1 of 1

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TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

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7	PHIV-13005-004	0						X			Extrusion welding procedure for HDPE pipe, flat stock, and geomembrane liner		X		13005-1.04	X	

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PLASTIC FUSION FABRICATORS, INC.
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HDPE WELDING QUALITY ASSURANCE PLAN

Introduction

The following procedures are to be used as guidelines for HDPE welding on any Plastic Fusion Fabricators, Inc. job site. Non-destructive testing will be conducted on all welded joints, whenever possible. Inspections will be conducted at the vendor's site and in the field.

Any repair procedures or modifications of procedures listed here must be approved by Plastic Fusion prior to start of work.

General Welding Procedures

Inspect the sheet edge to make certain that it has been beveled to a 30-degree angle. A piece of foil tape must be placed on the edge requiring the field weld. The distance between the edge of the sheet and the copper tape must not exceed ¼" (6 mm).

Scrape or grind pending materials specified the mating surfaces of the sheet and weld area. Preparation of weld area should not be performed more than 30 minutes prior to welding. If a grinder is used on the weld area, it must be hand scraped afterwards.

For sample preparation (Test Welds), the sheets must be placed with a root gap of approximately 3/16" to ¼". The gap is no more than 1/8" with hand welding.

Prior to extrusion welding, purge extrusion welder with 5' to 6' of the specified welding rod. In addition the welding shoe must be pre-heated by extruding approximately 12" to 18" of material on a wood board. This process must be repeated in the event the extrusion welder remains idle for more than 5 minutes.

Welding

Suggested welding parameters are as follows:

Hot Gas

AirFlow	45 – 60 1/min.
Temperature	320 degree – 340 degree C

Extrusion Welding

- 3 mm rod and gun

- AirFlow	-280 – 320 1/min.
- Preheat Temperature	-250 – 265 degree C
- Material Temperature	-210 – 230 degree C

- 4 mm rod and gun

- Flow	-300 – 400 1/min.
- Preheat Temperature	-250 – 265 degree C
- Material Temperature	-210 – 230 degree C

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Welding Continued-

During the extrusion welding process, the heat-affected zone should be visible (dull surface on sheet) and must be probed with a sharp tool such as a knife, awl, etc. to assure proper preheating of the sheet.

Probe to minimum of 1/16" penetration at least every 5 feet of weld and at all starts, stops and intersections.

The excess weld material of all extrusion welds must be scraped away to facilitate visual inspection and ultrasonic inspection.

All hand welding is to consist of a 3-mm root weld and two 4-mm cover welds. All welds are to be scraped before the application of additional welds. Scrape 3-mm rods before using for hand welding.

Stop and Start of Welds

All starts and stops are to be extended a minimum of 2" over the adjacent weld. Existing welds will be tapered for the last 2". Preheat at the beginning of the scraped area until material is softened as determined by probing, and then commence welding.

Field Welding

Inspect all joints for the presence of moisture. Any joint exhibiting moisture must be scraped to form a 30" bevel on each edge of the crack followed by placing a 3 mm root weld in the crack to prevent moisture from coming out during the extrusion welding process.

Site/Shop Quality Assurance/Quality Control

Environmental Conditions

Temperatures and relative humidity shall be determined four times daily (prior to commencing work, mid-morning, noon and mid-afternoon) during the period when any welding is expected to be performed.

Welding will not be allowed to proceed if the surface temperature of the HDPE sheet is less than 5 degrees F above the dew point. Maximum allowable surface temperature of the HDPE sheet will be 96 degrees F. Minimum sheet surface temperature of 50 degrees F.

All incoming welding rod, cap strip, and disc seal materials shall be stored in a cool dry environment.

Non-Destructive Testing

A preliminary spark test may be conducted after the welds have been allowed to cool in ambient temperature, approximately three to five hours, using 100 volts per mil of sheet thickness, not to exceed 25,000 volts for routine testing. A higher voltage is only to be performed by approved personnel. On each successive spark test the voltage must be reduced by 10%. Spark test after scraping excess material from welds.

Vacuum testing may be used where it is deemed necessary by owner or Plastic Fusion Fabricators, Inc.

Equipment Checking

All thermoplastic welding equipment to be used, i.e., large extrusion guns (4mm diameter rod type), mini-extrusion guns (3mm diameter rod type) and hand welding guns, will be checked by Equipment Checking Continued-

vendor quality assurance/quality control person before being used. Welding equipment will be calibrated at least one time each day. Temperature measuring devices will be re-calibrated on a semi-annual basis.

Test Welds

Test welds are required to verify that adequate conditions (environment and equipment) exist for field welding. Test welds must be produced at the beginning of each day, before production welding. In addition, these welds shall be made before a different lot or batch number of rod material is used in production welding, at any time welding equipment is suspected to be malfunctioning, and whenever specified welding parameters are used.

Welder Qualification

Every thermoplastic welding technician that will weld at the shop and jobsite must be qualified in welding practices per this procedure. Weld re-certification will include test welds being made and evaluated for each welder. Each welder will complete a 5 ft. test strip of extrusion weld and an 18 inch hot air hand weld that will be subjected to a visual inspection, tensile testing and bend testing.

Documentation

Records of all welds will be maintained so that the technician performing the welds can be traced through the entire job. These records will include plans of each trench section showing the location and type of weld made, the date of weld, name of the welding technician who made the weld, the welding gun identification number and lot number and/or spool number of the welding rod used to make the weld. Any forms deemed appropriate by the vendor shall be part of the record keeping process. All welders will make their welds upon completion and a record will be kept on construction drawings or in the document manual.

Material Specification

The following information is required with all polyethylene material of construction:

- Lot number
- Resin identification
- Melt flow index (d1238) – after processing
- % Crystallinity – after processing
- Identification that all sheet and weld rods were made by the same manufacturer

The sheet manufacturer must supply weld rods. No mixing of rod and sheet from different manufacturers is permitted.

Testing of Hot Air and Extrusion Welding

Scope

This procedure is provided to describe methods of sample preparation and testing of welded polyethylene for the purpose of assuring proper welding conditions and techniques.

Summary of Methods

Samples of polyethylene identical with that being installed are welded using the same apparatus being used for installation in the same area where the installation is being conducted, each day before any welding is started. Samples must be made according to the type of welding to be performed that day.

Apparatus

1. Precut polyethylene sheet (nominal 5mm (0.197") thick) measuring 5" (12.7 cm) X 18" (45.7 cm) with a 30 degree beveled edge made along one of the long dimensions. Sheet material must be made from Hostalen 5040 – T12 Resin.

2. Mounting board and clamps to board sheet in place while welding sample pieces.

3. Welding guns – Each extrusion device and each hot air welding device to be used in manufacture that day must be used to weld test panels in each orientation expected to be performed that day. Such devices should be set to the temperature and airflow to be used that day, in the area where they are expected to be used.

4. Weld rod – Guns should be set up with the type and lot number of rod to be used that day. If the weld rod lot number is changed during the workday, new test panels must be made.

5. Saw with a blade suitable for cutting PE sheet.

6. Bend tester (optional) is described in DVS 2203 for use in checking the bend angle of welded test specimens (may use hand bending).

7. Digital Thermometer for checking of preheat and material temperatures.

8. Temperature and % relative humidity measuring devices to check such in the area of the welding.

9. Tensile tester.

Sample Preparation

1. Test sheets are mounted on a board which is then oriented (horizontal or vertical) to reflect the type of welding to be tested.

2. Sheet is then scraped and prepared for welding using the type of tooling to be used on actual practice that day.

3. Preheat and material temperatures should be checked and recorded for each test sample.

4. Weld samples with extrusion or hot air welding device. Preheat should be checked by testing the sheet in the weld zone by probing with a sharp tool. Welding should be continuous from one end of the sheet sample to the other.

Sample Preparation Continued-

5. Weld samples should be allowed to cool and then dressed using standard procedures and tools used in actual practice.

6. Each sample should be marked as follows:

   a. Welder's name, date, and time welded
   b. I.D. number of welding device
   c. Ambient air temperature, % relative humidity and dew point

7. Welded samples should be allowed to condition before cutting and testing. One inch should be cut off and discarded from each end of sample. Appropriate sized pieces (1" wide) shall be cut from sheet for bend test. Remainder of sheet shall be stored as retained samples.

Test Procedure

1. Bend test procedure shall be run per the English translation of DVS 2203, Part 5.

2. Tensile test procedure shall be run per ASTM C1147-90.

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7	PHIV-13005-005	0						X			Simultaneous butt fusion procedures		X		13005-1.04	X	

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Heat Fusion Joining Procedures

INFORMATION ONLY

CSR PolyPipe 4810 PE 3408

Plastic Fusion Fabricators, Inc.
Your Total Containment Resource
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CSR PolyPipe

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Butt Fusion ..... pages 4 & 5

Socket Fusion ..... pages 6 & 7

Sidewall Fusion ..... pages 8 & 9

The statements and technical data given in this brochure were developed on the basis of conservative test measures and are believed to be accurate. The information is meant to serve only as a general guide, however, and the individual user is encouraged to verify the specific parameters of each application. Due to wide variations in service conditions, quality of installation, etc., no warranty or guarantee, express or implied, is given in conjunction with use of this material.

CSR PolyPipe is an active member of the American Gas Association (AGA), the Plastics Pipe Institute (PPI) and the American Society for Testing and Materials (ASTM).

For additional information concerning fusion procedures, please call the Technical Services Department at (800) 433-5632.

INTRODUCTION

The purpose of this manual is to provide a guide for fusion joining CSR PolyPipe 4810 PE 3408 gas piping. The fusion procedures outlined for butt fusion, socket fusion and sidewall fusion have been proven to consistently produce sound fusion joints when used correctly.

Additionally, the procedures given in this manual for fusion joining CSR PolyPipe's 4810 PE 3408 products are intended to aid a fusion technician in becoming qualified to join gas piping according to U.S. Department of Transportation (DOT) Title 49, Part 192 regulations. Any operator who wishes to become qualified to join polyethylene gas distribution piping should be qualified by the operator of the pipeline using the test procedures set forth in Section 192.285 of the DOT Title 49, Part 192 regulation.

QUALIFICATION PROCEDURE

I. Any person joining polyethylene gas pipe should receive training in each of the fusion procedures.

II. Any person joining polyethylene gas pipe should make a sample joint for each procedure used. Each sample joint should pass the following inspections and tests:

   A. Pressure and tensile testing as described in Section 192.283, CFR,
   B. Ultrasonically inspected and found not to contain flaws, or
   C. Cut into at least three strips, each of which is:
      1. Visually examined and found free of voids or discontinuity on the cut surface of the joint.
      2. Deformed by bending, torque or impact, and if failure occurs, must not initiate in the joint area.

III. A person must be requalified under an applicable procedure during a 12-month period if that person:

   A. Does not make any joints under the procedure.
   B. Has three joints or 3% of the joints made, whichever is greater, that are found to be unacceptable by Paragraph 192.513, CFR.

IV. Each operator shall establish a method to determine that each person making a joint in plastic pipelines in his system is qualified in accordance with this section.

IMPORTANT NOTES ON FUSION CONFIDENCE

Reliable fusion joints of polyethylene piping systems can be accomplished under a reasonable latitude of conditions. The following is a listing of general notes to help ensure proper equipment and techniques are utilized.

1. **Use heat fusion only.**
   Threading and/or solvent bonding of polyethylene pipe is unacceptable. Do not use either of these methods for joining of CSR PolyPipe's products. Mechanical fittings may be used. The particular fitting manufacturer should be consulted for installation instructions.

2. **Correct heater plate temperatures.**
   Heater plate thermometers should be tested for accuracy with a surface pyrometer or crayon indicators (melt sticks) at least once per day.

3. **Adequate fusion pressures.**
   A fusion interface pressure of 75 psi is recommended for butt fusion of CSR PolyPipe PE 3408 piping. Fusion equipment manufacturers should be consulted for proper conversion of this interfacial pressure to gauge pressure for their specific equipment.

4. **Severe ambient temperature conditions.**
   Extreme heat, cold or wind will alter heat and cooling times. Care must be taken to ensure that fusion times and procedures compensate for these conditions to produce a correct fusion joint. Should a question exist, the joint or joints should be subjected to appropriate test methods for qualification of the procedure under the adverse conditions present. Care should also be used to ensure that the fusion procedure is protected from rain, snow or other conditions of excessive moisture.

5. **Double check fusion technique.**
   Contact pressures and heating/cooling cycles may vary dramatically according to pipe size and wall thickness. Operators should not rely exclusively on automated fusion equipment for joint qualification. In addition, visual inspection and qualification should always be made. If necessary, test methods should be utilized to formulate correct pressures and heat/cool cycle times.

6. **Use adequate cooling times.**
   An important parameter in the fusion procedure is adequate cooling time. All joints should remain stationary at least until the fusion is cool to the touch. On thick-walled pipes, additional cooling time may be necessary.

7. **Dirt, oil and debris.**
   Any of these substances on the heater plate, pipe ends, facer or anywhere else that contacts the fusion surface can cause improper fusion. Even airborne, invisible, pollutants can contaminate a heater plate. Ensure that all equipment and pipe ends are clean!

8. **Fusion to unlike materials.**
CSR PolyPipe is fusion-compatible with all competitive polyethylene PE 3408 pipe resin materials. However, special techniques may need to be utilized with certain products that have a significantly different melt flow. CSR PolyPipe has fusion compatibility guides available for CSR PolyPipe 4810 with the various competitive high density gas pipe products.

9. **Use proper roughening material.**
Several areas of this guide call for the use of abrasive paper. Do not use sandpaper. Use only emery cloth or garnet cloth as this type of abrasive will not leave deposits embedded in the polyethylene material.

10. **Cleaning of pipe ends.**
Try to avoid wiping the pipe areas after facing or roughening operations. If shavings or other debris must be removed, use only a clean cotton cloth as contaminated rags or use of solvents can leave harmful deposits on the fusion zone.

11. **Equipment maintenance.**
Heater surfaces are generally coated with a non-stick material. Cleaning techniques should be used accordingly. If a solvent is deemed necessary, do not use gasoline or other petroleum products. Refer to the equipment manufacturer's instructions for proper cleaning products.

12. **Proper heating times.**
Note that the listed heating times have defined start times. Do not assume that the heat time starts at contact of heater. Read the applicable footnotes as each listing of heater time carries an appropriate explanation of the heat cycle start point.

13. **Note that the heater plate is hot.**
When the heater plate is not in use be sure to use a heater insulator holder. The heater insulator holder should be used at all times when the heater plate is not being utilized to ensure that the contact surfaces of the heater remain clean and also to prevent inadvertent contact which can result in burn injuries.

14. **Bend back test specimens.**
Bend back testing is suggested to verify fusion joint integrity. The specimen shall be made by cutting the pipe longitudinally into strips about 1" wide by about 12" long with the fusion centered in the strip. Use at least 3 per joint. The fusion sample should be bent as shown in the particular fusion procedure. The sample should be free of cracks and separations in order to be acceptable.

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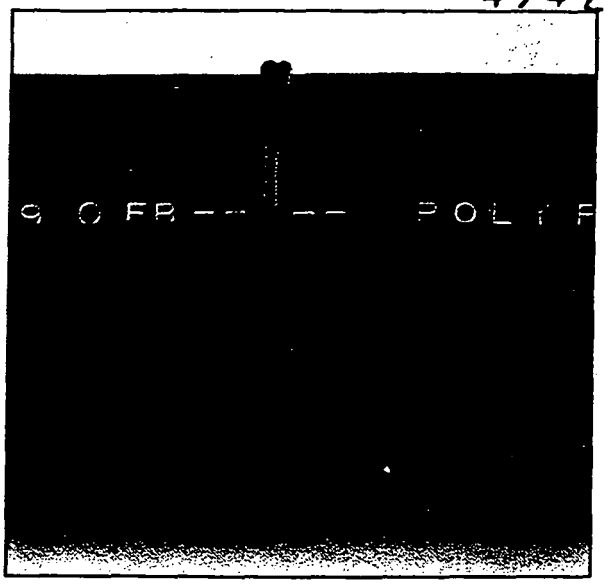


BUTT FUSION

Procedure for CSR PolyPipe 4810 PE 3408 pipe and fittings

1. Clean pipe ends with a clean, lint-free cloth.
2. Square the two opposing pipe ends.
3. Check pipe end alignment in clamps. Adjust clamps if required.
4. Verify proper heater temperature. Temperature should be 490°F- 510°F.
5. Insert heater plate between opposing pipe ends and apply sufficient force to initiate contact between pipe ends and heater plate. After contact between heater plate and pipe end is established, use only enough force to maintain contact. Caution: maintain contact only; do not apply pressure.
6. Apply heat for the time listed in the tables.
7. Remove heater plate and bring the heated pipe ends together quickly, being careful not to slam the pipe ends together. Apply sufficient pressure to form a "double rollback bead."
8. Maintain fusion pressure while allowing the joint to cool as given in tables.
9. Allow joint to cool an additional five minutes prior to removing joint from fusion jig.
10. Inspect joint for quality.

Notes:

1. CSR PolyPipe recommends a butt fusion temperature of 500°± 10°F for PE 3408 gas piping products.
2. A fusion interface pressure of 75 psi is recommended for butt fusion of CSR PolyPipe PE 3408 piping. Fusion equipment manufacturers should be consulted for proper conversion of this interfacial pressure to gauge pressure for their specific equipment.

BUTT FUSION

for CSR PolyPipe PE 3408, SDR 1

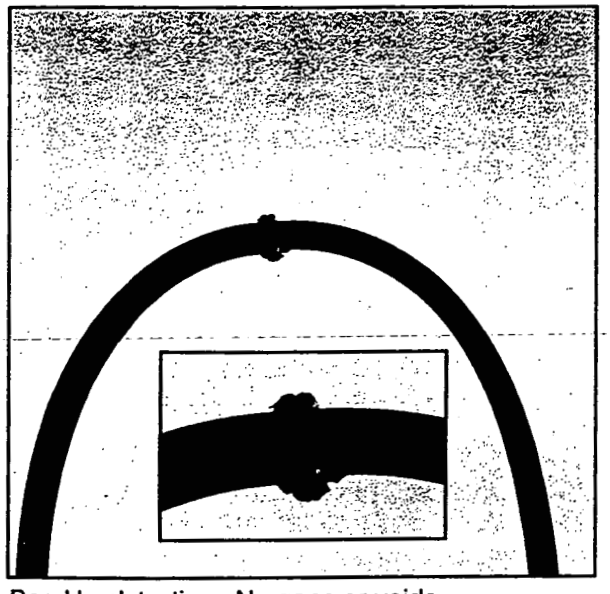
Pipe Size IPS (inches)	Heating Time (seconds)
1	16 - 20
1 1/4	20 - 24
2	28 - 32
3	32 - 38
4	38 - 44
6	56 - 66
8	72 - 82

Notes:

1. Fusion time cycles given above begin after a bead of molten material is evident the entire circumference of pipe.

Butt Fusion

Proper Joining



Bend back testing. No gaps or voids.

TIME CYCLES

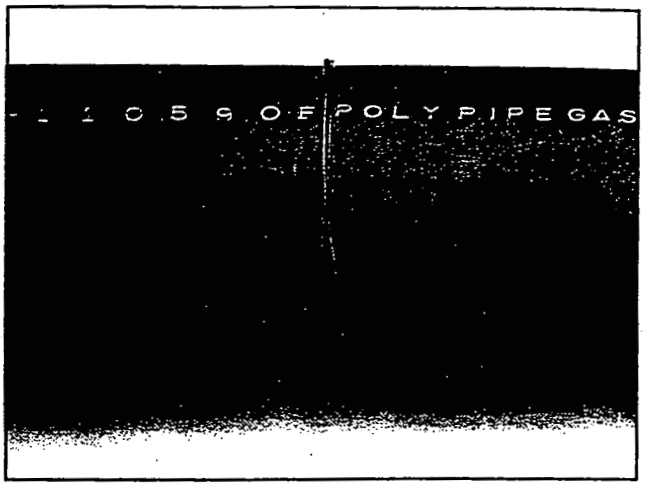
and SDR 11.5, pipe and fittings

Cooling Time (seconds)	Bead Size (inches)
90	1/16
90	1/16
90	1/8
180	1/8
210	1/8 to 3/16
240	3/16
300	3/16 to 1/4

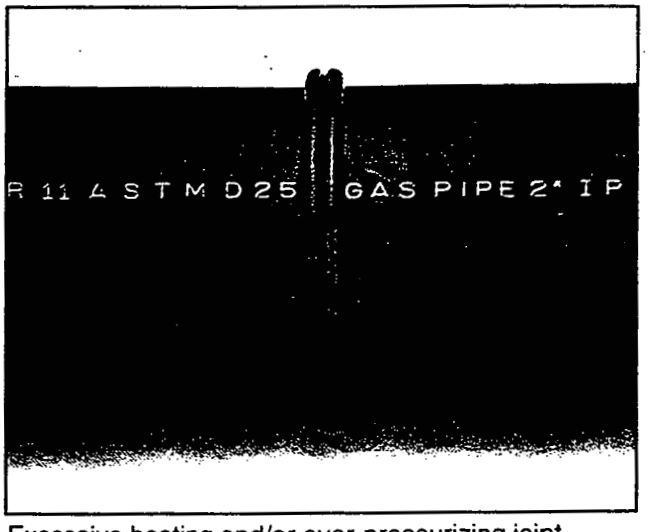
2. Temperature and time cycles are based on 73°F conditions with no wind, rain, or snow. If conditions are different, time cycles may need to be altered.

Examples of improper joining

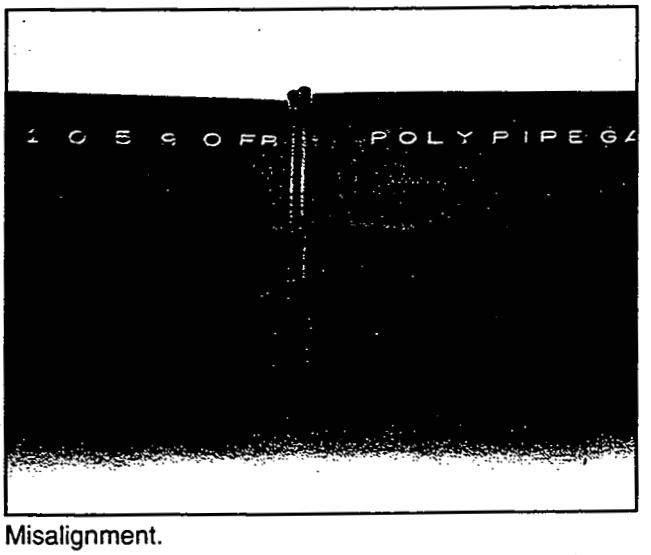
4942



Incomplete facing.



Excessive heating and/or over-pressurizing joint.



Misalignment.

000131

SOCKET FUSION

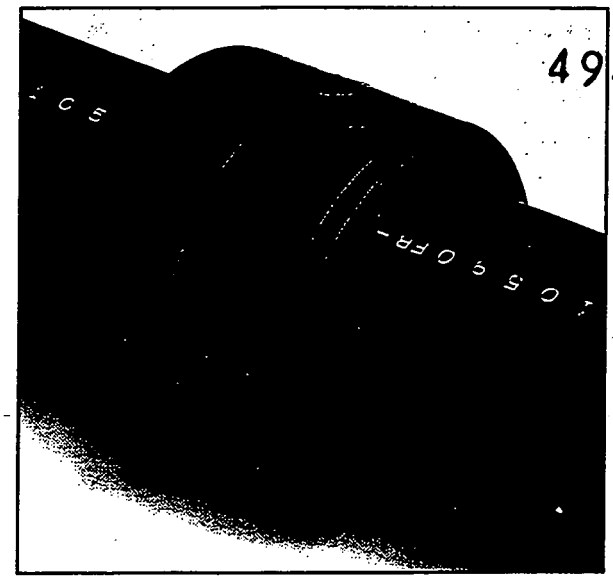
Procedure for CSR PolyPipe 4810 PE 3408 pipe and fittings

1. Cut pipe square.
2. Chamfer pipe end. Remove burrs and chips inside pipe ends.
3. Utilize proper depth gauge and cold ring to ensure correct insertion depth and pipe roundness.
4. Clean pipe and fitting with cloth to remove all contaminants.
5. Verify proper heater plate temperature. Temperature should be 490°F - 510°F.
6. Force fitting and pipe onto heater plate. Be sure to insert pipe completely into female socket and the fitting completely onto the male socket.
7. Apply heat for the time listed in the tables.
8. Remove pipe and fitting from heater plate being careful not to torque or twist the pipe or fitting.
9. Quickly check melt to ensure melt is complete. All surfaces should indicate contact with heater. If unsatisfactory, destroy fitting and repeat steps 1 through 8.
10. Insert pipe into fitting until cold ring is flush with fitting. Do not twist or rotate.
11. Allow joint to cool for proper cooling time. Be sure to maintain pressure while cooling.
12. Allow joint to cool an additional five minutes before removing cold ring.
13. Inspect joint for quality.

Note:

CSR PolyPipe recommends a socket fusion temperature of 500° ± 10°F for PE 3408 gas piping products.

Proper Joining



4942

SOCKET FUSION

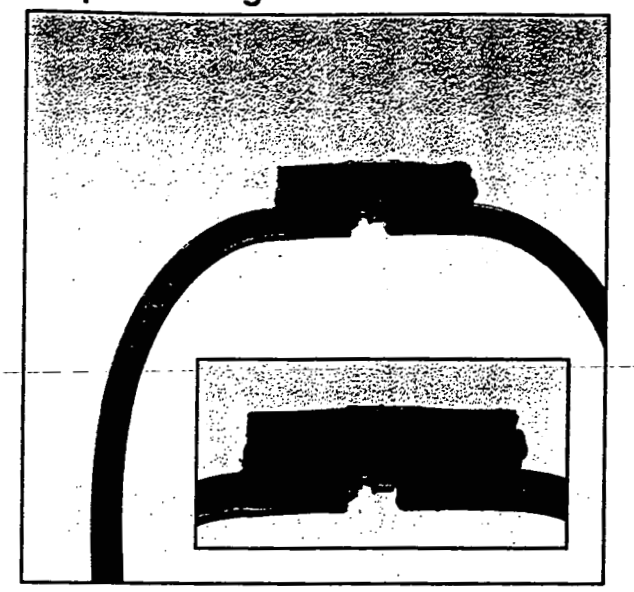
for CSR PolyPipe PE 3408

Pipe Size (inches)	Heating Time (seconds)
1/2 CTS	8 - 10
3/4 CTS	10 - 12
1 CTS	12 - 14
1/2 IPS	8 - 10
3/4 IPS	12 - 14
1 IPS	14 - 16
1 1/4 IPS	18 - 20
1 1/2 IPS	18 - 20
2 IPS	22 - 26
3 IPS	25 - 30
4 IPS	30 - 35

Notes:
1. Socket fusion time cycle begins after pipe and fitting are fully inserted on heater plate.

Socket Fusion....

Proper Joining



Bend back testing. No gaps or voids.

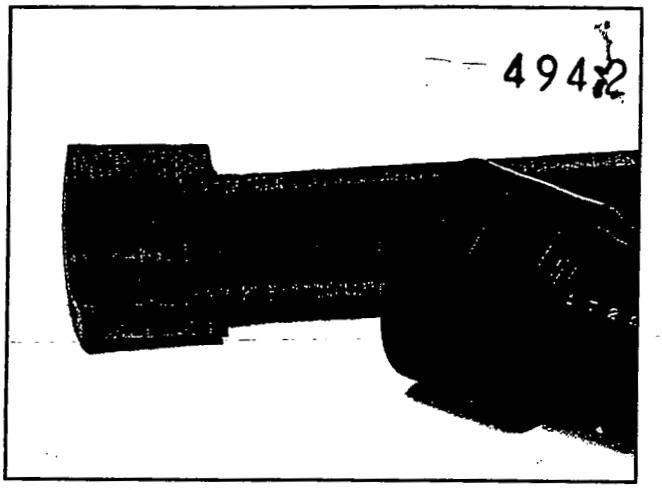
TIME CYCLES

pipe and fittings

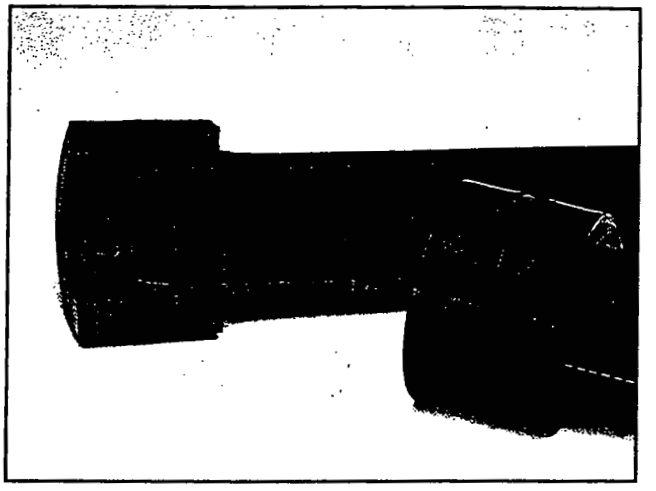
	Cooling Time (seconds)
	30
	30
	30
	30
	30
	30
	60
	60
	60
	75
	75

2. Temperature and time cycles are based on 73°F conditions with no wind, rain, or snow. If conditions are different, time cycles may need to be altered.

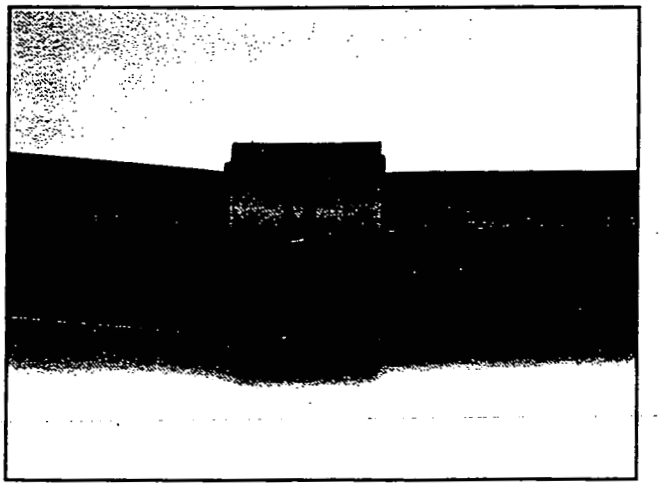
Examples of improper joining



Improper stab depth. Short stab depth caused by failure to use a depth gauge.

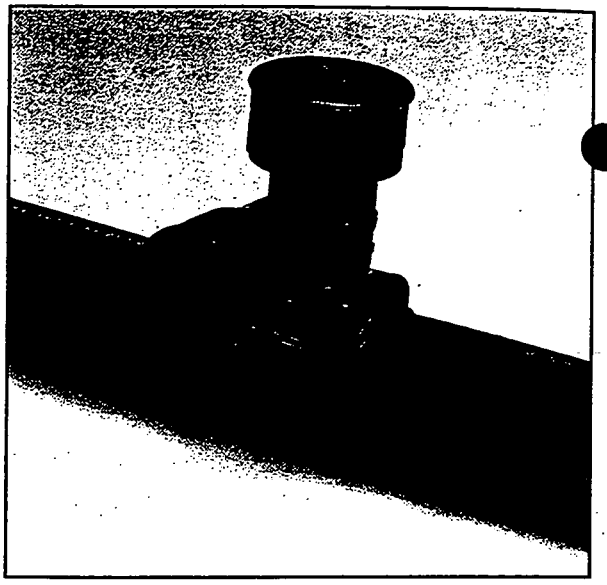


Improper stab depth. Overstabbed caused by failure to use a cold ring.



Misalignment.

000133



SIDEWALL FUSION

Procedure for CSR PolyPipe 4810 PE 3408 pipe and fittings

1. Attach sidewall fusion jig onto pipe.
2. Roughen fusion surfaces (both pipe and fitting) with 60 - 80 grit emery cloth.
3. Install fitting into fusion jig.
4. Verify proper heater plate temperature. Temperature should be 490°F- 510°F.
5. Insert heater plate between pipe main and fitting base. Apply pressure to form melt bead around perimeter of heating tool on pipe main.
6. Apply heat for the time listed in the tables while maintaining the recommended heating pressure.
7. Remove heater plate and visibly check melt pattern on pipe and fitting base. Melt pattern should match the heater patterns with no cold spots. If unacceptable, destroy fitting and start over.
8. Quickly bring the pipe and fitting surfaces together, applying sufficient pressure to form proper fusion bead.
9. Allow joint to cool as given in tables. Be sure to maintain pressure while cooling.
10. Cool joint an additional five minutes prior to removing fusion jig.
11. Inspect joint for quality.

Note:
1. CSR PolyPipe recommends sidewall fusion temperature of 500° ± 10°F for PE 3408 gas piping products.

SIDEWALL FUSION

for CSR PolyPipe PE 340

SERVICE SADDLE AND TAPPING TEE

Pipe Size IPS (inches)	Heating Pressure (psi)	Heating Time (seconds)
2	70 - 90	45 - 55
3	70 - 90	45 - 55
4	70 - 90	45 - 55
6	70 - 90	45 - 55
8	70 - 90	45 - 55

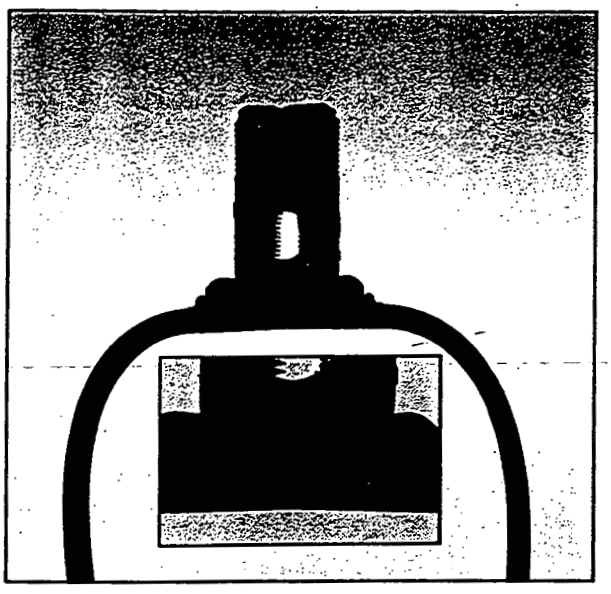
BRANCH SADDLE

Pipe Size IPS (inches)	Heating Pressure (psi)	Heating Time (seconds)
2	130 - 150	50 - 60
3	130 - 150	75 - 85
4	130 - 150	80 - 90
6	130 - 150	85 - 95
8	130 - 150	90 - 100

Main Size (inches)	Melt Size (inches)	Bead Size (inches)
2	1/16	1/8
3	1/16 to 1/8	3/16
4	1/8	3/16 to 1/4
6	1/8	1/4
8	1/8	1/4

Sidewall Fusion

Proper Joining



Bend back testing. No gaps or voids.

TIME CYCLES

pipe and fittings

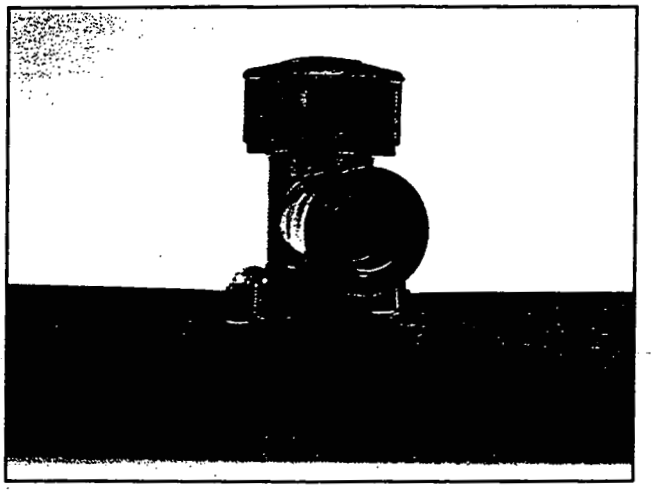
Fusion Pressure (psi)	Cooling Time (seconds)
60 - 80	120
60 - 80	120
60 - 80	120
60 - 80	120
60 - 80	120

Fusion Pressure (psi)	Cooling Time (seconds)
70 - 90	180
90 - 110	180
100 - 120	210
110 - 130	210
120 - 140	210

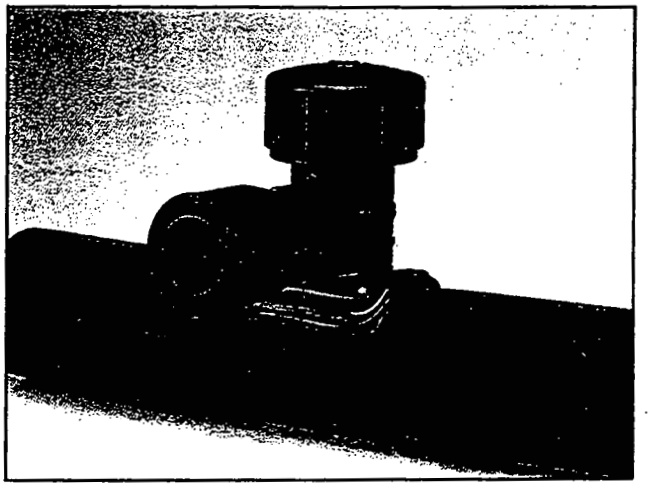
Notes:
1. Sidewall fusion time cycle begins after pipe and fitting are firmly seated against the heater faces.
2. Fusion equipment manufacturers should be consulted for proper gauge pressures and torque values required to achieve the above given pressures for their particular fusion equipment.
3. Temperature and time cycles are based on 73°F conditions with no wind, rain or snow. If conditions are different, time cycles may need to be altered.

Examples of improper joining

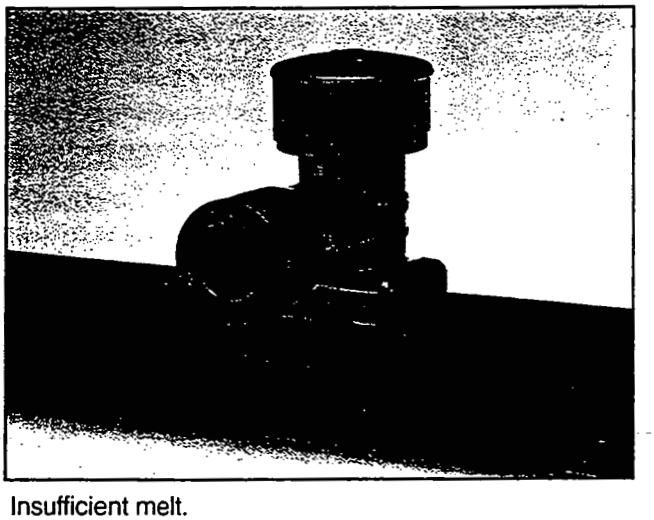
4942



Fitting misaligned on pipe.



Excessive heating and/or over-pressurizing joint.

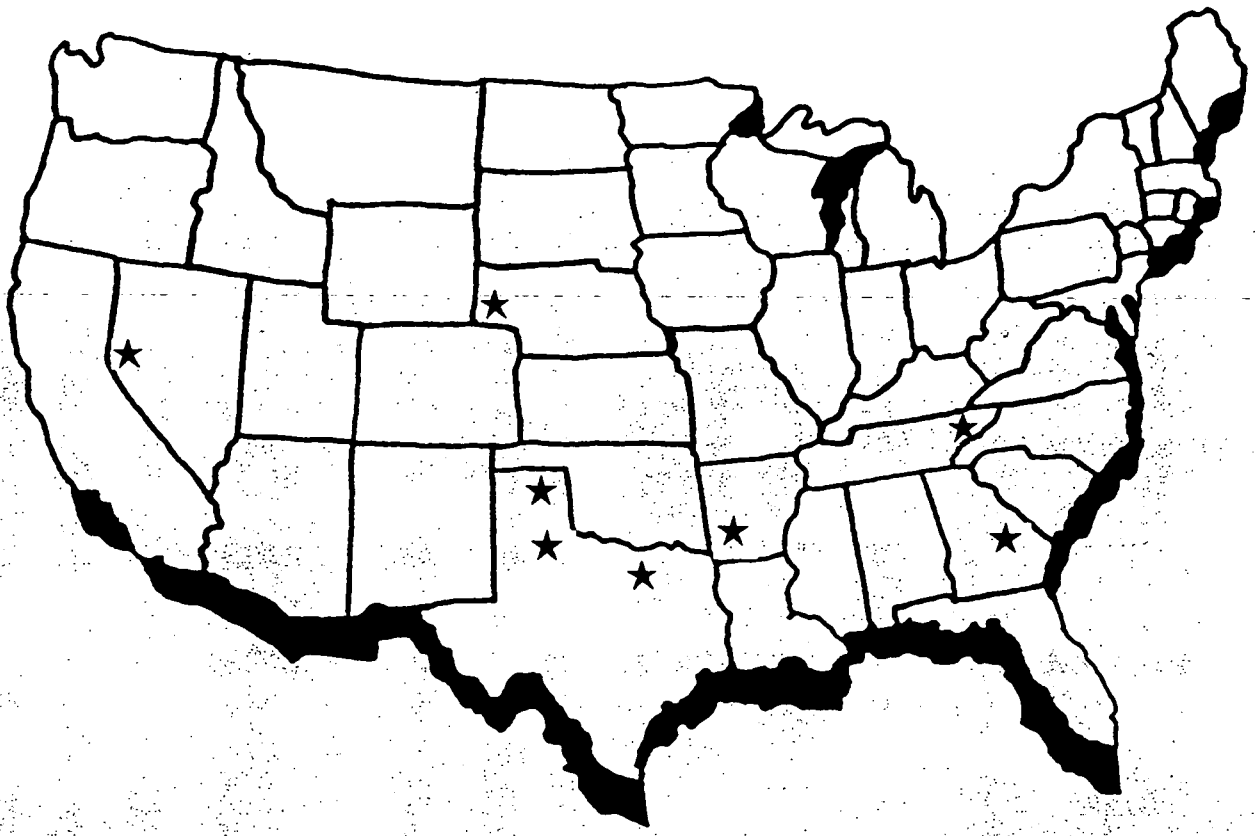


Insufficient melt.

000135

CSR PolyPipe™

4942



GAINESVILLE PLANT
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Gainesville, TX 76241-0390
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(800) 433-5632
Fax: (940) 668-8612

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230 Lyon Dr.
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DISTRIBUTED BY:

CSR™
PolyPipe

000136

CSR PolyPipe is an active member of the Plastics Pipe Institute, AGA, and ASTM.

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-006	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Hunt

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Teresa Schwab DATE: 4/24/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-006	0						X			Name of Manufacturer of HDPE flat stock used to fabricate liner penetration boxes		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7			RECEIVED	
Chuck VanArsdale - Approver	64			MAY 13 2002	
Gregg Johnson	64				
Bill Zebick	64				
Mike Godbey	64				
Kwasi Bodu-Turnebeah	38				
Don Pfister	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000132

RECEIVED BY: Chuck C. VanArsdale DATE: 5/6/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ORIGINAL

4942

COMPRESSION POLYMERS GROUP
801 Corey Street • Moosic, PA 18507 • (570) 346-8797 • Fax: (570) 346-5080

April 17, 2002

Plastic Fusion Fab
3455 Stanwood Blvd
Huntsville, AL 35811

Attn: Mickey

This is to certify that on your PO# 5446, our invoice #057611 we shipped 46 sheets of 1" x 48 x 120", HDPE pipe grade Union Carbide resin DGDB-2480 Black 3408. These sheets conform to ASTM 1248, Type III, Grade P34, Class C, Category 5. This material was manufactured in Moosic, Pennsylvania.

If you have any further questions, please feel free to contact me.

Sincerely,

Jenn Arzie
Customer Service

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 5/6/02

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-007	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanine M Yant

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 4/24/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITT ACTIO	
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B
7	PHIV-13005-007	0							X		Certification that HDPE flat stock meets material requirements per section 13005		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Mike Godber - Approver	64				
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Bill Zebick	64				
Don Pfister	45				

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000439

RECEIVED BY: Michael M Godber DATE: 5/08/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
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DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FT 4942

ORIGINAL

4942

COMPRESSION POLYMERS GROUP
801 Corey Street • Moosic, PA 18507 • (570) 346-8797 • Fax: (570) 346-5080

April 17, 2002

Plastic Fusion Fab
3455 Stanwood Blvd
Huntsville, AL 35811

Attn: Mickey

This is to certify that on your PO# 5446, our invoice #057611 we shipped 46 sheets of 1" x 48 x 120", HDPE pipe grade Union Carbide resin DGDB-2480 Black 3408. These sheets conform to ASTM 1248, Type III, Grade P34, Class C, Category 5. This material was manufactured in Moosic, Pennsylvania.

If you have any further questions, please feel free to contact me.

Sincerely,

Jenn Arzie
Customer Service

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 5/08/02

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

JCS 5/13/02

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-008	REV.: 1	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Grant

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 5/13/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-008	1 JCS 5-10-02							X		Certification that no reclaimed polymer was added to resin during manufacturing of the products used for this project		X	X	13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Mike Godbar - Approver	64				
Chuck Van Arsdale	64				
Kwasi Badu-Tweneboah	38				
Bill Zebick	64				
Don Kister	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

VIRGIN HDPE MEANS NO RECLAIMED POLYMER.

ORIGINAL

000144

RECEIVED BY: Michael Galles DATE: 5/13/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

484 2

FS-F-1955
Rev. 3: 05/14/1999, CT-2.4.2

4942

COMPRESSION POLYMERS GROUP
801 Corey Street • Moosic, PA 18507 • (570) 346-8797 • Fax: (570) 346-5080

May 7, 2002

Plastic Fusion Fab
3455 Stanwood Blvd
Huntsvill, Al 35811

Attn: Mickey

This is to certify that on your PO# 5446, our invoice #057611 we shipped 46 sheets of 1" x 48 x 120 virgin HDPE pipe grade Union Carbide resin DGDB-2480 Black 3408. These Sheets conform to ASTM 1248, Type III, Grade P34, Class C, Category 5. This material was manufactured in Moosic, Pennsylvania.

If you have any further questions, please feel free to contact me.

Sincerely,

Jenn Arzie
Customer Service

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 5/29/02

INFORMATION ONLY

Rinker Materials
PolyPipe®
1050 Industrial Drive South
Erwin, TN 37650

Phone: 423-743-9116 Fax: 423-743-8419

4942

PRODUCT CERTIFICATION

Delivery / Picking Number: 8005485621

Ship To:	SAME		Customer:	PLASTIC FUSION FABRICATORS
				3455 Stanwood Blvd.
				Huntsville, AL 35811
				256/852-0378
				256/852-0388

Dear Customer:

Rinker Materials PolyPipe® certifies that the listed piping products were produced from resins and concentrates as determined by and defined in ASTM D3350. Routine in-plant inspection, quality control sampling, and long term testing meets or exceeds the customer specifications or standards listed below:

	API Spec 15LE
	AWWA C901 / C906
	Factory Mutual per Rinker Materials PolyPipe® MS-1116
	NSF 14 / 61
	NSF 61
	IAPMO
X	ASTM D2513
	Customer Specification
X	PPI Rating for PE 3408
	PE2406 Type II, Grade P24 Category 5 with Cell Classification of 234363C, D or E HDB 1250 @ 23° C
X	PE3408 Type III, Grade P34 Category 5 with Cell Classification of 345464C, D or E HDP 1600 @ 23° C

Deleted:

Products: P.O. #P05518 SHIP DATE: 04/09/02
1,200.00 FT. 6"IPS SDR 11.0 BLK 40'

Certified By: Tim Moore Position: Q.A. Lab Tech Date: 04/16/02

Deleted: 08/28/2001

7.10.12
Issued by: Terry L. Bryant
Approved by: Allison Crabtree
Issue Date: 10/13/1998
Revision: 09/05/2001

Rinker Materials
PolyPipe®
1050 Industrial Drive South
Erwin, TN 37650

Phone: 423-743-9116 Fax: 423-743-8419

4942

PRODUCT CERTIFICATION

Delivery / Picking Number: 8004018838

Ship To:	SAME		Customer:	PLASTIC FUSION FABRICATORS
				3455 Stanwood Blvd.
				Huntsville, AL 35811
				256/852-0378
				256/852-0388

Dear Customer:

Rinker Materials PolyPipe® certifies that the listed piping products were produced from resins and concentrates as determined by and defined in ASTM D3350. Routine in-plant inspection, quality control sampling, and long term testing meets or exceeds the customer specifications or standards listed below:

____ API Spec 15LE
____ AWWA C901 / C906
____ Factory Mutual per Rinker Materials PolyPipe® MS-1116
____ NSF 14 / 61
____ NSF 61
____ IAPMO
X ASTM D2513
____ Customer Specification
X PPI Rating for PE 3408
____ PE2406 Type II, Grade P24 Category 5 with Cell Classification of 234363C, D or E HDB 1250 @ 23° C
X PE3408 Type III, Grade P34 Category 5 with Cell Classification of 345464C, D or E HDP 1600 @ 23° C

Deleted:

Products: P.O. #PO5121 SHIP DATE: 11/19/01
640.00 FT. 10"IPS SDR 11.0 BLK 40'

Certified By: Tim Moore Position: Q.A. Lab Tech Date: 04/16/02

Deleted: 08/28/2001

7.10.12
Issued by: Terry L. Bryant
Approved by: Allison Crabtree
Issue Date: 10/13/1998
Revision: 09/05/2001

SUPPLIER DOCUMENT SUBMITTAL

JLS 6/13/02

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-010	REV.: ~~0~~ 1	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Yant

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 5/13/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-010	~~0~~ 1 JLS 5/13/02						X			Detailed shop drawings of liner boxes Type I, Type II, Type III, and Type IV showing box component dimensions, location of welds, weld types, and material tolerances		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
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Gregg Johnson	604				
Bill Zebick	604				
Mike Godber	604				
Kwasi Badu-Tweneboah	38				
Don Pfister					

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000145

ORIGINAL

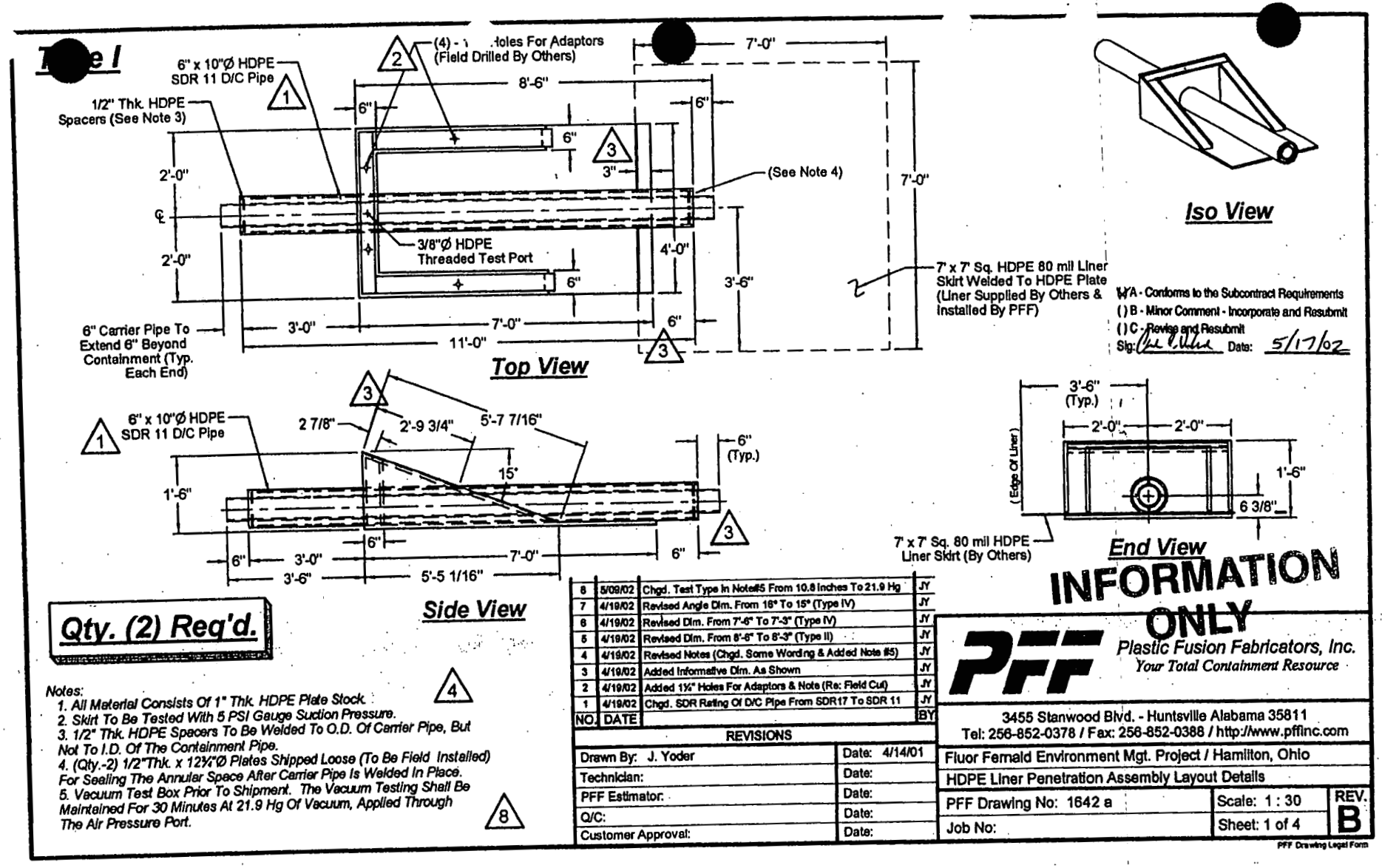
RECEIVED BY: [illegible] DATE: 5/17/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

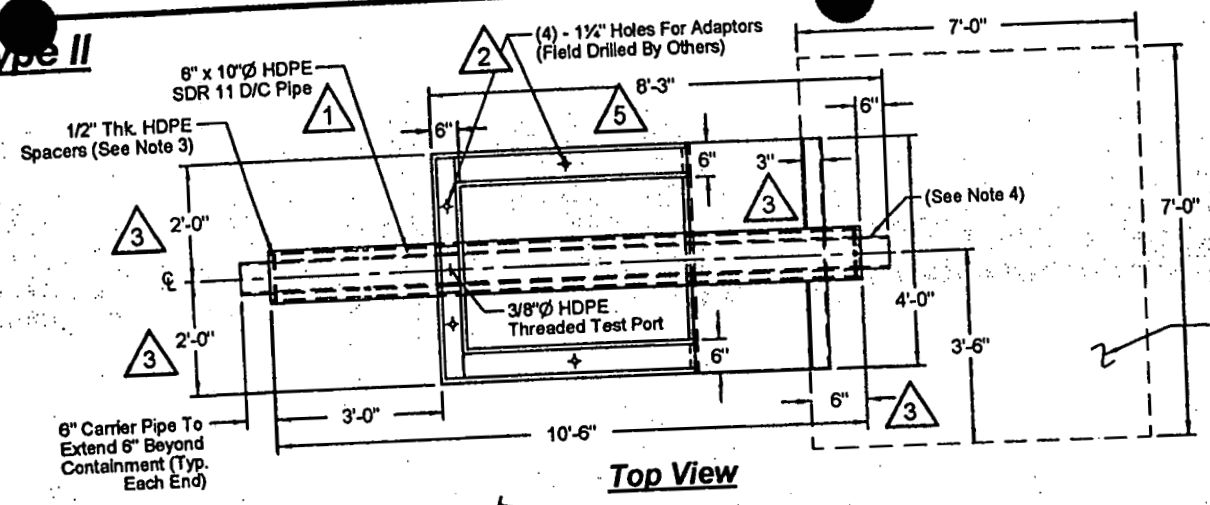
4942


Type I
6" x 10"Ø HDPE SDR 11 D/C Pipe
1/2" Thk. HDPE Spacers (See Note 3)
(4) - 1 .1oles For Adaptors (Field Drilled By Others)
8'-6"
7'-0"
6"
3"
(See Note 4)
2'-0"
3/8"Ø HDPE Threaded Test Port
4'-0"
3'-6"
7' x 7' Sq. HDPE 80 mil Liner Skirt Welded To HDPE Plate (Liner Supplied By Others & Installed By PFF)
6" Carrier Pipe To Extend 6" Beyond Containment (Typ. Each End)
3'-0"
11'-0"
Top View
Iso View
W/A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 5/17/02
2 7/8"
2'-9 3/4"
5'-7 7/16"
15°
1'-6"
6" (Typ.)
5'-5 1/16"
Side View
3'-6" (Typ.)
(Edge Of Liner)
6 3/8"
7' x 7' Sq. 80 mil HDPE Liner Skirt (By Others)
End View
Qty. (2) Req'd.
Notes:
1. All Material Consists Of 1" Thk. HDPE Plate Stock.
2. Skirt To Be Tested With 5 PSI Gauge Suction Pressure.
3. 1/2" Thk. HDPE Spacers To Be Welded To O.D. Of Carrier Pipe, But Not To I.D. Of The Containment Pipe.
4. (Qty.-2) 1/2"Thk. x 12¾"Ø Plates Shipped Loose (To Be Field Installed) For Sealing The Annular Space After Carrier Pipe Is Welded In Place.
5. Vacuum Test Box Prior To Shipment. The Vacuum Testing Shall Be Maintained For 30 Minutes At 21.9 Hg Of Vacuum, Applied Through The Air Pressure Port.
NO. DATE BY
8 5/09/02 Chgd. Test Type In Note#5 From 10.8 Inches To 21.9 Hg JY
7 4/19/02 Revised Angle Dim. From 18° To 15° (Type IV) JY
6 4/19/02 Revised Dim. From 7'-6" To 7'-3" (Type IV) JY
5 4/19/02 Revised Dim. From 8'-6" To 8'-3" (Type II) JY
4 4/19/02 Revised Notes (Chgd. Some Wording & Added Note #5) JY
3 4/19/02 Added Informative Dim. As Shown JY
2 4/19/02 Added 1¾" Holes For Adaptors & Note (Re: Field Cut) JY
1 4/19/02 Chgd. SDR Rating Of D/C Pipe From SDR17 To SDR 11 JY
REVISIONS
Drawn By: J. Yoder Date: 4/14/01
Technician: Date:
PFF Estimator: Date:
Q/C: Date:
Customer Approval: Date:
INFORMATION ONLY
PFF
Plastic Fusion Fabricators, Inc.
Your Total Containment Resource
3455 Stanwood Blvd. - Huntsville Alabama 35811
Tel: 256-852-0378 / Fax: 256-852-0388 / http://www.pffinc.com
Fluor Fernald Environment Mgt. Project / Hamilton, Ohio
HDPE Liner Penetration Assembly Layout Details
PFF Drawing No: 1642 a
Scale: 1 : 30
Job No:
Sheet: 1 of 4
REV. B
PFF Drawing Legal Form

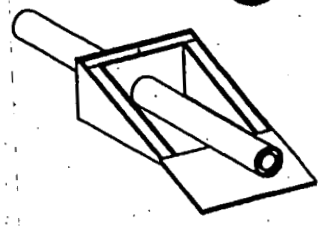
000146

4942

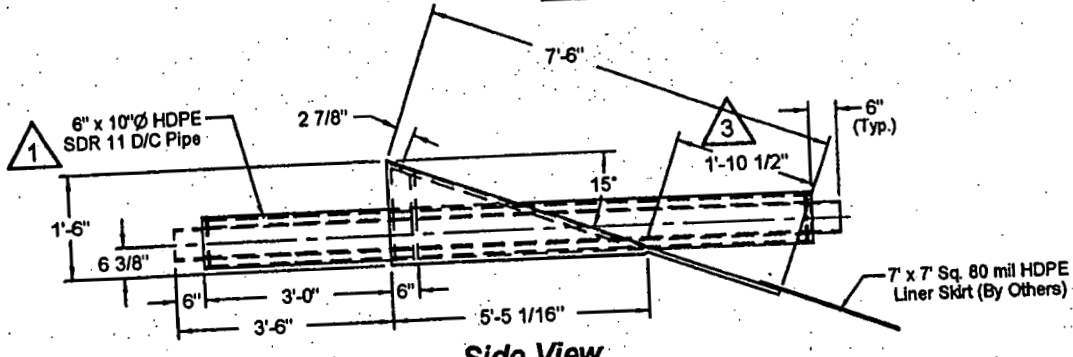
Type II



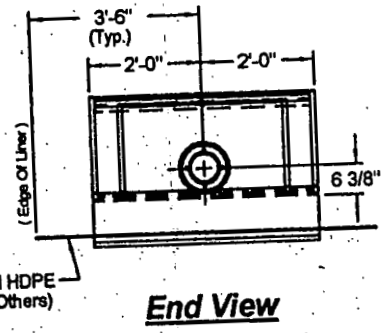
Top View



Iso View



Side View



End View

Notes:
1. All Material Consists Of 1" Thk. HDPE Plate Stock.
2. Skirt To Be Tested With 5 PSI Gauge Suction Pressure.
3. 1/2" Thk. HDPE Spacers To Be Welded To O.D. Of Carrier Pipe, But Not To I.D. Of The Containment Pipe.
4. (Qty.-2) 1/2"Thk. x 12¾"Ø Plates Shipped Loose (To Be Field Installed) For Sealing The Annular Space After Carrier Pipe Is Welded In Place.
5. Vacuum Test Box Prior To Shipment. The Vacuum Testing Shall Be Maintained For 30 Minutes At 21.9 Hg Of Vacuum, Applied Through The Air Pressure Port.

Qty. (4) Req'd.

Customer Approval: | Date:

Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

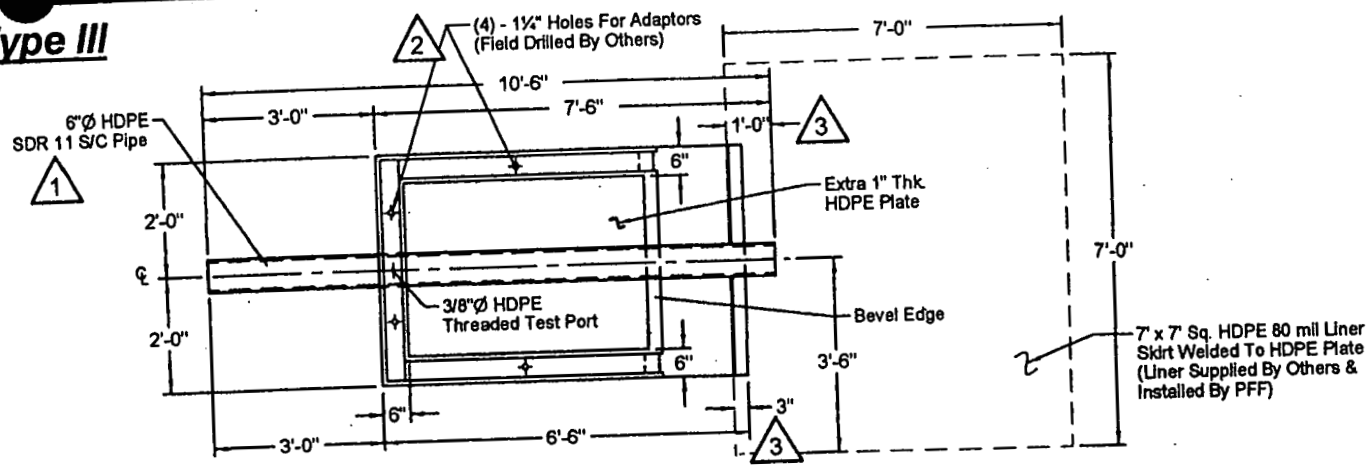
PFF Drawing No: 1642 b	Scale: 1 : 30	REV. B
Job No:	Sheet: 2 of 4	

PFF Drawing Legal Form

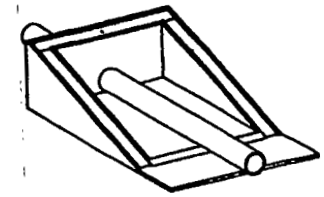
000147

4942

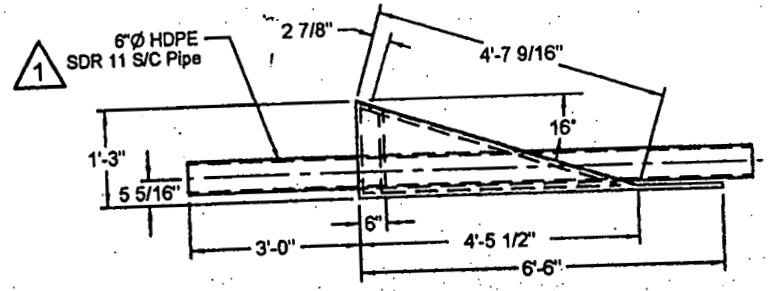
Type III



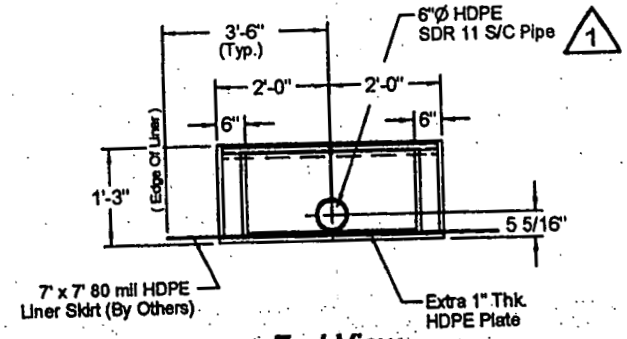
Top View



Iso View



Side View



End View

Notes:
1. All Material Consists Of 1" Thk. HDPE Plate Stock.
2. Skirt To Be Tested With 5 PSI Gauge Suction Pressure.
3. 1/2" Thk. HDPE Spacers **Not Required On This Structure.**
4. (Qty.-2) 1/2"Thk. x 12¾"Ø Plates **Not Required On This Structure.**
5. Vacuum Test Box Prior To Shipment. The Vacuum Testing Shall Be Maintained For 30 Minutes At 21.9 Hg Of Vacuum, Applied Through The Air Pressure Port.

Qty. (2) Req'd.

Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

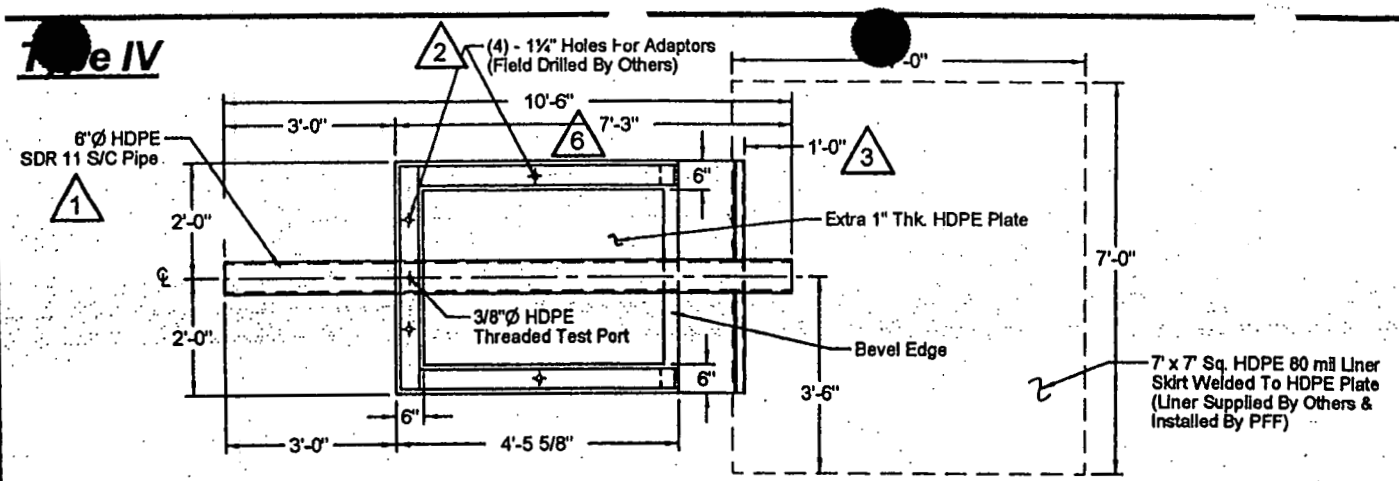
PFF Drawing No: 1642 c		Scale: 1 : 30	REV. B
Job No:		Sheet: 3 of 4	
Customer Approval:	Date:		

PFF Drawing Form A

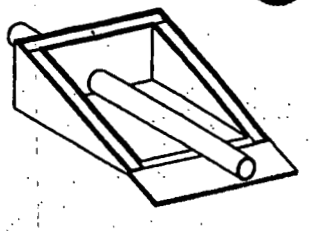
000148

4942

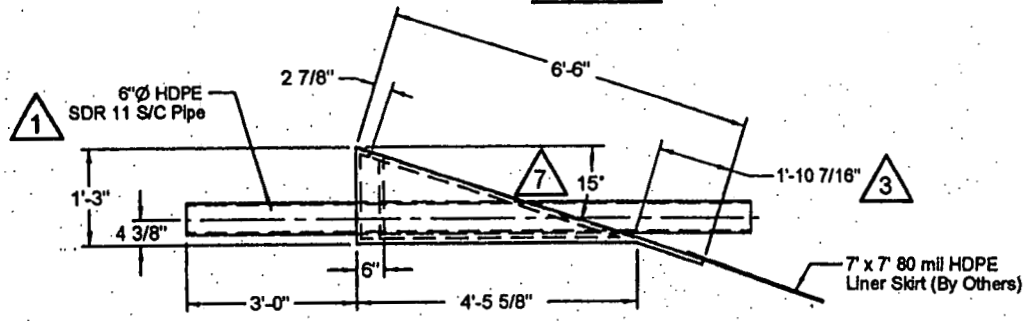
Type IV



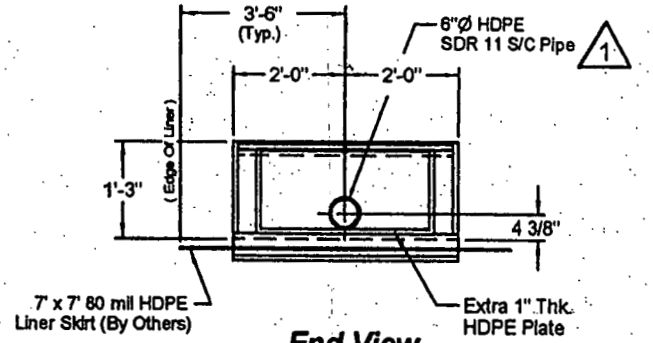
Top View



Iso View



Side View



End View

Notes:
1. *All Material Consists Of 1" Thk. HDPE Plate Stock.*
2. *Skirt To Be Tested With 5 PSI Gauge Suction Pressure.*
3. *1/2" Thk. HDPE Spacers Not Required On This Structure.*
4. *(Qty.-2) 1/2"Thk. x 12¾"Ø Plates Not Required On This Structure.*
5. *Vacuum Test Box Prior To Shipment. The Vacuum Testing Shall Be Maintained For 30 Minutes At 21.9 Hg Of Vacuum, Applied Through The Air Pressure Port.*

Qty. (2) Req'd.

PFF — Plastic Fusion Fabricators, Inc.
Your Total Containment Resource

PFF Drawing No: 1642 d		Scale: 1 : 30	REV. B
Customer Approval:	Date:	Job No:	Sheet: 4 of 4

PFF Drawing Form A

000149

4942

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-012	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanice M Yount

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 4/24/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-012	0						X			Detailed handling and storing instructions			X	13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Chuck VanAredale - Approver	64				
Gregg Johnson	64				
Bill Zebick	64				
Mike Godber	64				
Kwasi Bodu-Twenebrah	38				
Don Pfister	45				

RECEIVED
MAY 13 2002

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

0004150

RECEIVED BY: Chuck C. VanAredale DATE: 5/6/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ORIGINAL

PLASTIC FUSION FABRICATORS, INC.
THERMOPLASTIC CONSULTING FABRICATION INSTALLATION
3455 STANWOOD BLVD.
HUNTSVILLE, AL 35811
256/852/0378 BUS
256/852/0388 FAX

Part 1 - SHIPPING PREPARATION AND PACKING INSTRUCTIONS

1.1 This procedure will follow the terms and conditions as outlined by Plastic Fusion Fabricators, Inc. (PFF).

1.2 The liner penetration boxes will be packaged on a wood pallet banded with 1" steel bands.

1.3 In the event additional marking or labeling is required in order to identify the shipment: **Do not use staples, nails, or any other means which could potentially penetrate the plastic liner.** PFF highly recommends the use of shipping or duct tape to attach additional information to the fabricated components.

1.4 Package size and weight as follows: **See Packing List attached.**

1.5 All precaution in handling should be taken to prevent damage to the liner penetration boxes.

Part 2 - INSTRUCTIONS FOR LIFTING AND TRANSPORT

2.1 The liner penetration boxes may be lifted by Conventional forklift (or equal) with a lifting capacity of 3,000 lbs. or more and forks that extend a minimum of five (5) feet. Strongly recommend the use of leather work gloves for each individual handling material during offload. Do not attempt to lift or move liner penetration boxes by the pipe penetration.

Part 3 – STORAGE

3.1 The fabricated components should be stored in an environment that is clean, dry, level and protected against direct sun radiation. The temperature shall not be less than 50°F (10°C) and not more than 90°F (32°C).

3.2 The fabricated components should not be stacked nor should any objects be placed on top of them.

3.4 Efforts should be made to protect the fabricated components from high traffic areas to avoid damage.

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: [illegible] Date: 5/6/02

INFORMATION ONLY

SUPPLIER DOCU SUBMITTAL

JWS 5/13/02

F PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-013	REV.: 1	4/22/2002	Page 1 of 1

OM:
stic Fusion Fabricators, Inc.
55 Stanwood Blvd
untsville, AL 35811
GNATURE: Jeanine M Yant

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Linda Schwab DATE: 5/13/02

TY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION A	B
7	PHIV-13005-013	1 JWS 5/13/02						X			Fabricator's Quality Assurance Procedures including spark testing of geomembrane liner and pneumatic testing of liner penetration boxes		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
~~Chuck Van Arsdale - Approver~~	64				
Gregg Johnson	64				
Bill Zebrick	64				
Mike Godwer	64				
Kevin Pardu - Turnerbaah	38				
Don Pfister	45				

D COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

000152

CEIVED BY: Chuck Van Arsdale DATE: 5/17/02

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INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

VACUUM TESTING LINER PENETRATION BOXES

1) Insure that all testing equipment is in good order and free from leaks. To obtain inches of mercury at O degrees C multiply psi by 2.036.

2) Connect vacuum pump hose to air/vacuum test adapter. Insure test valve is in the "open" position prior to testing. Vacuum pump must be capable of producing 25 in Hg. Start vacuum pump and observe gauge. Once gauge reads the specified psi of 10.8 or vacuum of 21.9 close air/vacuum test adapter valve and turn off vacuum pump. DO NOT EXCEED 14.7 PSI. Migration of the vacuum through the annulus of the liner penetration box may be a timely process. If required this procedure may be repeated several times in order to reach the specified psi or vacuum. Allow the box to stand under vacuum for a minimum of 5 minutes before attempting to adjust pressure setting. Once the pressure has stabilized, adjust psi or vacuum by opening air/vacuum test adapter valve, if required, to the desired psi or vacuum. Close valve upon obtaining desired vacuum. Allow to stand for 30 minutes. No noticeable drop in vacuum should be observed for the test to be deemed acceptable.

3) If a leak is detected locate it and contact PFF (Plastic Fusion Fabricators, Inc.) IMMEDIATELY! The leak can be located with the use of ultrasonic leak detector. See attached sheets for an example of such a device.

4) Upon completion of test, document test time and pressure. Before removing test follow the simple step-by-step procedure provided.

   Step 1: Release vacuum pressure from sump annulus first! **DO NOT ATTEMPT TO REMOVE TEST FITTINGS UNTIL ALL VACUUM PRESSURE IS RELEASED FROM SUMP ANNULUS. INJURY TO HANDS (FINGERS) COULD OCCUR.**

   (X) Conforms to the Subcontract Requirements
   ( ) B - Minor Comment - Incorporate and Resubmit
   ( ) C - Revise and Resubmit
   Sig: [illegible] Date: 5/17/02

   Step 2: Remove air/vacuum test adapter. Test is now complete.

INFORMATION ONLY

Please contact Plastic Fusion Fabricators, Inc. at 1-800-356-1480 with any questions or concerns pertaining to the information provided above.

PLASTIC FUSION FABRICATORS, INC.
CONSULTING • FABRICATION • INSTALLATION
3455 Stanwood Blvd • Huntsville, AL 35811 • 256-852-0378 • FAX 256-852-0388
www.pffinc.com

This is to prevent any moisture buildup between the sheet to be welded an/or to provide consistent rate of speed for the wedge welding device.

3.3.7 Nondestructive Seam Continuity Testing

3.3.7.1 Concept

PFF shall nondestructively test all field seams over their full length using a vacuum test unit, air pressure testing, or other approved method. (Vacuum testing is described in section 3.3.7.2 and air pressure testing is described in section 3.3.7.3). The purpose of nondestructive tests is to check the continuity of seams. It does not provide information on seam strength. Continuity testing shall be carried out as the seaming work progresses, not at the completion of all field seaming. Spark testing, as described in section 3.3.7.5, is an alternate method of nondestructive testing that is used in corners, around penetrations and other areas where vacuum testing or air pressure testing cannot be performed.

N/A

3.3.7.2 Vacuum Testing

The equipment shall be comprised of the following:

A vacuum box assembly consisting of a rigid housing, a transparent viewing window, and a soft neoprene gasket attached to the bottom;

A steel vacuum tank and pump assembly equipped with a pressure controller gauge to indicate chamber vacuum, and pipe connections;

A rubber pressure/vacuum hose with fittings and connections;

A bucket and wide brush, mop or spray assembly;

A soapy solution;

The following procedures shall be followed:

Energize the vacuum pump and reduce the tank pressure to approximately 5 psi (10 inches. of HG.);

Wet a strip of geomembrane approximately 12 inches by 48 inches (0.3 m by 1.2 m) with the soapy solution;

Place the box over the wetted area;

Close the bleed valve and open the vacuum valve;

Ensure that a leak tight seal is created;

For a period of approximately 5 to 10 seconds, examine the geomembrane through the viewing window for the presence of soap bubbles;

If no bubble appears after 10 to 15 seconds, close the vacuum valve and open the bleed valve, move the box over the next adjoining area with a minimum 3 inches (75 mm) overlap, and repeat the process;

All areas where soap bubbles appear shall be marked and repaired in accordance with Section 3.4.

3.3.7.3

PRESSURE TEST SPECIFICATIONS FOR DUAL TRACK HOT WEDGE WELDS

Test Pressure (After 5 Min.) PSI Max. Pressure

Sheet Thickness	Min.	Max.	Drop Allowed
30 mil	24	30	5 PSI
40 mil	24	30	5 PSI
60 mil	27	30	3 PSI
80 mil	27	30	3 PSI
100 mil & thicker	30	32	2 PSI

3.3.7.4 Air Pressure Testing (For Double Fusion Seam Only)

The equipment shall be comprised of the following:

an air pump (manual or motor driven) equipped with pressure gauge capable of generating and sustaining a minimum pressure of 25 psi (160 kPa);

a rubber hose with fittings and connections;

a sharp hollow needle, or other approved pressure feed device.

The following procedures shall be followed:

seal both ends of the seam to be tested;

insert needle or other approved pressure feed device into the tunnel created by the fusion weld;

energize the air pump to a minimum pressure of 25 psi (160 kPa), close valve, and sustain pressure for approximately five minutes;

if loss of pressure exceeds above listed values, or does not stabilize, locate faulty area and repair in accordance with Section 3.4;

remove needle or other approved pressure feed device and seal.

3.3.7.5 Spark Testing

The equipment shall be comprised of the following:

SUPPLIER DOCUMENT SUBMITTAL

OF PROJECT NO.: 20104

CONTRACT NO: PHIV

SUBMITTAL NO. 20104-PHIV--13005-015

REV.: 0

DATE: ~~6/22/02~~ 6-11-02

ROM:
astic Fusion Fabricators, Inc.
155 Stanwood Blvd.
Huntsville, AL 35811
GNATURE: Jeanice M Yount

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 6/18/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-015	0						X			Results of Fabricator Quality Control Test		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Chuck Van Arsdale - Approver	64				
Gregg Johnson	64				
Bill Zebick	64				
Mike Godber	64				
Kwasi Bodu-Tweneboah	38				
Don Hister	45				

O COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000156

CEIVED BY: Chuck Van Arsdale DATE: 6/20/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

FS-F-4955
Rev. 3: 05/14/1999. CT-2.4.2

ORIGINAL

PLASTIC FUSION FABRICATORS, INC.
THERMOPLASTIC CONSULTING FABRICATION INSTALLATION
3455 STANWOOD BLVD.
HUNTSVILLE, AL 35811
256/852/0378 BUS
256/852/0388 FAX

Date: June 12, 2002
FLUOR FERNALD
PFF Job F2158

The following are the testing methods used for the liner penetration boxes and the results of these test.

Each liner skirt was spark and vacuum tested. The spark test was performed using a Wegner spark tester model Weg 20 (PPM MK3). The vacuum test was performed using an American Testing vacuum box at five psi.

The vacuum test of the box was performed using a Dayton pump. The test was held for thirty minutes at twenty three inches of mercury.

Results as follows:

1642a; drawing type 1; PFF designation A: Liner was spark and vacuum tested on 5/23/02 by Randy Nickelson. No defects were found during testing. The box was vacuum tested on 6/11/02 by John Yant. No defects were found during testing.

1642a; drawing type 1; PFF designation B: Liner was spark and vacuum tested on 5/24/02 by Randy Nickelson. No defects were found during testing. The box was vacuum tested on 6/11/02 by John Yant. No defects were found during testing.

1642b; drawing type 2; PFF designation A: Liner was spark and vacuum tested on 5/28/02 by Randy Nickelson. No defects were found during testing. The box was vacuum tested on 6/11/02 by John Yant. No defects were found during testing.

1642b; drawing type 2; PFF designation B: Liner was spark and vacuum tested on 5/29/02 by Randy Nickelson. No defects were found during testing. The box was vacuum tested on 6/11/02 by John Yant. No defects were found during testing.

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [illegible] Date: 6/20/02

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHASE IV

SUBMITTAL NO.: 20104-PH IV-13005-016

REV.: 0

DATE: 8/05/02

Page ___ of ___

FROM: FLUOR FERNALD

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

SIGNATURE: [signature]

RECEIVED BY: Teresa Schwab DATE: 8/6/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-13005-016							X			DETAILED INSTALLATION PROCEDURES FOR LINER PENETRATION BOXES.		X					

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC 1	52-7				
CHUCK VAN ATSDALE (APPROVER)	MS 64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI-BADU TWENEBOAH	33				
DON PFISTER	45				

RECEIVED
AUG 0 3 2002

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

0001558

RECEIVED BY: [signature] DATE: 8/8/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
REV. 3: 05/14/1999. CT-2.4.2

PROCEDURE FOR THE INSTALLATION OF PENETRATION BOXES

1.0 EXCAVATION

- Do not install liner penetration boxes until the CQC Consultant completes performance testing and confirmation of compliance of underlying layers, including acceptance of Contractor's survey results for underlying layers.
- Notify the Construction Manager a minimum of 2 working days prior to the start of liner penetration box installation.
- Excavate compacted clay liner and granular drainage material to the lines and grades shown on the Construction Drawings for placement of liner penetration boxes. Minimize over excavation and disturbance of the compacted clay liner and granular drainage material.

2.0 BOX INSTALLATION

- Grade compacted clay liner surface and granular drainage material surface under the foot print of the box on which liner penetration box is to be installed. Make surface smooth to obtain close contact between compacted clay liner and liner penetration box. Recompact material in accordance with Section 2225 and regrade if contact occurs between the bottom of the box and the compacted clay liner surface.
- Apply bentonite granules at a rate of 1 lb/ft^2 over the compacted clay liner under the footprint of the box.
- Install the penetration box at the locations and elevation shown of the Construction Drawings.
- Join the section of pipe between liner penetration boxes and Enhanced Permanent Leachate Transmission System Valve Houses using butt-fusion welding as specified in Section 2605.
- Backfill around LCS, LCS redundant, and LDS pipes in accordance with Sections 2215 and 2225 using soil bentonite mix.
- Backfill around liner penetration boxes using soil-bentonite mixture and compact in accordance with the requirements of Section 2225. Fill any interface between the compacted clay liner and liner penetration box with bentonite granules.
- Air pressure test the liner penetration box after they have been backfilled. The boxes shall be tested at a 21.9 inches of vacuum pressure.
- After the vacuum pressure test has passed, install 1.25 inch diameter bentonite fill holes at locations shown on the Construction Drawings and fill chamber of each liner penetration box with bentonite granules. After bentonite filling is complete, seal each hole with HDPE extrudate

placed with extrusion welding equipment as specified in Section 02770.

- Weld geomembrane to each penetration box skirt as soon as air pressure testing, surveying, and bentonite filling are complete.

3.0 VACUUM TESTING PENETRATION BOXES

- Insure that all testing equipment is in good order and free from leaks.
- Connect vacuum pump hose to air/vacuum test adapter. Insure test valve is in the "open" position prior to testing. Vacuum pump shall be capable of producing 25 in. Hg. Start vacuum pump and observe gauge. Once gauge reads the specified vacuum of 21.9 inches and close the test adapter valve. Turn off the vacuum pump.
- Migration of the vacuum through the annulus of the liner penetration box may be a timely process. If required this procedure may be repeated several times in order to reach the specified vacuum.
- Allow the box to stand under vacuum for a minimum of 5 minutes before attempting to adjust pressure setting. Once the pressure has stabilized adjust the vacuum by opening the test adaptor valve to achieve the desire vacuum pressure.
- Close the valve upon obtaining desired vacuum. Allow to stand for 30 minutes. No noticeable drop in vacuum should be observed for the test to be deemed acceptable.
- In the event an unexplainable pressure loss occurs, excavate the liner penetration box and investigate for leaks and perform necessary repairs. Replace any liner penetration box that has a pressure leak if the leak cannot be found and repaired.

4.0 CONSTRUCTION QUALITY REQUIREMENTS

- CQC Consultant will monitor installation of liner penetration boxes in accordance with this Section and the Construction Quality Assurance (CQA) Plan.
- CQC Consultant will monitor air pressure testing of liner penetration boxes to confirm and document compliance with this Section.

5.0 SURVEY CONTROL

- The penetration boxes shall be surveyed to confirm the tolerances are within 0.1 feet vertical and 0.5 feet horizontal for any dimension shown on the Construction Drawings for the liner penetration boxes.

SUPPLIER DOCUMENT SUBMITTAL

DF PROJECT NO.: 20104 | CONTRACT NO: PHIV | SUBMITTAL NO. 20104-PHIV--13005-017 | REV.: 1 | ~~4/22/2002~~ 6-11-02 | Page 1 of 1

ROM:
lastic Fusion Fabricators, Inc.
455 Stanwood Blvd
Huntsville, AL 35811
IGNATURE: Jeanice M Yost

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 6/17/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B
7	PHIV-13005-017	1							X		Certification from the Fabricator that material and fabricated liner penetration boxes meet the requirements of section 13005		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Mike Godber - Approver	64				
Chuck Van Arsdale	64				
Kwasi Badu-Tweneboah	38				
Bill Zebick	64				
Don Pfister	45				

COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000161

CEIVED BY: Michael W. Godley DATE: 6/18/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

4942

FS-F-4933
Rev. 3: 05/14/1999 CT-2.4.2

PLASTIC FUSION FABRICATORS, INC.
THERMOPLASTIC CONSULTING FABRICATION INSTALLATION
3455 STANWOOD BLVD.
HUNTSVILLE, AL 35811
256/852/0378 BUS
256/852/0442 FAX

FINAL ACCEPTANCE
SHOP FABRICATION

Job No. F2158
Owner: D.O.E.
G.C.: Fluor Fernald, Inc. – P.O. # 02FF0623
Project: U. S. Department of Energy
Site Location: 7400 Willey Road, Hamilton, OH 45013-9402

Plastic Fusion Fabricators, Inc. has completed a final inspection on this 11 day of June, 2002. PFF hereby certifies that all components related to this project have been fabricated as specified in strict accordance with job requirements and specifications. This Final Acceptance documents job completion and does not serve to void any prior agreement regarding workmanship warranty or guarantee.

I, Mike Godfrey of Fluor Fernald have observed the vacuum pressure testing and agree that testing was done in accordance with the specifications of the submittals.

☐ HDPE Liner Penetration Boxes

Owner Designated Representative — Date: June 11, 2002

PFF Designated Representative — Date: June 11, 2002

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 6/18/02

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--13005-018	REV.: 0	4/22/2002	Page 1 of 1

FROM:
Plastic Fusion Fabricators, Inc.
3455 Stanwood Blvd
Huntsville, AL 35811
SIGNATURE: Jeanie M Hunt

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 4/24/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITT ACTIO A	B
7	PHIV-13005-018	0							X		Certification that welders are qualified to perform extrusion welding		X		13005-1.04	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	M
ECDC	52-7				
Mike Godber - Approver	64				
Chuck VanArsdale	64				
Kwasi Badu-Tweneboah	38				
Bill Zebick	64				
Don Phister	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

001463

RECEIVED BY: Michael W Godber DATE: 5/08/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

FS-F-4955
Rev. 3: 05/14/1999 CT-2.4.2

4942

Company: PFF
Welder: Danny Askins
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9/24/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.981	0.204	0.2	596	2980	2978
C2	0.978	0.2	0.1956	597	3050	
C3	0.974	0.202	0.1967	599	3040	
C4	0.972	0.194	0.1886	556	2950	
C5	0.982	0.192	0.1885	560	2970	
1	0.975	0.198	0.193	554	2870	96%
2	0.978	0.196	0.1917	529	2760	92
3	0.969	0.196	0.1899	520	2740	91
4	0.974	0.198	0.1929	530	2750	92
5	0.979	0.198	0.1938	530	2740	91
6	0.983	0.196	0.1927	531	2760	92
7	0.972	0.196	0.1905	525	2750	92
8	0.981	0.196	0.1923	530	2760	92
9	0.982	0.196	0.1925	531	2760	92
10	0.981	0.195	0.1913	520	2720	91
Ave.			0.1927	547	2840	
SD			0.00306	28.7	123.4	

10/10 ≥ 90% of Control = PASS

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 5/08/02

INFORMATION ONLY

Company: PFF
Welder: Kevin Grove
Plastic: HDPE
Weld: extruder
Date: 8/16/01
<Not Defined>:

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.961	0.194	0.1864	526	2820	2798
C2	0.98	0.196	0.1921	536	2790	
C3	0.988	0.197	0.1946	546	2800	
C4	0.994	0.2	0.1988	552	2780	
C5	0.975	0.195	0.1901	533	2800	
1	0.984	0.198	0.1948	516	2650	95%
2	0.982	0.198	0.1944	528	2710	97
3	0.978	0.194	0.1897	515	2710	97
4	0.988	0.195	0.1927	519	2690	96
5	0.983	0.194	0.1907	520	2730	98
6	0.99	0.198	0.196	519	2650	95
7	0.987	0.194	0.1915	520	2720	97
8	0.986	0.194	0.1913	525	2740	98
9	0.974	0.197	0.1919	521	2720	97
10	0.982	0.194	0.1905	523	2750	98
Ave.			0.1924	527	2740	
SD			0.003	10.8	53.9	

10/10 > 80 % of control
all welds held, none broke before plastic yield

PASS

Company: PFF
Welder: T. Harris
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-17-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	1	0.194	0.194	536	2760	
C2	0.954	0.195	0.186	516	2780	
C3	0.998	0.194	0.1936	548	2830	2812
C4	0.97	0.198	0.1921	546	2840	
C5	0.992	0.198	0.1964	560	2850	
1	0.989	0.194	0.1919	505	2630	94%
2	0.974	0.194	0.189	503	2660	95
3	0.986	0.193	0.1903	502	2640	94
~~4~~	~~0.985~~	~~0.986~~	~~0.971~~	~~513~~	~~528~~	
5	0.988	0.195	0.1927	512	2660	95
6	0.971	0.197	0.1913	503	2630	94
7	0.974	0.197	0.1919	505	2630	94
8	0.986	0.194	0.1913	510	2660	95
9	0.98	0.196	0.1921	503	2620	93
10	0.978	0.197	0.1927	501	2600	92
11	0.981	0.194	0.1903	510	2680	95
Ave.			0.24	517	2560	
SD			0.1949	19.27	549	

10/10 = 90% of Control

PASS

Company: PFF
Welder: Kevin Knoell
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-19-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	1.051	0.194	0.204	585	2870	2860
C2	1.052	0.194	0.204	580	2840	
C3	1.052	0.194	0.204	585	2860	
C3	1.04	0.194	0.202	576	2860	
C4	1.051	0.194	0.204	586	2870	
1 ~~C5~~	1.046	0.194	0.203	552	2720	95%
2	1.047	0.194	0.203	556	2740	96
3	1.04	0.194	0.202	554	2750	96
4	1.045	0.194	0.203	553	2730	95
5	1.044	0.194	0.203	551	2720	95
6	1.049	0.194	0.204	553	2720	95
7	1.038	0.194	0.201	551	2740	96
8	1.048	0.194	0.203	554	2720	95
9	1.053	0.194	0.204	551	2700	94
10	1.043	0.194	0.202	549	2710	95
Ave.			0.203	562	2770	
SD			0.000946	14.85	68	

10/10 ≥ 94% of control = PASS
Excellent

Company: PFF
Welder: M. Lavrik
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 10/2/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	1.045	0.198	0.207	597	2890	2908
C2	1.044	0.195	0.204	606	2980	
C3	1.037	0.196	0.203	589	2900	
C4	1.054	0.195	0.206	590	2870	
C5	1.051	0.196	0.206	597	2900	
1	1.044	0.195	0.204	564	2770	95%
2	1.048	0.195	0.204	565	2760	95
3	1.041	0.195	0.203	559	2760	95
4	1.041	0.195	0.203	571	2810	97
5	1.052	0.194	0.204	561	2750	95
6	1.054	0.194	0.204	568	2780	96
7	1.045	0.197	0.206	565	2740	94
8	1.045	0.194	0.203	558	2750	95
9	1.046	0.194	0.203	565	2780	96
10	1.04	0.195	0.203	553	2730	94
Ave.			0.204	574	2810	
SD			0.00135	17.11	75.8	

10/10 ≥ 94% of Control = PASS

Company: PFF
Welder: Randy Nickelson
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-18-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.998	0.196	0.1956	554	2830	
C2	0.992	0.193	0.1915	557	2910	
C3	0.975	0.198	0.193	545	2820	2858
C45	0.982	0.196	0.1925	552	2870	
C5	0.988	0.196	0.1936	555	2860	
1	0.988	0.194	0.1917	509	2650	93%
2	0.984	0.193	0.1899	514	2710	94
3	0.986	0.194	0.1913	518	2710	94
4	0.985	0.193	0.1901	517	2720	95
5	0.987	0.193	0.1905	516	2710	94
6	0.989	0.194	0.1919	519	2710	94
7	0.99	0.193	0.1911	521	2730	96
8	0.982	0.194	0.1905	511	2680	94
9	0.993	0.195	0.1936	520	2680	94
10	0.965	0.196	0.1891	495	2620	92
Ave.			0.1917	527	2750	
SD			0.001714	20	88.4	

10/10 ≥ 90% of Control

PASS

Company: PFF
Welder: Jerry D. Salard
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9/24/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.976	0.2	0.1952	537	2750	2768
C2	0.972	0.199	0.1934	534	2760	
C3	0.99	0.198	0.196	551	2810	
C4	0.985	0.2	0.197	546	2770	
C5	0.965	0.202	0.1949	536	2750	
2	0.974	0.2	0.1948	505	2590	94 %
2	0.985	0.198	0.195	503	2580	93
3	0.982	0.199	0.1954	509	2600	94
4	0.979	0.2	0.1958	505	2580	93
5	0.99	0.198	0.196	511	2610	94
6	0.979	0.202	0.1978	510	2580	93
7	0.978	0.2	0.1956	510	2610	94
8	0.981	0.2	0.1962	512	2610	94
9	0.984	0.201	0.1978	511	2580	93
10	0.98	0.199	0.195	506	2590	94
Ave.			0.1957	519	2650	
SD			0.001155	16.67	87.5	

10/10 ≥ 93% of Control - PASS

Company: PFF
Welder: Don Sanders
Plastic: HDPE
Weld Type: Extruder
tested by: MIKE
date: 9/27/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.99	0.2	0.198	542	2740	
C 2	0.986	0.198	0.1952	539	2760	
C3	0.988	0.198	0.1956	539	2760	2764
C4	0.986	0.192	0.1893	522	2760	
C5	0.97	0.194	0.1882	526	2800	
1	0.972	0.196	0.1905	493	2590	94%
2	0.985	0.196	0.1931	505	2620	95
3	0.978	0.197	0.1927	511	2650	96
4	0.981	0.194	0.1903	500	2630	95
5	0.984	0.195	0.1919	497	2590	94
6	0.952	0.194	0.1847	483	2620	95
7	0.977	0.194	0.1895	489	2580	93
8	0.984	0.194	0.1909	493	2580	93
9	0.981	0.196	0.1923	503	2620	95
10	0.988	0.196	0.1936	504	2600	94
Ave.			0.1917	510	2660	
SD			0.00328	19.41	78.8	

10/10 ≥ 93% of Control = PASS

Company: PFF
Welder: J. K. Wade
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-18-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	1.032	0.204	0.211	576	2730	
C2	1.044	0.201	0.21	585	2790	
C3	1.044	0.202	0.211	585	2780	2848
C4	1.033	0.195	0.201	598	2970	
C5	1.034	0.196	0.203	602	2970	
1	1.045	0.2	0.209	567	2710	95%
2	1.036	0.198	0.205	561	2730	96
3	1.032	0.198	0.204	559	2740	96
4	1.044	0.197	0.206	557	2710	95
5	1.008	0.197	0.1986	539	2710	95
6	1.039	0.2	0.208	569	2740	96
7	1.042	0.199	0.207	560	2700	95
8	1.045	0.2	0.209	557	2660	93
9	1.028	0.198	0.204	555	2730	96
10	1.04	0.199	0.207	555	2680	94
Ave.			0.206	568	2760	
SD			0.00358	17.47	91.2	

10/10 Z 93% of Control

PASS

Company: PFF
Welder: Keith Ward
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-18-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.992	0.194	0.1924	535	2780	2782
C2	0.962	0.198	0.1905	538	2830	
C3	0.988	0.198	0.1956	549	2800	
C4	0.988	0.194	0.1917	523	2730	
C5	0.99	0.195	0.193	535	2770	
1	0.981	0.194	0.1903	520	2730	98 %
2	0.98	0.195	0.1911	516	2700	97
3	0.98	0.194	0.1901	519	2730	98
4	0.994	0.196	0.1948	521	2670	96
5	0.991	0.195	0.1932	525	2710	97
6	0.99	0.195	0.193	520	2690	97
7	0.986	0.194	0.1913	522	2730	98
8	0.984	0.195	0.1919	522	2720	98
9	0.983	0.195	0.1917	522	2730	98
10	0.992	0.194	0.1924	524	2720	98
Ave.			0.1922	526	2740	
SD			0.001579	8.95	41.4	

10/10 ≥ 96 % of Control
Excellent
PASS

U

4942

Company: PFF
Welder: Sammy White
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9-17-01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	1.044	0.186	0.1942	560	2890	2900
C2	1.043	0.186	0.194	562	2900	
C3	1.043	0.196	0.204	595	2910	
C4	1.038	0.197	0.204	588	2880	
C5	1.039	0.197	0.205	598	2920	
1	1.041	0.191	0.1988	535	2690	93%
2	1.043	0.189	0.1971	541	2750	95
3	1.039	0.192	0.1995	533	2670	92
4	1.046	0.191	0.1998	542	2710	93
5	1.043	0.192	0.2	536	2680	92
6	1.048	0.19	0.1991	537	2700	93
7	1.05	0.193	0.203	539	2660	92
8	1.043	0.191	0.1992	535	2690	93
9	1.042	0.189	0.1969	538	2730	94
10	1.041	0.192	0.1999	528	2640	91
Ave.			0.1997	551	2760	
SD			0.00335	24	104.6	

10/10 ≥ 90% of Control
PASS

Company: PFF
Welder: A. Wilson
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 10/2/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.922	0.204	0.1881	520	2760	2854
C2	0.965	0.199	0.192	551	2870	
C3	0.979	0.204	0.1997	552	2760	
C4	0.964	0.199	0.1918	563	2930	
C5	0.963	0.199	0.1916	566	2950	
1	0.963	0.201	0.1936	528	2730	96%
2	0.961	0.202	0.1941	524	2700	95
3	0.98	0.202	0.198	538	2720	95
4	0.963	0.202	0.1945	526	2710	95
5	0.967	0.202	0.1953	537	2750	96
6	0.967	0.202	0.1953	524	2680	94
7	0.944	0.201	0.1897	521	2750	96
8	0.962	0.204	0.1962	530	2700	95
9	0.969	0.201	0.1948	514	2640	93
10	0.963	0.195	0.1878	489	2600	91
Ave.			0.1935	532	2750	
SD			0.00338	19.84	98.3	

10/10 ≥ 90% of control = PASS

Company: PFF
Welder: Bruce Yarbrough
Plastic: HDPE
Weld Type: Extruder
tested by: Jim
date: 9/25/01

Sample Number	Width in	Thk in	CS Area in²	Max lbf	Max psi	
C1	0.964	0.201	0.1938	586	3020	3020
C2	0.975	0.2	0.195	597	3060	
C3	0.965	0.201	0.194	584	3010	
C4	0.95	0.2	0.19	568	2990	
C5	0.977	0.2	0.1954	590	3020	
1	0.972	0.199	0.1934	552	2850	94
2	0.975	0.199	0.194	562	2900	96
3	0.978	0.198	0.1936	560	2890	96
4	0.974	0.199	0.1938	554	2860	95
5	0.971	0.2	0.1942	561	2890	96
6	0.969	0.2	0.1938	562	2900	96
7	0.974	0.197	0.1919	561	2920	97
8	0.963	0.199	0.1916	557	2910	96
9	0.977	0.2	0.1954	559	2860	95
10	0.974	0.2	0.1948	556	2850	91
Ave.			0.1937	567	2930	
SD			0.001473	14.5	71.7	

10/10 ≥ 99% of Control = PASS
Excellent

Contractor/Installer's Submittals

Installer's Qualifications and Resumes

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-001	REV.: 0	DATE: 7/11/02	Page 1 of 3

FROM:
FLUOR FERNALD

SIGNATURE: Chuck C. VanAnde for Jerry Foster

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Jeannie Rosa DATE: 7-11-02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-001	0						X			Layoth drawings for geomembrane & GCL installation		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000149

RECEIVED BY: Chuck C. VanAnde DATE: 7/12/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

4942

ON-SITE DISPOSAL FACILITY
PHASE IV

A - Conforms to the Subcontract Requirements
B - Minor Comment - Incorporate and Resubmit
C - Revise and Resubmit
Sig: Date: 7/12/02

The Istre Co.
13811 S. Poplar Place
Glenpool, OK 74033

Submittal No. 20104 - PHIV-02770-001
Revision 0, 7/11/2002

Document No. PHIV- 02770-001
Revision 0

ECDC CONTROLLED
COPY NO. 76896

Title/Description: Layout Drawings for Geomembrane & GCL Installation

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104

CONTRACT NO: PHIV

SUBMITTAL NO. 20104-PHIV--02770-002 | REV.: 0 | DATE: 7/08/02 | Page 1 of 2

FROM: FLUOR FERNALD

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

SIGNATURE: SHWOLINSKY 7/8/02

RECEIVED BY: Teresa Schwab DATE: 7/9/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-002	0					X				Geomembrane, GCL, etc. Installation Schedule			X	02770-1.04	✓		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK (APPROVER)	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

RECEIVED BY: Bill Zebick DATE: 7/12/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

0001881

4942

ES-F-4955

Cell 4 & 5 Liner Construction Sequence
Work East Side and then West Side

07/03/2002 13:39

	ES	EF
C	6/12	8/2
L		
G1	8/14	8/21
S1	8/21	8/26
L		
T	9/9	9/17
G2	9/23	9/25
S2	9/27	10/2
G3	10/3	10/6
Wedge	10/7	10/11
Sacrif	10/14	10/15
Catch	10/7	10/11
Haul Rd	10/9	10/11
12"	10/14	10/25
24"	10/28	11/22

	ES	EF
C	7/22	8/16
L		
G1	8/29/	9/3
S1	9/4	9/9
L		
T	9/19	9/25
G2	9/26	9/30
S2	10/3	10/8
G3	10/11	10/15
Catch	10/16	10/22
Wedge	10/16	10/22
Sacrif	10/24	10/25
Haul Rd	10/18	10/22
12"	10/23	11/7
24"	11/8	12/9

Cell #4 West
3

Cell #4 East
1

C = Clay
L = Liner
G = Geotextile
S = Stone
T = Testing

Cell #5 West
4

Cell #5 East
2

INFORMATION ONLY

	ES	EF
C	7/10	7/12
L		
G1	8/1	8/5
S1	8/6	8/13
L		
T	8/26	9/3
G2	9/4	9/6
S2	9/12	9/20
G3	9/23	9/29
Wedge	9/30	10/4
Sacrif	10/7	10/8
12"	10/14	10/25
24"	10/28	11/22

	ES	EF
C	7/11	7/10
L		
G1	8/6	8/8
S1	8/13	8/20
L		
T	9/5	9/11
G2	9/16	9/18
S2	9/24	9/26
G3	9/30	10/4
Wedge	10/14	10/18
Sacrif	10/21	10/22
12"	10/23	11/7
24"	11/8	12/9

NOTE: 7/15 - 8/16 (1 Liner Crew)
8/19 - 9/10 (2 Liner Crews)

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Bill Zebell Date: 7/12/02

4942

0001182

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-003	REV.: 0	DATE: 6/23/02	Page 1 of 2

FROM:
FLUOR FERNALD

SIGNATURE: [signature] 6/23/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: [signature] DATE: 6/27/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-003	0						X			Installer's letter of approval from geosynthetic material manufacturer		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: ____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000183

ORIGINAL

RECEIVED BY: [signature] DATE: 7/3/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ES-F-4955
Rev. 3: 05/14/1999 CT-2.4.2

4942

GSE®

GSE Lining Technology, Inc.

19103 Gundle Road
Houston, Texas 77073
800-433-7000
281-443-8564
Fax: 281-875-6518

June 3, 2002

The Istre Company
13811 S. Poplar Pl.
Glenpool, OK 74033

Attn: Jerry Istre

CERTIFICATION

This is to certify that **The Istre Company** is an approved and authorized Dealer and installer of GSE products. As an authorized Dealer of GSE, **The Istre Company** has been provided with a copy of GSE's proprietary product manual containing the data sheets of all GSE's products, and the GSE Field Installation quality assurance manual. As an authorized Dealer of GSE, **The Istre Company** has access to GSE's Technical Department representatives who can respond to questions on specifications and installation techniques. Individual employees of authorized GSE Dealer may have participated in training programs sponsored by GSE at its headquarters in Houston, Texas.

Regards,

David Leggett
V.P. of Dealer Sales

DL:db

INFORMATION ONLY

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 7/3/02

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-004	REV.: 0	DATE:	Page 1 of

FROM:
FLUOR FERNALD

SIGNATURE: Chuck Van Arsdale for Jerry Johnson

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Jeannie Rada DATE: 7-11-02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-004	0						X			Geomembrane & GCL installation work plan		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000185

RECEIVED BY: Chuck C. Van Arsdale DATE: 7/12/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

RS R 4955

INSTALLATION WORK PLAN

The Istre Company

Equipment to be Used

1 Equipment Trailer
2. 2 Crew Vehicles
3. 4 Fusion Machines
4. 3 Extruder Kits
5. 1 Tensiometer
6. 2 Vacuum Boxes
7. 5 Generators With Cords (to meet Secion 5.0 requirments
8. 4 Pressure Gauges
9. 20 Sets of Clanps
10. Cutting Tools with Pouches
11. Electric powered leaf blower
12. Wet and Dry Vacuum Cleaner
13. Geotextile Sewing Machine

ECDC CONTROLLED
COPY NO. 76896

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: [illegible] Date: 7/12/02

The Istre Company

Work Plans

1. GCL Refer to section 02772
2. Geomembrane Refer to section 02770
3. Geotextiles Refer to section 02714

The work plan will be enforced to the specifacations

Also refer to Submittal #20104-PHIV-02770-012 for geomembrane installation methods and coordination of geomembrane installation with installation of geotextile and GCL

GSE

GSE Lining Technology, Inc.

RECOMMENDED HANDLING AND STORAGE PROCEDURES

HANDLING

1. Material manufactured by GSE Lining Technology, Inc. is provided on flat, wound rolls in three approximate sizes:
   22.5 ft (6.75 m) wide and 2 ft (600 mm) in diameter, 2800 lbs (1275 kg)
   24.0 ft (7.32 m) wide and 2 ft (600 mm) in diameter, 3500 lbs (1610 kg)
   34.5 ft (10.5 m) wide and 2 ft (600 mm) in diameter, 4400 lbs (2025 kg)
   Actual roll dimensions are provided when material is shipped.

2. To assist in handling, two (2) lifting straps are supplied with each roll. For effective handling, a lifting bar (not supplied) 8.2 ft (2.5 m) long must be used to lift the rolls for loading and unloading.

3. Extreme care must be used in crane handling so that damage to the edges of the rolls does not occur during handling.

4. If other handling equipment is used which could come into direct contact with the material, care should be exercised to assure the material is not damaged or punctured.

STORAGE

1. The material is manufactured to be suitable for outdoor installation; therefore, covered storage is not required. **Caution:** If high winds, hail or other adverse environmental conditions are expected, covered storage may be considered to assure the material is not damaged. Also, where local conditions warrant protection from theft or vandalism, consideration should be given to storage in a secured area.

2. The ground surface on which the material is stored should be similar in character to the area to be lined. It should be free of all debris, rocks and other protrusions which could damage the liner material.

3. Rolls can be stored by stacking one on top of the other. The recommended maximum number of rolls which can be stacked on top of one another is five (5) rolls, *i.e*, five high.

4. Boxes of welding rod should not be left outside but stored in a secure, dry, covered area.

12 Shipping, Handling and Storage

12.1 All lot and roll numbers should be recorded and compared to the packing list. Each roll of GCL should also be visually inspected during unloading to determine if any packaging has been damaged. Damage, whether obvious or suspected, should be recorded and marked.

12.2 Major damage suspected to have occurred during transit should be reported immediately to the carrier and to CETCO. The nature of the damage should also be indicated on the bill of lading with the specific lot and roll numbers.

12.3 The party directly responsible for unloading the GCL should refer to this manual prior to shipment to ascertain the appropriateness of their unloading equipment and procedures. Unloading and on-site handling of the GCL should be supervised to ensure these goals are achieved. Roll dimensions and weights will vary with the dimensions of the product ordered.

12.4 Rolls should be stacked in a manner that prevents them from sliding or rolling from the stacks. This can be accomplished by frequent chocking of the bottom layer of rolls. Rolls should be stacked no higher than the height at which the spreader bar assembly can be safely handled by laborers (typically no higher than four). Rolls should never be stacked on end.

12.5 Rolls should be stored at the job site away from high-traffic areas but sufficiently close to the active work area to minimize handling. The designated storage area should be flat, dry and stable. Moisture protection of the GCL is provided by its packaging; however, an additional tarpaulin or plastic sheet is recommended.

NOTICE: This document is intended for use as a GENERAL GUIDELINE for the installation of CETCO's GCLs. The information and data contained herein are believed to be accurate and reliable. CETCO makes no warranty of any kind and accepts no responsibility for the results obtained through application of this information.

1500 West Shure Drive | Arlington Heights, IL | 60004-1440 | TEL 800.527.9948 | FAX 847.577.5571

©2001, CETCO

TNS MILLS, INC.

Geotextile Division

Installation Procedure
Geotextile Fabrics

I. Geotextile Unloading & Storage:

A. The geotextile shall be labeled, stored, and handled in accordance with ASTM D 4873, "Guide for Identification, Storage and Handling of Geotextiles".

B. Geotextile rolls are to be unloaded under supervision of the geotextile installer using straps or other devices that will prevent damage to the geotextile material.

C. The geotextile shall be kept dry and wrapped in a waterproof wrapping so that it is protected from UV light and the elements during shipping and storage. Torn wrapping shall be repaired within 48 hours using an approved protective covering.

D. Rolls should be stored on supports that will not damage the material. The material must be elevated at least 2 inches above the sub grade.

E. If any material is found to be damaged during unloading, a notation should be made as to the roll number, location of damage and type. This information should be given to the Project Manager.

The Istre Company

Daily average Material Installation

1. GCL 48,000 sf Per Day
2. Geomembrane 48,000 sf Per Day
3. Geotextile 60,000 sf Per Day

Quality Assurance

See Submittal #2004-PHIV-02770-012
for quality assurance methods and procedures

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.:	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV-02770-005	REV.: 1	DATE: 8/16/02	Page 1 of 2

FROM:
The Istre Company

SIGNATURE: [illegible] 8/16/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 8/19/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02770-005	1						X			Resume of new QA Inspector			X	02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

000192

RECEIVED BY: [illegible] DATE: 8/27/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ES-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

THE ISTRE COMPANY

Hal White
Q C Tech
Resume
Employed May 2002 thru present

Bavarian Landfill – Walton, KY
Solmax 40 Mill Textured
GCL
380,000 Sq. Ft. – May 2002

Waste Services of the Bluegrass, KY
Solmax 60 Mill Textured
Geocomposite
297,000 Sq. Ft. – May 2002

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: _____ Date: 8/27/07

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: [illegible]04	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-005	REV.: 0	DATE: 6/18/02	Page 1 of 6

FROM:
FLUOR FERNALD

SIGNATURE: 6/18/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 6/19/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-005	0						X			Resumes of geosynthetic material installation contractor project manager, superintendent, and QC manager			X	02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000194

RECEIVED BY: Chuck C. Van Arsdale DATE: 6/24/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

FS-F-4955
Rev. 3: 05/14/1999 CT-2 4 2

ORIGINAL

THE ISTRE COMPANY

Liner Specialist

13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

4942

Jerry Istre – Personal Resume

Formatted: Level 1

1. City of Dayton, WY – Dayton, WY – 12 Mil Phillips 50,000 sf Sewage Lagoon
2. BFI – Atlanta City, NJ – Poly America – 40 Mil 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cell
3. Ft. Howard Paper Co. – Savannah, GA. – 40 & 60 Mil Poly America 3,000,000 sf Sludge Ponds
4. Kaiser Aluminum – New Orleans, La.- 40 Mil Poly America 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cap
5. Inspiration Cooper – Claypool, Az – 40 & 80 Mil Poly America 100,000 sf Acid Pond
6. Hycroft Mine – Winnamucca, NV – 40 Mil Poly America 1,000,000 sf Leach Pad
7. Perry Eng. - Leesburg, Va. – 30 Mil Poly America 1,000,000 sf Landfill Cell
8. U.S. Corps of Eng. – Fayetteville, NC – 12 Mil Phillips 150,000 sf Fuel Tank Storage
9. Summitville Mine – Summitville, CO – 60 mil Poly America 1,000,000 sf Side Slopes Leach Pad
10. Gilt Edge – Deadwood, SD – 60 mil Poly America 1,370,000 sf Geonet 650,000 sf Leach Pad
11. Rollins Enviromental Ser. - Baton Rouge, La. – 80 Mil National Seal 1,000,000 sf Geonet 500,000 sf Geogrid 500,000 sf Landfill Cell
12. Wolverine Tube - Decator, Alabama – 40 Mil National Seal 100,000 sf Acid pond
13. American Cyanamid – Leplace, La.- 20 Mil National Seal 290,000 sf 6 oz Geotextile 290,000 sf Landfill Cap
14. Builders Transport – Dallas Texas – XR-5 national Seal 10,000 sf Tank Containment
15. Manada Const.- Newburg, Pa.- 40 Mil National Seal 211,000 sf Sludge Ponds
16. Cheveron - St James La. – 100 Mil 40,000 sf Tank Containment
17. Ethal Corp -. Baton Rouge, La.- 30 Mil National Seal 500,000 sf 6 oz Geotextile 500,000 sf Landfill Cell
18. Manada Const. – Newburg, Pa.- 60 Mil Poly America 3,000,000 sf Sludge ponds
19. Sun Times – Aurora, IL- 20 Mil Poly America 200,000 sf Landscape Pond
20. Peters Const. – Granite City, IL.- 60 Mil Poly America 1,200,000 sf Landfill Cell
21. Viet Const.- Grove MN - 40 Mil Poly America 250,000 sf Storm Drain Lagoon
22. IL. State – West Chicago, IL- 30 Mil Poly America 70,000 sf 6 oz Geotextile 70,000 sf HWY Containment
23. Wayne Disposal – Belleville, Mi.- 80 Mil Poly America 650,000 sf 6 oz Geotextile 650,000 sf Geonet 650,000 sf Medical Waste Landfill Cell
24. City of Indianapolis – Indianapolis IN.- 60 Mil Poly America 400,000 sf 6 oz Geotextile 400,000 sf Landfill Cell

Deleted: -

INFORMATION ONLY

(X) A - Conforms to the Subcontract Requirements
( ) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: Date: 6/24/02

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

25. NB Power – New Castle New Brunswick, Canada – 60 Mil 500,000 sf 6 oz Geotextile 500,000 sf Tank Farm
26. Sydny Steel – Sydny Nova Scotia, Canada – 60 Mil GSE 50,000 sf 6 oz Geotextile 50,000 sf Product Pond

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

27. Bruin Lagoon – Bruin Lagoon, Pa. – GSE – 200,000 sf 6 oz Geotextile 200,000 sf Landfill Cell
28. USA Steel – Pueblo Co. – GSE – 30 Mil 1,300,000 sf Landfill Cell
29. Hudson Electric – Newburg, NY GSE 60 Mil 1,300,000 sf Geocomposit 1,300,000 sf Gunseal 500,000 sf Landfill Cap and Cell
30. BFI – New Orleans, La. – Drisco Pipe SDR-11 12 Miles of Laterials 6 oz Geotextile 950,400 sf – Methane System
31. Muni of Coboconk – Coboconk, Onterio, Canada – GSE – 60 Mil 800,000 sf Lagoons
32.Muni of Tamagami – Tamagami, Onterio, Canada – GSE – 60 Mil 250,000 sf Lagoon
33. NS Power – North /Sydney, Nova Scotia, Canada – GSE – 60 mil 1,300.000 sf 8 oz Gextile 1,300,000 sf Leach Pad
34. Muni. Of Glecien – Glecien, Alberta, Canada, - GSE – 60 Mil 500,000 sf Lagoon
35. Muni. Of Tamagami – Tamagami, Onterio, Canada – GSE – 80 Mil 250,000 sf lagoon
36. Uniroyal – Elmira, Ont. Canada – GSE – 60 Mil 170,000 sf 6 oz Geotextile 340,000 sf Building Containment
37. Gyr Const. Clyde River NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
38.FBD – Coral Habor, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
39. Gyr Const. – Igloolic, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
40. USA Waste – Bethlaham, NH. – GSE – 60 Mil 500.000 sf 8 oz Geotextile 500,000 sf Landfill Cell
41. Terrafix – Lacdubonnie, Manitoba, Canada GSE – 60 Mil 400,000 sf 6 oz Geotextile 800,000 sf Landfill Cell
42. Nortuck Const. – Arviet NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
43. Hovat Const. – Coral Harbor, NWT Canada - GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
44. EB Eddie – Espenola, Ont. Canada - GSE – 80 Mil 500,000 sf 8 oz Geotextile 500,000 sf Acid Pond
45. Muni. Of Rangely – Rangely, Me.- GSE – 300,000 sf Lagoon
46. Muni of Yarmouth – yarmouth, Ma. – GSE – 40 Mil 500,000 sf Landfill Cap
47.CF Industries – Bartow, Florida – GSE – 40 Mil 1,500,000 sf Mine Cap
48. Cargil – Bartow, Florida – GSE – 80 Mil 60,000 sf Building Roofs
49. C.F. Industries – Bartow, Florida – GSE – 60 Mil 60,000 sf Sumps
50. Labbie and Sons – Brunswick, ME. – GSE – 375,000 sf Landfill Cap
51. City of Warren – Warren ME. – GSE – 300,000 sf Geocomposit 300,000 sf Landfill Cap

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

4942

Tracy Beebout
Q C Manager
Resume
Employed Sept 2000 thru present

DOE - Piketon, Ohio
Solmax 80 Mill Smooth
300,000 Sq. Ft. - September 2000

Petro Environmental - DOE - Piketon, Ohio
GSE 40 Mill Smooth
500,250 Sq. Ft. - May 2000

Envirocon
U. S. Steel - Clairton, PA.
Solmax 40 Mill Textured
695,000 Sq. Ft. - December 2000

Fernald - Ross, Ohio
GSE 60 Mill Textured
291,000 Sq. Ft. - August 2001

TVA - Muscle Shoals, AL
Solmax 40 Mill Smooth
410,000 Sq. Ft. - September, 2001

Wingate – Ft. Lauderdale, Fl
GSE 40 Mill Textured & Smooth
330,000 Sq. Ft. – June 2001

FMC – Meadville, Pa
Solmax 40 Mill Smooth
258,000 Sq. Ft. – December 2001

Baverian – Walton, Ky
Solmax 40 Mil Textured
380,000 Sq. Ft – May 2002

Waste Services- Georgetown, Ky
Solmax 60 Mil Textured
297,000 Sq. Ft.- 2002

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SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20...	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV-02770-006	REV.: 2	DATE: 8/16/02	Page 1 of 2

FROM:
The Istre Company

SIGNATURE: Chuck C. Van Arsdale 8/16/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 8/19/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02770-006	2						X			Resume of new seamer			X	02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64			C	
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

0001199

RECEIVED BY: Chuck C. Van Arsdale DATE: 8/27/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

T-4942

FS-F-4955
Rev. 3: 05/14/1999 CT-2.4.2

THE ISTRE COMPANY

Todd Beebout
Welding Tech
Resume
Employed May 2002 thru present

Bavarian Landfill – Walton, KY
Solmax 40 Mill Textured
GCL
380,000 Sq. Ft. – May 2002

Waste Services of the Bluegrass, KY
Solmax 60 Mill Textured
Geocomposite
297,000 Sq. Ft. – May 2002

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: _____ Date: 8/27/02

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-006	REV.: 1	DATE: 7/08/02	Page 1 of 10

FROM:
FLUOR FERNALD

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

SIGNATURE: SH WOWIRSKY 7/8/02

RECEIVED BY: Teresa Schwab DATE: 7/9/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-006	1						X			Resumes of personnel performing geosyntheic material seamming operations and dates/durations of employment			X	02770-1.04		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

SEAMERS INCLUDED IN THIS SUBMITTAL HAVE FAILED DRUG TESTING AND WILL NOT BE WORKING ON PROJECT. PLEASE REPLACE RESUMES ~~AS~~ OF REPLACEMENT LABOR

ORIGINAL

000201

4942

RECEIVED BY: DATE:

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955

Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

4942

Joesph Beebout
Superientendent
Empolyed June 99 thru Present

RE: Resume

1. Fernald Ross, OH DOE Cell #3 GSE 80 Mil. 735,000 sf GCL 735,000 sf 8 oz Geotextile 1,200,000 sf
2. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf
3. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf
4. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
5. Rhode Island Cap Poly America 40 Mil. 140,000 sf
6. Long Island Cap Poly America 40 Mil. 500,000 sf
7. James Town NY Cap Poly America 60 Mil. 2,000,000 sf
8. Billerica, Ma Cap Poly America 40 Mil. 1,500,000 sf
9. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
10. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
11. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
12. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
13. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
14. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

INFORMATION ONLY

( ) A - Conforms to the Subcontract Requirements
(X) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: [illegible] Date: 7/12/02

PHONE 918-688-9241
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jpClstre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Joesph W. Beebout
Master Seamer
Empolyed Sept. 99 thru Present

RE: Resume

1. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf
2. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf
3. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
4. Rhode Island Cap Poly America 40 Mil. 140,000 sf
5. Long Island Cap Poly America 40 Mil. 500,000 sf
6. James Town NY Cap Poly America 60 Mil. 2,000,000 sf
7. Billerica, Ma Cap Poly America 40 Mil. 1,500,000 sf
8. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
10. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
11. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
12. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
13. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
14. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

PHONE 918-688-9241
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THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Skylar King
Weld Tech
Empolyed June 2001 thru Present

RE: Resume

1. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
2. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
3. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
4. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
5. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
6. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
7. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

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THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Shawn Jacobs
Weld & QC Tech
Empolyed Jan 2001 to Present

RE: Resume

1. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
2. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
3. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
4. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
5. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
6. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

PHONE 918-688-9241
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jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

4942

Todd Beebout
Weld-Tech
Empolyed Jan 2001 to Present

RE: Resume

1. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
2. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
3. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
4. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
5. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
6. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY

Justin McElhone
Weld Tech
Empolyed June 1998 to Present

RE: Resume

1. Fernald Ross, OH DOE Cell #3 GSE 80 Mil. 335,000 sf and GCL. 1999
2. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf. June 2000
3. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf. June 2000
4. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf. 1998
5. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf

13. Baverian – Walton, Ky - Solmax 40 Mil Tex 380,000 sf and GCL 380,000 sf
14. Waste Services – Georgetown, Ky - Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

THE ISTRE COMPANY

David Lipps
Weld Tech
Empolyed November 1999 and June 2002 to Present

RE: Resume

1. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf. November 1999.
2. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
3. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

Hal White
Weld Tech
Empolyed June 15, 2002 to Present

RE: Resume

1. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
2. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

THE ISTRE COMPANY

Daniel White
Weld Tech
Empolyed June 15, 2002 to Present

RE: Resume

1. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
2. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 2010	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV-02770-007	REV.: 2	DATE: 8/16/02	Page 1 of 2

FROM:
The Istre Company

SIGNATURE: Chuck C. Van Arsdale 8/16/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Susan Schwab DATE: 8/19/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-007	2						X			Evidence of crew experience for new seamer in accordance with 02270		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

ORIGINAL

000211

RECEIVED BY: Chuck C. Van Arsdale DATE: 8/27/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

4942

THE ISTRE COMPANY

Todd Beebout
Welding Tech
Resume
Employed May 2002 thru present

Bavarian Landfill – Walton, KY
Solmax 40 Mill Textured
GCL
380,000 Sq. Ft. – May 2002

Waste Services of the Bluegrass, KY
Solmax 60 Mill Textured
Geocomposite
297,000 Sq. Ft. – May 2002

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: _____ Date: 8/27/02

INFORMATION ONLY

000212

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-007	REV.: 1	DATE: 7/08/02	Page 1 of 18

FROM:
FLUOR FERNALD

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

SIGNATURE: SH WOLINSKY 7/8/02

RECEIVED BY: Teresa Schwab DATE: 7/9/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION A	B	C
7	PHIV-02770-007	1						X			Evidence of geosynthetic installation contractor crew experience for superintendent, seamers, and other seaming personnel in accordance with section 02770		X		02770-1.04		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE (APPROVER)	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

SEAMERS LISTED IN THIS SUBMITTAL HAVE FAILED DRUG TESTING AND WILL NOT BE ON-SITE. PLEASE SUBMIT RESUMES OF THOSE REPLACING THEM

ORIGINAL

0002213

RECEIVED BY: _____ DATE: _____

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

1942

FS-F-4955

Liner Specialist

13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Company Resume (Sub-Contract Work)

Comanco: Tampa, Florida
Contact: mark Topp
Phone 813-988-8829
Equipment: Columbine
Jerry Istre Responsibility: Owner/Superintendent

1. IMC – Bartow, Florida – GSE 40 Mil 1,500,000 sf Mine Cap June 1997
2. Cargil – Bartow Florida – GSE 80 Mil 60,000 sf Building Roofs August 1997
3. IMC – Bartow, Florida – GSE 60 Mil 40,000 sf Sumps Sept. 1997

INFORMATION ONLY

( ) A - Conforms to the Subcontract Requirements
(X) B - Minor Comment - Incorporate and Resubmit
( ) C - Revise and Resubmit
Sig: [illegible] Date: 7/12/02

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

4942

Company Resume (Sub-Contract Work)

EDCI : Huntsville, Alabama
Contact – Ms. Diane Harris
Phone: 256-551-0372
Equipment : Poly America
Jerry Istre Responsibility: Cold Weather Consultant

1. DOE Fernald – Ross, Ohio – National Seal 80 Mil Textured 400,000 sf Landfill Cell # 1 Dec 1997
2. City of Indian Lake, New York – GSE 60 Mil 300,000 sf Landfill Cap November 1998

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Company Resume (Sub-Contract Work)

Terrafix: 425 Attwell Dr, Rexdale Onterio, Canada M9W5C4
Contact: John Mooney
Phone (416-674-0363)
Equipment: Columbine
Jerry Istre Responsibility: (Owner/Superintendent)

1. City of Warren, Maine – GSE 60 Mil 300,000 sf Geocomposit 300,000 sf Landfill Cap March 1996
2. E.B. Eddy paper Mill – Esponola, Onterio, Canada – GSE 80 Mil 500,000 sf Geocomposit 500,000 sf Acid pond
3. City of Rangly Maine – GSE 60 Mil 350,000 sf Sewage Lagoons August 1996
4. City of Yarmouth Ma. GSE 40 Mil 500,000 sf Landfill Cap Sept. 1996
5. USA Waste Bethlahem, New Hampshire – GSE 60 Mil 500,000 sf Geocomposit 500,000 sf 6 oz Geotextile 500,000 sf Landfill Cell November 1996
6. City of Southridge Ma. – GSE 60 Mil 300,000 sf landfill Cell November 1999

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Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

THE ISTRE COMPANY
Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Petro Environmental
Contact: MR. Mark Mather or Mr. Pete Mather

Phone: 513-489-6789
Equipment: Columbine
Jerry Istre Responsibility: Owner/Superintendent

DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 400,000 sf GCL 400,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell #1 Oct – Dec. 1997
DOE Fernald – Ross Ohio National Seal 80 Mil. Textured 20,000 sf Decon Pad March 1998
DOE Fernald – Ross Ohio Solmax Textured 80 Mil. Textured 750,000 sf GCL 750,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell #2 Aug. 1998
DOE Fernald – Ross Ohio HDPE pipe sdr-17 Radiological dust control system 7 Miles March-December 1998
Petro Golf Course – Columbus, Ohio HDPE pipe sdr 11 & 17 Deep water Drainage 11 Miles Feb – July 1999
DOE Fernald – Ross, Ohio GSE Textured 80 Mil 700,000 sf GCL 700,000 sf 8 oz Geotextile 1,200,000 sf Landfill Cell # 3 August 1999
ODOT - Marysville, Ohio Solmax 60 Mil Smooth 19,899 sf HWY Drainage April 2000
Reilly Tar – Dover, Ohio Solmax 60 Mil Textured 50,000 sf GCL 50,000 sf Vault Cap May 2000
DOE Piketon, Ohio GSE Textured 40 Mil Smooth 500,525 sf GCL 500,525 sf Geocomposit 500,525 sf Landfill Cap May 2000
DOE Piketon, Ohio Solmax 80 Mil Smooth 300,000 sf Geocomposit 300,000 sf Landfill Cap Sept. 2000
DOE Fernald – Ross, Ohio GSE 60 Mil Smooth 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf Landfill Cap Cell # 1 June – August 2001
DOE Fernald – Ross, Ohio GSE 80 Mil Textured 25,740 sf Landfill Cell SP-7 Dec 2001

PHONE 918-688-9241
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jpCistre@aol.com

Liner Specialist

13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Jerry Istre – Personal Resume

Formatted: Level 1

1. City of Dayton, WY – Dayton, WY – 12 Mil Phillips 50,000 sf Sewage Lagoon
2. BFI – Atlanta City, NJ – Poly America – 40 Mil 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cell
3. Ft. Howard Paper Co. – Savannah, GA. – 40 & 60 Mil Poly America 3,000,000 sf Sludge Ponds
4. Kaiser Aluminum – New Orleans, La.- 40 Mil Poly America 1,000,000 sf 6 oz Geotextile 1,000,000 sf Landfill Cap
5. Inspiration Cooper – Claypool, Az – 40 & 80 Mil Poly America 100,000 sf Acid Pond
6. Hycroft Mine – Winnamucca, NV – 40 Mil Poly America 1,000,000 sf Leach Pad
7. Perry Eng, - Leesburg, Va. – 30 Mil Poly America 1,000,000 sf Landfill Cell
8. U.S. Corps of Eng. – Fayetteville, NC – 12 Mil Phillips 150,000 sf Fuel Tank Storage
9. Summitville Mine – Summitville, CO – 60 mil Poly America 1,000,000 sf Side Slopes Leach Pad
10. Gilt Edge – Deadwood, SD – 60 mil Poly America 1,370,000 sf Geonet 650,000 sf Leach Pad
11. Rollins Enviromental Ser. - Baton Rouge, La. – 80 Mil National Seal 1,000,000 sf Geonet 500,000 sf Geogrid 500,000 sf Landfill Cell
12. Wolverine Tube - Decator, Alabama – 40 Mil National Seal 100,000 sf Acid pond
13. American Cyanamid – Leplace, La.- 20 Mil National Seal 290,000 sf 6 oz Geotextile 290,000 sf Landfill Cap
14. Builders Transport – Dallas Texas – XR-5 national Seal 10,000 sf Tank Containment
15. Manada Const.- Newburg, Pa.- 40 Mil National Seal 211,000 sf Sludge Ponds
16. Cheveron - St James La. – 100 Mil 40,000 sf Tank Containment
17. Ethal Corp -. Baton Rouge, La.- 30 Mil National Seal 500,000 sf 6 oz Geotextile 500,000 sf Landfill Cell
18. Manada Const. – Newburg, Pa.- 60 Mil Poly America 3,000,000 sf Sludge ponds
19. Sun Times – Aurora, IL- 20 Mil Poly America 200,000 sf Landscape Pond
20. Peters Const. – Granite City, IL.- 60 Mil Poly America 1,200,000 sf Landfill Cell
21. Viet Const.- Grove MN - 40 Mil Poly America 250,000 sf Storm Drain Lagoon
22. IL. State – West Chicago, IL- 30 Mil Poly America 70,000 sf 6 oz Geotextile 70,000 sf HWY Containment
23. Wayne Disposal – Belleville, Mi.- 80 Mil Poly America 650,000 sf 6 oz Geotextile 650,000 sf Geonet 650,000 sf Medical Waste Landfill Cell
24. City of Indianapolis – Indianapolis IN.- 60 Mil Poly America 400,000 sf 6 oz Geotextile 400,000 sf Landfill Cell

Deleted: -

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpCistre@aol.com

25. NB Power – New Castle New Brunswick, Canada – 60 Mil 500,000 sf 6 oz Geotextile 500,000 sf Tank Farm
26. Sydny Steel – Sydny Nova Scotia, Canada – 60 Mil GSE 50,000 sf 6 oz Geotextile 50,000 sf Product Pond

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27. Bruin Lagoon – Bruin Lagoon, Pa. – GSE – 200,000 sf 6 oz Geotextile 200,000 sf Landfill Cell
28. USA Steel – Pueblo Co. – GSE – 30 Mil 1,300,000 sf Landfill Cell
29. Hudson Electric – Newburg, NY GSE 60 Mil 1,300,000 sf Geocomposit 1,300,000 sf Gunseal 500,000 sf Landfill Cap and Cell
30. BFI – New Orleans, La. – Drisco Pipe SDR-11 12 Miles of Laterials 6 oz Geotextile 950,400 sf – Methane System
31. Muni of Coboconk – Coboconk, Onterio, Canada – GSE – 60 Mil 800,000 sf Lagoons
32. Muni of Tamagami – Tamagami, Onterio, Canada – GSE – 60 Mil 250,000 sf Lagoon
33. NS Power – North /Sydney, Nova Scotia, Canada – GSE – 60 mil 1,300.000 sf 8 oz Gextile 1,300,000 sf Leach Pad
34. Muni. Of Glecien – Glecien, Alberta, Canada, - GSE – 60 Mil 500,000 sf Lagoon
35. Muni. Of Tamagami – Tamagami, Onterio, Canada – GSE – 80 Mil 250,000 sf lagoon
36. Uniroyal – Elmira, Ont. Canada – GSE – 60 Mil 170,000 sf 6 oz Geotextile 340,000 sf Building Containment
37. Gyr Const. Clyde River NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
38. FBD – Coral Habor, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
39. Gyr Const. – Igloolic, NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
40. USA Waste – Bethlaham, NH. – GSE – 60 Mil 500.000 sf 8 oz Geotextile 500,000 sf Landfill Cell
41. Terrafix – Lacdubonnie, Manitoba, Canada GSE – 60 Mil 400,000 sf 6 oz Geotextile 800,000 sf Landfill Cell
42. Nortuck Const. – Arviet NWT Canada – GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
43. Hovat Const. – Coral Harbor, NWT Canada - GSE – 60 Mil 70,000 sf 8 oz Geotextile 70,000 sf 8 oz Geotextile 70,000 sf Tank Farm
44. EB Eddie – Espenola, Ont. Canada - GSE – 80 Mil 500,000 sf 8 oz Geotextile 500,000 sf Acid Pond
45. Muni. Of Rangely – Rangely, Me.- GSE – 300,000 sf Lagoon
46. Muni of Yarmouth – yarmouth, Ma. – GSE – 40 Mil 500,000 sf Landfill Cap
47. CF Industries – Bartow, Florida – GSE – 40 Mil 1,500,000 sf Mine Cap
48. Cargil – Bartow, Florida – GSE – 80 Mil 60,000 sf Building Roofs
49. C.F. Industries – Bartow, Florida – GSE – 60 Mil 60,000 sf Sumps
50. Labbie and Sons – Brunswick, ME. – GSE – 375,000 sf Landfill Cap
51. City of Warren – Warren ME. – GSE – 300,000 sf Geocomposit 300,000 sf Landfill Cap

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Tracy Beebout
Q C Manager
Resume
Employed Sept 2000 thru present

DOE - Piketon, Ohio
Solmax 80 Mill Smooth
300,000 Sq. Ft. - September 2000

Petro Environmental - DOE - Piketon, Ohio
GSE 40 Mill Smooth
500,250 Sq. Ft. - May 2000

Envirocon
U. S. Steel - Clairton, PA.
Solmax 40 Mill Textured
695,000 Sq. Ft. - December 2000

Fernald - Ross, Ohio
GSE 60 Mill Textured
291,000 Sq. Ft. - August 2001

TVA - Muscle Shoals, AL
Solmax 40 Mill Smooth
410,000 Sq. Ft. - September, 2001

Wingate – Ft. Lauderdale, Fl
GSE 40 Mill Textured & Smooth
330,000 Sq. Ft. – June 2001

FMC – Meadville, Pa
Solmax 40 Mill Smooth
258,000 Sq. Ft. – December 2001

Baverian – Walton, Ky
Solmax 40 Mil Textured
380,000 Sq. Ft – May 2002

Waste Services- Georgetown, Ky
Solmax 60 Mil Textured
297,000 Sq. Ft.- 2002

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Joesph Beebout
Superientendent
Empolyed June 99 thru Present

RE: Resume

1. Fernald Ross, OH DOE Cell #3 GSE 80 Mil. 735,000 sf GCL 735,000 sf 8 oz Geotextile 1,200,000 sf
2. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf
3. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf
4. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
5. Rhode Island Cap Poly America 40 Mil. 140,000 sf
6. Long Island Cap Poly America 40 Mil. 500,000 sf
7. James Town NY Cap Poly America 60 Mil. 2,000,000 sf
8. Billerica, Ma Cap Poly America 40 Mil. 1,500,000 sf
9. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
10. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
11. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
12. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
13. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
14. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Joesph W. Beebout
Master Seamer
Empolyed Sept. 99 thru Present

RE: Resume

1. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf
2. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf
3. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
4. Rhode Island Cap Poly America 40 Mil. 140,000 sf
5. Long Island Cap Poly America 40 Mil. 500,000 sf
6. James Town NY Cap Poly America 60 Mil. 2,000,000 sf
7. Billerica, Ma Cap Poly America 40 Mil. 1,500,000 sf
8. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
10. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
11. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
12. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
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14. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Skylar King
Weld Tech
Empolyed June 2001 thru Present

RE: Resume

1. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf
2. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
3. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
4. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
5. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
6. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
7. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Shawn Jacobs
Weld & QC Tech
Empolyed Jan 2001 to Present

RE: Resume

1. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
2. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
3. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
4. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
5. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
6. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

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Liner Specialist
13811 SOUTH POPLAR PLACE
GLENPOOL OKLAHOMA 74033

Todd Beebout
Weld-Tech
Empolyed Jan 2001 to Present

RE: Resume

1. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf
2. TVA – Muscle Shoals, Al Solmax 40 Mil Smth 410,000 sf
3. Wingate – Ft. Lauderdale, Fl GSE Tex & Smth 330,000 sf
4. FMC – Meadville, Pa. Solmax 40 Mil Smth 258,000 sf 10 oz Geotextile 516,000 sf
5. Baverian – Walton, Ky. Solmax 40 Mil Tex 380,000 sf and Cetco GCL 380,000 sf
6. Waste Services – Georgetown, Ky Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

PHONE 918-688-9241
Fax 918-291-2052
Cell 918-688-9241
jpClstre@aol.com

THE ISTRE COMPANY

Justin McElhone
Weld Tech
Empolyed June 1998 to Present

RE: Resume

1. Fernald Ross, OH DOE Cell #3 GSE 80 Mil. 335,000 sf and GCL. 1999
2. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf. June 2000
3. Piketon, OH DOE Cap GSE 40 Mil. 535,000 sf GCL 535,000 sf Geocomposit 535,000 sf. June 2000
4. Fernald, OH DOE Cap GSE 40 Mil. 335,000 sf GCL 335,000 sf 8 oz Geotextile 335,000 sf. 1998
5. Envirocon US Steel – Clairton, Pa. Solmax 40 Mil Tex 695,000 sf GCL 695,000 sf Geocomposit 695,000 sf

13. Baverian – Walton, Ky - Solmax 40 Mil Tex 380,000 sf and GCL 380,000 sf
14. Waste Services – Georgetown, Ky - Solmax 40 Mil Tex 297,000 sf and Geocomposit 297,000 sf

THE ISTRE COMPANY

David Lipps
Weld Tech
Empolyed November 1999 and June 2002 to Present

RE: Resume

1. Indian Lake, NY Cap Poly America 60 Mil. 300,000 sf Geocomposit 300,000 sf. November 1999.
2. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
3. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

Hal White
Weld Tech
Empolyed June 15, 2002 to Present

RE: Resume

1. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
2. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

THE ISTRE COMPANY

Daniel White
Weld Tech
Empolyed June 15, 2002 to Present

RE: Resume

1. Waste Services of The Bluegrass, Georgetown, KY – Solmax 60 Mil. Textured and Geocomposite. 522,000 sf. July 2002
2. Bavarian – Walton, KY – Solmax 40 Mil. Textured and GCL. 760,000 sf. July 2002

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-009	Rev. 0	DATE: 11/21/02	Page 1 of 2

FROM:
Jerry Istre Company

SIGNATURE: Chuck C. VanArsdale 11/21/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Linda Schwabb DATE: 11/26/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02770-009	0							X		Warranty of Geomembrane Installation			X	02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: _____ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000231

RECEIVED BY: Michael W. Godber DATE: 12/12/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ORIGINAL

FS-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

The Istre Company

Flour Fernald
7400 Willey Road
Ross, Ohio 45030

RE: Liner System Guarantee

This is to certify that The Istre Company will guarantee the workmanship of the liner system for a period of two years.

This does not include acts of vandalism, landfill failure, equipment damage or acts of God.

This guarantee will be effective from November 19, 2002 thru November 19, 2004.

Jerry Istre, Owner

INFORMATION ONLY

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Date: 12/12/02

Test Equipment Calibration

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO.: 20104	CONTRACT NO: PHIV	SUBMITTAL NO. 20104-PHIV--02770-008	Rev. 0	DATE: 7/30/02	Page 1 of 8

FROM:
Jerry Istre Company

SIGNATURE: Chuck C. VanArsdale 7/30/02

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Terri Schwab DATE: 8/1/02

			DOCUMENT FAMILY									SUBMITTAL TYPE				SUBMITTAL ACTION		
QTY	DOCUMENT NUMBER	REV	PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	DRFT	CFC	INF	ASSOCIATED SPECIFICATION	A	B	C
7	PHIV-02770-008	0							X		Certificate of calibration for field tensiometer, vacuu gauges, and pressure gauges		X	X	02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
ECDC	52-7				
CHUCK VANARSDALE	64				
GREGG JOHNSON	64				
BILL ZEBICK	64				
MIKE GODBER (APPROVER)	64				
KWASI BADU-TWENEBOAH - GEOSYNTEC	38				
DON PFISTER - DOE	45				

NO COMMENTS: X COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000234

RECEIVED BY: Michael W. Godber DATE: 8/8/02
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

4942

ORIGINAL

4942

CALIBRATION CERTIFICATE

Customer Name: THE ISTRE CO.
Tensiometer Serial Number: NAL

110 Volt [X]
220 Volt [ ]
LBS

Device Calibrated: S-Type load cell
Range: 0-500 lbs. Tension
Model No: M2300-500
Serial No: 126721

Calibration Apparatus:
Dead Weight system w/
Fluke Model 8840A Multimeter

Readout Model No: 2840AG-24123
Readout Serial No: 10553035-149
Channel No: N/A

W1	2	R1	808
W2	152	R2	2683
W3	302	R3	4557

Indicator reading with no load: 0

Applied Force lbs.	Output (mv):	Display reading:	Deviation Error:
2	2.423	2	0.00
52	4.296	52	0.00
102	6.175	102	0.00
152	8.049	152	0.00
202	9.917	202	0.00
252	11.794	252	0.00
302	13.667	302	0.00

Total Deviation Error (%): 0.00%

Temperature at time of calibration: 73 degrees F
Exitation Voltage: 10 V DC

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: Michael Jordan Date: 8/12/02

Scale Factor (1):	0.0800	Offset (1):	-63
Scale Factor (2):	0.0800	Offset (2):	-63
Break point:	2683	Calibration Check #	

Traceable to NIST Standards

INFORMATION ONLY

*NOTE: Readout and load cell above have been systems calibrated and are considered a matched pair. In general, calibrated readouts and load cells are not interchangeable.

This calibration conforms to the standards set by ASTM E4.

Calibration performed by: BILL AULTZ

Signature: Bill Aultz Date: 7/16/02

000235

JAY INDUSTRIAL TECHNOLOGIES GROUP

JayIndustrial.com

Certificate of Accuracy

Customer: ISRTE
Address: 13811 EAST POPLAR
City, State, Zip: GLENPOOL, OK. 74033

Certification Number: 1601

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			20 1005 02 L.
Range	0-100 PSIG			0 - 60 PSI
Accuracy	.05%			2 % FULL SCALE
Serial Number	AQS-12455			N / A
Date Certified	10/22/01			JULY 18, 2002

Notes: O. S. = OFF SCALE

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PSI		PSIG		
0		0		No Readable Error
5		5		No Readable Error
10		10		No Readable Error
15		15		No Readable Error
20		20		No Readable Error
25		25		No Readable Error
30		30		No Readable Error
35		35		No Readable Error
40		40		No Readable Error
45		45		No Readable Error
50		50		No Readable Error
55		55		No Readable Error
60		60		No Readable Error

Minor Division	1 PSI
Ambient Temperature	72 ° F.
Barometric Pressure	30.04 IN. HG.
Relative Humidity	52 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.
We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz Date: 7/18/02

R. Utz
Signature

Tomorrow's supply channel solution...*Today*

JAY INDUSTRIAL TECHNOLOGIES GROUP

4942

JayIndustrial.com

Certificate of Accuracy

Customer	ISRTE
Address	13811 EAST POPLAR
City, State, Zip	GLENPOOL, OK. 74033

Certification Number: 1602

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			20 1005 02 L.
Range	0-100 PSIG			0 - 60 PSI
Accuracy	.05%			2 % FULL SCALE
Serial Number	AQS-12455			N / A
Date Certified	10/22/01			JULY 18, 2002

Notes: O. S. = OFF SCALE

	Value Indicated		Deviation	
alue Applied	Before	After	Before	After
PSI		PSIG		
0		0		No Readable Error
5		5		No Readable Error
10		10		No Readable Error
15		14		- 1
20		19		- 1
25		24		- 1
30		29		- 1
35		34		- 1
40		40		No Readable Error
45		45		No Readable Error
50		50		No Readable Error
55		55		No Readable Error
60		60		No Readable Error

Minor Division	1 PSI
Ambient Temperature	72 ° F.
Barometric Pressure	30.04 IN. HG.
Relative Humidity	52 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.

We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz Date: 7/18/02

Signature

000237

JAY INDUSTRIAL TECHNOLOGIES GROUP

JayIndustrial.com

Certificate of Accuracy

Customer: ISRTE
Address: 13811 EAST POPLAR
City, State, Zip: GLENPOOL, OK. 74033

Certification Number: 1603

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			20 1005 02 L
Range	0-100 PSIG			0 - 60 PSI
Accuracy	.05%			2 % FULL SCALE
Serial Number	AQS-12455			N / A
Date Certified	10/22/01			JULY 18, 2002

Notes: O. S. = OFF SCALE

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PSI		PSIG		
0		0		No Readable Error
5		5		No Readable Error
10		10		No Readable Error
15		15		No Readable Error
20		20		No Readable Error
25		25		No Readable Error
30		30		No Readable Error
35		35		No Readable Error
40		40		No Readable Error
45		45		No Readable Error
50		50		No Readable Error
55		56		+ 1
60		O. S.		O. S.

Minor Division	1 PSI
Ambient Temperature	72 ° F.
Barometric Pressure	30.04 IN. HG.
Relative Humidity	52 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.
We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz Date: 7/18/02

Signature

Tomorrow's supply channel solution...*Today*

JAY INDUSTRIAL TECHNOLOGIES GROUP

JayIndustrial.com

Certificate of Accuracy

Customer	ISRTE
Address	13811 EAST POPLAR
City, State, Zip	GLENPOOL, OK. 74033

Certification Number: 1604

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844			
Description	ATE-PSI			PRESSURE GAUGE
Manufacturer	Ashcroft			ASHCROFT
Model Number	AQS-2			20 1005 02 L
Range	0-100 PSIG			0 - 60 PSI
Accuracy	.05%			2 % FULL SCALE
Serial Number	AQS-12455			N / A
Date Certified	10/22/01			JULY 18, 2002

Notes: O. S. = OFF SCALE

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PSI		PSIG		
0		0		No Readable Error
5		5		No Readable Error
10		10		No Readable Error
15		15		No Readable Error
20		20		No Readable Error
25		25		No Readable Error
30		30		No Readable Error
35		34		- 1
40		39		- 1
45		44		- 1
50		49		- 1
55		54		- 1
60		60		No Readable Error

Minor Division	1 PSI
Ambient Temperature	72 ° F.
Barometric Pressure	30.04 IN. HG.
Relative Humidity	52 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.

We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz

Date: 7/18/02

Signature

Tomorrow's supply channel solution...*Today*

JAY INDUSTRIAL TECHNOLOGIES GROUP

JayIndustrial.com

Certificate of Accuracy

Customer	ISTRE
Address	13811 EAST POPLAR
City, State, Zip	GLENPOOL, OK. 74033

Certification Number: 1609

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844	4229-40912		
Description	ATE-PSI	ATE-Vacuum		COMPOUND GAUGE
Manufacturer	Ashcroft	Ashcroft		ASHCROFT
Model Number	AQS-2	AQS-2		20 1005 02 L.
Range	0-100 PSIG	0-30 In. Hg. Vac.		15 PSI / 30 IN. HG. VAC.
Accuracy	.05%	.05%		2 % FULL SCALE
Serial Number	AQS-12455	AQS-4229		N / A
Date Certified	10/22/01	10/30/01		JULY 20, 2002

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PRESS. - VAC.		P. - V.		PRESS. - VAC.
PSI - IN. HG.				
0 - 0		0 - 0		No Readable Error
3 - 5		3 - 5		No Readable Error
6 - 10		6 - 10		No Readable Error
9 - 15		9 - 15		No Readable Error
12 - 20		12 - 19		0 - -1
15 - 25		15 - 23		0 - -2

Minor Division	0.5 PSI / 1 IN. HG.
Ambient Temperature	72 ° F.
Barometric Pressure	30.03 IN. HG.
Relative Humidity	48 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.

We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz Date: 7/20/02

Signature

Tomorrow's supply channel solution...*Today*

JAY INDUSTRIAL TECHNOLOGIES GROUP

JayIndustrial.com

Certificate of Accuracy

Customer	ISTRE
Address	13811 EAST POPLAR
City, State, Zip	GLENPOOL, OK. 74033

Certification Number: 1610

	Standard	Standard	Standard	Instrument Certified
NIST Number	12455-31844	4229-40912		
Description	ATE-PSI	ATE-Vacuum		COMPOUND GAUGE
Manufacturer	Ashcroft	Ashcroft		ASHCROFT
Model Number	AQS-2	AQS-2		20 1005 02 L.
Range	0-100 PSIG	0-30 In. Hg. Vac.		15 PSI / 30 IN. HG. VAC.
Accuracy	.05%	.05%		2 % FULL SCALE
Serial Number	AQS-12455	AQS-4229		N / A
Date Certified	10/22/01	10/30/01		JULY 20, 2002

Notes:

Value Applied	Value Indicated Before	Value Indicated After	Deviation Before	Deviation After
PRESS. - VAC.		P. - V.		PRESS. - VAC.
PSI - IN. HG.				
0 - 0		0 - 0		No Readable Error
3 - 4		3 - 4		No Readable Error
6 - 8		6 - 8		No Readable Error
9 - 12		9 - 12		No Readable Error
12 - 16		12 - 16		No Readable Error
15 - 24		15 - 24		No Readable Error
— - 28		— - 28		No Readable Error

Minor Division	1 PSI / 2 IN. HG.
Ambient Temperature	72 ° F.
Barometric Pressure	30.03 IN. HG.
Relative Humidity	48 %

Sales Order Number: J 220440

Customer Purchase Order Number: N / A

This instrument is certified using standards traceable to N.I.S.T.

We further certify that our calibration system complies with MIL. STD. 45662-A.

Certified By: Bob Utz Date: 7/20/02

Signature

Tomorrow's supply channel solution...*Today*

FDF PROJECT NO.: 1

CONTRACT NO: PHIV

SUBMITTAL NO. 20104-PHIV-02770-010 | REV: 1 | DATE: 9/6/02 | 1 of 12

FROM:
Leak Location Services, Inc.
16124 University Oak
San Antonio, Texas 78249

SIGNATURE: Daren Laine (Daren L. Laine)

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 9/9/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-010	1						X			Electrical Leak Detection Testing Work Plan		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Document Control					
Chuck Van Arsdale (Approver)	104				
Gregg Johnson	104				
Kwasi Badu-Twenenboah (GEOSYNTEC)	38				
Bill Zebick	104				
Mike Godber	104				
Don Pfister (DOE)	45				

NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

000242

RECEIVED BY: Chuck Van Arsdale DATE: 9/17/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

ORIGINAL

4942

LEAK LOCATION SERVICES, INC.
16124 UNIVERSITY OAK • SAN ANTONIO, TEXAS 78249 • (210) 408-1241 / FAX (210) 408-1242

TEST PLAN FOR ELECTRICAL LEAK LOCATION SURVEY OF OSDF LANDFILL CELLS 4 AND 5

September 2002

Revision 1

I. INTRODUCTION

This work plan is written for conducting electrical leak surveys of landfill cell 4 and 5 primary liners located at Fernald site in accordance with section 02770 part 1.04G of the project specifications and the scope of work for solicitation number F02PB10162. This test plan is based on the assumption that Fluor Fernald, Inc. (Contractor) will provide specific support and labor as described in this plan.

II. WORK PLAN

A. General

The leak detection survey will be conducted in parallel with the geomembrane installation and prior to covering the primary liner with geotextile and the soil aggregate. A one or two person survey crew from LLSI will conduct the survey work. The Contractor will provide the assistance of two supervised laborers to help with the survey.

B. Qualifications and Experience

Leak Location Services, Inc is the world leader in electrical leak location testing with more than 50 years of combined experience in the subject work. The principals of LLSI began the development of the electrical leak location method at Southwest Research Institute in 1981 with the first commercial leak location survey preformed in 1985. Leak Location Services, Inc. was formed in 1992 as a Texas corporation. In addition:

- LLSI owns the exclusive patent rights on the electrical leak location method covered by United States patents 4,740,757, 4,950,374, 4,947,470, 5,661,406, 6,331,778B1 with an additional foreign patent;

- LLSI has successfully used the electrical leak location method on more than 500 projects world wide including projects at the Fernald site, North America, South America, Europe, The Middle East, The Far East, and Asia;

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: _____ Date: 9/17/02

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COPY NO. 76896

- LLSI has tested more than 75 million square feet of geomembrane. This includes double and single-lined landfills, ponds, lagoons, tanks, vaults, and landfill caps;

- LLSI personnel have surveyed over 4.4 million square feet of bare liner on eleven separate projects. Table 1 included in the Appendix presents a list of the bare liner surveys performed by LLSI during the past three years.

- Testing has included smooth, textured, and reinforced geomembranes. Including HDPE, LLDPE, PVC, XR-5, Hypalon, and Polypropylene in most of the various thicknesses; and

- The principals of LLSI have published more than 25 technical papers about the leak location method and applications.

Currently, all leak location supervisors and senior technicians have a minimum of three years of geomembrane leak location experience including a minimum of 1,000,000 square feet of electrical leak detection testing experience. All technicians currently have a minimum of 40 hours of training with a minimum of 250,000 square feet of liner testing experience. In addition, all LLSI personnel have 40-hour HASWOPER training pursuant to 29 CFR 1910.120, Mine Safety and Health Administration (MSHA) training, and confined space entry training.

C. Project Personnel

Mr. Martin Morales will function as the lead supervisor for this project and Mr. Herman Flores will function as assistant supervisor. We have also included the resume of Mr. Bryan Bergemann as an alternate supervisor. A brief résumé of the key field personnel that will perform the survey work are listed below:

MARTIN MORALES

Mr. Morales is a specialist in field applications of the electrical leak location method for geomembrane liners. He has a Bachelor Degree in Electronic Engineering from De Vry Institute. He has four years experience in geomembrane leak location including leading crews for approximately 70 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Morales is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

HERMAN J. FLORES

Mr. Herman Flores is a Project Leader at Leak Location Services, Inc. He has a BS degree in Industrial Technology from Abilene Christian University. He has one year of experience in field applications of the electrical leak location testing method. Mr. Flores has worked on

approximately 60 projects, including leading several projects. He is particularly experienced in surveys of geomembranes covered with earth materials. He is responsible for writing proposals and reports and is thoroughly knowledgeable in the electrical leak location method.

Mr. Flores has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of hydrogen sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. He has received MSHA training for work at surface mines.

BRYAN BERGEMANN

Mr. Bergemann is a Senior Leak Location Technician with seven years of experience in field applications of the electrical leak location method for geomembrane liners. His experience includes leading crews for approximately 120 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Bergemann is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

D. Electrical Leak Detection Work Plan

1. Description of Method

The electrical leak location method is to detect electrical paths through the liner. A voltage is connected to one electrode placed in the electrically conducting material covering the liner and to a second electrode placed in the electrically conducting material located beneath the liner. Electrical current flowing through the leaks in the liner produces localized anomalous areas of high current density near the leaks. These areas are located by making electrical potential measurement scans on the geomembrane material (liner).

A variation of the method is the water puddle test for bare liners. This method detects electrical current flowing through holes in the geomembrane liner using a small amount of water that is put in contact with the liner. A squeegee, sponge, or a water stream is used to push the water over the liner. An electrical power supply is connected to earth ground and to the leak detector. When a hole in the liner is encountered, electrical current will flow through water in the leak contacting earth ground. The current is monitored using an electronic detector that converts the increase in the current to an audible tone indication. This method does not require the liner to be flooded with water. However, the liner under test must be in complete contact with the underlying geosynthetic clay liner (gcl). Therefore, liner wrinkles and liner trampoline areas cannot be adequately tested.

2. Test Plan

The work is proposed to be conducted on two field trips by a one- or two - person leak location survey crew with the assistance of two supervised laborers provided by the Contractor. The survey crew will test approximately one-half of cells 4 and 5 during the first field trip. This is approximately 7 acres and will require up to four consecutive days to complete depending on site conditions, crew size, and the number of leaks located. The remaining area will be tested approximately 10 days after the completion of the initial survey. This delay is anticipated because of the time required to complete the liner installation and receive the results of the standard liner CQA tests.

The survey will be conducted on the bare geomembrane using the water puddle method. This method does not require the entire liner to be flooded with water. However, the depth of the water in front of the squeegee will be 0.1 inches or greater. Therefore, only the area immediately in front of the squeegee will temporarily be covered with water. The liner area will be systematically scanned with the sensor. When a leak is detected, it will be located and marked for repair. Leak location tests cannot be conducted if the water is frozen, if it is raining, or if the liner is completely wet.

3. Voltage and Grounding Requirements

The DC power supply used for leak location surveys requires a source of AC power. This will be supplied by a small portable motor generator (110 VAC, 5 A) or commercial AC power. A ground fault interrupt circuit will be used in conjunction with the AC power.

4. Water Management

One factor for accommodating the simultaneous installation of the liner system and the bare liner testing is the ability to manage the water used for the test so it does not flow into the area where the liner crew is currently installing the liner. This will require the leak location field crew to survey no closer than 100 feet from the liner installers. In addition, the edges of the liner must be temporarily elevated to prevent the water from running off of the liner material and contacting the gcl or the underlying LDS drainage layer. The water that pools on top of the liner material must be removed. The Contractor shall be responsible for removing the water and elevating the edges of liner material. After the liner is tested for leaks and the test results have been accepted and approved by Fluor Fernald and the CQC consultant, the liner installers can start installing the subsequent layers of the liner system in the areas that have been tested if this does not interfere with the water hoses and temporary piping used for the bare liner test.

5. Safe Work Practices

State and federal law, as well as LLSI company policy, make the safety and health of our employees the first consideration in operating our business. Safety and health in our business must be a part of every operation, and every employee's responsibility at all levels. LLSI intends to comply with all laws concerning the operation of the business and the health and safety

of our employees and the public. No employee is required to work at a job known to be unsafe or dangerous to their health. Following the LLSI safety plan, reporting dangerous conditions, and controlling workplace hazards is a condition of employment at LLSI.

Prior to the start of the ELD field work, all LLSI personnel performing the field work shall attend a site safety briefing provided by Fluor Fernald. In addition, LLSI personnel shall follow the safe work practices detailed in the Construction Traveler document number 20104-FLR.3.89.06C provided for this scope of work. All equipment that will be used in the field by LLSI personnel for the performance of this work shall be inspected and approved prior to use by Fluor Fernald.

LLSI safety policy is that accident prevention shall be considered of primary importance in all phases of operation and administration. Zero injuries and illnesses is our goal. Each supervisor must make the safety of all employees an integral part of his or her regular management function. Each employee has the duty to accept and follow established safety regulations and procedures. Every effort will be made to provide adequate training to all LLSI employees. A complete copy of the LLSI safety is available at our corporate office.

6. Leak Location Quality Control Procedures

The QA plan is to use prescribed checklists (See Appendix) when conducting a leak location survey. Each item on the checklist will be initialed and dated by the project leader or by a knowledgeable person designated by the project leader. A sample check list is located in the Appendix.

7. Scheduling

LLSI will coordinate with the Fluor Fernald, Inc. project manager and will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager. Initially a two-person field crew will mobilize to the project site for safety training, physical exam, and drug testing. We anticipate two consecutive days will be required for the training, exams, and drug testing.

The testing of bare liner will start immediately following the required training. Approximately 7-acres of landfill liner will be available for testing during the first mobilization. Therefore, the two-person field crew will test the designated areas of cells 4 and 5 in approximately four consecutive days. The field crew will demobilize after the completion of the initial survey.

A one or two-person field crew will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager to complete the bare liner survey. We anticipate a delay of approximately ten days between the first and second mobilizations.

However, if during the initial mobilization additional liner is available for surveying prior to the LLSI field crew demobilizing from the site then one-person from LLSI will remain on-site to survey areas of liner as they become available. The Fluor Fernald, Inc. project

manager must request in writing that one person from LLSI will remain on-site during the duration of the liner installation.

E. Reporting

The results of the leak detection testing will be reported to a designated field representative of the Fluor Fernald, Inc. during the daily progress of the work. The Contractor will be responsible for repairing the leaks while LLSI is on-site. A list of the locations of the leaks found will be submitted to the representative after completion of all leak location field work before the survey crew leaves the site. A letter report documenting the work and results of the surveys will be prepared and submitted within seven days after completion of the field work.

III. PREPARATIONS AND SUPPORT REQUIRED FROM CONTRACTOR

Fluor Fernald, Inc. will be responsible for preparing the landfill for the survey and for repairing the damaged liner. Other support to be provided by the Fluor Fernald, Inc.:

- Provide a source of AC power for the leak location surveys (110 VAC, 5 A);
- Provide two supervised laborers with equipment to help with the leak surveys. This includes moving water hoses and piping, moving sand bags, keeping the survey area clean, and other tasks;
- Provide a water truck with pump, water, and driver;
- Temporarily elevate the edges of the liner to prevent the water from contacting the primary gcl and secondary drainage layer;
- Removing excessive water from the liner; and
- All labor and equipment support shall be available during the hours and schedule designated by LLSI, including working through weekends if needed.

IV. QUALITY ASSURANCE

Leak Location Services, Inc. will be required to complete the "Water Puddle Survey Checklist" as part of the testing set-up procedure. In addition, the "Water Puddle Survey Checklist" will be completed whenever the ground connection is moved or otherwise re-established.

APPENDIX

Leak Location Services, Inc.

Safety Check List

(Note: This form is to be completed by the survey team leader before starting the survey)

Date: _____

Site Name: _____

Survey Personnel: _____

Your Name: _____

(Check all that apply. If not checked explain)

- ❑ Grounded structures insulated (if applicable):
- ❑ Hazardous locations identified and barricaded:
- ❑ Site specific safety briefing completed:
- ❑ Location of nearest telephone:
  Emergency telephone number:
  Hospital:
  Plant safety office:
  EMS:
  Fire:
- ❑ Location of nearest shower and eye wash station identified (if applicable).
- ❑ Location of nearest first aid station identified.
- ❑ Location of nearest emergency facility located.

Notes:

Leak Location Services, Inc.

Water Puddle Survey Check List

(Note: This form is to be completed **daily** by the survey team leader before starting the survey.)

Date: _____ Site Name: _____

Start Time: _____ Stop Time: _____

Survey Personnel: _____ _____

_____ _____

Your Name: _____ Panels Surveyed: _____

Leaks Located: _____ Leaks Repaired: _____

Support Required for following day: _____

_____

Note: Describe all leaks located. Document size, shape, and type. (i.e. puncture, cut, hole, seam) Attach a drawing to this daily log showing location of any leaks located and the area surveyed.

_____

(Check all that apply. If not checked explain)

- ☐ Power supply positive connected to soil or LDZ electrode.
- ☐ GFCI connected to power supply and tested.
- ☐ Check oil level in generator (if applicable).
- ☐ Check survey equipment for:
  - ☐ Hose for leaks
  - ☐ Connection tight.
  - ☐ Worn squeegee blade.
  - ☐ Wire for cuts or breaks.
  - ☐ Wire connectors tight.
  - ☐ Wiring polarity.
- ☐ Check A.C. line voltage and record in log book.

Turn Power to On

- ☐ Test squeegee probe for correct polarity with reference to ground.
- ☐ Test squeegee probe sensitivity using artificial leak basin or scrape material

Leak Location Services, Inc.

Report Check List

(Note: This form is to be completed by the survey team leader)

Site Name:_____ Site Location:_____

Client Name:_____ Your Name:_____

Start Date:_____ End Date:_____ Total Leaks:_____

Area of Survey:_____ Survey Grid Spacing _____ ft. by _____ ft.

Type of Facility: ❑ Landfill ❑ Pond ❑ Tank ❑ Other _____

Type of Liner: ❑ HDPE ❑ PP ❑ Hypalon ❑ PVC

❑ Smooth ❑ Textured ❑ Reinforced ❑ Other _____

Liner Thickness ❑ 36-mil ❑ 45-mil ❑ 60-mil ❑ 80-mil ❑ 100-mil

Liner Manufacture ❑ Serrot ❑ GSE ❑ Polyflex ❑ AGRU

❑ Other _____

Double geomembrane-lined ❑ yes ❑ no

Primary/Secondary welded together ❑ yes ❑ no

Primary liner covered by: ❑ geocomposite ❑ geotextile ❑ Drainage material

❑ Bare liner ❑ Other _____

Drainage material ❑ gravel (size _____) ❑ sand ❑ soil

❑ Other _____

LDZ has: ❑ GCL ❑ geocomposite ❑ geonet ❑ sand/gravel

❑ Other _____

Side slope riser ❑ yes ❑ no Gravity drain: ❑ yes ❑ no

Sketch of liner profile on back of sheet ❑ yes ❑ no

Table 1. List of Bare Liner Surveys Performed by LLSI

No	Site Name	Location	Facility Type	Area (sq. ft.)	Liner Type	Start Complete	Survey Personnel
1	JRS	Caldwell, ID	Pond	52,000	XR-5	08/19/1999 09/13/1999	B. Bergemann and A. Adames
2	Phelps-Dodge Corp.	Bagdad, AZ	Tank	800	HDPE Stud	01/18/2000 01/26/200	G. Darilek
3	Griffith Energy Corp.	Kingman, AZ	Pond	158,000	60-mil HDPE	08/01/2000 08/07/2000	M. Morales, G. Darilek, A. Cheung
4	Delaware Solid Waste Authority - Cell 4	Georgetown, DE	Landfill	871,200	60-mil PP	02/27/2001 10/02/2001	B. Bergemann and H. Hernandez
5	Molly Corporation	Mountain Pass, CA	Pond	575,000	60-mil HDPE	04/07/2001 04/11/2001	G. Darilek, M. Morales, and H. Hernandez
6	Frederick County DEP - Cell 2A Area B	Frederick, MD	Landfill	556,280	60-mil HDPE	06/01/2001 08/09/2001	B. Bergemann and F. Flores
7	Bell Carter Co.	Corning, CA	Pond	250,000	60-mil HDPE	06/07/2001 06/09/2001	B. Bergemann and H. Hernandez
8	Fernald OSDF Cell 1	Hamilton, OH	Cap	326,700	60-mil HDPE	06/25/2001 08/14/2001	M. Morales and H. Hernandez
9	Arizona Power Coop.	Benson, AZ	Pond	925,650	60-mil HDPE	07/09/2001 07/14/2001	M. Morales and G. Darilek
10	IBP, Inc.	Garden City, KS	Pond	392,000	60-mil HDPE	10/21/2001 10/28/2001	B. Bergemann and L. Simmons
11	PPL Sundance Energy	Casa Grande, AZ	Pond	338,000	60-mil HDPE	05/8/2002 05/18/2002	B. Bergemann

Electrical Leak Detection Work Plan

Table 1. List of Bare Liner Surveys Performed by LLSI

No	Site Name	Location	Facility Type	Area (sq. ft.)	Liner Type	Start Complete	Survey Personnel
1	JRS	Caldwell, ID	Pond	52,000	XR-5	08/19/1999 09/13/1999	B. Bergemann and A. Adames
2	Phelps-Dodge Corp.	Bagdad, AZ	Tank	800	HDPE Stud	01/18/2000 01/26/200	G. Darilek
3	Griffith Energy Corp.	Kingman, AZ	Pond	158,000	60-mil HDPE	08/01/2000 08/07/2000	M. Morales, G. Darilek, A. Cheung
4	Delaware Solid Waste Authority - Cell 4	Georgetown, DE	Landfill	871,200	60-mil PP	02/27/2001 10/02/2001	B. Bergemann and H. Hernandez
5	Molly Corporation	Mountain Pass, CA	Pond	575,000	60-mil HDPE	04/07/2001 04/11/2001	G. Darilek, M. Morales, and H. Hernandez
6	Frederick County DEP - Cell 2A Area B	Frederick, MD	Landfill	556,280	60-mil HDPE	06/01/2001 08/09/2001	B. Bergemann and F. Flores
7	Bell Carter Co.	Corning, CA	Pond	250,000	60-mil HDPE	06/07/2001 06/09/2001	B. Bergemann and H. Hernandez
8	Fernald OSDF Cell 1	Hamilton, OH	Cap	326,700	60-mil HDPE	06/25/2001 08/14/2001	M. Morales and H. Hernandez
9	Arizona Power Coop.	Benson, AZ	Pond	925,650	60-mil HDPE	07/09/2001 07/14/2001	M. Morales and G. Darilek
10	IBP, Inc.	Garden City, KS	Pond	392,000	60-mil HDPE	10/21/2001 10/28/2001	B. Bergemann and L. Simmons
11	PPL Sundance Energy	Casa Grande, AZ	Pond	338,000	60-mil HDPE	05/8/2002 05/18/2002	B. Bergemann

Leak Location Services, Inc.

Report Check List

(Note: This form is to be completed by the survey team leader)

Site Name:_____ Site Location:_____

Client Name:_____ Your Name:_____

Start Date:_____ End Date:_____ Total Leaks:_____

Area of Survey:_____ Survey Grid Spacing _____ ft. by _____ ft.

Type of Facility: ❑ Landfill ❑ Pond ❑ Tank ❑ Other _____

Type of Liner: ❑ HDPE ❑ PP ❑ Hypalon ❑ PVC

❑ Smooth ❑ Textured ❑ Reinforced ❑ Other _____

Liner Thickness ❑ 36-mil ❑ 45-mil ❑ 60-mil ❑ 80-mil ❑ 100-mil

Liner Manufacture ❑ Serrot ❑ GSE ❑ Polyflex ❑ AGRU

❑ Other _____

Double geomembrane-lined ❑ yes ❑ no

Primary/Secondary welded together ❑ yes ❑ no

Primary liner covered by: ❑ geocomposite ❑ geotextile ❑ Drainage material

❑ Bare liner ❑ Other _____

Drainage material ❑ gravel (size _____) ❑ sand ❑ soil

❑ Other _____

LDZ has: ❑ GCL ❑ geocomposite ❑ geonet ❑ sand/gravel

❑ Other _____

Side slope riser ❑ yes ❑ no Gravity drain: ❑ yes ❑ no

Sketch of liner profile on back of sheet ❑ yes ❑ no

FDF PROJECT NO.: 1

CONTRACT NO: PHIV

SUBMITTAL NO. 20104-PHIV-02770-010 | REV: 1 | DATE: 9/6/02 | 1 of 12

FROM:
Leak Location Services, Inc.
16124 University Oak
San Antonio, Texas 78249

SIGNATURE: Daren L. Laine (Daren L. Laine)

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7

RECEIVED BY: Teresa Schwab DATE: 9/9/02

QTY	DOCUMENT NUMBER	REV	DOCUMENT FAMILY: PRO	H&S	MED	TRG	CON	ENG	QAC	OPER	TITLE/DESCRIPTION	SUBMITTAL TYPE: DRFT	CFC	INF	ASSOCIATED SPECIFICATION	SUBMITTAL ACTION: A	B	C
7	PHIV-02770-010	1						X			Electrical Leak Detection Testing Work Plan		X		02770-1.04	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
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NO COMMENTS: ✓ COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

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RECEIVED BY: Chuck Van Arsdale DATE: 9/17/02

(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)
A - Conforms to the Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

FS-F-4955
Rev. 3: 05/14/1999, CT-2.4.2

ORIGINAL

942

LEAK LOCATION SERVICES, INC.
16124 UNIVERSITY OAK • SAN ANTONIO, TEXAS 78249 • (210) 408-1241 / FAX (210) 408-1242

TEST PLAN FOR ELECTRICAL LEAK LOCATION SURVEY OF OSDF LANDFILL CELLS 4 AND 5

September 2002

Revision 1

I. INTRODUCTION

This work plan is written for conducting electrical leak surveys of landfill cell 4 and 5 primary liners located at Fernald site in accordance with section 02770 part 1.04G of the project specifications and the scope of work for solicitation number F02PB10162. This test plan is based on the assumption that Fluor Fernald, Inc. (Contractor) will provide specific support and labor as described in this plan.

II. WORK PLAN

A. General

The leak detection survey will be conducted in parallel with the geomembrane installation and prior to covering the primary liner with geotextile and the soil aggregate. A one or two person survey crew from LLSI will conduct the survey work. The Contractor will provide the assistance of two supervised laborers to help with the survey.

B. Qualifications and Experience

Leak Location Services, Inc is the world leader in electrical leak location testing with more than 50 years of combined experience in the subject work. The principals of LLSI began the development of the electrical leak location method at Southwest Research Institute in 1981 with the first commercial leak location survey preformed in 1985. Leak Location Services, Inc. was formed in 1992 as a Texas corporation. In addition:

- LLSI owns the exclusive patent rights on the electrical leak location method covered by United States patents 4,740,757, 4,950,374, 4,947,470, 5,661,406, 6,331,778B1 with an additional foreign patent;

- LLSI has successfully used the electrical leak location method on more than 500 projects world wide including projects at the Fernald site, North America, South America, Europe, The Middle East, The Far East, and Asia;

[X] A-Conforms to the Subcontract Requirements
[ ] B-Minor Comment - Incorporate and Resubmit
[ ] C-Revise and Resubmit
Sig: [illegible] Date: 9/17/02

www.leaklocationservices.com results@leaklocationservices.com

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- LLSI has tested more than 75 million square feet of geomembrane. This includes double and single-lined landfills, ponds, lagoons, tanks, vaults, and landfill caps;

- LLSI personnel have surveyed over 4.4 million square feet of bare liner on eleven separate projects. Table 1 included in the Appendix presents a list of the bare liner surveys performed by LLSI during the past three years.

- Testing has included smooth, textured, and reinforced geomembranes. Including HDPE, LLDPE, PVC, XR-5, Hypalon, and Polypropylene in most of the various thicknesses; and

- The principals of LLSI have published more than 25 technical papers about the leak location method and applications.

Currently, all leak location supervisors and senior technicians have a minimum of three years of geomembrane leak location experience including a minimum of 1,000,000 square feet of electrical leak detection testing experience. All technicians currently have a minimum of 40 hours of training with a minimum of 250,000 square feet of liner testing experience. In addition, all LLSI personnel have 40-hour HASWOPER training pursuant to 29 CFR 1910.120, Mine Safety and Health Administration (MSHA) training, and confined space entry training.

C. Project Personnel

Mr. Martin Morales will function as the lead supervisor for this project and Mr. Herman Flores will function as assistant supervisor. We have also included the resume of Mr. Bryan Bergemann as an alternate supervisor. A brief résumé of the key field personnel that will perform the survey work are listed below:

MARTIN MORALES

Mr. Morales is a specialist in field applications of the electrical leak location method for geomembrane liners. He has a Bachelor Degree in Electronic Engineering from De Vry Institute. He has four years experience in geomembrane leak location including leading crews for approximately 70 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Morales is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

HERMAN J. FLORES

Mr. Herman Flores is a Project Leader at Leak Location Services, Inc. He has a BS degree in Industrial Technology from Abilene Christian University. He has one year of experience in field applications of the electrical leak location testing method. Mr. Flores has worked on

approximately 60 projects, including leading several projects. He is particularly experienced in surveys of geomembranes covered with earth materials. He is responsible for writing proposals and reports and is thoroughly knowledgeable in the electrical leak location method.

Mr. Flores has completed training for hazardous waste operation per 29 CFR 1910.120. He has completed training on the hazards of hydrogen sulfide, the protective and respiratory equipment needed, and procedures to follow when working around hydrogen sulfide. He has received MSHA training for work at surface mines.

BRYAN BERGEMANN

Mr. Bergemann is a Senior Leak Location Technician with seven years of experience in field applications of the electrical leak location method for geomembrane liners. His experience includes leading crews for approximately 120 geomembrane leak location projects. These projects have included geomembrane liners for liquid impoundments, storage tanks, landfills, and landfill caps. He is thoroughly familiar with the work, including field applications, and equipment construction, troubleshooting, and maintenance.

Mr. Bergemann is trained and qualified for hazardous waste operations, confined space entry, and work at surface mines.

D. Electrical Leak Detection Work Plan

1. Description of Method

The electrical leak location method is to detect electrical paths through the liner. A voltage is connected to one electrode placed in the electrically conducting material covering the liner and to a second electrode placed in the electrically conducting material located beneath the liner. Electrical current flowing through the leaks in the liner produces localized anomalous areas of high current density near the leaks. These areas are located by making electrical potential measurement scans on the geomembrane material (liner).

A variation of the method is the water puddle test for bare liners. This method detects electrical current flowing through holes in the geomembrane liner using a small amount of water that is put in contact with the liner. A squeegee, sponge, or a water stream is used to push the water over the liner. An electrical power supply is connected to earth ground and to the leak detector. When a hole in the liner is encountered, electrical current will flow through water in the leak contacting earth ground. The current is monitored using an electronic detector that converts the increase in the current to an audible tone indication. This method does not require the liner to be flooded with water. However, the liner under test must be in complete contact with the underlying geosynthetic clay liner (gcl). Therefore, liner wrinkles and liner trampoline areas cannot be adequately tested.

2. Test Plan

The work is proposed to be conducted on two field trips by a one- or two - person leak location survey crew with the assistance of two supervised laborers provided by the Contractor. The survey crew will test approximately one-half of cells 4 and 5 during the first field trip. This is approximately 7 acres and will require up to four consecutive days to complete depending on site conditions, crew size, and the number of leaks located. The remaining area will be tested approximately 10 days after the completion of the initial survey. This delay is anticipated because of the time required to complete the liner installation and receive the results of the standard liner CQA tests.

The survey will be conducted on the bare geomembrane using the water puddle method. This method does not require the entire liner to be flooded with water. However, the depth of the water in front of the squeegee will be 0.1 inches or greater. Therefore, only the area immediately in front of the squeegee will temporarily be covered with water. The liner area will be systematically scanned with the sensor. When a leak is detected, it will be located and marked for repair. Leak location tests cannot be conducted if the water is frozen, if it is raining, or if the liner is completely wet.

3. Voltage and Grounding Requirements

The DC power supply used for leak location surveys requires a source of AC power. This will be supplied by a small portable motor generator (110 VAC, 5 A) or commercial AC power. A ground fault interrupt circuit will be used in conjunction with the AC power.

4. Water Management

One factor for accommodating the simultaneous installation of the liner system and the bare liner testing is the ability to manage the water used for the test so it does not flow into the area where the liner crew is currently installing the liner. This will require the leak location field crew to survey no closer than 100 feet from the liner installers. In addition, the edges of the liner must be temporarily elevated to prevent the water from running off of the liner material and contacting the gcl or the underlying LDS drainage layer. The water that pools on top of the liner material must be removed. The Contractor shall be responsible for removing the water and elevating the edges of liner material. After the liner is tested for leaks and the test results have been accepted and approved by Fluor Fernald and the CQC consultant, the liner installers can start installing the subsequent layers of the liner system in the areas that have been tested if this does not interfere with the water hoses and temporary piping used for the bare liner test.

5. Safe Work Practices

State and federal law, as well as LLSI company policy, make the safety and health of our employees the first consideration in operating our business. Safety and health in our business must be a part of every operation, and every employee's responsibility at all levels. LLSI intends to comply with all laws concerning the operation of the business and the health and safety

of our employees and the public. No employee is required to work at a job known to be unsafe or dangerous to their health. Following the LLSI safety plan, reporting dangerous conditions, and controlling workplace hazards is a condition of employment at LLSI.

Prior to the start of the ELD field work, all LLSI personnel performing the field work shall attend a site safety briefing provided by Fluor Fernald. In addition, LLSI personnel shall follow the safe work practices detailed in the Construction Traveler document number 20104-FLR.3.89.06C provided for this scope of work. All equipment that will be used in the field by LLSI personnel for the performance of this work shall be inspected and approved prior to use by Fluor Fernald.

LLSI safety policy is that accident prevention shall be considered of primary importance in all phases of operation and administration. Zero injuries and illnesses is our goal. Each supervisor must make the safety of all employees an integral part of his or her regular management function. Each employee has the duty to accept and follow established safety regulations and procedures. Every effort will be made to provide adequate training to all LLSI employees. A complete copy of the LLSI safety is available at our corporate office.

6. Leak Location Quality Control Procedures

The QA plan is to use prescribed checklists (See Appendix) when conducting a leak location survey. Each item on the checklist will be initialed and dated by the project leader or by a knowledgeable person designated by the project leader. A sample check list is located in the Appendix.

7. Scheduling

LLSI will coordinate with the Fluor Fernald, Inc. project manager and will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager. Initially a two-person field crew will mobilize to the project site for safety training, physical exam, and drug testing. We anticipate two consecutive days will be required for the training, exams, and drug testing.

The testing of bare liner will start immediately following the required training. Approximately 7-acres of landfill liner will be available for testing during the first mobilization. Therefore, the two-person field crew will test the designated areas of cells 4 and 5 in approximately four consecutive days. The field crew will demobilize after the completion of the initial survey.

A one or two-person field crew will mobilize to the project site upon written notification from the Fluor Fernald, Inc. project manager to complete the bare liner survey. We anticipate a delay of approximately ten days between the first and second mobilizations.

However, if during the initial mobilization additional liner is available for surveying prior to the LLSI field crew demobilizing from the site then one-person from LLSI will remain on-site to survey areas of liner as they become available. The Fluor Fernald, Inc. project

manager must request in writing that one person from LLSI will remain on-site during the duration of the liner installation.

E. Reporting

The results of the leak detection testing will be reported to a designated field representative of the Fluor Fernald, Inc. during the daily progress of the work. The Contractor will be responsible for repairing the leaks while LLSI is on-site. A list of the locations of the leaks found will be submitted to the representative after completion of all leak location field work before the survey crew leaves the site. A letter report documenting the work and results of the surveys will be prepared and submitted within seven days after completion of the field work.

III. PREPARATIONS AND SUPPORT REQUIRED FROM CONTRACTOR

Fluor Fernald, Inc. will be responsible for preparing the landfill for the survey and for repairing the damaged liner. Other support to be provided by the Fluor Fernald, Inc.:

- Provide a source of AC power for the leak location surveys (110 VAC, 5 A);
- Provide two supervised laborers with equipment to help with the leak surveys. This includes moving water hoses and piping, moving sand bags, keeping the survey area clean, and other tasks;
- Provide a water truck with pump, water, and driver;
- Temporarily elevate the edges of the liner to prevent the water from contacting the primary gcl and secondary drainage layer;
- Removing excessive water from the liner; and
- All labor and equipment support shall be available during the hours and schedule designated by LLSI, including working through weekends if needed.

IV. QUALITY ASSURANCE

Leak Location Services, Inc. will be required to complete the "Water Puddle Survey Checklist" as part of the testing set-up procedure. In addition, the "Water Puddle Survey Checklist" will be completed whenever the ground connection is moved or otherwise re-established.

APPENDIX

Leak Location Services, Inc.

Safety Check List

(Note: This form is to be completed by the survey team leader before starting the survey)

Date: _____

Site Name: _____

Survey Personnel: _____

Your Name: _____

(Check all that apply. If not checked explain)

- ☐ Grounded structures insulated (if applicable):
- ☐ Hazardous locations identified and barricaded:
- ☐ Site specific safety briefing completed:
- ☐ Location of nearest telephone:
  Emergency telephone number:
  Hospital:
  Plant safety office:
  EMS:
  Fire:
- ☐ Location of nearest shower and eye wash station identified (if applicable).
- ☐ Location of nearest first aid station identified.
- ☐ Location of nearest emergency facility located.

Notes:

Leak Location Services, Inc.

Water Puddle Survey Check List

(Note: This form is to be completed **daily** by the survey team leader before starting the survey.)

Date: _____ Site Name: _____

Start Time: _____ Stop Time: _____

Survey Personnel: _____ _____

_____ _____

Your Name: _____ Panels Surveyed: _____

Leaks Located: _____ Leaks Repaired: _____

Support Required for following day: _____

_____

Note: Describe all leaks located. Document size, shape, and type. (i.e. puncture, cut, hole, seam)
Attach a drawing to this daily log showing location of any leaks located and the area surveyed.

_____

(Check all that apply. If not checked explain)

- ❑ Power supply positive connected to soil or LDZ electrode.
- ❑ GFCI connected to power supply and tested.
- ❑ Check oil level in generator (if applicable).
- ❑ Check survey equipment for:
  - ❑ Hose for leaks
  - ❑ Connection tight.
  - ❑ Worn squeegee blade.
  - ❑ Wire for cuts or breaks.
  - ❑ Wire connectors tight.
  - ❑ Wiring polarity.
- ❑ Check A.C. line voltage and record in log book.

Turn Power to On

- ❑ Test squeegee probe for correct polarity with reference to ground.
- ❑ Test squeegee probe sensitivity using artificial leak basin or scrape material

APPENDIX G

Field Moisture/Density Test Results

Compacted Fill

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase III North Access Road extension

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 15 day Feb month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D (698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"

MATERIAL SOURCE: Cell Four

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Trox. 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
1	Road ℄ 19+50	10" / 1	RA-04	11.6	125.1	12.6	137.1	121.7	97.3	P				
2	Road ℄ 20+00	10" / 2	RA-04	11.6	125.1	12.7	137.5	122.0	97.5	P				
3	Road ℄ 21+25	10" / 3	RA-04	11.6	125.1	11.9	137.8	123.2	98.5	P				
4	Road ℄ 22+00	10" / 4	RA-04	11.6	125.1	12.4	134.3	119.5	95.5	P				
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CL

SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase ~~III~~ North Access Road Extension

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 19 day Feb month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Cell 4

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
5	Road ℄ 17+50	10"/1	RAØ4	11.6	125.1	12.9	135.8	120.3	96.2	P				
6	Road ℄ 18+25	10"/2	RAØ4	11.6	125.1	11.0	135.7	122.2	97.7	P				
7	Road ℄ 19+00	10"/3	RAØ4	11.6	125.1	12.4	136.9	121.8	97.4	P				
8	Road ℄ 20+25	10"/4	RAØ4	11.6	125.1	13.1	135.9	120.2	96.1	P				
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cells 4+5 Construction

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 12 day April month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/(COMPACTED)): 8"

MATERIAL SOURCE: on-site

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
9	W. berm	8"/L-1	OSDF-9	16.0	114.2	15.2	132.7	115.2	100.9	✓				
10	W. berm	8"/L-1	↓	↓	↓	16.0	131.7	113.5	99.4	✓				
11	E. berm	8"/L-1				13.3	127.8	112.8	98.8	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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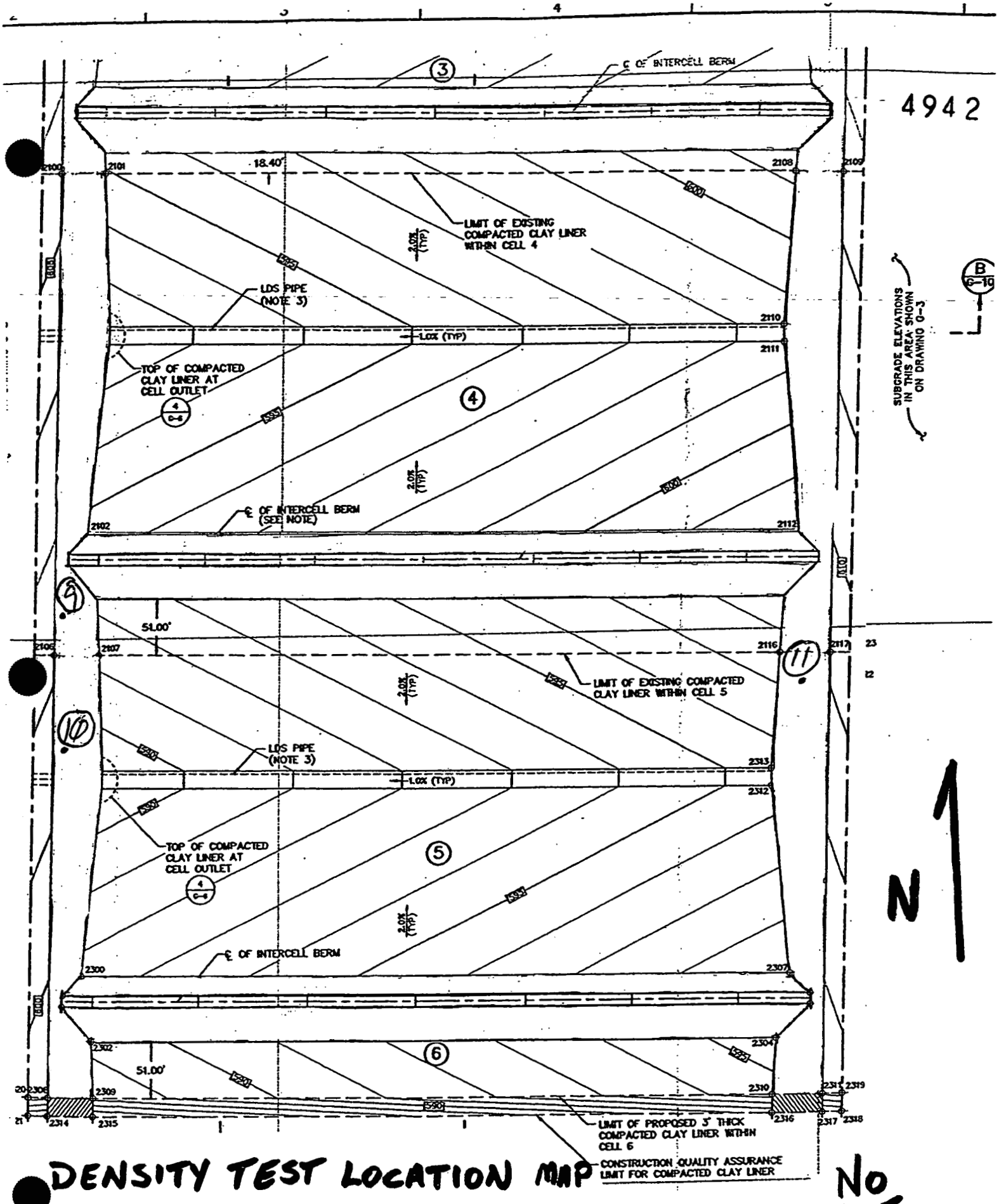

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DENSITY TEST LOCATION MAP

NO SCALE

12 DAY April Month 2002 YEAR

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2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.7

DESCRIPTION: Phase IV

DATE: 18 day April month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/1

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
12	East berm	6"/L-1	PCP-55	11.7	126.5	13.1	138.7	122.6	96.9	✓				
13	East berm	6"/L-1	PCP-55	11.7	126.5	12.4	140.8	125.3	99.1	✓				
14	East drainage ditch	6"/L-1	PCP-55	11.7	126.5	10.7	140.2	126.7	100.2	✓				
15	East drainage ditch	6"/L-1	PCP-55	11.7	126.5	12.0	139.0	124.1	98.1	✓				
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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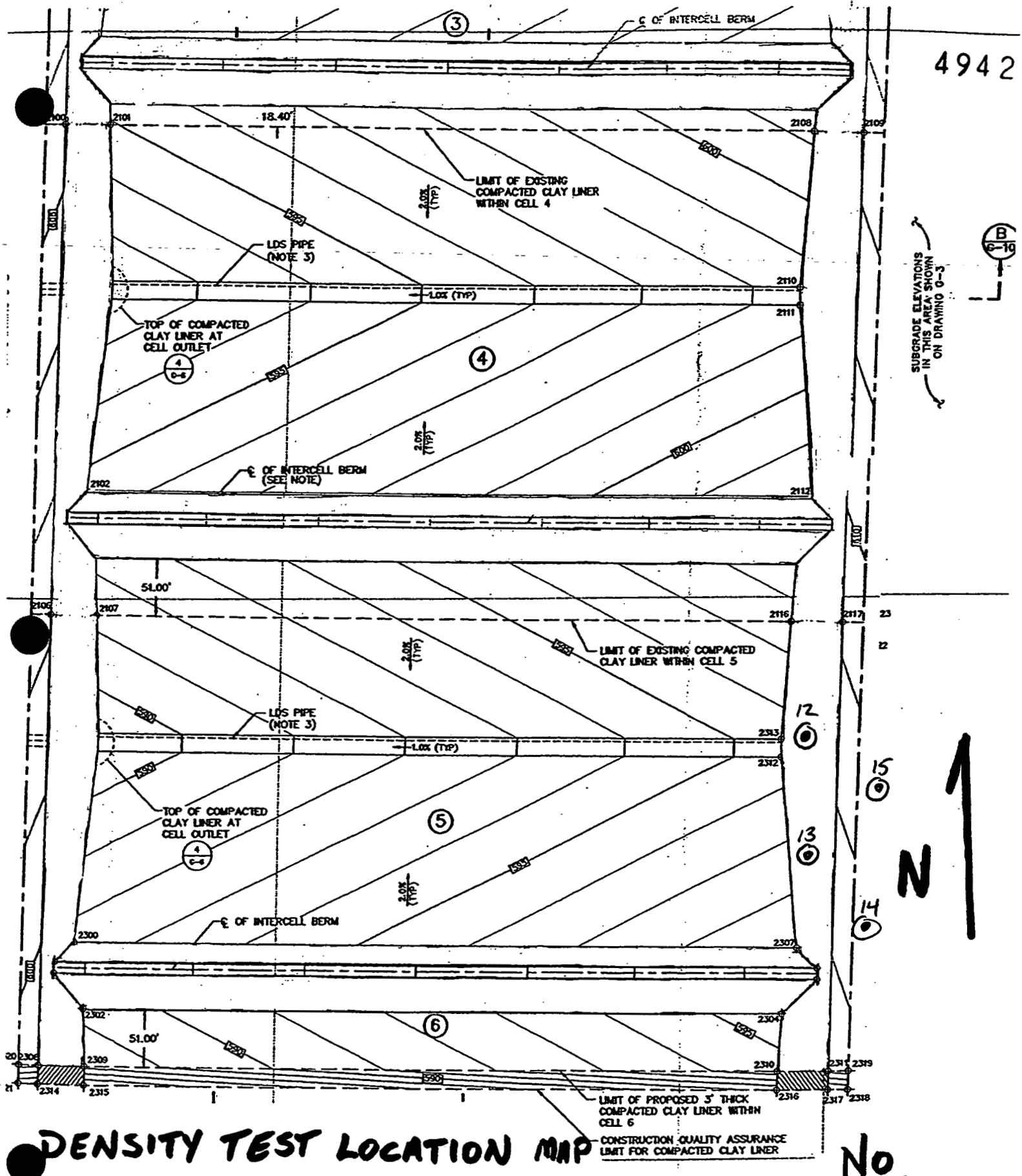

N 1

DENSITY TEST LOCATION MAP

NO SCALE

18 DAY April Month 2002 YEAR

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2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DESCRIPTION: Phase IV

DATE: 25 19 day April month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"

MATERIAL SOURCE: on-site / borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
16	See Sketch	6"/L-1	~~OSDF16~~ KS PCP-55	~~13.6~~ 11.7 KS	~~119.1~~ 126.5 KS	12.4	136.6	121.6	96.1	✓	—	—	—	—
17	" "	6"/L-1	OSDF16	13.6	119.1	12.6	135.1	12Ø.Ø	1ØØ.8	✓	—	—	—	—
18	" "	6"/L-2	OSDF16	13.6	119.1	13.6	135.1	118.9	99.8	✓	—	—	—	—
19	" "	6"/L-1	PCP-55	11.7	126.5	10.8	136.1	122.8	97.1	✓	—	—	—	—
2Ø	" "	6"/L-3	OSDF16	13.6	119.1	13.8	136.6	12Ø.Ø	1ØØ.8	✓	—	—	—	—
21	" "	6"/L-2	PCP-55	11.7	126.5	12.8	136.Ø	12Ø.6	95.3	✓	—	—	—	—
22	" "	6"/L-4	OSDF16	13.6	119.1	11.5	136.8	122.7	1Ø3.Ø	✓	—	—	—	—
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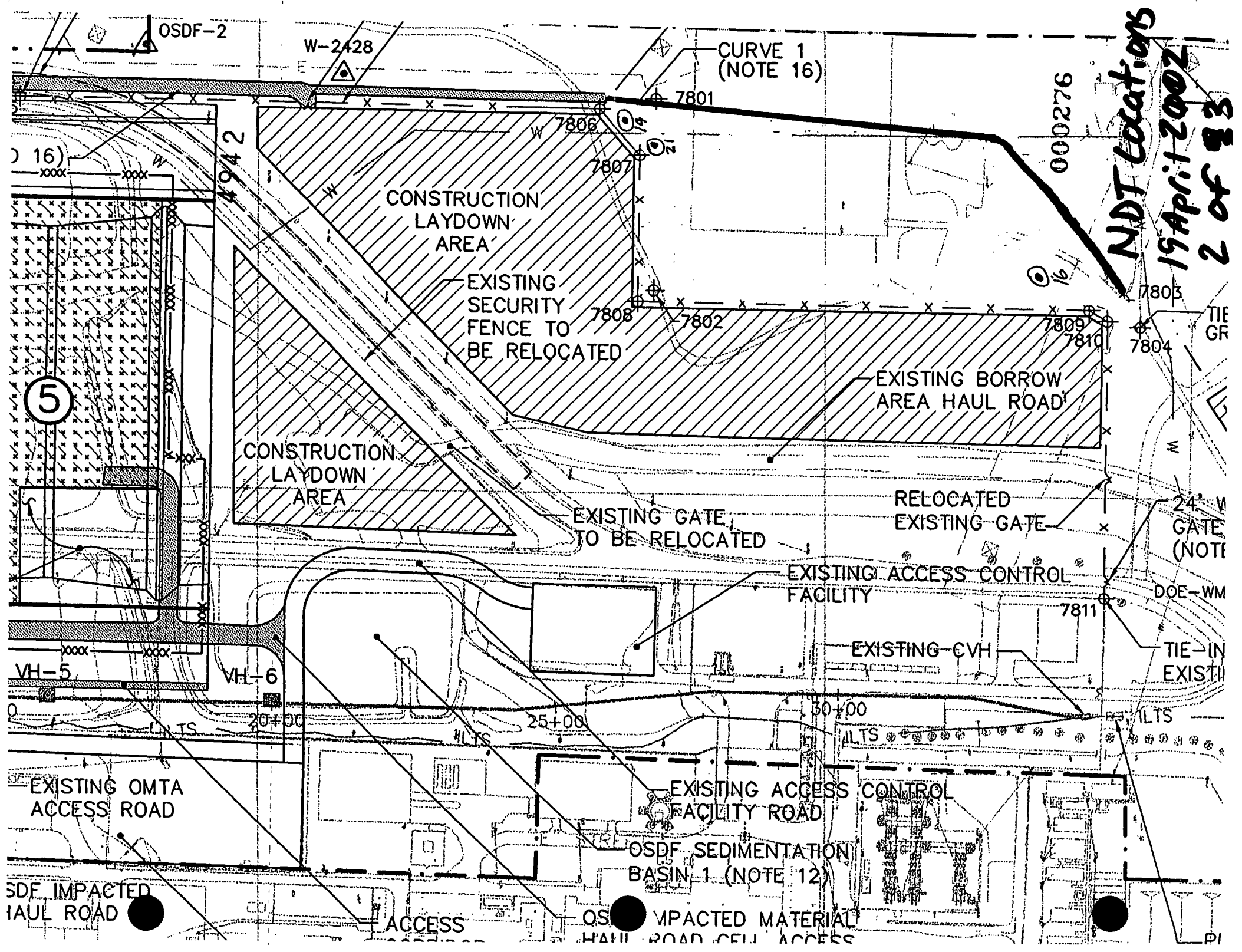
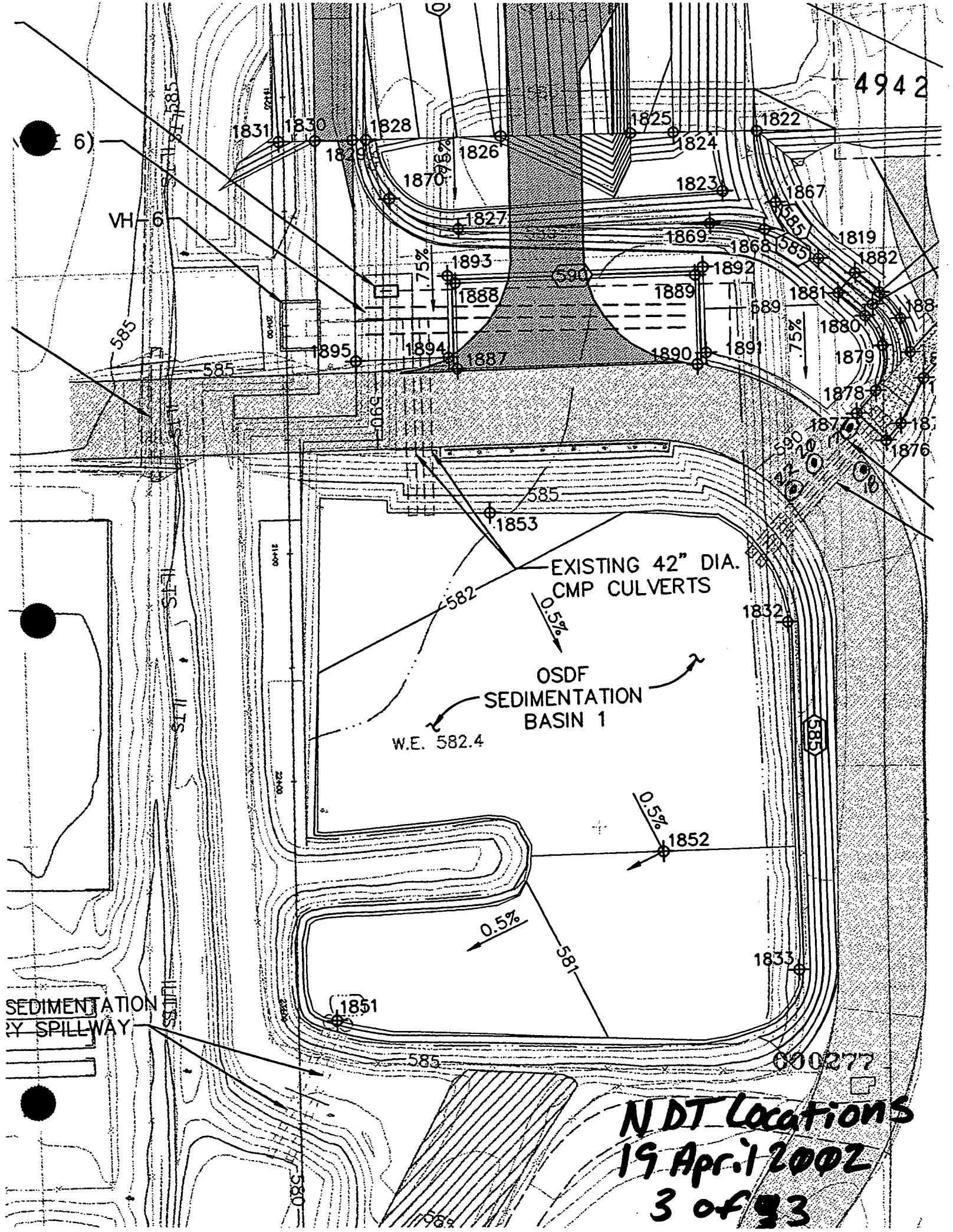
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)


OSDF-2
W-2428
CURVE 1
(NOTE 16)
7801
7806
7807
CONSTRUCTION
LAYDOWN
AREA
EXISTING
SECURITY
FENCE TO
BE RELOCATED
7808
7802
7809
7810
7803
7804
EXISTING BORROW
AREA HAUL ROAD
CONSTRUCTION
LAYDOWN
AREA
EXISTING GATE
TO BE RELOCATED
RELOCATED
EXISTING GATE
EXISTING ACCESS CONTROL
FACILITY
7811
DOE-WM
EXISTING CVH
VH-5
VH-6
20+00
25+00
30+00
ILTS
EXISTING OMTA
ACCESS ROAD
EXISTING ACCESS CONTROL
FACILITY ROAD
OSDF SEDIMENTATION
BASIN 1 (NOTE 12)
ACCESS
NDT Locations
19 April 2002
2 of 3



NDT Locations
19 April 2002
3 of 33

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 24 day April month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8"

MATERIAL SOURCE: borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
* 23	See Sketch	6"/L-2	PCP-57	10.5	128.7	10.4	139.4	126.2	98.1	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

* Higher rock content than previous similar material

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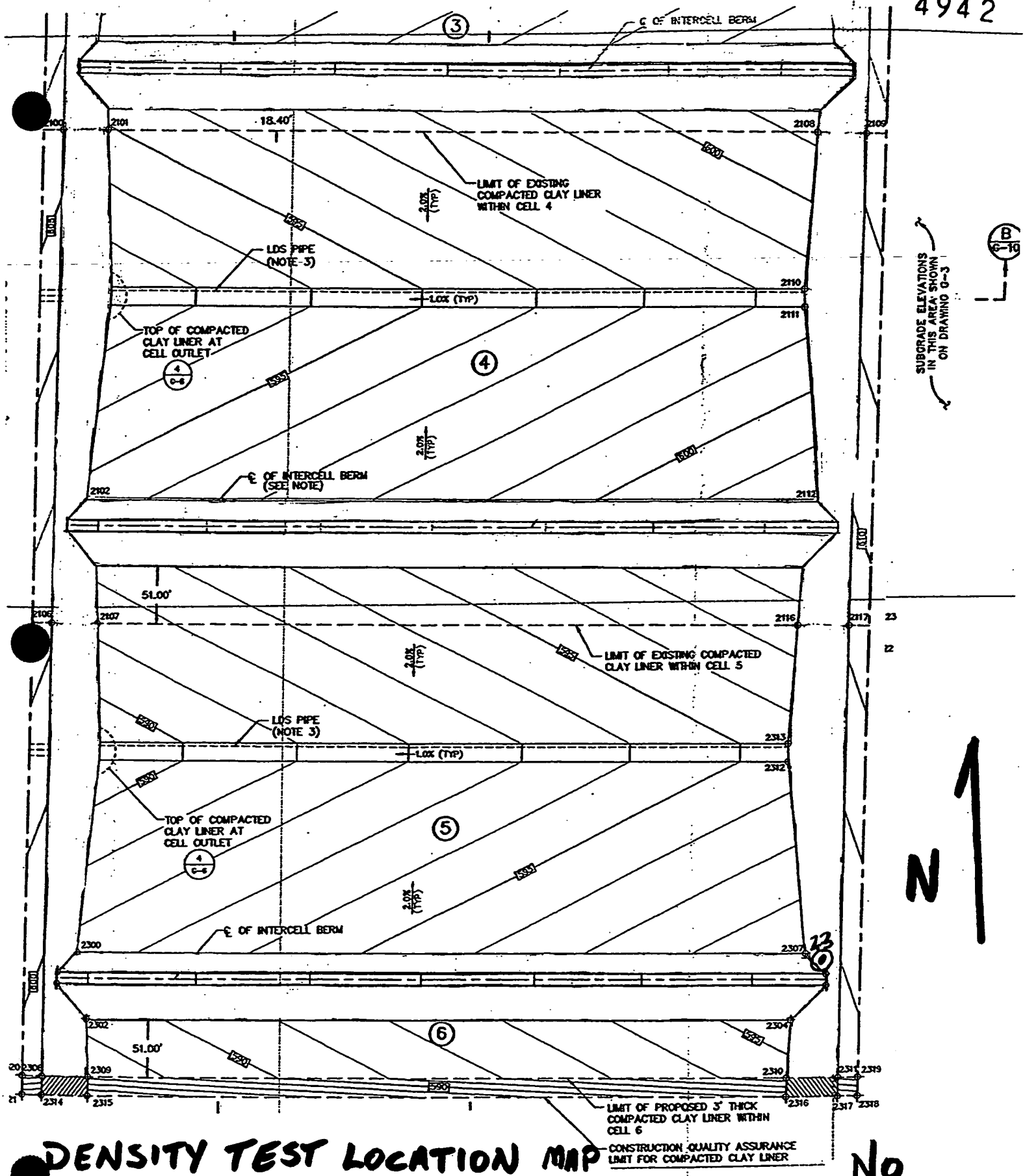

N 1

DENSITY TEST LOCATION MAP

NO SCALE

24 DAY April Month 2002 YEAR

000279

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 26 day April month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"±1"

MATERIAL SOURCE: Borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
24	See Sketch	6"/L-2	OSDF-02	15.0	113.0	16.7	126.5	108.4	95.9	✓	—	—	—	—
25	" "	6"/L-2	RCP-57	10.5	128.7	10.2	140.3	127.4	99.0	✓	—	—	—	—
26	" "	6"/L-2	RCP-57	10.5	128.7	9.7	139.1	126.7	98.5	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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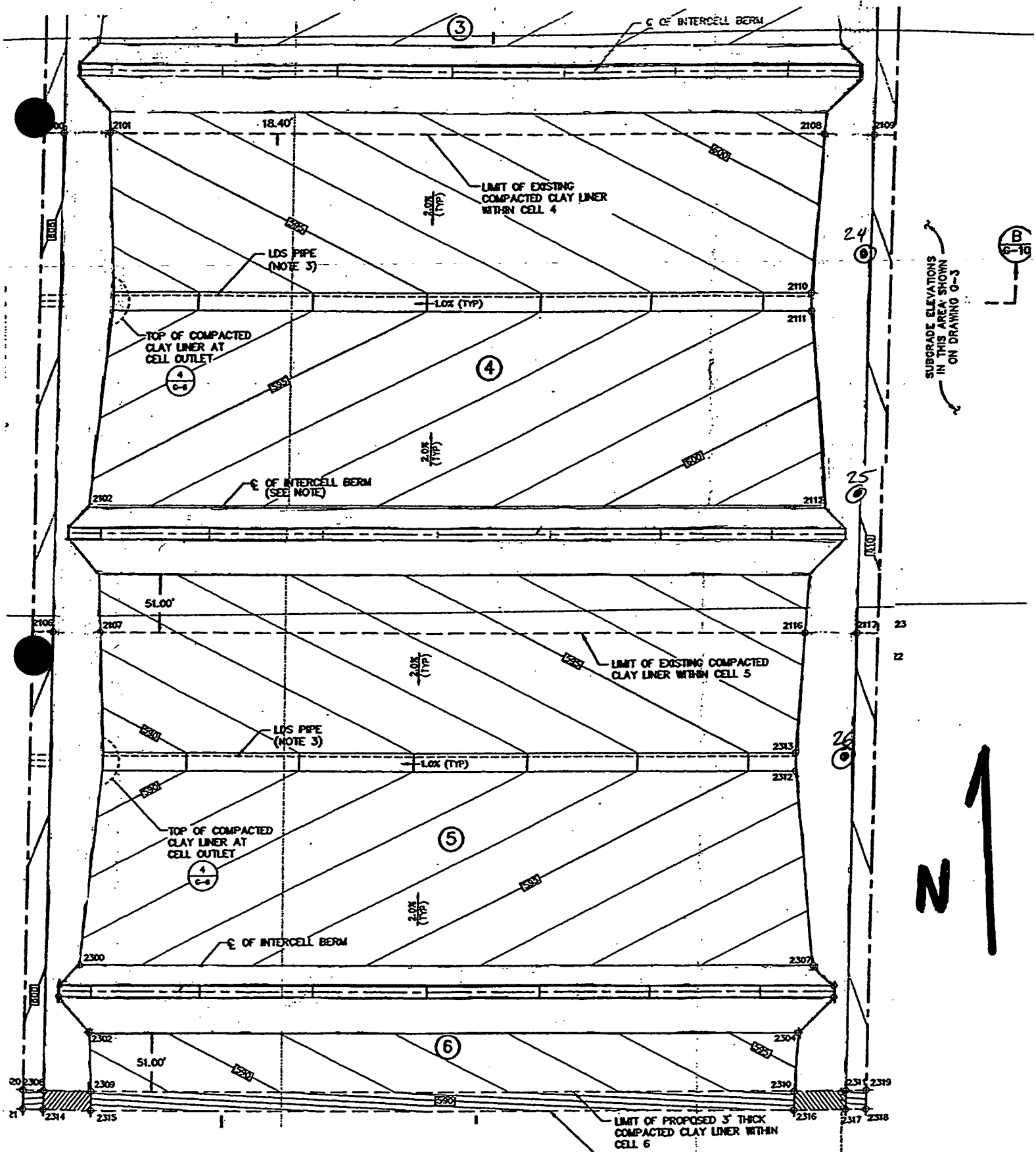

N 1

DENSITY TEST LOCATION MAP

NO SCALE

26 DAY April Month 2002 YEAR

000281

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DESCRIPTION: Phase IV

DATE: 3Ø day April month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"Z"

MATERIAL SOURCE: Borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
27	See Sketch	6"/L-3	PCP57*	10.5	128.7	11.4	143.6	129.Ø	100.2	✓	—	—	—	—
28	↓	6"/L-3	PCP57*	10.5	128.7	9.3	145.4	133.1	103.4	✓	—	—	—	—
29		6"/L-3	PCP57*	10.5	128.7	9.5	143.Ø	13Ø.6	101.5	✓	—	—	—	—
3Ø		6"/L-2	PCP-57	1Ø.5	128.7	11.7	141.Ø	126.2	98.1	✓	—	—	—	—
31		6"/L-2	PCP-57	1Ø.5	128.7	11.8	142.1	127.1	98.8	✓	—	—	—	—
32		6"/L-2	PCP-57	1Ø.5	128.7	11.3	142.5	128.Ø	99.5	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *CFØ2-4 Collected at these locations.
CFØ2-4 126.7 pcf and 11.2% opt. moist.

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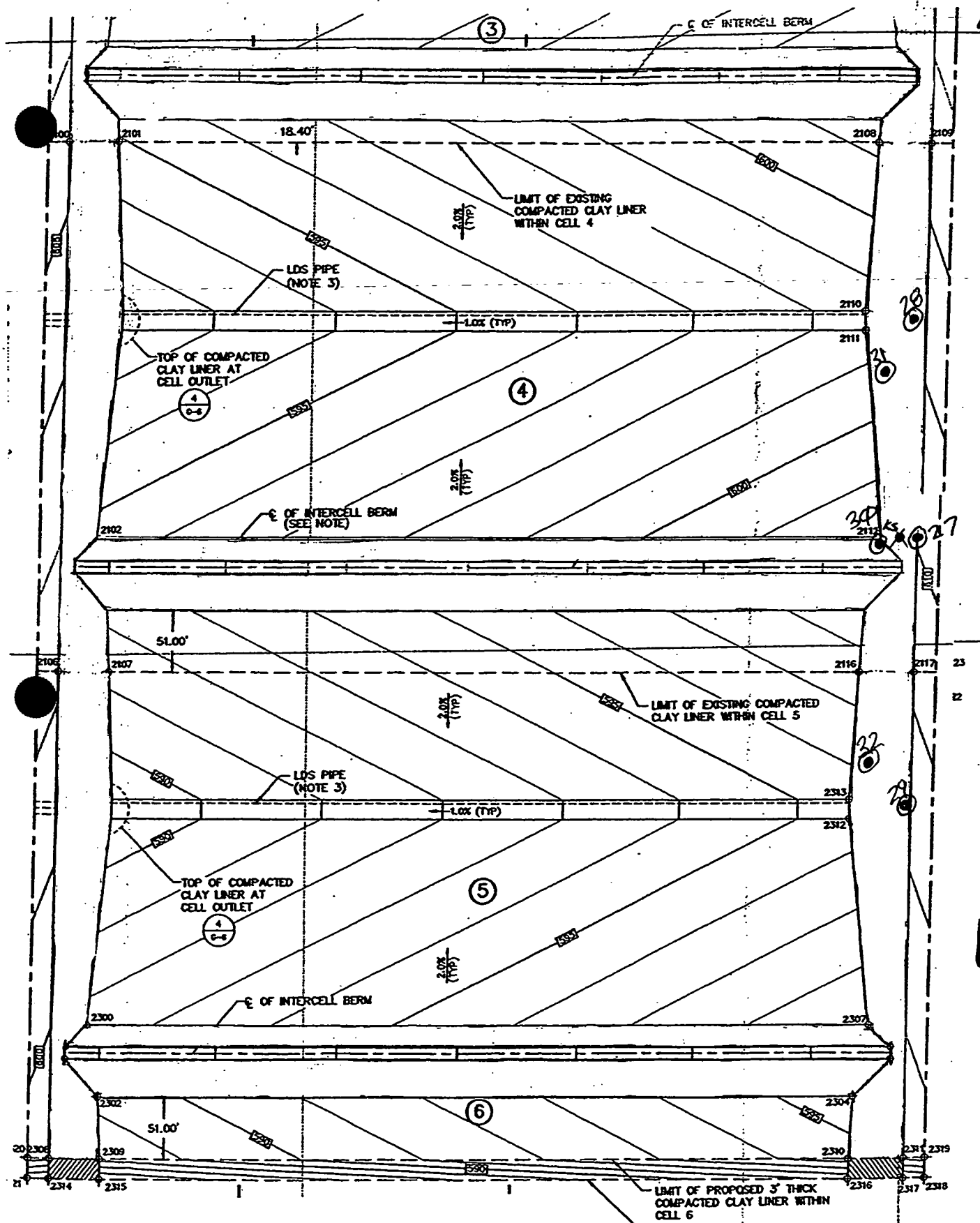

N 1

DENSITY TEST LOCATION MAP

NO SCALE

30 DAY April Month 2002 YEAR

000283

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 1 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8±1

MATERIAL SOURCE: Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Trox 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: CS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
33	See Location Map	8" / L-4	OSDF-16	13.6	119.1	14.5	136.2	118.9	99.8	✓	—	—	—	—
34	" " "	8" / L-4	OSDF-16	13.6	119.1	12.3	135.5	120.6	101.3	✓	—	—	—	—
35	" " "	8" / L-4	PCP57	10.5	128.7	8.9	139.5	128.1	99.5	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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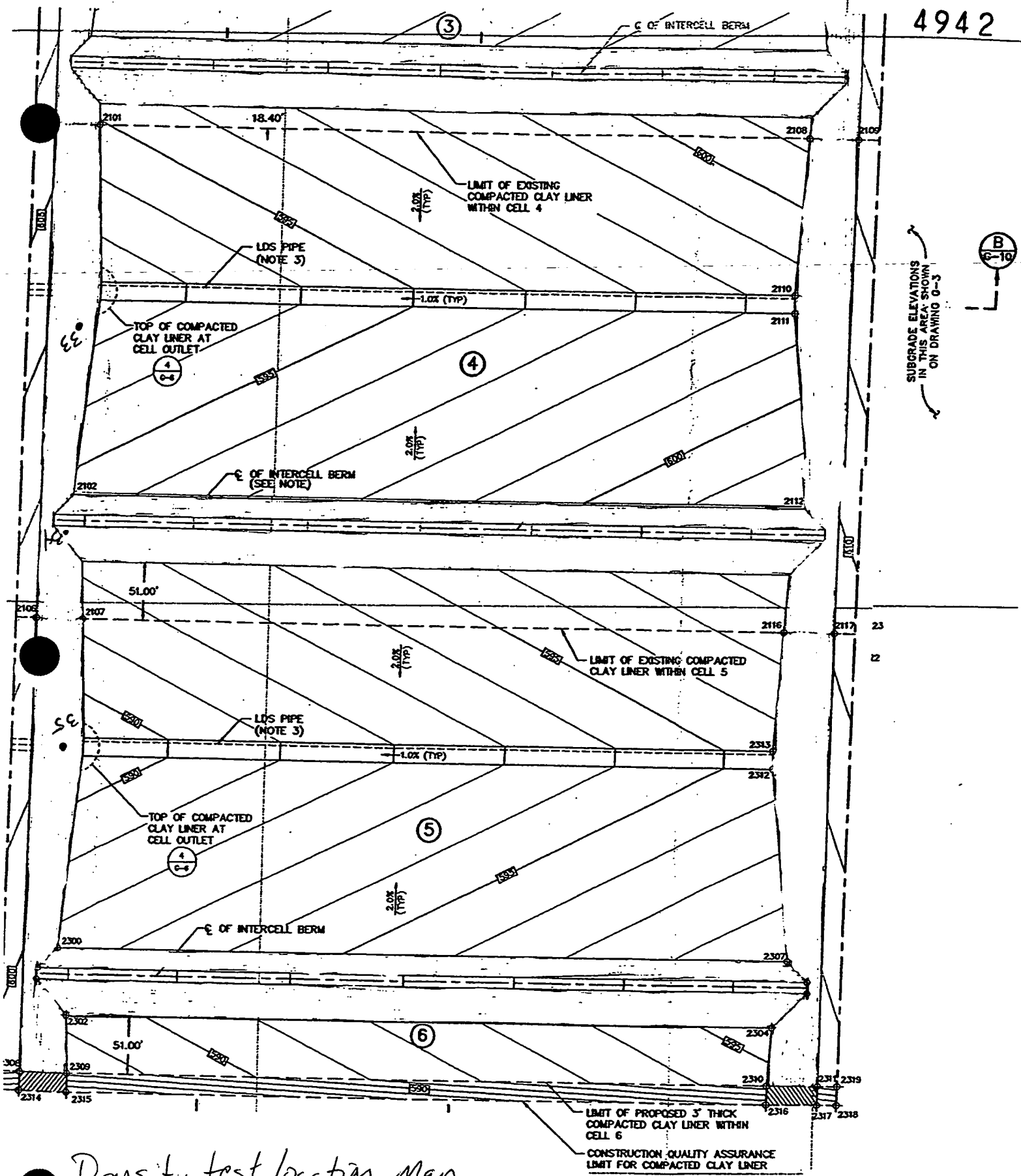

Density test location map

1 May 2002

000285

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 1 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 8"/7"

MATERIAL SOURCE: borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. 27448 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
36	See Sketch	8"/L-4	PCP-57	10.5	128.7	11.0	141.5	127.5	99.1	✓	—	—	—	✓
37	↓	8"/L-4	PCP-57	10.5	128.7	10.2	140.1	127.1 ~~128.0~~	98.8 ~~99.5~~	✓	—	—	—	—
38		8"/L-4	PCP-57	10.5	128.7	12.3	143.0	127.3	98.9	✓	—	—	—	—
39		8"/L-5	PCP-57	10.5	128.7	11.3	140.2	126.0	97.9	✓	—	—	—	—
40		8"/L-5	PCP-57	10.5	128.7	12.2	141.1	125.8	97.8	✓	—	—	—	—
41	✓	8"/L-5	PCP-57	10.5	128.7	12.0	142.0	126.8	98.5	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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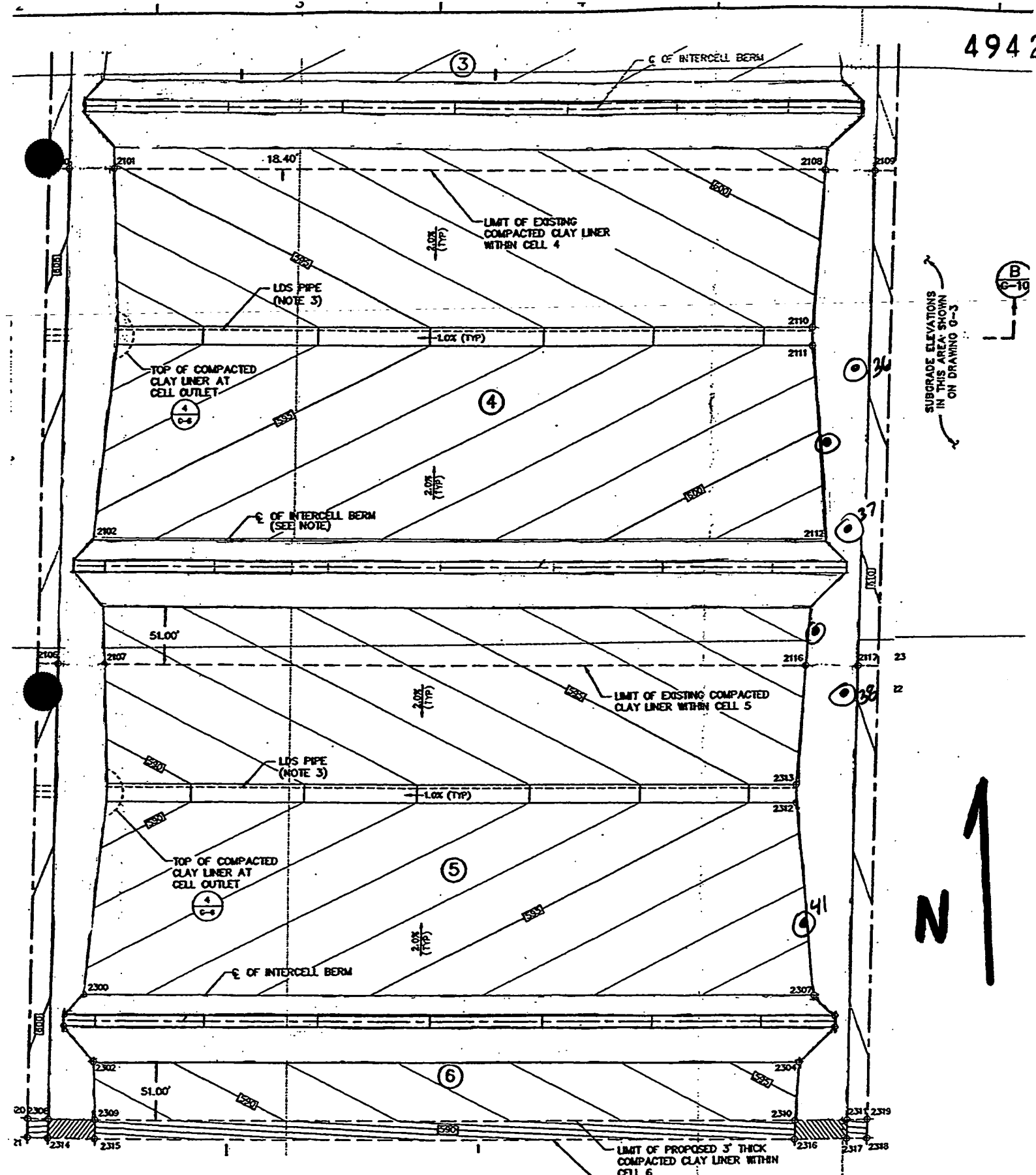

N 1

DENSITY TEST LOCATION MAP

NO SCALE

1 DAY May MONTH 2002 YEAR

000287

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DATE: 2 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/"

MATERIAL SOURCE: borrks on-site MATERIAL TYPE (CIRCLE ONE): FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
42	See Sketch	8"/C-1	OSDF-02	15.0	113.0	12.8	132.9	117.8	104.2	✓	—	—	—	—
43	↓	8"/C-1	OSDF-02	15.0	113.0	15.0	130.9	113.7	100.6	✓	—	—	—	—
44 KS														

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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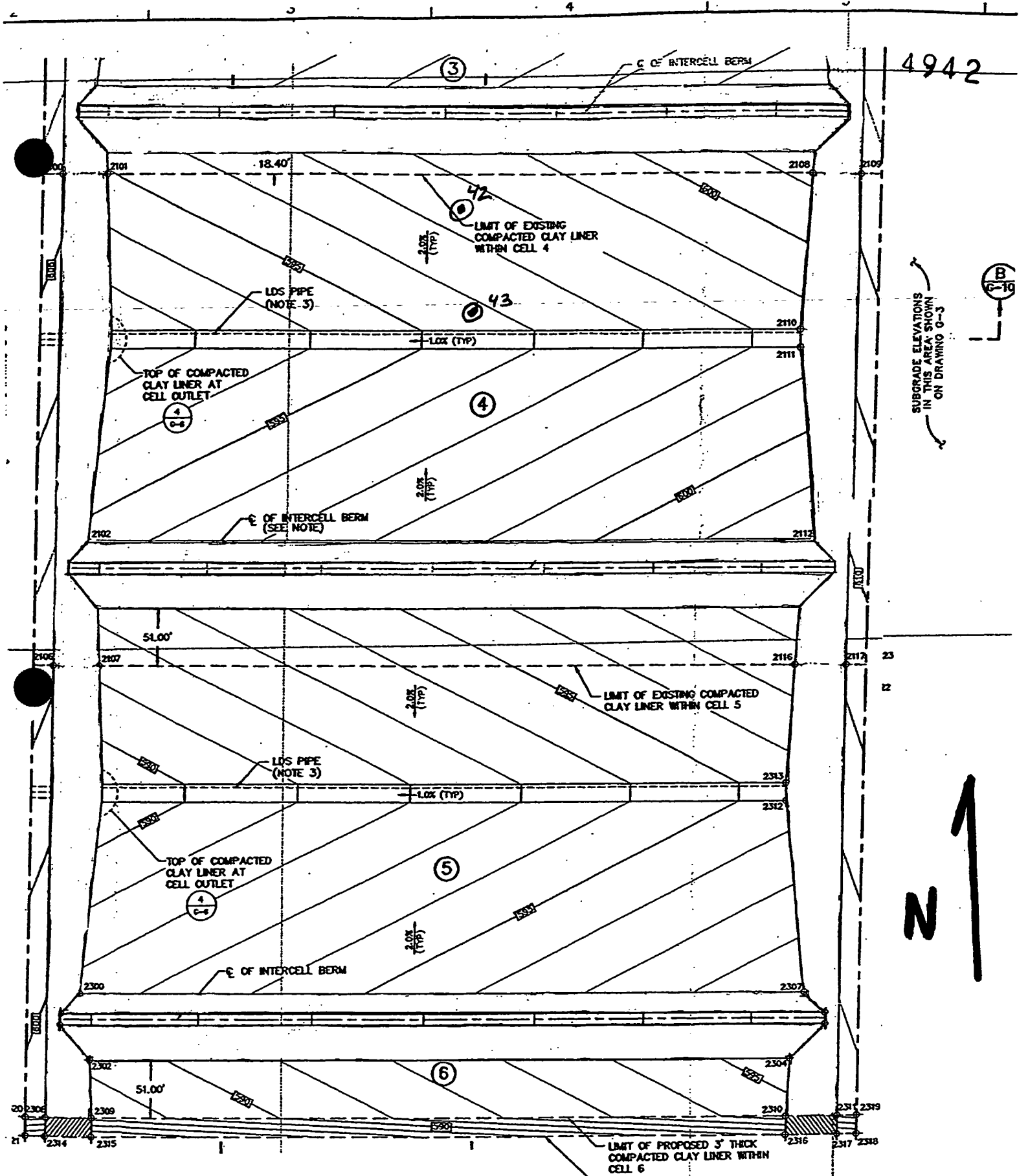

N 1

DENSITY TEST LOCATION MAP

NO SCALE

2 DAY May Month 2002 YEAR

000289

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 3 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10

MATERIAL SOURCE: Cell 4 Floor excavation MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
44	See Location Map	10"/1	CF02-5	13.0	122.0	12.4	136.5	121.4	99.5	✓				
45	" " "	10"/1	CF02-5	13.0	122.0	12.5	137.5	122.2	~~99.3~~ 100.2	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CS SHEET NO. 1 OF 2

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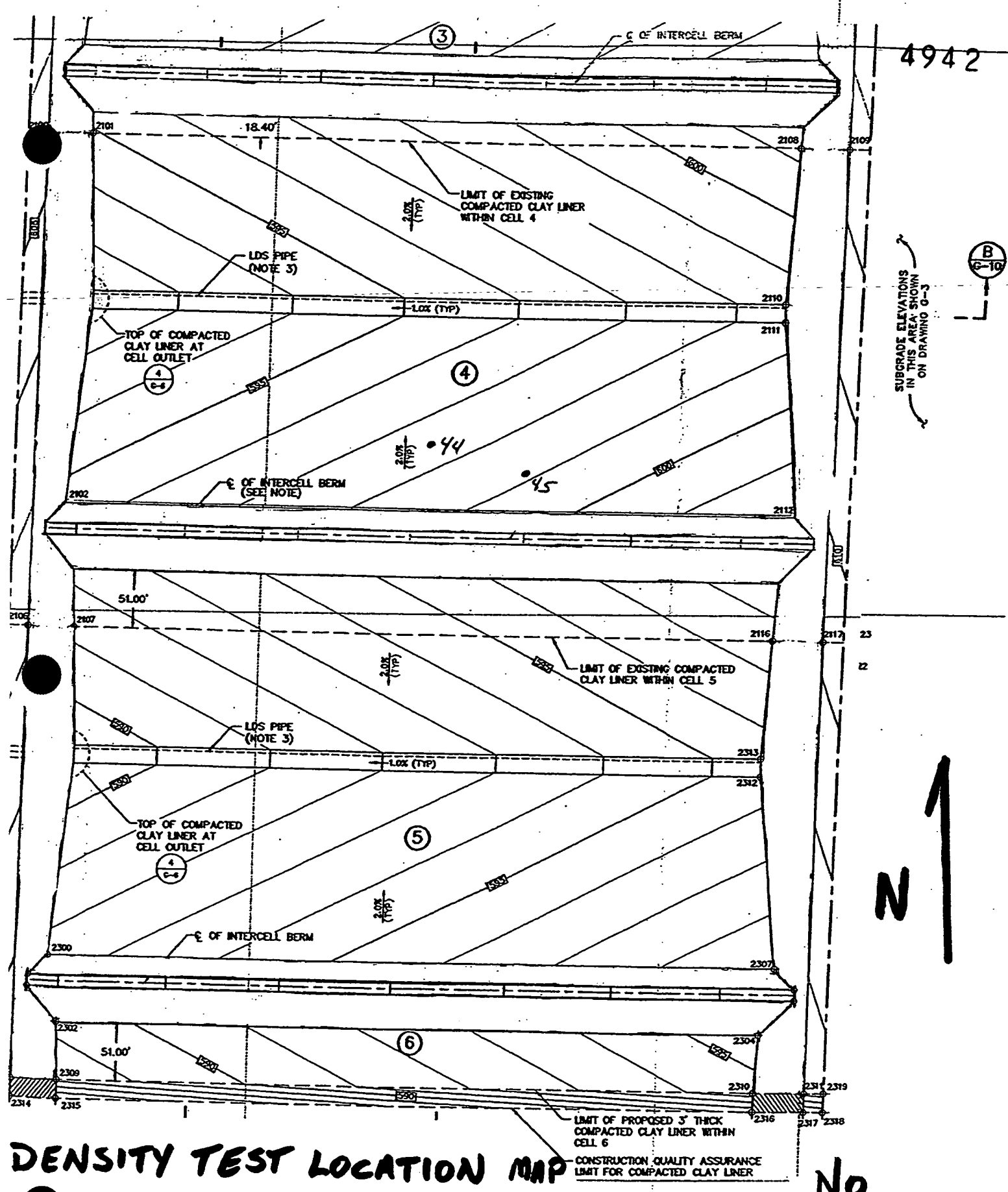

N 1

DENSITY TEST LOCATION MAP

3 DAY May MONTH 2002 YEAR

NO SCALE

000291

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 6Q1341 TASK NO.: Φ4.1

DATE: 3 day May month 2ΦΦ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / (COMPACTED)): 8"/"

MATERIAL SOURCE: Cell 4 / borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
46 A	See Sketch	8" / L-2	CF02-5	13.0	122.0	13.2	136.3	12Φ.4	98.7	✓				
47 B		8" / L-~~8~~7	PCP-57	10.5	128.7	1Φ.9	141.3	127.4	99.0	✓				
48 C		8" / L-~~8~~7	PCP-57	10.5	128.7	1Φ.6	143.2	129.4	100.6	✓				
49 D		8" / L-~~8~~7	PCP-57	10.5	128.7	1Φ.3	142.5	129.2	100.4	✓				
50 E		8" / L-2	CF02-5	13.0	122.0	14.Φ	135.9	119.2	97.7	✓				
51 F		8" / L-8	PCP-57	10.5	128.7	1Φ.6	143.4	129.6	100.7	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 1 OF 2

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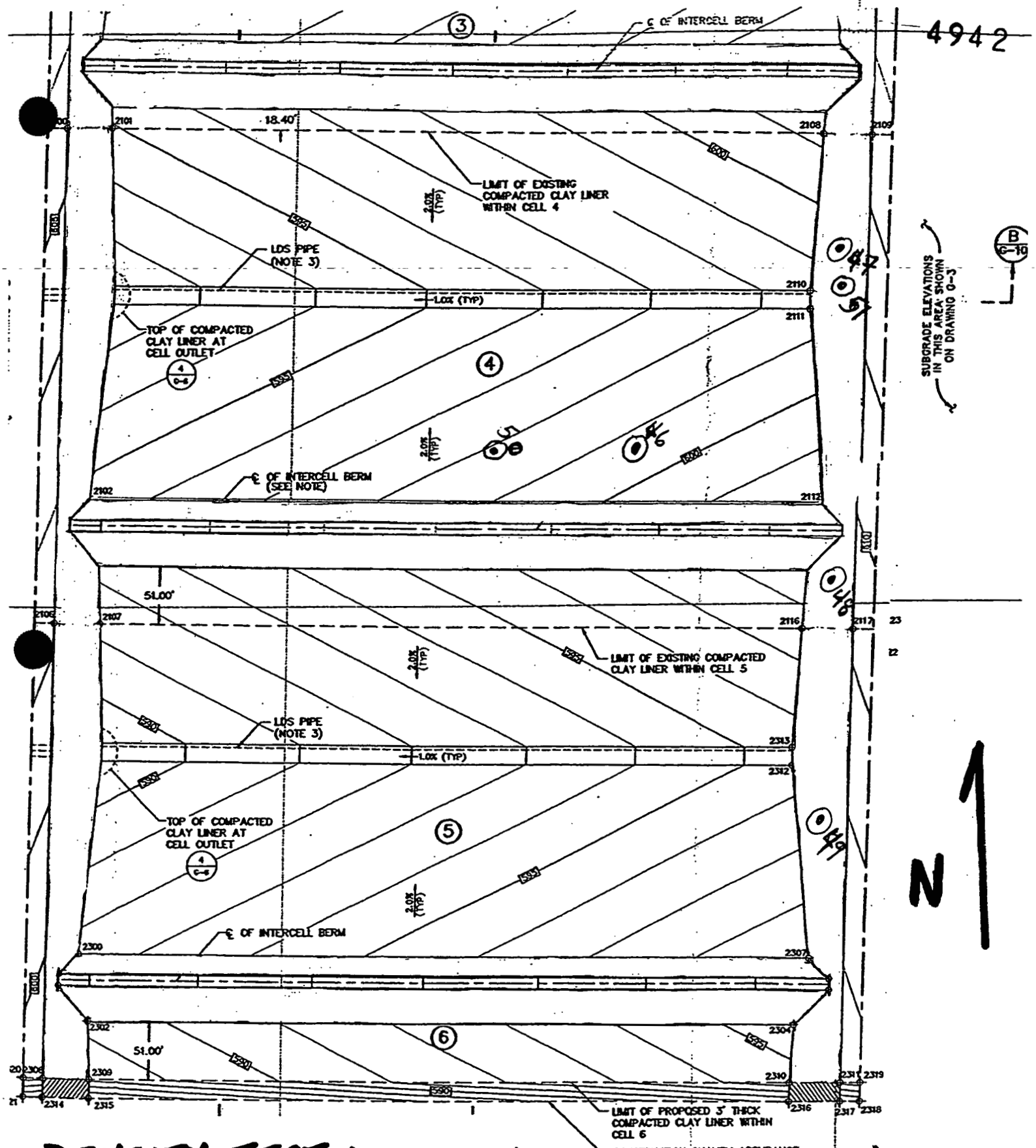

DENSITY TEST LOCATION MAP

3 DAY May Month 2002 YEAR

NO SCALE

000293

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 4 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10

MATERIAL SOURCE: Cell 4 Ex/Borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxx 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
52	See Location Map	8"/2	CF02-05	13.0	122.0	11.4	136.6	122.6	100.5	✓				
53	" " "	8"/2	CF02-05	13.0	122.0	12.1	138.2	123.3	101.1	✓				
54	" " "	8"/3	CF02-05	13.0	122.0	10.6	135.9	122.9	100.7	✓				
55	" " "	8"/3	CF02-05	13.0	122.0	11.4	137.1	123.1	100.9	✓				
56	" " "	8"/3	CF02-05	13.0	122.0	10.9	137.2	123.7	101.4	✓				
57	" " "	8"/4	CF02-05	13.0	122.0	11.6	137.8	123.5	~~123.5~~ 101.2	✓				
58	" " "	8"/4	CF02-05	13.0	122.0	11.0	136.9	123.4	101.1	✓				
59	" " "	8"/4	CF02-05	13.0	122.0	10.2	136.5	123.8	101.5	✓				
60	" " "	8"/3	CF02-05	13.0	122.0	11.0	137.3	123.7	101.4	✓				
61	" " "	8"/7	PLP-57 ~~CF02~~	10.5	128.7	9.8	142.6	129.8	100.9	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

7-4942

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: _____ PROJECT NO.: _____ TASK NO.: _____

DATE: 4 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
62		8"/7	CF02-6	8.7	134.6	7.6	144.9	134.7	100.1	✓				
63		8"/7	CF02-6	8.7	134.6	8.5	~~134.1~~ 145.5	134.1	99.6	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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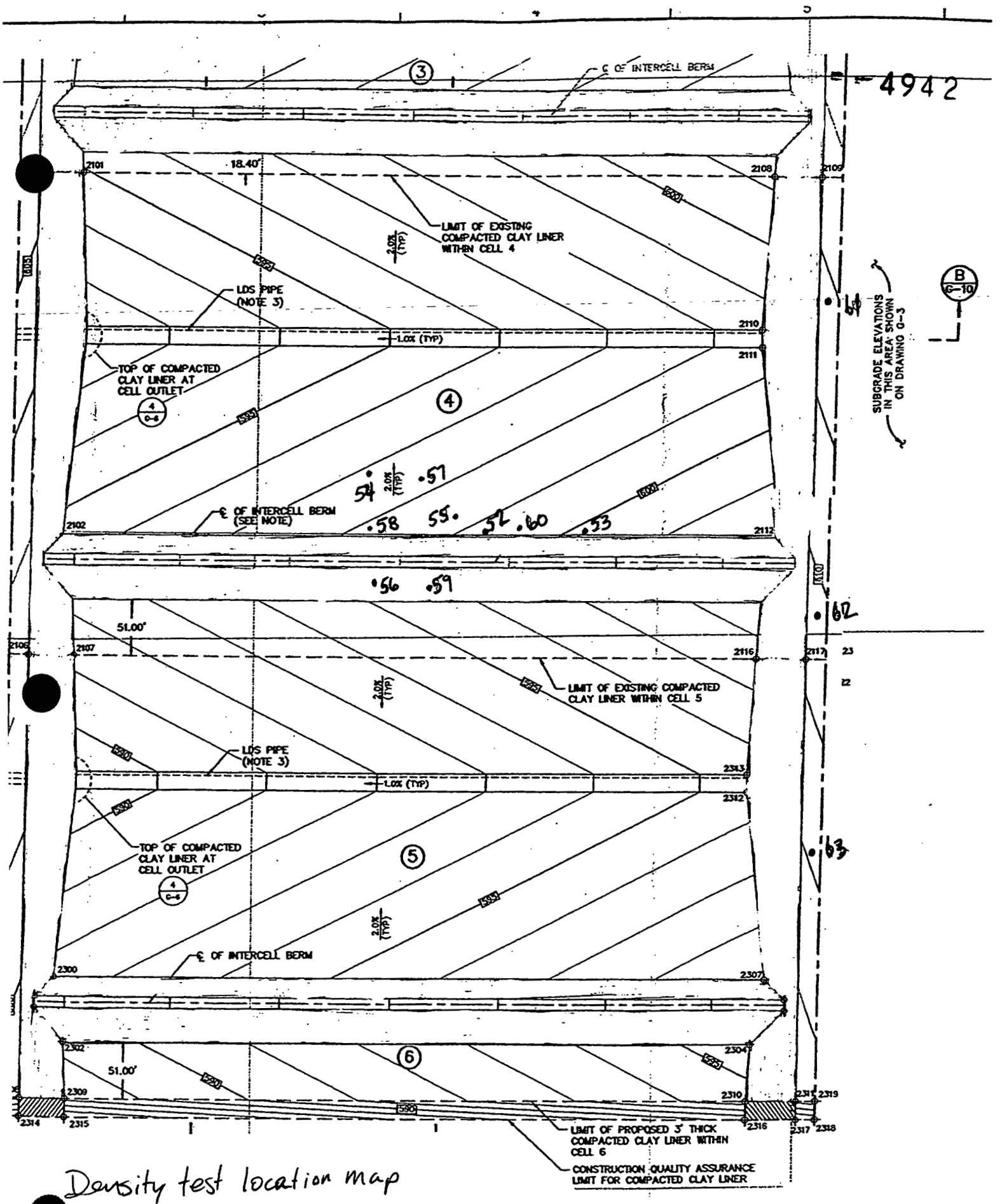
2-4942



Density test location map

4 May 2002

000296

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DATE: 6 day May month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8"±1"

MATERIAL SOURCE: on-site

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
64 A	See Sketch	8"/L-8	CF02-6	8.7	134.6	7.9	142.7	132.2	98.3	✓				
65 B	↓	8"/L-8	CF02-6	8.7	134.6	7.2	143.3	133.7	99.3	✓				
66 C		8"/L-8	CF02-6	8.7	134.6	6.5	145.9	136.9	101.8	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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000297

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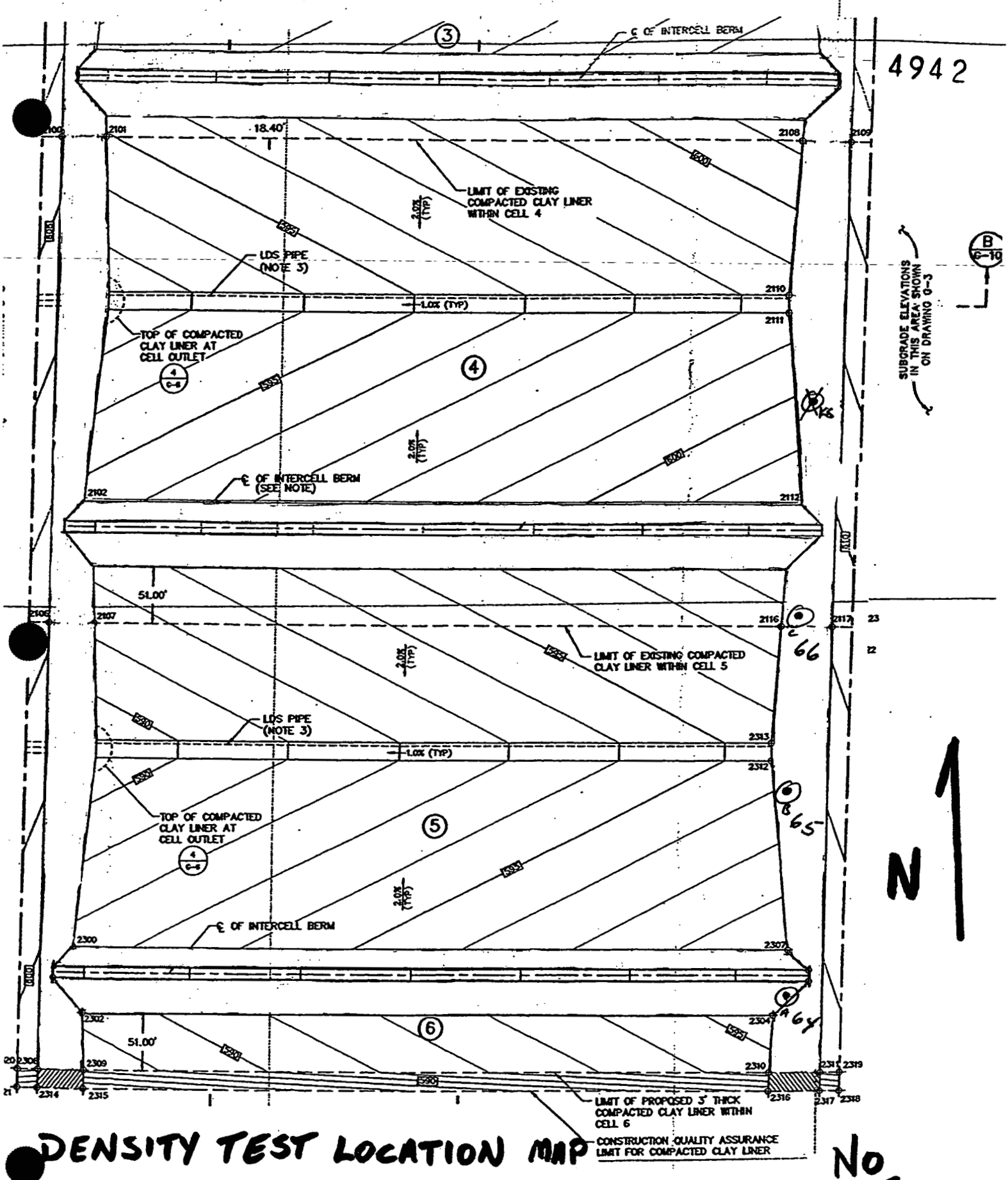

DENSITY TEST LOCATION MAP

NO SCALE

6 DAY May MONTH 2002 YEAR

000298

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 15 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
4467	See Location Map	8" / 6	CF02-6	8.7	134.6	7.4	143.2	133.3	99.1	✓				
4568	" " "	8" / 6	CF02-6	8.7	134.6	7.9	144.1	133.5	99.2	✓				
4669	" " "	8" / 6	CF02-6	8.7	134.6	7.3	142.8	133.0	98.9	✓				

000299

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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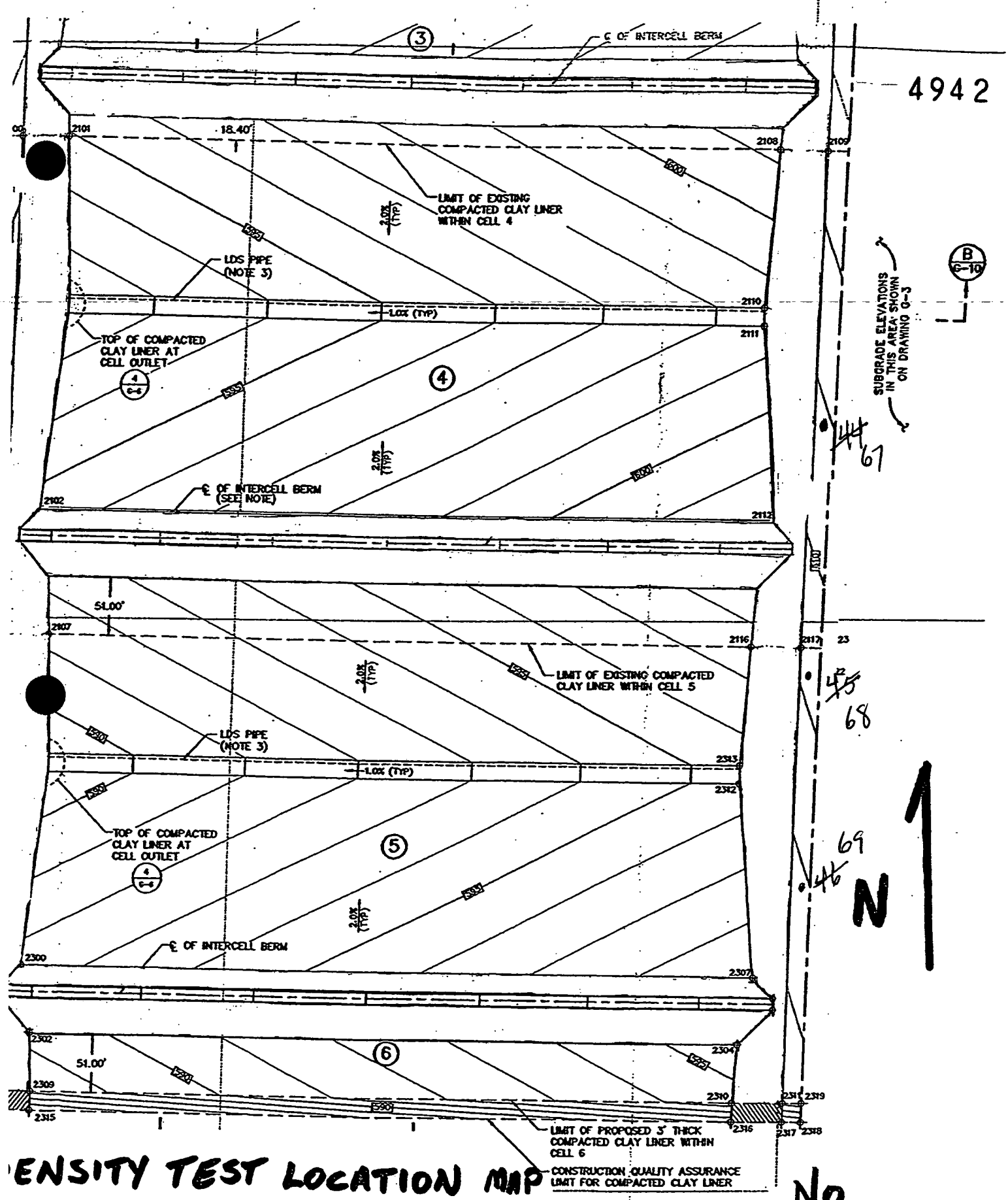
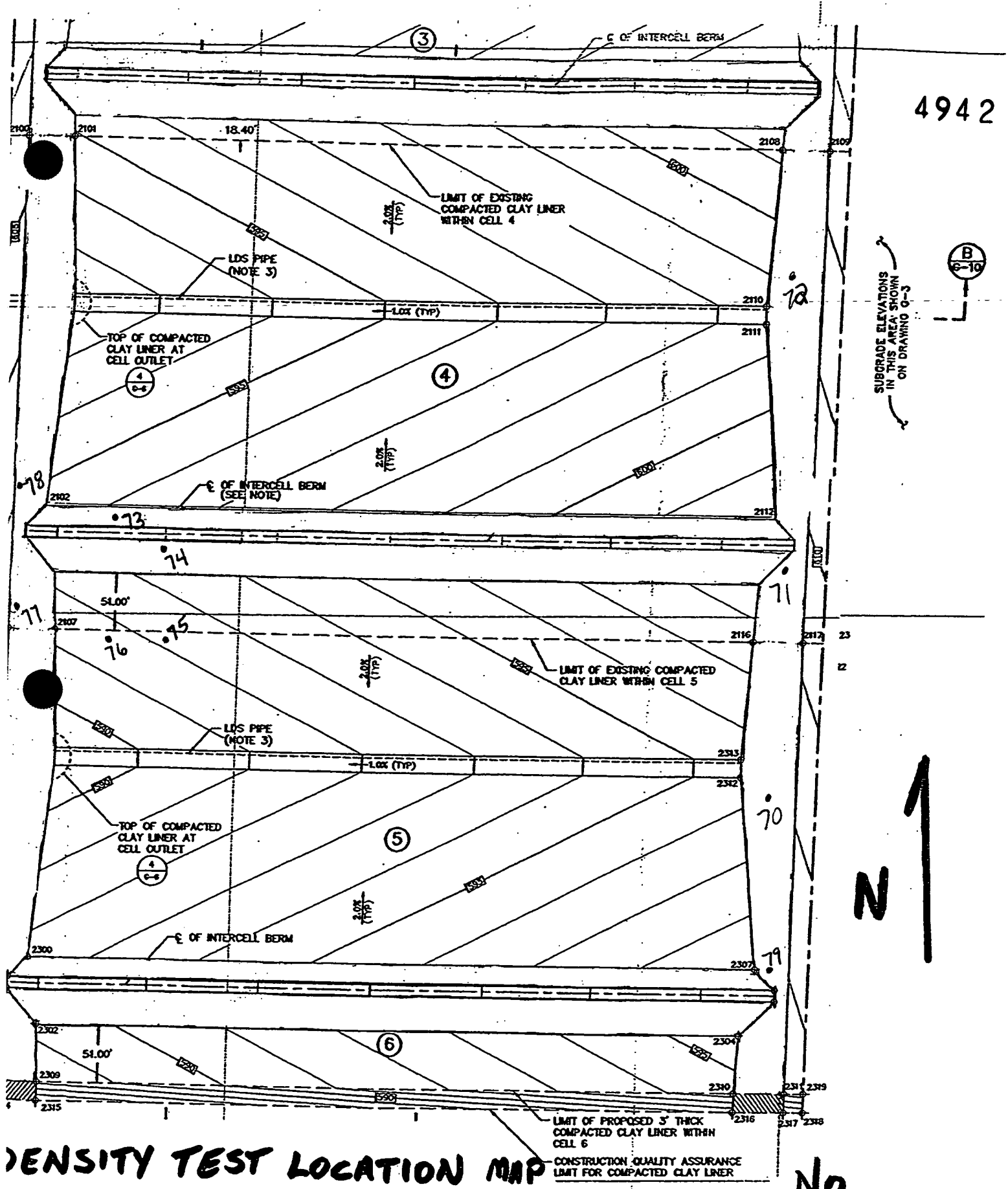


ENSITY TEST LOCATION MAP

5 DAY May MONTH 2002 YEAR

NO SCALE

4942



DENSITY TEST LOCATION MAP

16 DAY May MONTH 2002 YEAR

NO SCALE

000301

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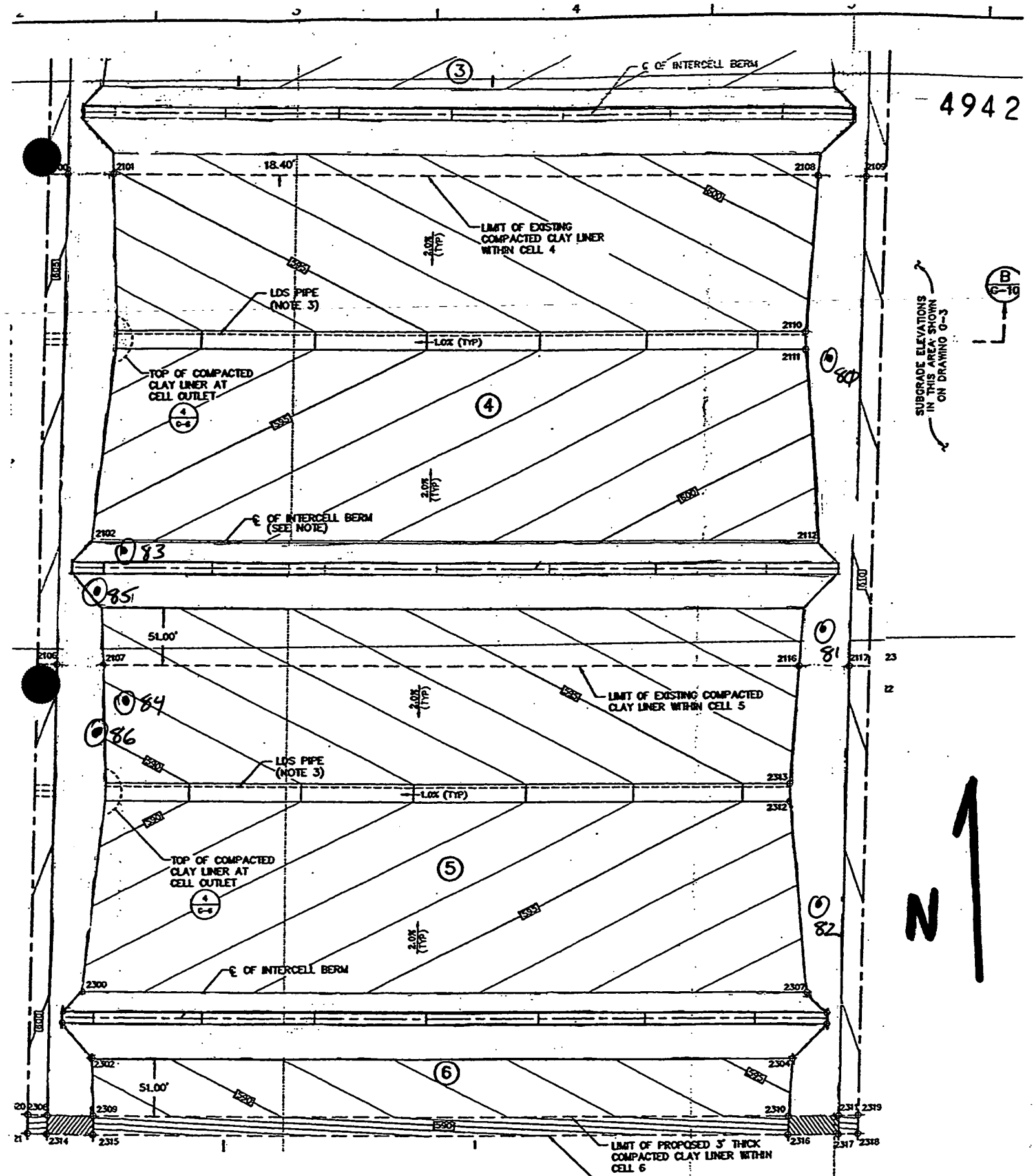

DENSITY TEST LOCATION MAP

NO SCALE

20 DAY May Month 2002 YEAR

000302

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IIC

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 21 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED) 8±1"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. ~~20979~~ 27418 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
87	See location map	8" / L-6	CF02-6	8.7	134.6	10.9	144.3	130.1	96.7	✓				
88	" " "	8" / L-6	PCP-37 ~~CF02-6~~	10.5	128.7	12.7	139.7	123.9	96.3	✓				
89	" " "	8" / L-7	CF02-6	8.7	134.6	11.4	143.7	129.0	95.8	✓				
90	" " "	8" / L-7	CF02-6	8.7	134.6	10.1	143.2	130.0	96.6	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 1 OF 2

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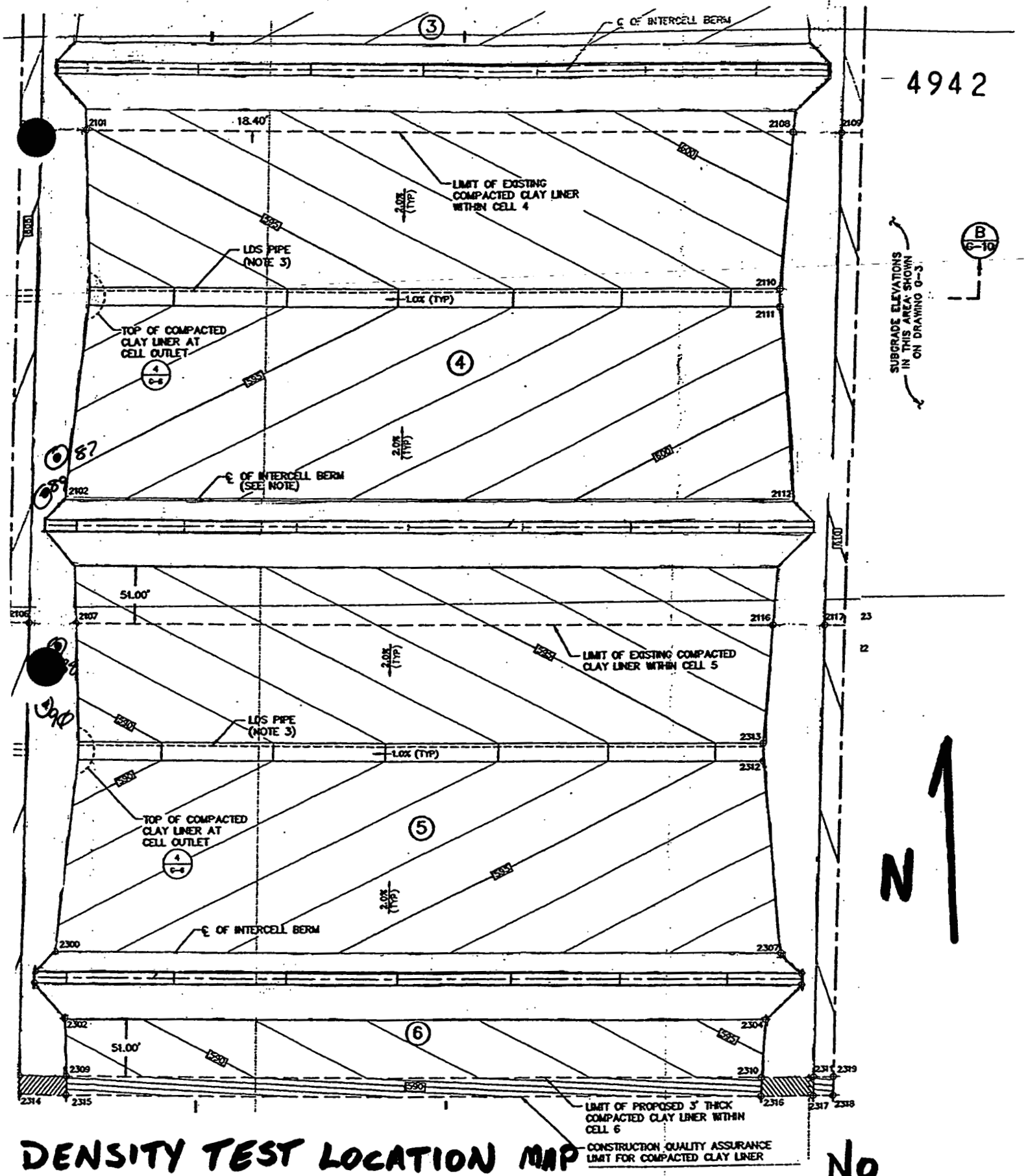

DENSITY TEST LOCATION MAP

21 DAY May MONTH 2002 YEAR

NO SCALE

000304

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 22 day May month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"±1"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3430 GAUGE SERIAL NO. ~~20979~~ 27418 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
91	See location map	8" / L-2	CF02-6	8.7	134.6	9.2	142.6	130.5	97.0	✓				
92		8" / L-9	PCP-57	10.5	128.7	10.9	140.4	126.5	98.4	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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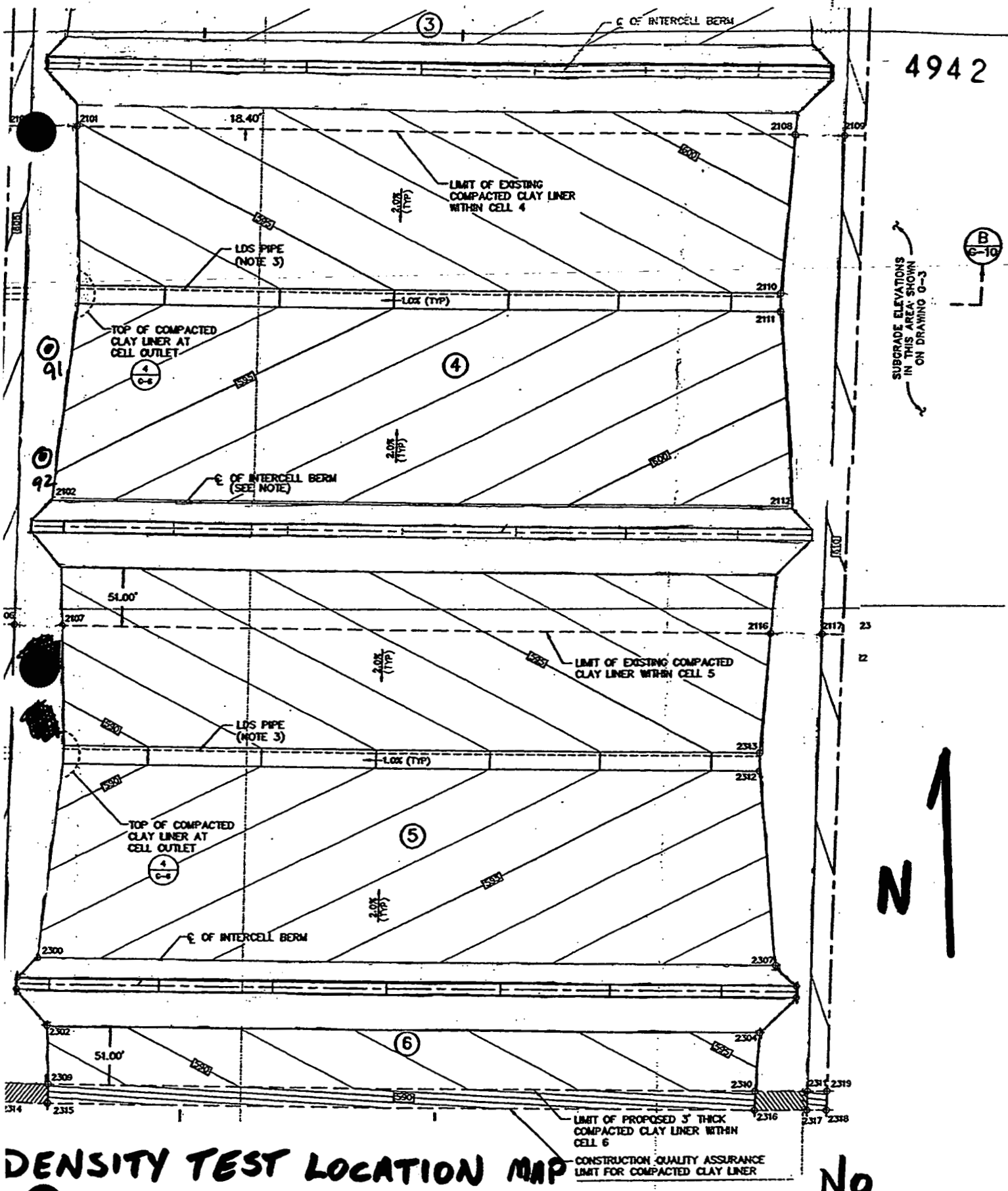

N 1

DENSITY TEST LOCATION MAP

22 DAY May Month 2002 YEAR

NO SCALE

2 of 2

000306

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G21341 TASK NO.: 04.1

DATE: 22 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Trox. 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: CJ

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
93		8in / 1	PCP-57	10.5	128.7	10.5	139.4	126.2	98.0	✓				
94		8in / 2	PCP-57	10.5	128.7	10.2	138.8	126.0	97.9	✓				

000307

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942

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SHEET NO. 1 OF 2

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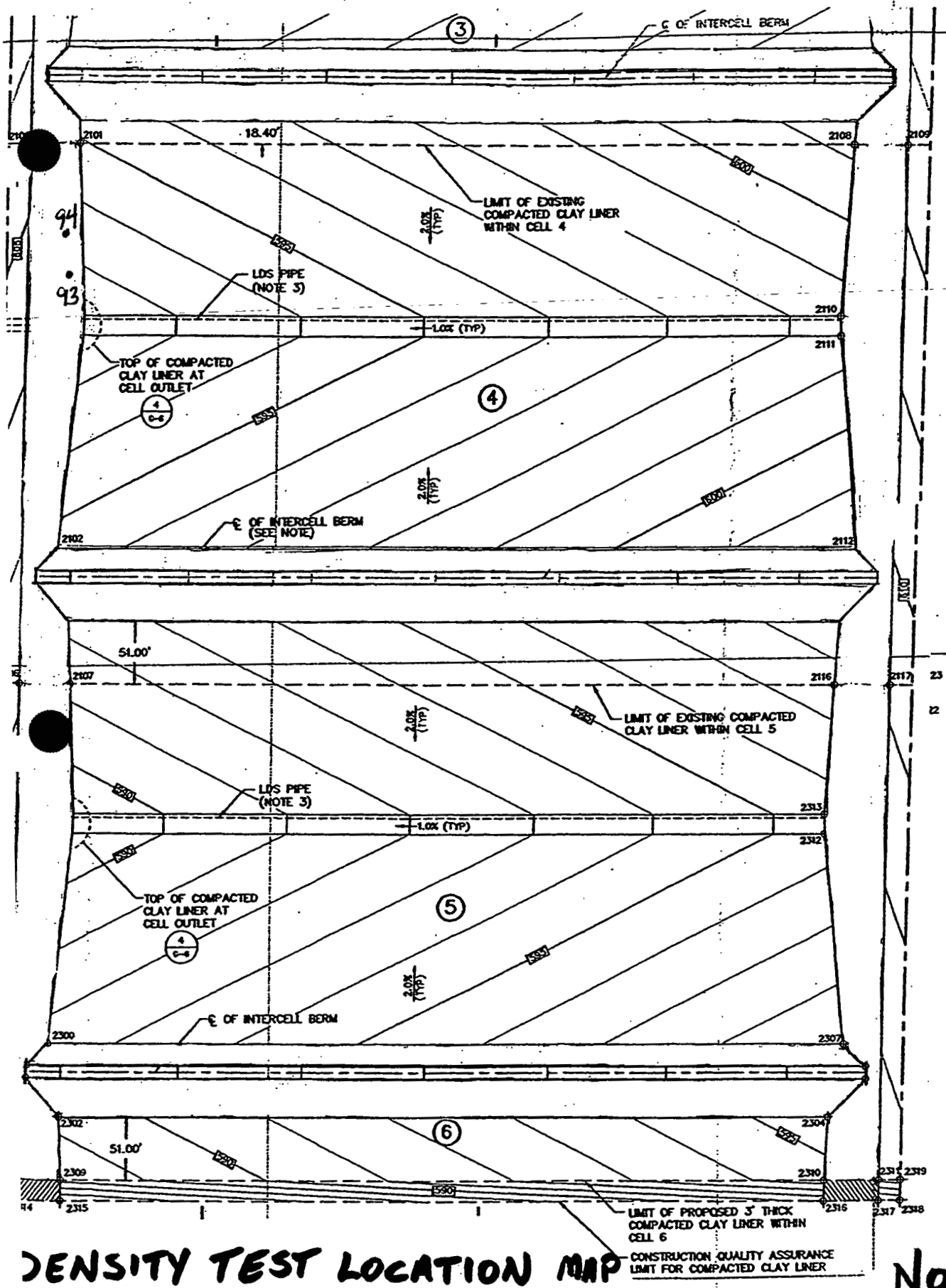


N 1

DENSITY TEST LOCATION MAP

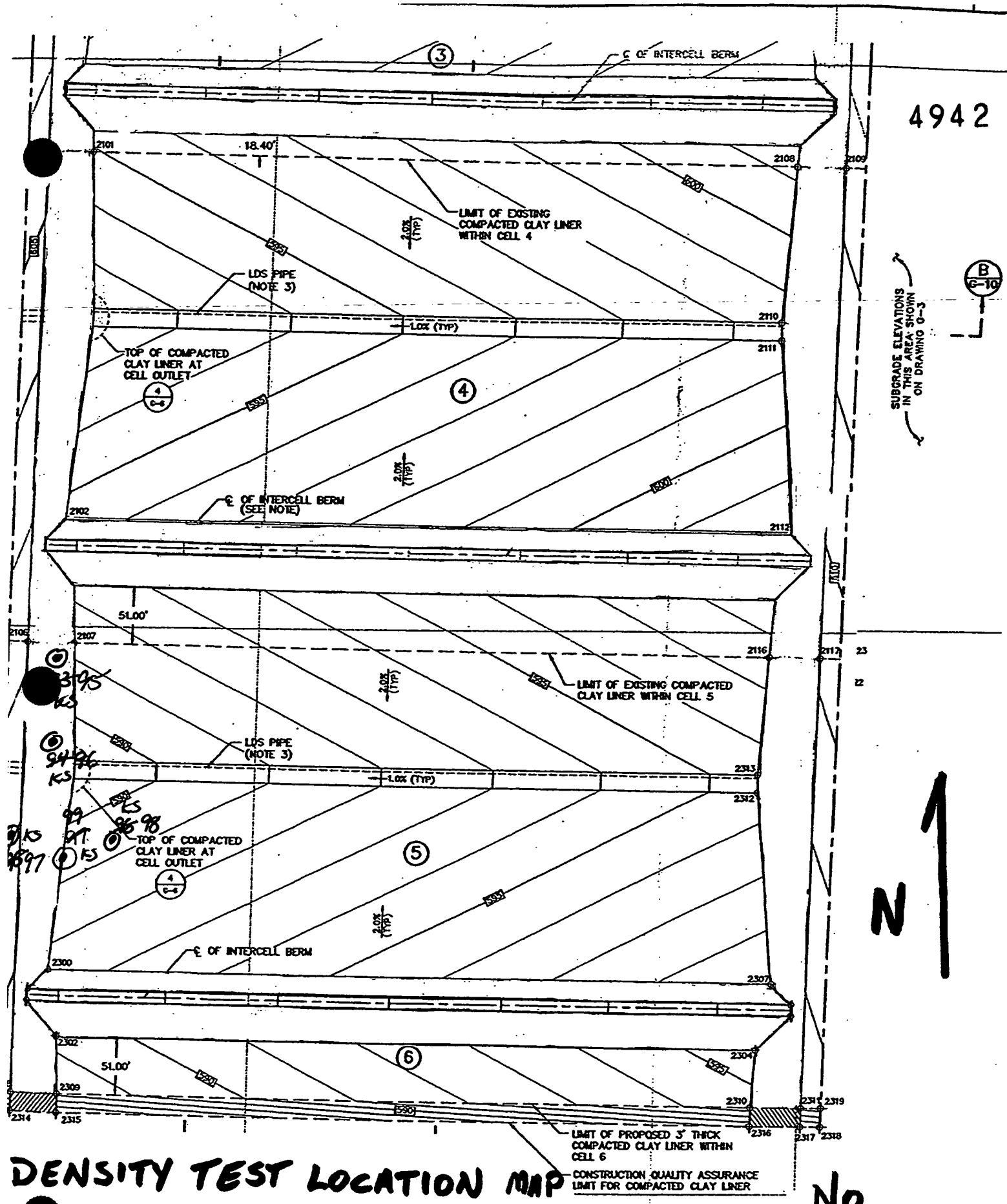
22 DAY May Month 2002 YEAR

NO SCALE

2 of 2

000308

4942



N 1

DENSITY TEST LOCATION MAP

23 DAY May Month 2002 YEAR

NO SCALE

000309

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 24 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D (698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8-6

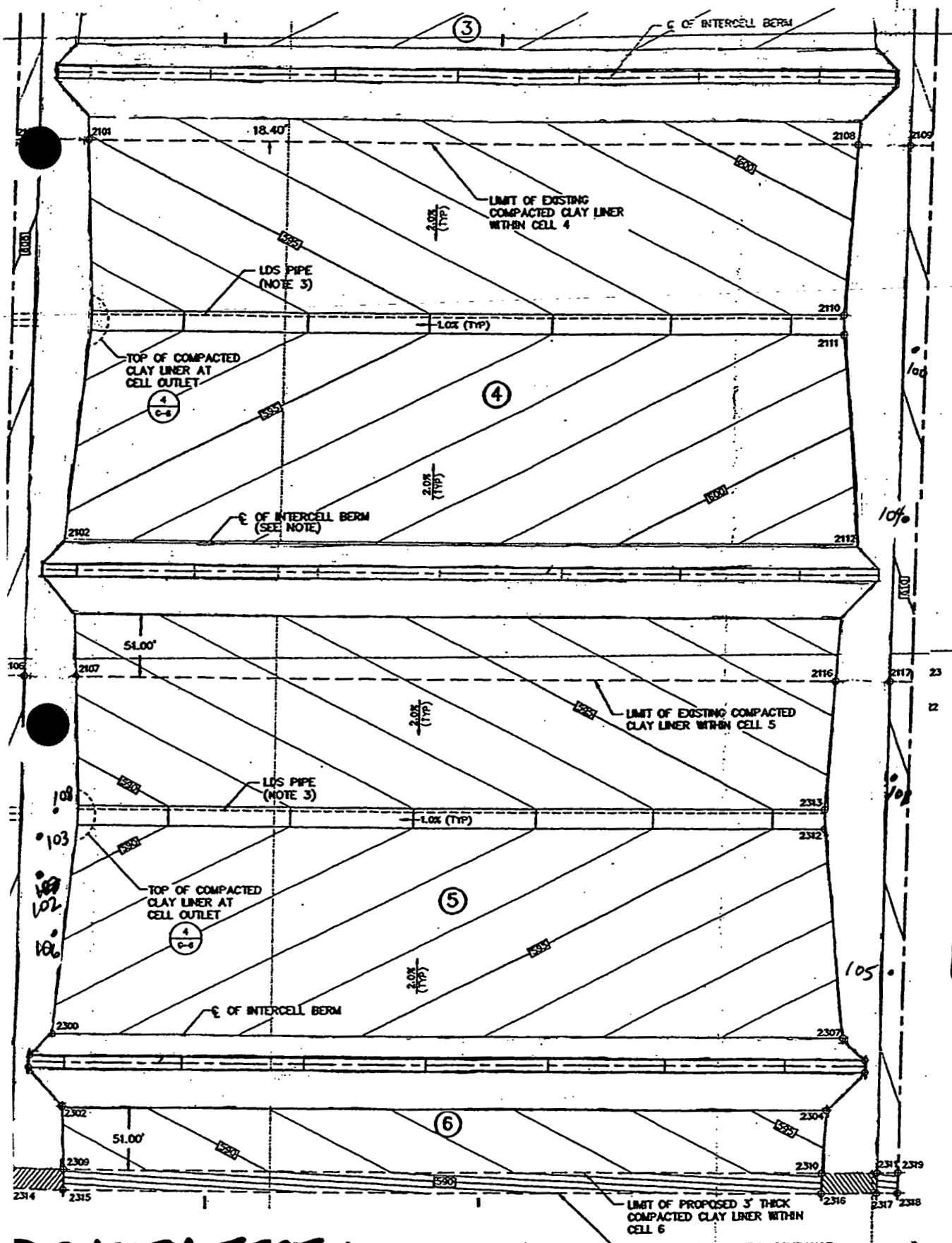
MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Trox. 3430 GAUGE SERIAL NO. 27418 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
100	See Location Map	8" / 11	PCP-57	10.5	128.7	10.4	139.3	126.2	98.0	✓				
101	" " "	8" / 12	PCP-57	10.5	128.7	10.0	138.1	125.6	97.5	✓				
102	" " "	8" / 5	PCP-57	10.5	128.7	11.1	139.1	125.2	97.3	✓				
103	" " "	8" / 6	PCP-57	10.5	128.7	9.9	138.6	126.1	98.0	✓				
104	" " "	8" / 13	PCP-57	10.5	128.7	11.3	138.4	~~125.2~~ 124.3	96.6	✓				
105	" " "	8" / 14	PCP-57	10.5	128.7	10.6	137.7	124.5	96.7	✓				
106	" " "	8" / 7	PCP-57	10.5	128.7	10.4	139.4	126.4	98.1	✓				
107	" " "	8" / 8	PCP-57	10.5	128.7	10.7	137.4	124.1	96.4	✓				
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942



N 1

DENSITY TEST LOCATION MAP

24 DAY May Month 2002 YEAR

NO SCALE

000311

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 30 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/7"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
108	See Location Map	8" / L-1	PCP-55	11.7	126.5	10.8	138.8	125.2	99.0	✓	—	—	—	—
109	↓	8" / L-2	PCP-55	11.7	126.5	11.4	137.0	122.9	97.2	✓	—	—	—	—
110		8" / L-3	PCP-55	11.7	126.5	11.7	138.1	123.6	97.7	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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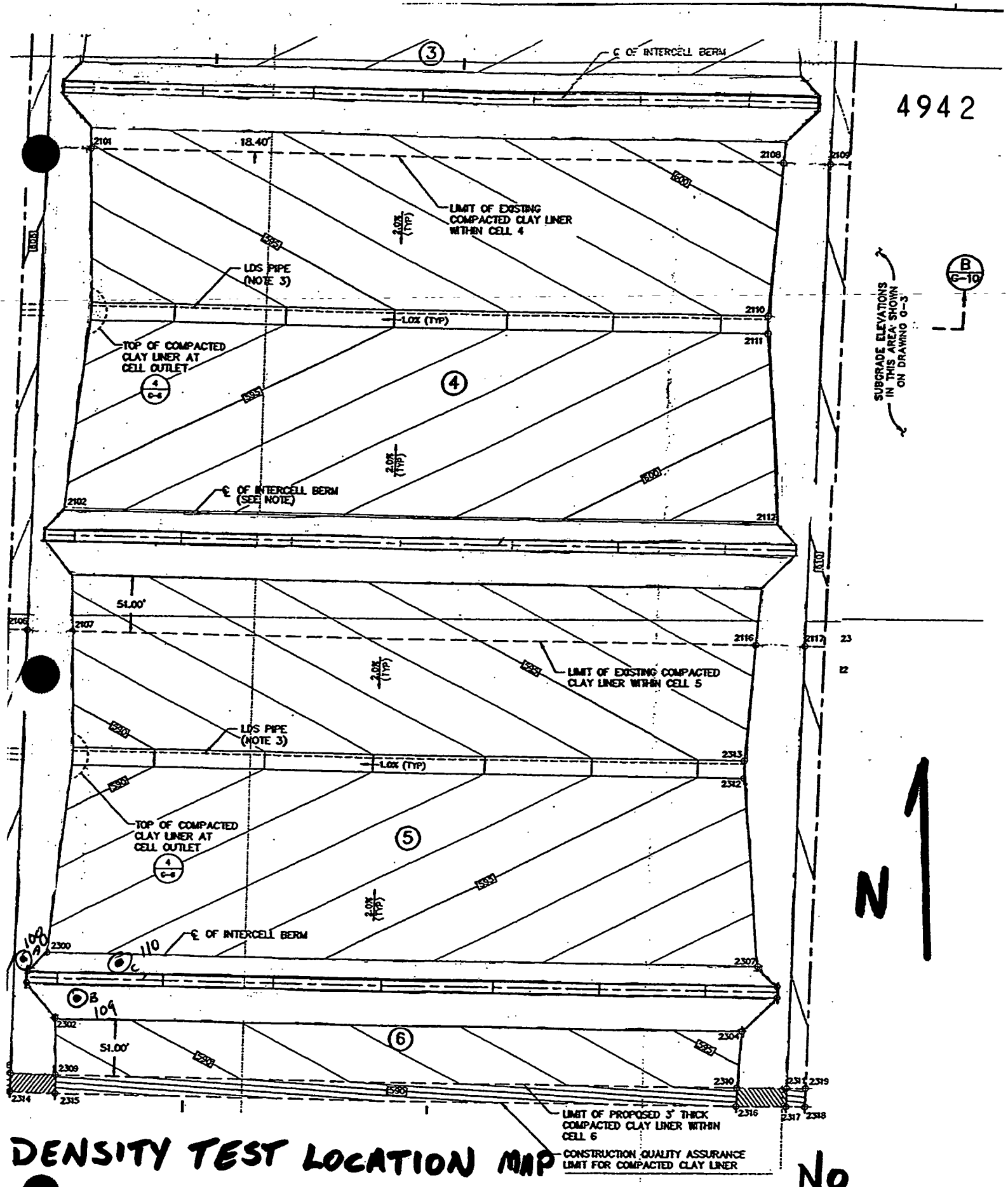

N 1

DENSITY TEST LOCATION MAP

30 DAY May Month 2002 YEAR

NO SCALE

000313

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DATE: 31 day May month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"/"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
*A	111	See Location Map	8" / L-4	PCP-55	11.7	126.5	11.0	134.5	121.2	95.8	✓	—	—	—	—
B	112	↓	8" / L-1	PCP-55	11.7	126.5	11.5	135.3	121.3	95.9	✓	—	—	—	—
C	113	↓	8" / L-1	PCP-55	11.7	126.5	10.3	136.0	123.3	97.5	✓	—	—	—	—
**D	114	↓	8" / L-15	PCP-55	11.7	126.5	9.9	135.8	123.6	97.7	✓	—	—	—	—
E	115	↓	8" / L-15	PCP-57	10.5	128.7	9.3	138.8	127.0	98.7	✓	—	—	—	—
F		↓	/												
		↓	/												
		↓	/												
		↓	/												
		↓	/												

0000314

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

* Drive ring #3 taken

** Drive ring #4 taken

4942

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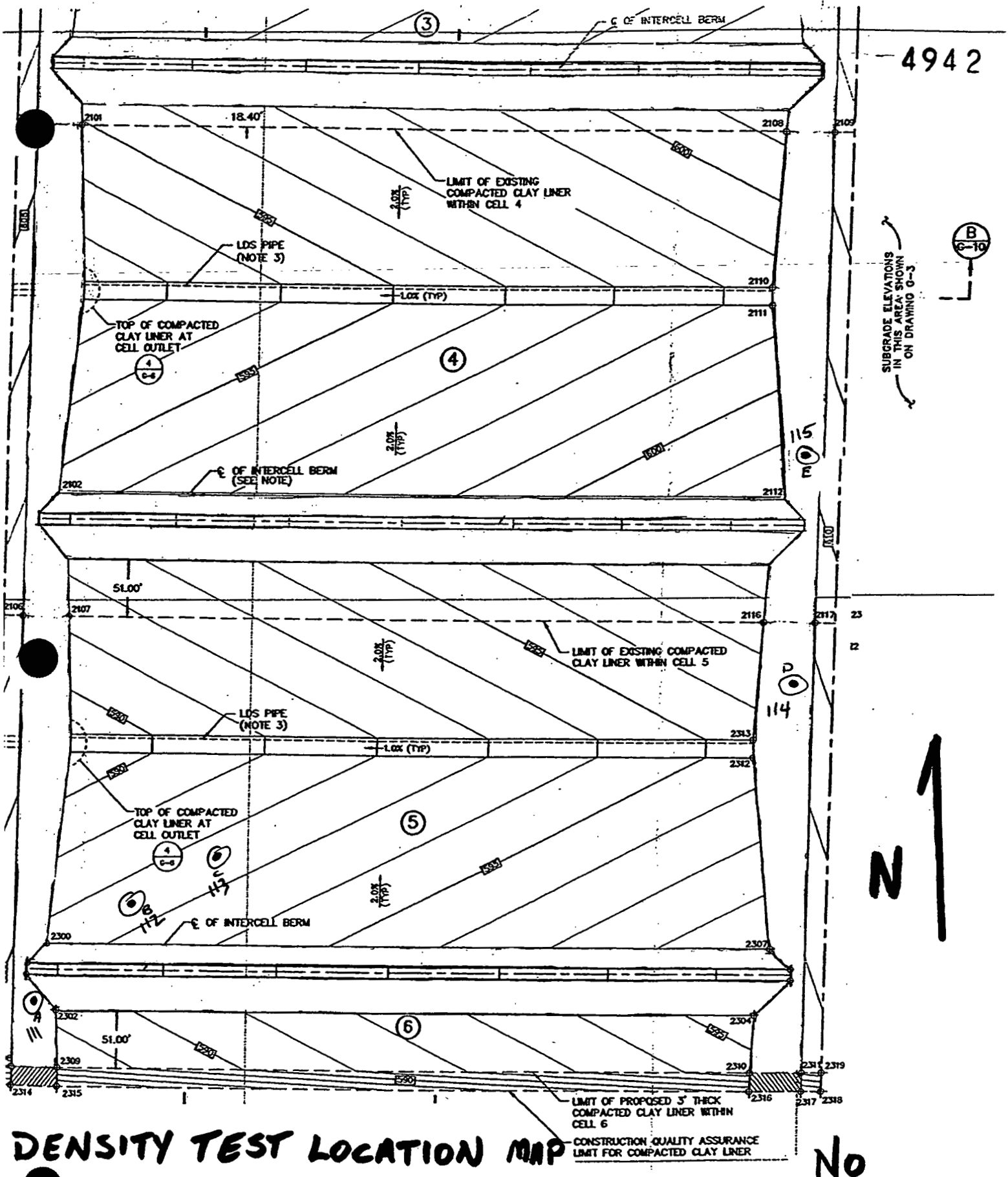

N 1

DENSITY TEST LOCATION MAP

31 DAY May Month 2002 YEAR

NO SCALE

000315

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ 1341 TASK NO.: Ø4.1

DATE: 1 day June month 2ØØ2 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8" / 1"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	FIELD TEST RESULTS PASS	FIELD TEST RESULTS FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A	116	See Location map ↓	8" / L-5	PCB-57	1Ø.5	128.7	11.5	14Ø.9	126.3	98.1	✓	—	—	—	—
B	117		8" / L-6	~~CF02-6~~ ~~PCB-57~~ KS	~~8.7~~ ~~1Ø.5~~ KS	~~134.6~~ ~~128.7~~ KS	11.6	143.1	128.2	95.2	✓	—	—	—	—

0000316

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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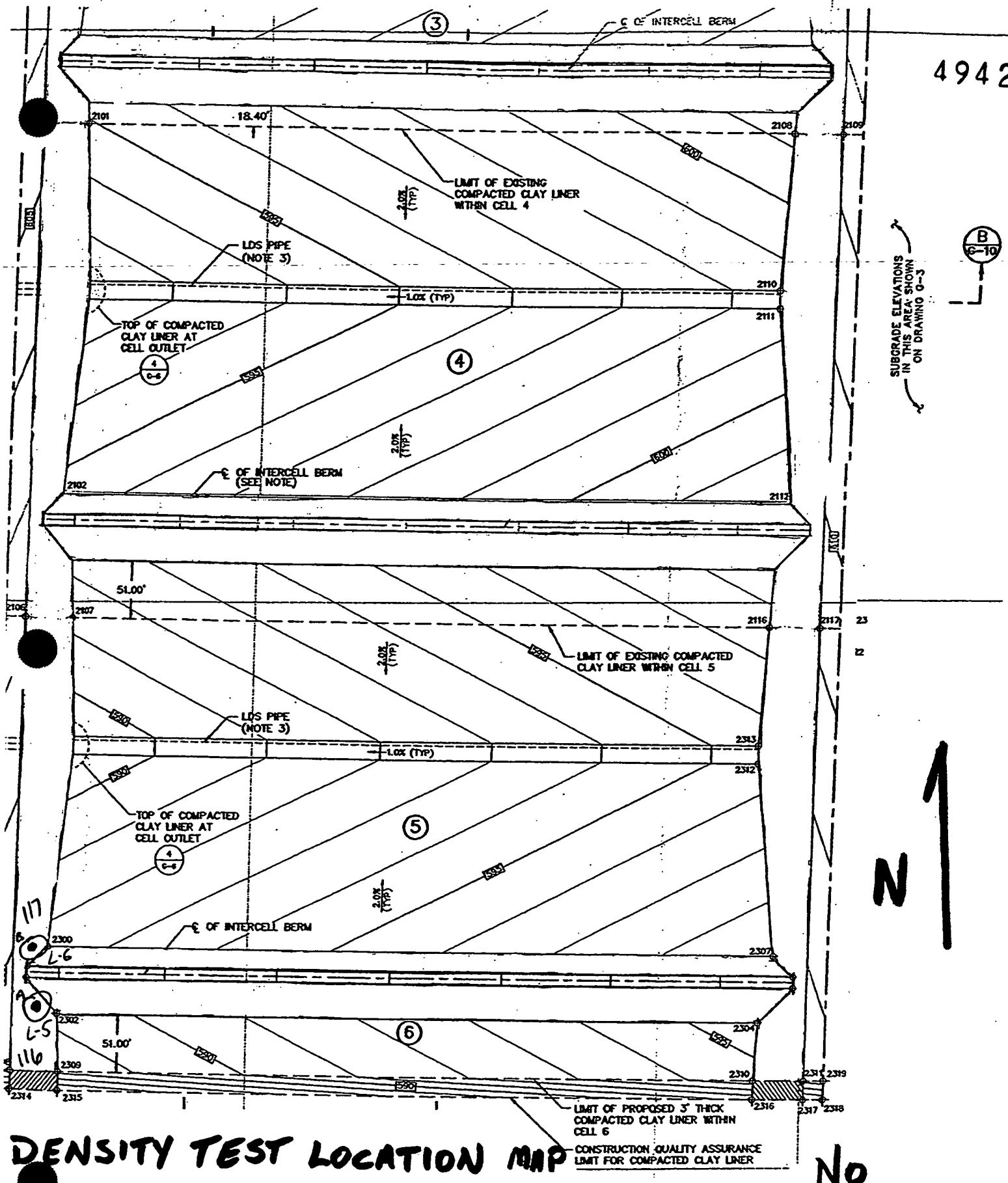

N 1

DENSITY TEST LOCATION MAP

NO SCALE

1 DAY June Month 2002 YEAR

000317

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ 1341 TASK NO.: 04.1

DATE: 1 day June month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8" ± 1"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A 116	See Location Map ↓	8" / L-5	PCP-57	10.5	128.7	11.5	140.9	126.3	98.1	✓	—	—	—	—
B 117		8" / L-6	~~CF02-6~~ ~~PCP-57~~ KS	~~8.7~~ ~~10.5~~ KS	~~134.6~~ ~~128.5~~ KS	11.6	143.1	128.2	95.2	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

000318

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DATE: 3 day June month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED): 8" 21"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE (CIRCLE ONE): (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A	118	See Location Map	8"/L-7	CF02-6	8.7	134.6	10.1	140.9	127.9	95.0	✓	—	—	—	—
B	119	↓	8"/L-8	CF02-6	8.7	134.6	8.4	142.6	131.5	97.7	✓	—	—	—	—
C	120		8"/L-1	CF02-6	8.7	134.6	10.2	141.6	128.5	95.5	✓	—	—	—	—
D	121		8"/L-1	CF02-6	8.7	134.6	9.5	140.8	128.6	95.5	✓	—	—	—	—
E	122		8"/L-1	PCP-57	10.5	128.7	10.8	139.5	125.9	97.8	✓	—	—	—	—

0003319

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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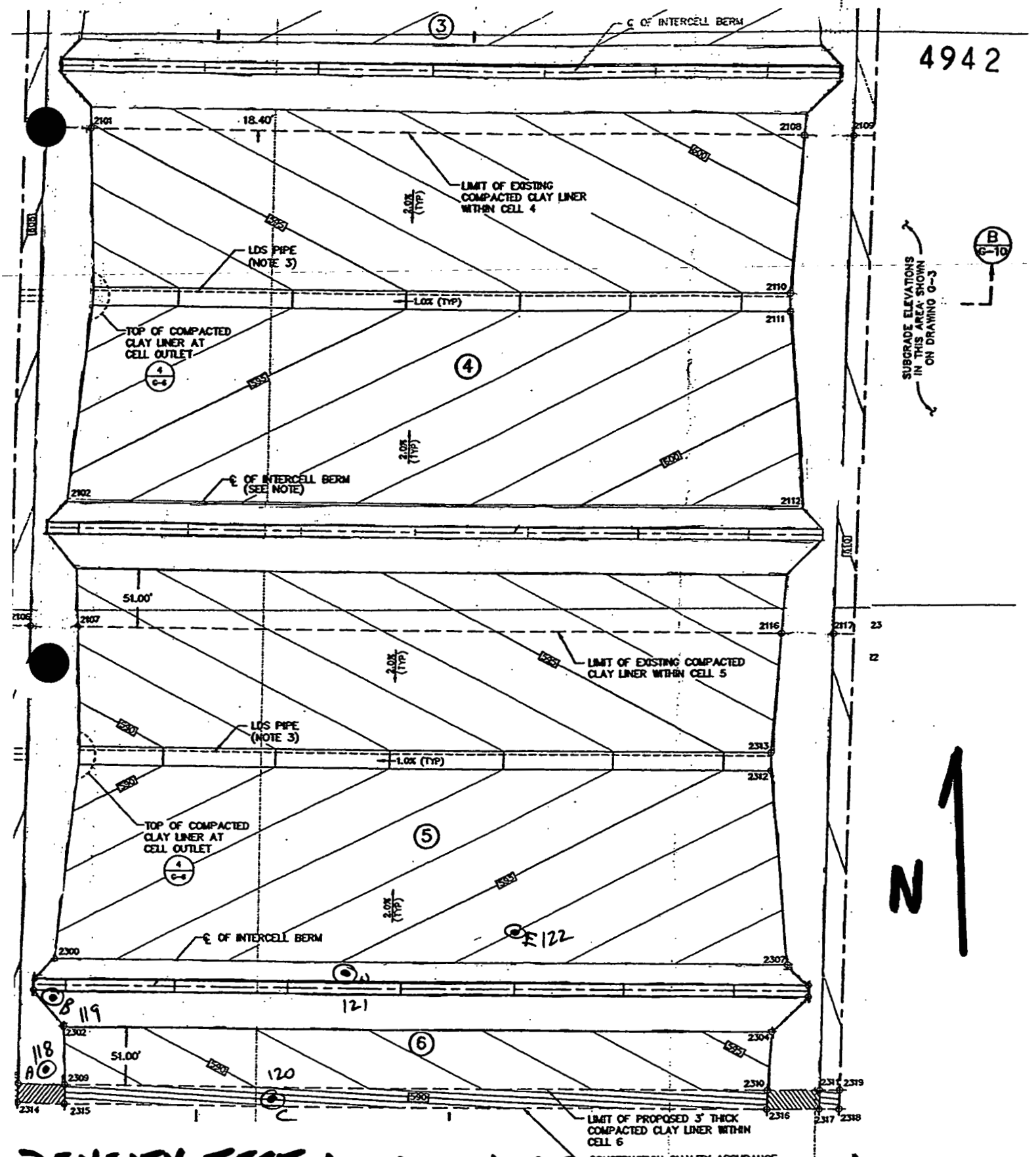

N 1

DENSITY TEST LOCATION MAP

NO SCALE

3 DAY June Month 2002 YEAR

000320

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) - Rpt. 2

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 4 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: borrow area MATERIAL TYPE (CIRCLE ONE): FILL / SUBGRADE / SUBBASE / CLAY / OTHER: —

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A	123	See Location map	8"/9	PCP-57	10.5	128.7	9.7	138.1	125.9	97.8	✓	—	—	—	—
B	124		8"/9	PCP-57	10.5	128.7	12.2	140.1	124.8	97.0	✓	—	—	—	—
C	125		8"/10	PCP-57	10.5	128.7	10.5	139.1	125.8	97.7	✓	—	—	—	—
D	126		8"/10	~~PCP~~ CFQZ-6 KS	8.7	134.6	9.8	141.6	129.0	95.8	✓	—	—	—	—

0003321

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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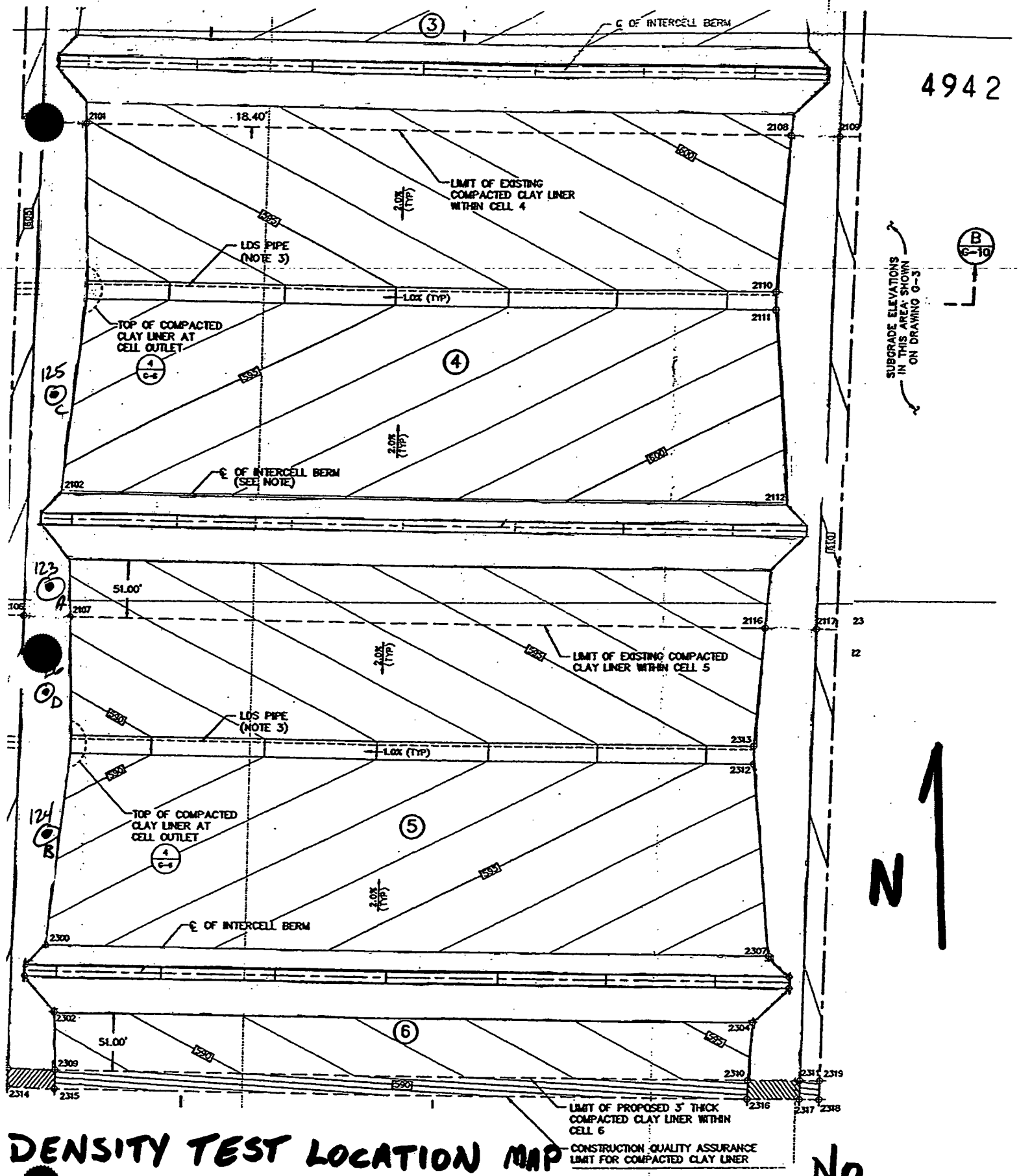


N 1

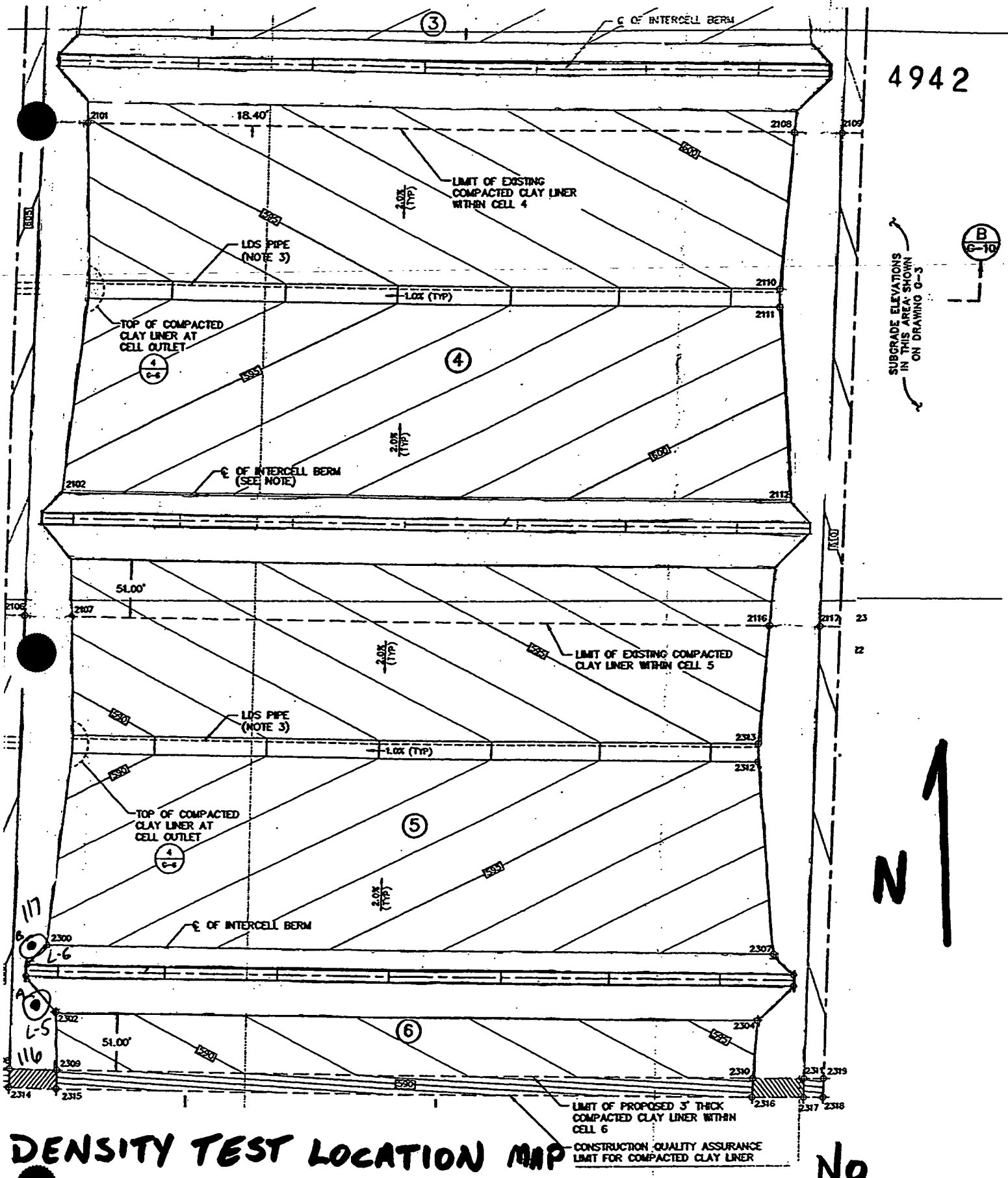
DENSITY TEST LOCATION MAP

4 DAY June Month 2002 YEAR

NO SCALE

000322

4942



N 1

DENSITY TEST LOCATION MAP

1 DAY June MONTH 2002 YEAR

NO SCALE

000323

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 5 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: on-site borrow area MATERIAL TYPE (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A	127	See Location Map	8" / L-11	PCP-57	10.5	128.7	9.6	140.8	128.4	99.8	✓	—	—	—	—
B	128		8" / C-11	PCP-57	10.5	128.7	10.3	139.0	126.0	97.9	✓	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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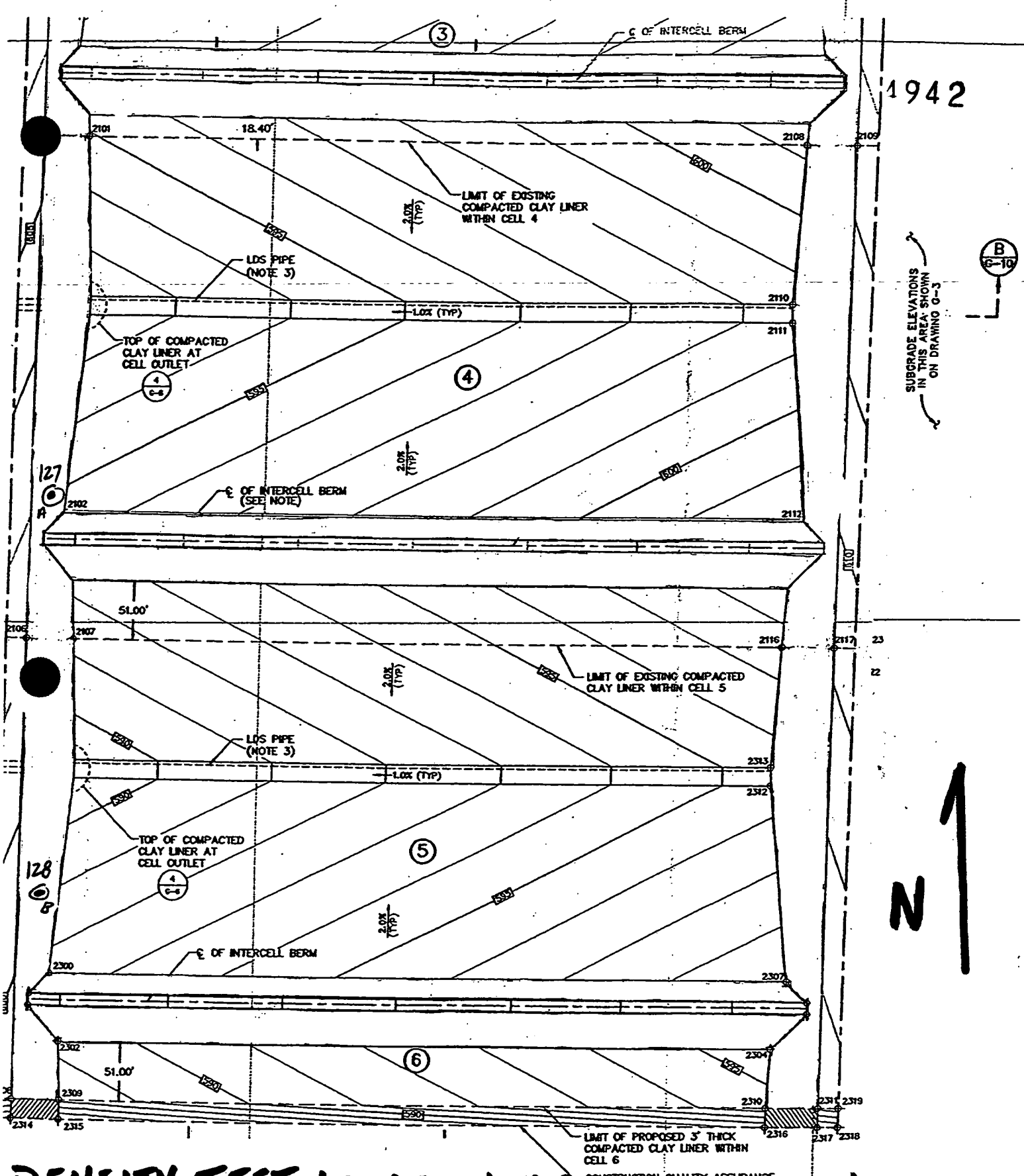

DENSITY TEST LOCATION MAP

5 DAY June Month 2002 YEAR

NO SCALE

000325

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 9 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 26979 CORRECTION FACTOR Y = N/A QA ID: BS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
129	See Location Map	8" / 1	OSDF-16	13.6	119.1	13.3	129.1	113.9	95.6	✓				
130	" " "	8" / 3	OSDF-16	13.6	119.1	13.5	133.4	117.5	98.7	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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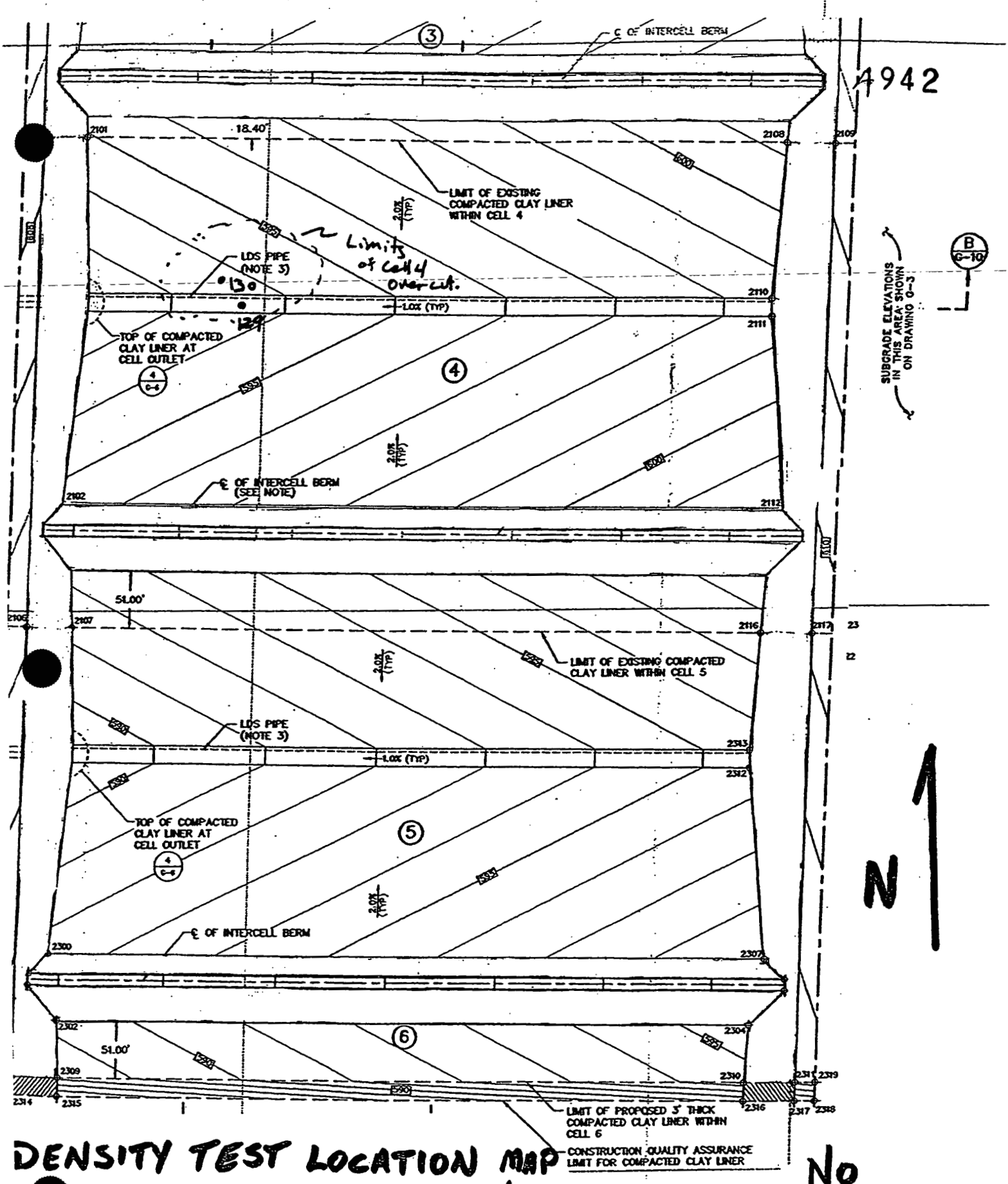

N 1

DENSITY TEST LOCATION MAP

9 DAY June MONTH 2002 YEAR

NO SCALE

000327

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 10 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS	RETEST FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL			
131	See Location Map	8"/4	OSDF16	13.6	119.1	12.9	131.9	116.8	98.1	✓				
132	" " "	8"/6	OSDF-16	13.6	119.1	13.6	132.0	116.1	97.5	✓				
133	" " "	8"/1	OSDF-16	13.6	119.1	131	132.7	117.3	98.5	✓				
134	" " "	8"/1	OSDF-16	13.6	119.1	13.9	132.1	116.0	97.4	✓				
135	" " "	8"/2	OSDF-16	13.6	119.1	12.7	130.2	115.5	97.0	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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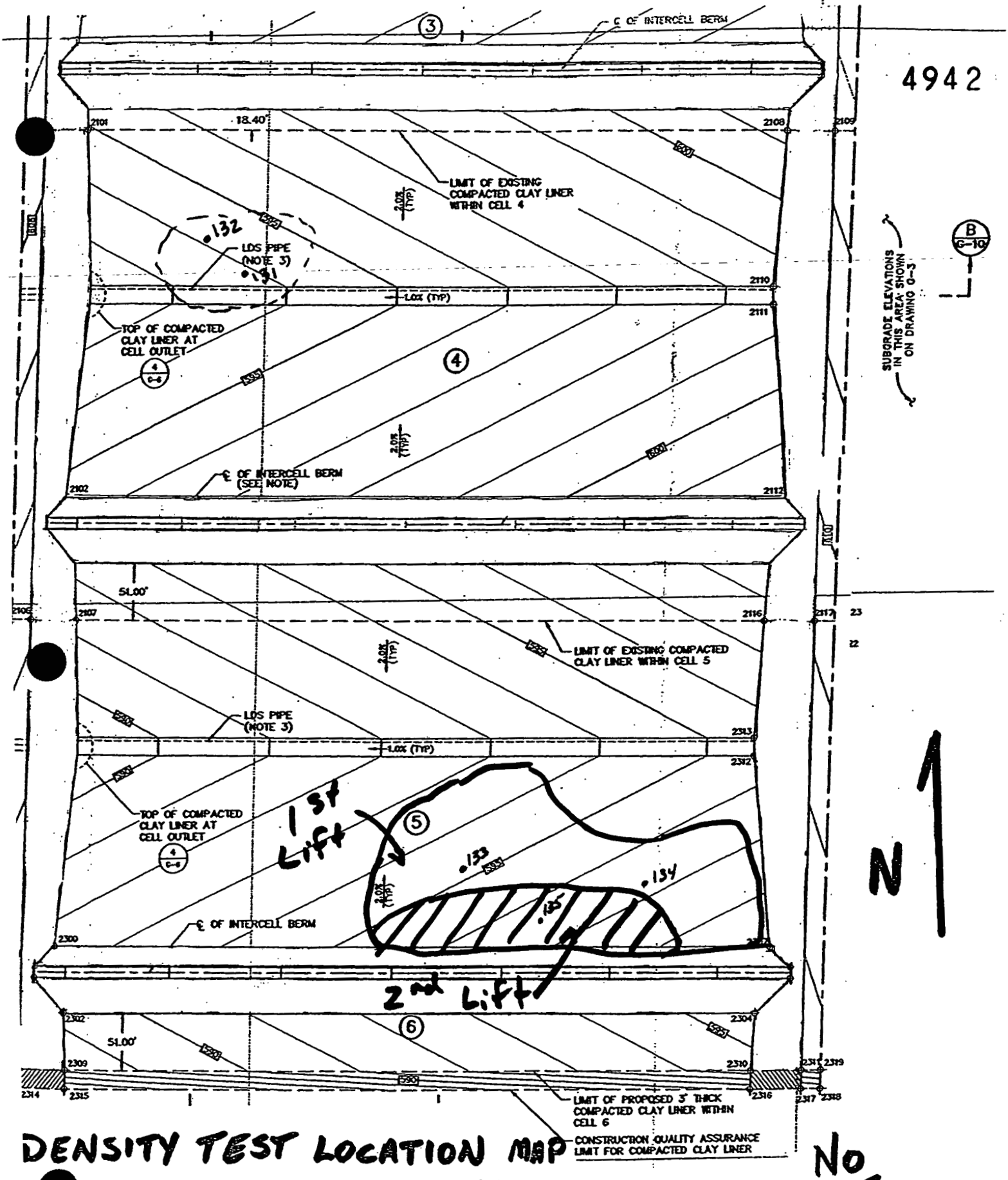

DENSITY TEST LOCATION MAP

10 DAY June MONTH 2002 YEAR

NO SCALE

000329

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 12 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East borrow area

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = N/A

QA ID: CJ

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS / FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		
136	See Location Map	8" / 2	CF02-6	8.7	134.6	9.1	143.0	131.1	97.8	✓			
137	" " "	8" / 3	CF02-6	8.7	134.6	9.8	144.1	131.2	97.5	✓			
138	" " "	8" / 4	PCP-57	10.5	128.7	10.6	140.4	127.0	98.7	✓			

000330

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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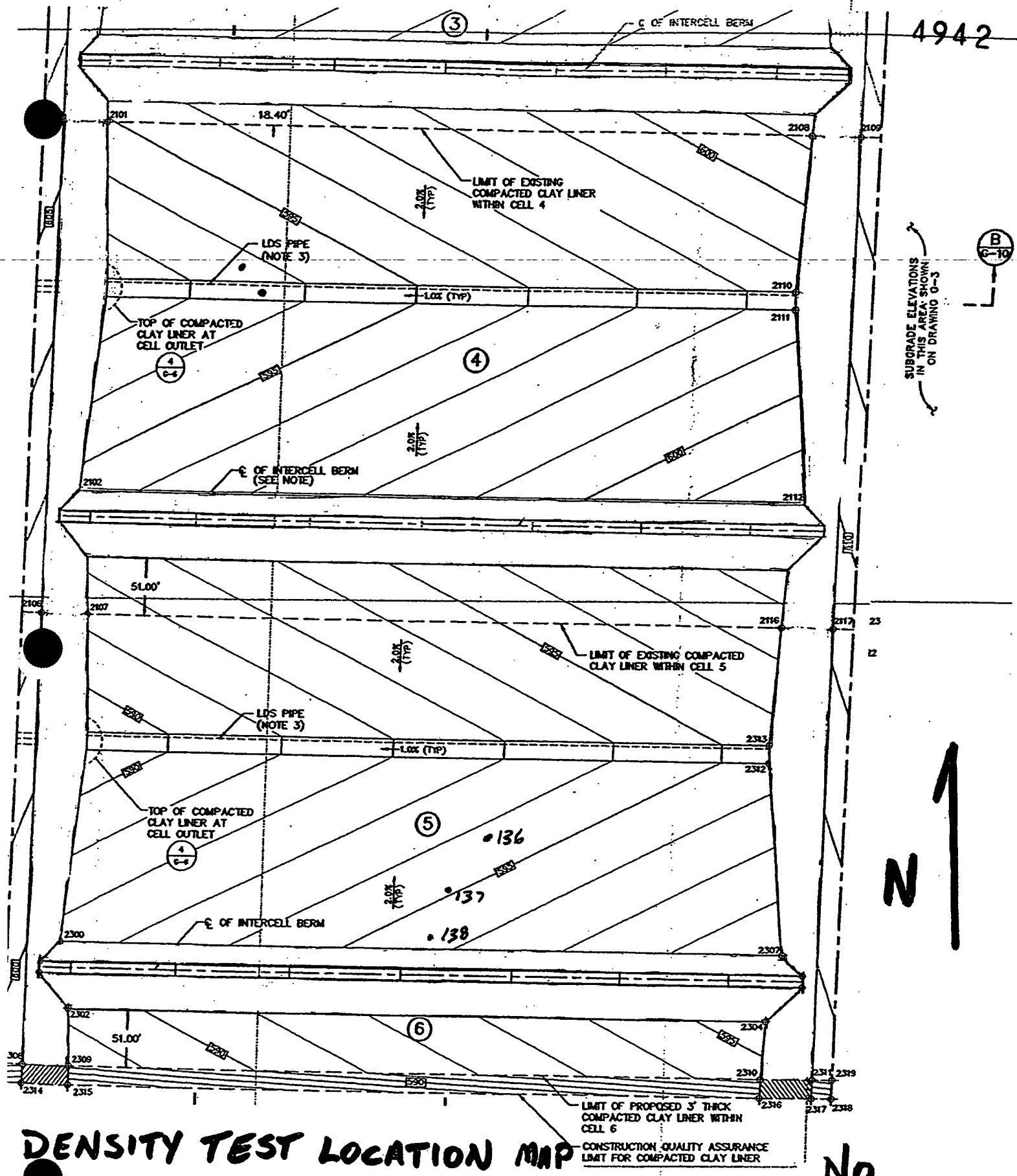

N 1

DENSITY TEST LOCATION MAP

12 DAY JUNE MONTH 2002 YEAR

NO SCALE

000331

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CA

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
139	See location Map	8"/2	CFØ2-6	8.7	134.6	9.8	142.6	129.9	96.5	✓				
140	" " "	8"/3	CFØ2-6	8.7	134.6	8.9	143.7	131.9	98.0	✓				
141	" " "	8"/4	CFØ2-6	8.7	134.6	9.3	142.9	130.7	97.1	✓				
142	" " "	8"/5	CFØ2-6	8.7	134.6	8.4	144.4	133.2	99.0	✓				
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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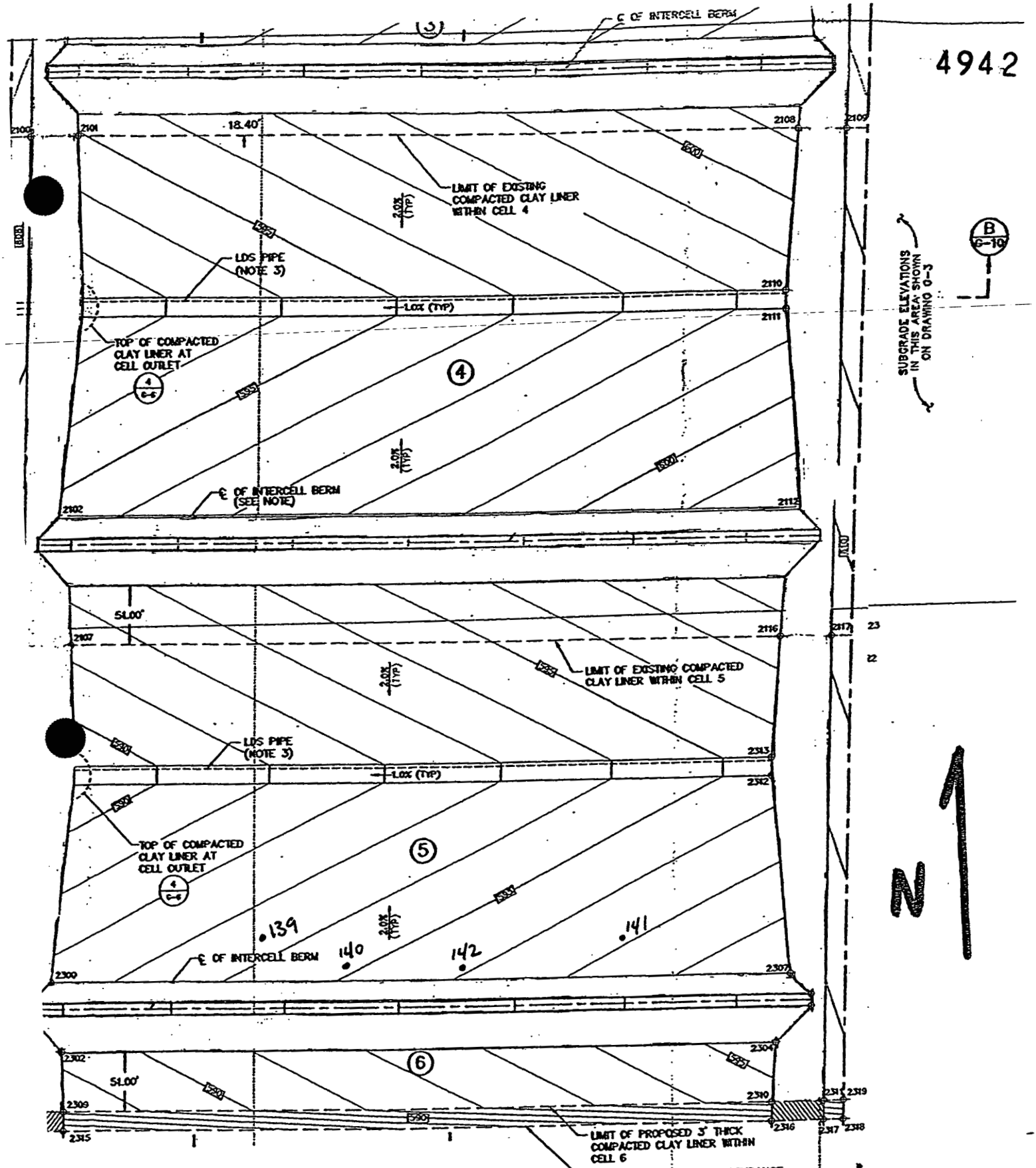

N 1

ENSITY TEST LOCATION MAP

NO SCALE

18 DAY June MONTH 2002 YEAR

000333

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G01341 TASK NO.: 041

DATE: 19 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: East Barrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
143	See location Map	8" / 1	CFØ2-6	8.7	134.6	10.1	144.1	130.9	97.2	✓				
144	" " "	8" / 2	CFØ2-6	8.7	134.6	8.7	142.2	130.8	97.1	✓				
145	" " "	8" / 3	CFØ2-6	8.7	134.6	8.9	143.6	131.8	97.9	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000334

4942

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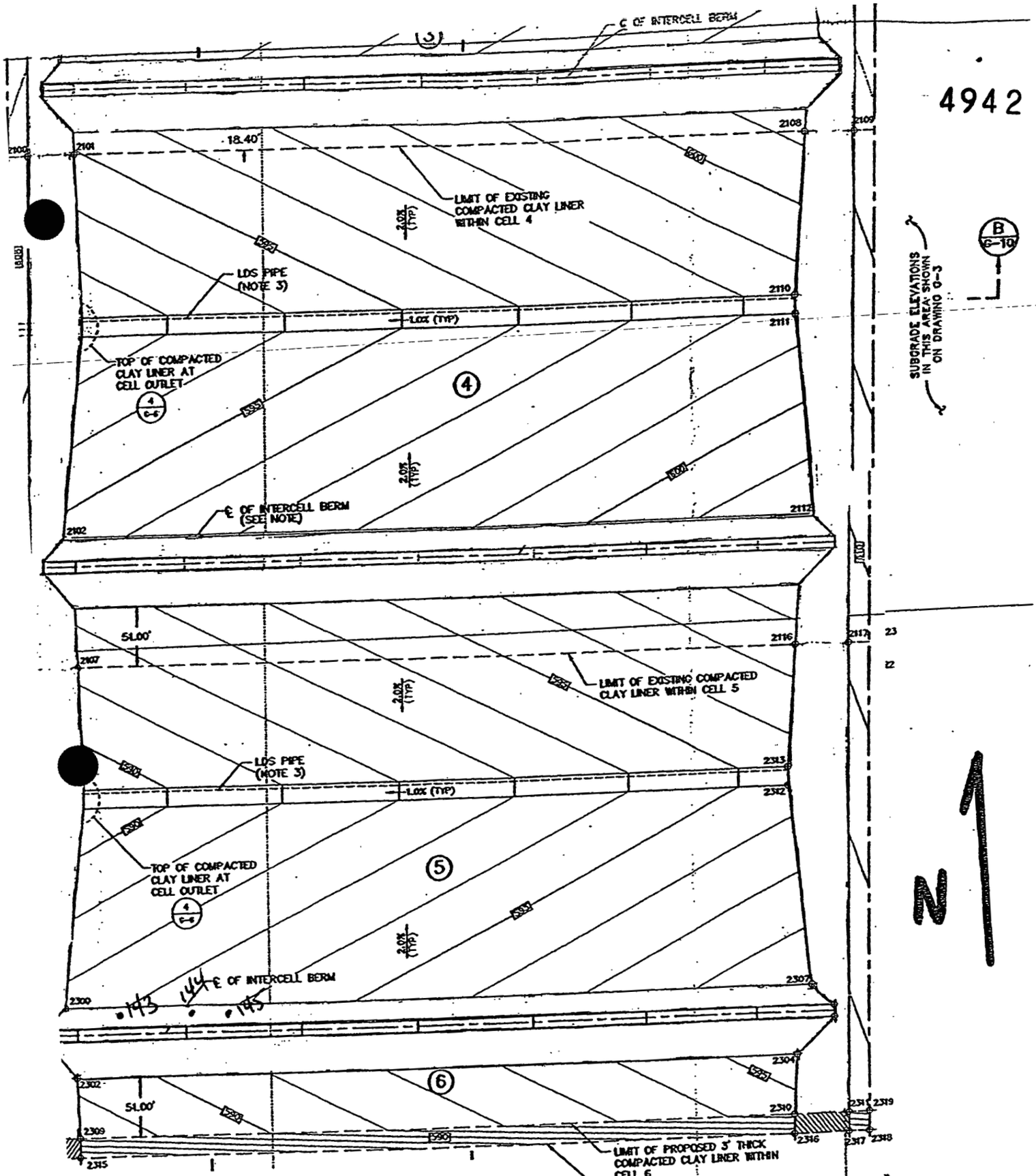
4942



N 1

ENSITY TEST LOCATION MAP

NO SCALE

19 DAY June Month 2002 YEAR

000335

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 20 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: GA

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	FIELD TEST RESULTS PASS	FIELD TEST RESULTS FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
146	See Location Map	8" / 4	CF02-6	8.7	134.6	10.4	143.7	130.2	96.7	✓				
147	" " "	8" / 5	CF02-6	8.7	134.6	10.8	144.2	130.1	96.7	✓				
148	" " "	8" / 5	~~PCP-58~~ CF02-6	8.7	134.6	8.7	142.1	130.7	97.1	✓				
149	" " "	8" / 6	~~PCP-59~~ CF02-6	8.7	134.6	8.3	141.5	130.7	97.1	✓				
150	" " "	8" / 6	~~PCP-51~~ CF02-6	8.7	134.6	9.1	142.4	130.5	96.9	✓				
		5 /												
		/												
		/												
		/												
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000336

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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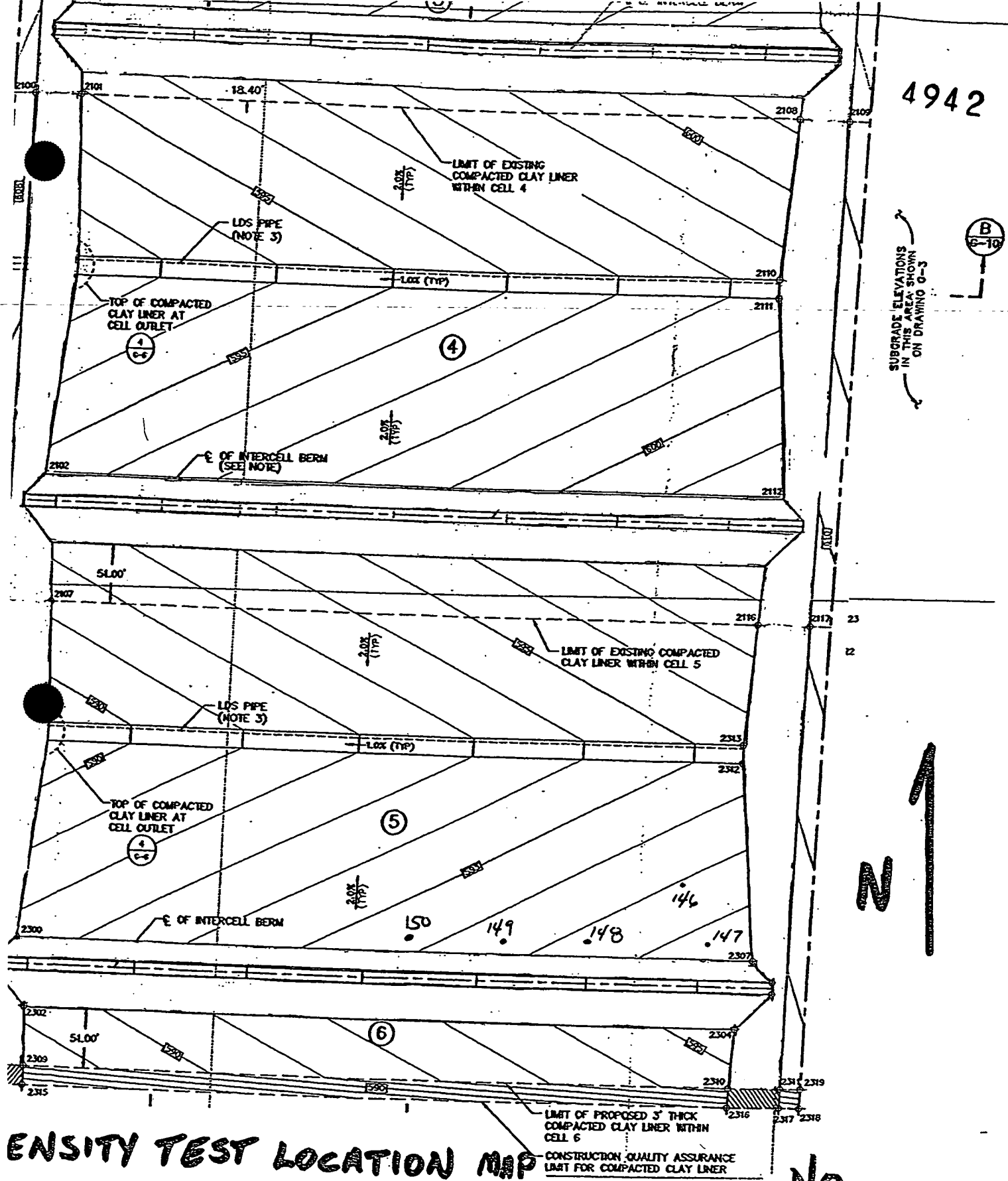

ENSITY TEST LOCATION MAP

20 DAY June Month 2002 YEAR

No SCALE

000337

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G21341 TASK NO.: 04.1

DATE: 22 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: East Borrow Area MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28979 CORRECTION FACTOR Y = N/A QA ID: CL

TEST NO.	TEST LOCATION Cell 5 Overcut Fill	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
151	See location Map	8"/2	CFD2-6	8.7	134.6	9.6	144.2	131.6	97.8	✓				
152	" " "	8"/3	CFD2-6	8.7	134.6	9.5	140.5	128.3	95.3	✓				
153	" " "	8"/3	CFD2-6	8.7	134.6	7.9	139.9	129.6	96.3	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. OF

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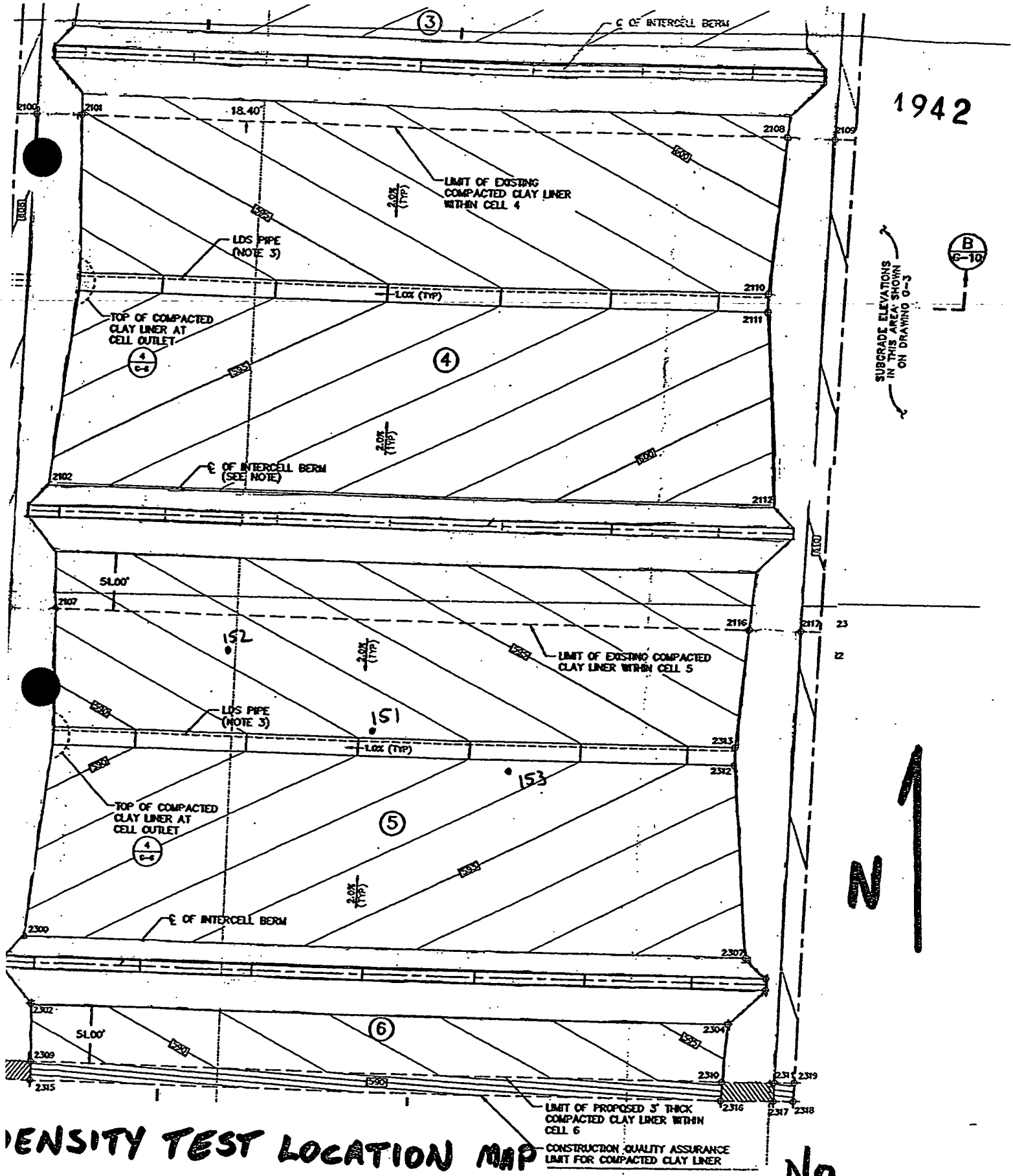

DENSITY TEST LOCATION MAP

22 DAY June MONTH 2002 YEAR

NO SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 02 day JULY month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ± 3% LIFT THICKNESS (LOOSE/COMPACTED): ~12"

MATERIAL SOURCE: GRAY TILL MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBD)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
154	Cell #5 - West Corridor	10"/L-1	CF02-6	8.7	134.6	7.5 —	141.9	132.0	98.1	✓				
155	Cell #5 - West Corridor	10"/L-2	CF02-6	8.7	134.6	8.7 —	140.7	129.4	96.1	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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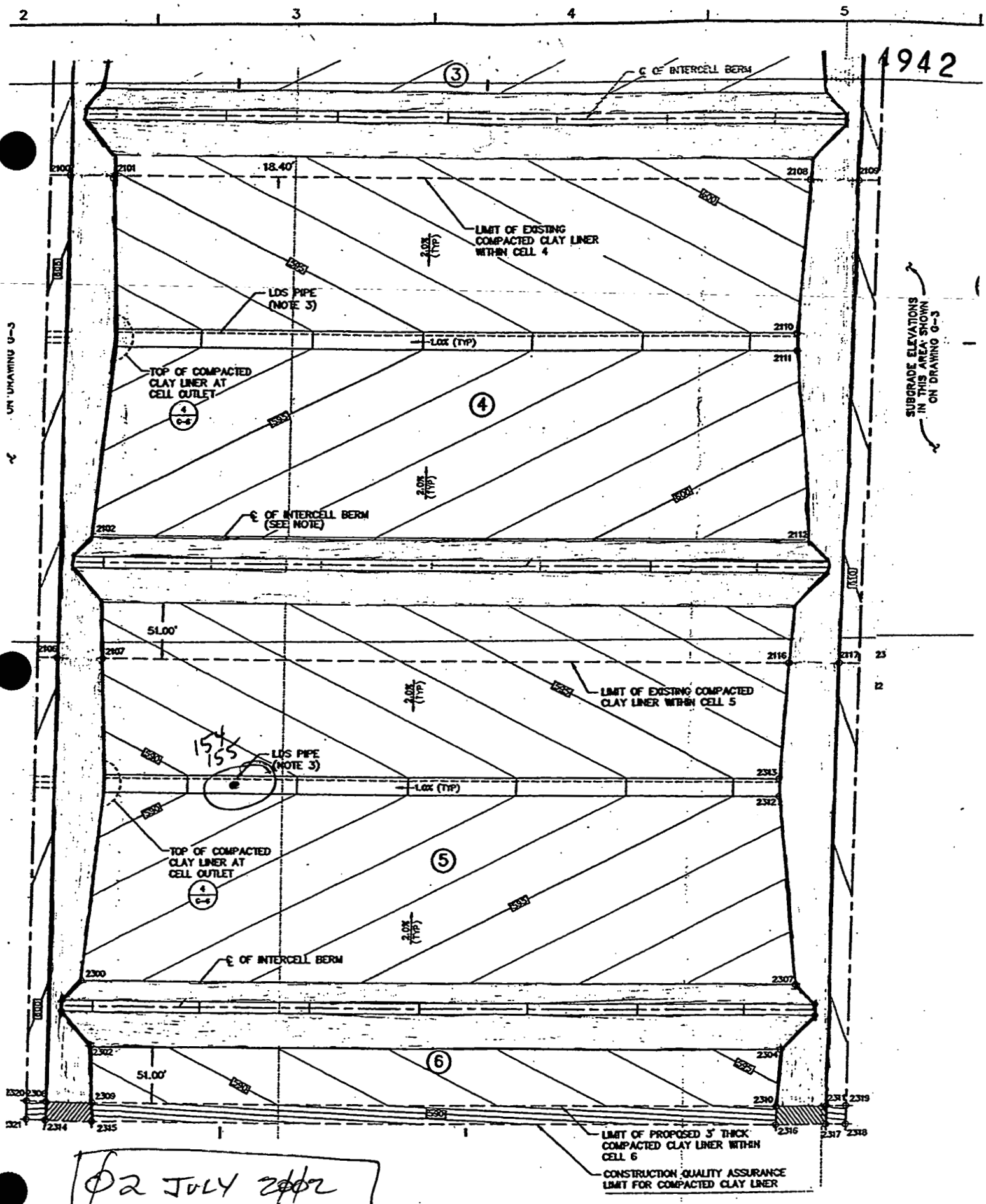

02 JULY 2002

GQ1341-04.1

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 6 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Unscreened Borrow Area MATERIAL TYPE (CIRCLE ONE): (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF 156	Haul Road, West 4:1 of Cell #4	8" / L-2	~~CF02-8~~	~~12.6~~ 9.5	~~123.3~~ 131.4 CHW	9.4	141.8	129.6	~~102.6~~ CHW 98.6	P	—	—	—	—
CF 157	Haul Road West 4:1 of Cell #5	8" / L-2	~~CF02-9~~	12.6	123.3	10.8	134.0	120.9	98.1	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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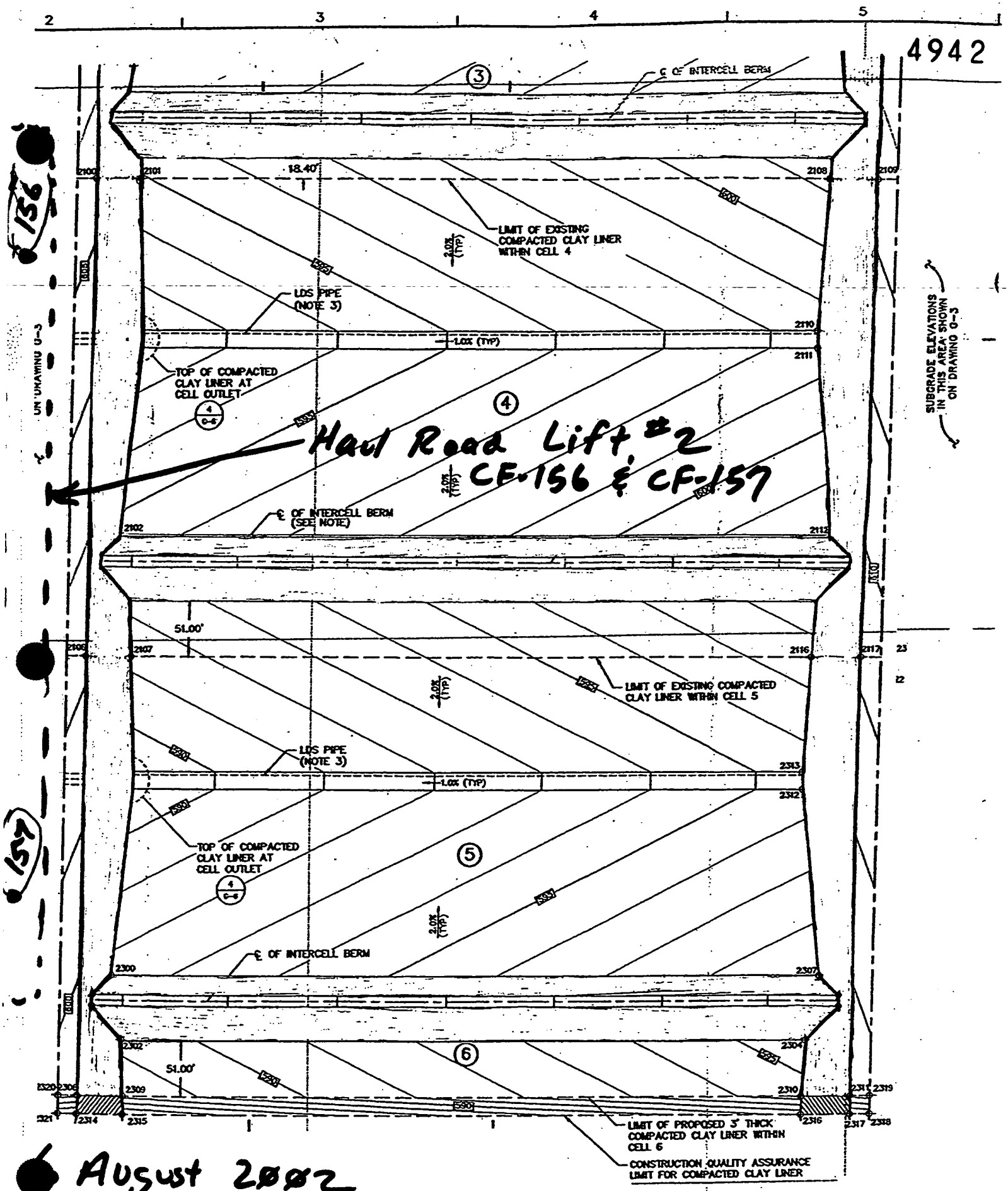

August 2002

GQ1341 04.1

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Sheet No. 5 of 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G0134I TASK NO.: 04.1

DATE: 7 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ≈10"

MATERIAL SOURCE: Unscreened Borrow Area MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF.158	Haul Road, West 4:1 of Cell #4	8" / L-3	CF02-9	12.6	123.3	11.7	131.4	117.6	95.4	P	—	—	—	—
CF.159	Haul Road West 4:1 of Cell #5	8" / L-3	CF02-9	12.6	123.3	12.8	137.0	121.1	98.2	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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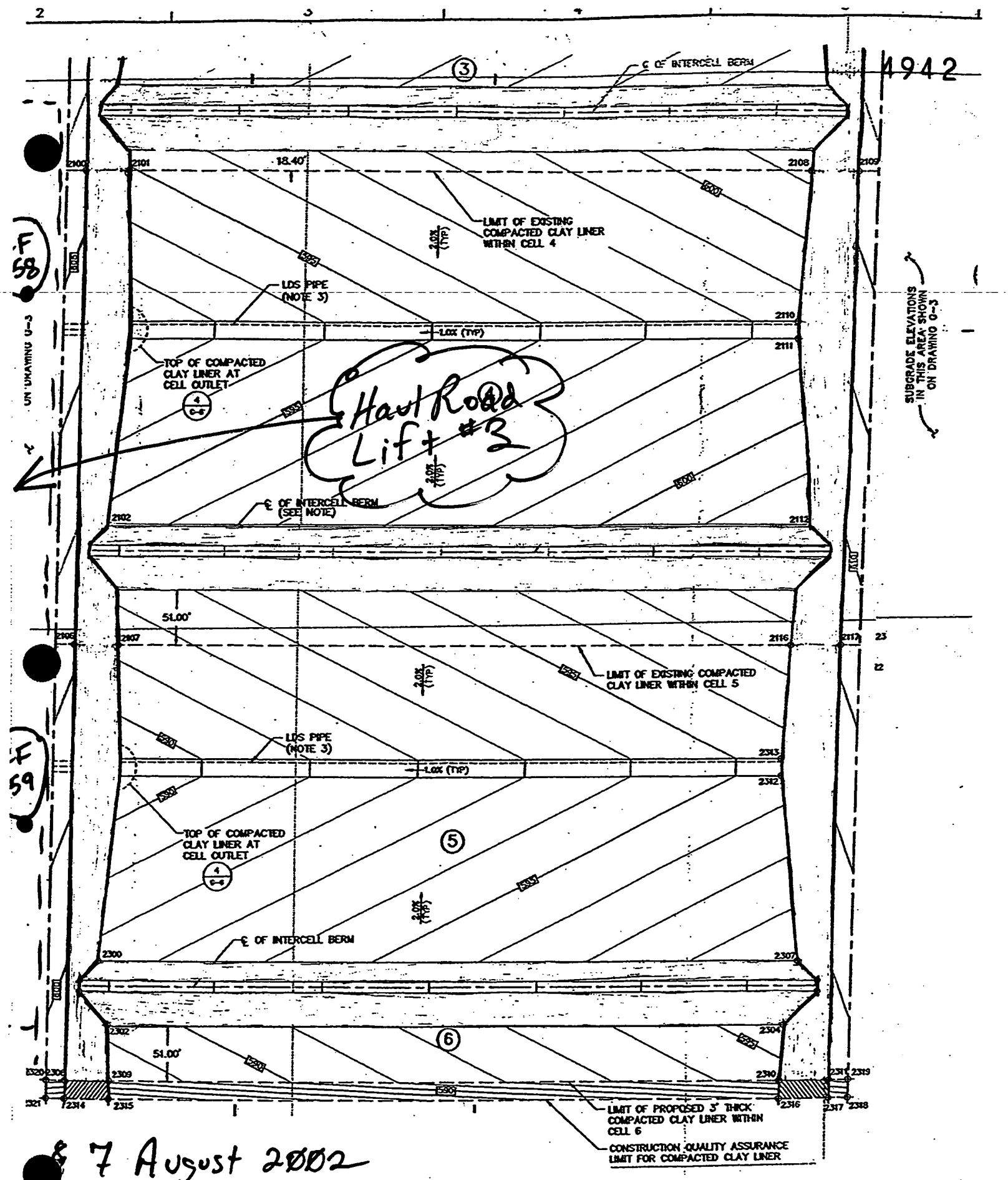

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Sheet No. 2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G91341 TASK NO.: 04.1

DATE: 8 day August month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Unscreened Borrow Material MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF 1.60	Haul Road West 4:1 Cell #4	8" / L-4	CE02-9	12.6	123.3	12.5	136.4	121.2	98.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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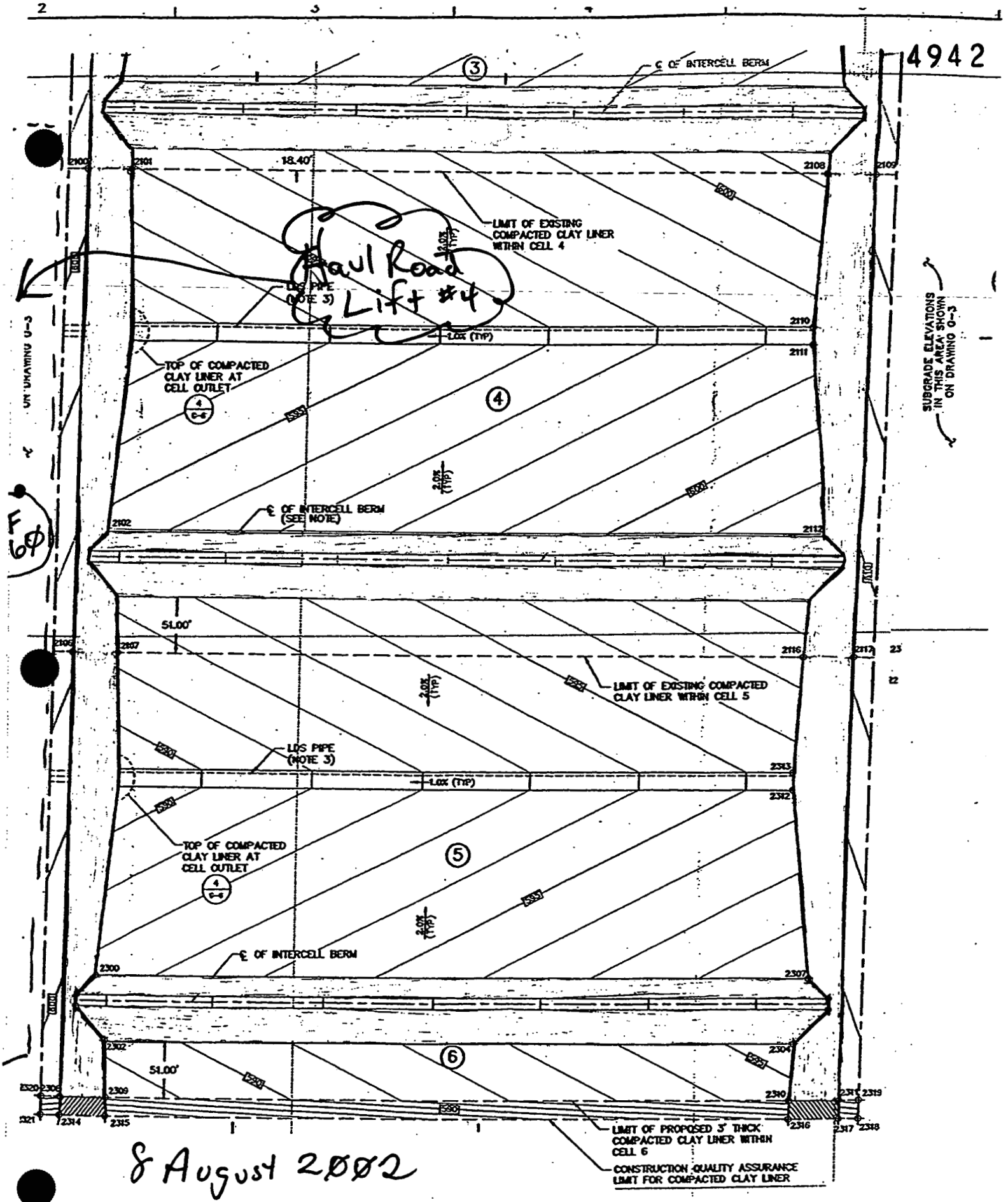

8 August 2002

GQ1341 04.1

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Sheet No. 2 of 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4-5

PROJECT NO.: 6Q1341 TASK NO.: 4.1

DATE: 5 day SEPT month 02 year

SPECIFICATION REQUIREMENTS

SOURCE: STOCKPILE 02-3 MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: Anchor Trench

% COMPACTION: 95 MOISTURE RANGE: 0-±3 OPTIMUM LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): 8"

NUCLEAR GAUGE TYPE: 3440 NUCLEAR GAUGE SERIAL NO. 20979 ASTM D 698: (CIRCLE ONE) A B C / ASTM D 1557: A B C

COR. FACTOR: .8481X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST PASS	RETEST FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *			
CF 02-161	EAST SIDE ANCHOR TRENCH CELL 4	6" / L-2	02-3	12.4	121.6	11.8	135.3	121.0	99.5	P	—	—	—		

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COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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SHEET NO. 1 OF 3

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5

PROJECT NO.: GA1341 TASK NO.: 4.1

DATE: 6 day SEPT month 02 year

SPECIFICATION REQUIREMENTS

SOURCE: STOCK PILE 02-3

MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / (OTHER) Anchor Trench

% COMPACTION: 95

MOISTURE RANGE: 0-±3 OPTIMUM

LIFT THICKNESS (CIRCLE ONE) (LOOSE)/COMPACTED): 8"

NUCLEAR GAUGE TYPE: 3470

ASTM D 698: (CIRCLE ONE) (A) B C / ASTM D 1557: A B C

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: .848/X + 3.669

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS								
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *	RETEST NO.	RETEST PASS / FAIL
CF02-162	CELL 4 E. SIDE ANCHOR TRENCH	6"/L-2	02-3	12.4	121.6	12.6	135.0	119.9	98.6	P	–	–	–	
CF02-163	CELL 4 E. SIDE ANCHOR TRENCH	6" L-3	02-3	12.4	121.6	10.6	130.4	117.9	97.0	P	–	–	–	
CF02-164	CELL 4 E. SIDE ANCHOR TRENCH	6" L-3	02-3	12.4	121.6	12.7	135.8	120.5	99.1	P	–	–	–	
CF02-165	CELL 4 E. SIDE ANCHOR TRENCH	6" L-4	02-3	12.4	121.6	11.8	136.2	121.8	100.1	P	–	–	–	

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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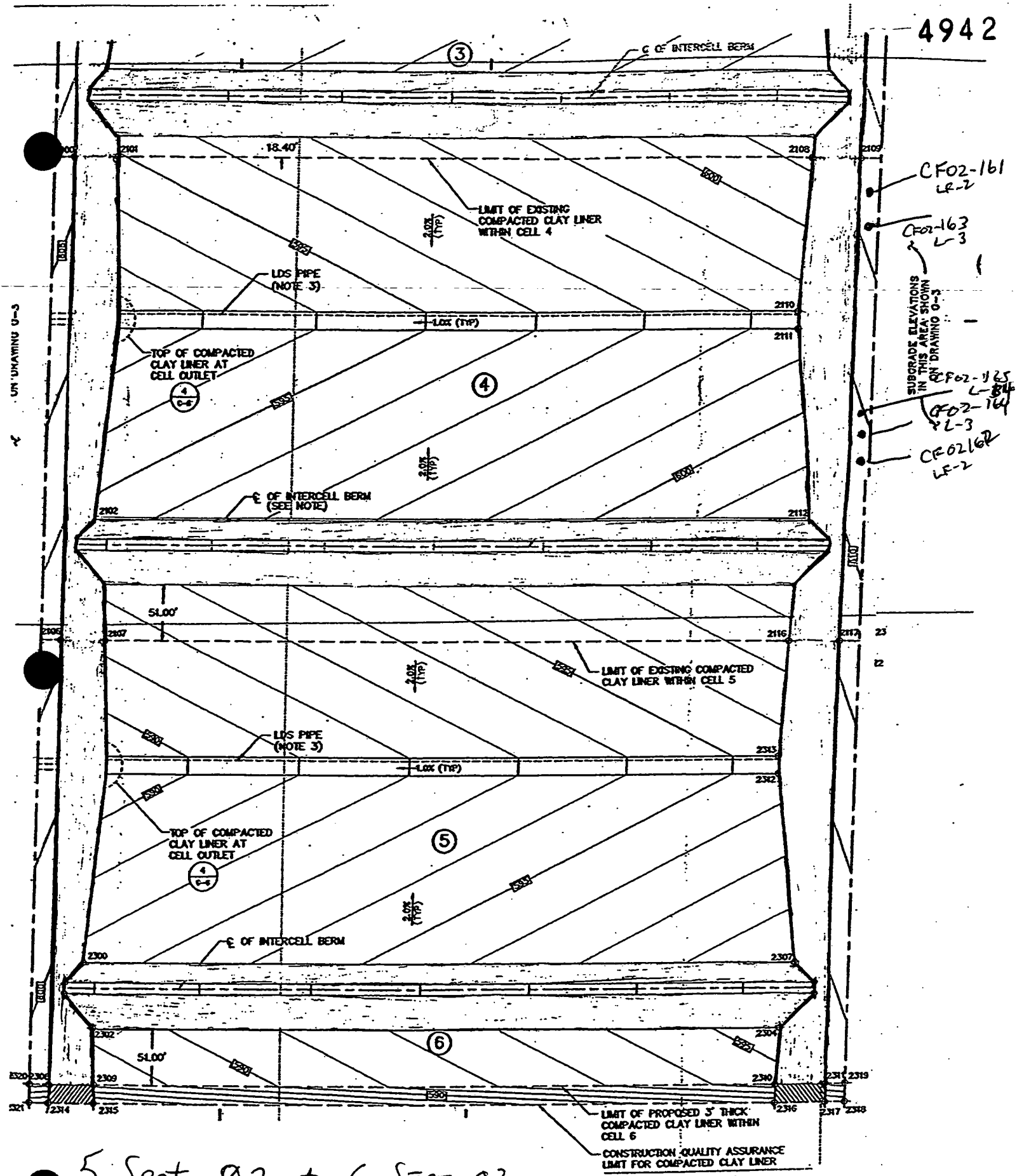

5 Sept 02 + 6 Sept 02

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GQ1341 04.1

Sheet No. ~~1~~ 3 of ~~1~~ 3

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IIC CELL 4+5

PROJECT NO.: GQ1341 TASK NO.: 4.1

DATE: 7 day SEPT month 02 year

SPECIFICATION REQUIREMENTS

SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: Anchor Trench Compacted Fill

% COMPACTION: 95%

MOISTURE RANGE: ~~0-3% OPTIMUM~~ ±3%

LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): 8"

NUCLEAR GAUGE TYPE: 3440

ASTM D 698: (CIRCLE ONE) A B C / ASTM D 1557: A B C

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: .8481x + 3.669

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST PASS / FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		
CF02-166	CELL 4 E. SIDE ANCHOR TRENCH	6" / L-4	02-3	12.4	121.6	12.2	130.6	~~114.6~~ 116.4	~~94.3~~ 95.7	P	–	–	–	
CF02-167	CELL 5 E. SIDE ANCHOR TRENCH	6" / L-2	02-3	12.4	121.6	14.9	132.7	115.5	95.0	P	–	–	–	
CF02-168	CELL 5 E. SIDE ANCHOR TRENCH	6" / L-2	02-3	12.4	121.6	14.8	133.4	116.4	95.7	P	–	–	–	
CF02-169	CELL 5 E. SIDE ANCHOR TRENCH	6" / L-3	02-3	12.4	121.6	14.3	132.3	115.7	95.2	P	–	–	–	
CF02-170	CELL 5/6 IC BERM ANCHOR TRENCH	6" / L-3	02-3	12.4	121.6	13.5	135.7	~~119.1~~ 119.6	~~98.0~~ 98.3	P	–	–	–	

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS * – DRIVE CYLINDER TAKEN.

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SHEET NO. 1 OF 2

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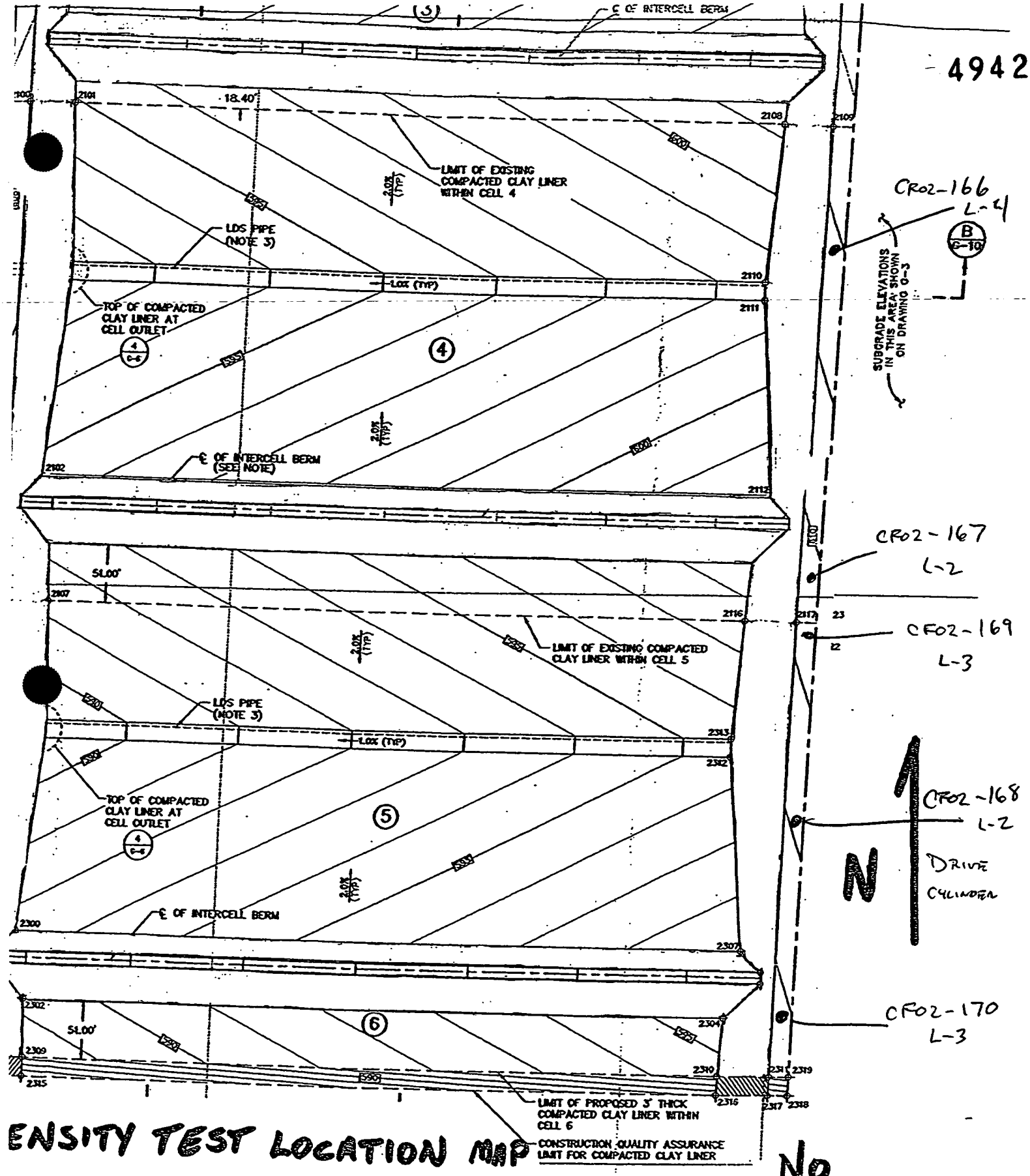

ENSITY TEST LOCATION MAP

2 DAY Sept MONTH 02 YEAR

NO SCALE

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2 of 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5 LINER

PROJECT NO.: GQ1341 TASK NO.: 4.1

DATE: 9 day SEPT month 02 year

SPECIFICATION REQUIREMENTS

SOURCE: STOCK PILE 03-02 MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: Clay Liner LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: 0-3 ± OPTIMUM ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS							RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
CFO-171	Cell 5 R. Slope Anchor Trench	6"/L-4	02-3	12.4	121.6	8.2	132.2	122.2	100.5		F	–	CFO2-172	P	–
CFO-172	↓	6"/L-4	02-3	12.4	121.6	10.3	132.1	124.3	102.2	P	–	–			
CFO-173		6"/L-4	02-3	12.4	121.6	11.9	135.7	121.3	99.7	P	–	–			

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COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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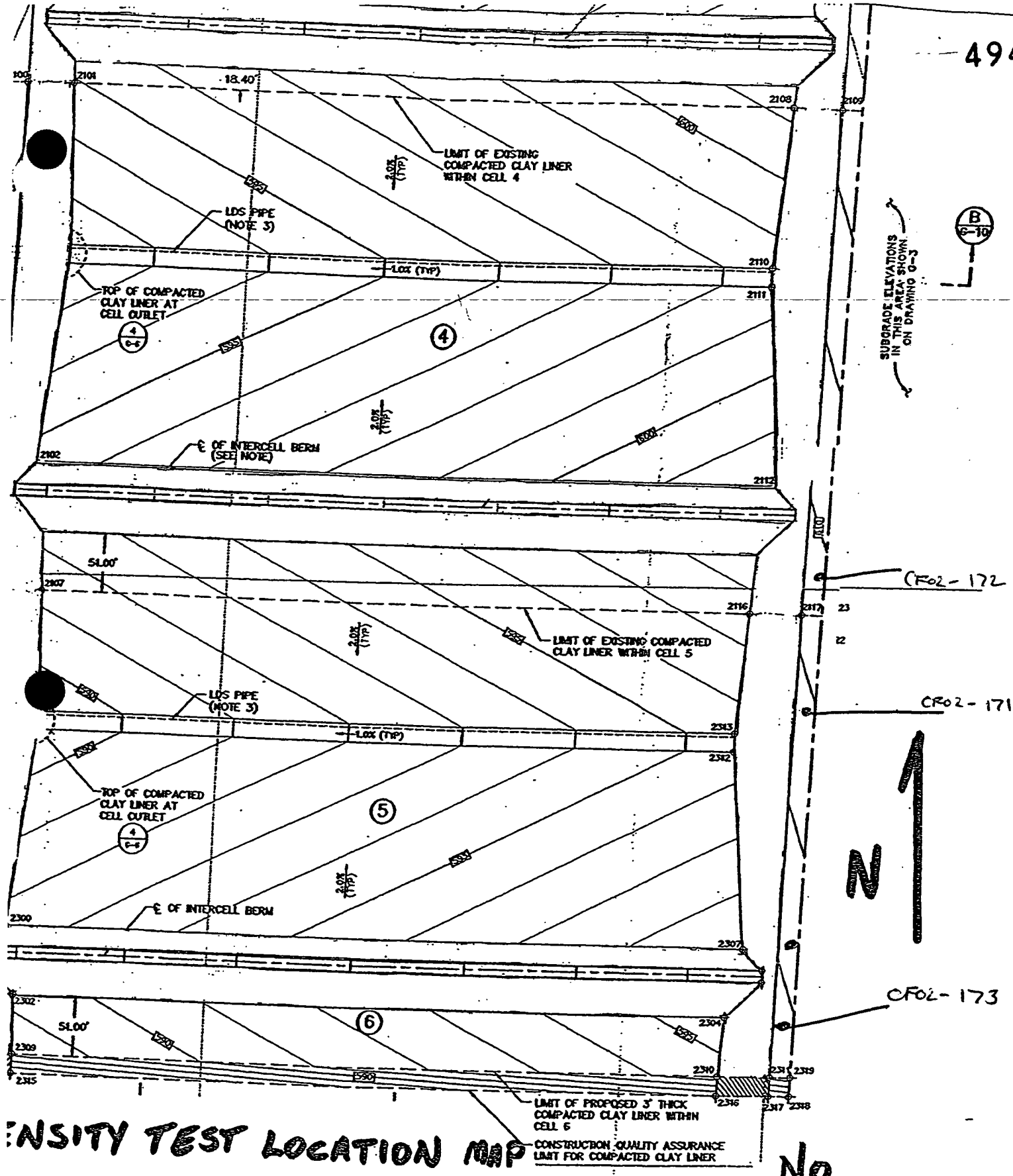

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ENSITY TEST LOCATION MAP

9 DAY Sept MONTH 02 YEAR

No SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & #5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 16 17 day Sept month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stakpile 02-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-174	Cell #4, West Anchor Trench	6" / L-2	02-3	12.4	121.6	13.3	131.3	115.9	95.3	P	—	—	—	—
CF02-175	Cell #4, West Anchor Trench	6" / L-2	02-3	12.4	121.6	14.8	134.8	117.4	96.5	P	—	—	—	—
CF02-176	Cell #4, West Anchor Trench	6" / L-3	02-3	12.4	121.6	13.6	134.9	118.7	97.6	P	—	—	—	—
CF02-177	Cell #4, West Anchor Trench	6" / L-3	02-3	12.4	121.6	13.9	131.5	115.5	95.0	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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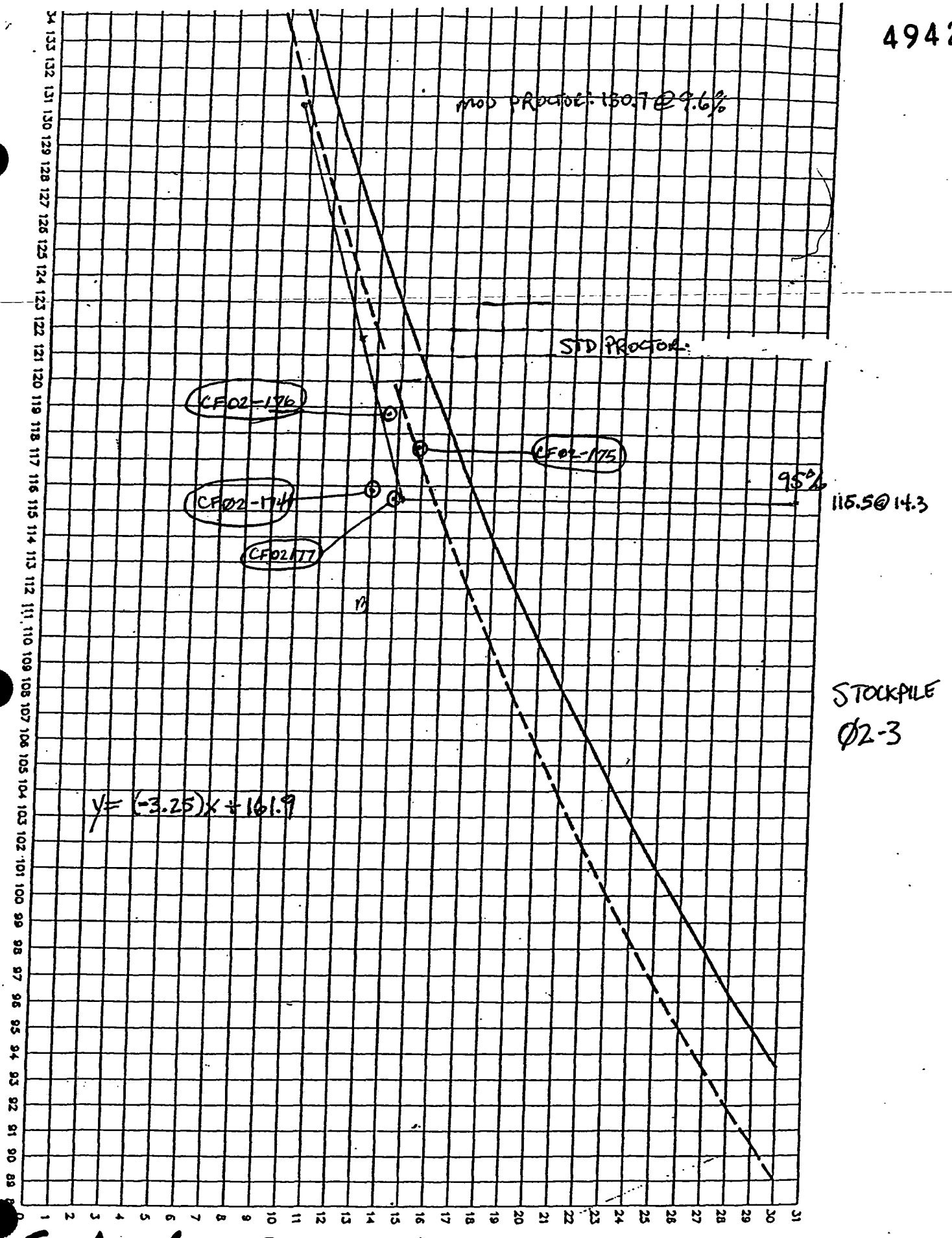

September 2002

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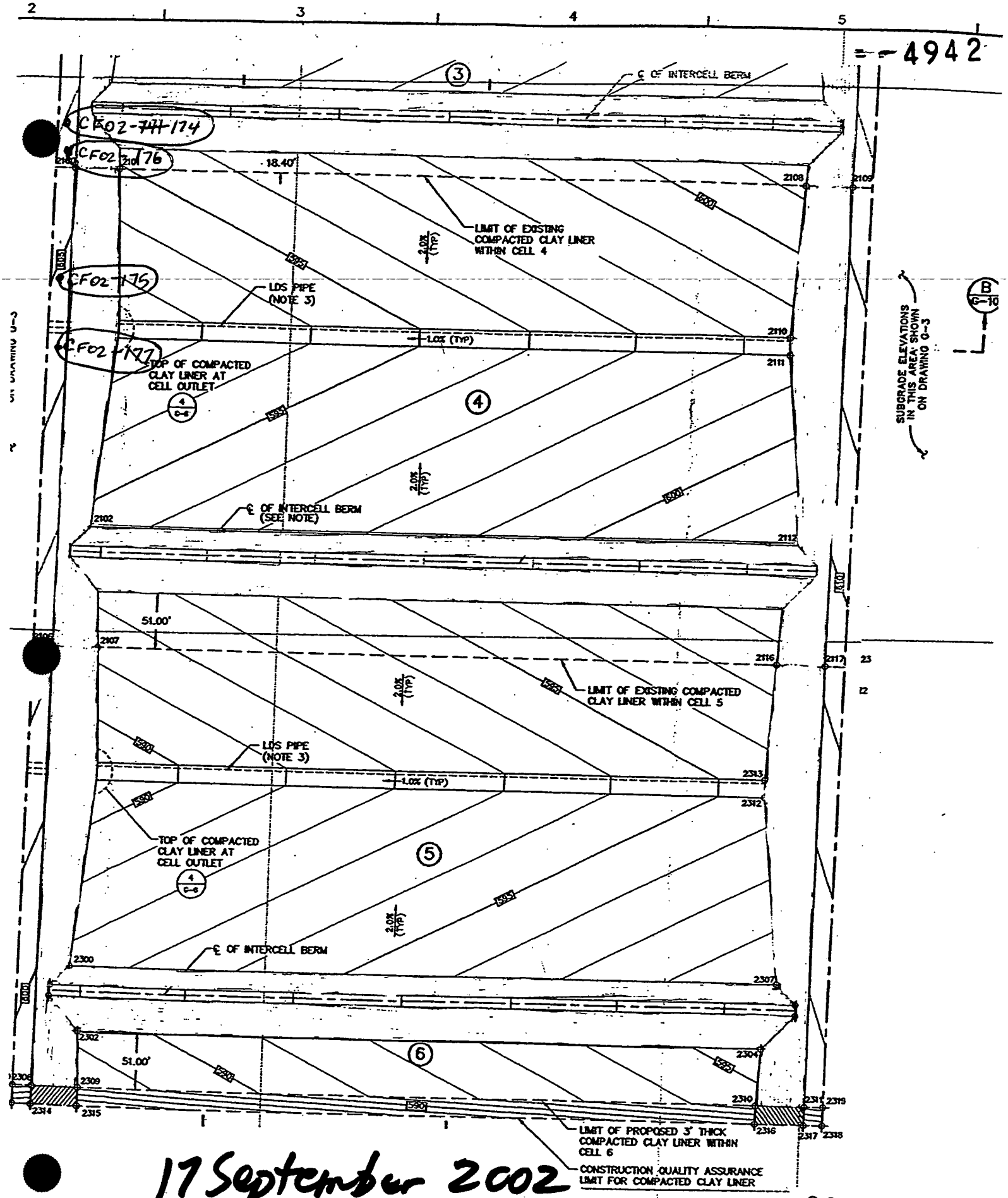

17 September 2002

GQ 1341 Ø4.1 Sheet No. 3 of 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & #5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day Sept month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: (C&W)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-178	Cell #4, West Anchor Trench	6" / L-4	Ø2-3	12.4	121.6	13.Ø	135.6	12Ø.Ø	98.7	P	—	—	—	—
CF02-179	Cell #4, West Anchor Trench	6" / L-4	Ø2-3	12.4	121.6	12.4	~~121~~ 136.6	121.6	1ØØ.Ø	P	—	—	—	—
CF02-180	Cell #4, West Anchor Trench	6" / L-2	02-3	12.4	121.6	14.8	130.5	113.7	93.5	—	F	CF02 181	P	—
CF02-181	Cell #4, West Anchor Trench	6" / L-2	Ø2-3	12.4	121.6	13.8	132.2	116.2	95.6	P	—	—	—	—
CF02-182	Cell #4, West Anchor Trench	6" / L-3	Ø2-3	12.4	121.6	13.7	134.4	118.2	97.2	P	—	—	—	—
CF02-183	Cell #5, West Anchor Trench	6" / L-2	Ø2-3	12.4	121.6	15.0	133.3	115.9	95.3	P	—	—	—	—
CF02-184	Cell #5, West Anchor Trench	6" / L-2	02-3	12.4	121.6	13.4	133.9	118.1	97.1	P	—	—	—	—
CF02-185	Cell #4, West Anchor Trench	6" / L-4	02-3	12.4	121.6	14.0	135.0	118.4	97.4	P	—	—	—	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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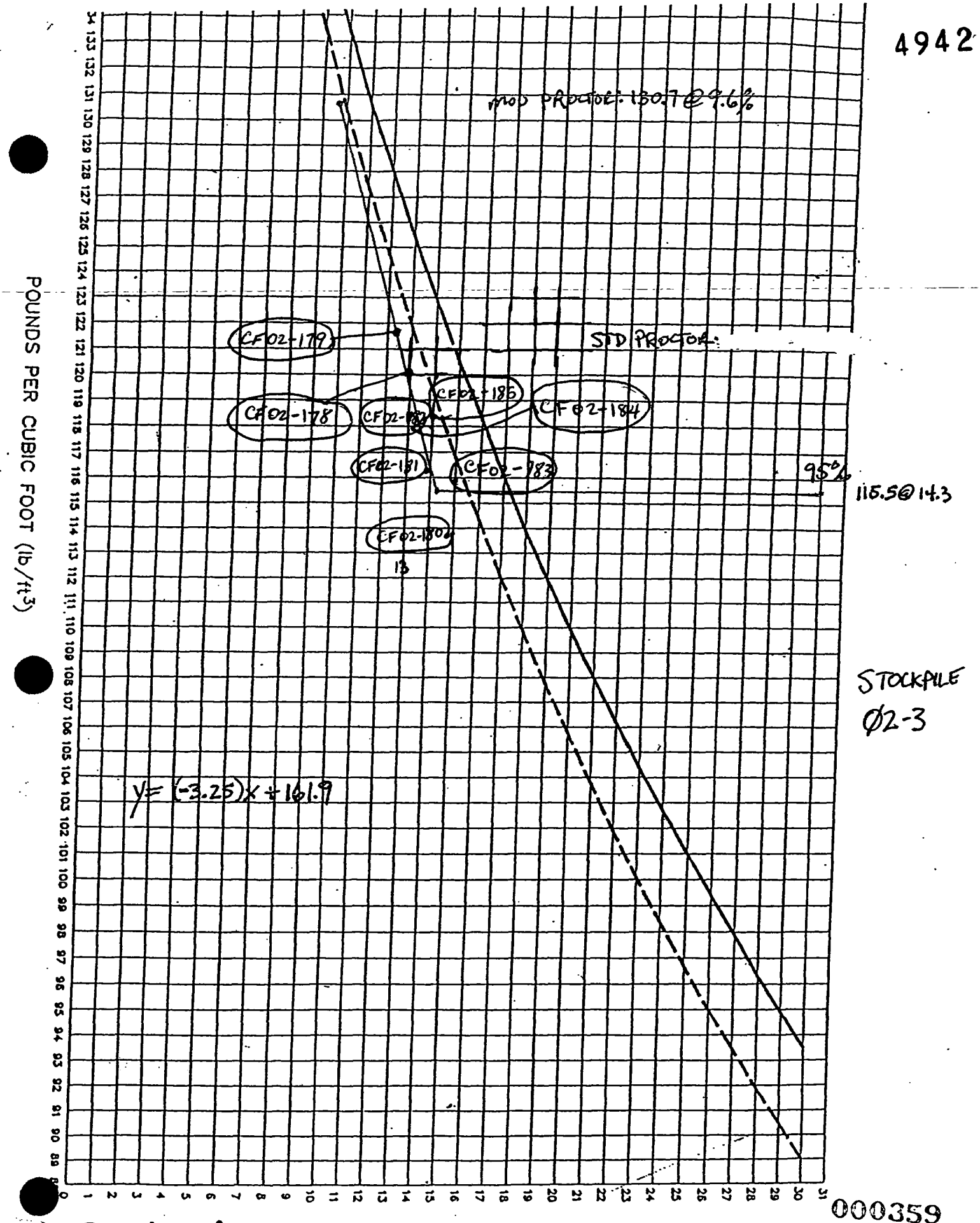

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16 September 2002

GQ1341 04.1

Sheet No. 2 of 3

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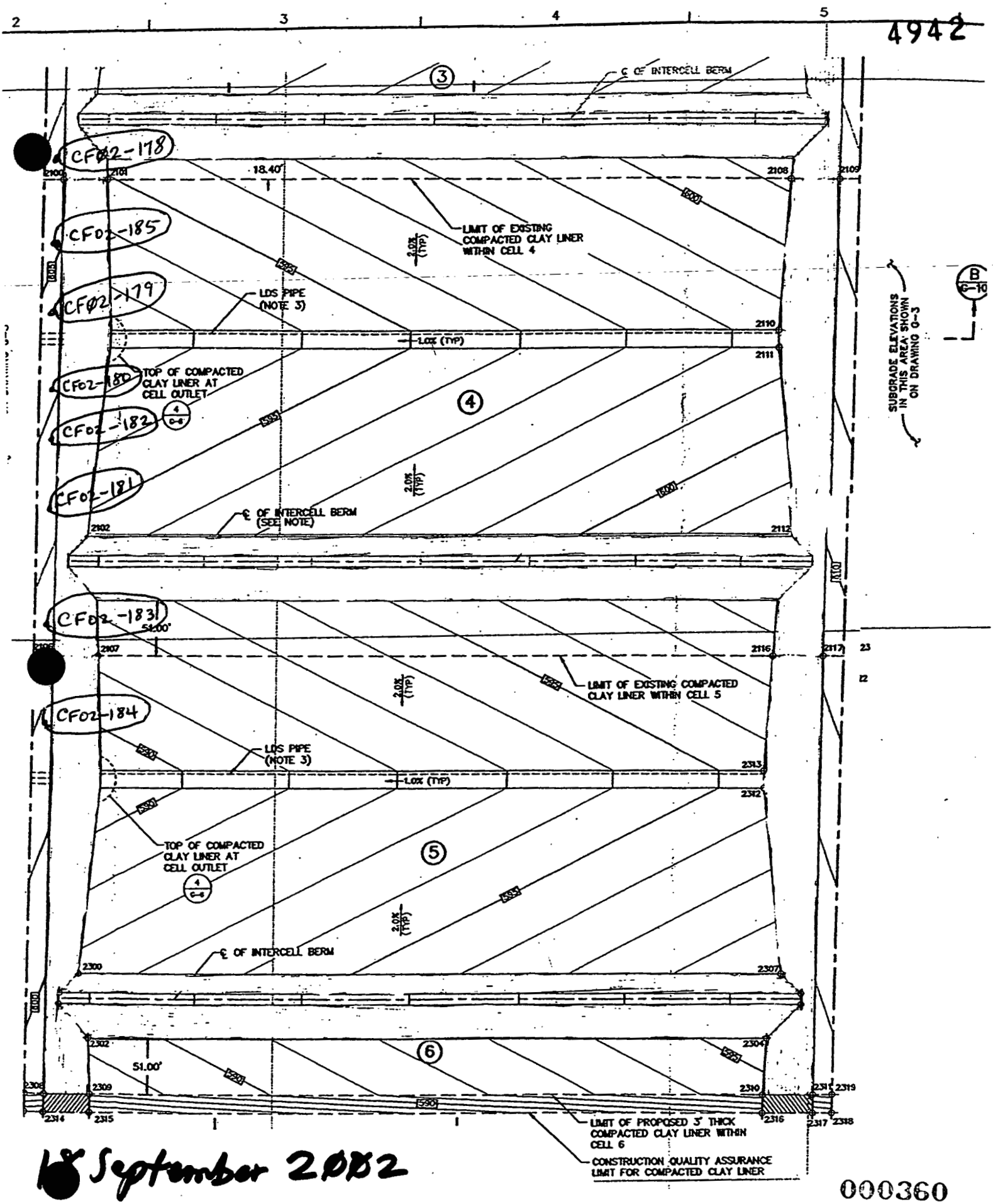

18 September 2002

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GQ1341 04.1

Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II Cells #4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 19 day Sept month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CAW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02 186	Cell #5, West Anchor Trench	6" / L-3	D2-3	12.4	121.6	14.1	132.7	116.3	95.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 3

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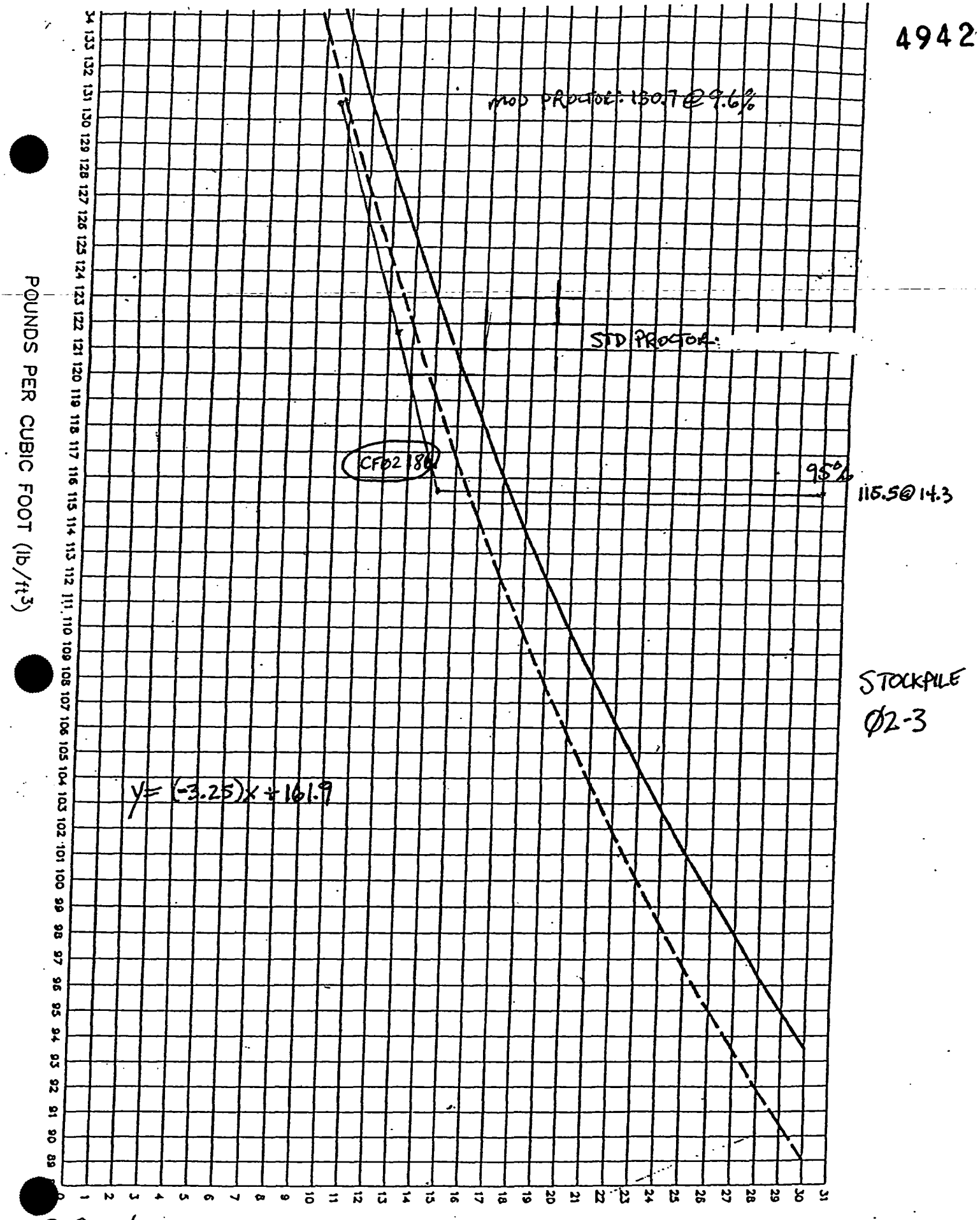

9 September 2002

GQ1341 Ø4.1

Sheet No. 2 of 3

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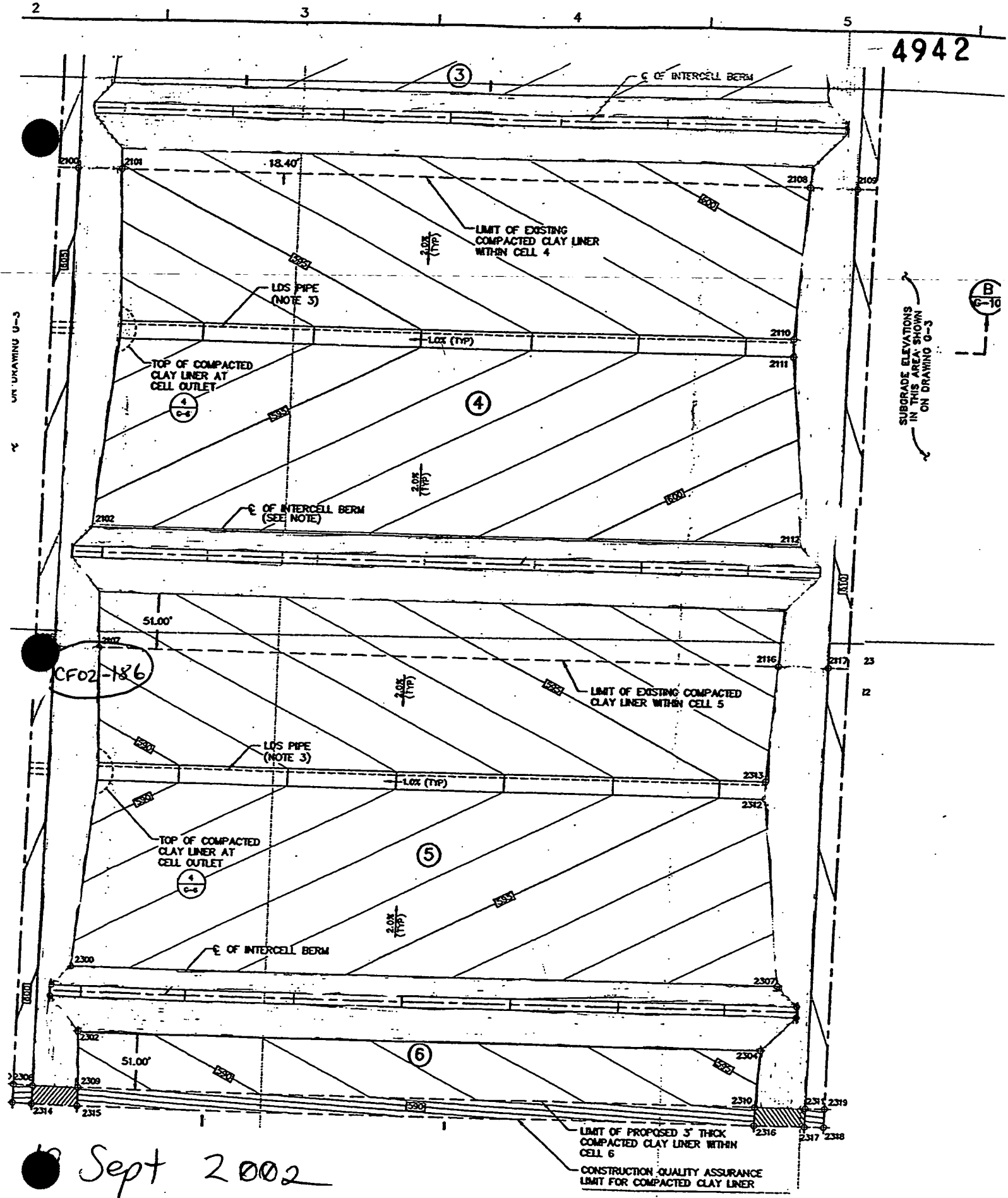

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Sept 2002

GQ1341 04.1

Sheet No. 3 of 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 23 day Sept month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: Cotw

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF 02187	Cell #5, WEST Anchor Trench	6" / L-2	02-3	12.4	121.6	13.9	133.7	117.5	96.6	P	—	—	—	—
CF 02-188	Cell #5, West Anchor Trench	6" / L-3	02.3	12.4	121.6	13.2	135.5	119.7	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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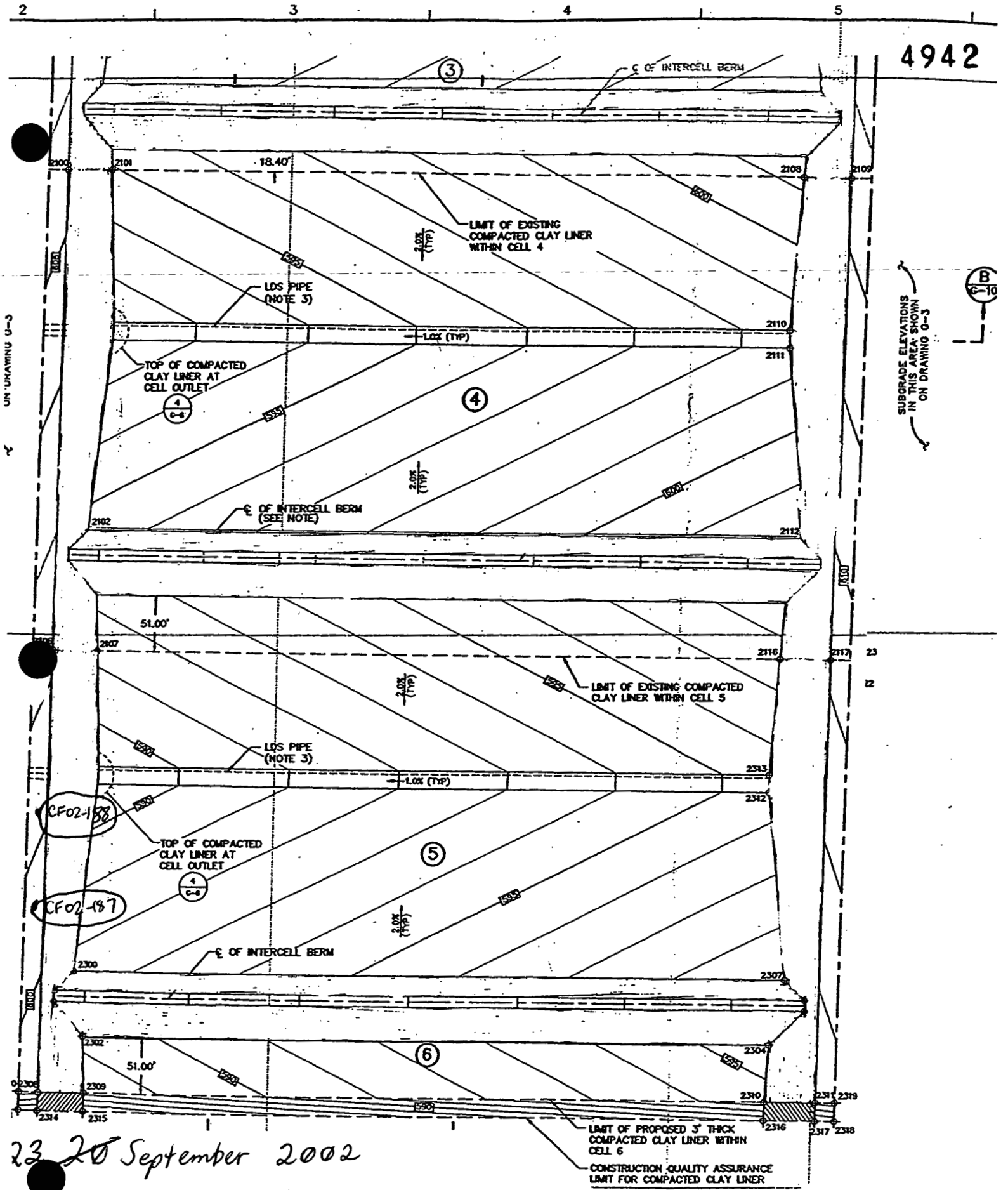

23 ~~20~~ September 2002

GQ 1341 04.1

Sheet No. 2 of 3

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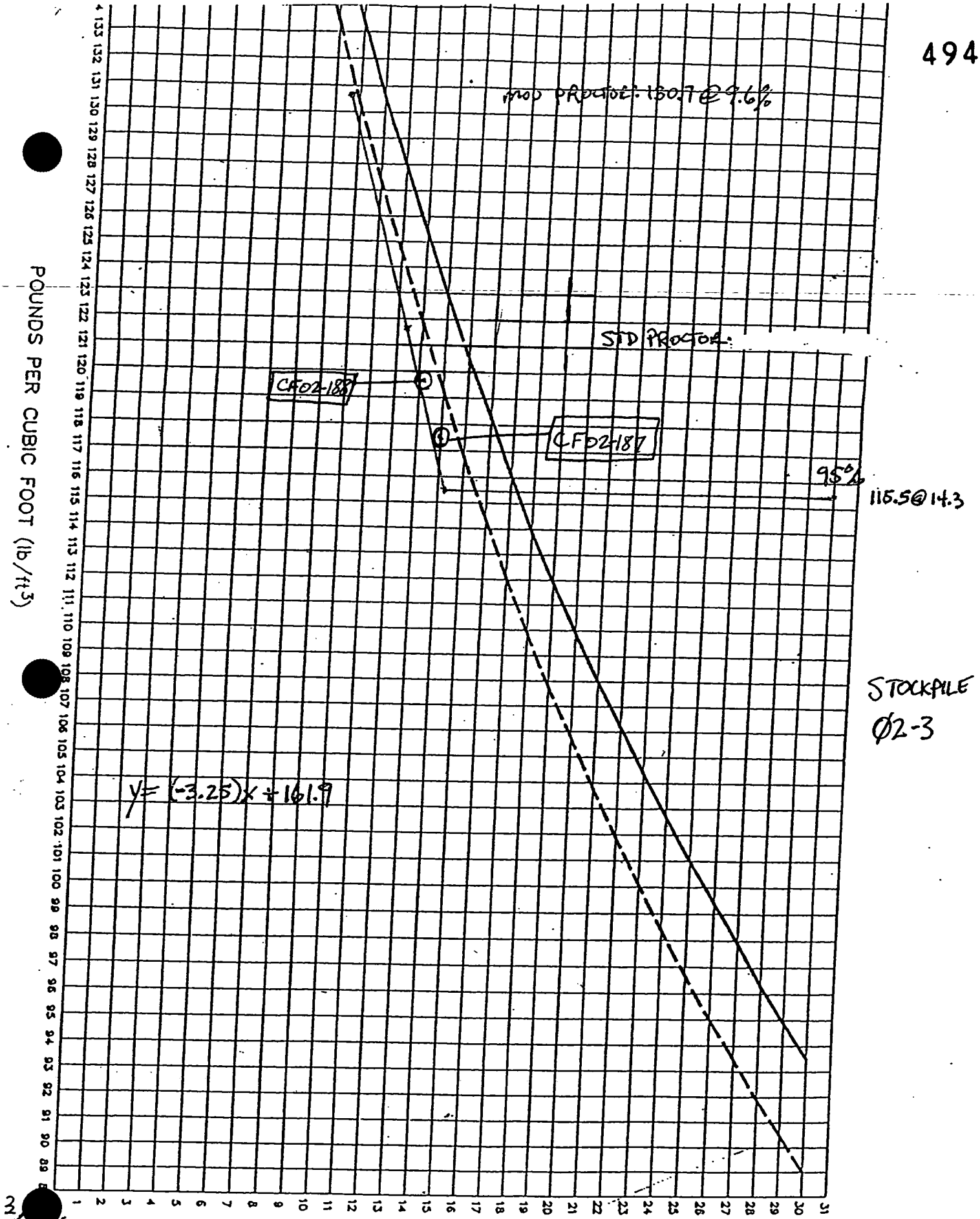

1 September 2002

GQ1341 Ø4.1

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase III Cell #4 & #5

PROJECT NO.: G0134 TASK NO.: 04.1

DATE: 24 day Sept month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-189	CELL #5 West Anchor Trench	6" / L2	02-3	12.4	121.6	16.9	130.3	~~111.5~~ ~~113.4~~	~~91.7~~ ~~93.3~~	—	F	CF02-190	P	—
CF02-190	↓	6" / L2	02-3	12.4	121.6	15.0	134.2	116.7	96.0	P	—	—	—	—
CF02-191	↓	6" / L3	02-3	12.4	121.6	12.9	132.4	117.3	96.5	P	—	—	—	—
CF02-192	↓	6" / L3	02-3	12.4	121.6	12.8	131.9	117.0	96.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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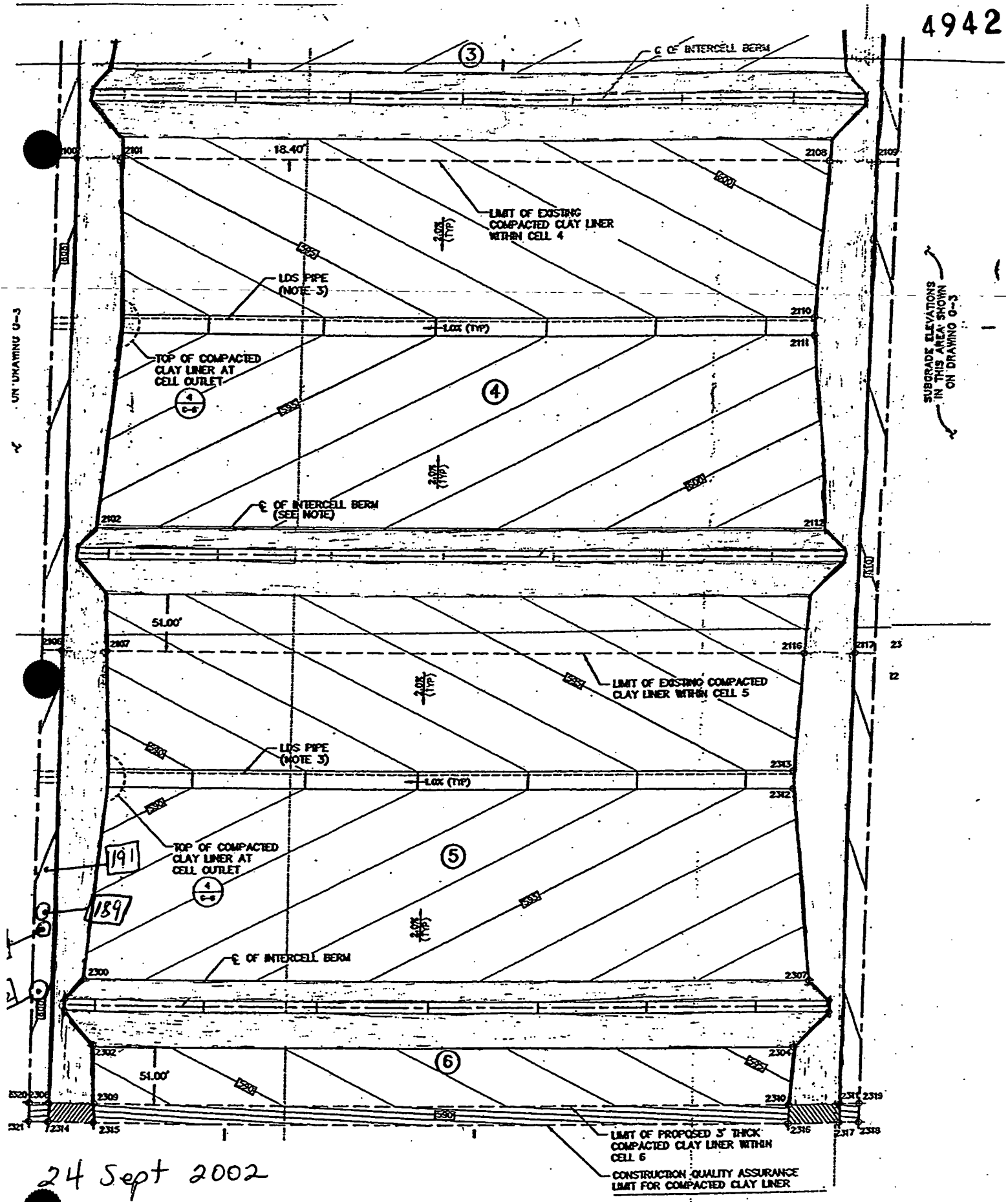

24 Sept 2002

GQ1341 04.1

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Sheet No. 2 of 3

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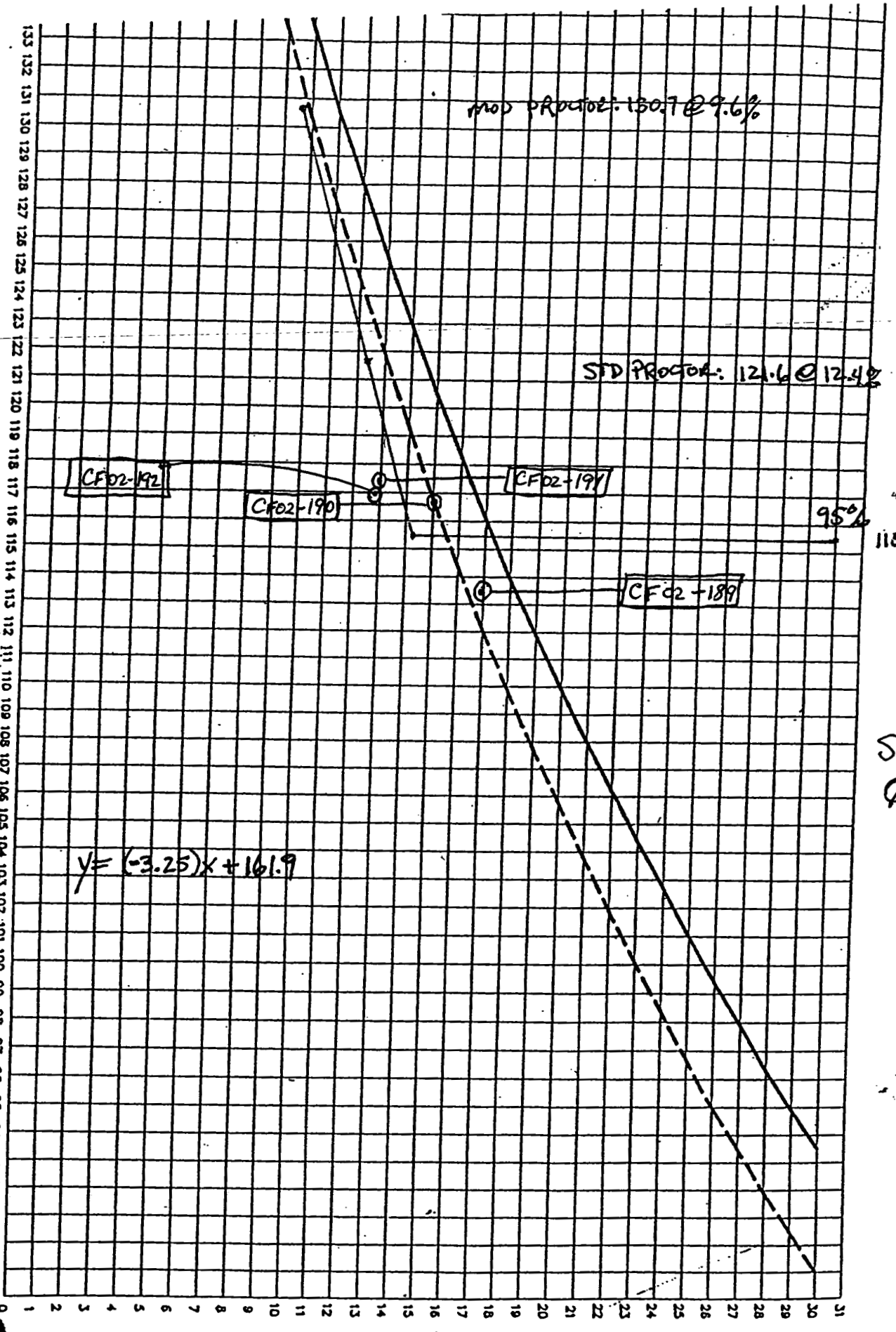

STOCKPILE
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24 Sept 2002

GQ1341 Ø4.1

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5 LINER

PROJECT NO.: 6Q1341 TASK NO.: 4.1

DATE: 24 day Oct month 2002 year

SPECIFICATION REQUIREMENTS: ASTM (D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3 OPTIMUM LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: STOCK PILE 3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. ~~20479~~ 75-2403

CORRECTION FACTOR Y = —

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-193	CELL 5 AT	6" / 3	02-3	12.4	121.6	13.4	135.6	119.6	98.3	P	—	—		
CF02-194	CELL 5 AT	6" / 3	02-3	12.4	121.6	12.5	136.3	121.2	99.6	P	—	—		
CF02-195	CELL 5 AT	6" / 4	02-3	12.4	121.6	13.4	132.7	117.0	96.2	P	—	—		
CF02-196	CELL 5 AT	6" / 4	02-3	12.4	121.6	14.0	134.1	117.6	96.7	P	—	—		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 2

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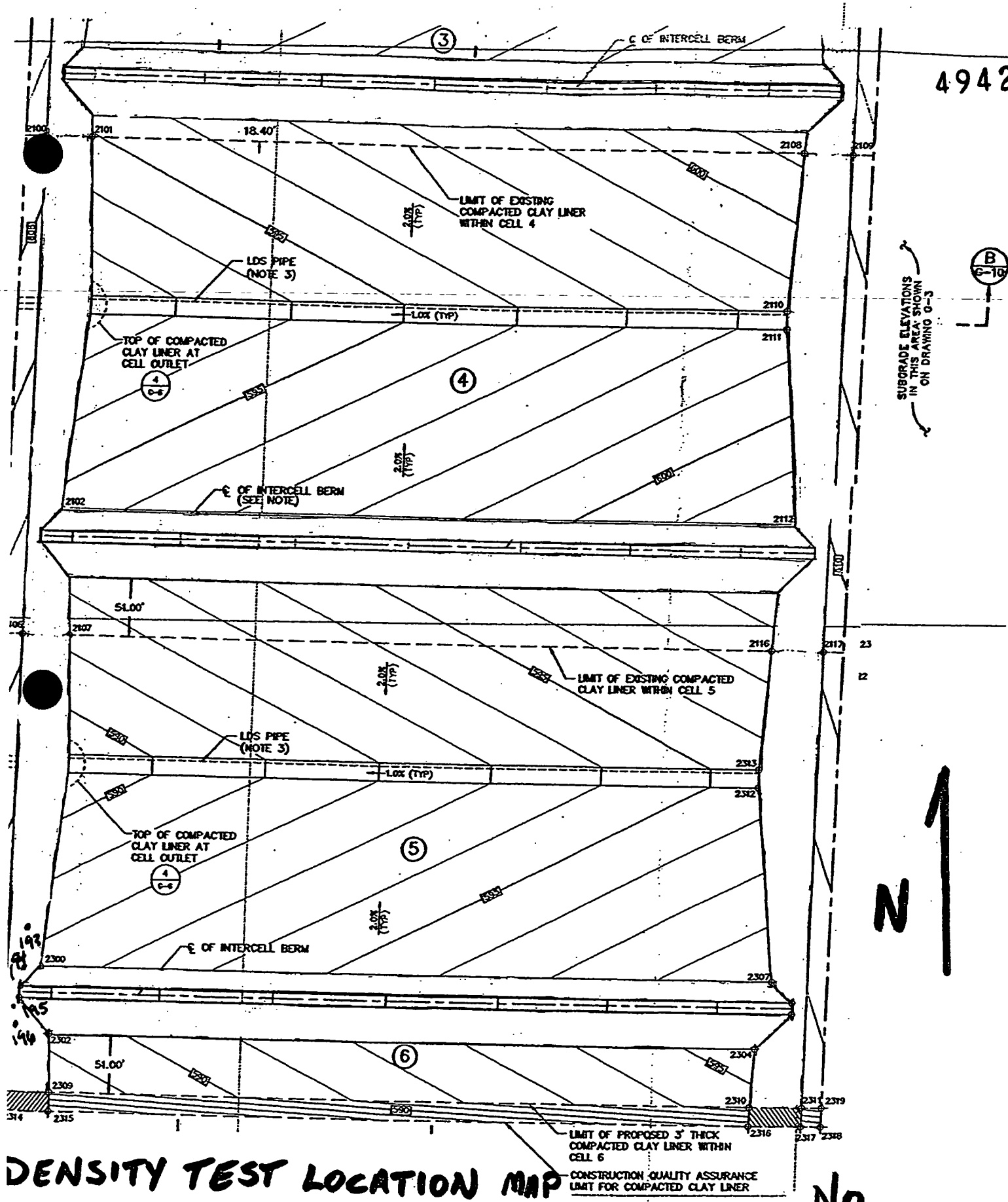

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DENSITY TEST LOCATION MAP

4 DAY Oct MONTH 2002 YEAR

NO SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & Cell #5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 7 day October month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS ((LOOSE)/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø2-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: (CHW)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-197	GIS #7	6" / L-3	Ø2-3	12.4	121.6	12.8	133.5	118.3	97.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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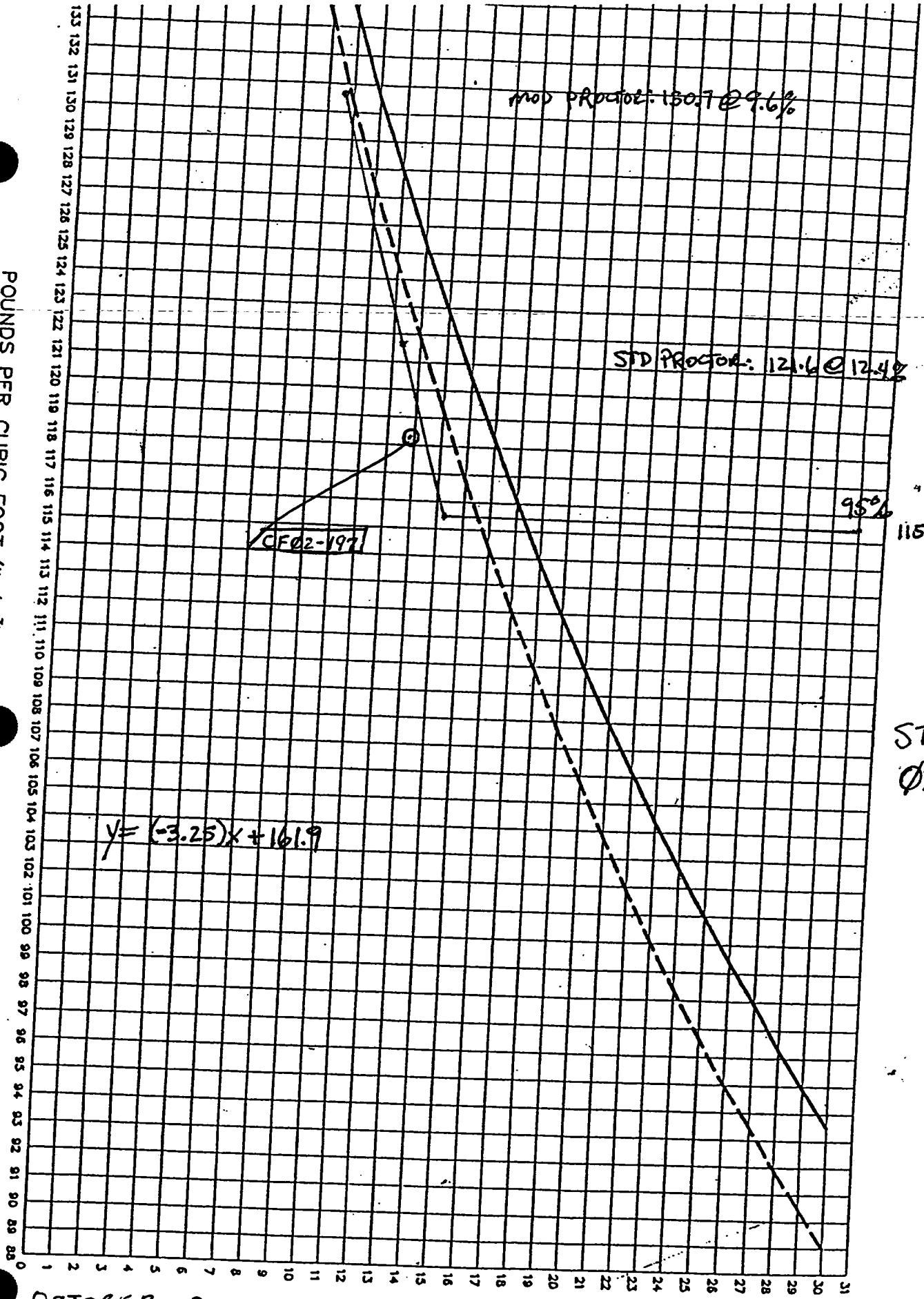

STOCKPILE
Ø2-3

OCTOBER 2002

GQ1341 04.1

Sheet No. 2 of 3

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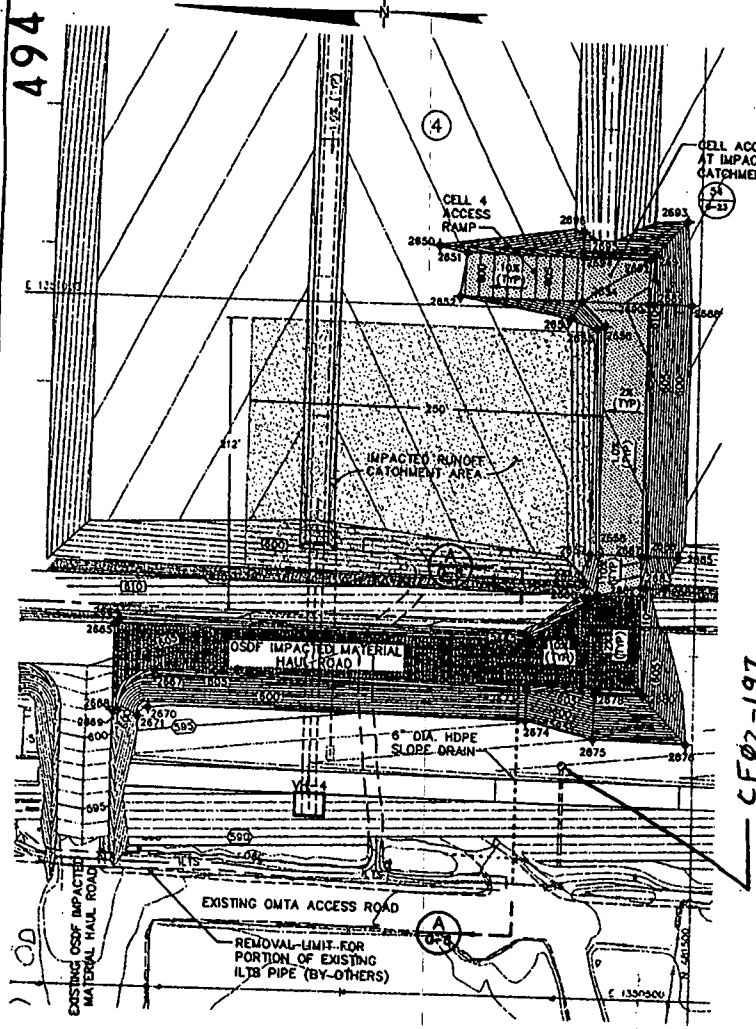
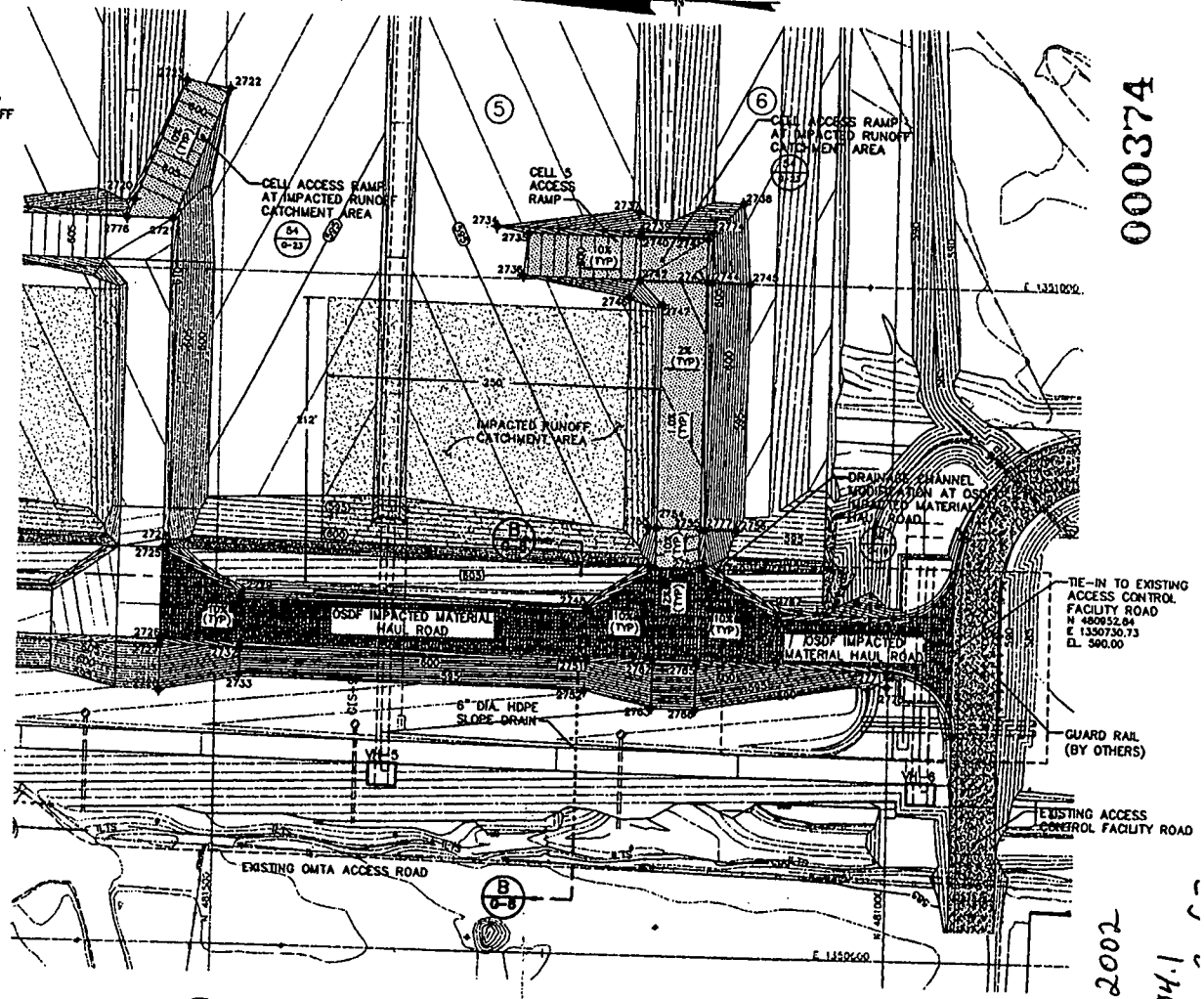
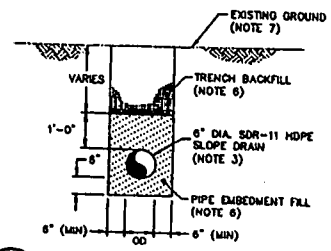


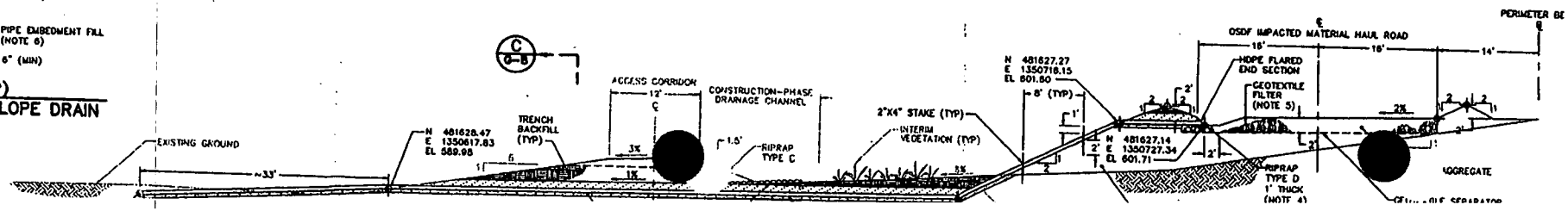
10 PLAN
0-1
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP AT CELL 4
SCALE: 1" = 50'



11 PLAN
0-2
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP AT CELL 5
SCALE: 1" = 50'



C
0-8
SECTION (TYP)
6-IN HDPE SLOPE DRAIN EMBEDMENT
SCALE: 1" = 5'



8 October 2002
GQ1341 94.1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5

PROJECT NO.: 6Q1341 TASK NO.: 4.1

DATE: 9 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% mc LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCK PILE 3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = –

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS / FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		
CF02-198	GIS #10	8" / 1	02-3	12.4	121.6	12.7	131.6	116.8	96.0	P	–	–	
CF02-199	GIS #9	8" / 3	02-3	12.4	121.6	12.1	136.5	121.8	100.1	P	–	–	

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 1

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5

PROJECT NO.: 601341 TASK NO.: 4.1

DATE: 10 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ± 3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCK PILE 03

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: 3440 GAUGE SERIAL NO. 75-2403 CORRECTION FACTOR Y = —

QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-200	ANCHOR TRENCH CELL 5 CORRIDOR	6" / 2	02-3	12.4	121.6	12.7	134.2	119.1	97.9	P	—	—		
CF02-201	AT CELL 5 N OF CORRIDOR	6" / 2	02-3	12.4	121.6	13.0	133.9	118.5	97.4	P	—	—		
CF02-202	AT CELL 5 N OF CORRIDOR	6" / 3	02-3	12.4	121.6	13.3	132.9	117.3	96.5	P	—	—		
CF02-203	AT CELL 5 N OF 4/5 IC BEAM	6" / 3	02-3	12.4	121.6	10.4	132.2	119.8	98.5	P	—	—		
CF02-204	AT CELL 5 AT CORRIDOR	6" / 4	02-3	12.4	121.6	10.8	129.9	117.3	96.4	P	—	—		
CF02-205	AT CELL 4/5 IC BEAM	6" / 4	02-3	12.4	121.6	11.7	133.5	119.6	98.3	P	—	—		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q1341 TASK NO.: 4.1

DESCRIPTION: PHASE IV CELL 4+5 — DATE: 11 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM (D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% OPT LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: STOCK PILE 02-3 MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = — QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-206	CELL 4/5 JC BEAM 100' S OF CORRIDOR	6" / 2	02-3	12.4	121.6	12.5	134.4	119.4	98.3	P	—	—		
CF02-207	CELL 4 EAST SIDE	6" / 2	02-3	12.4	121.6	12.3	132.4	117.9	97.0	P	—	—		
CF02-208	CELL 4/5 JC BEAM	6" / 3	02-3	12.4	121.6	12.9	130.9	116.8	95.4	P	—	—		
CF02-209	CELL 5 EAST SIDE	6" / 3	02-3	12.4	121.6	11.6	129.5	116.1	95.5	P	—	—		
CF02-210	CELL 5 EAST SIDE SOUTH OF CORRIDOR	6" / 4	02-3	12.4	121.6	11.8	134.0	119.9	98.6	P	—	—		
CF02-211	CELL 5 EAST SIDE SOUTH OF CORRIDOR	6" / 4	02-3	12.4	121.6	12.1	136.7	122.0	100.3	P	—	—		
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 1

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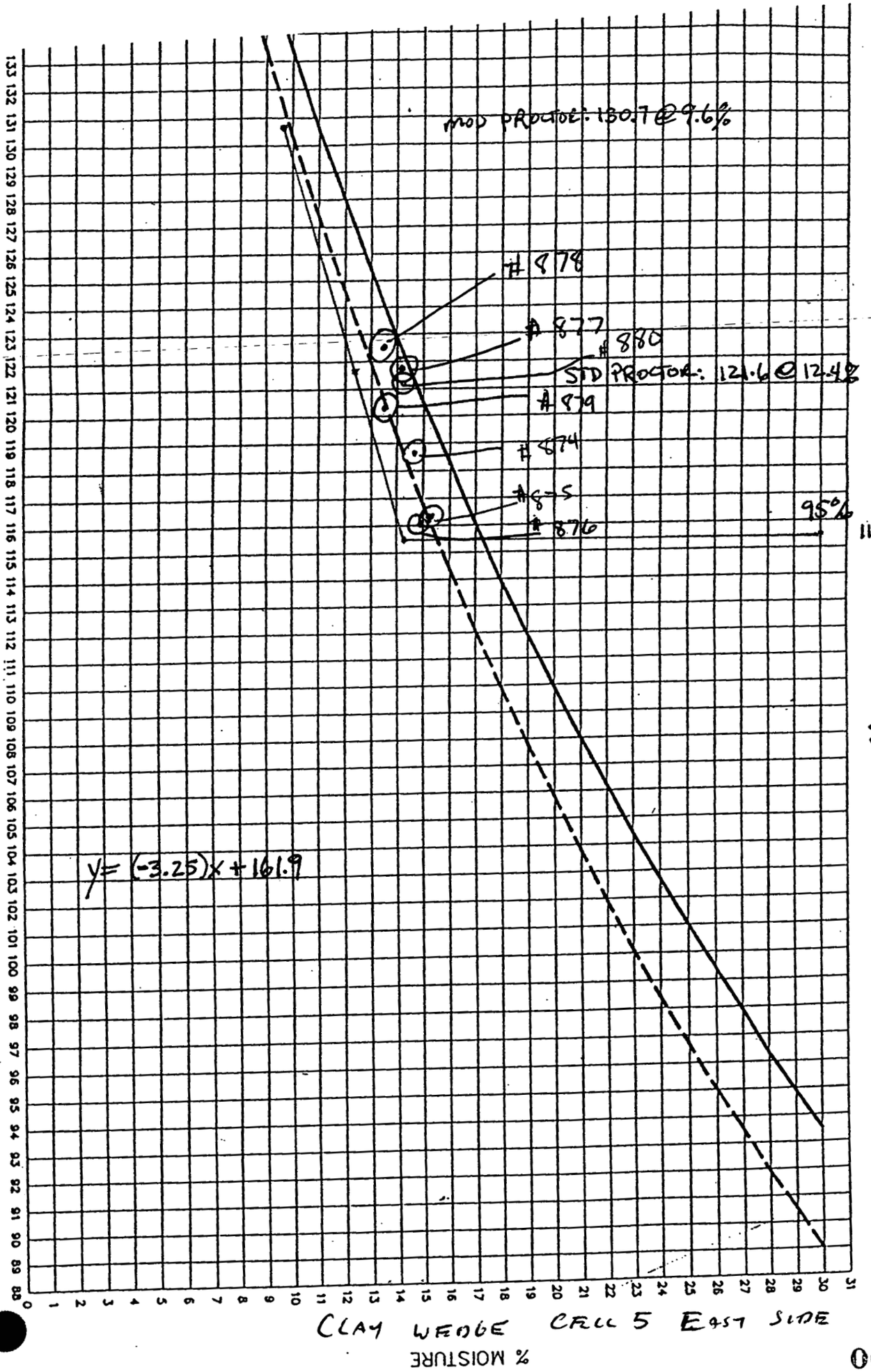

STOCKPILE
Ø2-3

CLAY WEDGE CELL 5 EAST SIDE

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Oct 9 —

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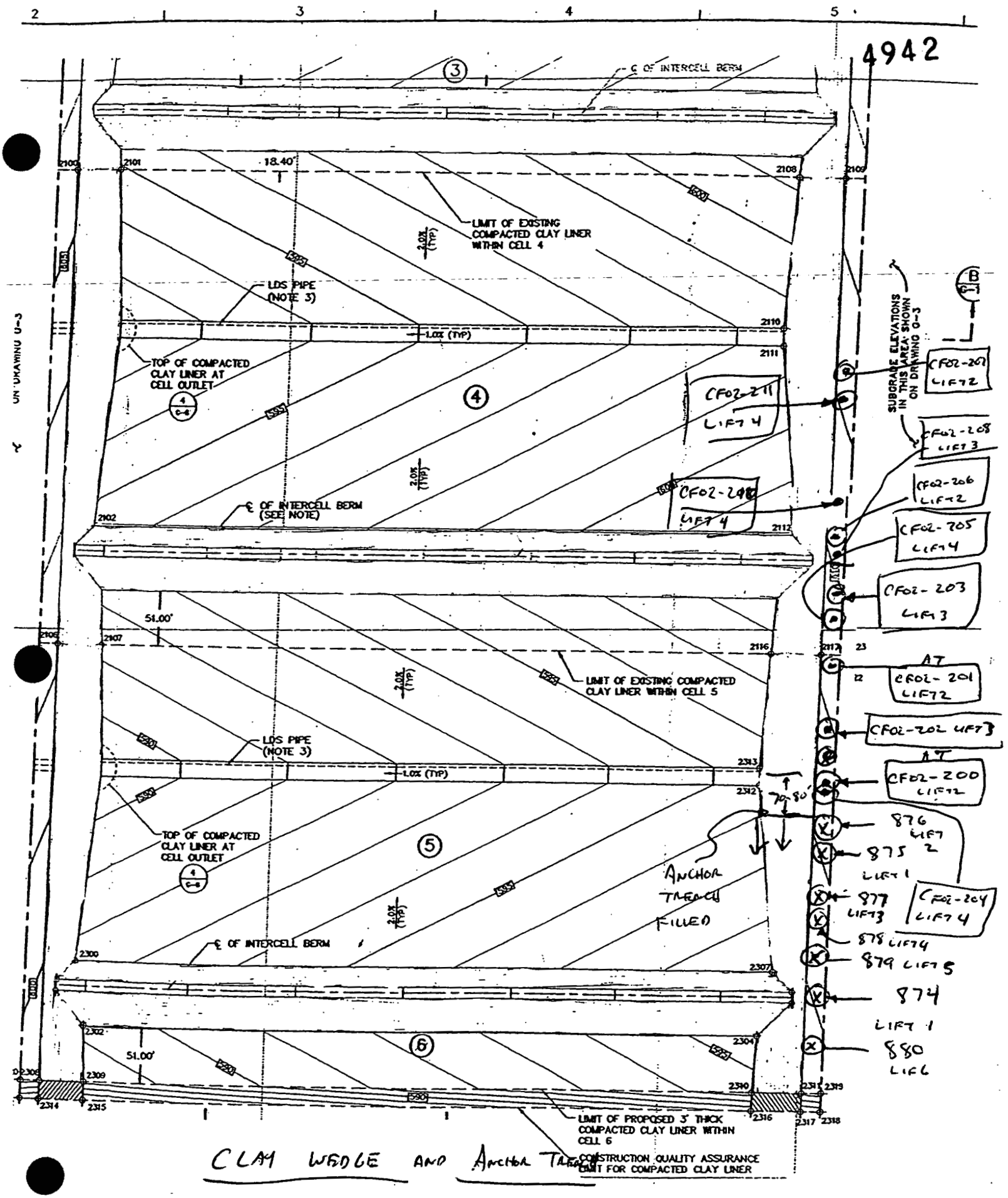

CLAY WEDGE AND ANCHOR TRENCH

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase II Cell #4 & #5

PROJECT NO.: GQ1341 TASK NO.: 941

DATE: 12 day October month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS ((LOOSE)/COMPACTED): 8"

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CP-02-212	Cell #5, East Anchor Trench	6" / 2	B2-3	12.4	121.6	12.3 —	~~118.8~~ 133.3	118.8	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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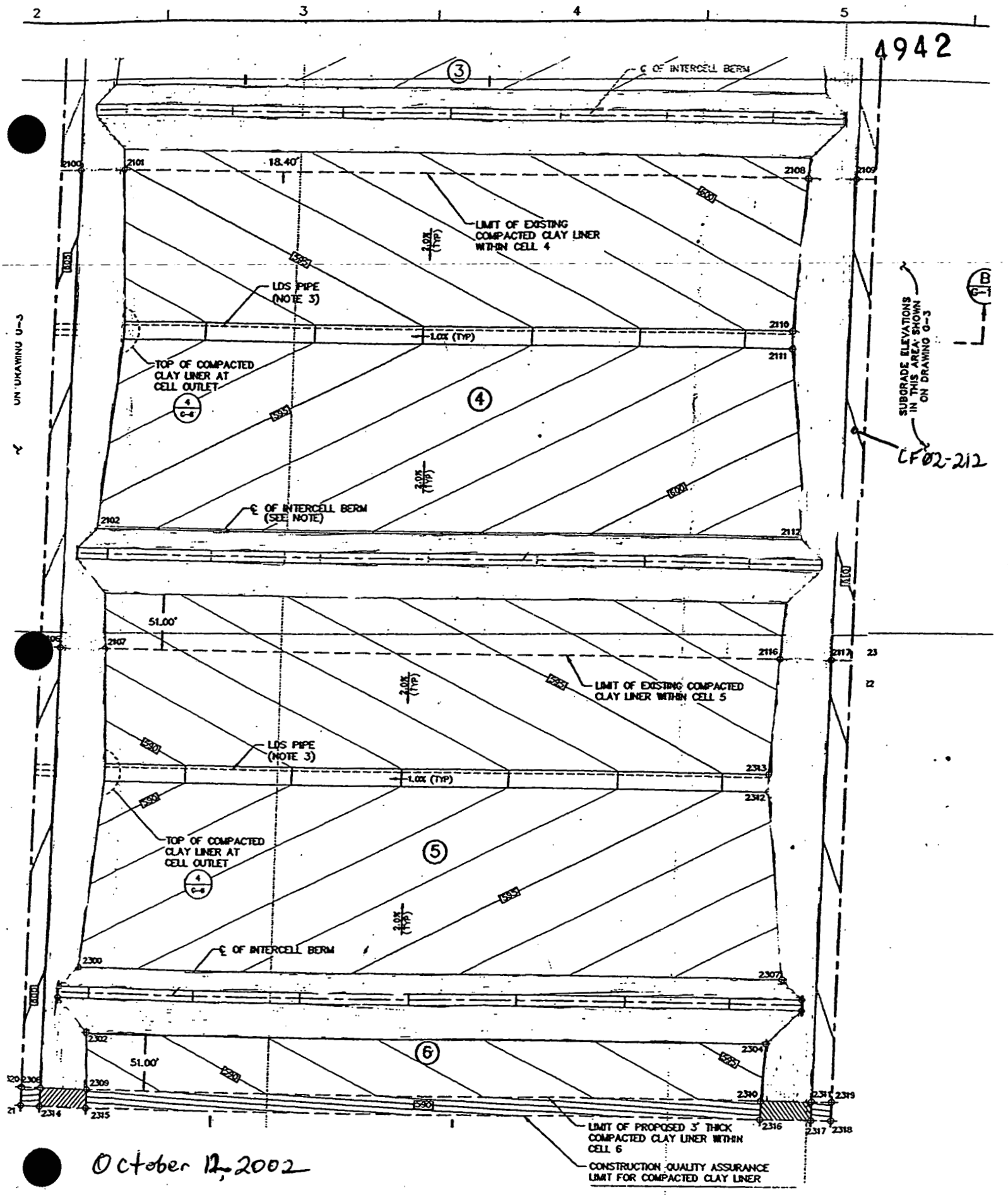

October 12, 2002

GQ 1341 04.1

Sheet No. 2 of 3

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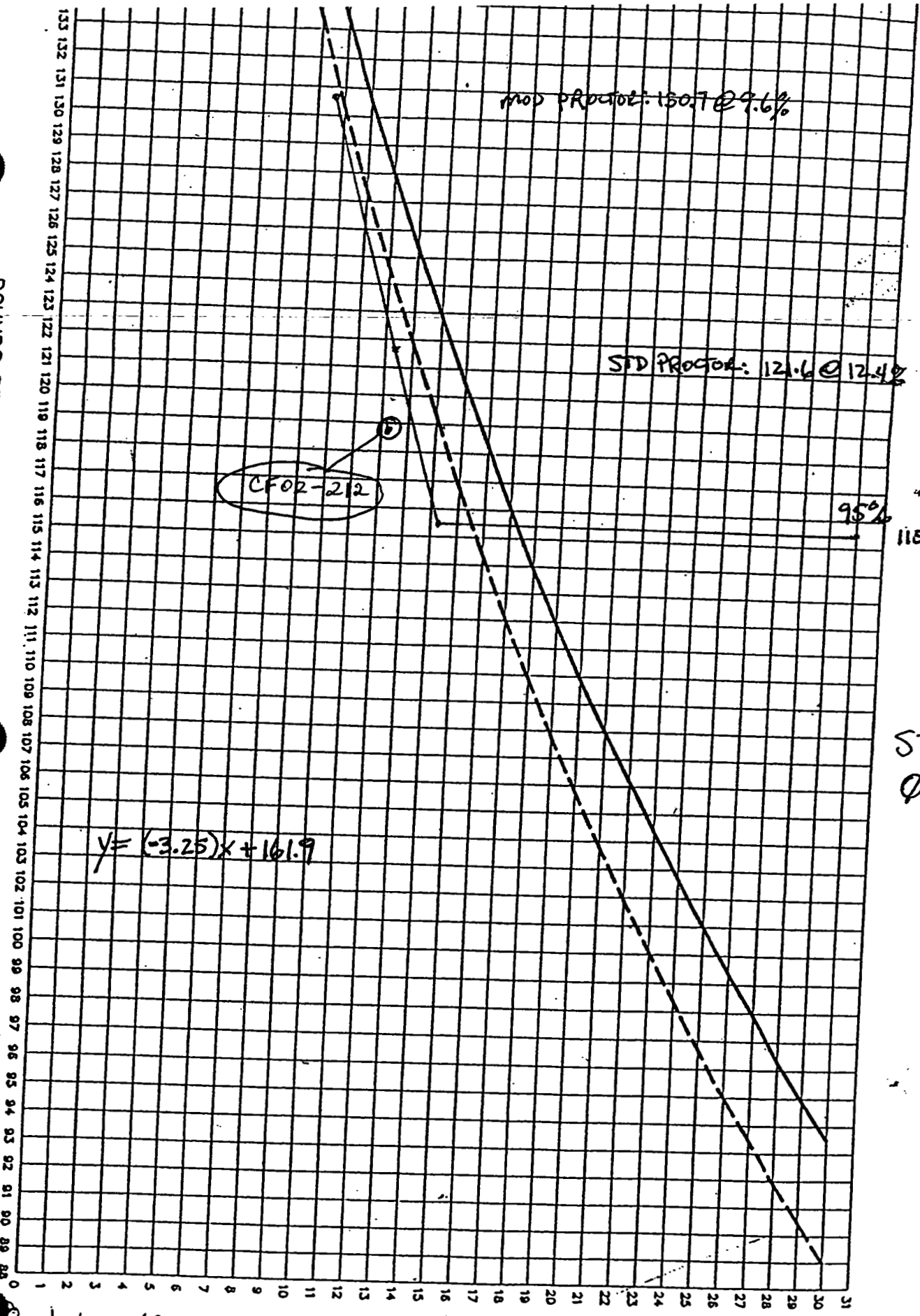

STOCKPILE
Ø2-3

October 12, 2002

GQ1341 Ø4.1

Sheet No. 3 of 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV cell # 4 & 5

PROJECT NO.: GF1341 TASK NO.: 94.1

DATE: 14TH day Oct month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: DW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CFL02-213	CELL 4 EAST ANCHOR TRENCH	6" / 2	02-3	12.4	121.6	11.2	129.9	116.8	96.0	P	–	–	–	–
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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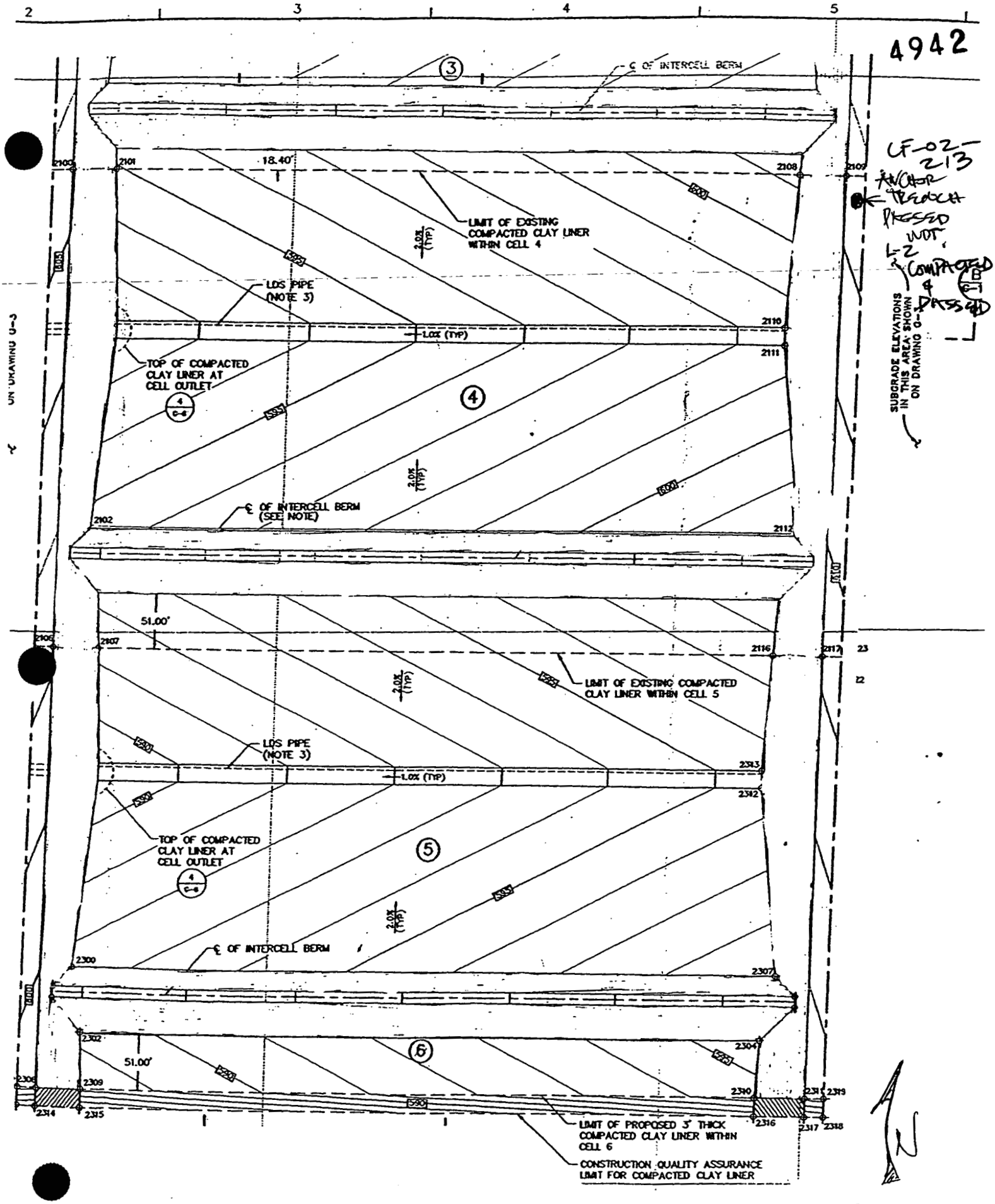

LF-02-213
ANCHOR TRENCH PASSED WDT, L-2 & COMPACTED & PASSED

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14TH OCTOBER 2002

ANCHOR TRENCH

2 of 3

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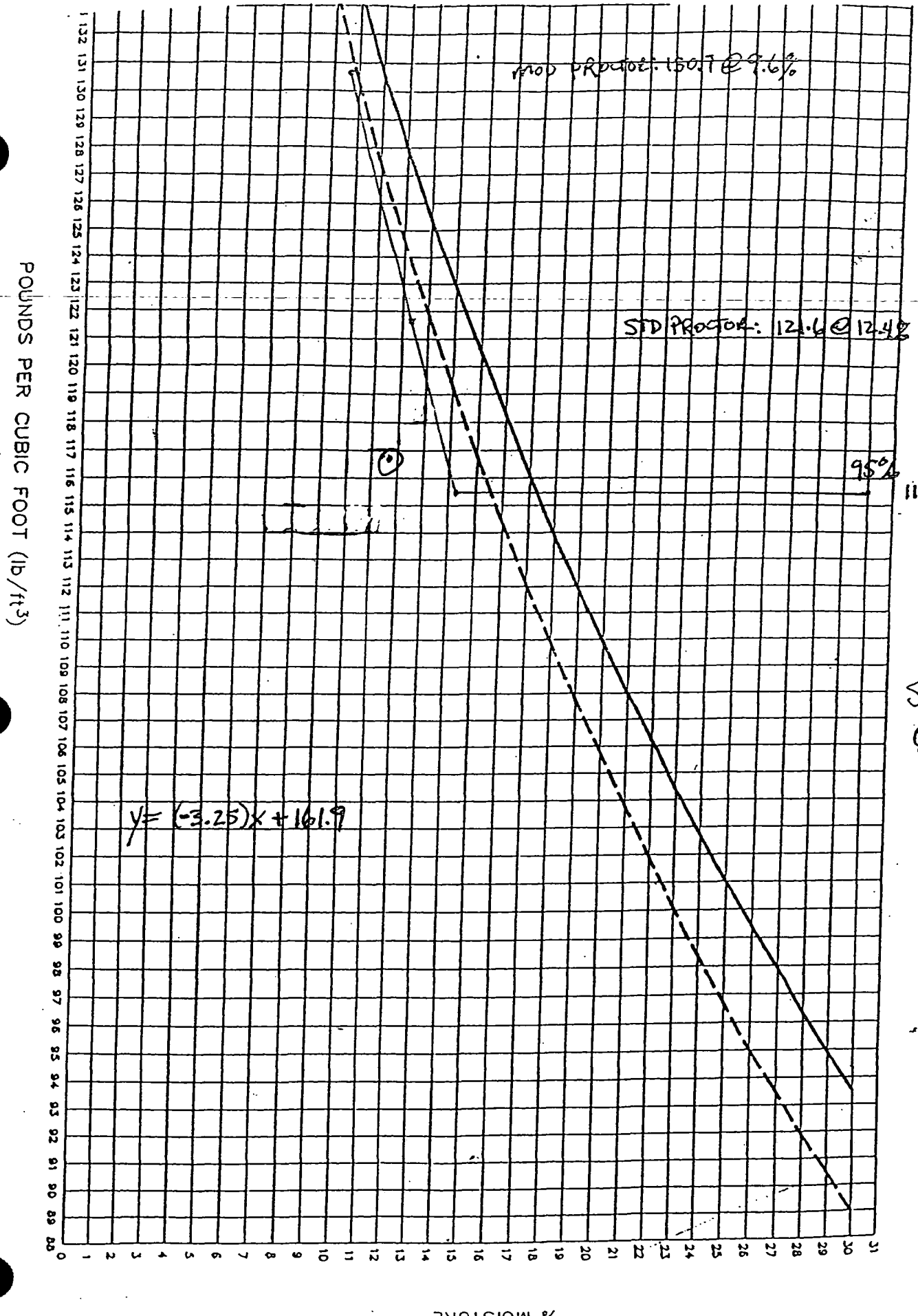

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14th OCTOBER 2002
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ANCHOR TRENCH

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL # 5

PROJECT NO.: 01341 TASK NO.: 04.1

DATE: 15TH day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED) 6"

MATERIAL SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF-02-214	CELL 4 EAST ANCHOR TRENCH	6" / 3	02-3	12.4	121.6	11.8	133.5	119.4	98.2	P	—	—	—	—
CF-02-215	CELL 4 EAST ANCHOR TRENCH	6" / 4	02-3	12.4	121.6	12.1	137.5	122.6	100.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 1 OF 3

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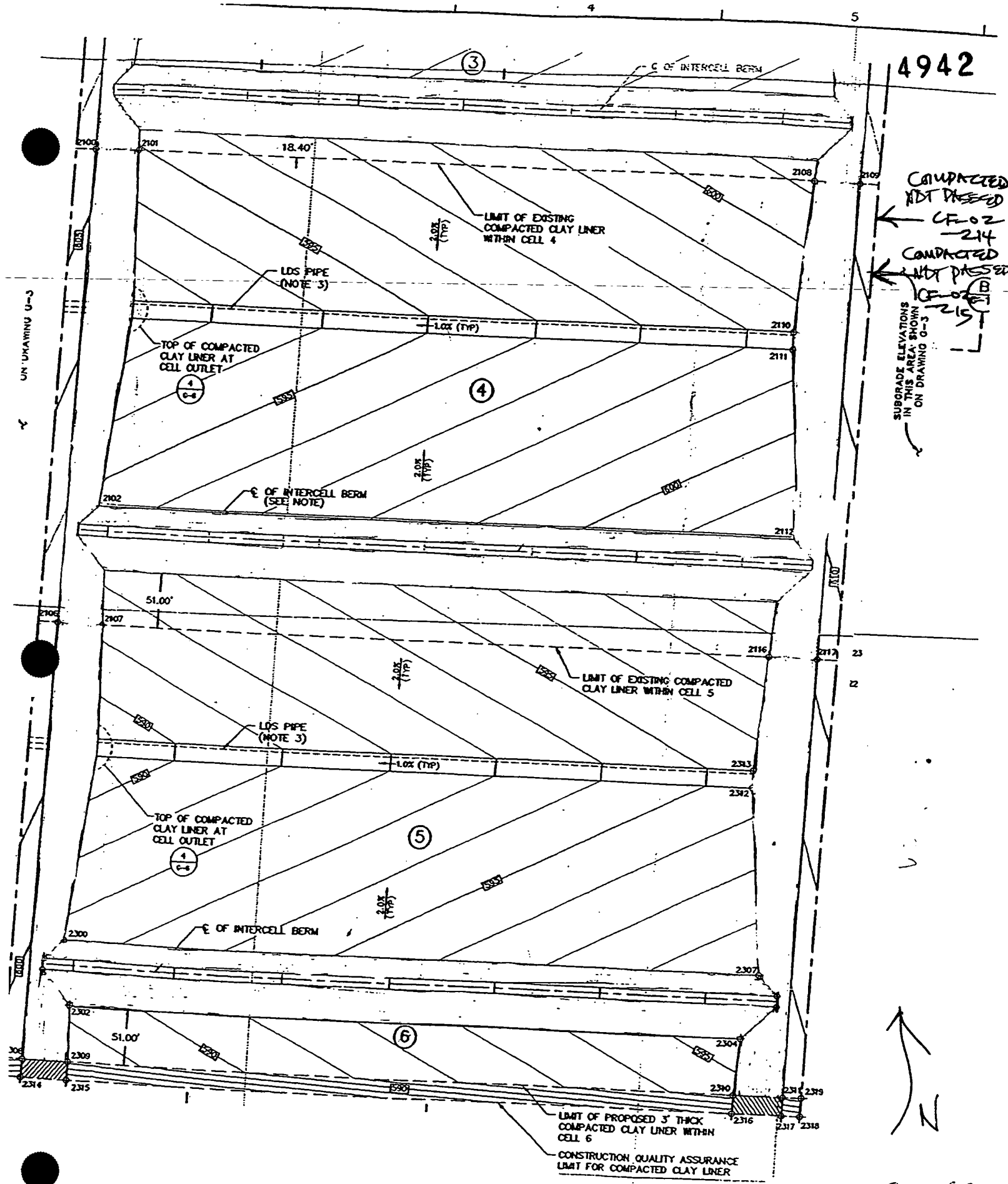

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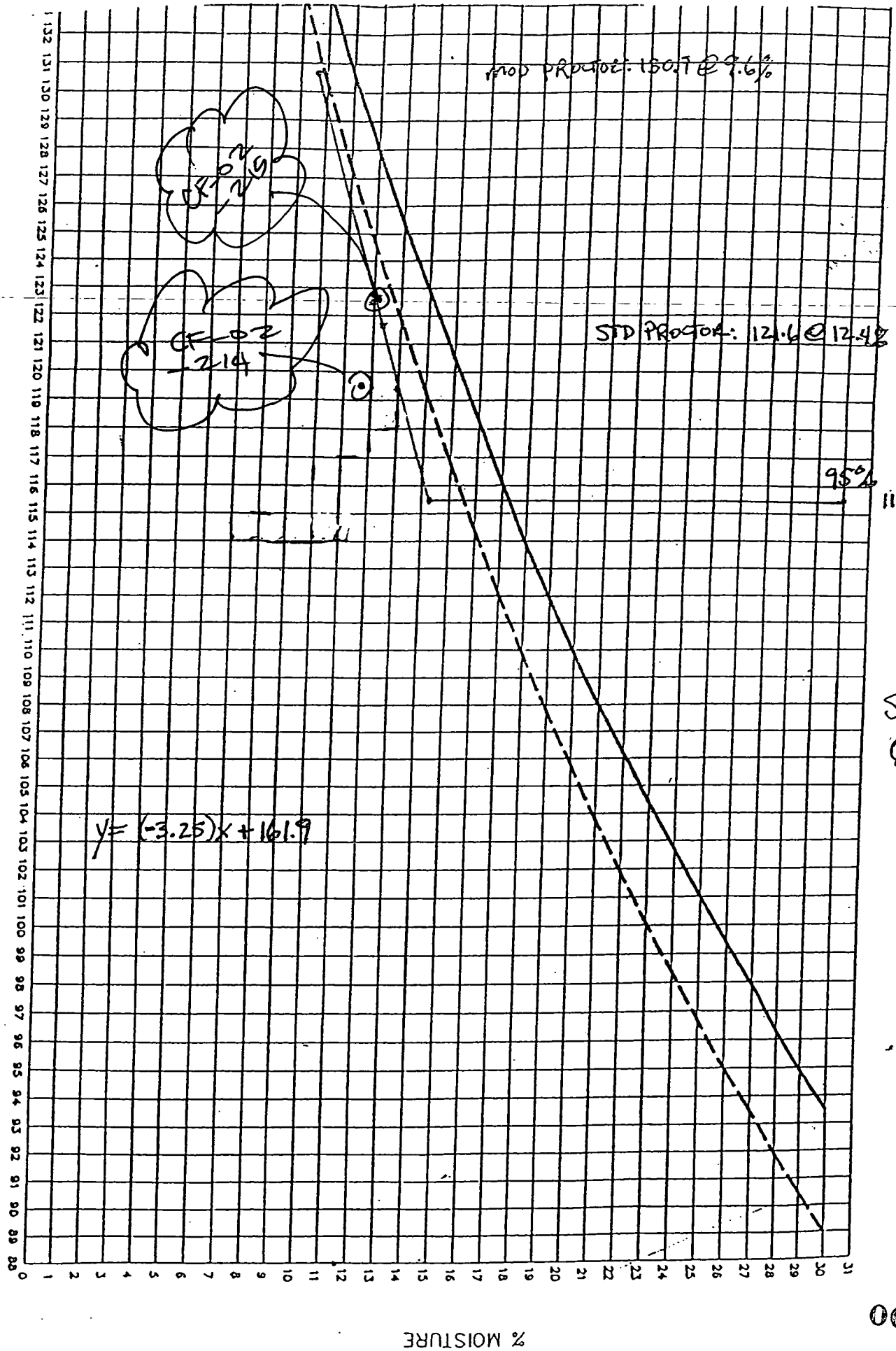

STOCKPILE
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15TH OCTOBER 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: DAASE IV CELL 4 $5

PROJECT NO. 60134 TASK NO.: 4.1

DATE: 30 day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0.5 LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: WEST ANCHOR TR. BACKFILL

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8981 + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
216	West Cell 4 Anchor TR.	6" / L-2	02-2	13.4	119.9	12.5	137.7	122.4	102.0	P	—	—	—	—
217	West Cell 4 Anchor TR.	6" / L-2	02-2	13.4	119.9	14.4	135.8	118.7	99.0	P	—	—	—	—
218	West Cell 4 Anchor TR.	6" / L-3	02-2	13.4	119.9	12.0	129.3	115.4	96.2	P	—	—	—	—
219	West Cell 4 Anchor TR.	6" / L-3	02-2	13.4	119.9	12.8	129.6	115.7	96.5	P	—	—	—	—
220	West Cell 4 Anchor TR.	6" / L-4	02-2	13.4	119.9	12.5	131.0	116.4	97.1	P	—	—	—	—
221	West Cell 4 Anchor TR.	6" / L-4	02-2	13.4	119.9	12.3	136.0	121.1	101.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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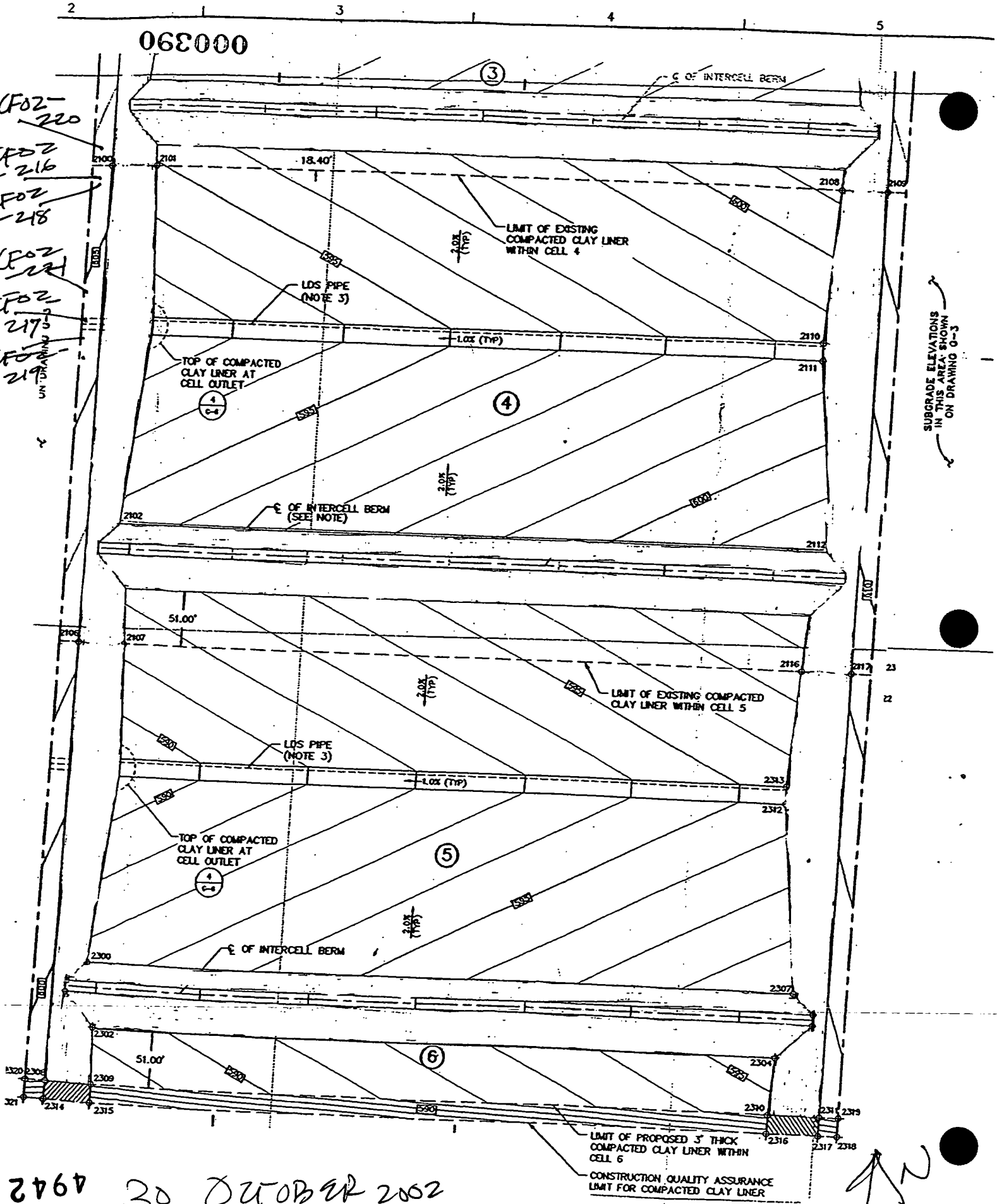
CF02-220
CF02-216
CF02-218
CF02-221
CF02-217
CF02-219



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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV Cell #4 & Cell #5

PROJECT NO.: GR1341 TASK NO.: 41

DATE: 31 day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 022 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: WEST ANCHOR TRENCH BACK FILL

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20999 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-222	Cell #4, W Anchor Trench	6" / L-2	022	13.4	119.9	13.5	132.7	116.9	97.5	P	—	—	—	—
CF02-223	Cell 5, W. Anchor Trench	6" / L-2	022	13.4	119.9	13.4	126.0	111.1	92.6	—	F	CF02-224	P	—
CF02-224	Cell 5, W. Anchor Trench	6" / L-2	022	13.4	119.9	13.2	131.2	115.9	96.7	P	—	—	—	—
CF02-225	Cell 4, W. Anchor Trench	6" / L-3	022	13.4	119.9	13.2	130.7	115.4	96.2	P	—	—	—	—
CF02-226	Cell 5, W. Anchor Trench	6" / L-3	022	13.4	119.9	14.4	130.8	116.0	97.0 96.8	P	—	—	—	—
CF02-227	Cell 4, W Anchor Trench	6" / L-4	022	13.4	119.9	14.0	132.2	116.0	96.7	P	—	—	—	—
CF02-228	Cell 5 W Anchor Trench	6" / L-4	022	13.4	119.9	15.2	133.1	115.5	96.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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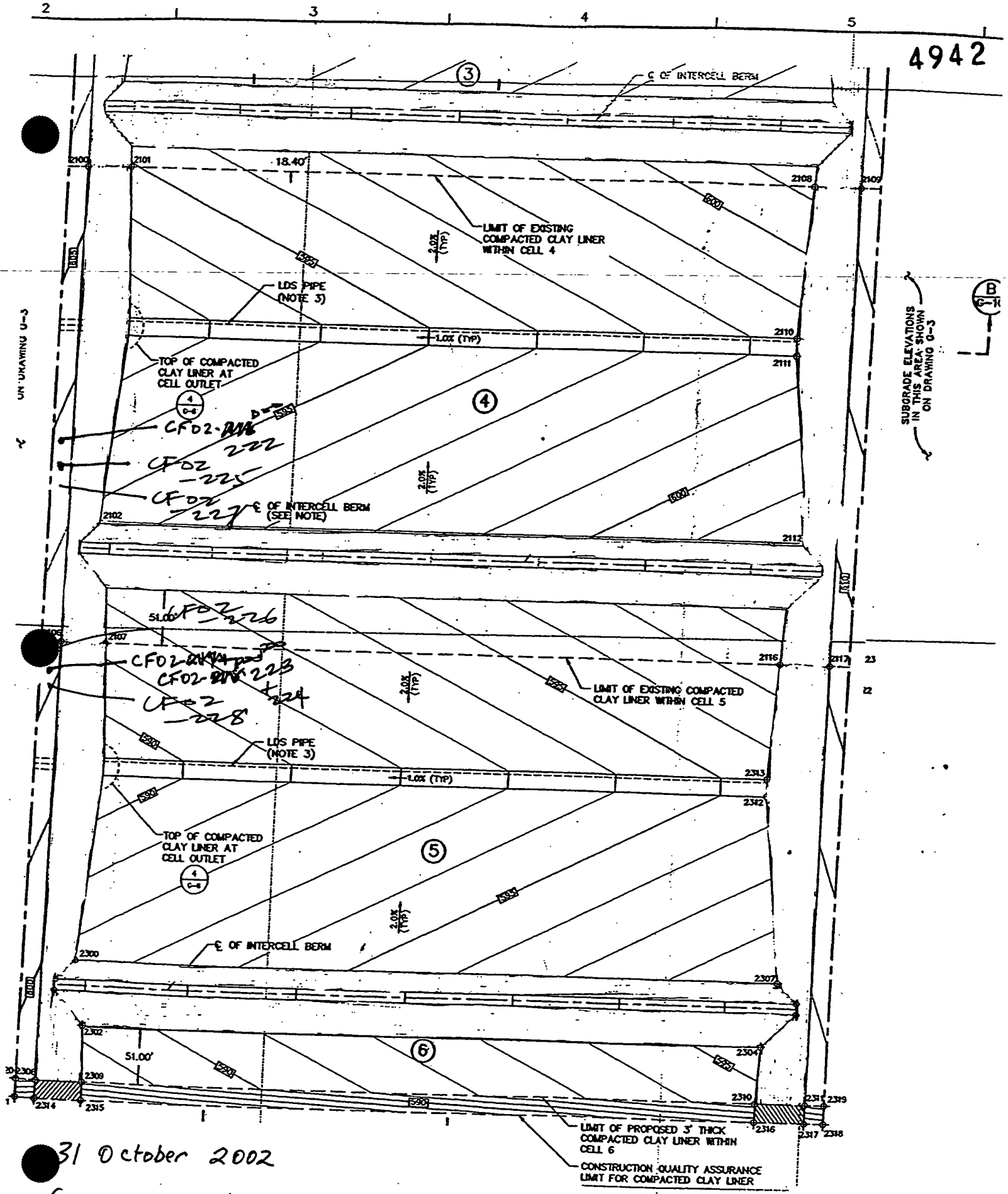

31 October 2002

GQ1341 04.1

Sheet No. 2 of 2

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE II Cell #4 & 5

PROJECT NO.: 001341 TASK NO.: 04.1

DATE: 1st day Nov. month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: WEST ANCHOR TRENCH BACKFILL

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 25979 CORRECTION FACTOR Y = N/A QA ID: DG/KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~CF02-229~~	~~Cell 5 West Anchor Trench~~	~~6"~~ / ~~L-2~~	~~02-2~~	~~13.4~~	~~119.9~~	~~13.5~~								
CF02-230	Cell 5 West Anchor Trench	6" / L-3	02-2	13.4	119.9	12.3	136.5	120.2	100.3	P	—	—	—	—
CF02-231	Cell 5 West Anchor Trench	6" / L-4	02-2	13.4	119.9	11.8	133.3	118.7	99.0	P	—	—	—	—
CF02-232	Cell 5 W. Anchor Trench	6" / L-2	02-2	13.4	119.9	12.9	140.3	125.5	104.6	P	—	—	—	—
CF02-233	Cell 5 W. Anchor Trench	6" / L-4	02-2	13.4	119.9	11.2	132.4	117.3	97.8	P	—	—	—	—
CF02-234	Cell 5 W. Anchor Trench	6" / L-3	02-2	13.4	119.9	12.0	130.3	117.1	97.7	P	—	—	—	—
CF02-235	Cell 5 W. Anchor Trench	6" / L-2	02-2	13.4	119.9	12.4	129.0	115.1	96.0	P	—	—	—	—
CF02-236	Cell 5 W. Anchor Trench	6" / L-4	02-2	13.4	119.9	12.6	136.5	121.4	101.3	P	—	—	—	—
CF02-237	Cell 5 W. Anchor Trench	6" / L-3	02-2	13.4	119.9	12.3	133.2	118.3	98.6	P	—	—	—	—
~~CF02-238~~	~~Cell 5 West Anchor Trench~~	~~6"~~ / ~~L-4~~	~~02-2~~	~~13.4~~	~~119.9~~		133.3	118.7	99.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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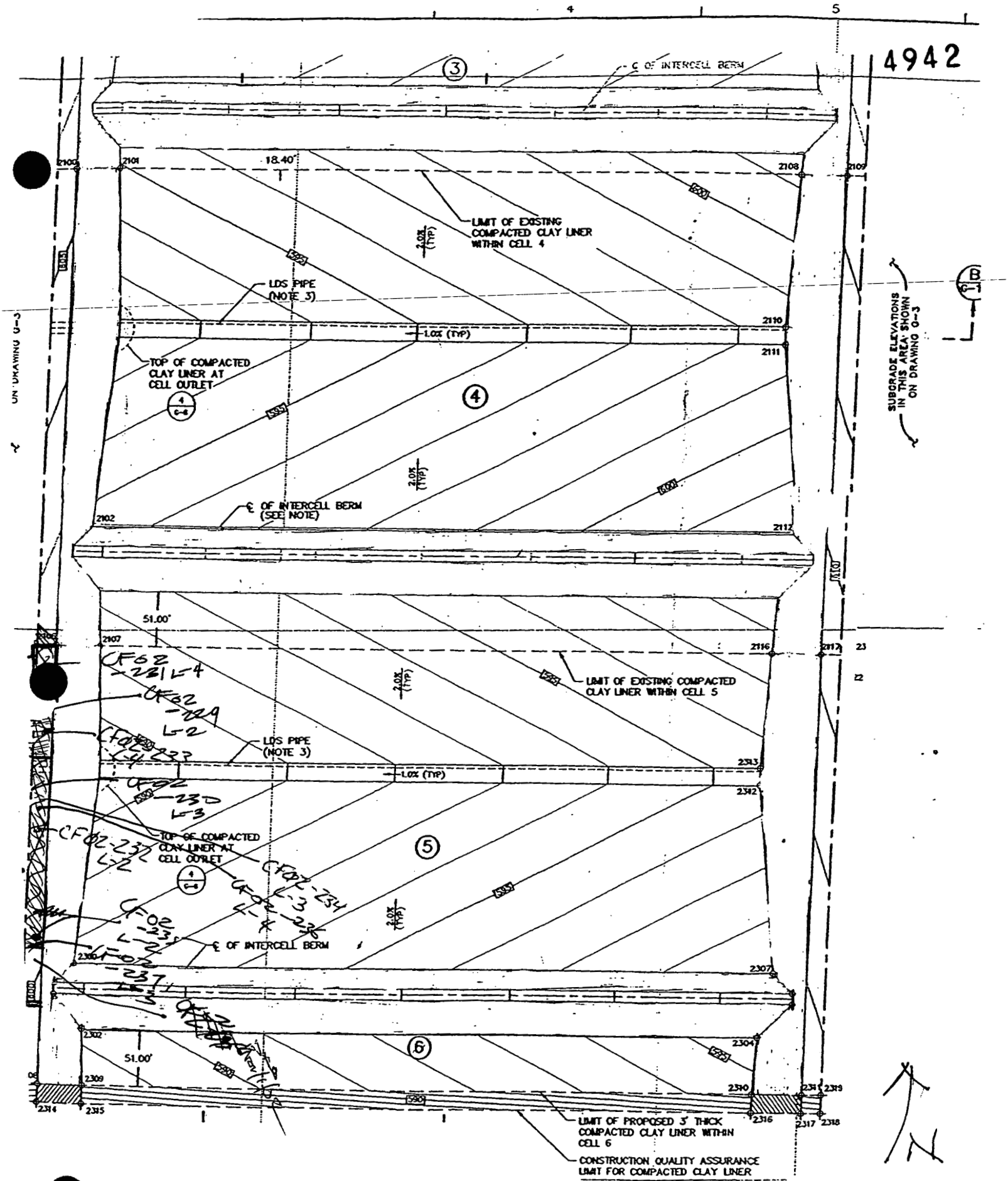

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GQ1341

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV 4 & 5

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 7th day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 / % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: BORROW AREA

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: GRAY TILL

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = ____ QA ID: DM

TEST NO. CF02	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
238	CELL 4/5 HAUL ROAD	6" / L-2	PORST	10.5	128.7	10.2	142.7	129.5	100.6	P	—	—	—	—
239	CELL 4/5 HAUL ROAD	6" / L-2	PORST	10.5	128.7	10.3	140.1	127.0	98.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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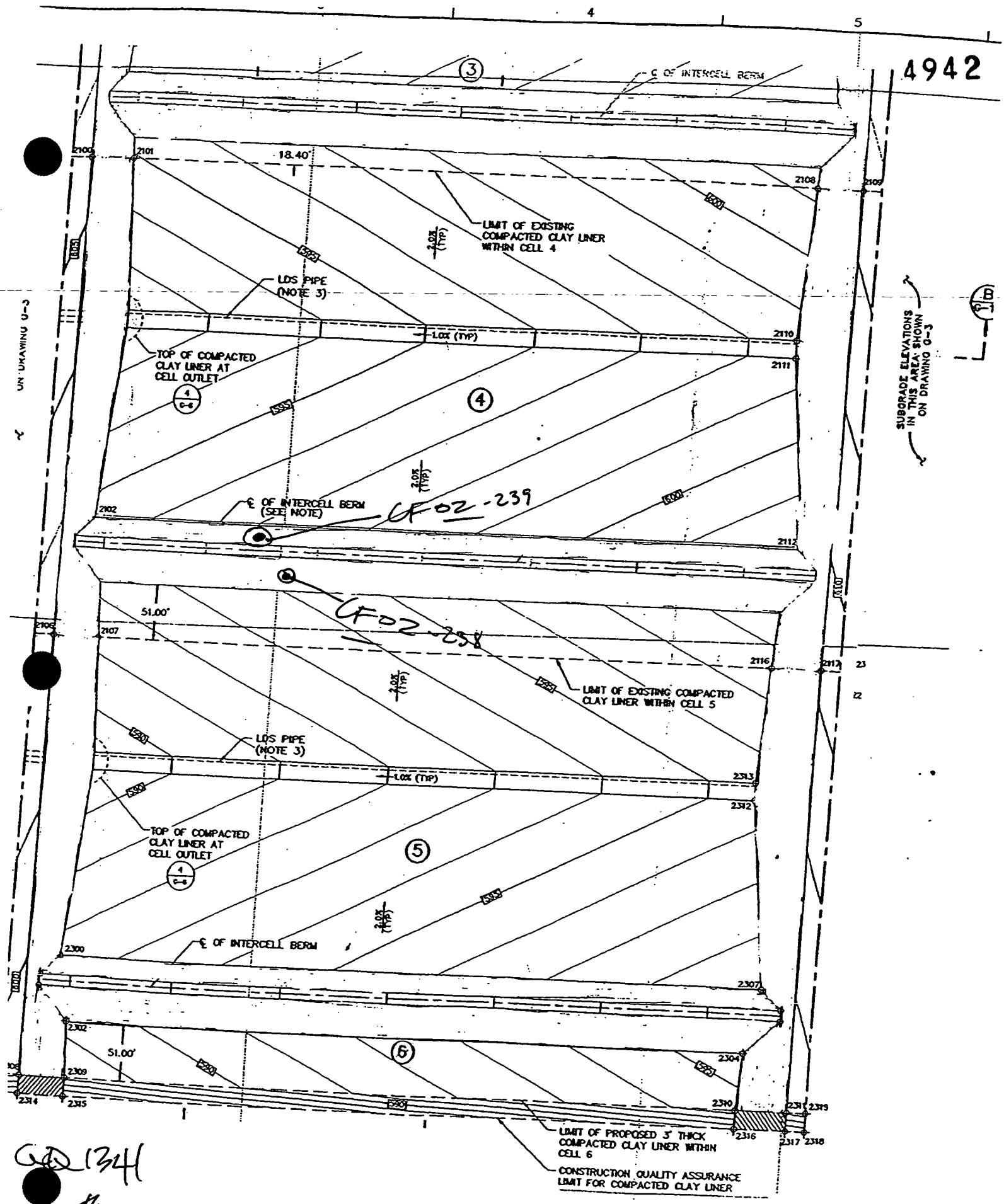

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9th November 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 and #5

PROJECT NO.: 6Q1341 TASK NO.: 0441

DATE: 12 day November month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 10"

MATERIAL SOURCE: Excavated Borrow Material MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-240	Haul Road on IC Berm of Cell #4 and Cell #5	10" / L-2	CF02-10	9.9	130.9	11.4 —	144.2	129.5	~~130.9~~ 98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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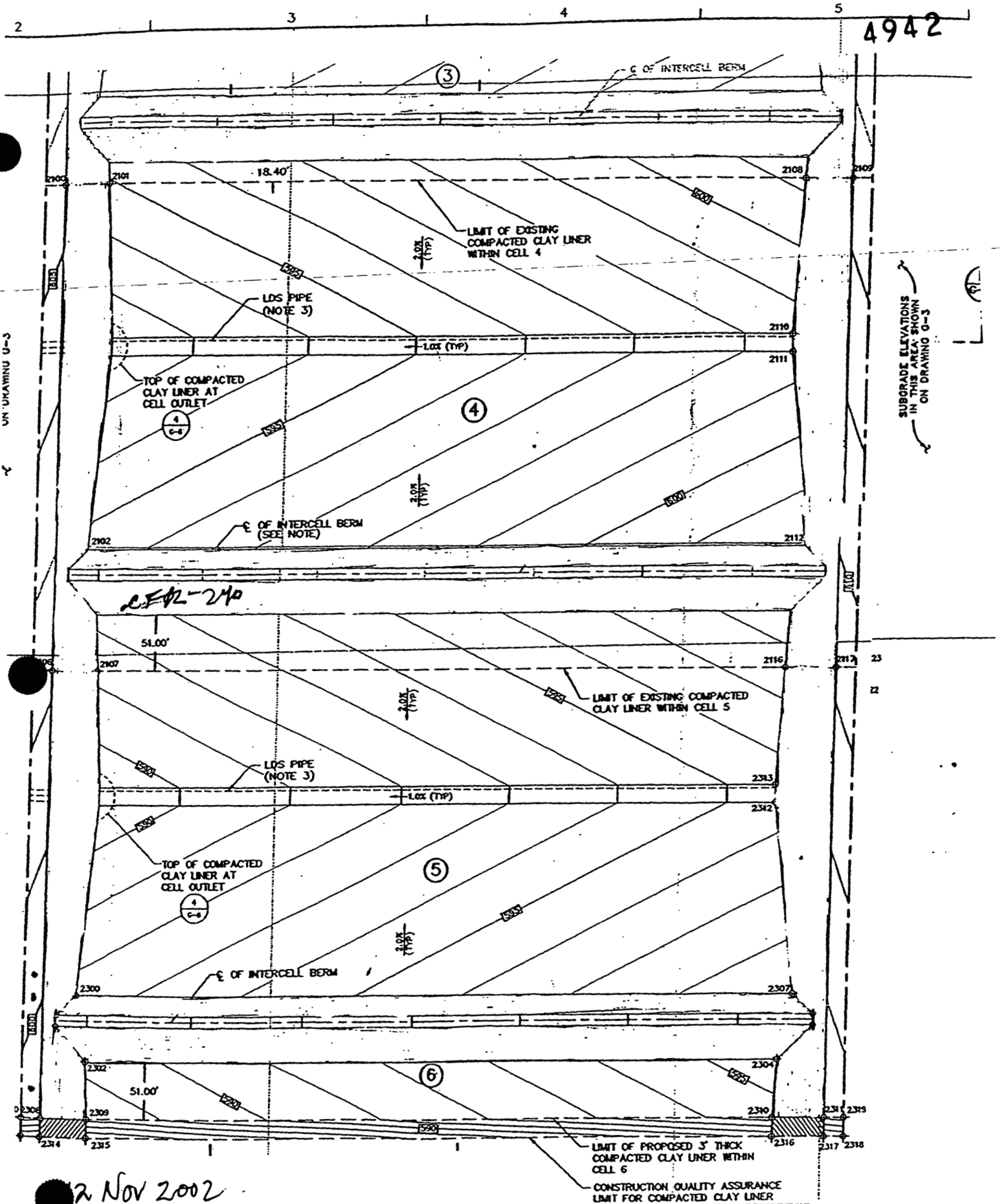

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Sheet No. 2 of 2

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV, CELLS 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 13 day (WEDNESDAY) NOV month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS ((LOOSE)/COMPACTED): 10"

MATERIAL SOURCE: BORROW AREA GRAY TILL MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBC)

	TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
1	CF02-241	CELL 4/5 I.C. BERM IMP	10"/L-3	CF02-10	9.9	130.9	9.5	144.9	132.3	101.1	P	—	—	—	—
2	CF02-242	HAUL ROAD	10"/L-3	CF02-10	9.9	130.9	10.3	143.4	130.0	99.3	P	—	—	—	—
3	CF02-243	" "	10"/L-4	CF02-10	9.9	130.9	8.9	146.3	134.4	102.6	P	—	—	—	—
4	CF02-244	" "	10"/L-4	CF02-10	9.9	130.9	9.5	145.1	132.5	101.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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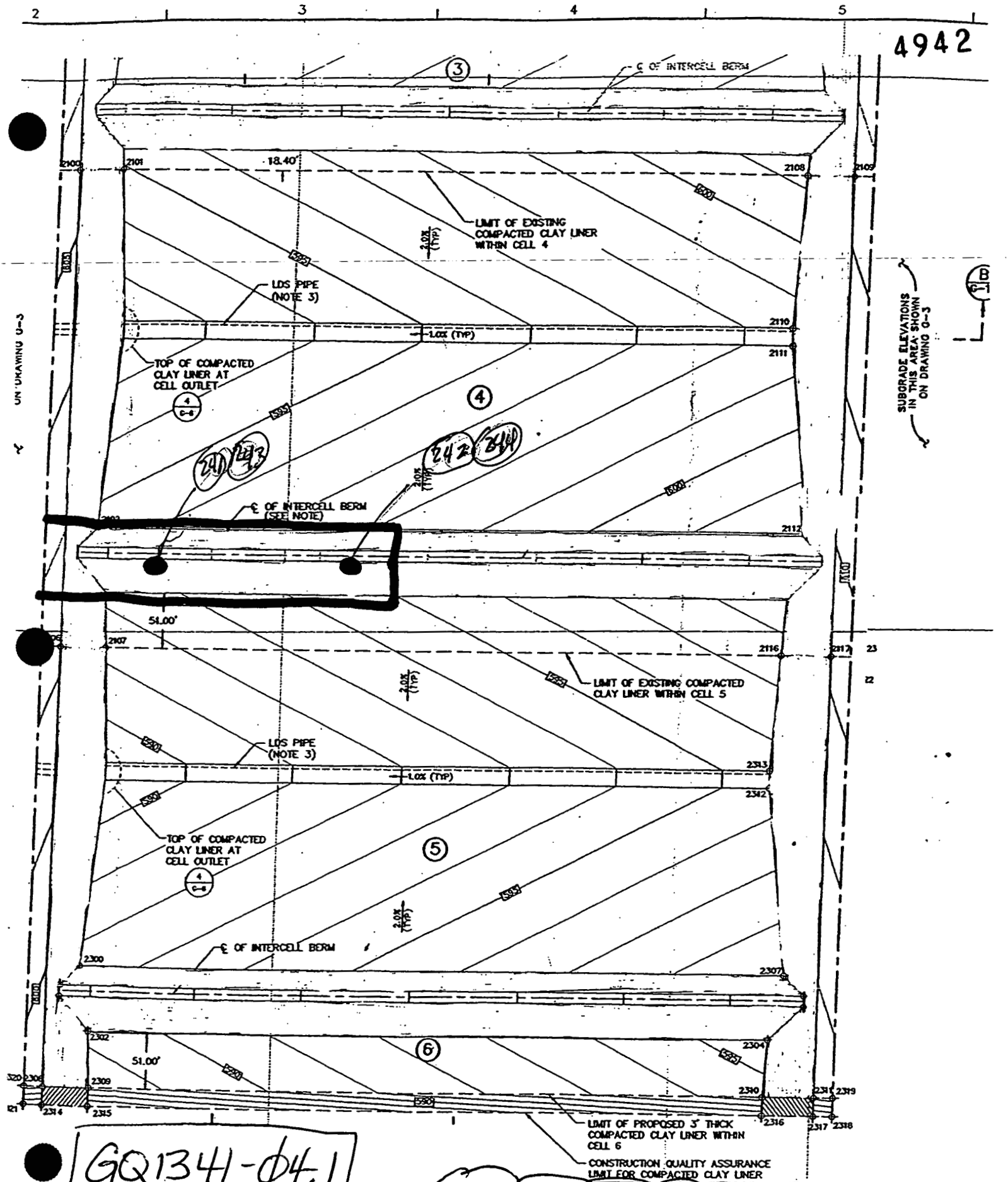

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COMPACTED FILL FOR IMP HAUL ROAD

13 NOV 2002

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SHEET No. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & Cell #5

PROJECT NO.: GR1341 TASK NO.: 04.1

DATE: 8 day November month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = N/A

QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-245	Cell #5 West Anchor Trench	6" / L-2	Ø2-2	13.4	119.9	12.4	128.9	114.8	95.7	P	—	—	—	—
CF02-246	Cell #6 West Anchor Trench	6" / L-3	Ø2-2	13.4	119.9	13.7	134.1	117.9	98.3	P	—	—	—	—
CF02-247	Cell #5 West Anchor Trench	6" / L-4	Ø2-2	13.4	119.9	12.8	137.4	121.8	101.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 2

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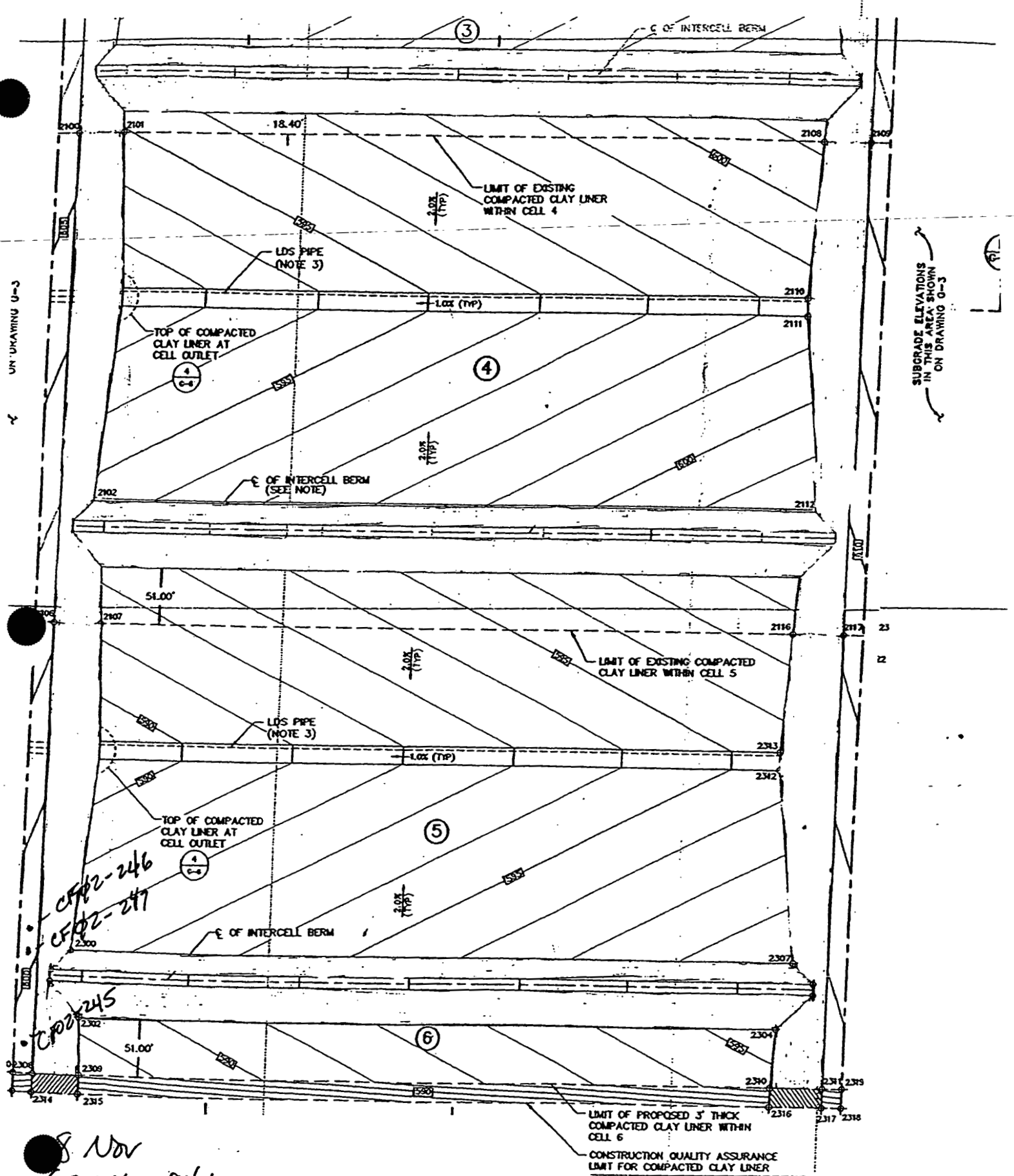

CF02-246
CF02-247
CF02-245

8 Nov
3Q1341 D4.1
Sheet No. 2 of 2

000402

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: OSDF DIKES IV

PROJECT NO.: 6913H TASK NO.: 04-1

DATE: 20th day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: 304 STOCKPILE

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 (DOT.)

NUCLEAR GAUGE TYPE: TROXLER

GAUGE SERIAL NO. 28979

CORRECTION FACTOR Y = N/A

QA ID: DM

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-248	CELL 5 WEST RD.	4 / 1	TEST STRIP	6.0	147.7	6.3	—	146.4	137.7	93.2	—	F	—	P
CF02-249	CELL 5 WEST RD	4 / 1	STRIP	6.0	147.7	6.6	—	154.2	144.7	98.0	P	—	248	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 2

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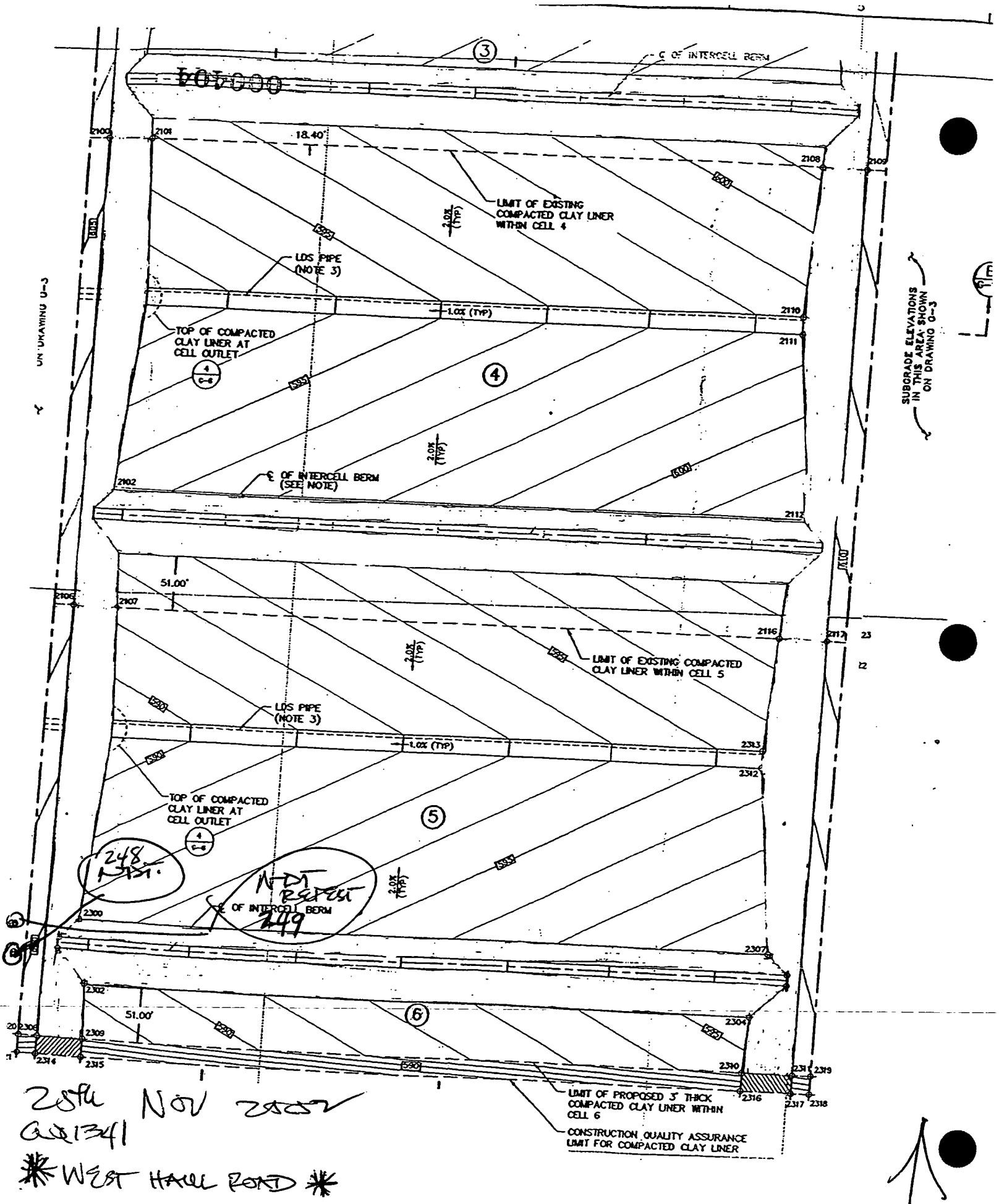

25th NOV 2002

GQ1341

* WEST HAUL ROAD *

4942

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: CQ341 TASK NO.: Ø4.1

DATE: 26 day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 12" / 8"

MATERIAL SOURCE: Sed. Basin Spoils MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
A	CF02-~~30~~	Cell 5/6 haul road East	10"/L-3	CF02-11	~~14.5~~ ~~11.4~~	~~124.8~~ ~~117.4~~	14.7	130.7	114.0	97.1	P	—	—	—	—
B	CF02-~~29~~	Cell 5/6 haul road West	10"/L-3	CF02-12	16.2	110.7	15.0	122.0	106.1	95.8	P	—	—	—	—
			/												
			/												
			/												
			/												
			/												
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			/												
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000405

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature]

SHEET NO. 1 OF 2

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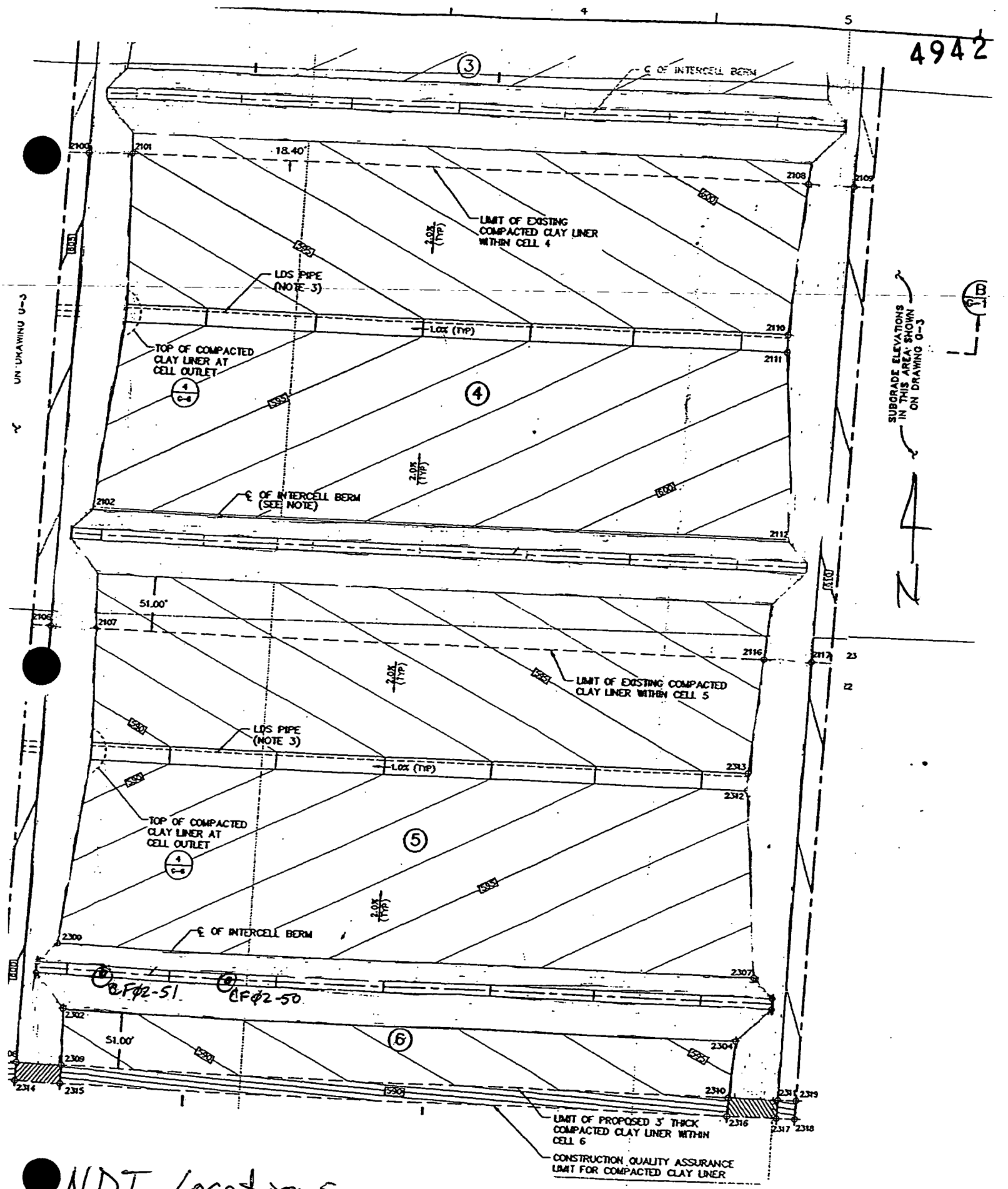

NDT Locations
Cell 5/6 Haul Road
26 Nov 2002

000406

NTS · 7 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV

PROJECT NO. 01341 TASK NO.: 04

DATE: 27th day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 12" 8"

MATERIAL SOURCE: SED. BASIN SPOILS MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-252	CELL 5/6 EAST HAUL RD.	10" / L4	CF02-13	12.5	122.5	13.4	139.4	122.9	100.3	P	—	—	—	—
CF02-253	CELL 5/6 EAST HAUL RD	10" / L5	CF02-13	12.5	122.5	14.8	138.4	120.5	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 1

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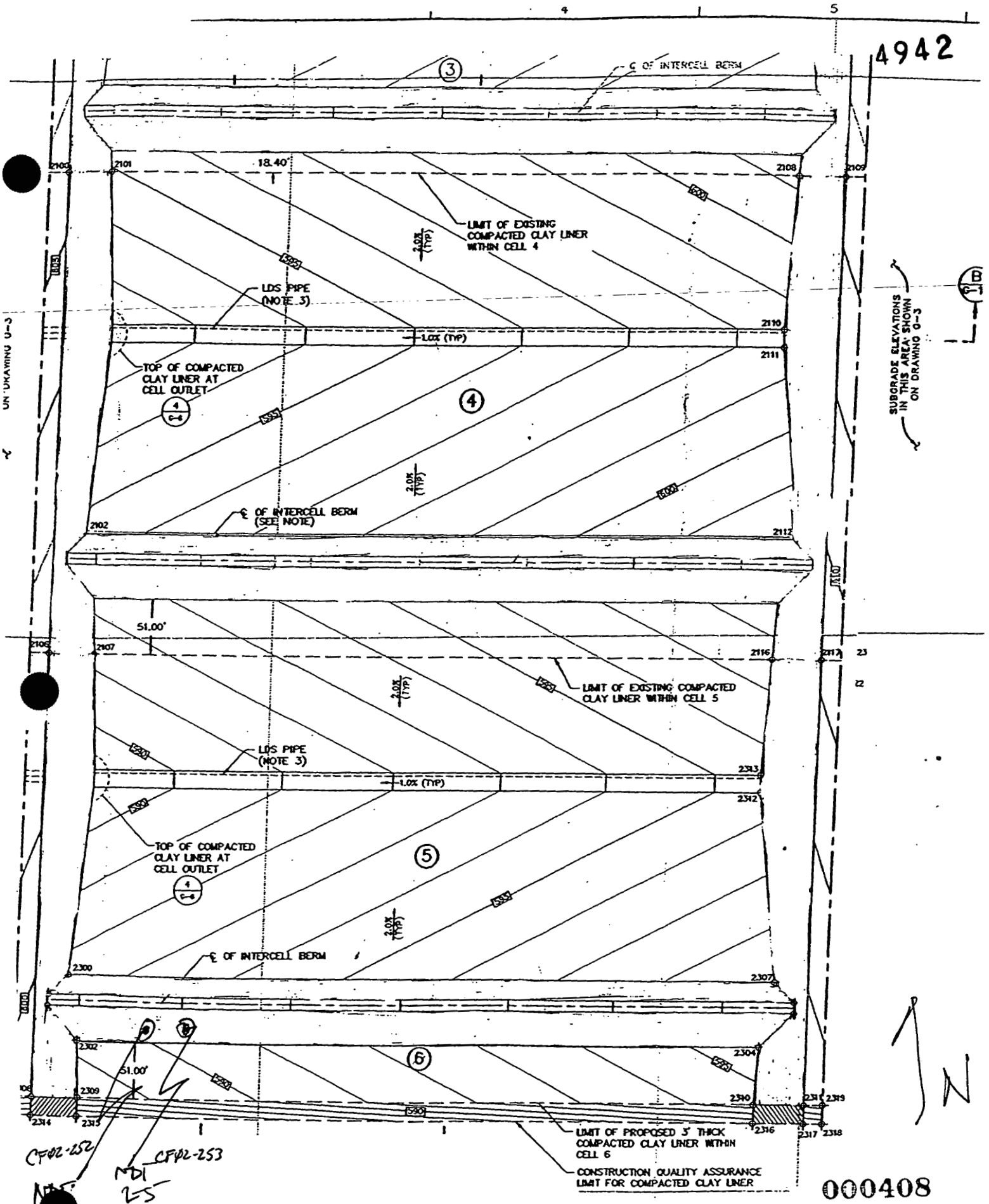

CF02-252

CF02-253

MDI 25

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GQ134H 04-1

SHEET No 2 of 2

NOV. 27th 2002

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. 60134 TASK NO.: Q4-1

DESCRIPTION: PHASE IV

DATE: 2ND day DEC month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: Borrow Area MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: DMO

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CF02-254	Cell 5/6 HAUL ROAD	10" / L-6	CF02-12	16.2	110.7	17.1	129.4	110.6	99.8	P	—	—	—	—
CF02-255	Cell 5/6 HAUL ROAD	10" / L-6	CF02-12	16.2	110.7	16.3	125.2	107.6	97.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

BOTH TEST WERE TAKEN FROM THE SAME SPOT DUE TO THE NATURE OF THE MATERIAL

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CJ SHEET NO. 1 OF 1

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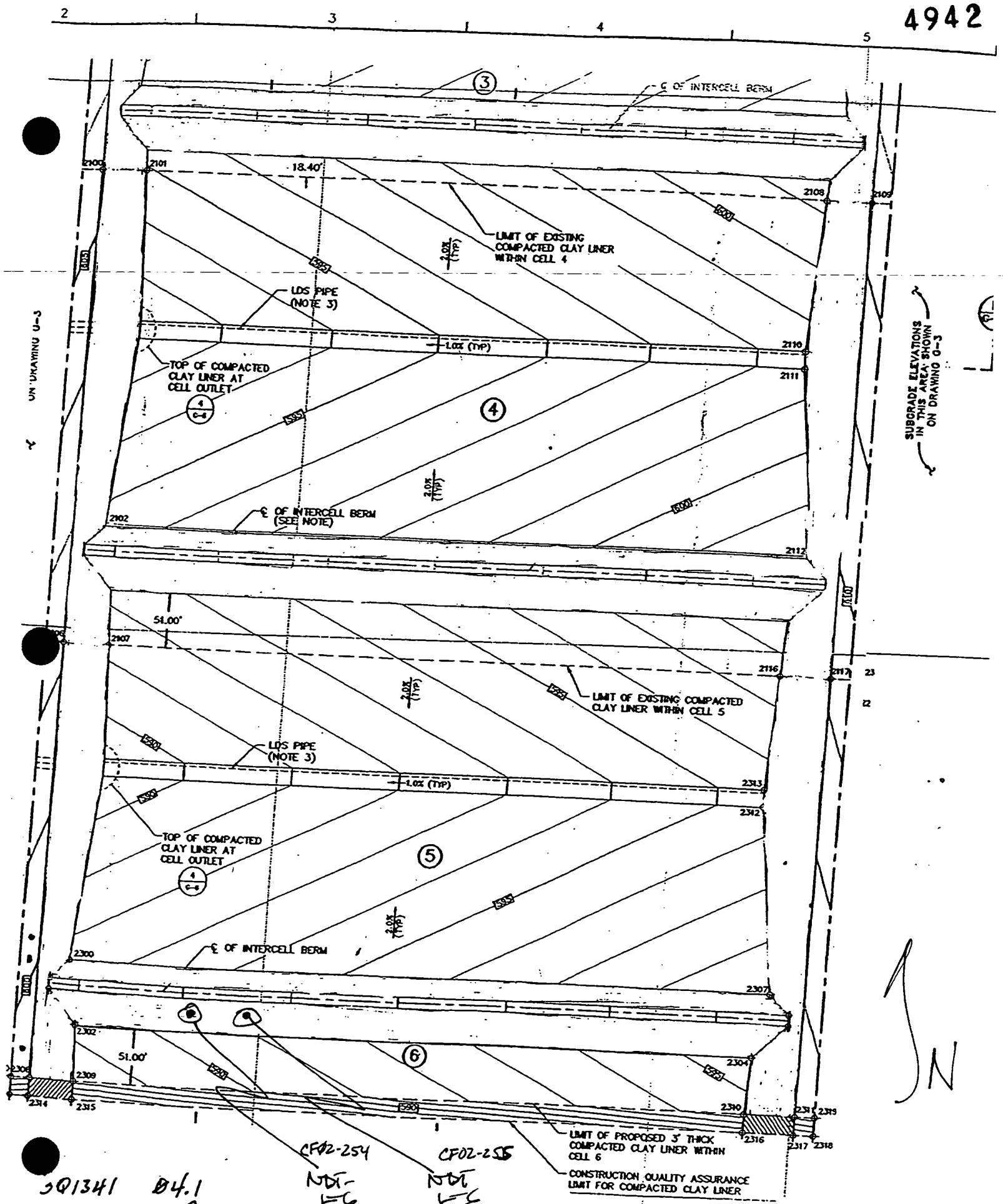

3Q1341 B4.1

Sheet No. 2 of 2

000410

2ND DEC. 2002

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV

DATE: 3 day Dec month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 12"

MATERIAL SOURCE: Stockpile 02-6 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
A	CF02-256	Cell 5/6 access rd. Spur	L-2/10"	Stockpile 02-6	11.4	124.8	9.7	139.8	127.5	102.2	P	—	—	—	—
B	CF02-257	Cell 5/6 access rd. Spur	L-3/10"	Stockpile 02-6	11.4	124.8	11.1	136.6	122.9	98.5	P	—	—	—	—

000411

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 1 OF 2

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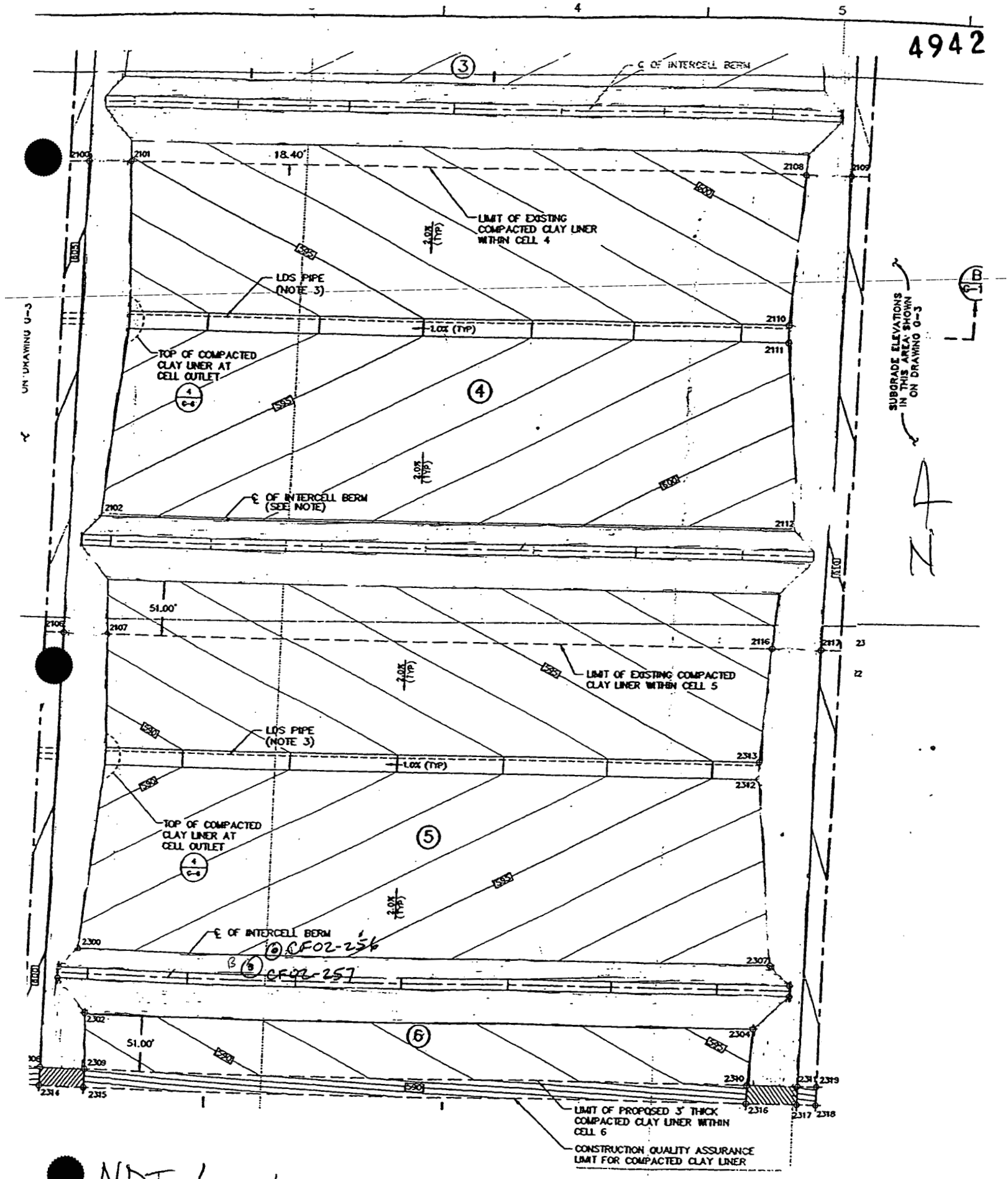

NDT Locations
Cell 516 Haul Road
3 Dec 2002

000412

NTS. 7 of 7.

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: Ø4.1

DESCRIPTION: PHASE IV

DATE: Ø6 day (MONDAY) JAN month 2ØØ3 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE / (COMPACTED)) 6"

MATERIAL SOURCE: ON SITE BORROW AREAS MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = NA QA ID: TAY

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CFØ2-258	BACKFILL OVER	6"/L-1	CFØ2-9	12.6	123.3	11.7	135.9	121.7	98.7	P	—	—	—	—
CFØ2-259	HORIZONTAL	6"/L-1	CFØ2-9	12.6	123.3	13.3	136.8	12Ø.7	97.9	P	—	—	—	—
CFØ2-26Ø	MONITORING	6"/L-2	CFØ2-9	12.6	123.3	12.4	134.5	119.7	97.1	P	—	—	—	—
CFØ2-261	WELL @ V.H #6	6"/L-2	CFØ2-9	12.6	123.3	11.6	136.4	122.2	99.1	P	—	—	—	—
							TBC							

000413

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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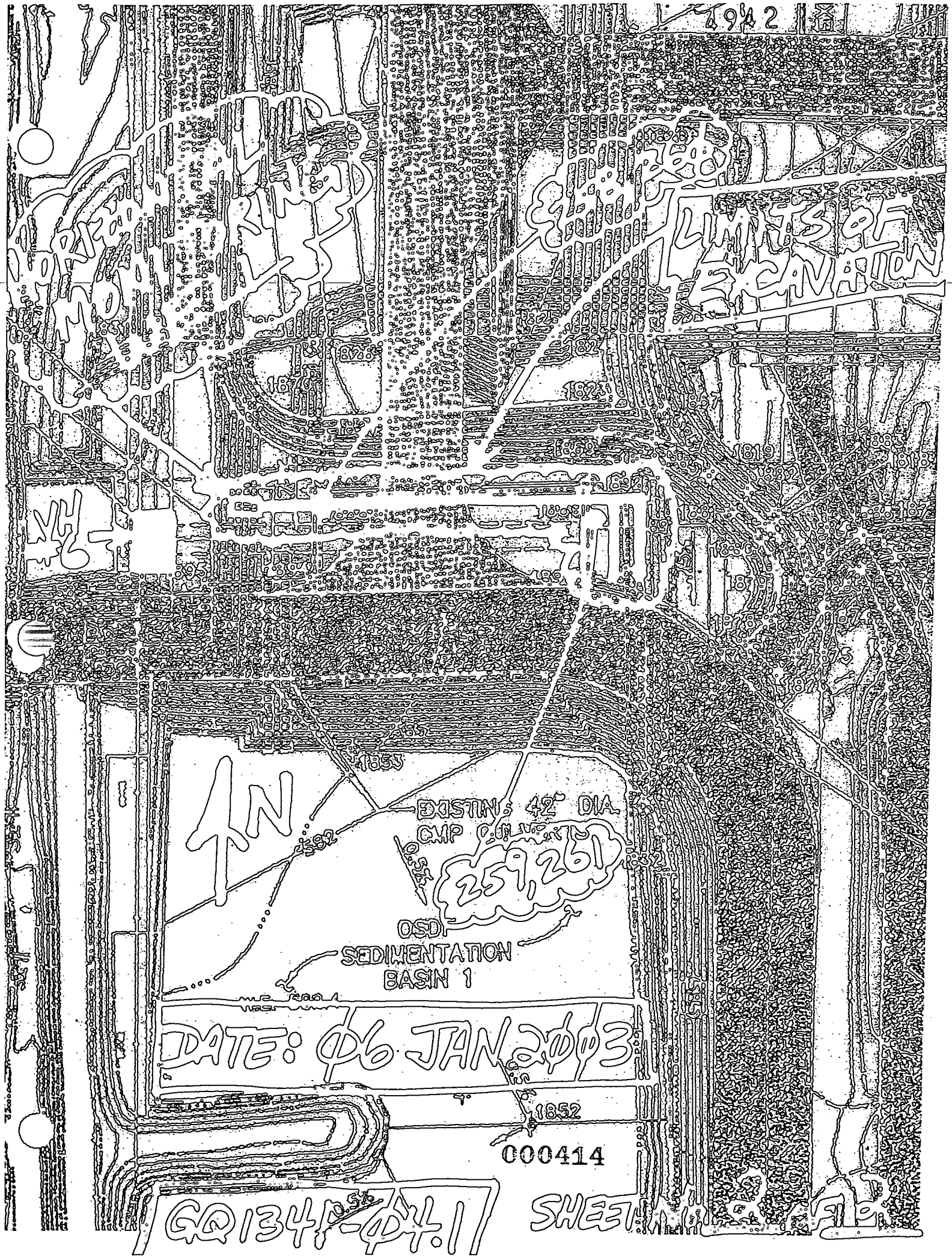
LIMITS OF EXCAVATION
BASIN: 42" DIA
CMP
259,261
OSD
SEDIMENTATION
BASIN 1
DATE: 06 JAN 2003
1852
000414
GQ134-04.1
SHEET

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV

PROJECT NO.: GQ134 TASK NO.: 041

DATE: 07 day JAN month 2003 year TUESDAY

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: ON SITE BORROW AREAS MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID TBD

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-262	BACKFILL OVER	8"/L-3	CF02-9	12.6	123.3	12.1	133.4	119.0	96.5	P	—	—	—	—
CF02-263	THE HORIZONTAL	8"/L-3	CF02-9	12.6	123.3	12.4	133.7	119.0	96.5	P	—	—	—	—
CF02-264	MONITORING WELL	8"/L-4	CF02-10	9.9	130.9	10.4	140.6	127.4	97.3	P	—	—	—	—
CF02-265	@ VH #6	8"/L-4	CF02-10	9.9	130.9	10.4	139.7	126.5	96.6	P	—	—	—	—
						TBC								

000445

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CJ SHEET NO. 1 OF 2

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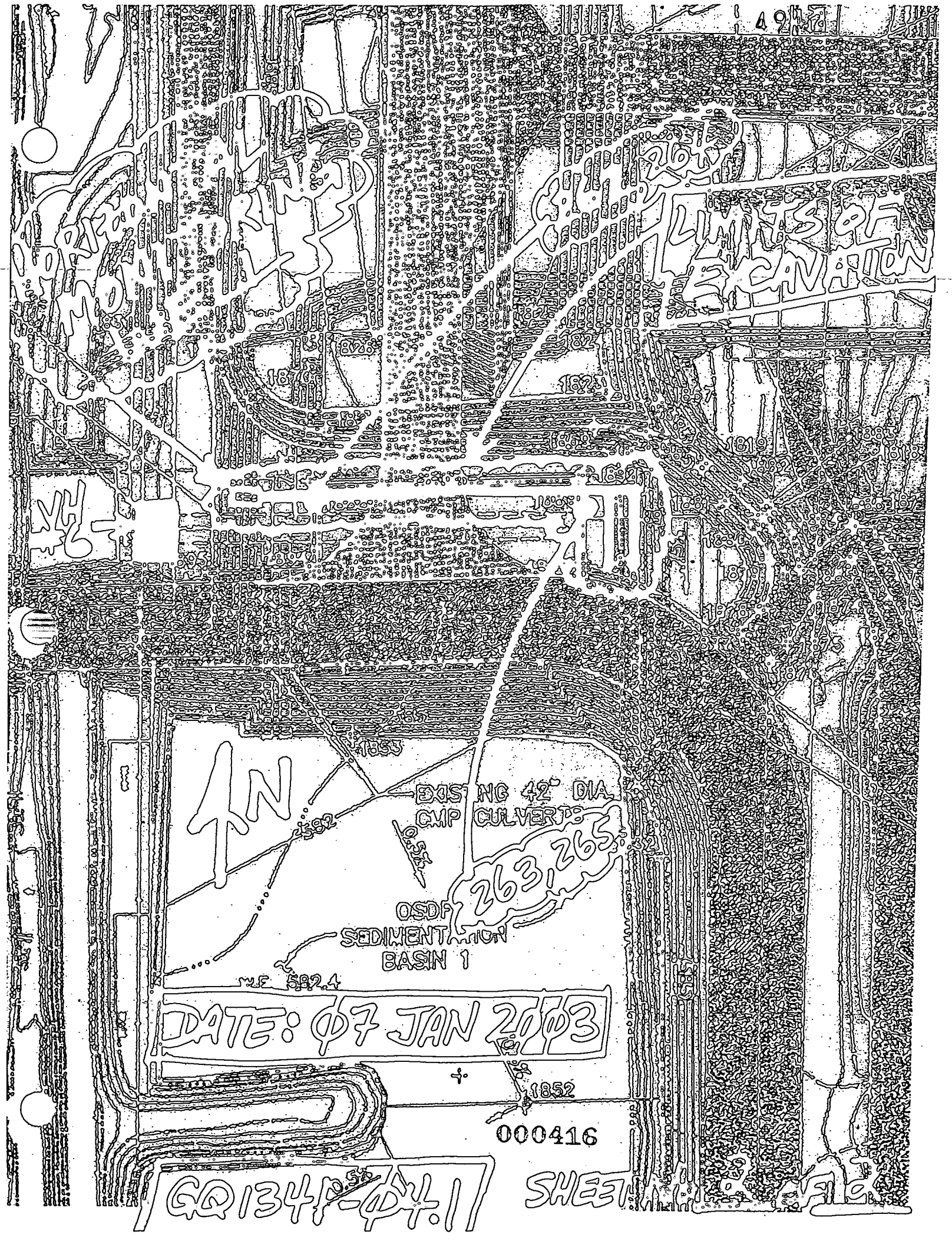
LIMITS OF EXCAVATION
EXISTING 42" DIA. CMP CULVERT
OSDF SEDIMENTATION BASIN 1
263,265
N
DATE: 07 JAN 2003
000416
GQ1341-04.1
SHEET

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV

PROJECT NO.: GR134 TASK NO.: 04.1

DATE: 08 day JAN month 2003 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: ON SITE BORROW

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID:

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-266	BACKFILL OVER	8" / L-5	CF02-10	9.9	130.9	10.3	142.1	128.9	98.5	P	—	—	—	—
CF02-267	THE HORIZONTAL	8" / L-5	CF02-10	9.9	130.9	10.5	140.9	127.5	97.4	P	—	—	—	—
CF02-268	MONITORING WELL	8" / L-6	CF02-10	9.9	130.9	10.2	142.2	129.1	98.6	P	—	—	—	—
CF02-269	@ V.H. #6	8" / L-6	CF02-10	9.9	130.9	10.5	138.3	125.2	95.6	P	—	—	—	—
CF02-270	↓ ↓	8" / L-7	CF02-10	9.9	130.9	10.0	141.8	128.9	98.5	P	—	—	—	—
CF02-271		8" / L-7	CF02-10	9.9	130.9	10.7	139.1	125.7	96.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000417

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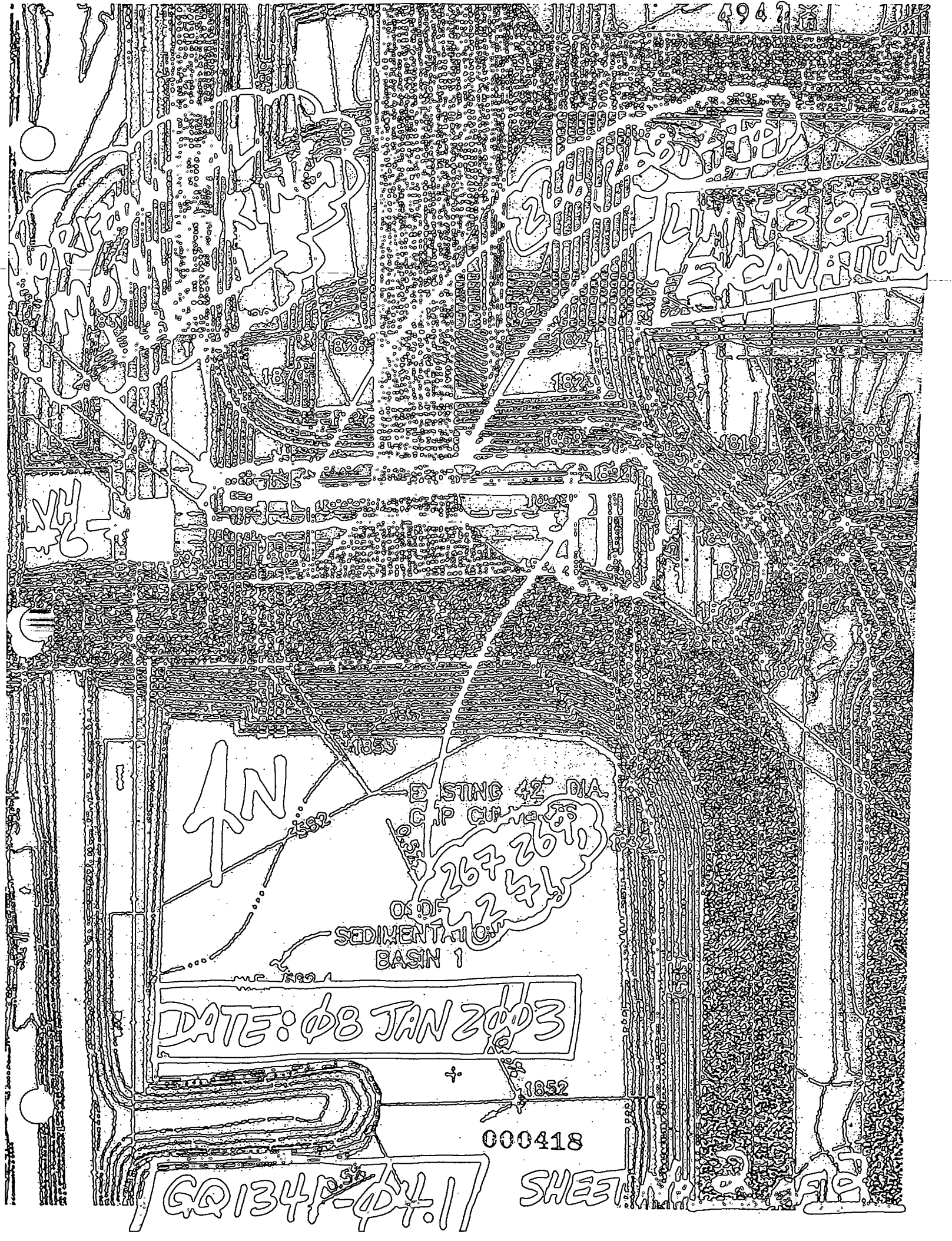
LIMITS OF EXCAVATION
EXISTING 42" DIA
CMP CULVERT
SEDIMENTATION
BASIN 1
DATE: 08 JAN 2003
000418
GQ134P-04.11
SHEET

GEOSYNTEC CONSULTANTS

FLUOR FERNALD, INC.

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: PHASE IV

DATE: 09 day JAN month 2003 year (THURSDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"

MATERIAL SOURCE: ON SITE BORROW MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TSM)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-272	BACKFILL OVER	8" / L-8	CF02-10	9.9	130.9	11.7 —	139.5	125.0	95.5	P	—	—	—	—
CF02-273	THE HORIZONTAL	8" / L-8	CF02-10	9.9	130.9	10.5 —	142.0	128.5	98.1	P	—	—	—	—
	MONITORING WELL	/												
	@ V.H. #6	/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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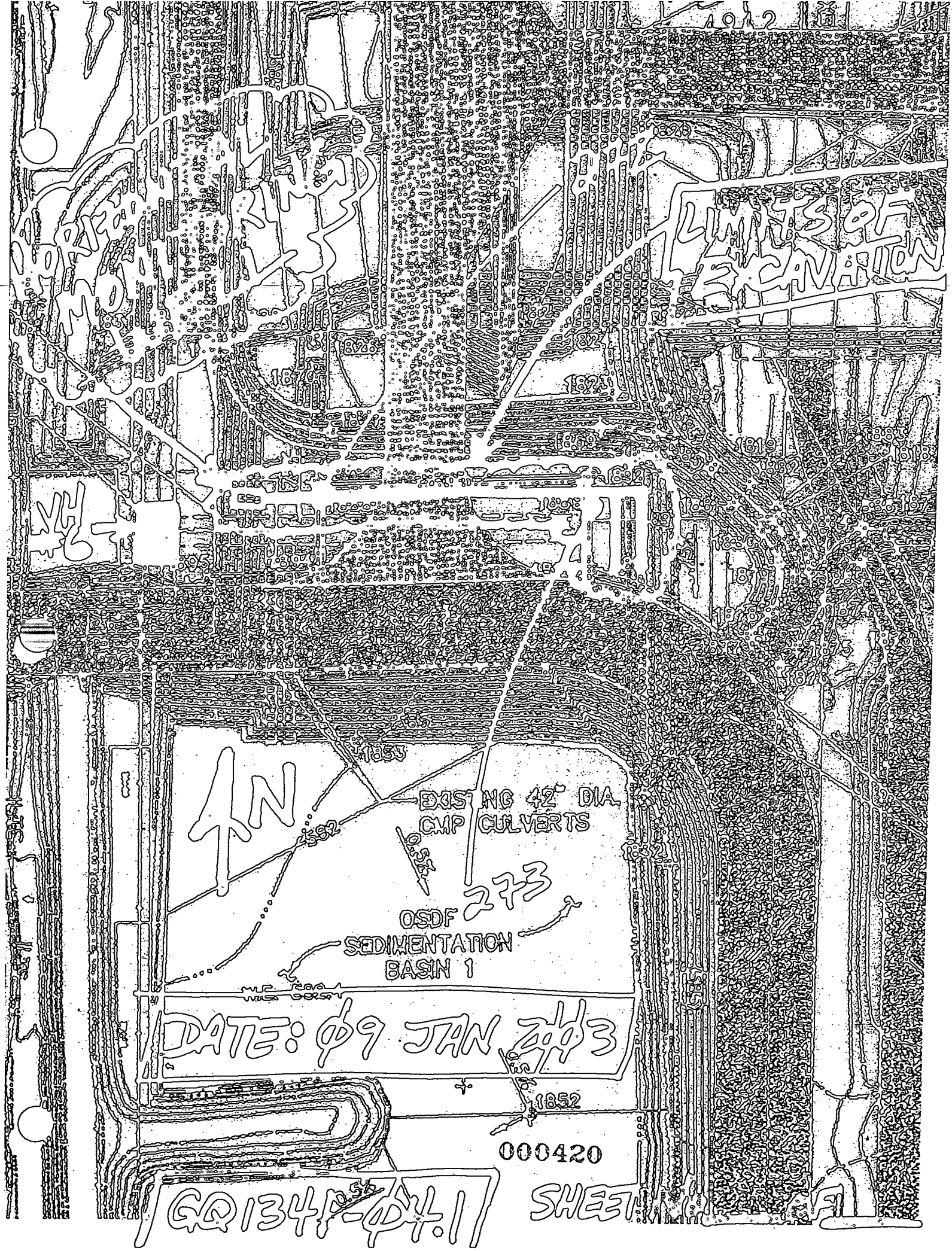
©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 1 OF 2


LIMITS OF EXCAVATION
EXISTING 42" DIA CMP CULVERTS
OSDF SEDIMENTATION BASIN 1
DATE: 09 JAN 2003
000420
GQ1341-04.1
SHEET

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: PHASE IV

DATE: 12 day MAR month 2003 year
WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/(COMPACTED)): 8"

MATERIAL SOURCE: ON SITE C.FILL STOCKPILE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = NA QA ID: (TBK)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CF02-274	AREA JUST EAST OF	8"/L-6	CF02-9	12.6	123.3	12.9	134.2	118.9	96.4	P	—	—	—	—
CF02-275	VH #6	8"/L-7	CF02-9	12.6	123.3	13.3	135.5	119.6	97.0	P	—	—	—	—
CF02-276	↓ ↓ ↓	8"/L-8	CF02-9	12.6	123.3	14.0	136.9	120.1	97.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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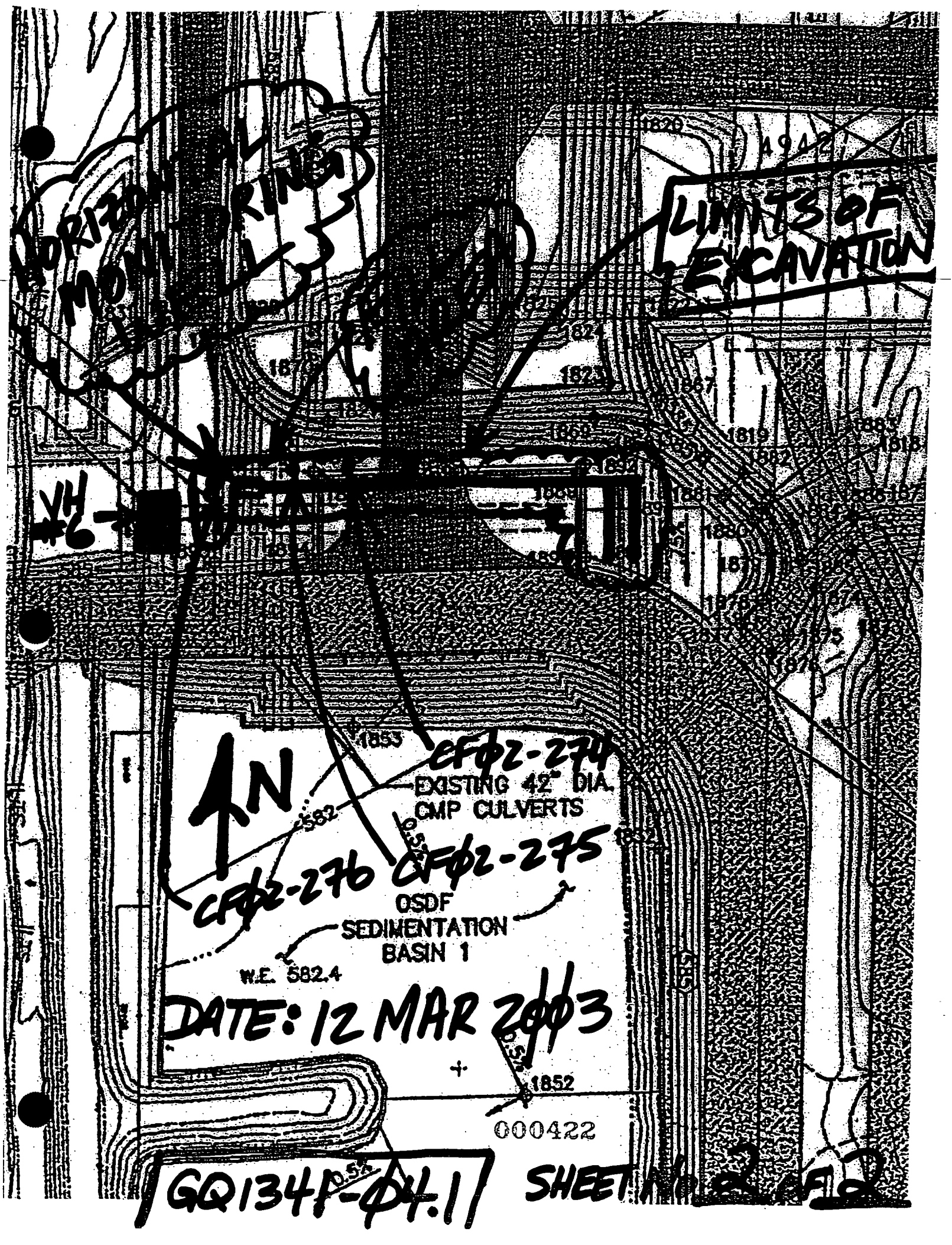
0004421

4942


HORIZONTAL MONITORING
LIMITS OF EXCAVATION
VH #6
1N
CF02-274
EXISTING 42" DIA.
CMP CULVERTS
CF02-276
CF02-275
OSDF
SEDIMENTATION
BASIN 1
W.E. 582.4
DATE: 12 MAR 2003
000422
GQ1341-04.1
SHEET

Compacted Fill Drive Cylinder
Test Results

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4942 942

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 1 day May month 2002 year

TEST NO.: #35 CFDT-01

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ± 3%

FDT LOCATION: West Berm Cell 5 FDT TEST NO.: 35

FIELD TEST DATA – ASTM D 2937 QA ID: CA

A	CYLINDER NO. 02-002 VOLUME[1]	(cf)	0.03544	E	WET UNIT WEIGHT = D/A	(lbs) 139.4
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	6.01	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 125.4
C	WEIGHT OF CYLINDER	(lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.66			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CA

O	WT. OF TARE NO. 63	(grams)	8.2	R	WT. OF WATER = P–Q	(grams) 44.7
P	WT. OF WET SOIL & TARE	(grams)	~~465.5~~ 456.5	S	WT. OF DRY SOIL = Q–O	(grams) 403.6
Q	WT. OF DRY SOIL & TARE	(grams)	411.8	T	MOISTURE CONTENT = (R/S)X100	(%) 11.1

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 128.7 (pcf) OPTIMUM MOISTURE CONTENT 10.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CA

DELTA MOISTURE CONTENT = T – U		2.2	U	FDT MOISTURE CONTENT	(%) 8.9
FDT WET UNIT WT.	(pcf)	139.5	V	FDT DRY UNIT WT.	(pcf) 128.1
DELTA DRY UNIT WT. = F – V		~~2.2~~ 2.7		FDT #	

COMMENTS:

000424

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4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO. 04.1

DESCRIPTION: Phase IV DATE: 24 day MAY month 2002 year

TEST NO.: # 98 CFDT-02

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West berm Cell 4 FDT TEST NO.: FDT # 92

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 02-007 VOLUME[1] (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	141.7
B	WEIGHT OF SAMPLE & CYLINDER 2762.2 (lbs)	6.09	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	124.3
C	WEIGHT OF CYLINDER 611.2gm (lbs)	~~611.2~~ 1.35	G	D/E	
D	WEIGHT OF WET SAMPLE = B-C 2150.06 (lbs)	4.74			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #103 (grams)	8.3	R	WT. OF WATER = P-Q (grams)	59.8
P	WT. OF WET SOIL & TARE (grams)	495.8	S	WT. OF DRY SOIL = Q-O (grams)	427.7
Q	WT. OF DRY SOIL & TARE (grams)	436.0	T	MOISTURE CONTENT = (R/S)X100 (%)	14.0 1.140

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 128.7 (pcf) OPTIMUM MOISTURE CONTENT 10.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	3.5	U	FDT MOISTURE CONTENT (%)	10.9
FDT WET UNIT WT. (pcf)	140.4	V	FDT DRY UNIT WT. (pcf)	126.5
DELTA DRY UNIT WT. = F – V	-2.2		FDT #	

COMMENTS: -2.2 ?

000425

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FLUOR FERNALD 4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 24 day May month 2002 year

TEST NO.: #95 CFDT-03

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ± 3%

FDT LOCATION: West berm Cell 5 FDT TEST NO.: FDT #97

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 02.004 VOLUME[1] (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	137.6
B	WEIGHT OF SAMPLE & CYLINDER 2693.5 gm (lbs)	5.94	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.87 KS
C	WEIGHT OF CYLINDER 609.1 gm (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.60			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #91 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	56.5
P	WT. OF WET SOIL & TARE (grams)	500.5	S	WT. OF DRY SOIL = Q–O (grams)	435.8
Q	WT. OF DRY SOIL & TARE (grams)	444.0	T	MOISTURE CONTENT = (R/S)X100 (%)	13.0 ~~18.0~~ 1.13

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 128.7 (pcf) OPTIMUM MOISTURE CONTENT 10.5 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	-0.7	U	FDT MOISTURE CONTENT (%)	13.7	
FDT WET UNIT WT. (pcf)	140.9	V	FDT DRY UNIT WT. (pcf)	~~126.7~~ 123.5	
DELTA DRY UNIT WT. = F – V	-5.0		FDT # #95		

COMMENTS:

000426

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FLUOR FERNALD 4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 31 day MAY month 2002 year

TEST NO.: #3 CFDT-04

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West berm cell 6 FDT TEST NO.: FDT # 111

FIELD TEST DATA – ASTM D 2937 QA ID:

A	CYLINDER NO. 02.006 VOLUME[1] (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	140.55
B	WEIGHT OF SAMPLE & CYLINDER 2735.9 gm (lbs)	6.03	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	124.0
C	WEIGHT OF CYLINDER 605.4 gm (lbs)	1.33	G		
D	WEIGHT OF WET SAMPLE = B–C 2130.5 gm (lbs)	4.70			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID:

O	WT. OF TARE NO. #65 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	53.3
P	WT. OF WET SOIL & TARE (grams)	460.9	S	WT. OF DRY SOIL = Q–O (grams)	399.4
Q	WT. OF DRY SOIL & TARE (grams)	407.6	T	MOISTURE CONTENT = (R/S)X100 (%)	13.34

6.1334

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 126.5 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	2.34	U	FDT MOISTURE CONTENT (%)	11.0
FDT WET UNIT WT. (pcf)	134.5	V	FDT DRY UNIT WT. (pcf)	121.2
DELTA DRY UNIT WT. = F – V	2.8		FDT # #3	

COMMENTS:

000427

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FLUOR FERNALD 4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 03 day June month 2002 year

TEST NO.: ~~No 4~~ CFDT-05

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: East berm Cell 5 FDT TEST NO.: FDT #114

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 02-005 VOLUME[1] (cf)	0.03338	E	WET UNIT WEIGHT = D/A (lbs)	141.1
B	WEIGHT OF SAMPLE & CYLINDER 2757.6 (lbs)	6.07	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	125.1
C	WEIGHT OF CYLINDER 616.4 gm (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C 2136.5 gm (lbs)	4.71			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. #103 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	51.5
P	WT. OF WET SOIL & TARE (grams)	462.1	S	WT. OF DRY SOIL = Q–O (grams)	402.3
Q	WT. OF DRY SOIL & TARE (grams)	410.6	T	MOISTURE CONTENT = (R/S)X100 (%)	12.8 1.121

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 126.5 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	2.9	U	FDT MOISTURE CONTENT (%)	9.9
FDT WET UNIT WT. (pcf)	135.8	V	FDT DRY UNIT WT. (pcf)	123.6
DELTA DRY UNIT WT. = F – V	1.5		FDT #	

COMMENTS:

000428

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4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 7 day August month 2002 year

TEST NO.: DC 02-32 CFDT-06

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Haul Road West 4:1 Cell #5 FDT TEST NO.: CF 158

FIELD TEST DATA – ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 02-006 VOLUME[1] (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	130.4
B	WEIGHT OF SAMPLE & CYLINDER 5.69 (lbs)	2579.0	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	115.3
C	WEIGHT OF CYLINDER 605.4 (lbs)	1.33	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.36			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. 103 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	46.2
P	WT. OF WET SOIL & TARE (grams)	406.2	S	WT. OF DRY SOIL = Q–O (grams)	351.7
Q	WT. OF DRY SOIL & TARE (grams)	360.0	T	MOISTURE CONTENT = (R/S)X100 (%)	13.1

1,131

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. ~~123.3~~ ~~126.5~~ 123.3 (pcf) OPTIMUM MOISTURE CONTENT ~~12.6~~ ~~11.7~~ 12.6 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U	1.4	U	FDT MOISTURE CONTENT (%)	11.7
FDT WET UNIT WT. (pcf)	131.4	V	FDT DRY UNIT WT. (pcf)	117.6
DELTA DRY UNIT WT. = F – V	-2.3		FDT #	

COMMENTS:

000429

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FLUOR FERNALD

4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 601341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 7 day August month 2002 year

TEST NO.: CFDT-08

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: ± 3%

FDT LOCATION: Haul Road West 4:1 Cell #4 FDT TEST NO.: CF1589

FIELD TEST DATA – ASTM D 2937 QA ID: CHW

A	CYLINDER NO. 02-004 VOLUME(1) (cf)	0.03344	E	WET UNIT WEIGHT = D/A (lbs)	136.7
B	WEIGHT OF SAMPLE & CYLINDER 2680.3 (lbs)	5.91	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.1
C	WEIGHT OF CYLINDER 609.1 (lbs)	1.34	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.57			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CHW

O	WT. OF TARE NO. 99 (grams)	8.4	R	WT. OF WATER = P–Q (grams)	52.5
P	WT. OF WET SOIL & TARE (grams)	415.0	S	WT. OF DRY SOIL = Q–O (grams)	354.1
Q	WT. OF DRY SOIL & TARE (grams)	362.5	T	MOISTURE CONTENT = (R/S)X100 (%)	14.8

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 123.3 (pcf) OPTIMUM MOISTURE CONTENT 12.6 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CHW

DELTA MOISTURE CONTENT = T – U	2.4	U	FDT MOISTURE CONTENT (%)	12.8
FDT WET UNIT WT. (pcf)	137.0	V	FDT DRY UNIT WT. (pcf)	121.5
DELTA DRY UNIT WT. = F – V	2.4		FDT # CF159	

COMMENTS:

000430

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4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 681341 TASK NO.: 4.1

DESCRIPTION: PHASE IV CELL 4+5 DATE: 7 day SEPT month 02 year

TEST NO.: FDT CE02-168 CFDT-09

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: 0-3% OPTIMUM

FDT LOCATION: CELL 5 E. SIDE ANCHOR TRENCH FDT TEST NO.: FDT CE02-168

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. CP2-009 VOLUME[1]	(cf)	0.03344	E	WET UNIT WEIGHT = D/A	(lbs) 131.9
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.78	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 112.7
C	WEIGHT OF CYLINDER	(lbs)	1.37	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.41			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS/DAE

O	WT. OF TARE NO. 16	(grams)	8.3	R	WT. OF WATER = P–Q	(grams) 44.0
P	WT. OF WET SOIL & TARE	(grams)	311.5	S	WT. OF DRY SOIL = Q–O	(grams) 259.2
Q	WT. OF DRY SOIL & TARE	(grams)	267.5	T	MOISTURE CONTENT = (R/S)X100	(%) 17.0 ~~16~~ DAE 1.17

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.6 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: JW

DELTA MOISTURE CONTENT = T – U		2.2	U	FDT MOISTURE CONTENT	(%) 14.8
FDT WET UNIT WT.	(pcf)	133.6	V	FDT DRY UNIT WT.	(pcf) 116.4
DELTA DRY UNIT WT. = F – V		~~116~~ 43.7		FDT # CF02-168	

COMMENTS:

000431

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FLUOR FERNALD 4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ 1341 TASK NO.: 4.1

DESCRIPTION: PHASE IV DATE: 7 day SEPT month 02 year

TEST NO.: CF02-169 CFDT-10

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: 0-3± OPTIMUM

FDT LOCATION: CELL 5 EAST SIDE ANCHOR TRENCH FDT TEST NO.: CF02-169

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 01-3 VOLUME[1] (cf)	0.03346	E	WET UNIT WEIGHT = D/A (lbs)	133.3
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.82	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	115.8
C	WEIGHT OF CYLINDER (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: KS

O	WT. OF TARE NO. 63 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	37.8
P	WT. OF WET SOIL & TARE (grams)	296.6	S	WT. OF DRY SOIL = Q–O (grams)	250.6
Q	WT. OF DRY SOIL & TARE (grams)	258.8	T	MOISTURE CONTENT = (R/S)X100 (%)	15.1 1.151

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.6 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: JW

DELTA MOISTURE CONTENT = T – U	0.8	U	FDT MOISTURE CONTENT (%)	14.3
FDT WET UNIT WT. (pcf)	132.3	V	FDT DRY UNIT WT. (pcf)	115.7
DELTA DRY UNIT WT. = F – V	0.1		FDT #	CF02-169

COMMENTS:

000432

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q1341 TASK NO.: 04.1

DESCRIPTION: Phase II DATE: 11 day Nov month 2002 year

TEST NO.: CF 02- CFDT 11

SPECIFICATION REQUIREMENTS: Sample taken 8 Nov 2002

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: West anchor trench Cell 5 FDT TEST NO.: FDT #245

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 0205 VOLUME[1] (cf)	.003357	E	WET UNIT WEIGHT = D/A (lbs)	132.6
B	WEIGHT OF SAMPLE & CYLINDER 2630.6 (lbs)	5.80	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	117.2
C	WEIGHT OF CYLINDER 612.1gm (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.45			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01–in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DLE

O	WT. OF TARE NO. 662 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	44.5
P	WT. OF WET SOIL & TARE (grams)	393.1	S	WT. OF DRY SOIL = Q–O (grams)	340.3
Q	WT. OF DRY SOIL & TARE (grams)	348.6	T	MOISTURE CONTENT = (R/S)X100 (%)	13.1

1,131

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 13.4 (pcf) OPTIMUM MOISTURE CONTENT 119.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U	.07	U	FDT MOISTURE CONTENT (%)	12.4
FDT WET UNIT WT. (pcf)	128.9	V	FDT DRY UNIT WT. (pcf)	114.8
DELTA DRY UNIT WT. = F – V	2.4		FDT #	

COMMENTS:

000433

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD 4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GG1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 13 day Nov month 2001 year

TEST NO.: CFDT-11

SPECIFICATION REQUIREMENTS: Nov 13, 2001

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Compacted FRC

% COMPACTION: 95% MOISTURE CONTENT RANGE: ± 3%

FDT LOCATION: Cell 4/5 K. Berm Haul Road FDT TEST NO.: FDT #241

FIELD TEST DATA – ASTM D 2937 QA ID: DE

A	CYLINDER NO. 99.1 VOLUME[1] (cf) 2830.6 cm³	0.03357	E	WET UNIT WEIGHT = D/A (lbs)	148.9
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	6.24	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	133.2
C	WEIGHT OF CYLINDER 598.0 gm (lbs)	1.25	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.99			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: DE

O	WT. OF TARE NO. #30 (grams)	8.5	R	WT. OF WATER = P–Q (grams)	65.8
P	WT. OF WET SOIL & TARE (grams)	630.8	S	WT. OF DRY SOIL = Q–O (grams)	557.0
Q	WT. OF DRY SOIL & TARE (grams)	565.5	T	MOISTURE CONTENT = (R/S)X100 (%)	11.8

1.118

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 130.9 (pcf) OPTIMUM MOISTURE CONTENT 9.9 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DE

DELTA MOISTURE CONTENT = T – U	2.3	U	FDT MOISTURE CONTENT (%)	9.5
FDT WET UNIT WT. (pcf)	144.9	V	FDT DRY UNIT WT. (pcf)	132.3
DELTA DRY UNIT WT. = F – V			FDT #	

COMMENTS:

000434

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FLUOR FERNALD

4942

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Phase IV DATE: 3 day Dec month 2002 year

TEST NO.: CF DT-12

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ±3%

FDT LOCATION: Cell 5/6 access Rd FDT TEST NO.: 257

FIELD TEST DATA – ASTM D 2937 QA ID: CJ

A	CYLINDER NO. 02-5 VOLUME(1) (cf)	0.03357	E	WET UNIT WEIGHT = D/A (lbs)	136.7
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.94	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	121.1
C	WEIGHT OF CYLINDER (lbs)	1.35	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.59			

NOTE: DRIVE CYLINDER VOLUME IS OBTAINED BY MEASURING THE HEIGHT AND DIAMETER, OF FOUR EQUALLY SPACED POINTS, TO AN ACCURACY OF 0.01-in., AND CALCULATING VOLUME USING AVERAGE HEIGHT AND DIAMETER.

FIELD MOISTURE CONTENT – ASTM D 2216 QA ID: CJ

O	WT. OF TARE NO. 16 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	47.1
P	WT. OF WET SOIL & TARE (grams)	425.4	S	WT. OF DRY SOIL = Q–O (grams)	369.4
Q	WT. OF DRY SOIL & TARE (grams)	377.7	T	MOISTURE CONTENT = (R/S)X100 (%)	12.9

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 124.8 (pcf) OPTIMUM MOISTURE CONTENT 11.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CJ

DELTA MOISTURE CONTENT = T – U		1.8	U	FDT MOISTURE CONTENT (%)	11.1
FDT WET UNIT WT. (pcf)		136.6	V	FDT DRY UNIT WT. (pcf)	122.9
DELTA DRY UNIT WT. = F – V		1.8		FDT #	

COMMENTS:

000435

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 and Cell #5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 15 day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED) 1'

MATERIAL SOURCE: ___ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ODOT 304

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
RB-01	Test Strip, 1ST Pass	8" / 1	—	—	—	5.8	134.1	126.7	—	—	—	—	—	—
RB-02	Test Strip, 3RD Pass	8" / 1	—	—	—	6.7	145.0	135.9	—	—	—	—	—	—
RB-03	Test Strip, 4TH Pass	8" / 1	—	—	—	5.2	144.3	137.1	—	—	—	—	—	—
RB-04	Test Strip, 5TH Pass	8" / 1	—	—	—	6.2	156.9 ~~147.7~~	147.7	—	—	—	—	—	—
RB-05	Cell #4, Haul Road	8" / 1	—	—	147.7	6.1	153.8	145.0	98.2	P	—	—	—	—
RB-06	Cell #4 Haul Road	8" / 1	—	—	147.7	5.9	154.4	145.8	98.7	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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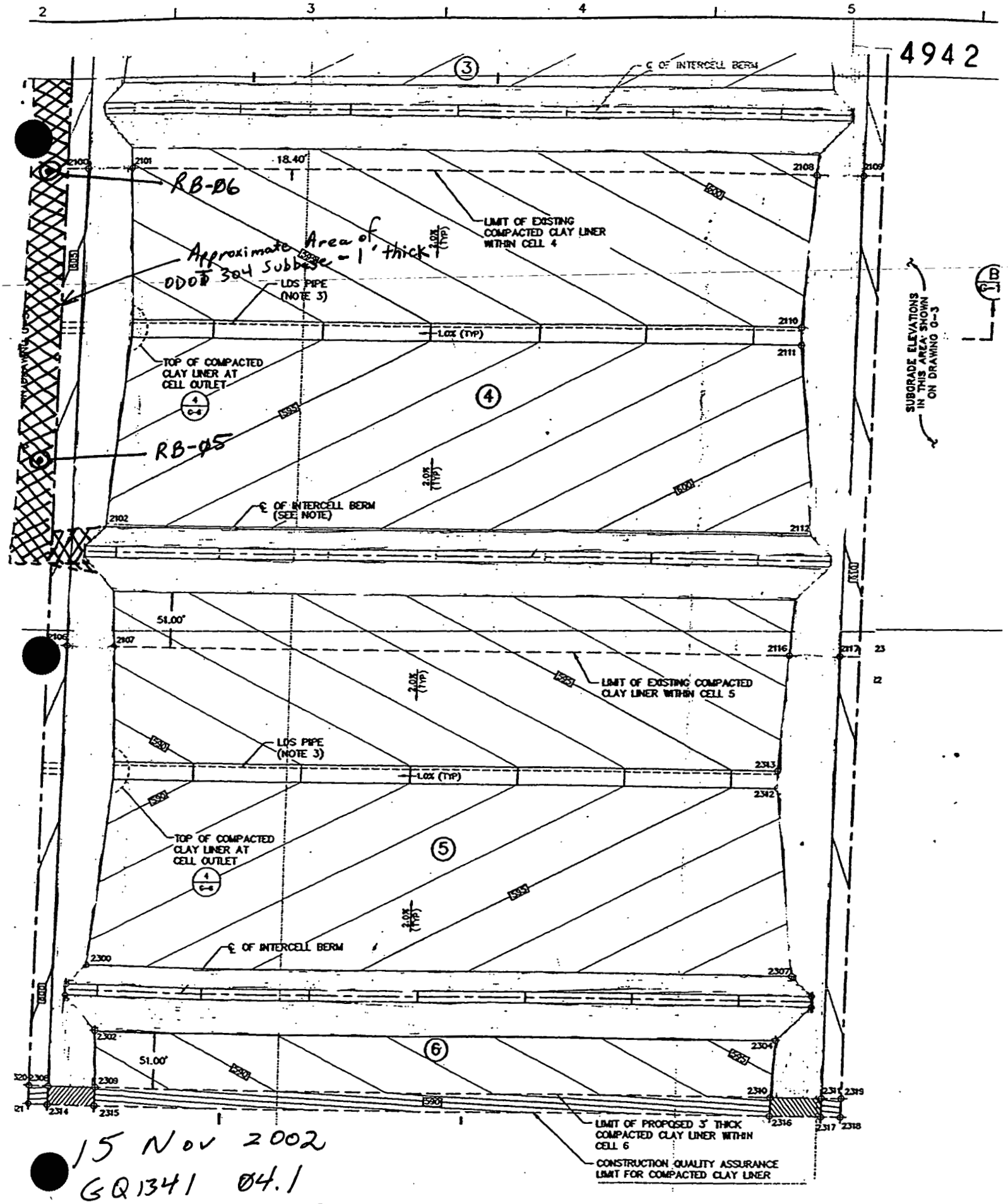
SHEET NO. 2 OF 2

000436

7-4942



15 Nov 2002
GQ1341 04.1
Sheet No. 1 of 2

000437

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 and Cell #5

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 18 day November month 2002 year

SPECIFICATION REQUIREMENTS: ~~ASTM D 698~~ / ASTM D 1557 98 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 1'

MATERIAL SOURCE: ODOT 304 Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / (SUBBASE) / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 30979 CORRECTION FACTOR Y = N/A QA ID: CHEN

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
RB-07	Cell #5, West Haul Road	10" / L-2	—	—	147.7	6.3	155.0	145.7	98.6	P	—	—	—	—
RB-08	Cell #5, West Haul Road	10" / L-2	—	—	147.7	6.9	158.4	148.2	100.3	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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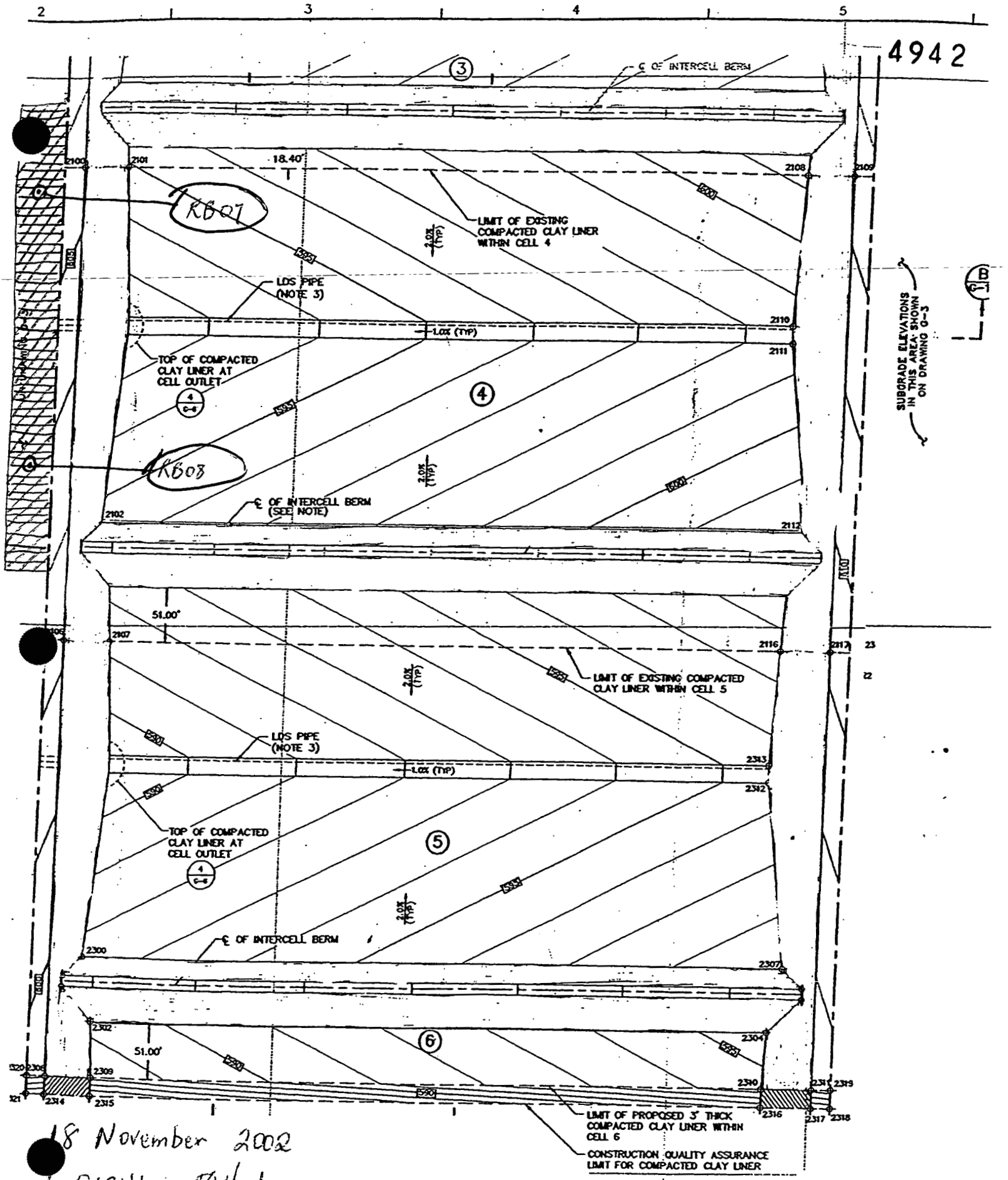
SHEET NO. 2 OF 3

4942



18 November 2002

GQ1341 Ø4.1

Sheet No. 3 of 3

000439

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 19 day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 Test Strip 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): 12"

MATERIAL SOURCE: off-site

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 Stone

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
RB-009	W. Haul Rd Near 4/5 ICB	8" / 1	Test Strip		147.7	5.4	148.8	141.2	95.6	P	—	—	—	—
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000440

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: _____

SHEET NO. _____ OF 2

4942

Compacted Clay Liner and Clay Wedge

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 9 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~-3%~~ 0+3% @ APZ LIFT THICKNESS (LOOSE/COMPACTED): ~~8"~~ 6"

MATERIAL SOURCE: Ø1-5 Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Trox 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x+3.3869 QA ID: CL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-1	See location Map	6"/1	Ø1-5	13.1	121.3	14.2 / 15.4	132.0	114.4	94.3		✓	CLØ2-8	✓	
CLØ2-2	" " "	6"/1	Ø1-5	13.1	121.3	14.1 / 15.3	130.7	113.4	93.5		✓	CLØ2-7	✓	
CLØ2-3	" " "	6"/1	Ø1-5	13.1	121.3	11.0 / 12.7	137.8	122.3	100.8		✓	CLØ2-9	✓	
CLØ2-4	" " "	6"/1	Ø1-5	13.1	121.3	12.2 / 13.7	138.0	121.4	100.1	✓				
CLØ2-5	" " "	6"/1	Ø1-5	13.1	121.3	11.3 / 13.0	137.9	122.0	100.6		✓	CLØ2-10	✓	
CLØ2-6	" " "	6"/1	Ø1-5	13.1	121.3	13.7 / 15.0	135.0	117.4	96.8	✓				
CLØ2-7	" " "	6"/1	Ø1-5	13.1	121.3	13.3 / 14.6	134.4	117.3	96.7	✓				
CLØ2-8	" " "	6"/1	Ø1-5	13.1	121.3	13.0 / 14.4	136.0	118.9	98.0	✓				
CLØ2-9	" " "	6"/1	Ø1-5	13.1	121.3	14.8 / 15.9	134.4	116.0	95.6	✓				
CLØ2-10	" " "	6"/1	Ø1-5	131	121.3	14.0 / 15.2	133.6	116.0	95.6	✓				

000442

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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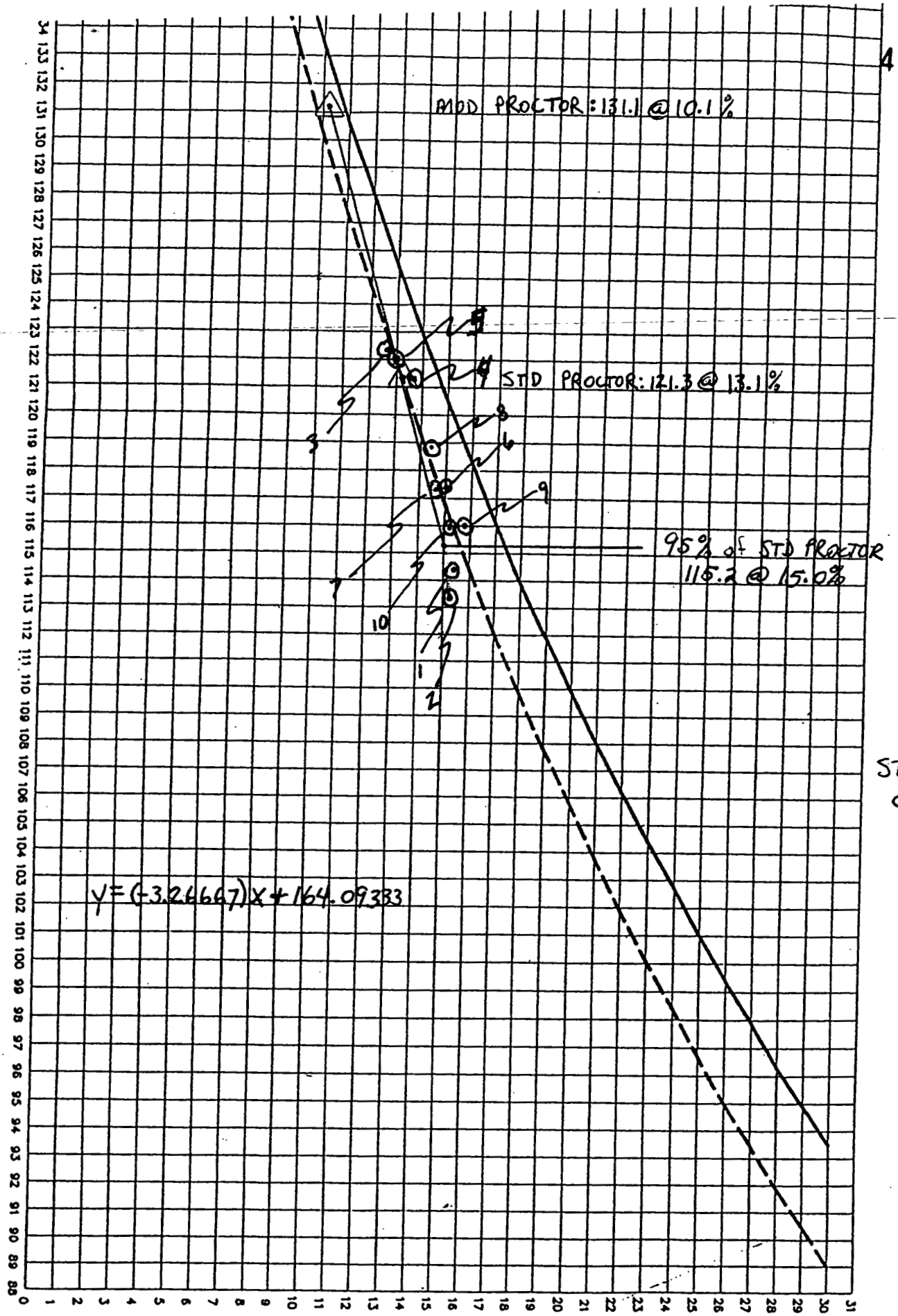

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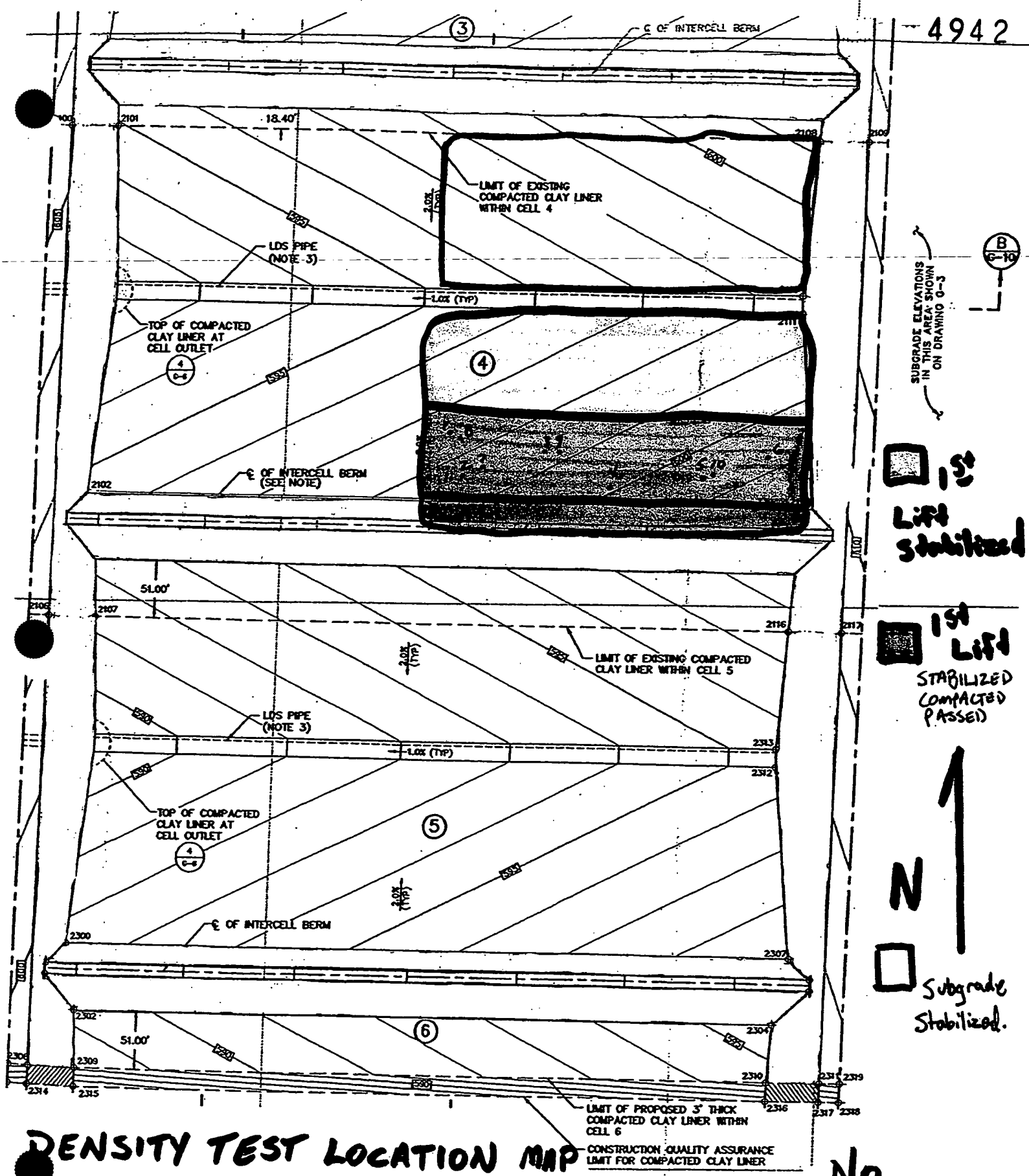

DENSITY TEST LOCATION MAP

9 DAY June MONTH 2002 YEAR

NO SCALE

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 10 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~0-3%~~ FAP2 LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: 01-5 Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Trox 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CA

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-11	See location map	6"/1	01-5	13.1	121.3	13.2 / 14.6	130.7	114.0	94.0		✓	CL02-13	✓	
CL02-12	" " "	6"/1	01-5	13.1	121.3	15.4 / 16.4	130.6	112.2	92.5		✓	CL02-14	✓	
CL02-13	" " "	6"/1	01-5	13.1	121.3	12.9 / 14.3	135.4	118.5	97.7	✓				
CL02-14	" " "	6"/1	01-5	13.1	121.3	13.9 / 15.2	134.5	116.8	96.3	✓				
CL02-15	" " "	6"/1	01-5	13.1	121.3	13.5 / 14.8	135.1	117.7	97.0	✓				
CL02-16	" " "	6"/1	01-5	13.1	121.3	14.1 / 15.3	133.3	115.6	95.3	✓				
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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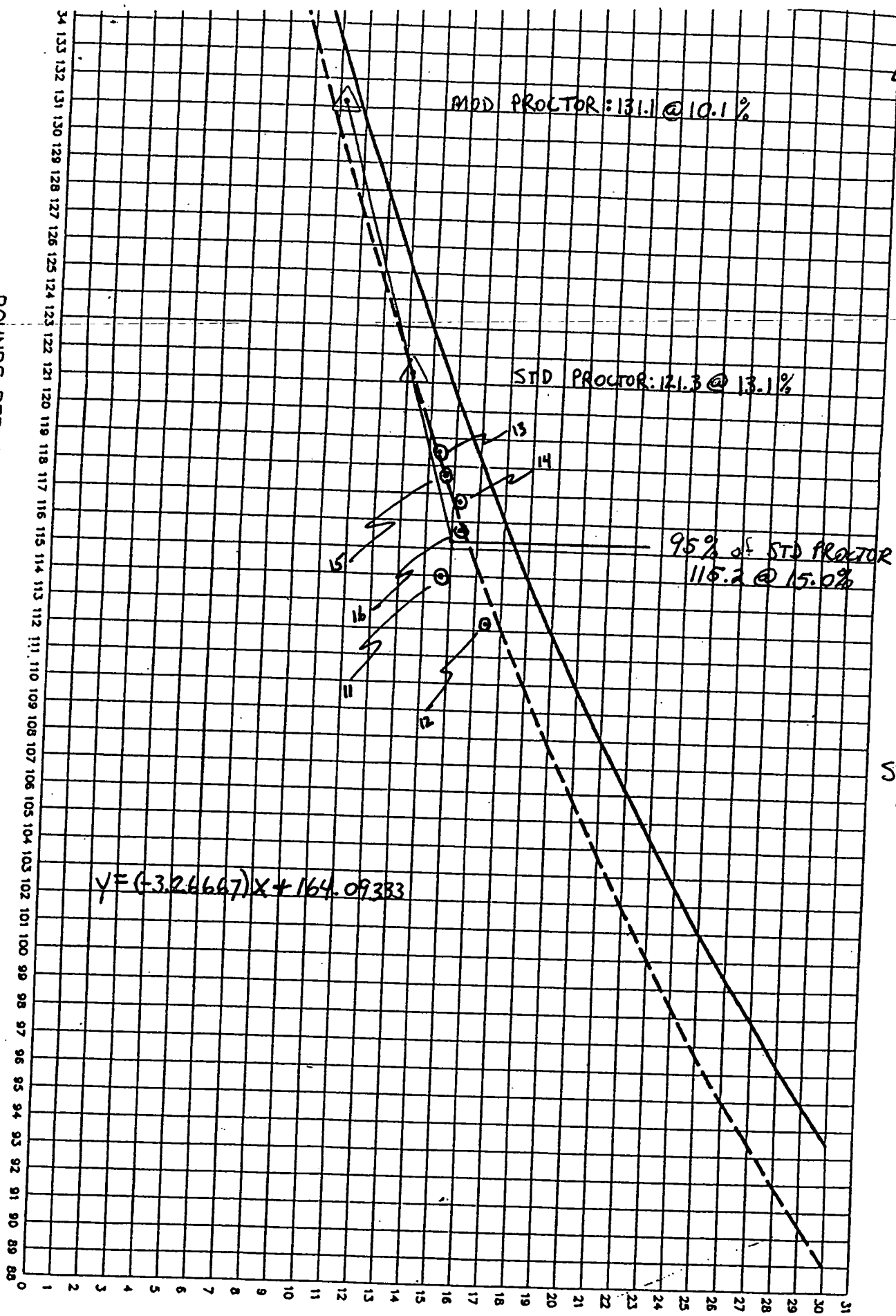

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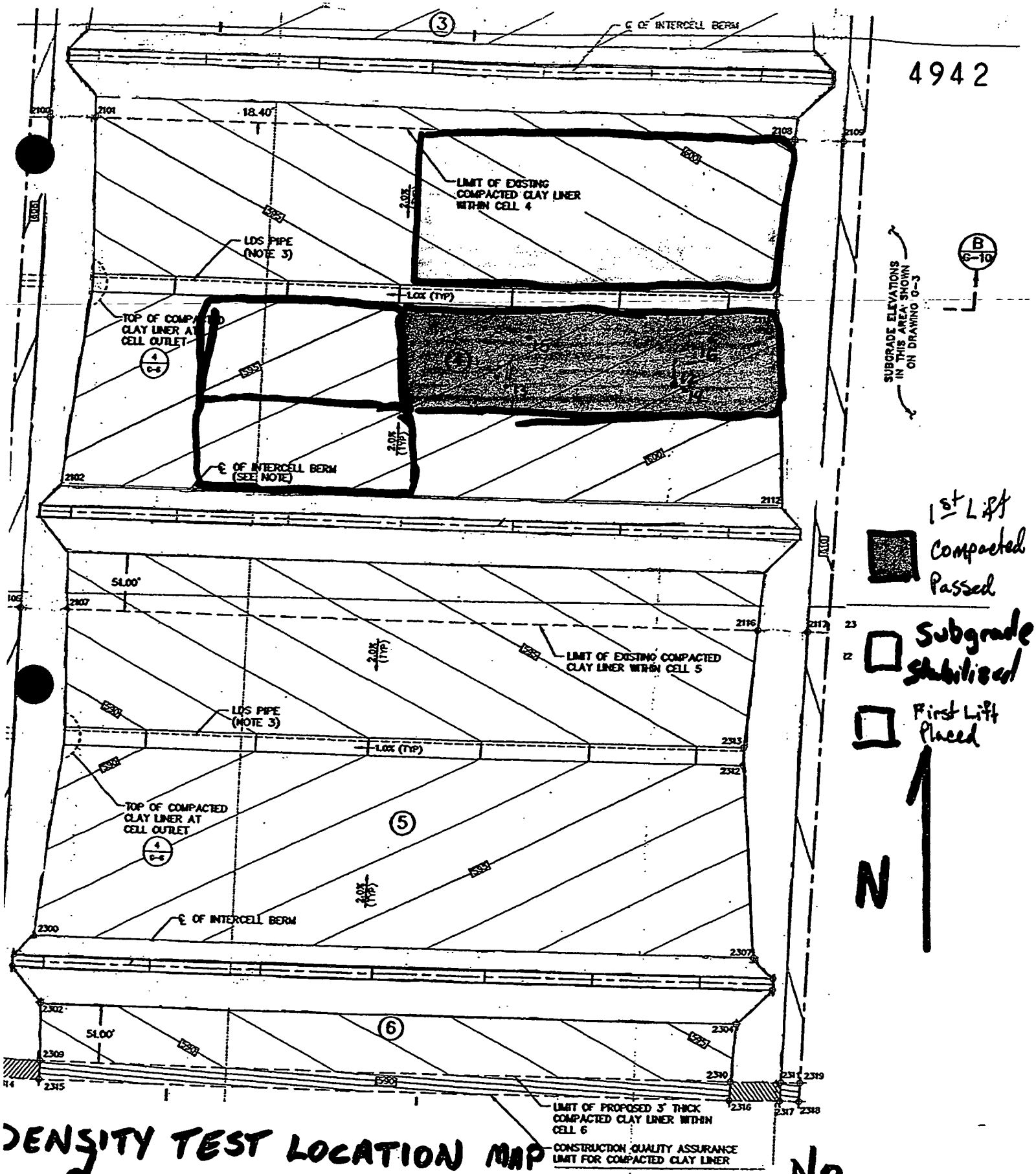

DENSITY TEST LOCATION MAP

DAY 18 DAY June MONTH 2012 YEAR

NO SCALE

000447

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 11 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: Stockpile Ø1-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-17	See Location Map	6"/1	Ø1-5	13.1	121.3	15.5 / 16.5	131.9	113.2	93.3		✓	CLØ2-28	✓	
CLØ2-18	" " "	6"/1	Ø1-5	13.1	121.3	12.9 / 14.3	135.5	118.5	97.7	✓				
CLØ2-19	" " "	6"/1	Ø1-5	13.1	121.3	13.7 / 13.9	133.7	116.1	95.7	✓				
CLØ2-20	" " "	6"/1	Ø1-5	13.1	121.3	15.0 / 15.2	130.3	112.2	92.5		✓	CLØ2-24	✓	
		/				16.1								
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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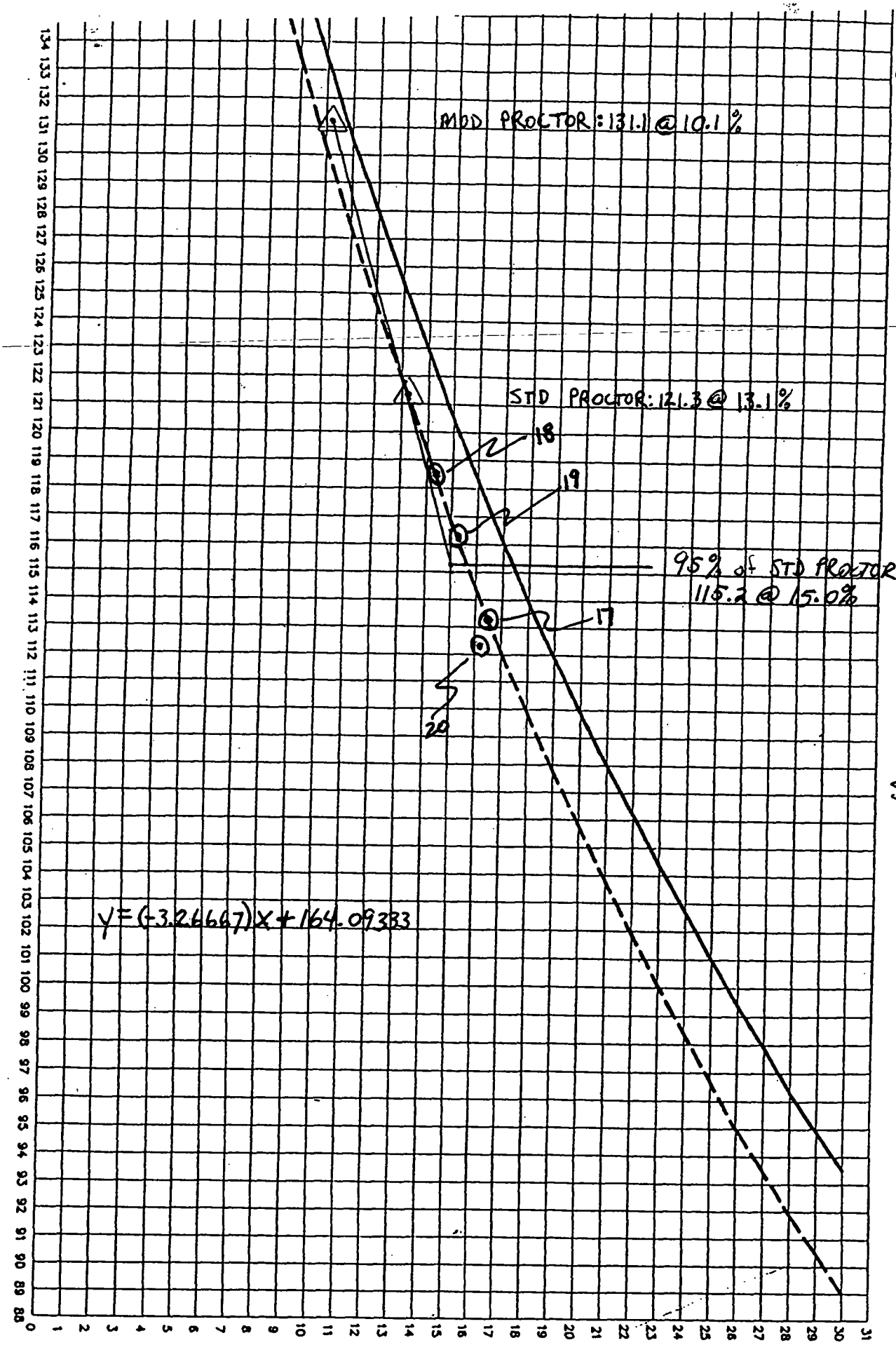

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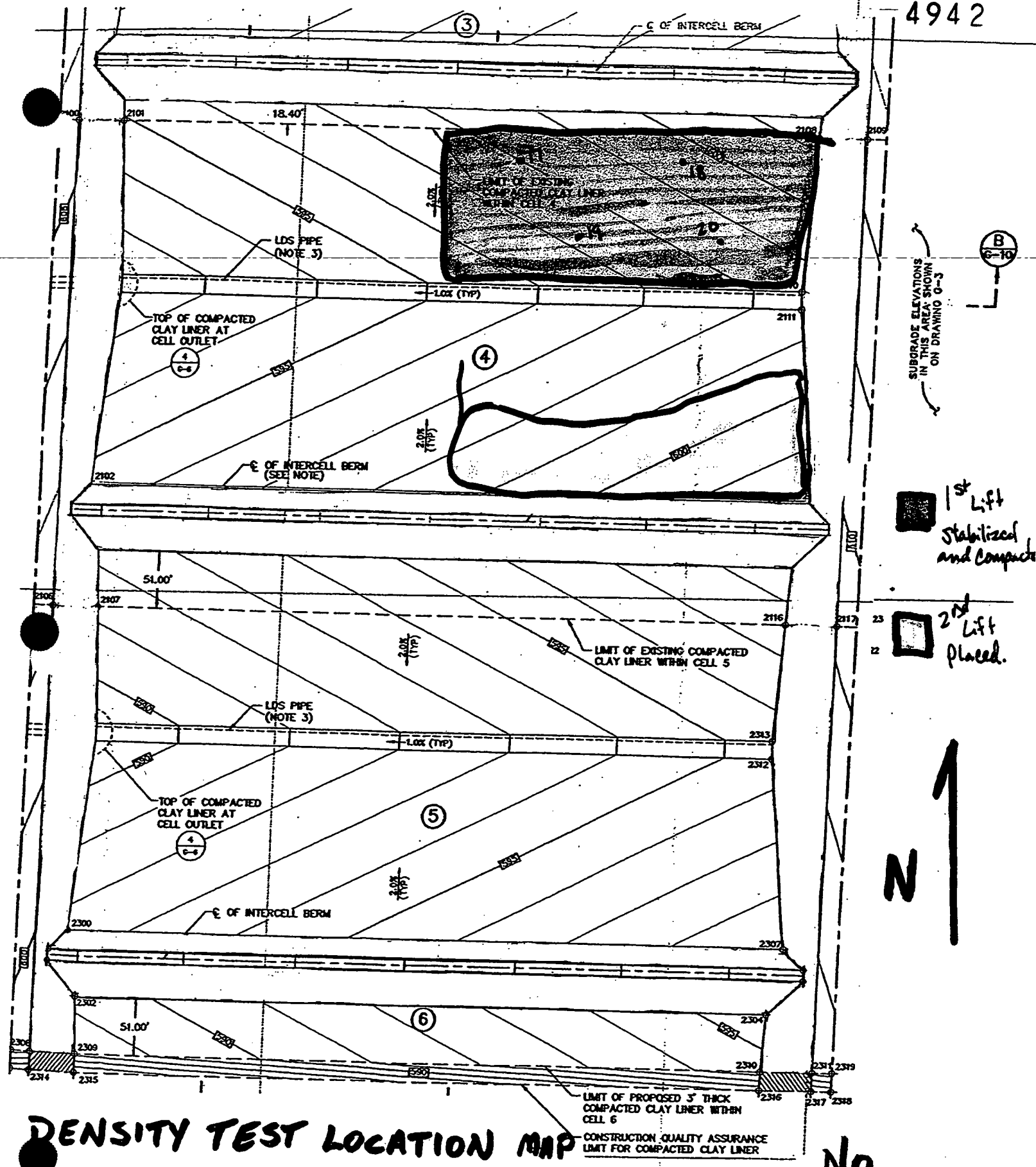

DENSITY TEST LOCATION MAP

11 DAY June MONTH 2002 YEAR

NO SCALE

000450

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS #4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 12 (WEDNESDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: AP2 +0-3 LIFT THICKNESS (LOOSE / (COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 01-5

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-21	CELL #4 - S. EAST END	6"/L-2	01-5	13.1	121.3	14.2 (15.4)	132.9	115.2	95.0	P	–	–	–	–
CL02-22	CELL #4 - S. EAST END	6"/L-2	01-5	13.1	121.3	13.0 (14.4)	135.2	118.2	97.4	P	–	–	–	–
CL-02-23	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	13.4 (14.7)	135.6	118.2	97.4	P	–	–	–	–
CL-02-24	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	14.8 (15.9)	134.9	116.4	96.0	P	–	–	–	–
CL02-25	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	14.0 (15.2)	135.3	117.4	96.8	P	–	–	–	–
CL02-26	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	15.0 (16.1)	133.8	115.2	95.0	P	–	–	–	–
CL02-27	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	14.9 (16.0)	135.5	116.8	96.3	P	–	–	–	–
CL-02-28	CELL #4 - N. EAST END	6"/L-1	01-5	13.1	121.3	13.9 (15.2)	134.9	117.1	96.5	P	–	–	–	–
CL-02-29	CELL #4 - S. EAST END	6"/L-2	01-5	13.1	121.3	13.0 (14.4)	134.4	117.5	96.9	P	–	–	–	–
CL02-30	CELL #4 - S. EAST END	6"/L-2	01-5	13.1	121.3	13.8 (15.1)	136.2	118.3	97.6	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 12 day JUNE month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 01-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-31	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	13.9 (15.2)	137.4	119.3	98.3	P	—	—	—	—
CL02-32	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	12.5 (14.0)	135.3	118.7	97.9	P	—	—	—	—
CL02-33	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	13.0 (14.4)	136.6	119.4	98.4	P	—	—	—	—
CL02-34	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	14.1 (15.3)	135.9	117.9	97.2	P	—	—	—	—
CL02-35	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	12.9 (14.3)	136.1	119.1	98.2	P	—	—	—	—
CL02-36	Cell #4 - S. East End	6"/L-2	01-5	13.1	121.3	13.4 (14.7)	134.8	117.5	96.9	P	—	—	—	—
		/												
		/												
		/												
		/												

000452

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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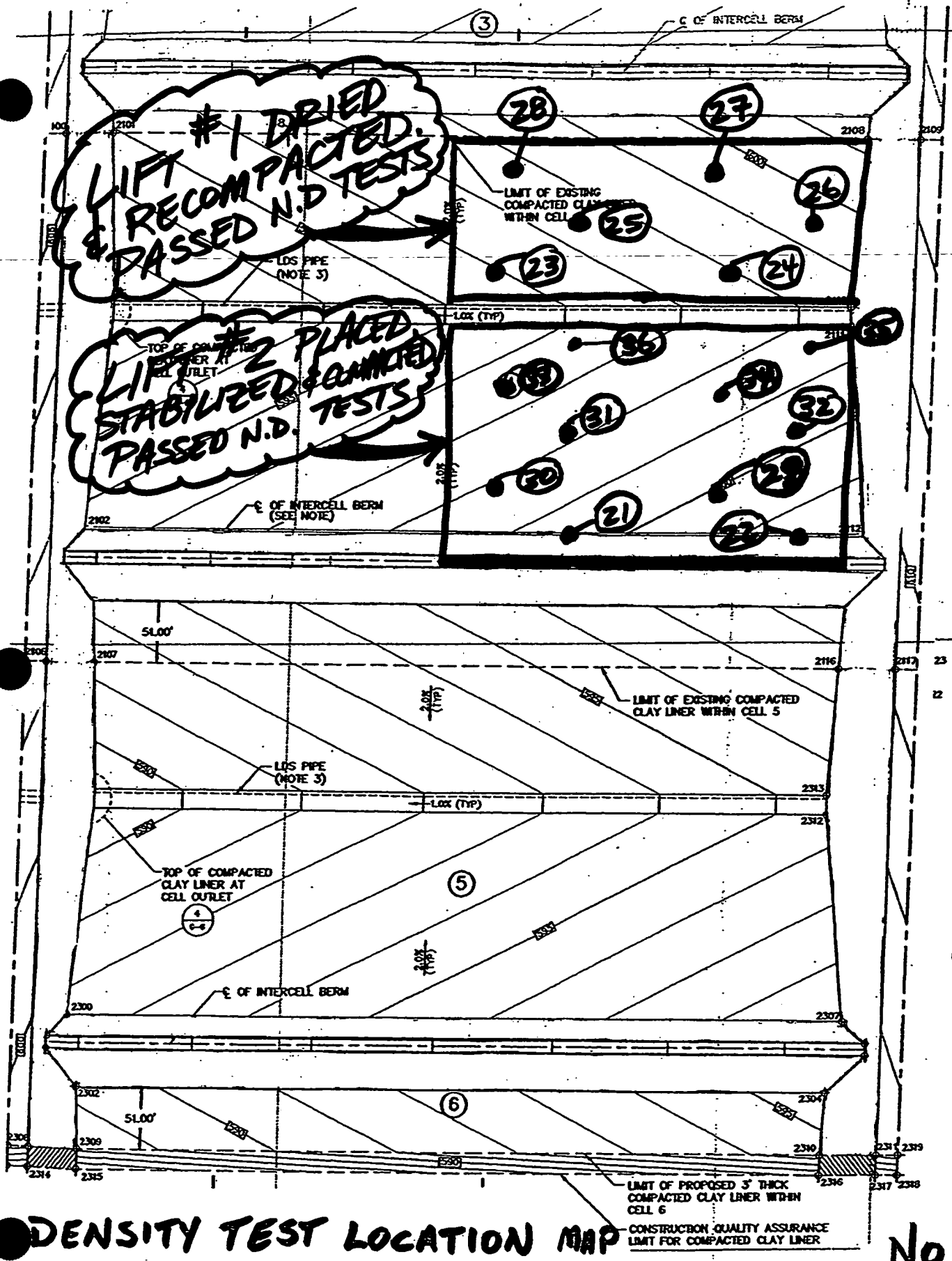
©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA SHEET NO. 2 OF 4

4942



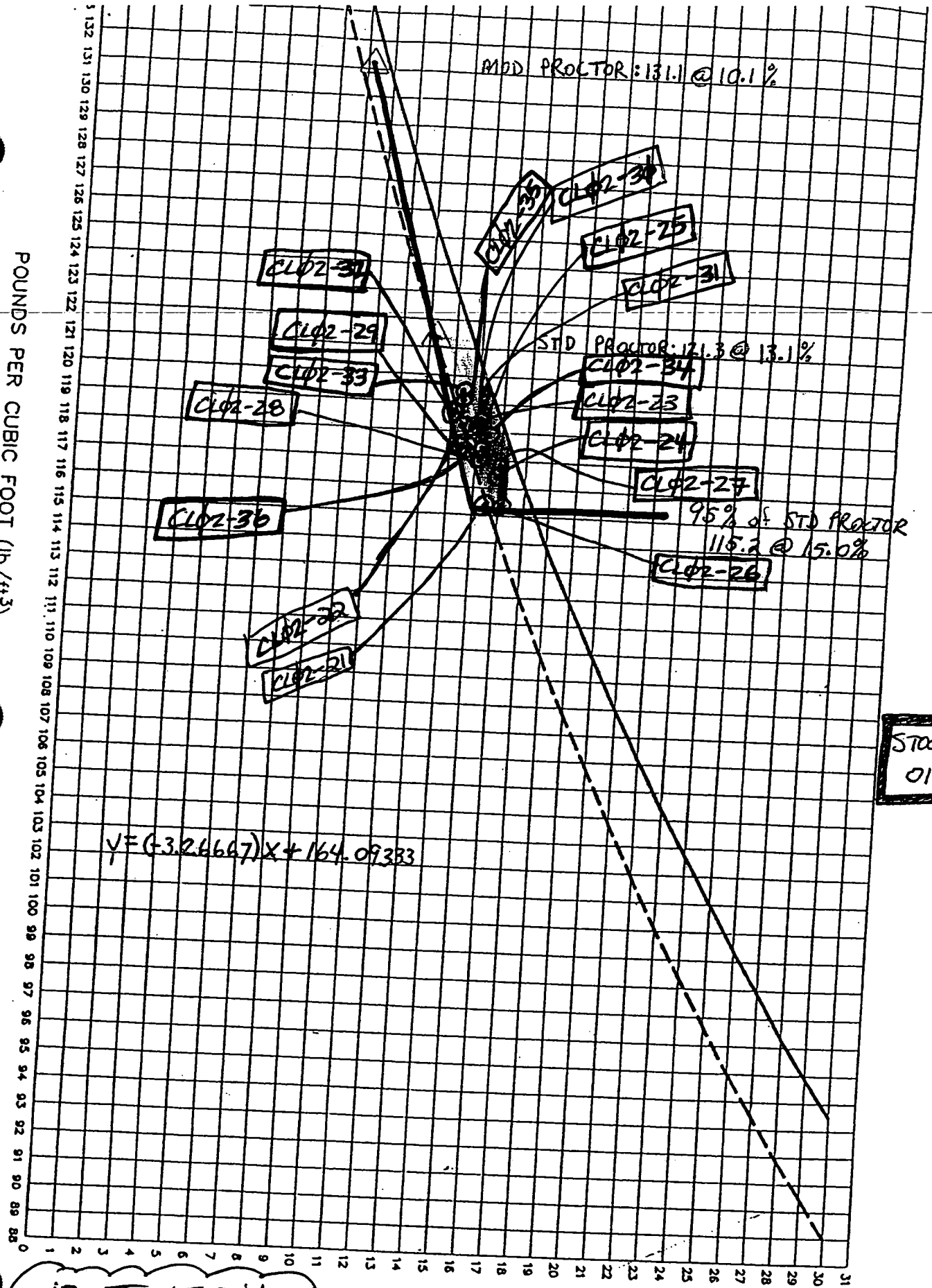
N 1

DENSITY TEST LOCATION MAP

12 DAY JUNE MONTH 2002 YEAR 000453 NO SCALE

SHEET No 3 OF 4

4942



STOCKPILE 01-5

12 JUNE 2ØØ2

GQ1341-Ø4.1

000454

SHEET No 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS #4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 13 day THURSDAY JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3 APZ LIFT THICKNESS (LOOSE (COMPACTED)): -6"

MATERIAL SOURCE: STOCKPILE 01-5 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-37	CELL #4 - S. WEST END	6"/L-1	01-5	13.1	121.3	14.1 (15.3)	136.3	118.2	97.5	P	–	–	–	–
CL02-38	CELL #4 - S. WEST END	6"/L-1	01-5	13.1	121.3	14.2 (15.4)	134.8	116.8	96.3	P	–	–	–	–
CL02-39	CELL #4 - S. WEST END	6"/L-1	01-5	13.1	121.3	12.7 (14.1)	136.0	119.2	98.3	P	–	–	–	–
CL02-40	CELL #4 - S. WEST END	6"/L-1	01-5	13.1	121.3	14.5 (15.7)	135.2	116.9	96.3	P	–	–	–	–

*

000455

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *DC02-01 TAKEN AT CL02-37*

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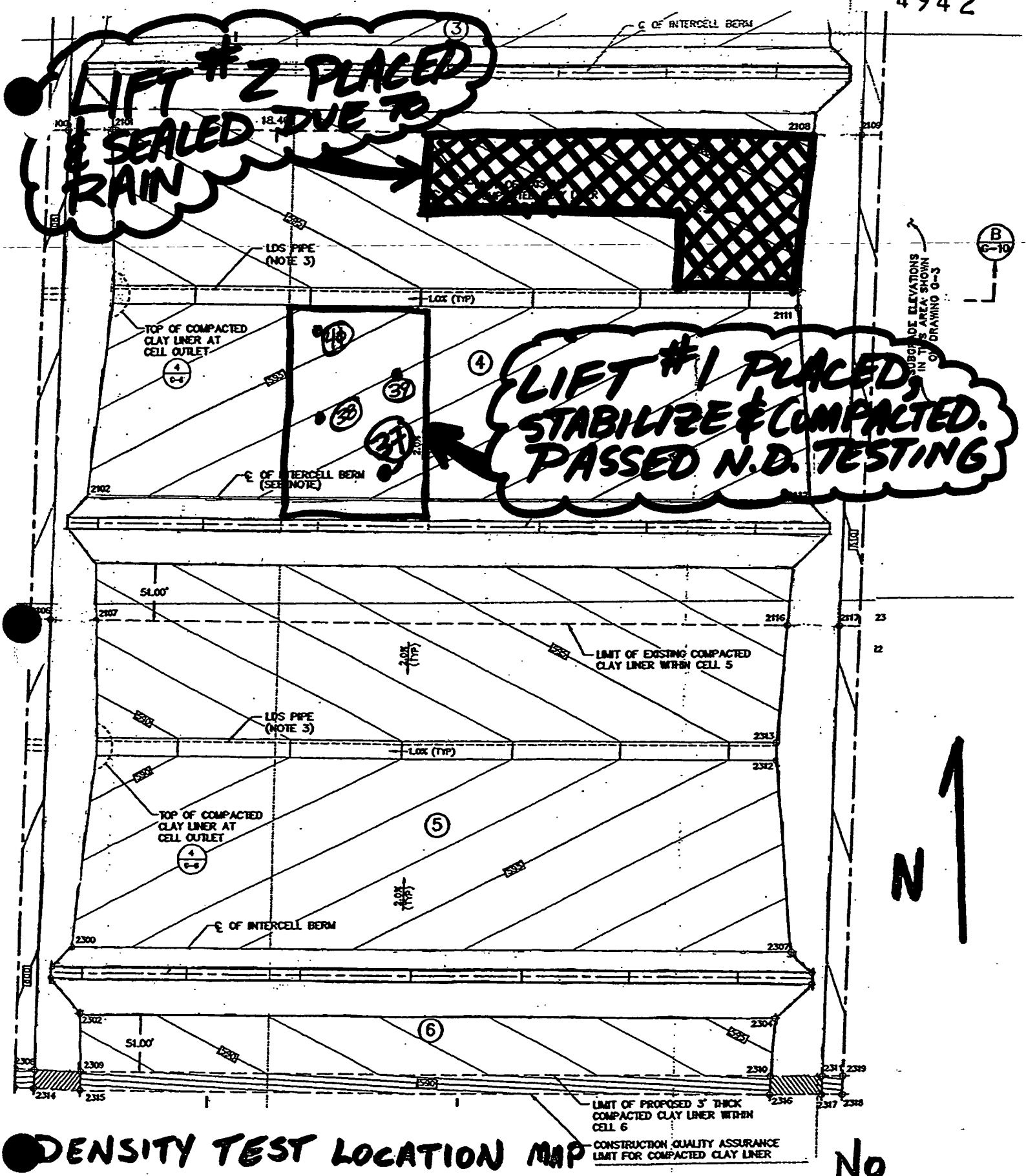
SHEET NO. 1 OF 3

4942



N 1

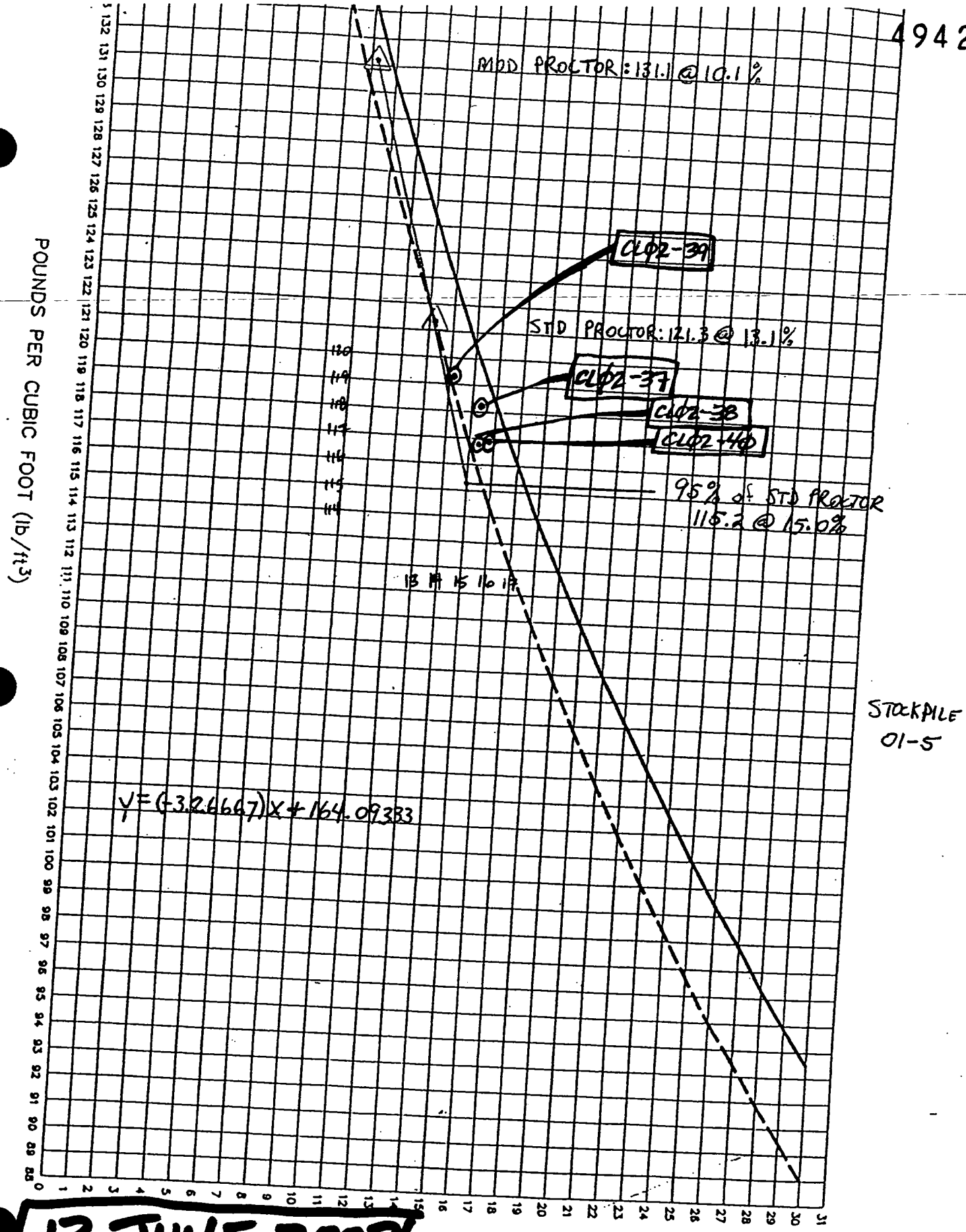
DENSITY TEST LOCATION MAP

13 DAY JUNE MONTH 2002 YEAR

000456

NO SCALE

SHEET No 2 OF 3



13 JUNE 2002

GQ134-04.1

SHEET No 3 OF 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: CELLS #4 & 5 — DATE: 17 (MONDAY) day JUNE month 2002 year

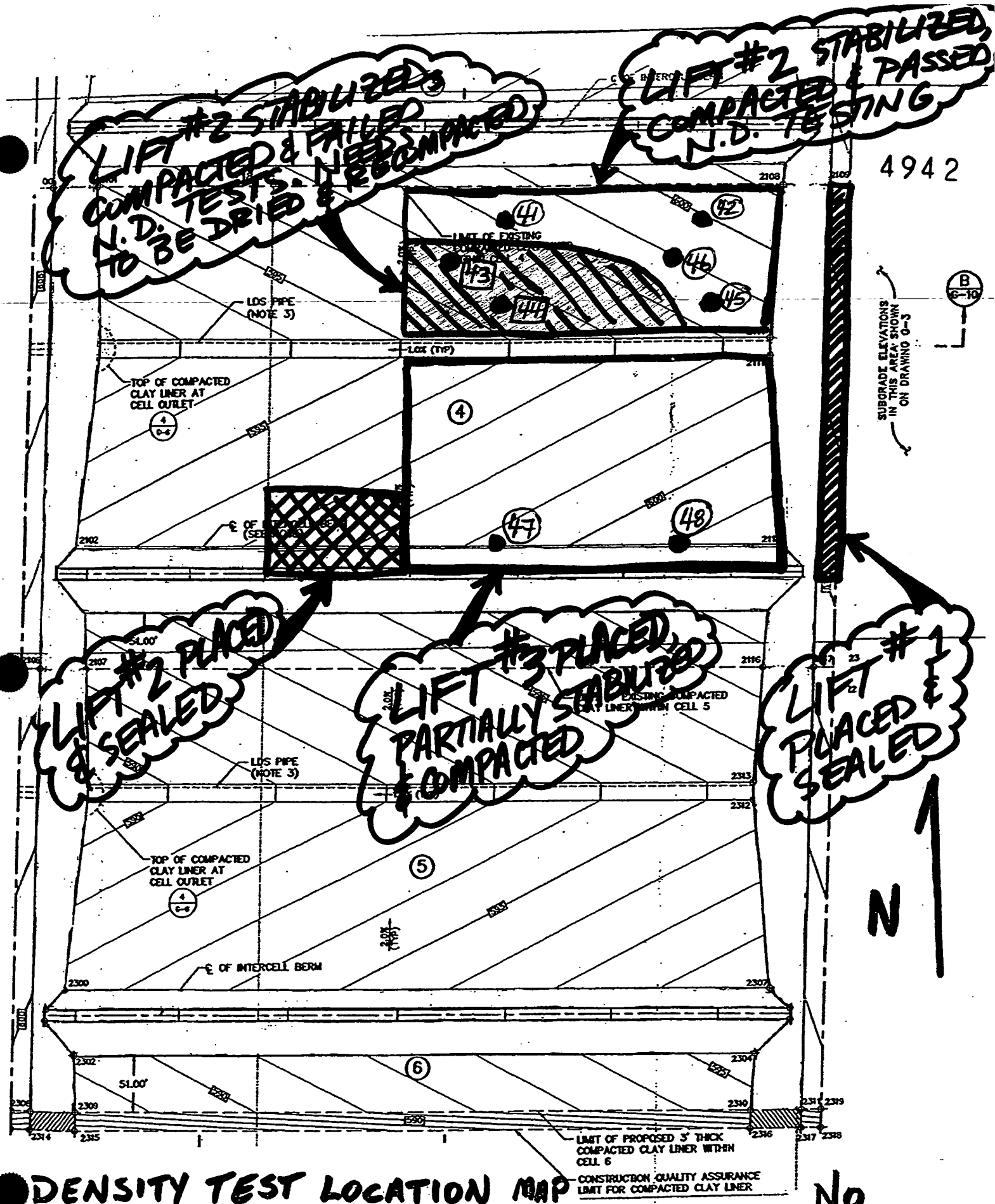
SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILES 01-2 & 5 — MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 — GAUGE SERIAL NO. 20979 — CORRECTION FACTOR Y = 0.8481X + 3.3669 — QA ID: (TBA)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-41	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	15.7 (16.7)	130.9	112.2	97.3	P	—	—	—	—
CL02-42	CELL #4 - N. EAST END	6"/L-2	01-5	13.1	121.3	12.4 (13.9)	137.1	120.4	99.3	P	—	—	—	—
CL02-43	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	17.8 (19.5)	127.8	107.8	93.5	—	F	CL02-50	P	—
CL02-44	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	18.7 (19.2)	127.2	106.7	92.6	—	F	CL02-49	P	—
CL02-45	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	17.2 (18.0)	129.6	109.8	95.3	P	—	—	—	—
CL02-46	CELL #4 - N. EAST END	6"/L-2	01-5	13.1	121.3	11.5 (13.1)	138.9	122.8	101.2	P	—	—	—	—
CL02-47	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.3 (15.5)	134.2	116.2	100.8	P	—	—	—	—
CL02-48	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	16.1 (17.0)	133.0	113.7	98.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)



DENSITY TEST LOCATION MAP

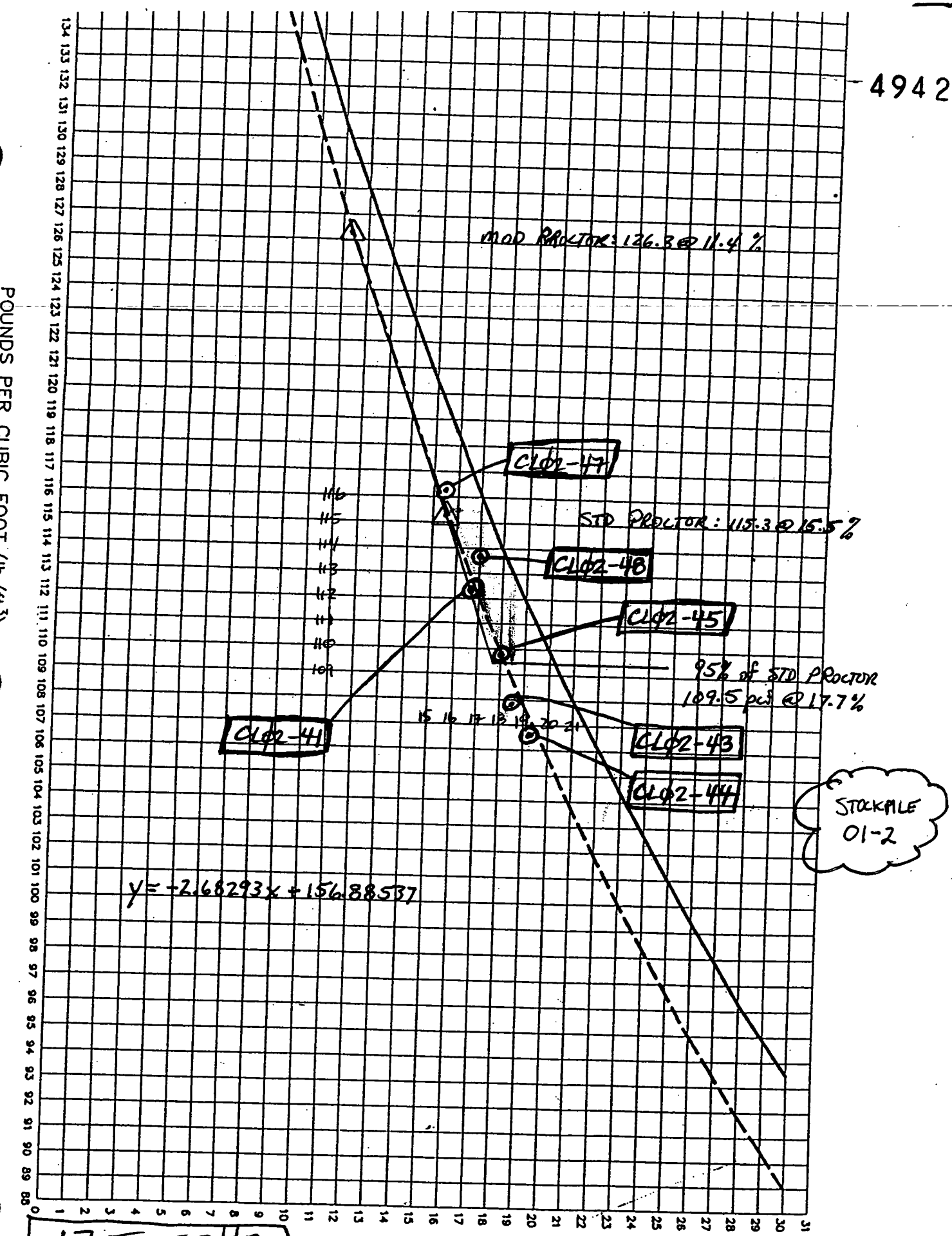
17 DAY JUNE MONTH 2004 YEAR

(MONDAY)

00045 SCALE No

SHEET No 2 of 4

4942



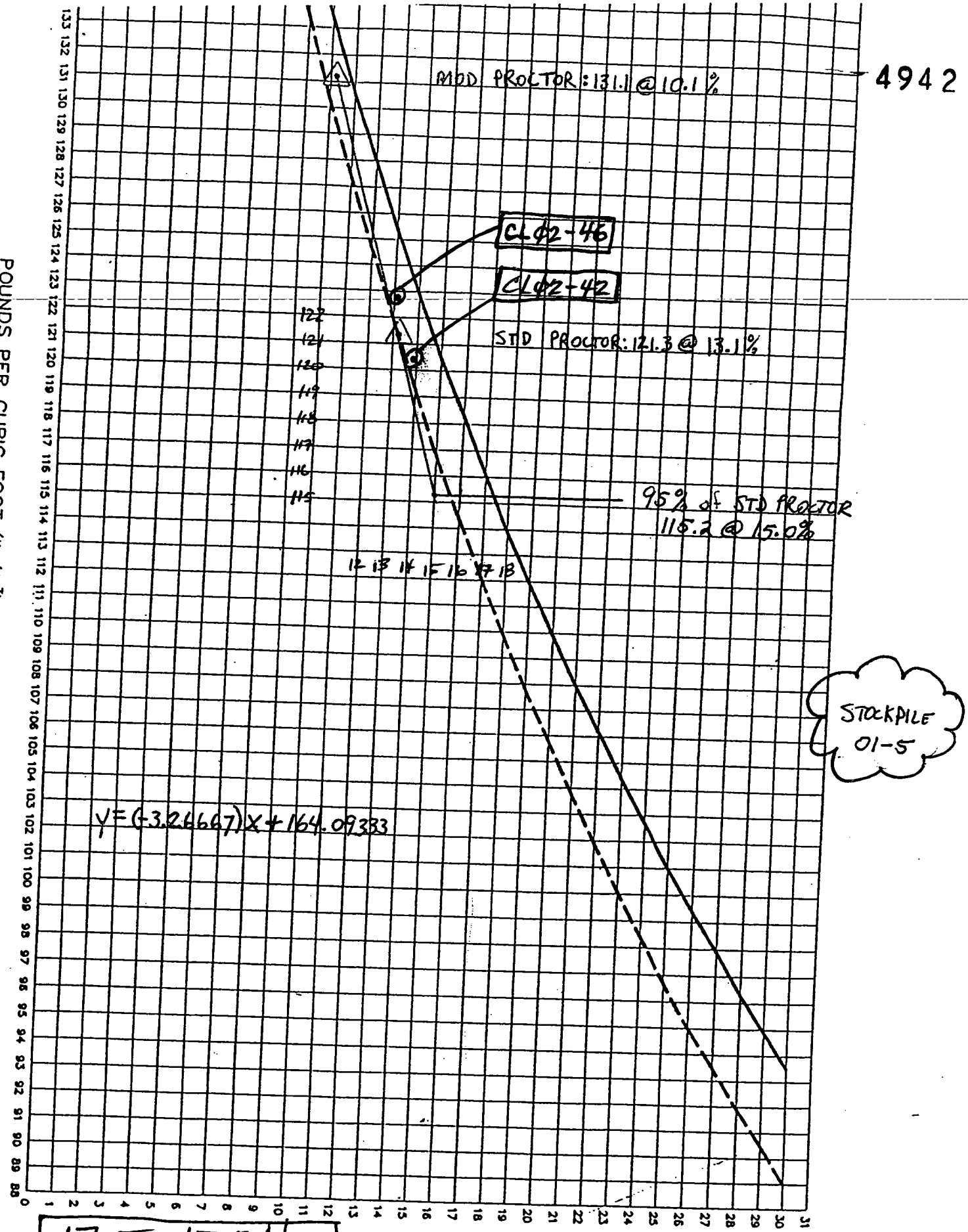
17 JUNE 2ØØ2

GQ1341-Ø4.1

000460

SHEET No 3 OF 4

4942



17 JUNE 2ØØ2

GQ1341-Ø4.1

000461

SHEET No 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 (TUESDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95/AP2 % COMPACTION / MOISTURE RANGE: +0-3/AP2 LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (PBC)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C002-49	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	14.4 (15.6)	134.4	116.3	100.8	P	–	–	–	–
C002-50	CELL #4 - N. EAST END	6"/L-2	01-2	15.5	115.3	16.5 (17.4)	131.8	112.3	97.4	P	–	–	–	–
C002-51	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.5 (15.7)	135.0	116.7	101.2	P	–	–	–	–
C002-52	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	15.2 (16.3)	134.2	115.4	100.1	P	–	–	–	–
C002-53	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	15.0 (16.1)	132.4	114.0	98.9	P	–	–	–	–
C002-54	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.6 (15.7)	133.9	115.7	100.4	P	–	–	–	–
C002-55	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.8 (15.9)	134.8	116.3	100.8	P	–	–	–	–
C002-56	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.9 (16.0)	134.9	116.2	100.7	P	–	–	–	–
C002-57	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.6 (15.7)	133.5	115.4	100.1	P	–	–	–	–
C002-58	CELL #4 - S. EAST END	6"/L-3	01-2	15.5	115.3	14.8 (15.9)	133.4	115.1	99.8	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *DC02-2 TAKEN AT C002-50*

004462

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS #4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 18 day JUNE month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0-3% (AP2) LIFT THICKNESS (LOOSE/COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: TBC

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-59	CELL #4 - EAST BENCH	6"/L-1	01-2	15.5	115.3	14.6 (15.7)	134.2	116.0	100.6	P	—	—	—	—
CL02-60	CELL #4 - EAST BENCH	6"/L-1	01-2	15.5	115.3	15.7 (16.7)	131.7	112.9	97.9	P	—	—	—	—
CL02-61	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	14.3 (15.5)	135.8	117.6	102.0	P	—	—	—	—
CL02-62	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	13.0 (14.4)	137.7	120.8	104.8	—	F	CL02-66	P	—
CL02-63	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	14.5 (15.7)	133.2	115.1	99.8	P	—	—	—	—
CL02-64	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	17.3 (16.0)	129.8	110.0	95.4	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [illegible]

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4942

LIFT #1 STABILIZED, COMPACTED & PASSED N.D. TESTING

4942

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

LDS PIPE (NOTE 5)

1.0% (TYP)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM (SEE NOTE)

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING G-3

SUBGRADE PASSED PROOFROLLING. TOP 2" STABILIZED & +5" ROCK REMOVED

LIFT #2 DRIED & RECOMPACTED. PASSED N.D. TESTS

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 5

LIFT #3 STABILIZED & COMPACTED. PASSED N.D. TESTING

℄ OF INTERCELL BERM

51.00'

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

N

DENSITY TEST LOCATION MAP

NO SCALE

18 DAY JUNE MONTH 2002 YEAR 000464

(TUESDAY)

SHEET No. 3 OF 5

LIFT #3 TOO DRY WILL BE WATERED & PROOFRAKED TOMORROW

4942

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

61 62 63 64

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 / C-6

LOX (TYP)

4

℄ OF INTERCELL BERM (SEE NOTE)

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING C-3

B / C-10

LIFT #1 PLACED & SEALED

LIFT #3 PLACED, PARTIALLY STABILIZED & COMPACTED

LDS PIPE (NOTE 3)

5

℄ OF INTERCELL BERM

6

51.00'

18.40'

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

N

DENSITY TEST LOCATION MAP

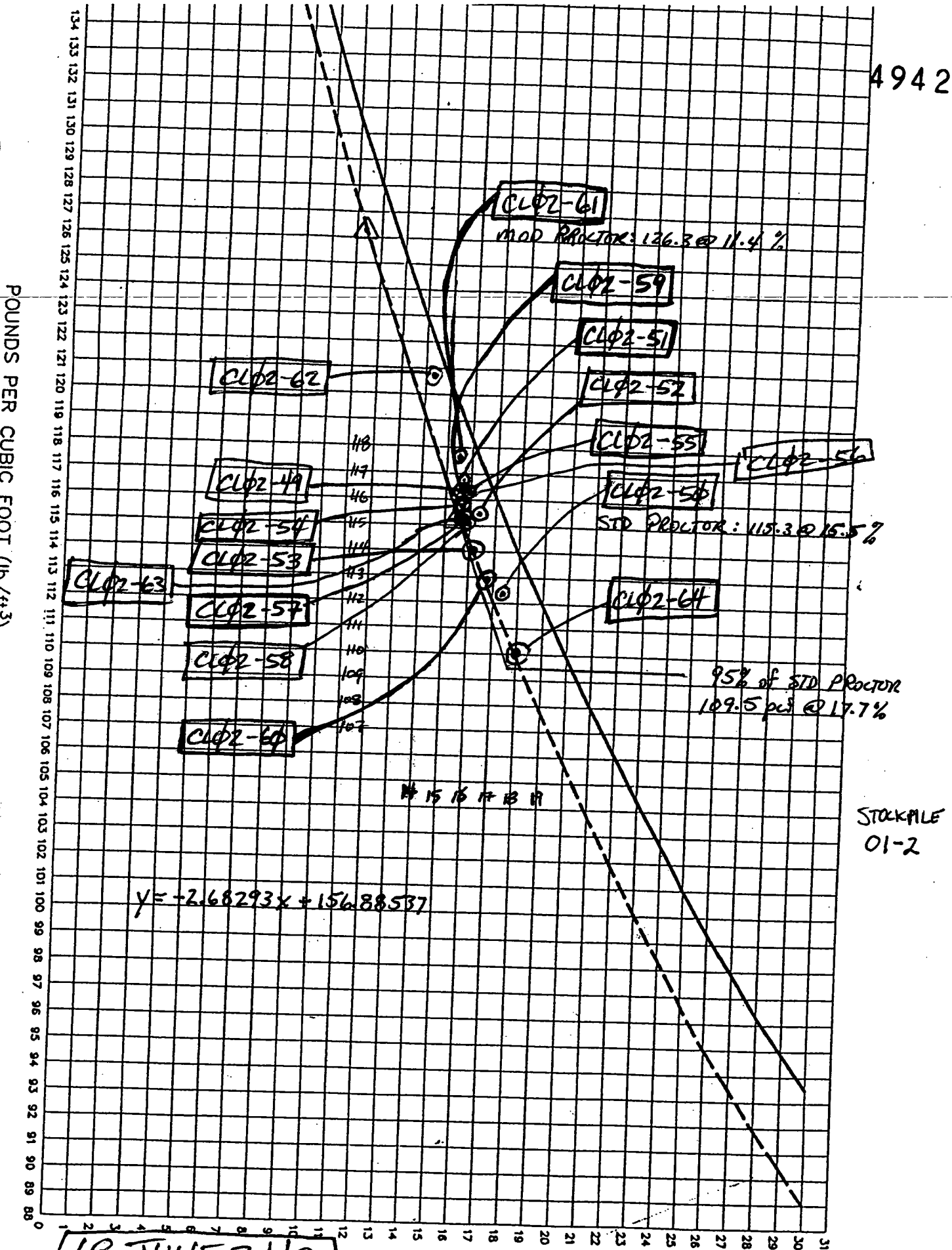
No SCALE

18 DAY JUNE MONTH 2002 YEAR 000465

(TUESDAY)

SHEET No 4 OF 5

4942



18 JUNE 2ØØ2

GQ1341-Ø4.1

000466

SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Cells 4 & 5

DATE: 19 day JUNE month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (APZ) / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-65	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	14.6 (15.7)	135.6	117.2	101.6	P	–	–	–	–
CL02-66	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	14.9 (16.0)	134.9	116.3	100.9	P	–	–	–	–
CL02-67	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	15.0 (16.1)	132.3	114.0	98.8	P	–	–	–	–
CL02-68	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	15.6 (16.6)	131.5	112.8	97.8	P	–	–	–	–
CL02-69	CELL #4 - N. EAST END	6"/L-3	01-2	15.5	115.3	14.7 (15.8)	133.5	115.3	100.0	P	–	–	–	–
CL02-70	CELL #4 - N. WEST END	6"/L-1	01-2	15.5	115.3	14.3 (15.5)	135.0	116.9	101.4	P	–	–	–	–
CL02-71	CELL #4 - N. WEST END	6"/L-1	01-2	15.5	115.3	15.0 (16.1)	134.5	115.8	100.5	P	–	–	–	–
CL02-72	CELL #4 - N. WEST END	6"/L-1	01-2	15.5	115.3	15.0 (16.1)	134.9	116.2	100.8	P	–	–	–	–
CL02-73	CELL #4 - N. WEST END	6"/L-1	01-2	15.5	115.3	14.5 (15.7)	135.4	117.0	101.5	P	–	–	–	–
CL02-74	CELL #4 - N. WEST END	6"/L-1	01-2	15.5	115.3	14.7 (15.8)	133.0	114.9	99.7	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells #4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 19 day JUNE month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (APZ) / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 29979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TRX)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-75	Cell #4-N. West End	6"/L-1	01-2	15.5	115.3	15.0 (16.1)	134.4	115.8	100.4	P	–	–	–	–
CL02-76	Cell #4 S.W. End	6"/L-1	01-2	15.5	115.3	15.0 (16.1)	134.1	115.5	100.2	P	–	–	–	–
CL02-77	Cell #4 S.W. End	6"/L-2	01-2	15.5	115.3	14.7 (15.8)	134.5	116.1	100.7	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 4

000468

4942

4942

LIFT #1 PLACED, STABILIZED, & COMPACTED

℄ OF INTERCELL BERM

18.40'

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

PASSED N.D. TESTING YESTERDAY

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM (SEE NOTE 7)

LIFT #4 PLACED & SEALED

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING G-3

LIFT #2 PLACED & PARTIALLY STABILIZED

LIFT #3 STABILIZED, COMPACTED & PASSED N.D. TESTING

LIFT #1 PLACED, PARTIALLY STABILIZED & COMPACTED

℄ OF INTERCELL BERM

51.00'

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

N

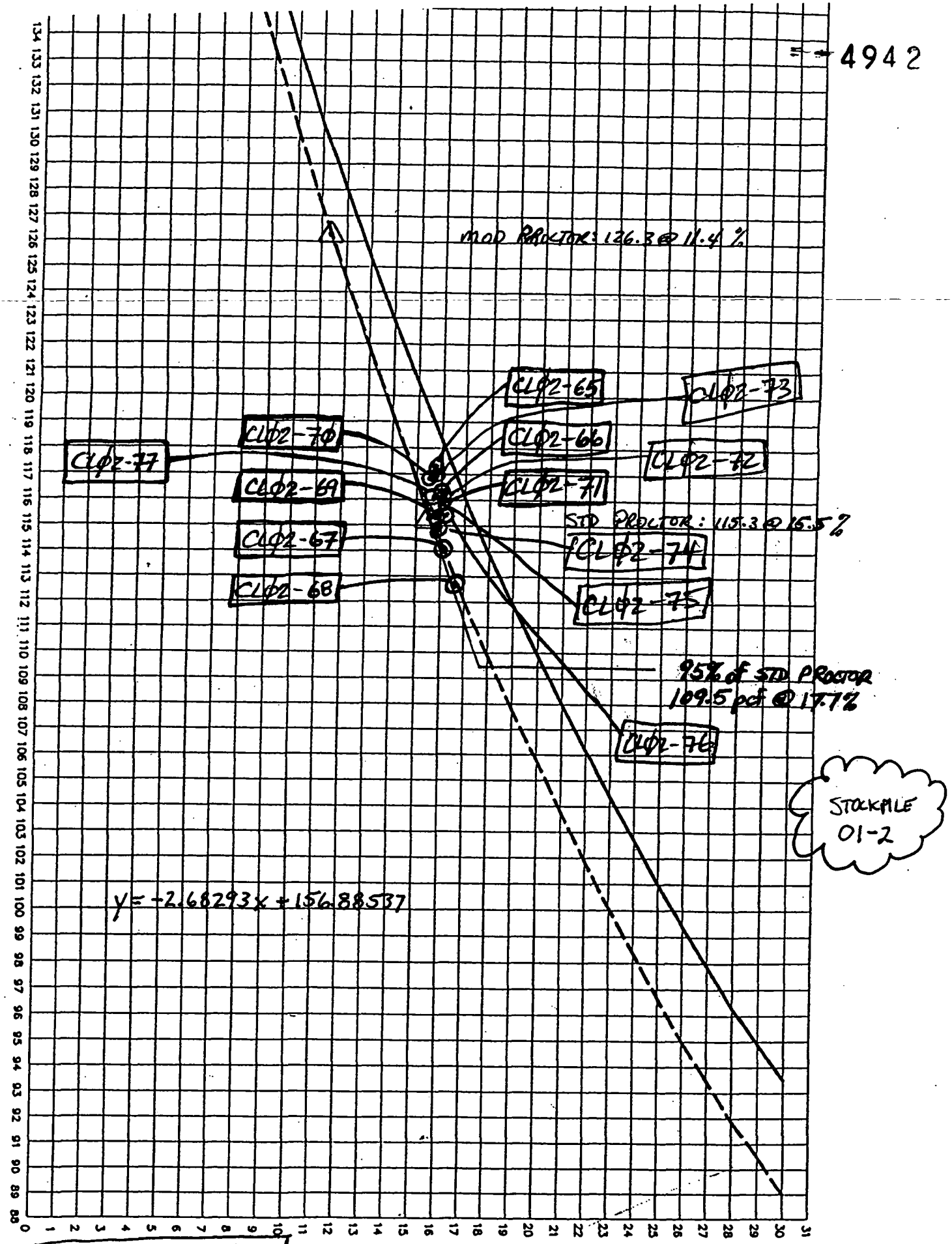
DENSITY TEST LOCATION MAP

NO SCALE

19 DAY JUNE MONTH 2002 YEAR 000469

(WEDNESDAY)

SHEET No 3 OF 4



19 JUNE 2002

GQ1341-04.1

000470

SHEET No. 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: CELLS 4 & 5 — DATE: 20 day (THURSDAY) JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: -10-3 APZ LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILES 01-2 & 01-10 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C02-78	CELL #4 - S. WEST END	6"/L-2	01-2	15.5	115.3	14.5 (15.7)	135.1	116.8	101.3	P	–	–	–	–
* C02-79	CELL #4 - S. WEST END	6"/L-1	01-2	15.5	115.3	14.9 (16.0)	133.6	115.2	99.9	P	–	–	–	–
C02-80	CELL #4 - S. WEST END	6"/L-1	01-2	15.5	115.3	14.3 (15.5)	134.6	116.5	101.0	P	–	–	–	–
C02-81	CELL #4 - S. WEST END	6"/L-1	01-2	15.5	115.3	14.7 (15.8)	133.0	114.8	99.6	P	–	–	–	–
C02-82	CELL #4 - S. WEST END	6"/L-1	01-2	15.5	115.3	15.0 (16.1)	132.9	114.5	99.3	P	–	–	–	–
C02-83	CELL #4 - S. WEST END	6"/L-2	01-2	15.5	115.3	15.0 (16.1)	133.7	115.2	99.9	P	–	–	–	–
C02-84	CELL #4 - S. WEST END	6"/L-2	01-2	15.5	115.3	14.3 (15.5)	134.4	116.4	101.0	P	–	–	–	–
C02-85	CELL #4 - S. WEST END	6"/L-2	01-2	15.5	115.3	14.3 (15.5)	134.0	116.0	100.6	P	–	–	–	–
C02-86	CELL #4 - DRAIN. CORR.	6"/L-1	01-10	13.6	120.7	14.1 (15.3)	132.9	115.3	95.5	P	–	–	–	–
C02-87	CELL #4 - DRAIN CORR.	6"/L-1	01-10	13.6	120.7	14.2 (15.4)	135.9	117.8	97.6	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-3 TAKEN @ C02-79 *

CHECKED BY: [illegible]

SHEET NO. 1 OF 6

000472

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells #4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 20 day THURSDAY JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0/-3 LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBU)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CQ02-88	Cell #4 - Drain. Corr.	6"/L-1	01-10	13.6	120.7	15.0 (16.1)	133.5	115.0	95.3	P	—	—	—	—
CQ02-89	Cell #4 - Drain Corr.	6"/L-1	01-10	13.6	120.7	15.5 (16.5)	133.8	114.8	95.1	P	—	—	—	—
CQ02-90	Cell #4 - East Bench	6"/L-2	01-10	13.6	120.7	15.2 (16.3)	134.0	115.2	95.5	P	—	—	—	—
CQ02-91	Cell #4 - East Bench	6"/L-2	01-10	13.6	120.7	15.6 (16.6)	133.9	114.8	95.1	P	—	—	—	—
CQ02-92	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	15.3 (16.3)	133.5	114.8	95.1	P	—	—	—	—
CQ02-93	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	15.2 (16.3)	134.9	116.0	96.1	P	—	—	—	—
CQ02-94	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	15.0 (16.1)	133.4	114.9	95.2	P	—	—	—	—
CQ02-95	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	15.5 (16.5)	135.0	115.9	96.0	P	—	—	—	—
CQ02-96	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	15.2 (16.3)	134.8	115.9	96.0	P	—	—	—	—
CQ02-97	Cell #4 - N. West End	6"/L-2	01-10	13.6	120.7	14.7 (15.8)	134.0	115.7	95.9	P	—	—	—	—

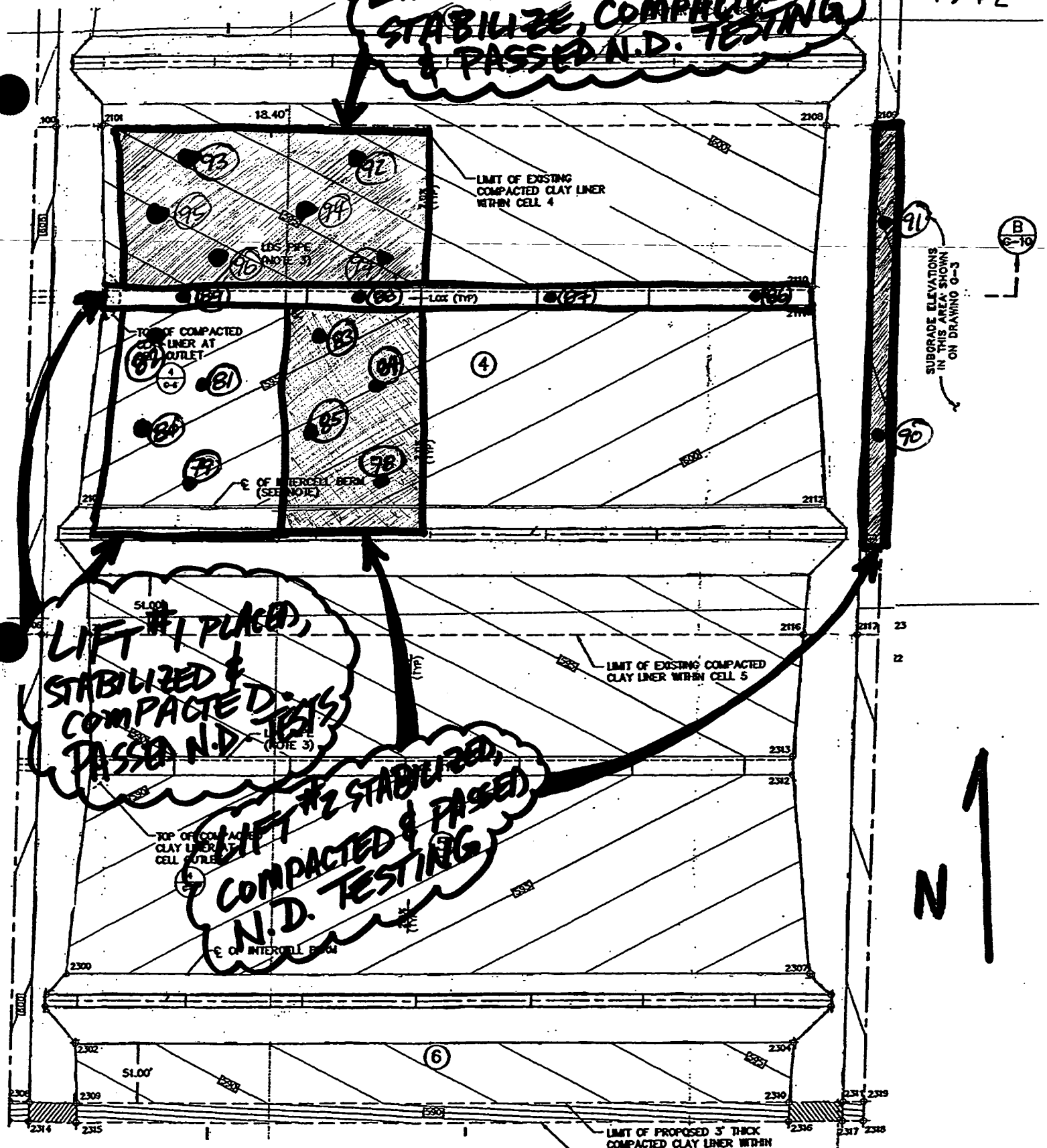
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [illegible]

SHEET NO. 2 OF 6

4942

LIFT #2 PLACED, STABILIZE, COMPACTED & PASSED N.D. TESTING



LIFT #1 PLACED, STABILIZED & COMPACTED PASSED N.D. TESTS

LIFT #2 STABILIZED, COMPACTED & PASSED N.D. TESTING

N

DENSITY TEST LOCATION MAP

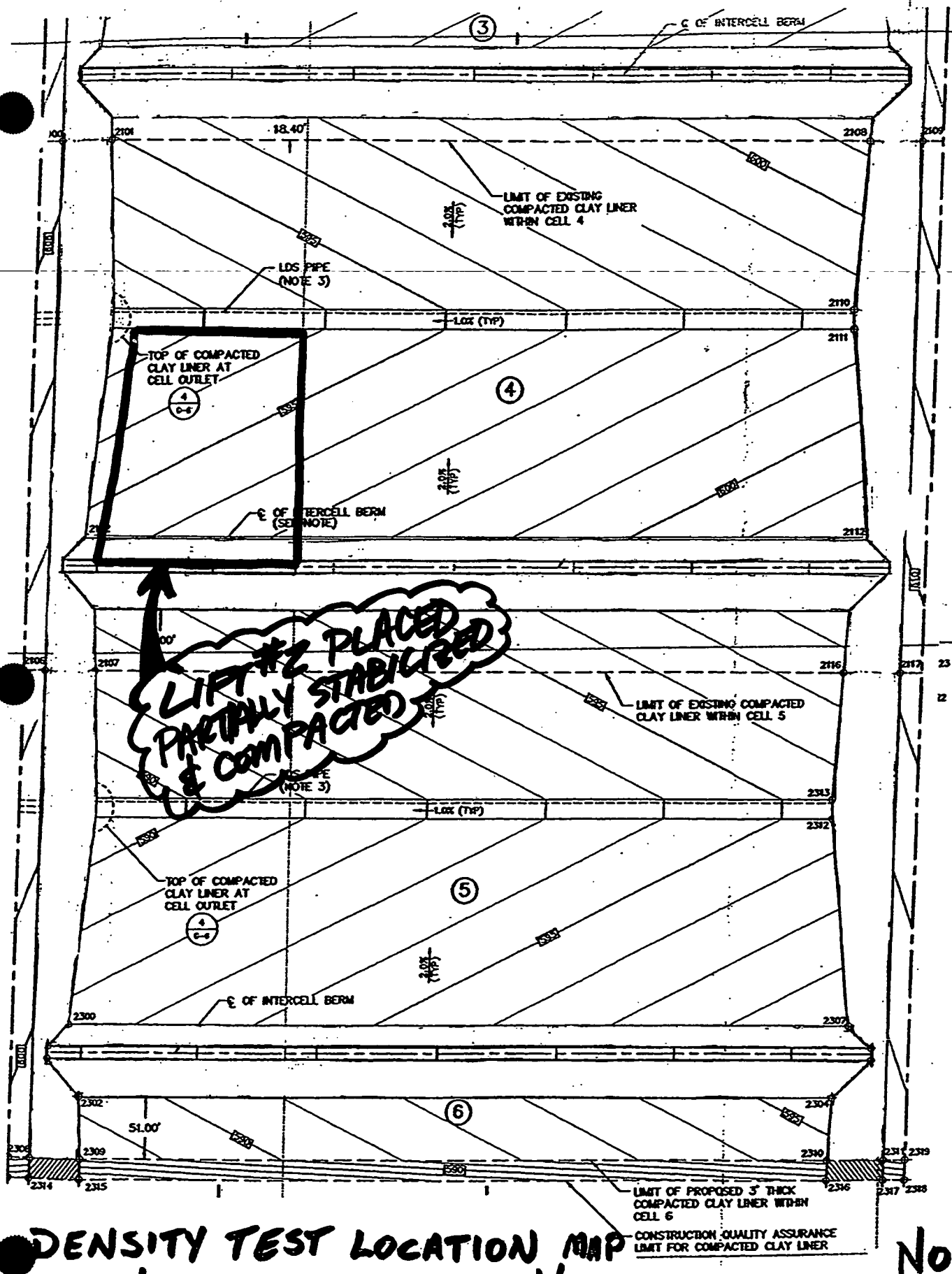
NO SCALE

24 DAY JUNE MONTH 2002 YEAR 000473

THURSDAY

SHEET No 3 OF 6

4942



N 1

DENSITY TEST LOCATION MAP

NO SCALE

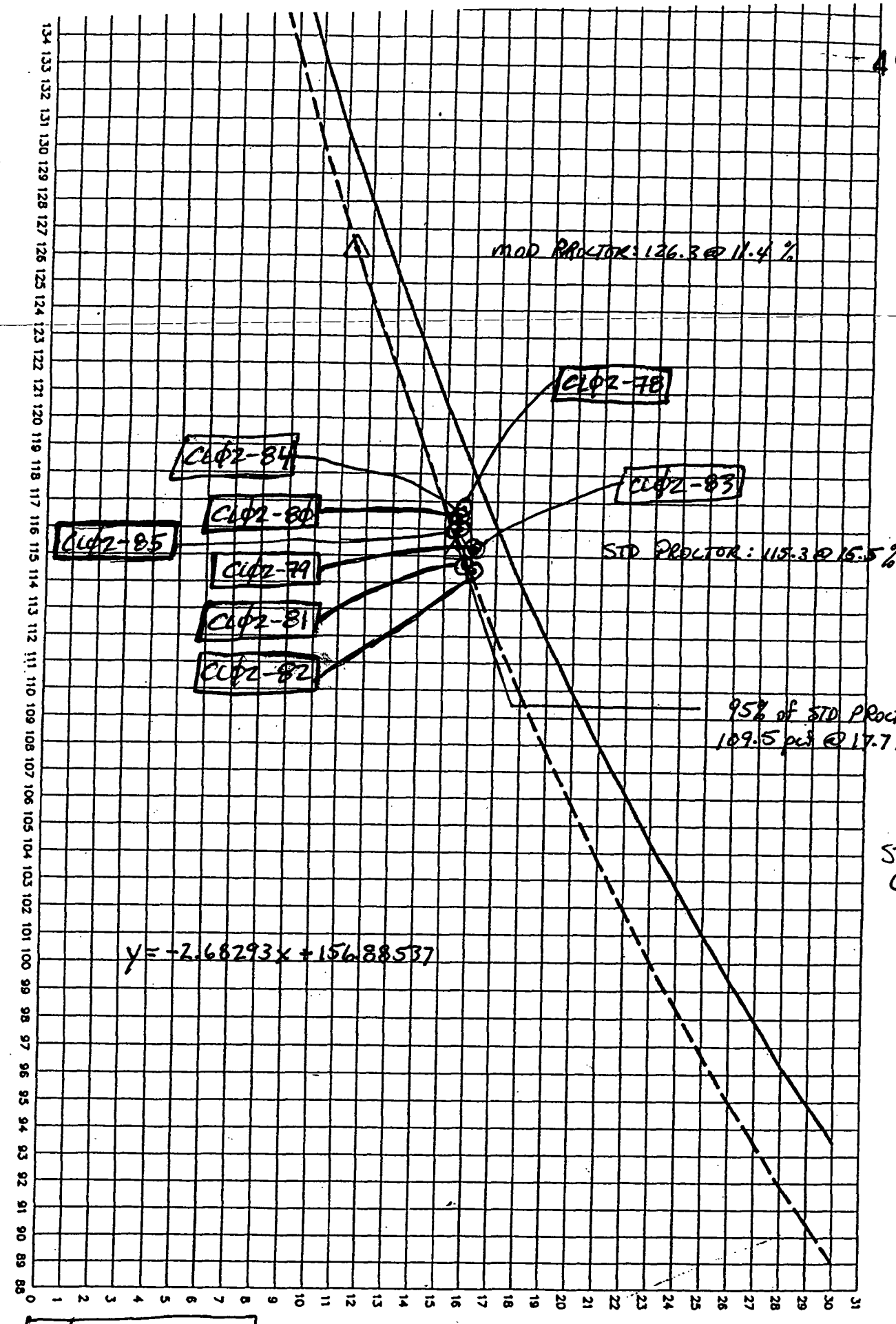
20 DAY JUNE MONTH 2002 YEAR

THURSDAY

000474

SHEET No 4 OF 6

4942



STOCKPILE
01-2

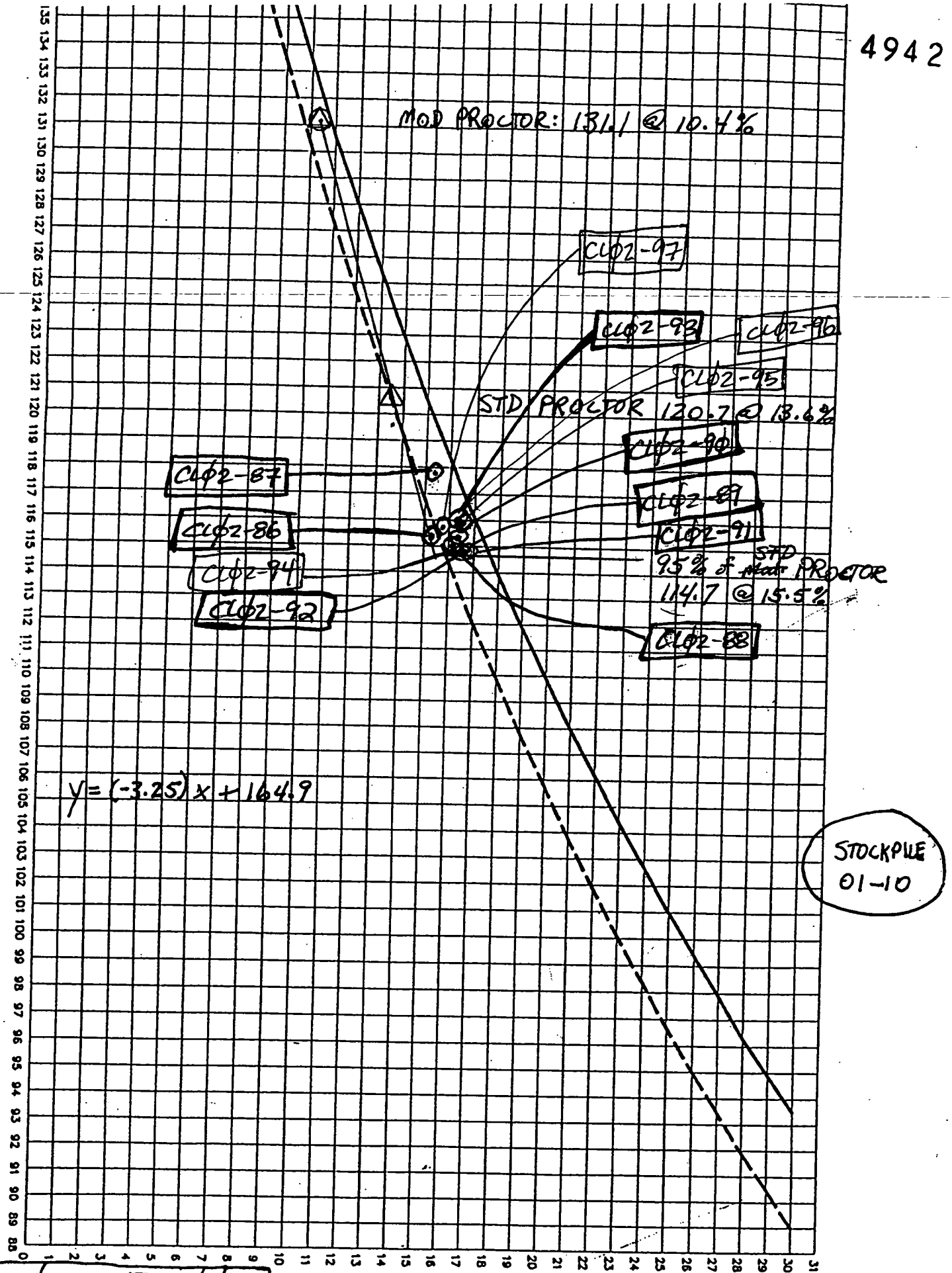
20 JUNE 2002

GQ134-04.1

000475

SHEET No. 5 OF 6

4942



20 JUNE 2002

GQ1341-04.1

000476

SHEET No 6 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1341 TASK NO.: 041

DESCRIPTION: Cells 4 & 5 — DATE: 21 (FRIDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (AVE) COMPACTION / MOISTURE RANGE: 10-3 (AVE) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 — MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) (CIRCLE ONE) — OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 — GAUGE SERIAL NO. 20979 — CORRECTION FACTOR Y = 0.8481 X + 3.3669 — QA ID: (TBD)

TEST NO.	TEST LOCATION* (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C002-98	Cell #4 - S. West End	6"/L-2	01-10	13.6	120.7	14.8 (15.9)	134.6	116.1	96.2	P	—	—	—	—
C002-99	Cell #4 - S. West End	6"/L-2	01-10	13.6	120.7	12.7 (14.1)	136.2	119.4	98.9	P	—	—	—	—
C002-100	Cell #4 - S. West End	6"/L-2	01-10	13.6	120.7	14.8 (15.9)	133.5	115.2	95.4	P	—	—	—	—
C002-101	Cell #4 - S. West End	6"/L-2	01-10	13.6	120.7	15.6 (16.6)	133.9	114.8	95.1	P	—	—	—	—
C002-102	Cell #4 - S. West End	6"/L-2	01-10	13.6	120.7	14.8 (15.9)	133.4	115.1	95.4	P	—	—	—	—
C002-103	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	14.0 (15.2)	134.8	117.0	96.9	P	—	—	—	—
C002-104	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	12.7 (14.1)	136.3	119.5	99.0	P	—	—	—	—
C002-105	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	14.6 (15.7)	135.1	116.8	96.8	P	—	—	—	—
C002-106	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	13.2 (14.6)	135.7	118.4	98.1	P	—	—	—	—
C002-107	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	13.1 (14.5)	135.0	117.9	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-4 TAKEN @ C002-100.

CHECKED BY: [illegible]

SHEET NO. 1 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells #4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 21 day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0.3 APZ LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TRE) (0)

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-108	Cell #4 - N. West End	6"/L-3	01-10	13.6	120.7	13.1 (14.5)	136.3	119.0	98.6	P	—	—	—	—
CL02-109	Cell #4 - Centre Corridor	6"/L-2	01-10	13.6	120.7	12.4 (13.9)	136.4	119.8	99.2	P	—	—	—	—
CL02-110	Cell #4 - Corridor	6"/L-2	01-10	13.6	120.7	13.8 (15.1)	135.3	117.5	97.4	P	—	—	—	—
CL02-111	Cell #4 - Corridor	6"/L-2	01-10	13.6	120.7	12.9 (14.3)	136.9	119.8	99.2	P	—	—	—	—
CL02-112	Cell #4 - Corridor	6"/L-2	01-10	13.6	~~107~~ 120.7 (8)	14.3 (15.5)	135.4	117.2	97.1	P	—	—	—	—

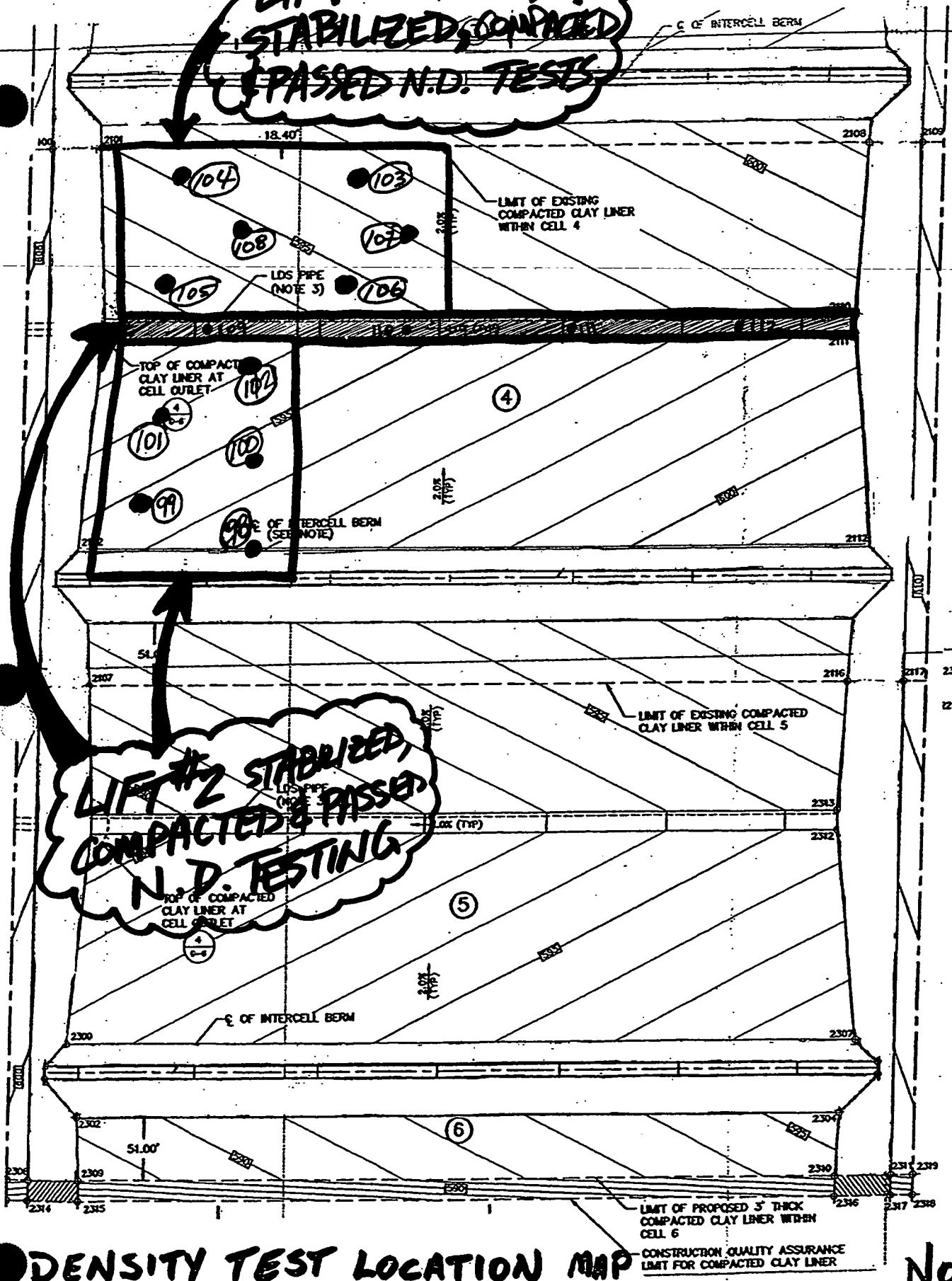
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000478

4942

4942

LIFT #3 PLACED, STABILIZED, COMPACTED & PASSED N.D. TESTS



N 1

DENSITY TEST LOCATION MAP

NO SCALE

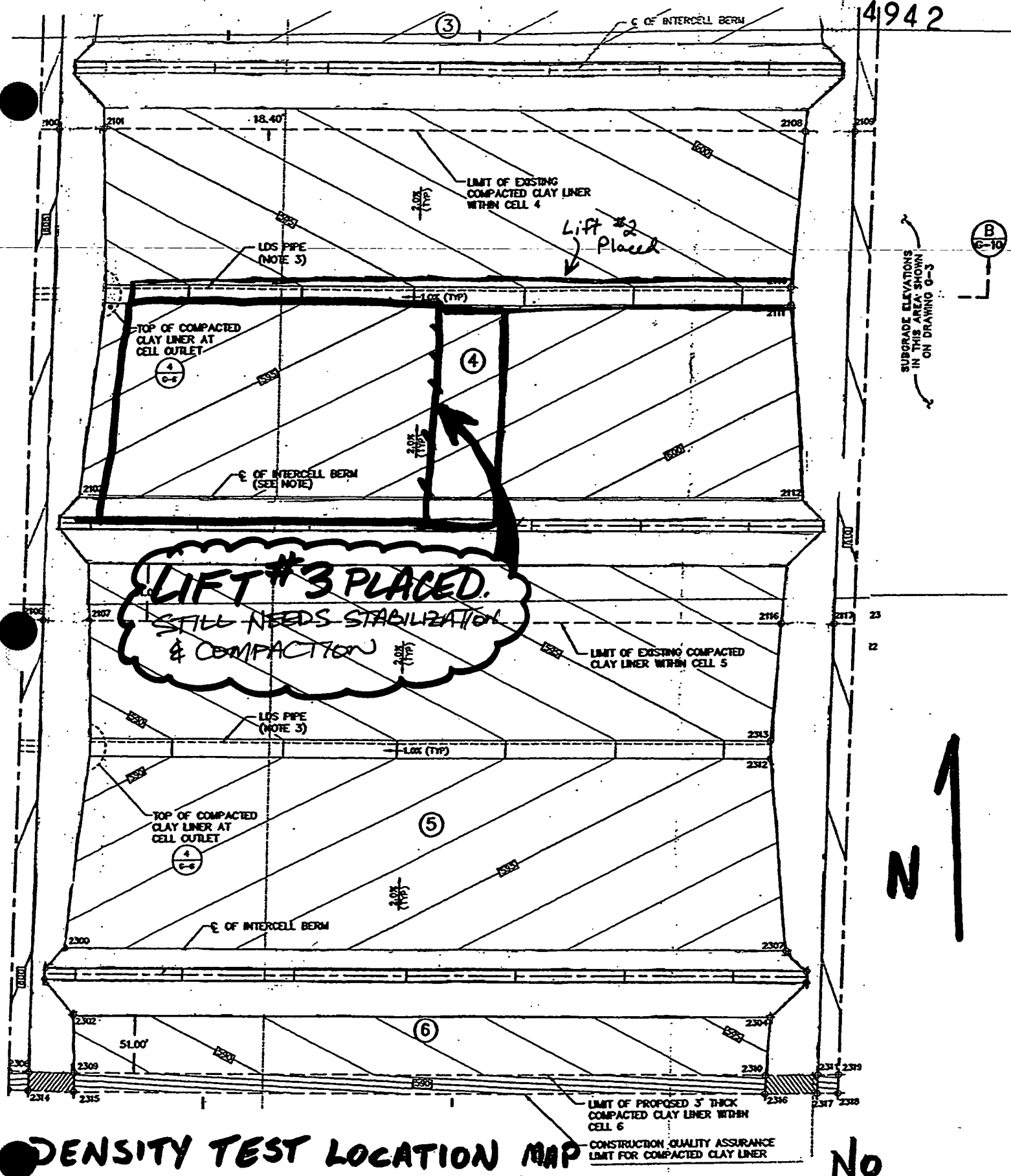
21 DAY JUNE MONTH 2002 YEAR

(FRIDAY)

000479

SHEET NO 3 OF 5

4942



N 1

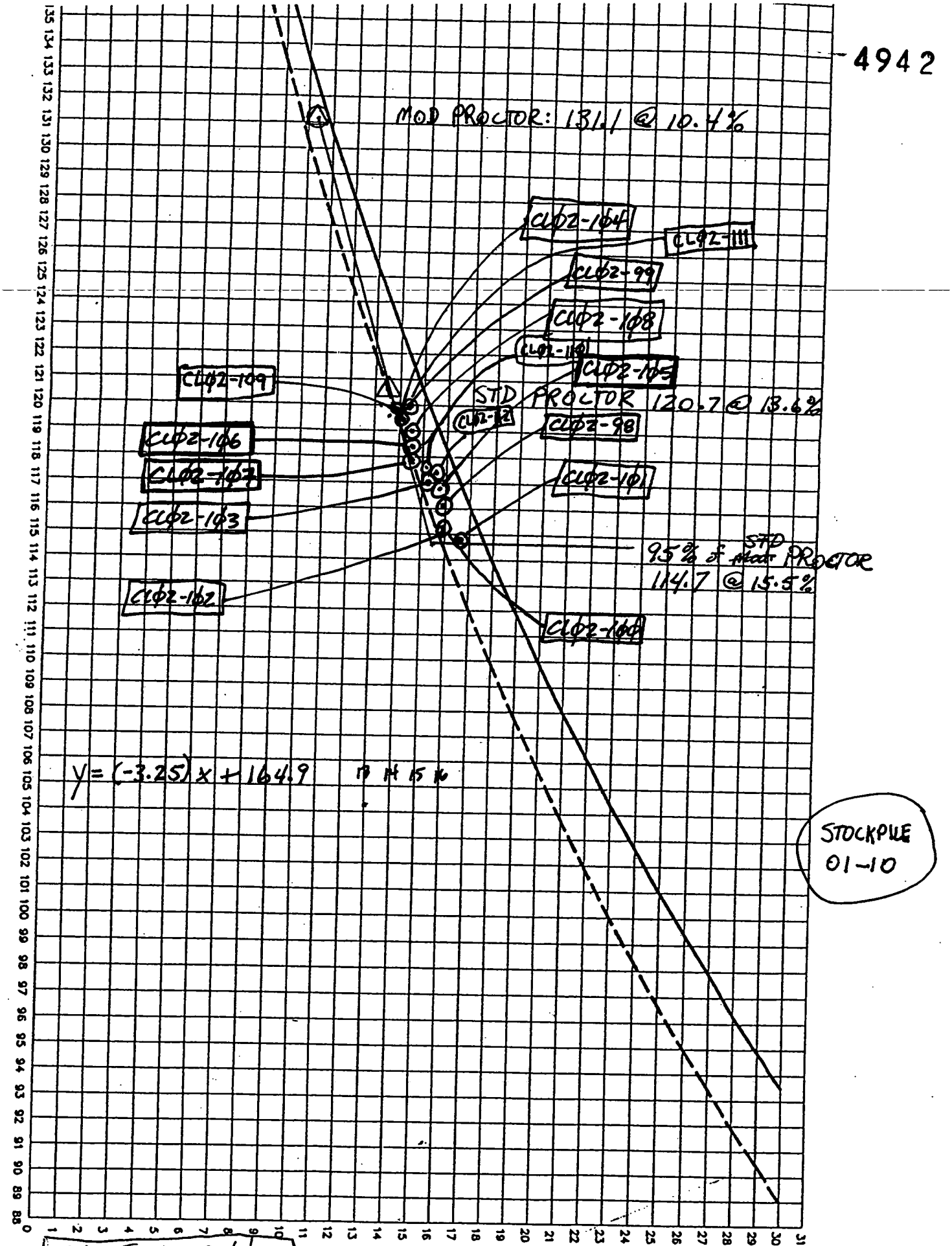
DENSITY TEST LOCATION MAP

21 DAY JUNE MONTH 2002 YEAR 000480 NO SCALE

(FRIDAY)

SHEET No 4 OF 5

4942



21 JUNE 2ØØ2

GQ1341-Ø4.1

000481

SHEET No. 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 60134 TASK NO.: 04.1

DESCRIPTION: Cells 4 & 5

DATE: 22 (SATURDAY) day June month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (AP2) COMPACTION / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CS

TEST NO.	TEST LOCATION— (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-113	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	12.3 (13.8)	137.9	121.2	100.4	P	—	—	—	—
CL02-114	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	13.1 (14.5)	134.9 ~~135.3~~	117.8	97.6	P	—	—	—	—
CL02-115	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	14.2 (15.4)	134.2	116.3	96.4	P	—	—	—	—
CL02-116	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	14.1 (15.3)	132.8	115.2	95.4	P	—	—	—	—
CL02-117	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	14.7 (15.8)	133.0	114.9	95.2	P	—	—	—	—
CL02-118	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	14.4 (15.6)	133.8	115.7	95.9	P	—	—	—	—
CL02-119	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	13.2 (14.6)	134.9	117.7	97.5	P	—	—	—	—
CL02-120	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	12.9 (14.3)	135.4	118.5	98.2	P	—	—	—	—
CL02-121	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	14.3 (15.5)	132.9	115.1	95.4	P	—	—	—	—
CL02-122	CELL #4 - S. WEST END	6"/L-3	01-10	13.6	120.7	13.6 (14.9)	133.9	116.5	96.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ134H TASK NO.: 04.1

DATE: 22 day (SATURDAY) June month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (MDD) COMPACTION / MOISTURE RANGE: +0-3 (MDD) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CS

TEST NO.	TEST LOCATION— (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-123	CELL #4 - S. WEST END	6" / L-3	01-10	13.6	120.7	14.4 (15.6)	132.9	115.0	95.2	P	—	—	—	—
CL02-124	CELL #4 - DRAIN. CORR.	6" / L-3	01-10	13.6	120.7	11.5 (13.1)	135.4	119.7	99.2	—	F	CL02-137	P	—
CL02-125	CELL #4 - D. CORRIDOR	6" / L-3	01-10	13.6	120.7	13.2 (14.6)	135.6	118.3 ~~119.8~~	98.0	P	—	—	—	—
CL02-126	CELL #4 - D. CORRIDOR	6" / L-3	01-10	13.6	120.7	15.2 (16.3)	133.8	115.0	95.3	P	—	—	—	—
CL02-127	CELL #4 - N. EAST END	6" / L-4	01-10	13.6	120.7	15.9 (16.9)	132.2	113.1	93.7	—	F	CL02-136	P	—
CL02-128	CELL #4 - N. EAST END	6" / L-4	01-10	13.6	120.7	15.0 (16.1)	133.7	115.2	95.4	P	—	—	—	—
CL02-129	CELL #4 - N. EAST END	6" / L-4	01-10	13.6	120.7	12.9 (14.3)	135.5	118.5	98.2	P	—	—	—	—
CL02-130	CELL #4 - N. EAST END	6" / L-4	01-10	13.6	120.7	14.9 (16.0)	133.7	115.3	95.5	P	—	—	—	—
CL02-131	CELL #4 - D. CORRIDER	6" / L-3	01-10	13.6	120.7	12.9 (14.3)	135.7	118.7	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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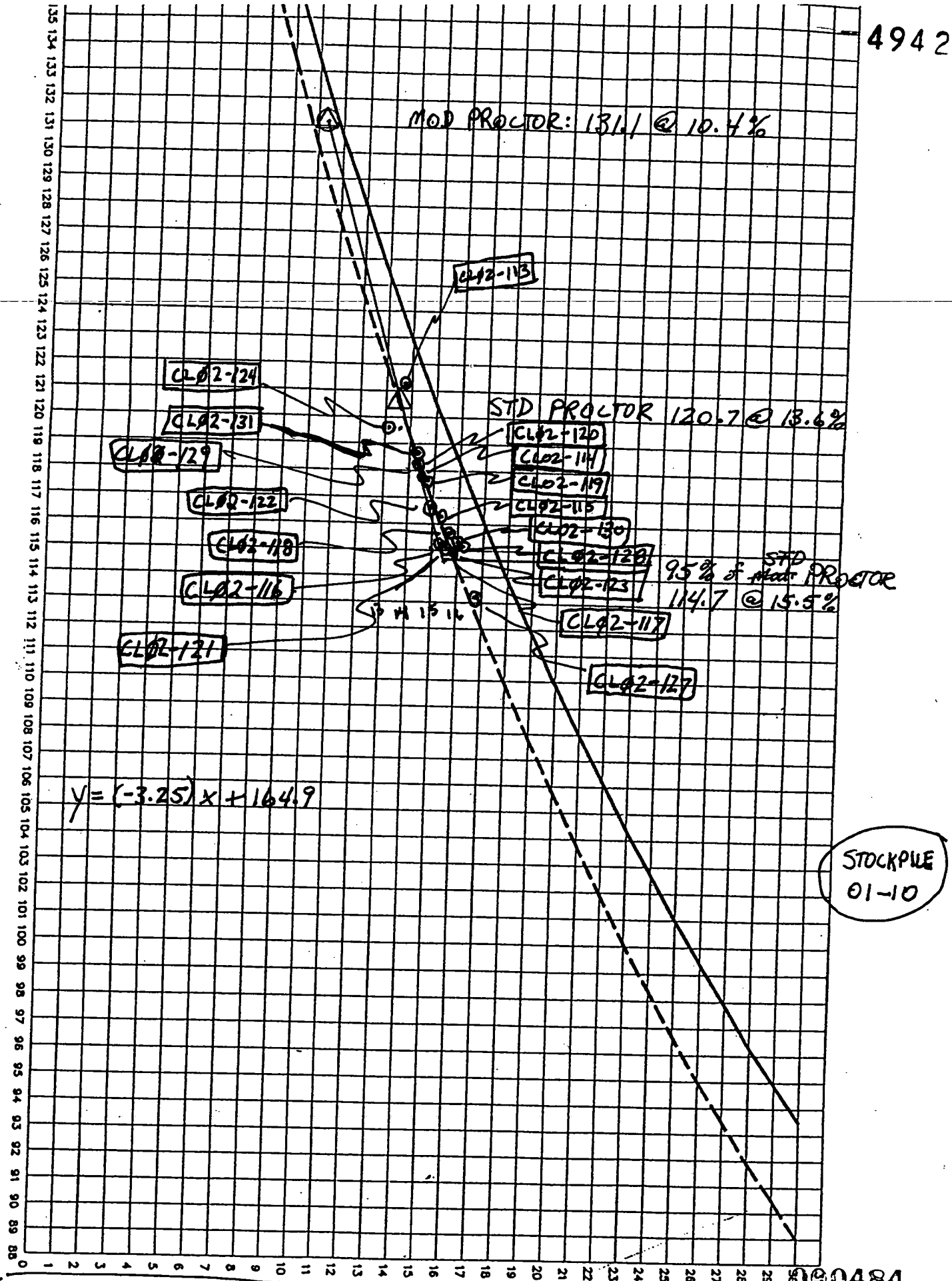

22 JUNE 2002

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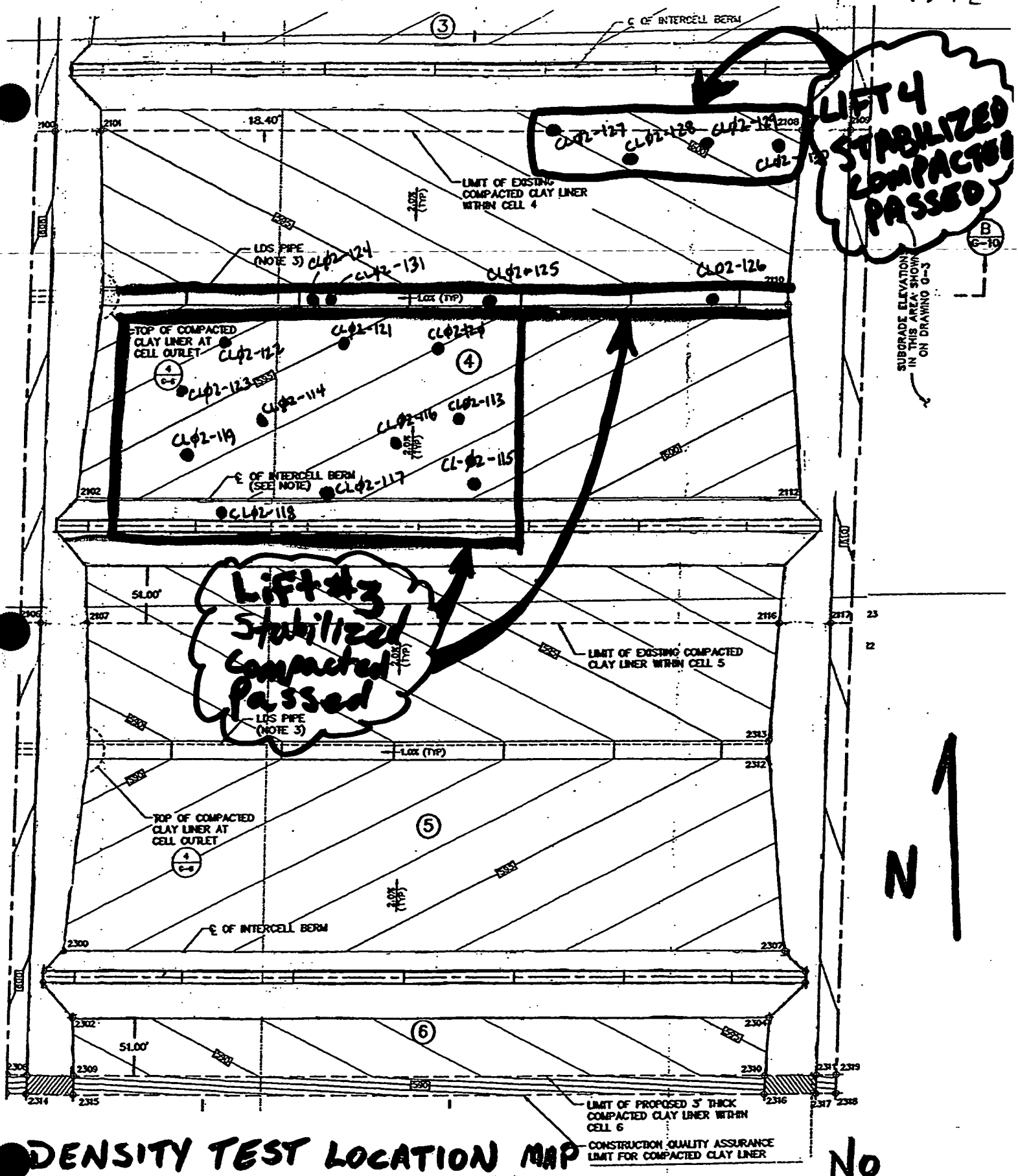

DENSITY TEST LOCATION MAP

22 DAY June MONTH 2002 YEAR

NO SCALE

000485

SHEET No 3 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells #4 & 5

PROJECT NO.: GQ134 TASK NO.: 041

DATE: 23 day JUNE month 2002 year (SUNDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0.3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID:

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-132	Cell #4 - East Slope	6"/L-1	01-10	13.6	120.7	13.7 (15.0)	136.4	118.6	98.3	P	–	–	–	–
CU02-133	Cell #4 - East Slope	6"/L-1	01-10	13.6	120.7	12.8 (14.2)	137.7	120.6	99.9	P	–	–	–	–
CU02-134	Cell #4 - East Slope	6"/L-1	01-10	13.6	120.7	14.0 (15.2)	135.5	117.6	97.4	P	–	–	–	–
CU02-135	Cell #4 - East Slope	6"/L-1	01-10	13.6	120.7	14.9 (16.0)	135.7	117.0	96.9	P	–	–	–	–
CU02-136	Cell #4 - N. East End	6"/L-4	01-10	13.6	120.7	12.9 (14.3)	138.5	121.2	100.4	P	–	–	–	–
CU02-137	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	13.0 (14.4)	136.2	119.1	98.6	P	–	–	–	–
CU02-138	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	12.7 (14.0)	138.5	121.4	100.6	P	–	–	–	–
CU02-139	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	14.3 (15.3)	133.9	115.9	96.0	P	–	–	–	–
CU02-140	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	14.6 (15.7)	132.9	114.9	95.2	P	–	–	–	–
CU02-141	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	14.3 (15.5)	135.4	117.2	97.1	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 23 (SUNDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% (AP2) COMPACTION / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE / (COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-142	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	12.6 (14.1)	138.2	121.1	100.3	P	–	–	–	–
CL02-143	Cell #4 - N. West End	6"/L-4	01-10	13.6	120.7	12.3 (13.8)	137.5	120.8	100.1	P	–	–	–	–
CL02-144	Cell #4 - N. East End	6"/L-4	01-10	13.6	120.7	13.2 (14.6)	136.0	118.7	98.3	P	–	–	–	–
CL02-145	Cell #4 - N. East End	6"/L-4	01-10	13.6	120.7	12.1 (13.6)	137.3	120.9	100.1	P	–	–	–	–
CL02-146	Cell #4 - N. East End	6"/L-4	01-10	13.6	120.7	13.8 (15.1)	136.8	118.9	98.5	P	–	–	–	–
CL02-147	Cell #4 - East Slope	6"/L-2	01-10	13.6	120.7	14.6 (15.7)	134.2	116.0	96.1	P	–	–	–	–
CL02-148	Cell #4 - East Slope	6"/L-2	01-10	13.6	120.7	12.4 (13.9)	137.2	120.5	99.8	P	–	–	–	–
CL02-149	Cell #4 - East Slope	6"/L-2	01-10	13.6	120.7	13.5 (14.8)	136.6	119.0	98.6	P	–	–	–	–
CL02-150	Cell #4 - S. East End	6"/L-4	01-10	13.6	120.7	14.9 (16.0)	134.1	115.6	95.8	P	–	–	–	–
CL02-151	Cell #4 - S. East End	6"/L-4	01-10	13.6	120.7	14.3 (15.5)	135.7	117.5	97.3	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

DC02-5 TAKEN @ CL02-144 DC02-6 TAKEN AT CL02-146*

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 23 day JUNE month 2002 year (SUNDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0 -3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-10

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBK)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-152	Cell #4 - S. East End	6"/L-4	01-10	13.6	120.7	14.9 (16.0)	133.8	115.3	95.6	P	–	–	–	–
CL02-153	Cell #4 - S. East End	6"/L-4	01-10	13.6	120.7	13.5 (14.8)	135.1	117.7	97.5	P	–	–	–	–
CL02-154	Cell #4 - S. East End	6"/L-4	01-10	13.6	120.7	14.2 (15.4)	133.9	116.0	96.1	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible] SHEET NO. 3 OF 5

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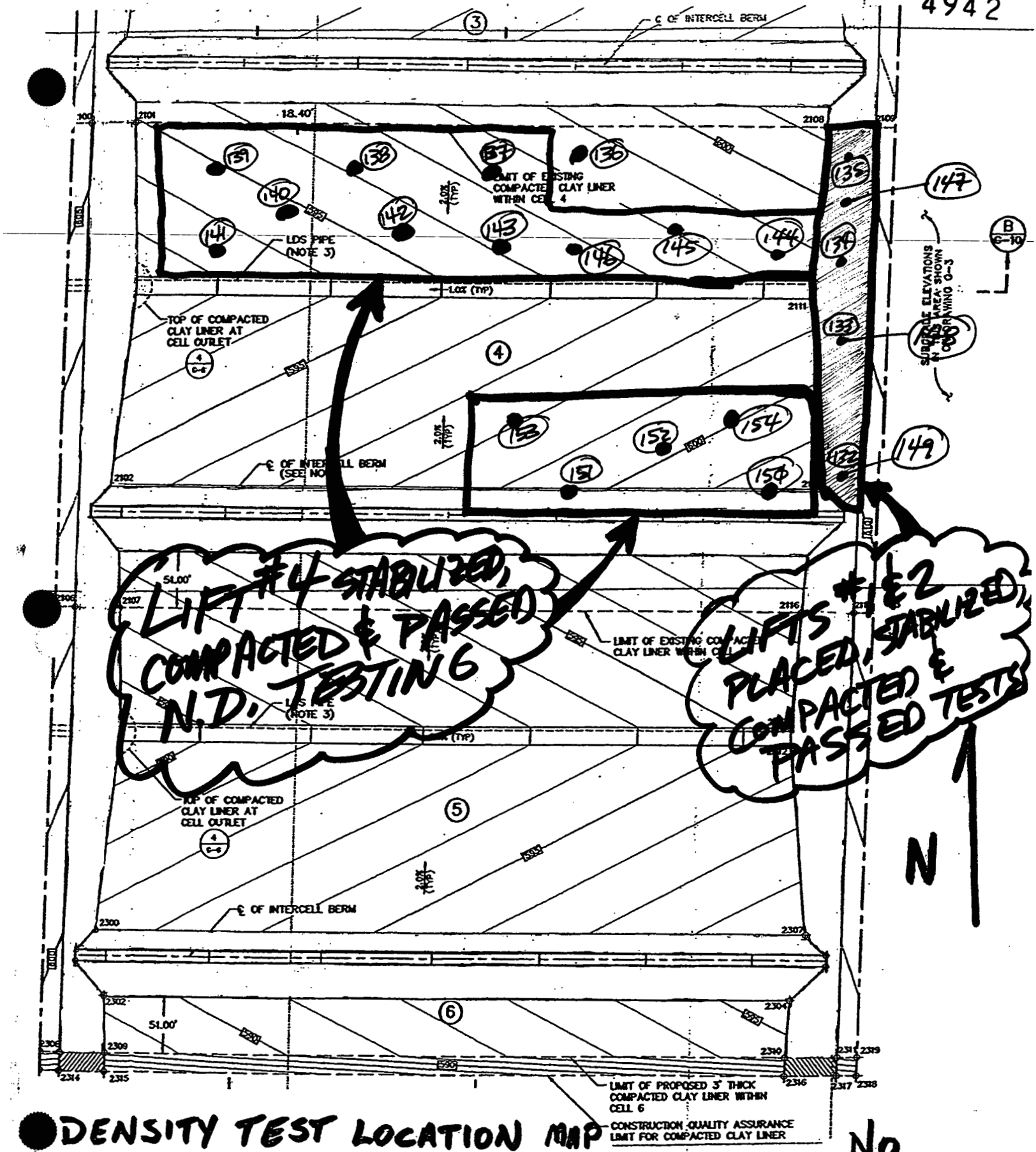

DENSITY TEST LOCATION MAP

23 DAY JUNE Month 2002 YEAR 000489 SCALE NO

(SUNDAY)

SHEET No 4 OF 5

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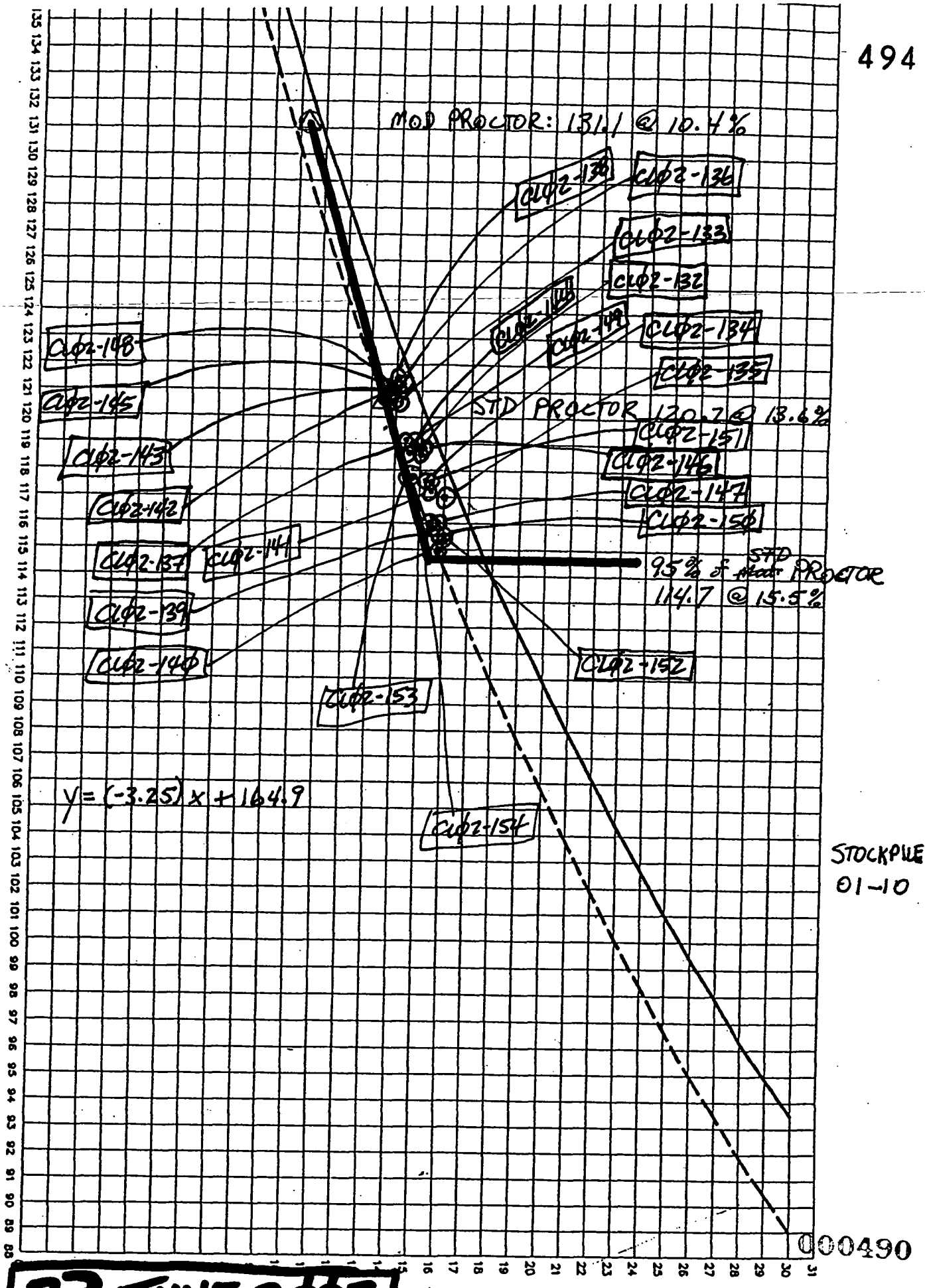

STOCKPILE
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23 JUNE 2002

GOB41-64.1

SHEET No 5 of 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 6Q134 TASK NO.: 04.1

DESCRIPTION: Cells 4&5

DATE: 24 (MONDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% (APZ) COMPACTION / MOISTURE RANGE: +0.3 (APZ) LIFT THICKNESS (LOOSE/COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILES 01-10/01-4 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: 164

TEST NO.	TEST LOCATION— (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-155	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	11.9 (13.5)	136.7	120.4	99.8	–	F	CU02-163	P	–
CU02-156	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	10.7 (12.4)	134.6	119.8	99.2	–	F	CU02-168	P	–
CU02-157	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	12.1 (13.6)	136.7	120.3	99.7	–	F	CU02-164	P	–
CU02-158	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	12.3 (13.8)	131.9	115.9	96.0	–	F	CU02-169	P	–
CU02-159	Cell #4 - East Slope	6"/L-3	01-4	14.1	118.8	13.5 (14.8)	135.8	118.3	99.6	P	–	–	–	–
CU02-160	Cell #4 - East Slope	6"/L-3	01-4	14.1	118.8	14.1 (15.3)	135.0	117.1	98.6	P	–	–	–	–
CU02-161	Cell #4 - East Slope	6"/L-3	01-4	14.1	118.8	12.8 (14.2)	138.8	121.5	102.3	P	–	–	–	–
CU02-162	Cell #4 - East Slope	6"/L-3	01-4	14.1	118.8	12.6 (14.1)	137.7	120.7	101.6	P	–	–	–	–
CU02-163	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	13.1 (14.5)	137.9	120.4	99.8	P	–	–	–	–
CU02-164	Cell #4 - S. West End	6"/L-4	01-10	13.6	120.7	12.2 (13.7)	137.9	121.3	100.5	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: CELLS 4&5

DATE: 24 (MONDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% (APR) COMPACTION / MOISTURE RANGE: +0-3 (APR) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBL)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CU02-165	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	12.1 / (13.6)	137.5	121.0	100.3	P	—	—	—	—
CU02-166	CELL #4 - EAST BENCH	6"/L-3	01-4	14.1	118.8	12.9 / (14.3)	129.8	113.6	95.6	—	F	CU02-175	P	—
CU02-167	CELL #4 - EAST BENCH	6"/L-3	01-4	14.1	118.8	11.1 / (12.8)	135.6	120.2	101.2	—	F	CU02-176	P	—
CU02-168	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	12.3 / (13.8)	137.1	120.5	99.8	P	—	—	—	—
CU02-169	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	14.6 / (15.7)	132.9	114.9	95.2	P	—	—	—	—
CU02-170	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	13.7 / (15.0)	135.3	117.7	97.5	P	—	—	—	—
CU02-171	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	14.1 / (15.3)	136.6	118.5	98.2	P	—	—	—	—
CU02-172	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	12.1 / (13.6)	137.7	121.2	100.4	P	—	—	—	—
CU02-173	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	13.8 / (15.1)	135.1	117.4	97.2	P	—	—	—	—
CU02-174	CELL #4 - S. WEST END	6"/L-4	01-10	13.6	120.7	13.6 / (14.9)	134.5	117.1	97.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: [signature]

SHEET NO. 2 OF 5

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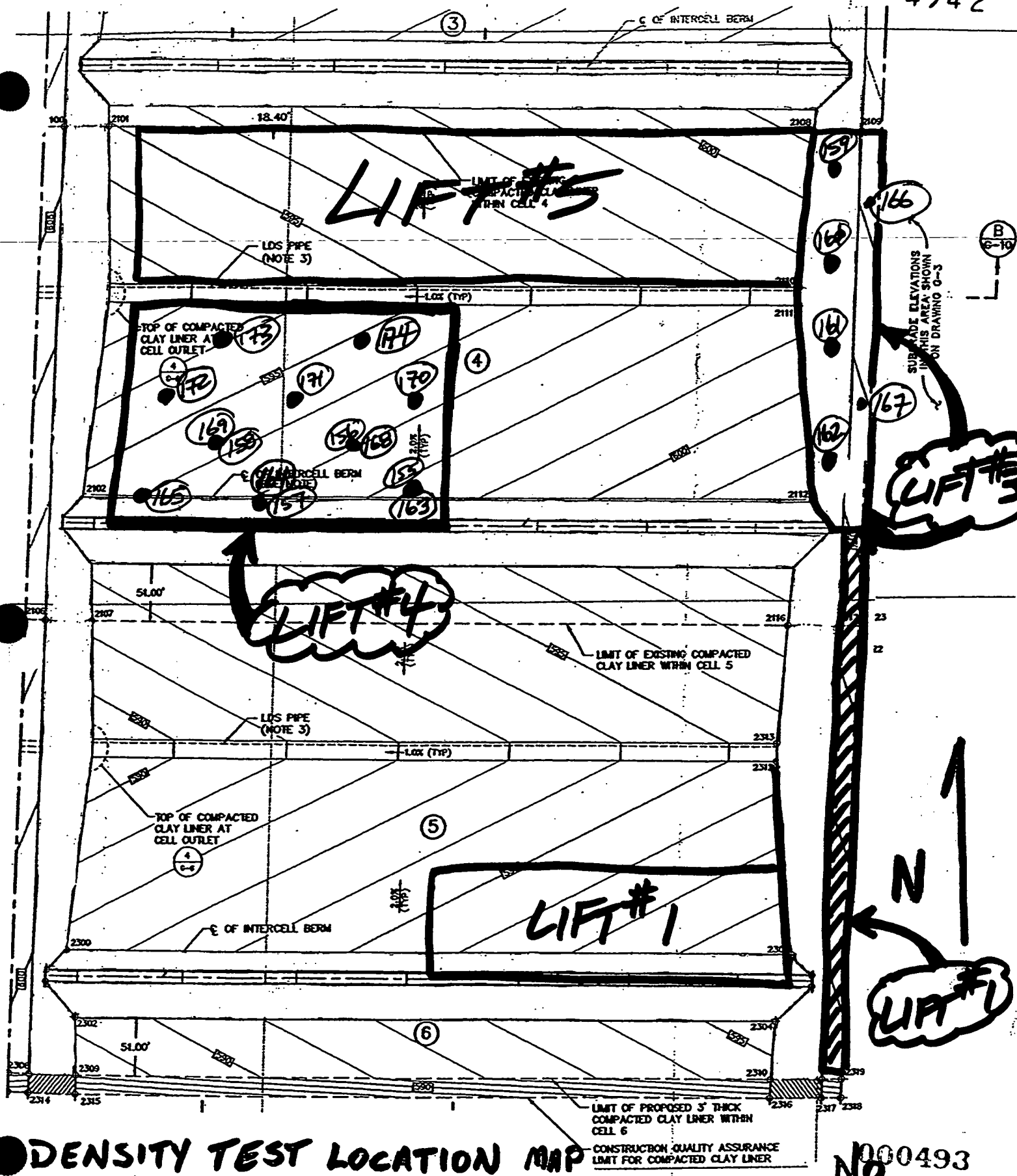


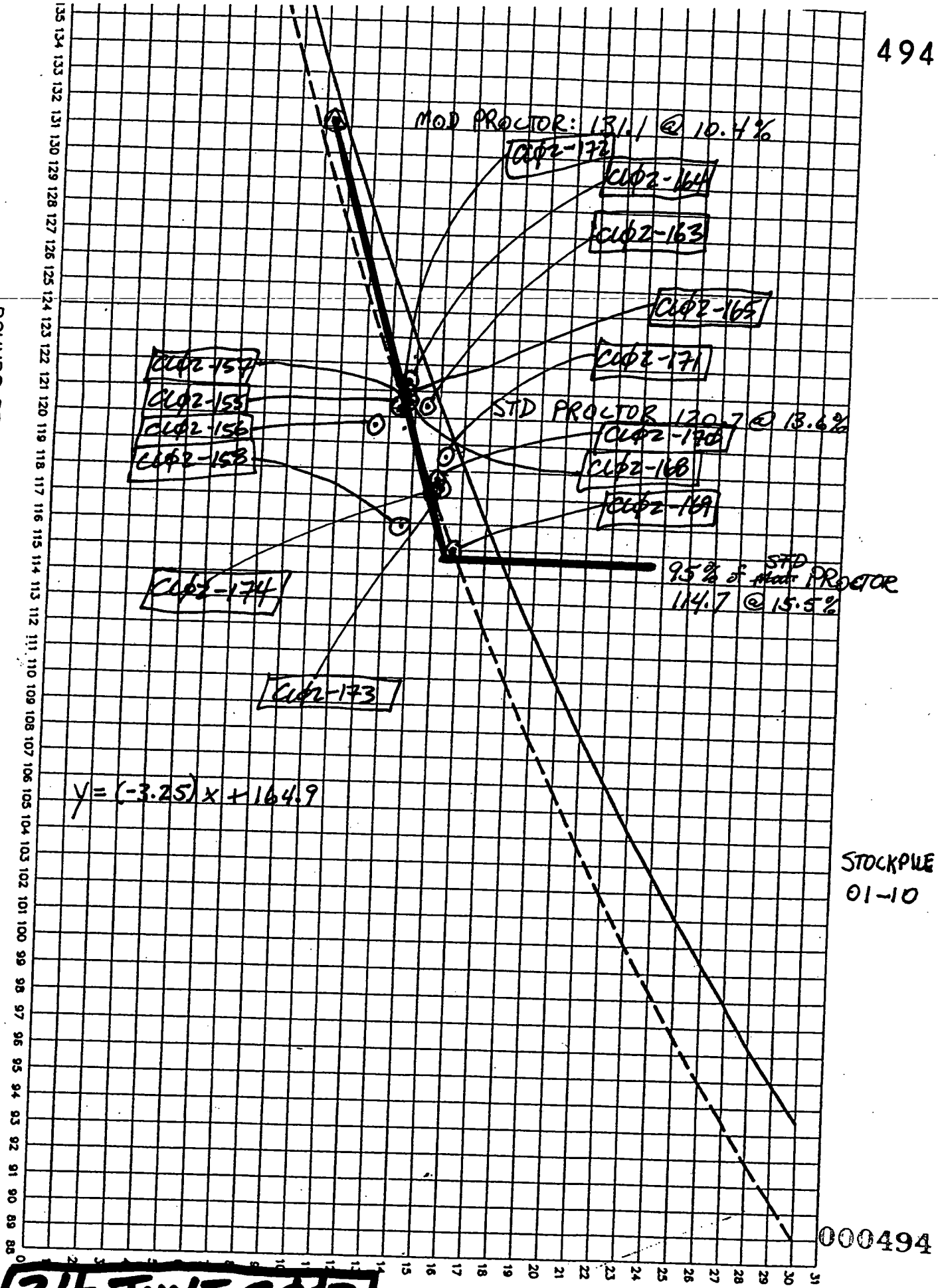
DENSITY TEST LOCATION MAP

NO SCALE

000493

24 DAY JUNE MONTH 2002 YEAR

SHEET No 3 OF 5

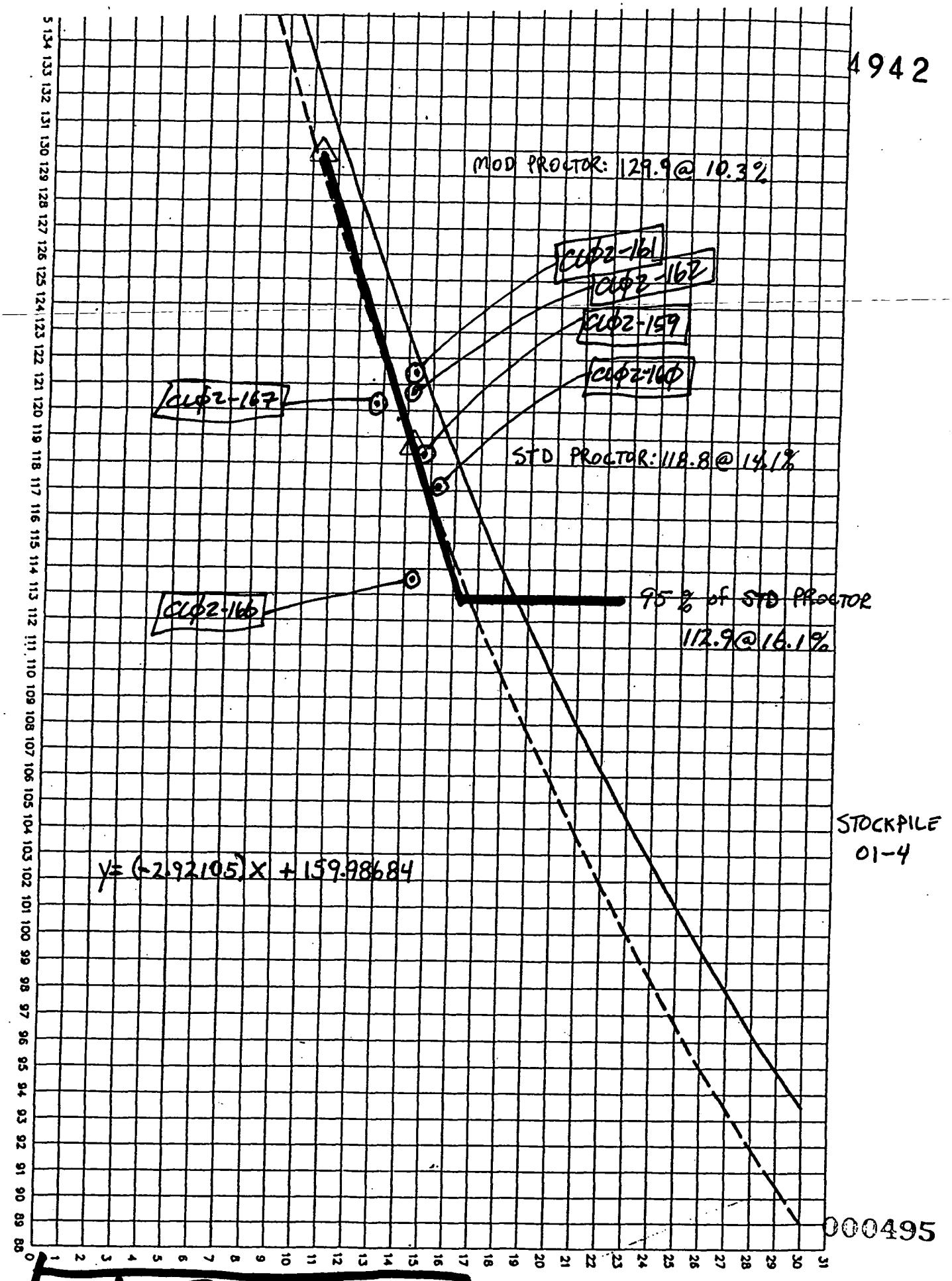


STOCKPILE
01-10

24 JUNE 2002

(GQ1341-041)

SHEET No. 4 OF 5



STOCKPILE
01-4

24 JUNE 2002

(GQ1344-04.1)

SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: CELLS 4 & 5

DATE: 25 day JUNE month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0.3 (AP2) LIFT THICKNESS (LOOSE/COMPACTED) ~6"

MATERIAL SOURCE: STOCKPILE MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: TBD

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-175	CELL #4 - EAST BENCH	6"/L-3	01-4	14.1	118.8	14.2 (15.4)	136.3	118.1	99.4	P	-	-	-	-
CL02-176	CELL #4 - EAST BENCH	6"/L-3	01-4	14.1	118.8	14.9 (16.0)	133.1	114.7	96.6	P	-	-	-	-

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CJ SHEET NO. 1 OF 3

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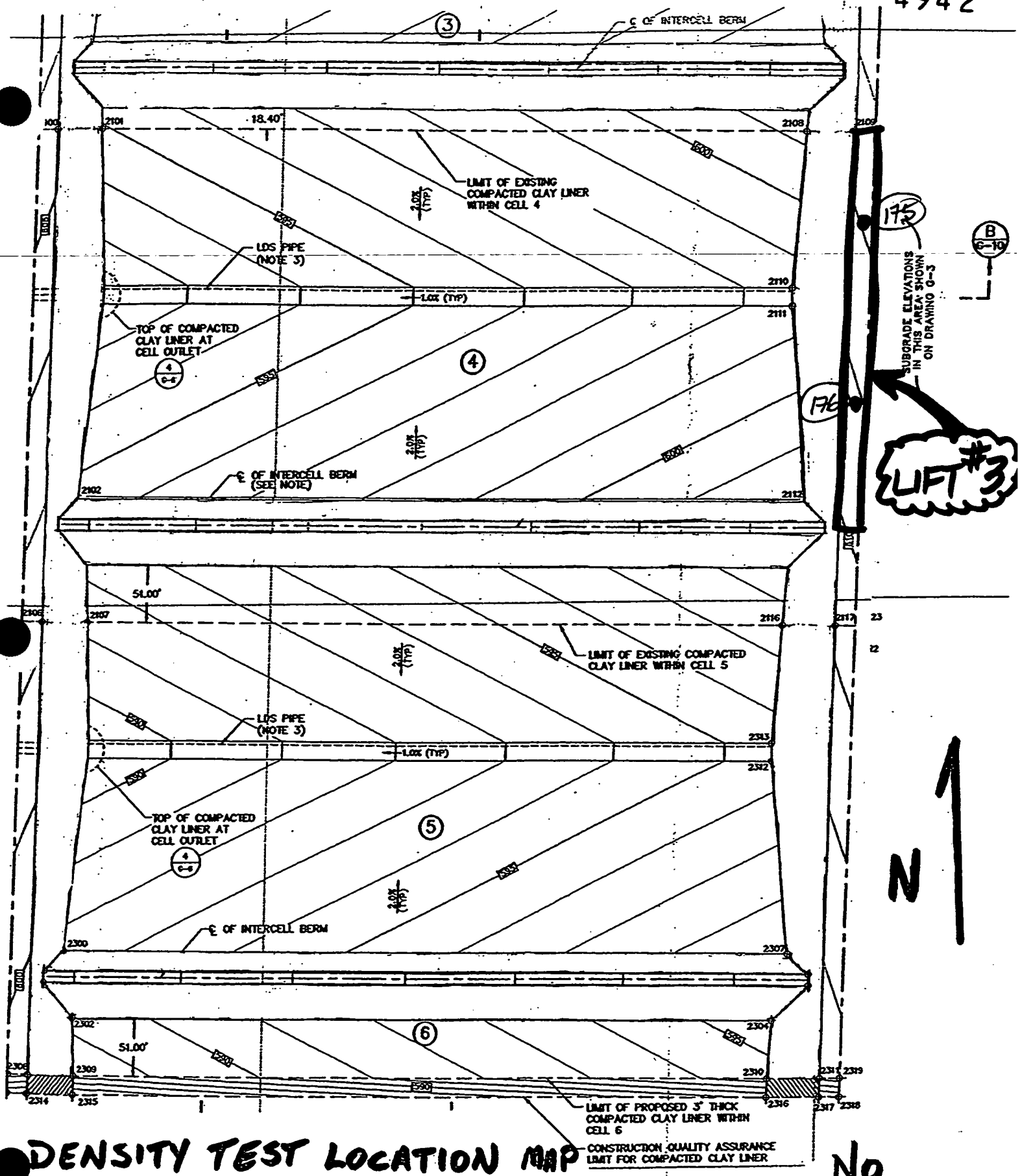


DENSITY TEST LOCATION MAP

NO SCALE

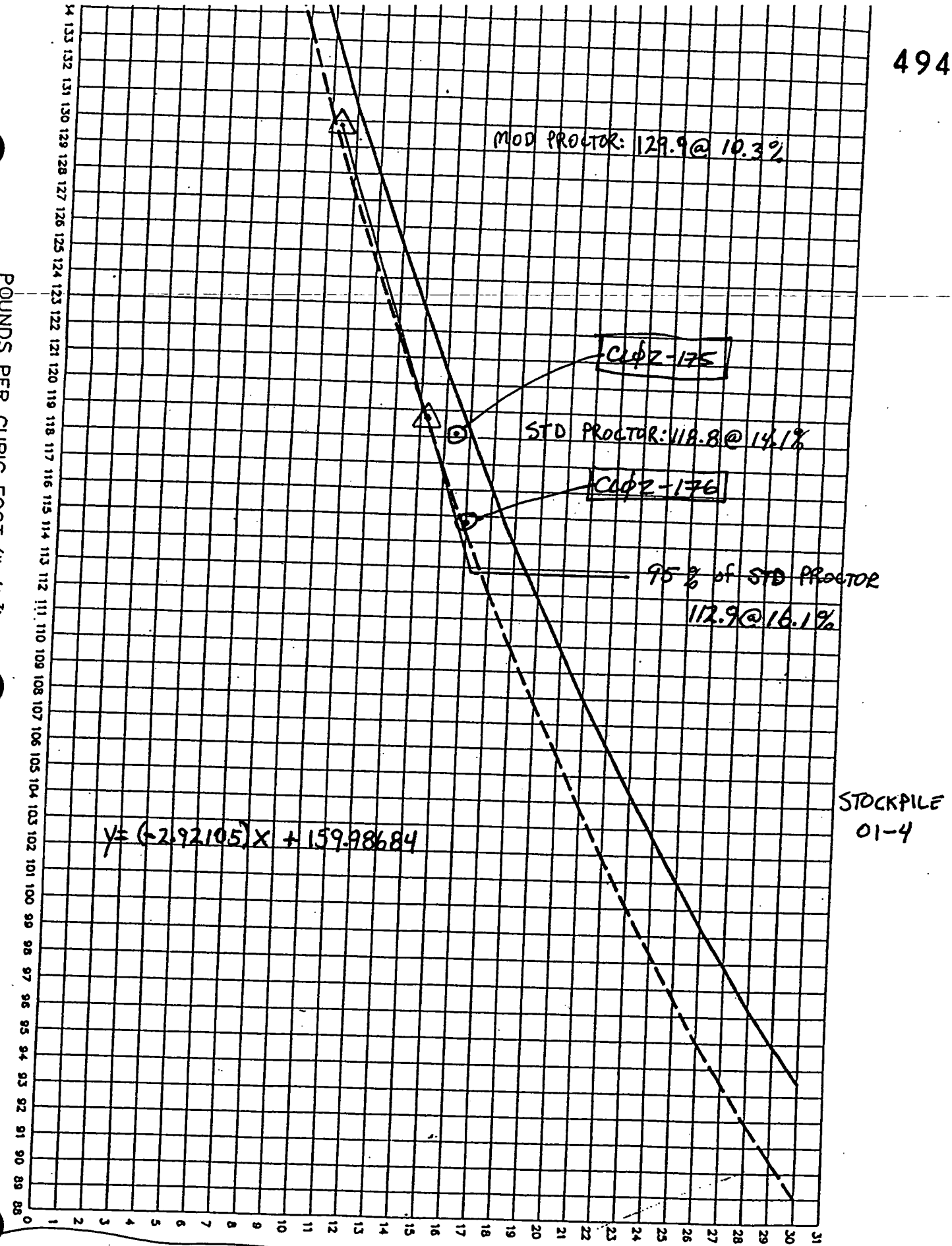
25 DAY JUNE MONTH 2002 YEAR

000497

TUESDAY

SHEET No 2 OF 3

4942



25 JUNE 2ØØ2

GQB4-Ø4.1

000498

SHEET No 3 OF 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 26 day (WEDNESDAY) JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-4 & 10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: TBD

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-177	CELL #4 - S. EAST END	6"/L-4	01-10	13.6	120.7	13.6 (14.9)	136.4	118.7	98.4	P	—	—	—	—
CL02-178	CELL #4 - S. EAST END	6"/L-4	01-10	13.6	120.7	15.1 (16.2)	133.8	115.1	95.4	P	—	—	—	—
CL02-179	CELL #4 - S. EAST END	6"/L-4	01-10	13.6	120.7	13.7 (15.0)	137.7	119.7	99.2	P	—	—	—	—
CL02-180	CELL #4 - S. EAST END	6"/L-4	01-10	13.6	120.7	14.4 (15.6)	136.0	117.6	97.5	P	—	—	—	—
CL02-181	CELL #4 - S. EAST END	6"/L-4	01-10	13.6	120.7	15.0 (16.1)	133.5	115.0	95.3	P	—	—	—	—
CL02-182	CELL #4 - EAST SLOPE	6"/L-4	01-4	14.1	118.8	14.5 (15.7)	133.4	115.3	97.1	P	—	—	—	—
CL02-183	CELL #4 - EAST SLOPE	6"/L-4	01-4	14.1	118.8	14.6 (15.7)	133.2	115.1	96.9	P	—	—	—	—
CL02-184	CELL #4 - EAST SLOPE	6"/L-4	01-4	14.1	118.8	15.4 (16.4)	133.1	114.3	96.3	P	—	—	—	—
CL02-185	CELL #4 - EAST BENCH	6"/L-4	01-4	14.1	118.8	14.4 (15.6)	133.5	115.5	97.2	P	—	—	—	—
CL02-186	CELL #4 - EAST BENCH	6"/L-4	01-4	14.1	118.8	15.7 (16.7)	133.4	114.3	96.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-7 TAKEN AT CL02-180 *

004994

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS #4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 26 day JUNE month 2002 year
WEDNESDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0.3 LIFT THICKNESS (LOOSE (COMPACTED): ~6"
AP2 AP2

MATERIAL SOURCE: STOCKPILE 01-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION — (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-187	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	13.3 (14.6)	136.2	118.8	100.0	P	—	—	—	—
CL02-188	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	15.3 (16.3)	133.5	114.8	96.6	P	—	—	—	—
CL02-189	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	13.9 (15.2)	135.4	117.5	98.9	P	—	—	—	—
CL02-190	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	13.3 (14.6)	137.6	120.1	101.1	P	—	—	—	—
CL02-191	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	13.7 (15.0)	135.1	117.5	98.8	P	—	—	—	—
CL02-192	CELL #4 - N. EAST END	6"/L-5	01-4	14.1	118.8	13.4 (14.7)	137.0	119.4	100.5	P	—	—	—	—
CL02-193	CELL #5 - EAST BENCH	6"/L-1	01-4	14.1	118.8	13.9 (15.2)	135.2	117.4	98.8	P	—	—	—	—
CL02-194	CELL #5 - EAST BENCH	6"/L-1	01-4	14.1	118.8	13.5 (14.8)	137.1	119.4	100.5	P	—	—	—	—
CL02-195	CELL #5 - EAST BENCH	6"/L-1	01-4	14.1	118.8	13.1 (14.5)	139.2	121.6	102.3	P	—	—	—	—
CL02-196	CELL #4 - N. WEST END	6"/L-5	01-4	14.1	118.8	15.3 (16.3)	133.5	114.8	96.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 6

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 26 day JUNE month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (APZ) / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: 780

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CC02-197	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	14.9 (16.0)	133.7	115.3	97.0	P	–	–	–	–
CC02-198	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	13.9 (15.2)	136.3	118.3	99.6	P	–	–	–	–
CC02-199	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	13.7 (15.0)	136.4	118.6	99.8	P	–	–	–	–
CC02-200	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	14.1 (15.3)	135.0	117.1	98.6	P	–	–	–	–
CC02-201	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	14.9 (16.0)	132.6	114.3	96.2	P	–	–	–	–
CC02-202	Cell #4 - N. West End	6"/L-5	01-4	14.1	118.8	14.9 (16.0)	133.0	114.7	96.5	P	–	–	–	–
CC02-203	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	15.5 (16.5)	132.2	113.5	95.5	P	–	–	–	–
CC02-204	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	15.8 (16.8)	132.0	113.0	95.1	P	–	–	–	–
CC02-205	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	13.1 (14.5)	135.6	118.4	99.7	P	–	–	–	–
CC02-206	Cell #4 - Drain Corr	6"/L-4	01-4	14.1	118.8	10.8 (12.5)	136.8	121.6	102.4	–	F	CC02-219	P	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-8 TAKEN AT CC02-199 *

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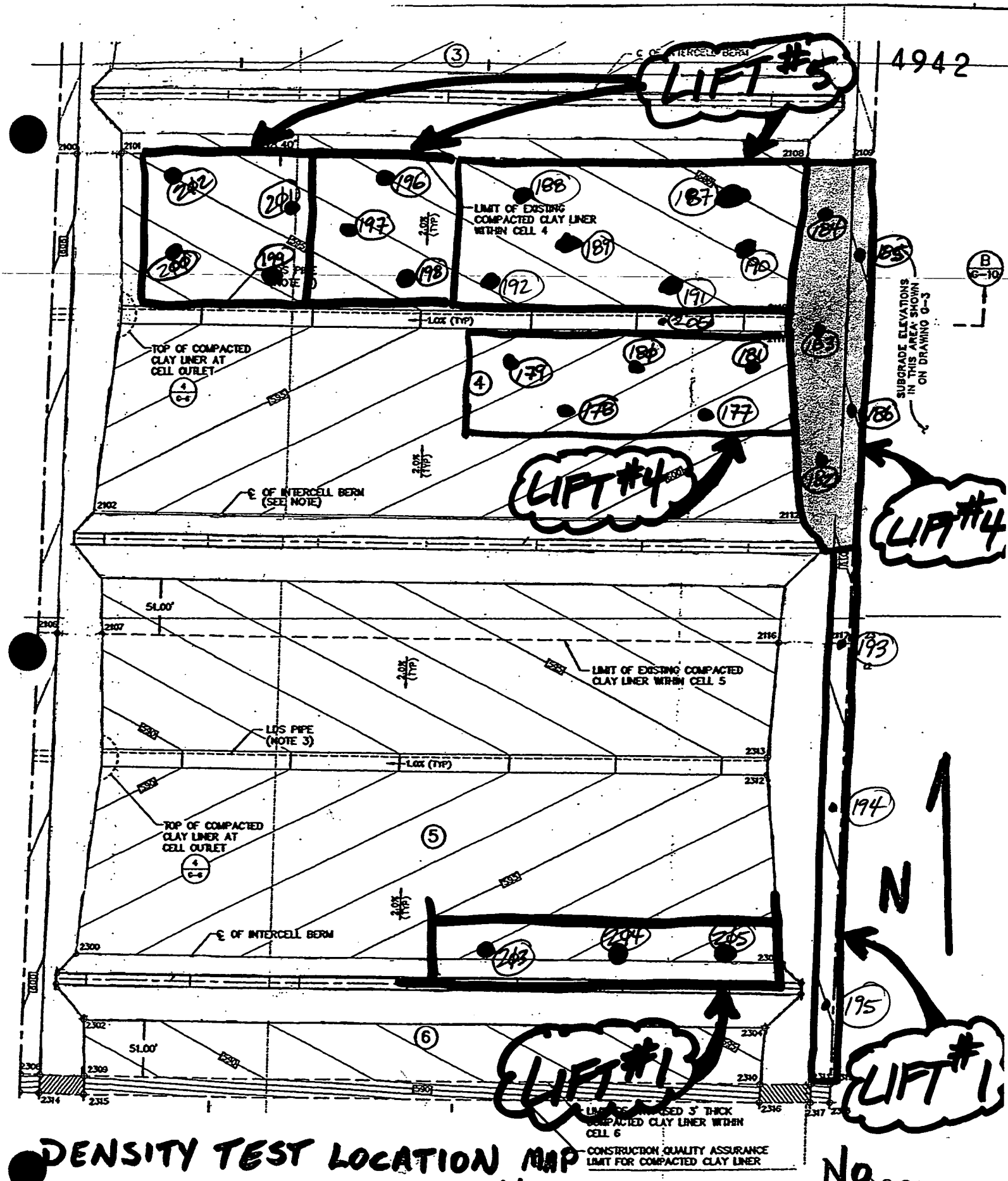


DENSITY TEST LOCATION MAP

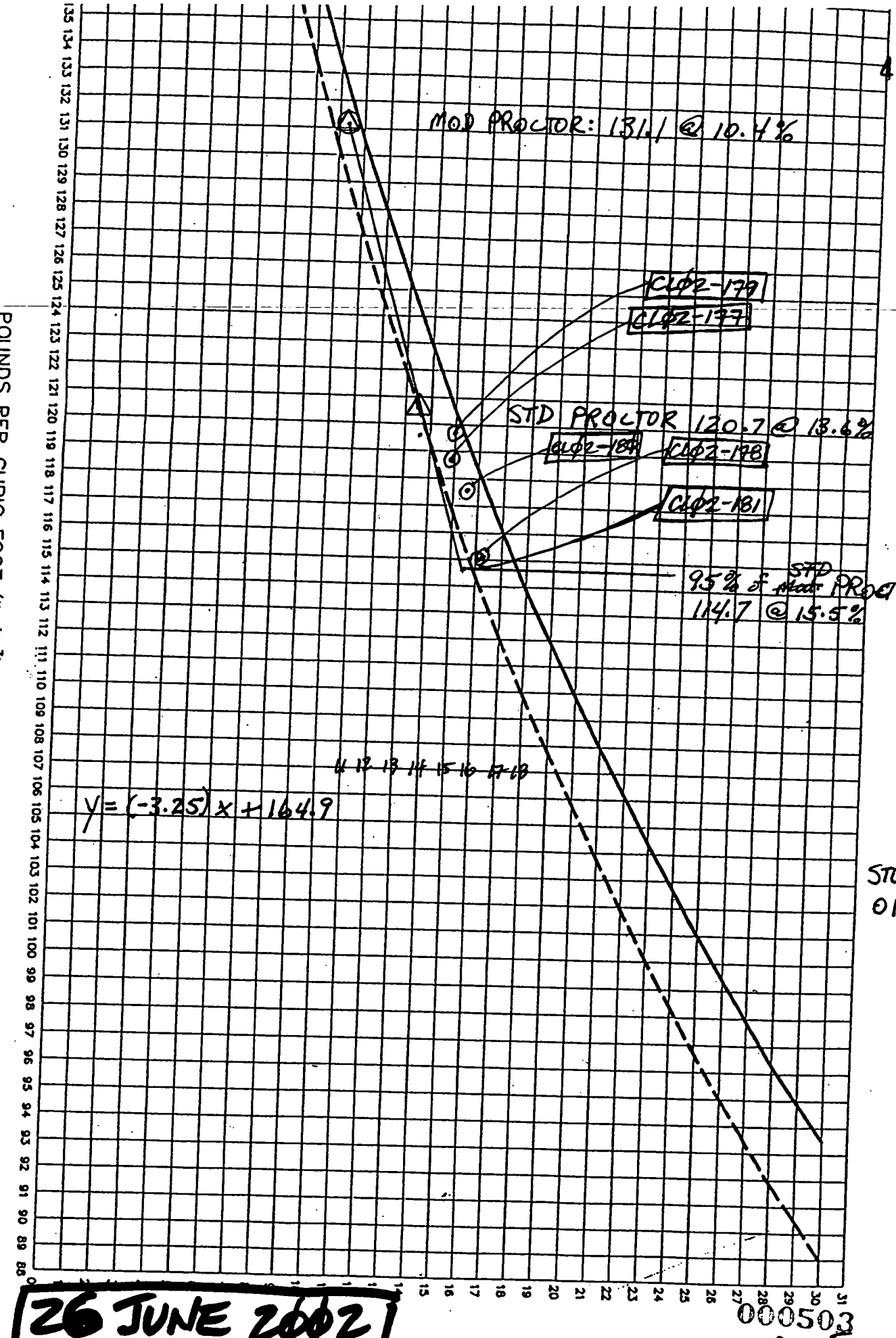
26 DAY JUNE Month 2002 YEAR

WEDNESDAY

NO SCALE

SHEET No 4 OF 6

000502



STOCKPILE
01-10

26 JUNE 2002

GQ1341-Ø4.1

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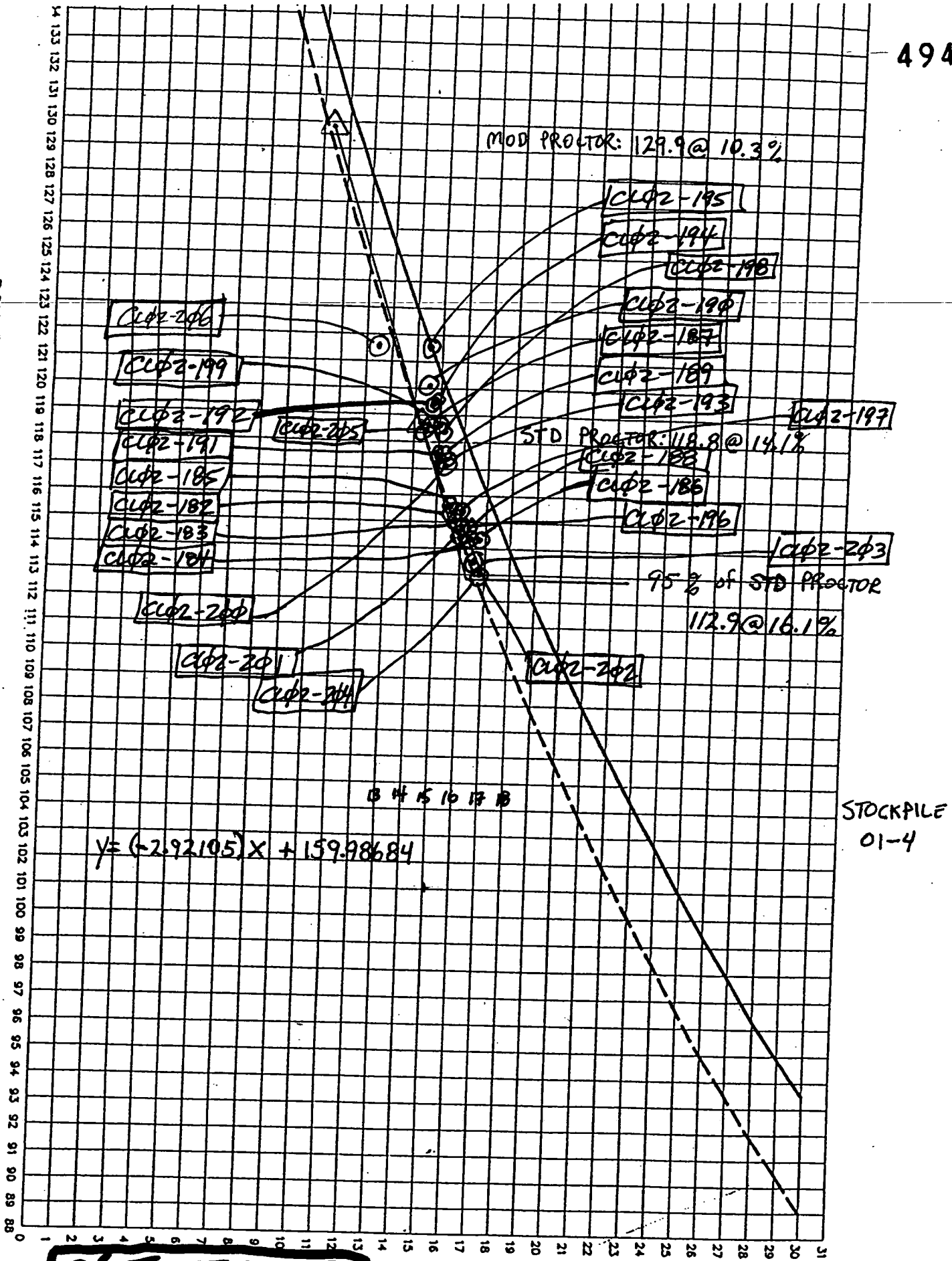
SHEET No 5 OF 6

4942



STOCKPILE 01-4

26 JUNE 2002

GQ1341-Ø4.1

000504

SHEET No 6 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: Cells 4 & 5

DATE: 27 day JUNE month 2002 year (THURSDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION— (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C002-207	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	12.4 (14.1)	139.1	121.9	102.6	P	—	—	—	—
C002-208	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	15.0 (16.1)	134.6	115.9	97.6	P	—	—	—	—
C002-209	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	15.1 (16.2)	133.2	114.6	96.5	P	—	—	—	—
C002-210	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	16.1 (17.0)	132.7	113.4	95.5	P	—	—	—	—
C002-211	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	15.8 (16.8)	132.4	113.4	95.5	P	—	—	—	—
C002-212	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	16.2 (17.1)	133.0	113.6	95.6	P	—	—	—	—
C002-213	Cell #5 - S. East End	6"/L-1	01-4	14.1	118.8	16.0 (16.9)	132.8	113.6	95.6	P	—	—	—	—
C002-214	Cell #4 - East Slope	6"/L-5	01-4	14.1	118.8	14.7 (15.8)	132.9	114.8	96.6	P	—	—	—	—
C002-215	Cell #4 - East Slope	6"/L-5	01-4	14.1	118.8	14.6 (15.7)	134.7	116.4	98.0	P	—	—	—	—
C002-216	Cell #4 - East Slope	6"/L-5	01-4	14.1	118.8	14.9 (16.0)	132.9	114.6	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4&5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 27 dgy (THURSDAY) JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: ~~+0-3~~ (AP2) LIFT THICKNESS (LOOSE / (COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-4

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TDL)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
02-217	Cell #4 - East Bench	6"/L-5	01-4	14.1	118.8	15.4 (16.4)	131.5	113.0	95.1	P	–	–	–	–
02-218	Cell #4 - East Bench	6"/L-5	01-4	14.1	118.8	15.3 (16.3)	131.9	113.4	95.5	P	–	–	–	–
02-219	Cell #4 - D. Corridor	6"/L-4	01-4	14.1	118.8	13.4 (14.7)	134.9	117.6	99.0	P	–	–	–	–
02-220	Cell #4 - D. Corridor	6"/L-4	01-4	14.1	118.8	15.1 (16.2)	132.4	113.9	95.9	P	–	–	–	–
02-221	Cell #4 - D. Corridor	6"/L-4	01-4	14.1	118.8	13.8 (15.1)	135.5	117.7	99.1	P	–	–	–	–
02-222	Cell #4 - D. Corridor	6"/L-4	01-4	14.1	118.8	12.7 (14.1)	135.9	119.1	100.3	P	–	–	–	–
02-223	Cell 4 - SE End	6"/L-5	01-4	14.1	118.8	15.1 (16.2)	131.8	113.4	95.5	P	–	–	–	–
02-224	Cell 4 - SE End	6"/L-5	01-4	14.1	118.8	~~15.7~~ 14.6 (15.7)	133.2	115.1	96.9	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 4

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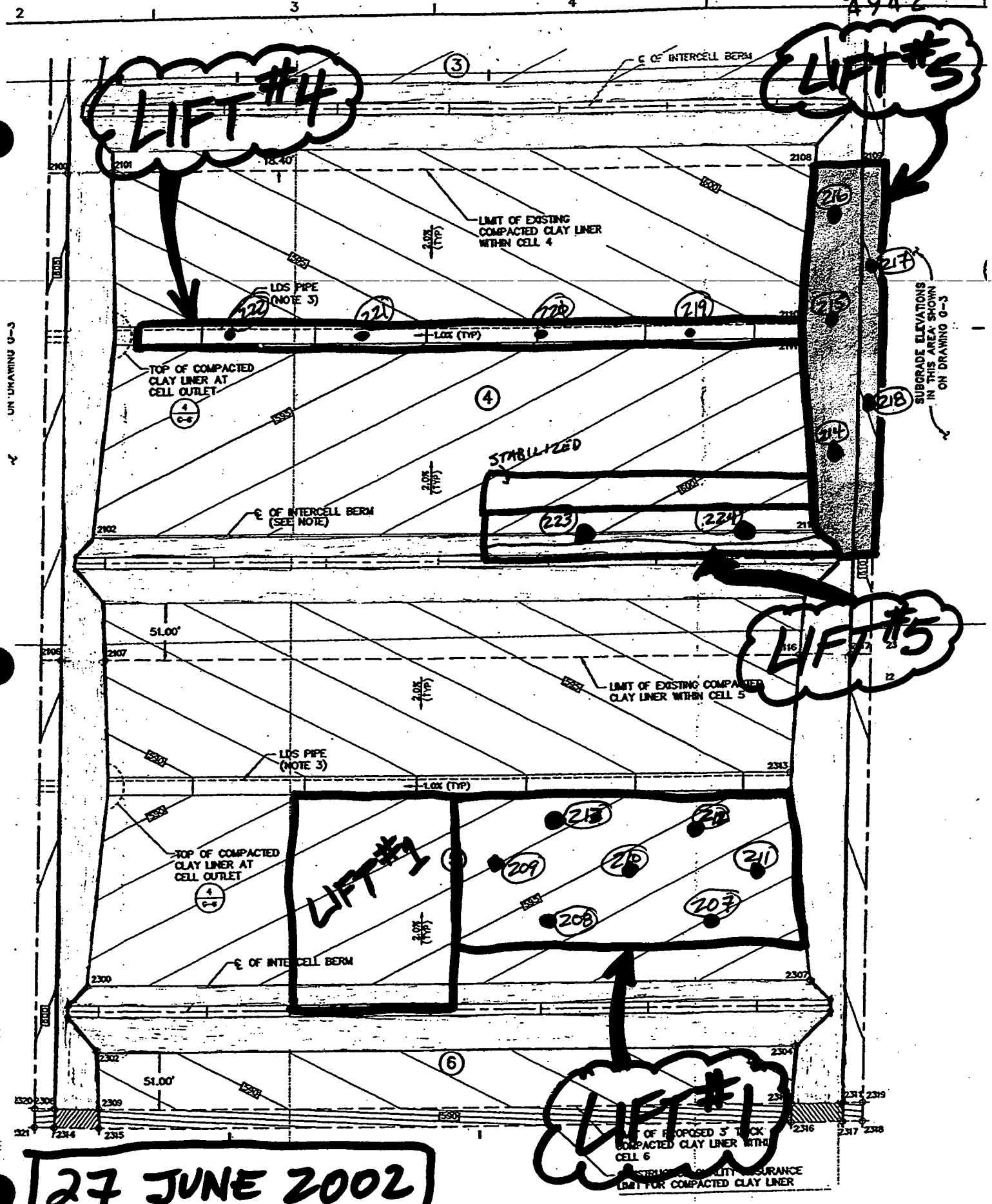

27 JUNE 2002

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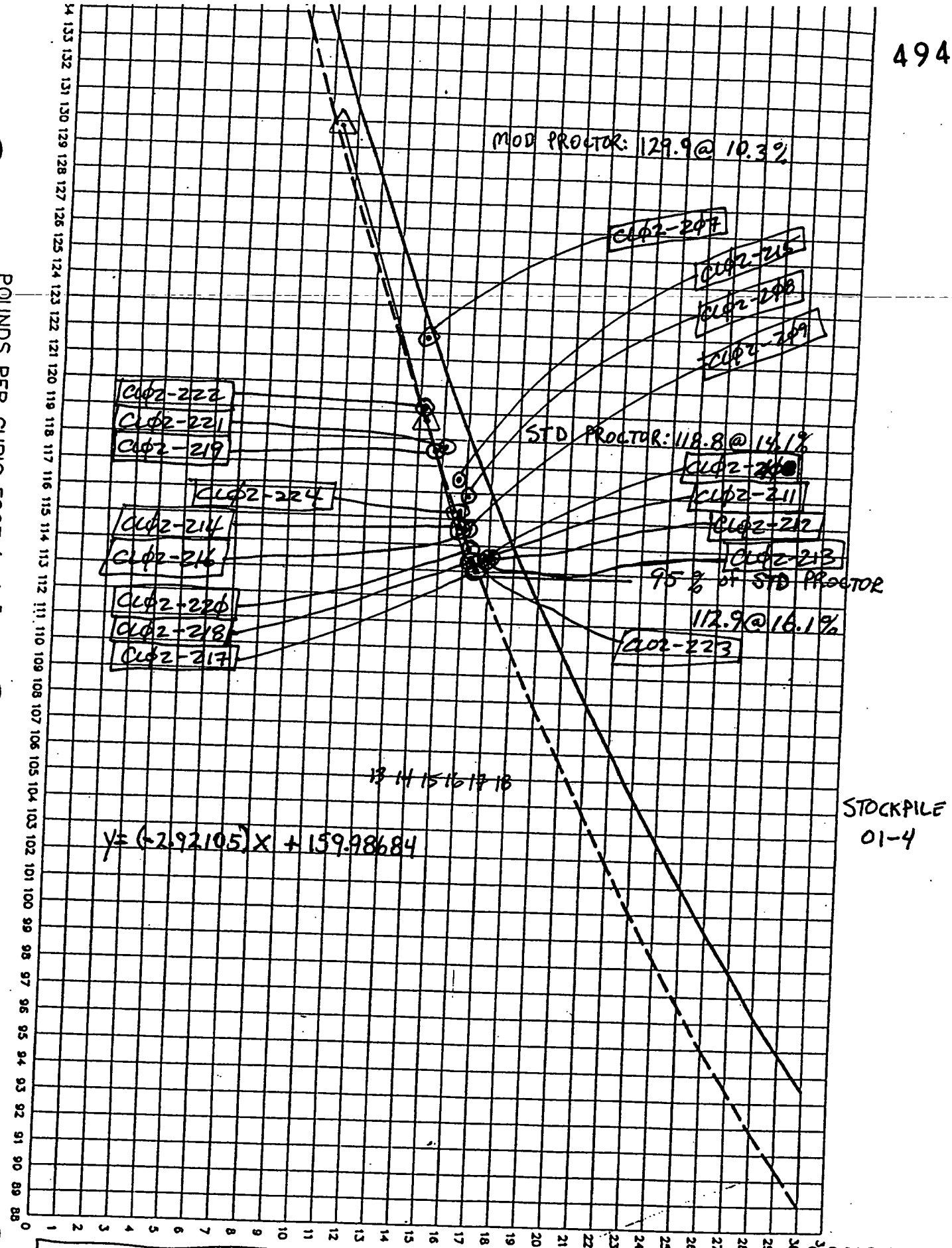
GQ 1341-04.1

SHEET No. 3 of 4



27 JUNE 2002

GQ1341-Ø4.1

SHEET No. 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Cells 4 & 5

DATE: 28 day JUNE month 2002 year (FRIDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-3 & 4 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X +3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-225	CELL #5 - S. WEST END	6"/L-1	01-4	14.1	118.8	14.6 (15.7)	134.4	116.2	97.8	P	—	—	—	—
CL02-226	CELL #5 - S. WEST END	6"/L-1	01-4	14.1	118.8	15.5 (16.5)	132.4	113.6	95.7	P	—	—	—	—
CL02-227	CELL #5 - S. WEST END	6"/L-1	01-4	14.1	118.8	16.0 (16.9)	132.5	113.3	95.4	P	—	—	—	—
CL02-228	CELL #5 - S. WEST END	6"/L-1	01-4	14.1	118.8	16.2 (17.1)	132.4	113.1	95.2	P	—	—	—	—
CL02-229	CELL #5 - S. WEST END	6"/L-1	01-4	14.1	118.8	16.1 (17.0)	133.0	113.7	95.7	P	—	—	—	—
CL02-230	CELL #4 - EAST BENCH	6"/L-6	01-3	13.9	118.9	15.3 (16.3)	133.8	115.0	96.8	P	—	—	—	—
CL02-231	CELL #4 - EAST BENCH	6"/L-6	01-3	13.9	118.9	16.0 (16.9)	132.7	113.5	95.6	P	—	—	—	—
CL02-232	CELL #4 - S. EAST END	6"/L-5	01-4	14.1	118.8	16.2 (17.1)	133.0	113.6	95.6	P	—	—	—	—
CL02-233	CELL #4 - S. EAST END	6"/L-5	01-4	14.1	118.8	14.3 (15.5)	133.3	115.4	97.1	P	—	—	—	—
CL02-234	CELL #4 - S. EAST END	6"/L-5	01-4	14.1	118.8	15.6 (16.6)	133.3	114.3	96.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *DC02-9 TAKEN AT CL02-230 *

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: Cells 4 & 5

DATE: 28 (FRIDAY) day JUNE month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 (APZ) % COMPACTION / MOISTURE RANGE: ±0-3 (APZ) LIFT THICKNESS (LOOSE/COMPACTED) ~6"

MATERIAL SOURCE: STOCKPILES 01-3 & 4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID:

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-235	Cell #4 - S. East End	6"/L-5	01-4	14.1	118.8	14.3 (15.5)	135.1	117.0	98.5	P	—	—	—	—
CU02-236	Cell #4 - S. East End	6"/L-5	01-4	14.1	118.8	16.2 (17.1)	132.6	113.2	95.3	P	—	—	—	—
CU02-237	Cell #4 - S. East End	6"/L-5	01-3	13.9	118.9	16.0 (16.9)	132.7	113.5	95.5	P	—	—	—	—
CU02-238	Cell #4 - S. East End	6"/L-5	01-3	13.9	118.9	13.4 (14.7)	135.4	118.0	99.3	P	—	—	—	—
CU02-239	Cell #4 - S. East End	6"/L-5	01-3	13.9	118.9	12.4 (13.9)	137.3	120.5	101.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 2 OF 5

000510

4942

14942

LIFT #6

LIFT #5

LIFT #1

STABILIZED TOP 2' OF SUBGRADE & REMOVED +5" STONES.

OLD MONITORING WELLS REMOVED

℄ OF INTERCELL BERM

18.40'

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

LDS PIPE (NOTE 3)

LDS (TYP)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM (SEE NOTE)

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING G-3

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 5

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM

51.00'

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

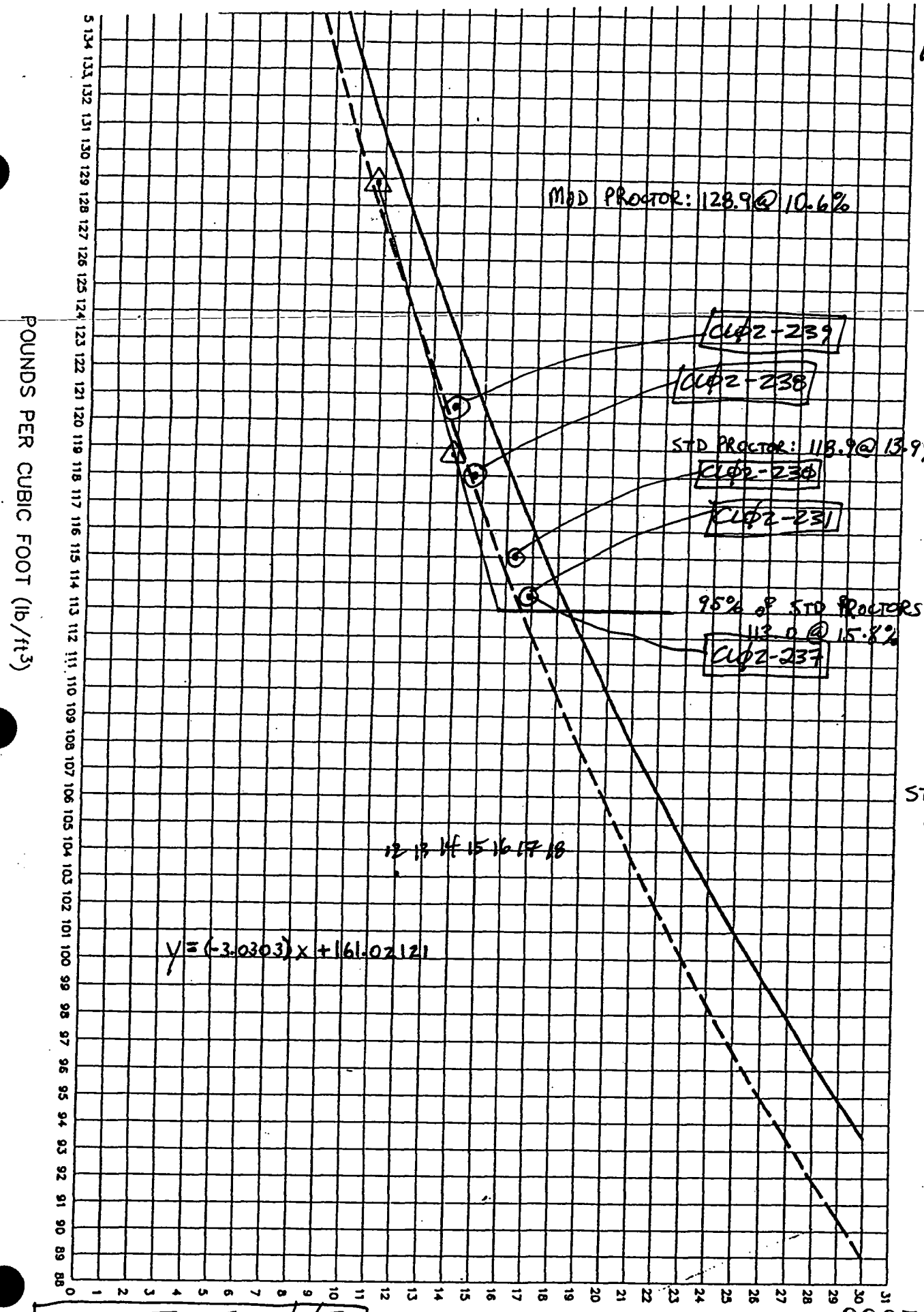
28 JUNE 2002

GQB41-04.1

000511

SHEET No 3 of 5

4942



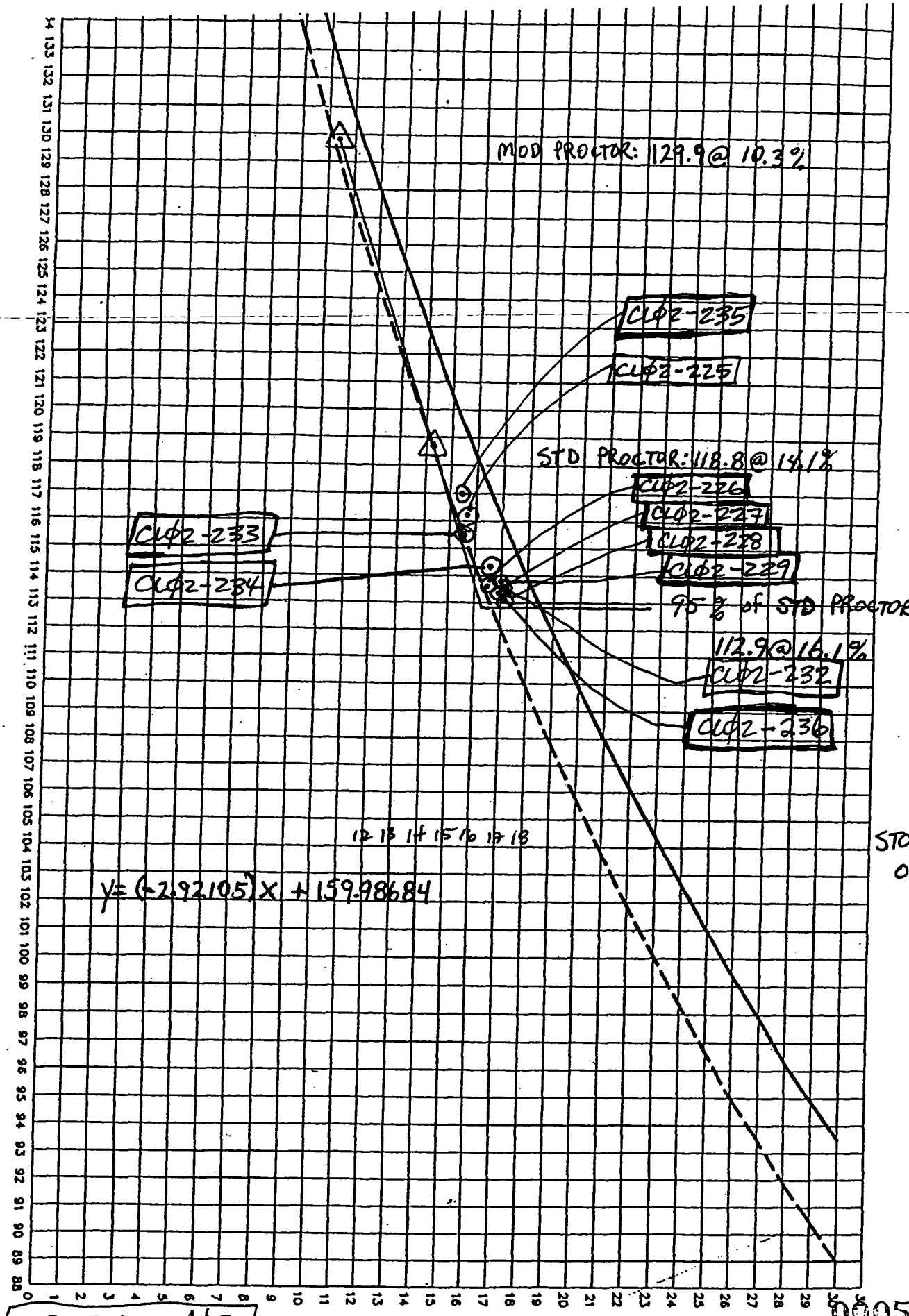
STOCKPILE
01-3

28 JUNE 2ØØ2

GQ134-Ø4.1

000512

SHEET No 4 OF 5



28 JUNE 2ØØ2

GQ1341-Ø4.1

SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ1341 TASK NO.: 04.1

DESCRIPTION: CELLS 4 & 5

DATE: 29 day (SATURDAY) JUNE month 2002 year

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 95% (AP2) COMPACTION / MOISTURE RANGE: ~~±03~~ (AP2) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: [illegible]

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-240	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~14.7~~ (15.8)	133.3	115.1	96.8	P	—	—	—	—
CU02-241	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~14.7~~ (15.8)	132.2	114.2	96.0	P	—	—	—	—
CU02-242	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~15.8~~ (16.8)	132.0	113.0	95.0	P	—	—	—	—
CU02-243	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~15.3~~ (16.3)	132.0	113.5	95.5	P	—	—	—	—
CU02-244	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~15.4~~ (16.4)	133.1	114.3	96.2	P	—	—	—	—
CU02-245	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~15.0~~ (16.1)	133.8	115.2	96.9	P	—	—	—	—
CU02-246	CELL #4 - EAST SLOPE	6"/L-6	01-3	13.9	118.9	~~14.6~~ (15.7)	131.9	114.0	95.9	P	—	—	—	—
CU02-247	CELL #4 - EAST SLOPE	6"/L-6	01-3	13.9	118.9	~~15.8~~ (16.8)	132.0	113.0	95.0	P	—	—	—	—
CU02-248	CELL #4 - EAST SLOPE	6"/L-6	01-3	13.9	118.9	~~16.0~~ (16.9)	132.8	113.6	95.5	P	—	—	—	—
CU02-249	CELL #4 - S. WEST END	6"/L-5	01-3	13.9	118.9	~~14.4~~ (15.6)	135.3	117.0	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ 134 TASK NO.: 04.1

DATE: 29 day (SATURDAY) JUNE month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE / (COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: TBD

TEST NO.	TEST LOCATION– (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST: PASS	RETEST: FAIL
a02-250	Cell 4 - S. West End	6"/L-5	01-3	13.9	118.9	15.7 (16.7)	133.1	114.1	95.9	P	—	—	—	—
a02-251	Cell 4 - S. West End	6"/L-5	01-3	13.9	118.9	14.9 (16.0)	133.5	115.1	96.8	P	—	—	—	—
a02-252	Cell 4 - S. West End	6"/L-5	01-3	13.9	118.9	14.5 (15.7)	134.3	116.1	97.6	P	—	—	—	—
a02-253	Cell 4 - S. West End	6"/L-5	01-3	13.9	118.9	14.0 (15.2)	134.9	117.1	98.5	P	—	—	—	—

000515

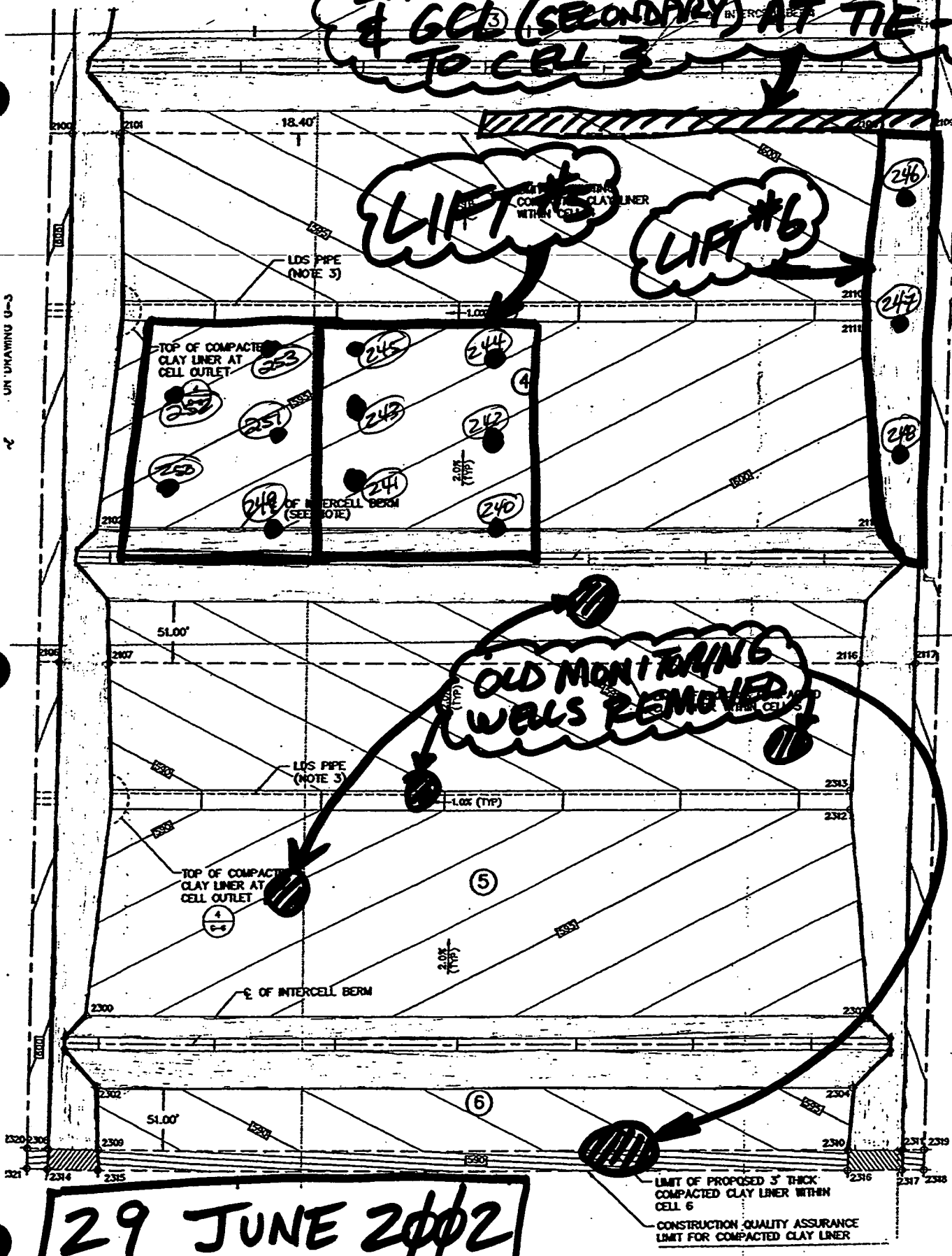
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible] SHEET NO. 2 OF 4

4942

LABORERS FOLDED BACK GCL, GML & GCL (SECONDARY) AT TIE-IN TO CELL 3

4942



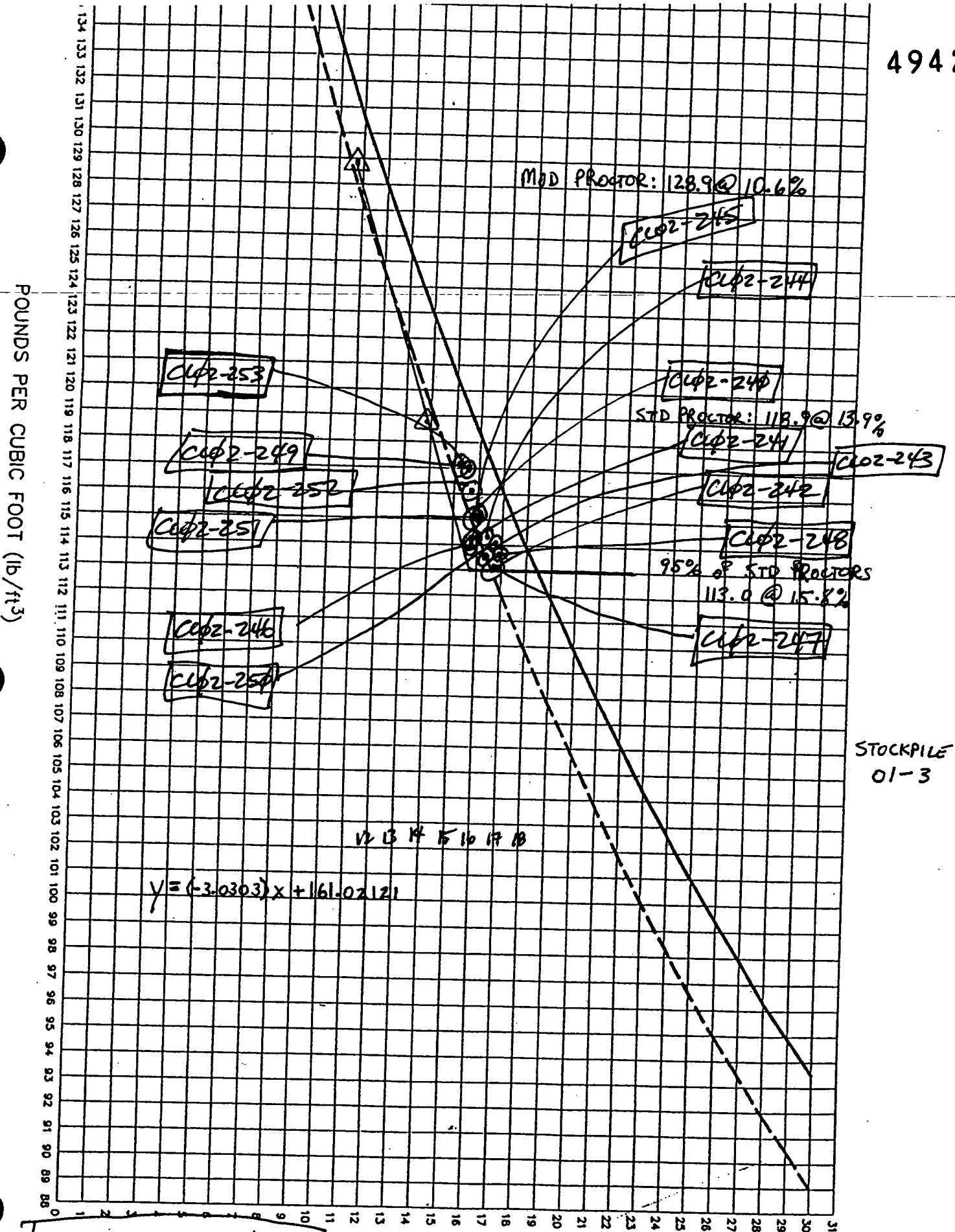
29 JUNE 2002

GQ1341-04.1

000516

SHEET No 3 of 4

4942



29 JUNE 2002

GQ1341-04.1

000517

SHEET No 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 30 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE Ø1-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: CJ

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CLØ2-254	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~17.0~~ 17.8	128.4	109.0	91.7	–	F	CLØ2-277	P	–
CLØ2-255	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~14.5~~ 15.7	133.1	115.0	96.8	P	–	–	–	–
CLØ2-256	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~13.0~~ 14.4	135.0	118.0	99.2	P	–	–	–	–
CLØ2-257	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~15.5~~ 16.5	131.8	113.1	95.2	P	–	–	–	–
CLØ2-258	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~14.2~~ 15.4	134.6	116.6	98.1	P	–	–	–	–
CLØ2-259	South half Cell 5	6"/2	Ø1-3	13.9	118.9	~~16.7~~ 17.5	127.3	108.3	91.1	–	F	CLØ2-276	P	–
CLØ2-260	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~15.7~~ 16.7	132.1	113.2	95.2	P	–	–	–	–
CLØ2-261	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~15.9~~ 16.9	132.4	113.3	95.3	P	–	–	–	–
CLØ2-262	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~15.4~~ 16.4	131.8	113.2	95.2	P	–	–	–	–
CLØ2-263	South half - Cell 5	6"/2	Ø1-3	13.9	118.9	~~13.2~~ 14.6	133.7	116.7	98.1	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DCØ2-1Ø TAKEN AT CLØ2-254 *

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 30 day June month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile Ø1-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: CL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-264	Cell 5 - South half	6"/2	Ø1-3	13.9	118.9	13.7 15.0	135.4	117.7	99.0	P	—	—	—	—
CLØ2-265	Cell 5 - South half	6"/2	Ø1-3	13.9	118.9	14.1 15.3	132.9	115.3	96.9	P	—	—	—	—
CLØ2-266	Cell 5 - South half	6"/2	Ø1-3	13.9	118.9	15.9 16.9	132.4	113.3	95.3	P	—	—	—	—
CLØ2-267	Cell 5 - South half	6"/2	Ø1-3	13.9	118.9	15.2 16.3	132.1	~~113.9~~ 113.6	95.5	P	—	—	—	—
CLØ2-268	Cell 4 - Corridor	6"/5	Ø1-3	13.9	118.9	15.9 16.9	132.2	113.1	95.1	P	—	—	—	—
CLØ2-269	Cell 4 - Corridor	6"/5	Ø1-3	13.9	118.9	15.7 16.7	132.4	113.5	95.4	P	—	—	—	—
CLØ2-270	Cell 4 - Corridor	6"/5	Ø1-3	13.9	118.9	15.6 16.6	131.9	113.1	95.1	P	—	—	—	—
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 5

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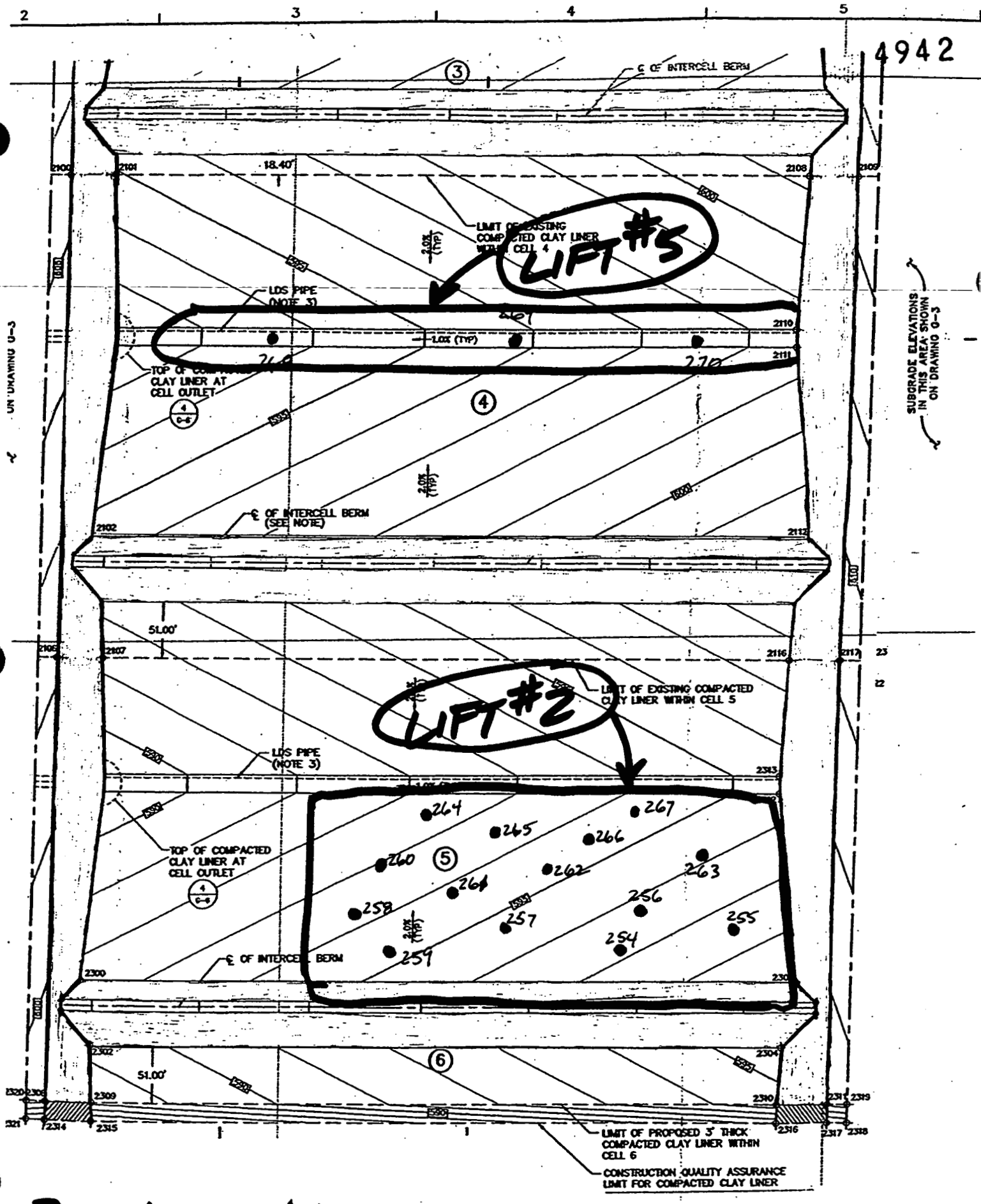
4942

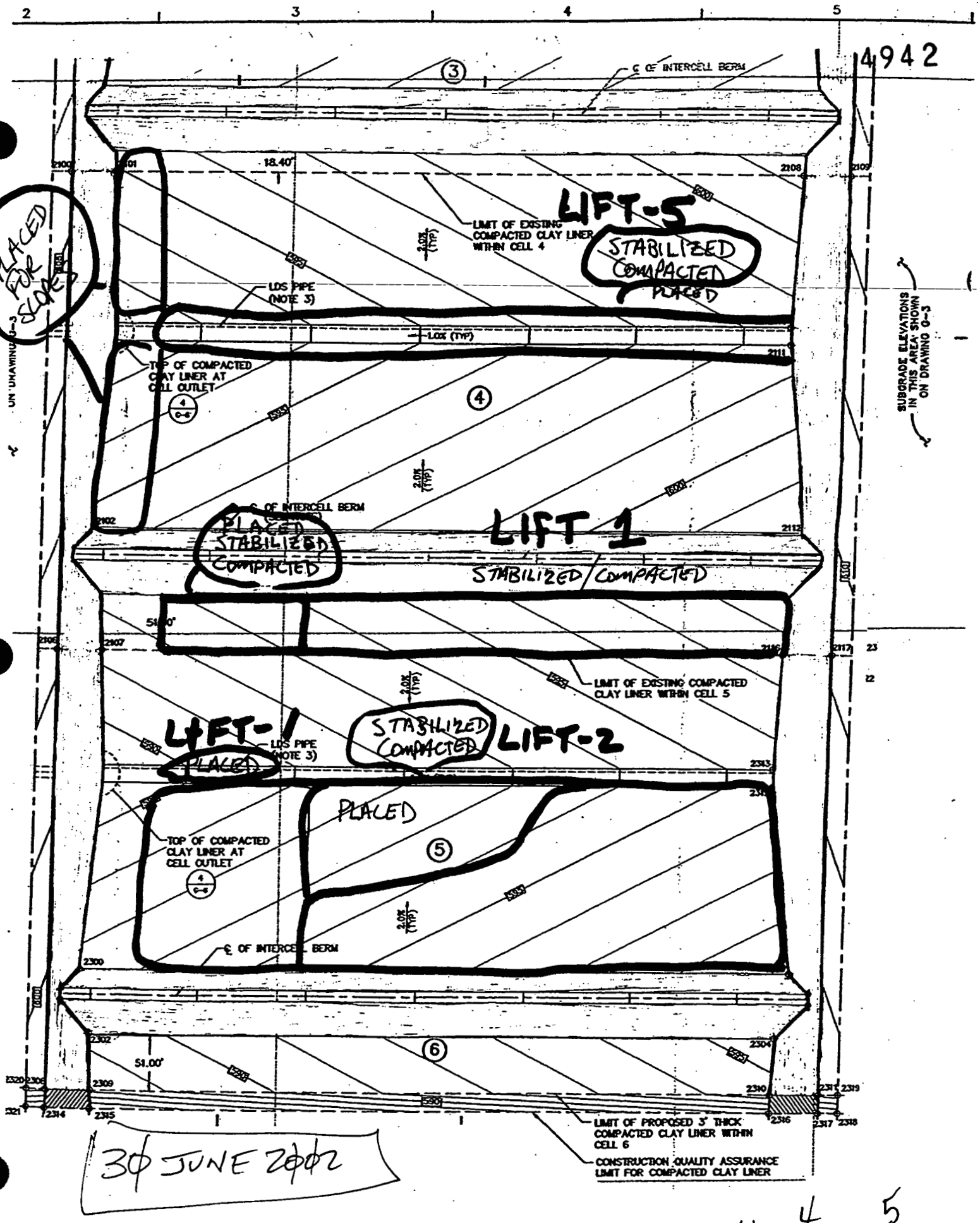


30 June 2002

SHEET No 3 OF 5

000520

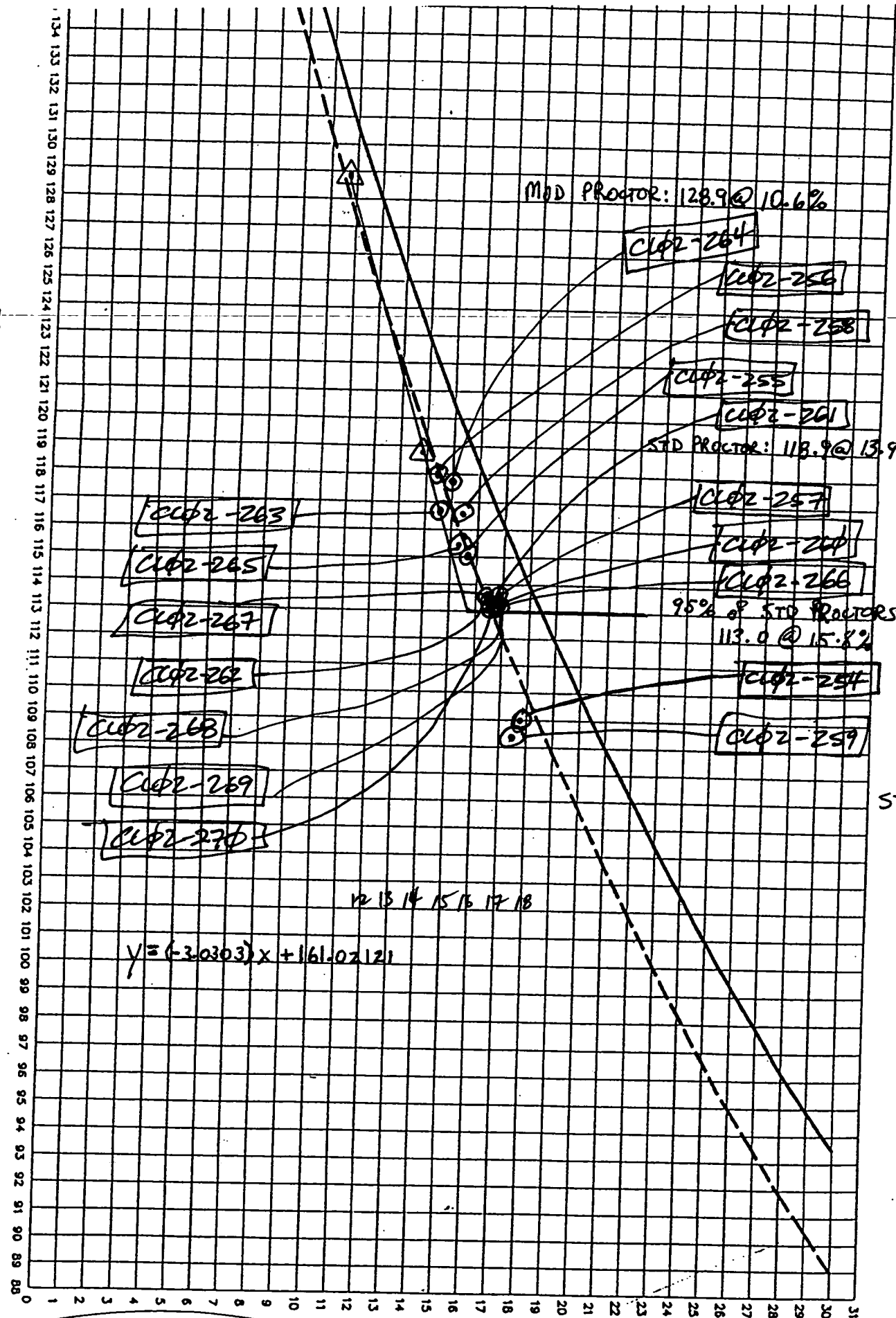
4942



30 JUNE 2002

SHEET No. 4 OF 5

000521



STOCKPILE 01-3

30 JUNE 2002

000522

SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ134 TASK NO.: 04.1

DESCRIPTION: CELLS 4 & 5

DATE: 01 day JULY month 2002 year (MONDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~+0-3~~ APZ LIFT THICKNESS (LOOSE (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C02-271	CELL #5 - 10:1 SLOPE	6"/L-1	01-3	13.9	118.9	~~13.5~~ (14.8)	133.6	116.4	97.9	P	—	—	—	—
C02-272	CELL #5 - 10:1 SLOPE	6"/L-1	01-3	13.9	118.9	~~12.5~~ (14.0)	137.1	120.3	101.1	P	—	—	—	—
C02-273	CELL #5 - 10:1 SLOPE	6"/L-1	01-3	13.9	118.9	~~12.8~~ (14.2)	136.1	119.2	100.3	P	—	—	—	—
C02-274	CELL #5 - 10:1 SLOPE	6"/L-1	01-3	13.9	118.9	~~15.1~~ (16.2)	131.4	113.1	95.1	P	—	—	—	—
C02-275	CELL #5 - 10:1 SLOPE	6"/L-1	01-3	13.9	118.9	~~15.4~~ (16.4)	132.4	113.7	95.7	P	—	—	—	—
C02-276	CELL #5 - S. CENTRAL END	6"/L-2	01-3	13.9	118.9	~~13.1~~ (14.5)	134.4	117.4	98.7	P	—	—	—	—
C02-277	CELL #5 - S. CENTRAL END	6"/L-2	01-3	13.9	118.9	~~14.4~~ (15.6)	133.4	115.4	97.1	P	—	—	—	—
C02-278	CELL #5 - S. WEST END	6"/L-1	01-3	13.9	118.9	~~15.2~~ (16.3)	134.3	115.5	97.1	P	—	—	—	—
C02-279	CELL #5 - S. WEST END	6"/L-1	01-3	13.9	118.9	~~13.3~~ (14.6)	134.1	117.0	98.4	P	—	—	—	—
C02-280	CELL #5 - S. WEST END	6"/L-1	01-3	13.9	118.9	~~15.6~~ (16.6)	132.4	113.6	95.5	P	—	—	—	—

*

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *DC02-11 TAKEN AT C02-275*

0085223

4942

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: SHEET NO. 1 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 01 (MONDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILES 01-3/99-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x+3.3669 QA ID:

TEST NO.	TEST LOCATION — (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
a02-281	Cell #5 - S. West End	6"/L-1	01-3	13.9	118.9	14.1 (15.3)	132.8	115.2	96.9	P	—	—	—	—
a02-282	Cell #5 - S. West End	6"/L-1	01-3	13.9	118.9	14.2 (15.4)	132.3	114.6	96.4	P	—	—	—	—
a02-283	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	12.5 (14.0)	137.1	120.3	97.9	P	—	—	—	—
a02-284	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	13.4 (14.7)	137.5	119.9	97.6	P	—	—	—	—
a02-285	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	13.7 (15.0)	135.5	117.8	95.9	P	—	—	—	—
a02-286	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	11.9 (13.5)	136.9	120.6	98.2	P	—	—	—	—
a02-287	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	14.8 (15.9)	134.2	115.8	94.3	—	F	a02-303	P	—
a02-288	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	14.7 (15.8)	134.5	116.1	94.6	—	F	a02-304	P	—
a02-289	Cell #5 - S. East End	6"/L-3	99-4	12.2	122.8	12.5 (14.8)	135.5	118.0	96.1	P	—	—	—	—
a02-290	Cell #5 - [redacted]. East End	6"/L-1	99-4	12.2	122.8	12.2 (13.7)	136.9	120.4	98.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 01 (MONDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) ASTM D 1557 95 (APZ) % COMPACTION / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 99-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBE)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
0002-291	CELL #5 - N. EAST END	6"/L-1	99-4	12.2	122.8	13.3 (14.6)	136.0	118.7	96.6	P	—	—	—	—
0002-292	CELL #5 - N. EAST END	6"/L-1	99-4	12.2	122.8	13.7 (15.0)	135.5	117.8	95.9	P	—	—	—	—
0002-293	CELL #5 - N. EAST END	6"/L-1	99-4	12.2	122.8	13.3 (14.6)	135.8	118.5	96.5	P	—	—	—	—
0002-294	CELL #5 - N. EAST END	6"/L-1	99-4	12.2	122.8	12.8 (14.2)	136.0	119.1	97.0	P	—	—	—	—

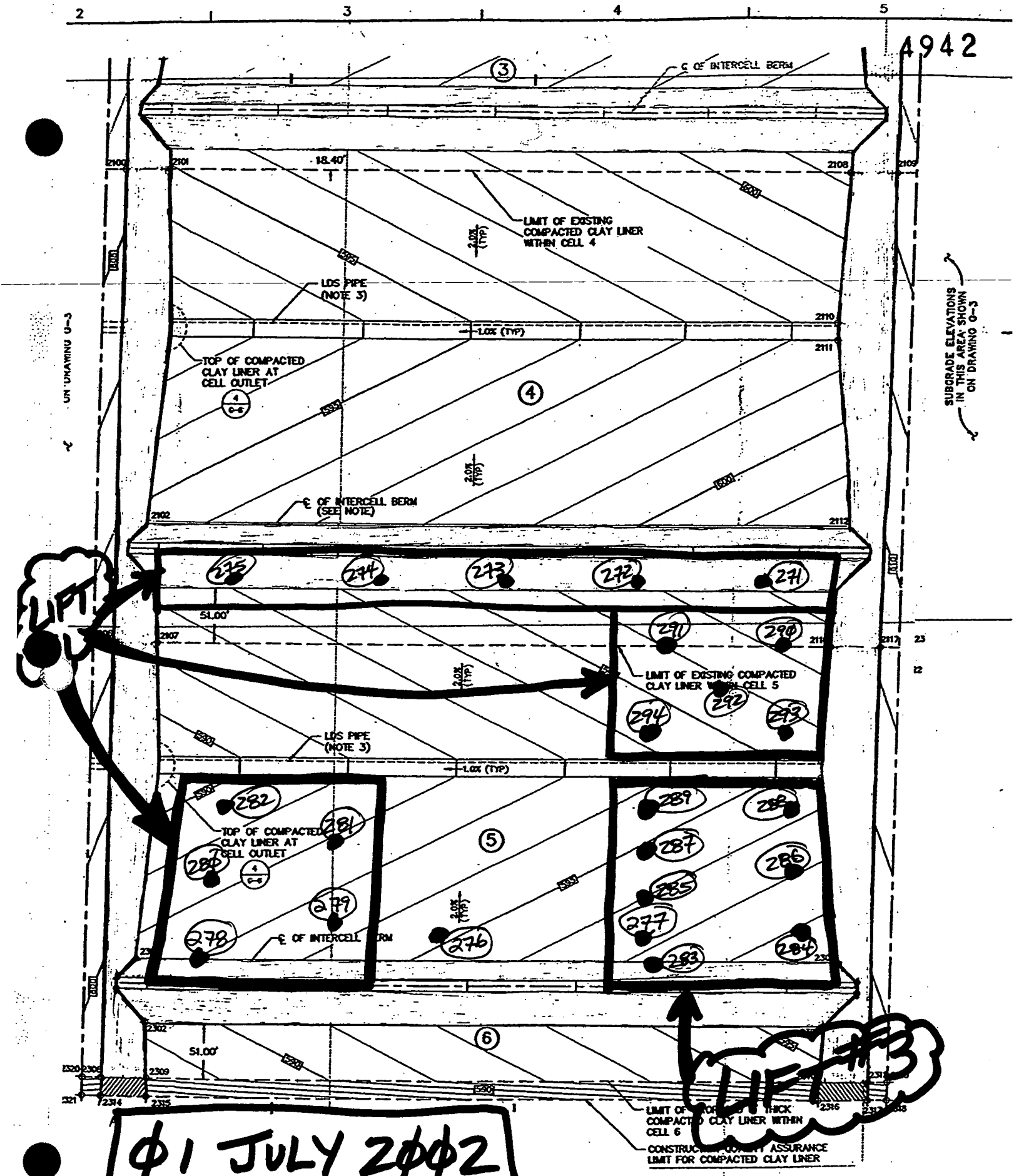
000525

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 3 OF 6

4942



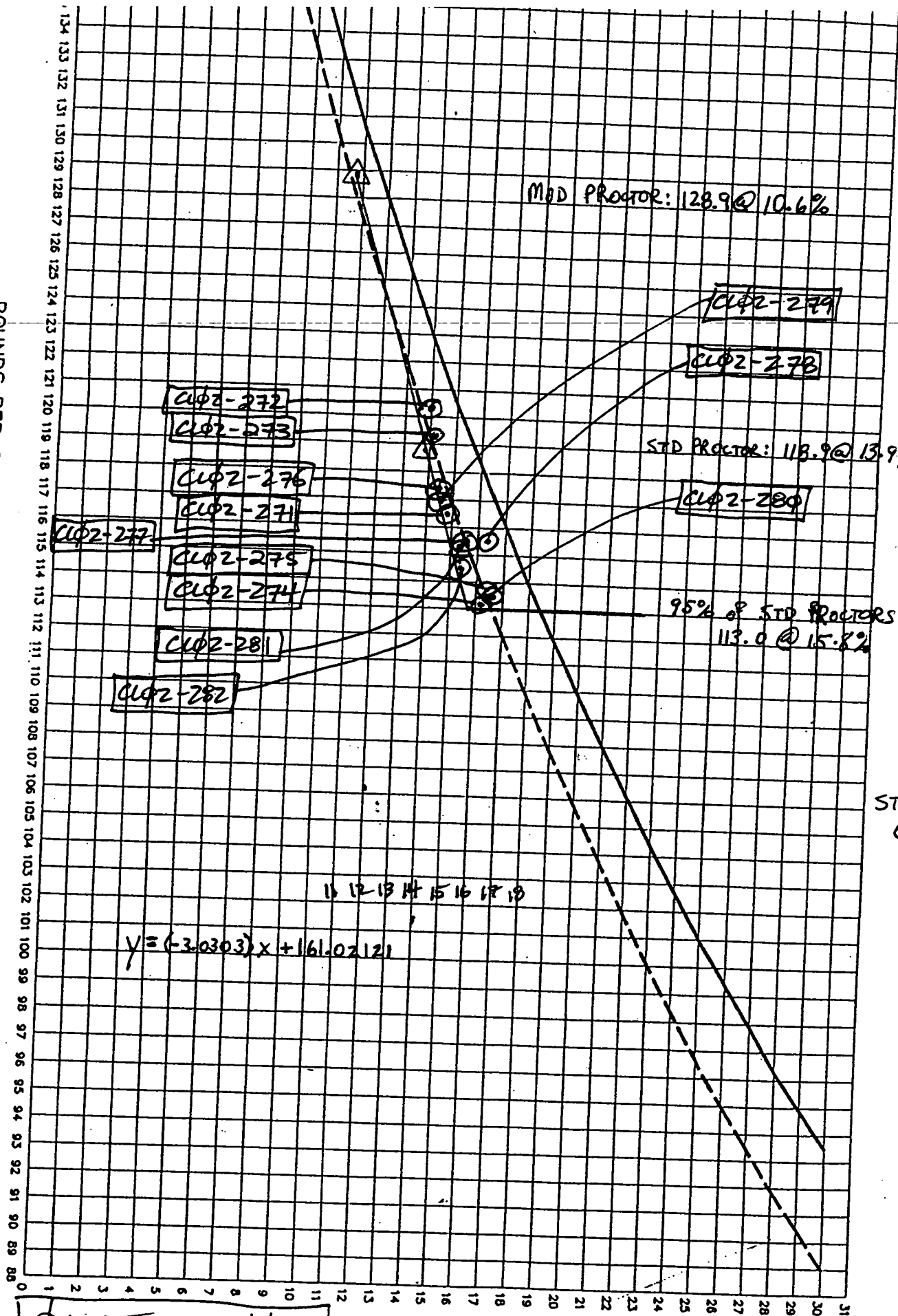
Φ1 JULY 2ΦΦ2

GQ1341-Φ4.1

000526

SHEET No 4 OF 6

4942



STOCKPILE 01-3

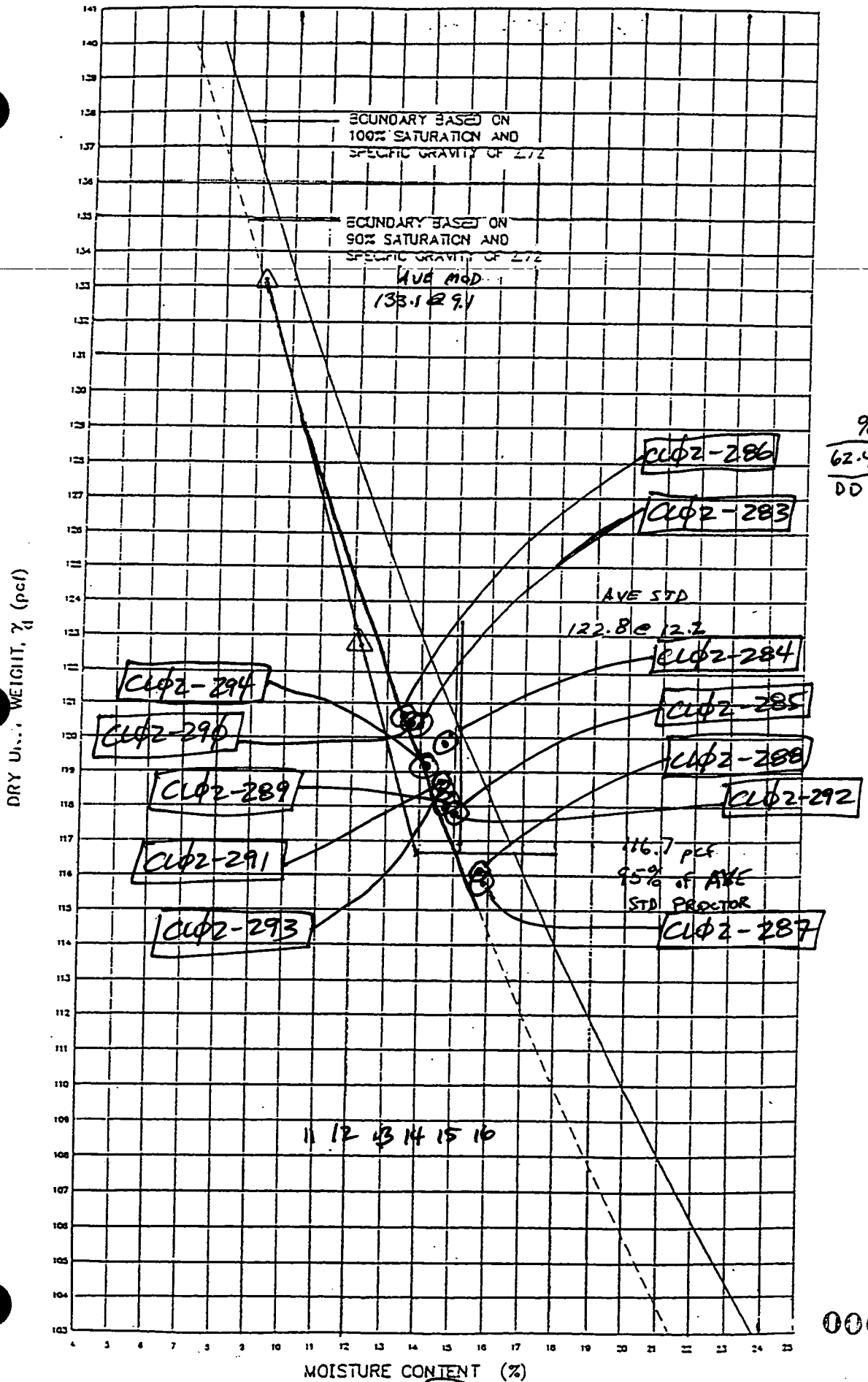
ØI-JULY-2ØØ2

GQ1341-Ø4.1

000527

SHEET No 5 OF 6

4942



STOCKPILE
99-4

$$\frac{\%m}{\frac{62.4}{DD} - \frac{1}{2.72}} = 0.9 \text{ (minimum)}$$

000528

Ø1 JULY 2ØØ2 GQ1341-Ø4.1

SHEET No 6 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 02 day JULY month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +0.3 (APZ) LIFT THICKNESS (LOOSE / (COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 99-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (VBK)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-295	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	12.4 (13.9)	137.8	121.0	98.5	P	–	–	–	– *
CL02-296	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	14.4 (15.6)	133.1	115.1	93.8	–	F	CL02-321	P	–
CL02-297	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	14.8 (15.9)	133.4	115.1	93.8	–	F	CL02-322	P	–
CL02-298	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	13.4 (14.7)	138.3	120.6	98.2	P	–	–	–	–
CL02-299	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	13.1 (14.5)	137.0	119.7	97.4	P	–	–	–	–
CL02-300	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	14.7 (15.8)	134.5	116.1	94.6	–	F	CL02-323	P	–
CL02-301	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	15.6 (16.6)	132.7	113.8	92.7	–	F	CL02-324	P	–
CL02-302	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	13.6 (14.9)	135.1	117.6	95.7	P	–	–	–	–
CL02-303	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	12.7 (14.1)	139.8	122.5	99.8	P	–	–	–	–
CL02-304	CELL #5-S. EAST END	6"/L-3	99-4	12.2	122.8	12.9 (14.3)	135.7	118.7	96.7	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-12 TAKEN AT CL02-295 *

009529

49425

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 02 day JULY month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (AA2) / MOISTURE RANGE: +0-3 (AA2) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILES 99-4 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.848/X + 3.3669 QA ID (TBD)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-305	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	11.2 (12.9)	136.3	120.7	98.3	—	F	CL02-309	P	—
CL02-306	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	13.5 (14.8)	134.2	116.9	95.2	—	F	CL02-310	P	—
CL02-307	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	11.7 (13.3)	135.9	119.9	97.7	—	F	CL02-311	P	—
CL02-308	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	11.5 (13.1)	136.2	120.4	98.0	—	F	CL02-313	P	—
CL02-309	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	12.7 (14.1)	136.8	119.9	97.6	P	—	—	—	—
CL02-310	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	13.5 (14.8)	135.4	117.9	96.0	P	—	—	—	—
CL02-311	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	13.7 (15.0)	137.3	119.4	97.2	P	—	—	—	—
CL02-312	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	13.6 (14.9)	135.3	117.8	95.9	P	—	—	—	—
CL02-313	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	12.0 (13.5)	136.9	120.6	98.2	P	—	—	—	—
CL02-314	Cell #5 - N. Central	6"/L-1	99-4	12.2	122.8	12.3 (13.8)	137.0	120.4	98.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000530 4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G01341 TASK NO.: 041

DATE: 2 day July month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 99-4

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481+3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-315	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	12.6 14.1	136.7	119.8	97.8	P	—	—	—	—
CL02-316	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	13.7 15.0	135.9	118.2	96.3	P	—	—	—	—
CL02-317	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	13.7 15.0	135.5	117.8	95.9	P	—	—	—	—
CL02-318	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	13.8 15.1	136.2	118.3	96.3	P	—	—	—	—
CL02-319	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	12.9 14.3	135.5	118.5	96.5	P	—	—	—	—
CL02-320	Cell 5 - SW Corner	6"/2	99-4	12.2	122.8	~~12.8~~ 14.0 15.2	134.6	116.8	95.1	P	—	—	—	—
CL02-321	Cell 5 - South Center	6"/3	99-4	12.2	122.8	12.8 14.2	137.6	120.5	98.1	P	—	—	—	—
CL02-322	Cell 5 - South Center	6"/3	99-4	12.2	122.8	13.2 14.6	136.5	119.1	97.0	P	—	—	—	—
CL02-323	Cell 5 - South Center	6"/3	99-4	12.2	122.8	11.8 13.4	137.9	121.6	99.0	P	—	—	—	—
CL02-324	Cell 5 - South Center	6"/3	99-4	12.2	122.8	12.7 14.1	135.8	120.5	98.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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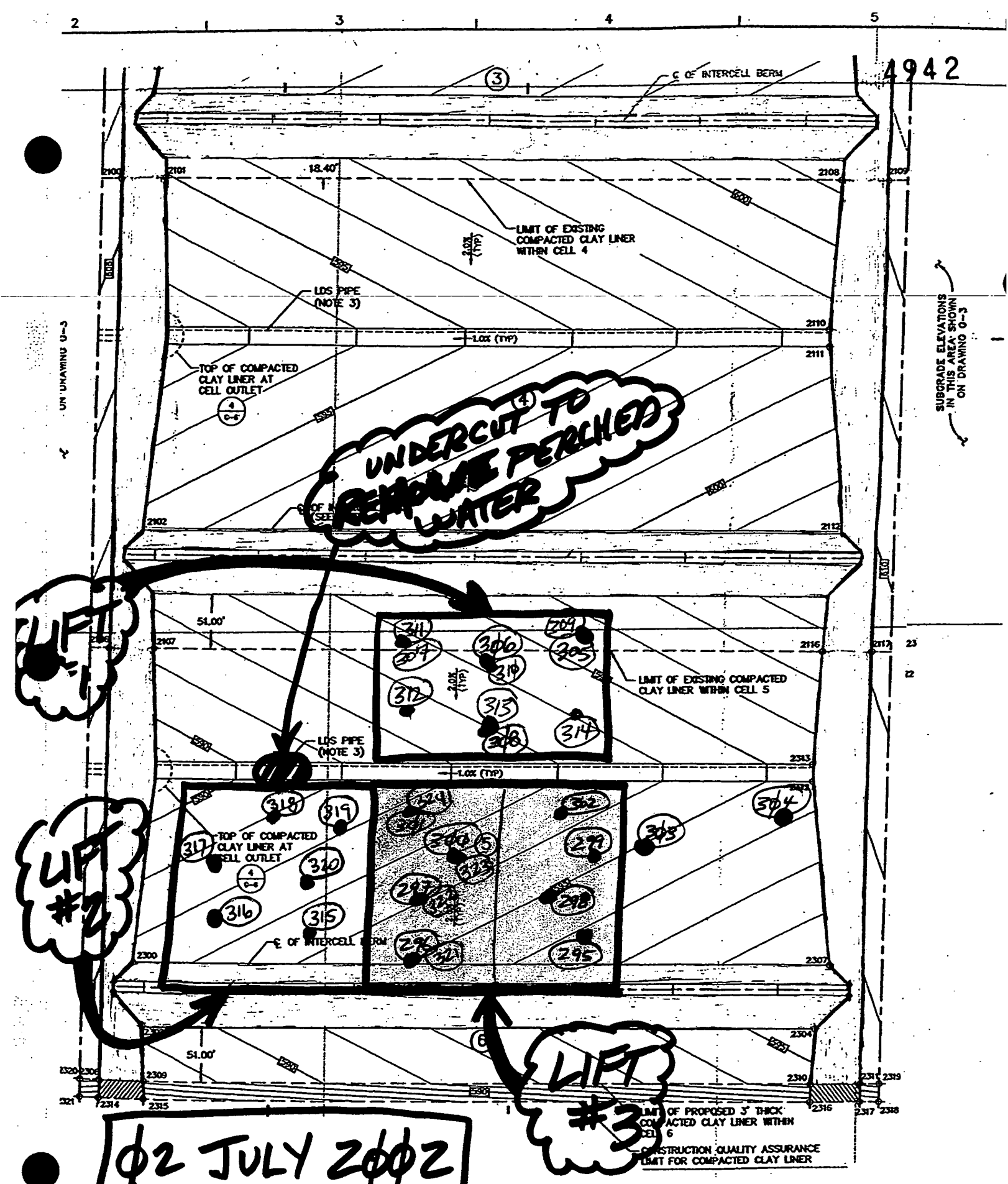
GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 3 OF 5

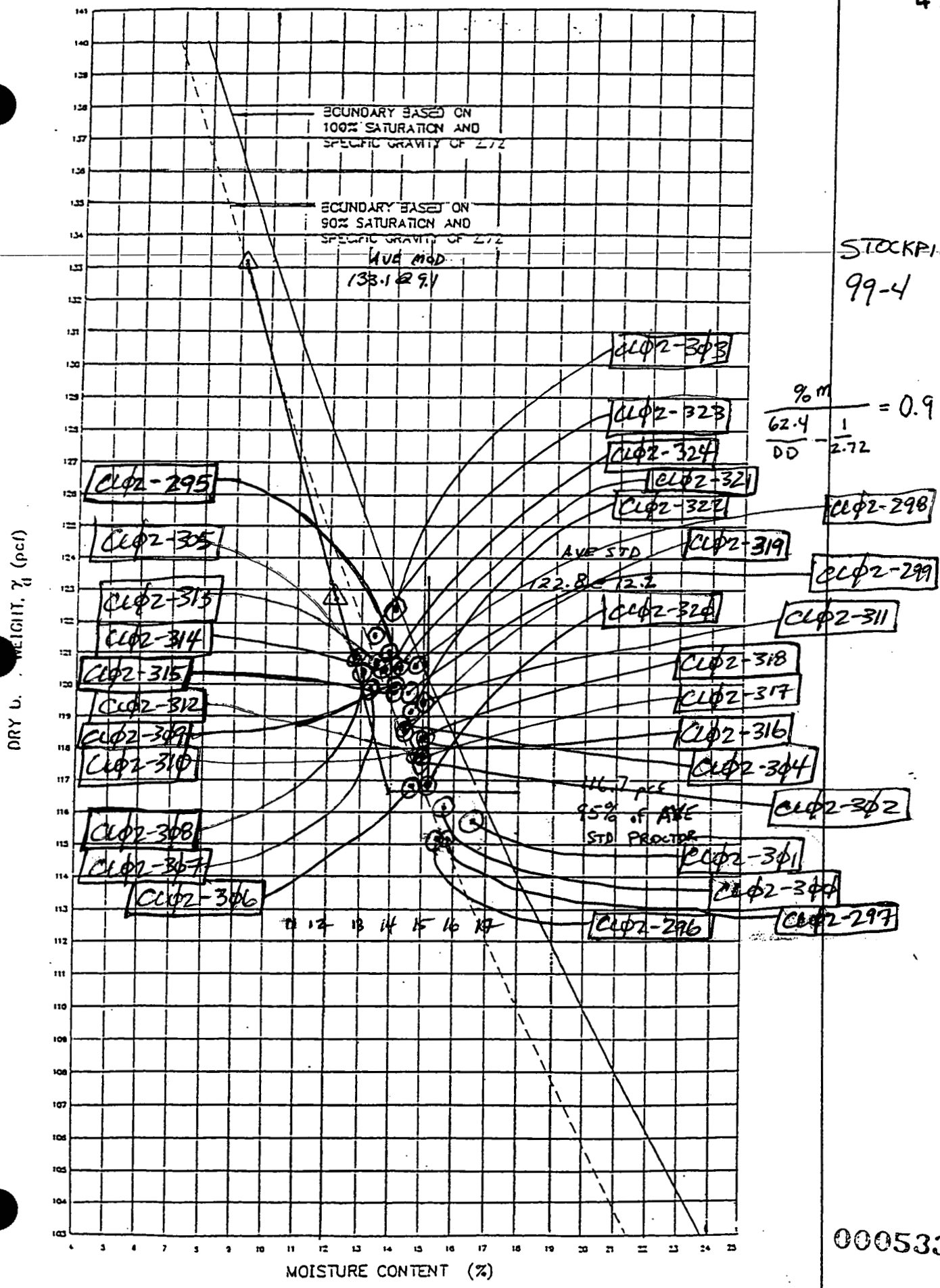


Ø2 JULY 2ØØ2

GQ1341-Ø4.1

000532

SHEET No 4 OF 5



$$\frac{\%M}{\frac{62.4}{DD} - \frac{1}{2.72}} = 0.9 \text{ (minimum)}$$

02 JULY 2002 GQ1341-04.1

SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 03 day (WEDNESDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +0-3% (APZ) LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILES 99-4/01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (234)

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CD2-325	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	13.1 (14.5)	137.1	119.7	97.5	P	–	–	–	–
CD2-326	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	12.9 (14.3)	137.8	120.6	98.2	P	–	–	–	–
CD2-327	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	13.2 (14.6)	135.7	118.4	96.4	P	–	–	–	–
CD2-328	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	13.4 (14.7)	136.4	118.9	96.8	P	–	–	–	–
CD2-329	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	12.7 (14.1)	137.7	120.7	98.3	P	–	–	–	–
CD2-330	CELL #5 - N. WEST END	6"/L-1	99.4	12.2	122.8	12.8 (14.2)	136.4	119.4	97.3	P	–	–	–	–
CD2-331	CELL #5 - 10:1 SLOPE	6"/L-2	99.4	12.2	122.8	11.4 (13.0)	137.9	122.0	99.4	P	–	–	–	–
CD2-332	CELL #5 - 10:1 SLOPE	6"/L-2	99.4	12.2	122.8	12.4 (13.9)	137.1	120.4	98.0	P	–	–	–	–
CD2-333	CELL #5 - 10:1 SLOPE	6"/L-2	[illegible]	12.2	122.8	11.4 (13.0)	138.1	122.2	99.5	P	–	–	–	–
CD2-334	CELL #5 - 10:1 SLOPE	6"/L-2	01-10	13.6	120.7	14.2 (15.4)	134.7	116.7	96.7	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-13 TAKEN AT CD2-332

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 03 day JULY month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +0-3% (APZ) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-10 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC)

TEST NO.	TEST LOCATION — (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-335	CELL #5 - 10:1 SLOPE	6" / L-2	01-10	13.6	120.7	13.0 (14.4)	135.4	118.4	98.1	P	—	—	—	—
CL02-336	CELL #5 - 10:1 SLOPE	6" / L-2	01-10	13.6	120.7	14.0 (15.2)	133.7	116.1	96.2	P	—	—	—	—
CL02-337	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	12.0 (13.5)	135.7	119.6	97.8	P	—	—	—	—
CL02-338	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	12.7 (14.1)	137.3	120.3	98.4	P	—	—	—	—
CL02-339	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	13.6 (14.9)	135.8	118.2	96.6	P	—	—	—	—
CL02-340	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	13.5 (14.8)	133.9	116.6	95.4	P	—	—	—	—
CL02-341	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	12.7 (14.1)	137.8	120.8	98.8	P	—	—	—	—
CL02-342	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	14.3 (15.5)	134.9	116.8	95.5	P	—	—	—	—
CL02-343	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	13.5 (14.8)	136.4	118.8	97.2	P	—	—	—	—
CL02-344	CELL #5 - S.WEST END	6" / L-3	01-9	12.6	122.3	13.1 (14.5)	136.5	119.2	97.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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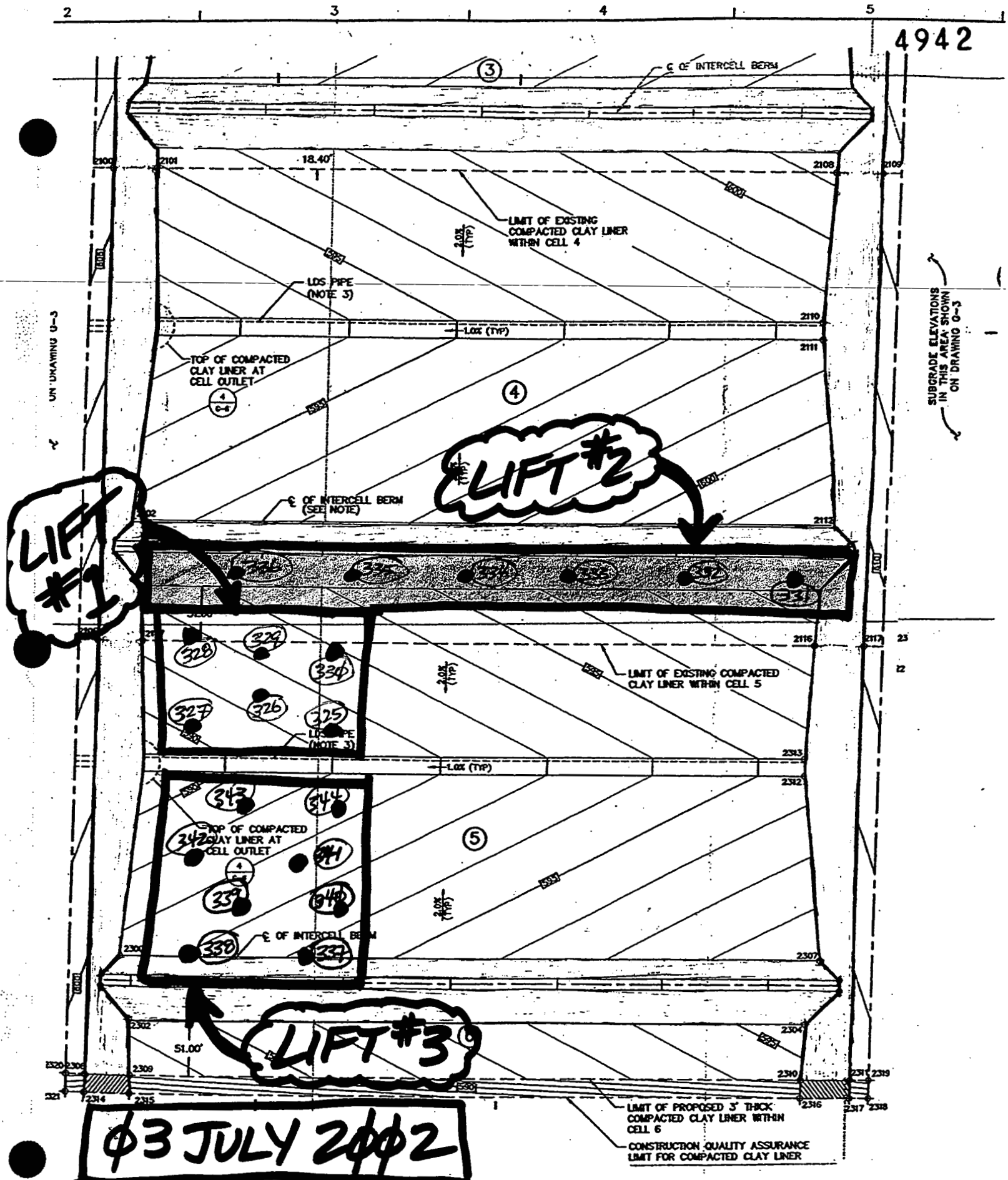
4942

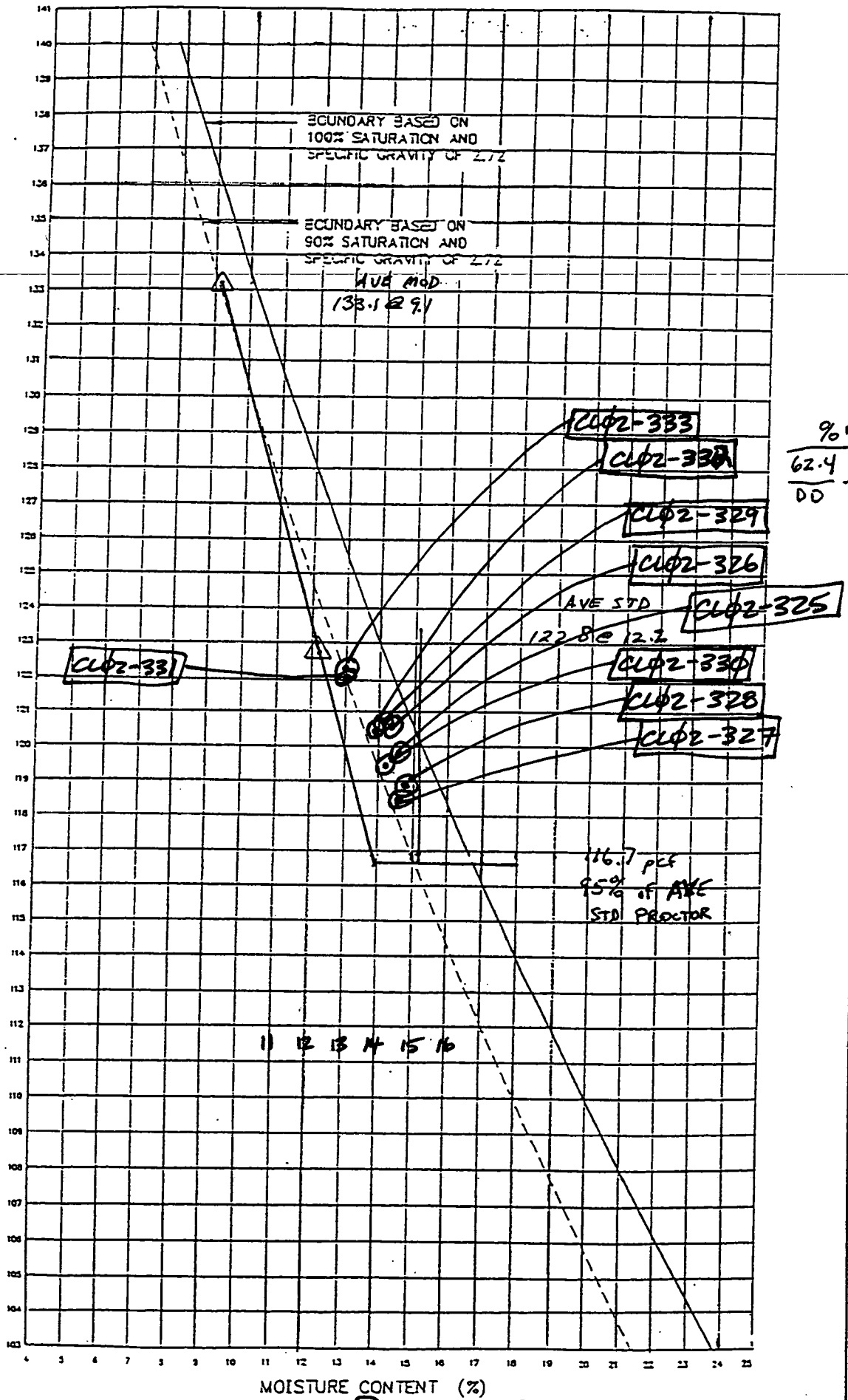


Φ3 JULY 2ΦΦ2

GQ1341-Φ4.1

000536

SHEET No 3 OF 6



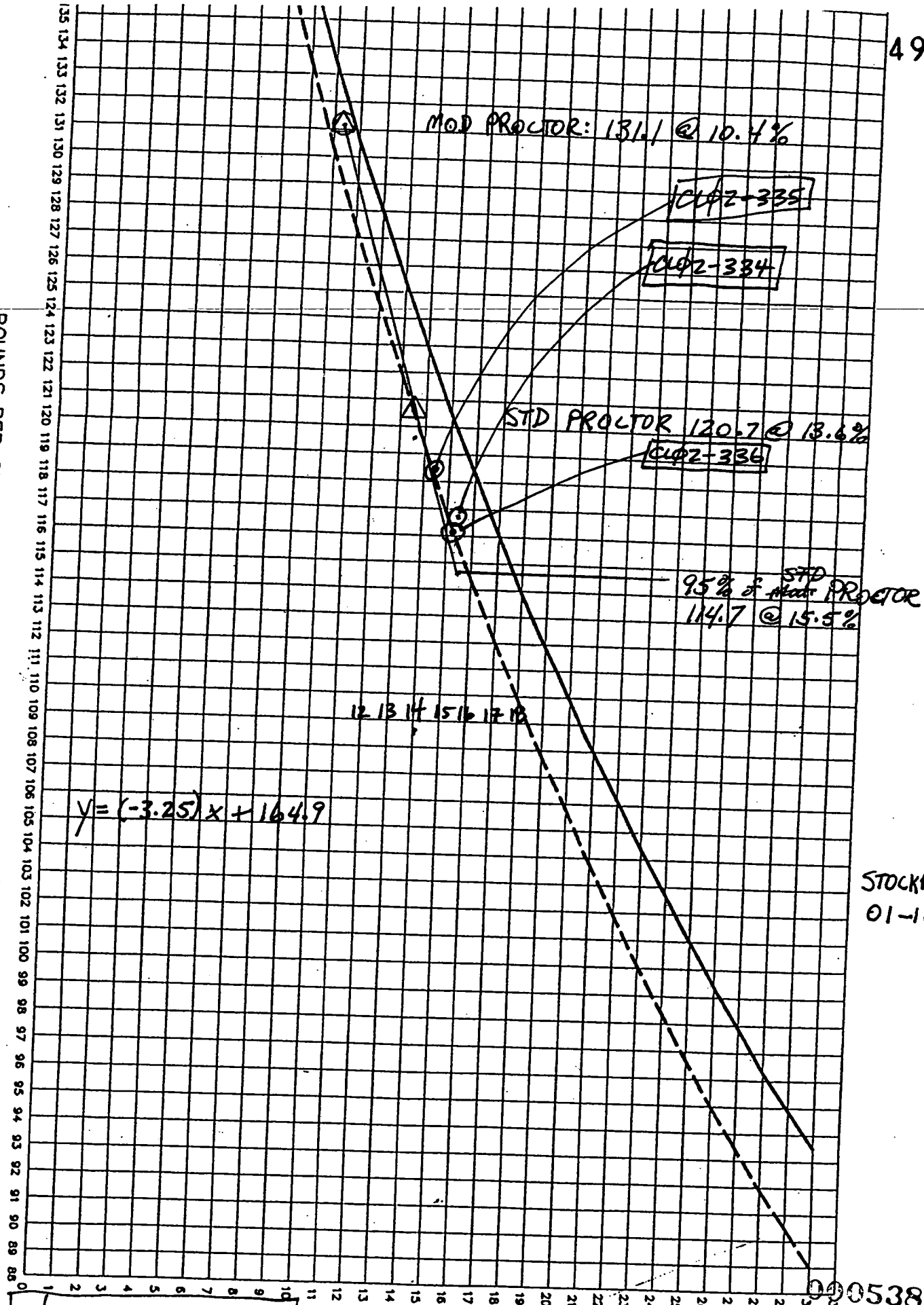
STOCKPILE
99-4

$$\frac{\%M}{\frac{62.4}{DD} - \frac{1}{2.72}} = 0.9 \text{ (minimum)}$$

000537

03 JULY 2002

GQ 1341-04.1



STOCKPILE
01-10

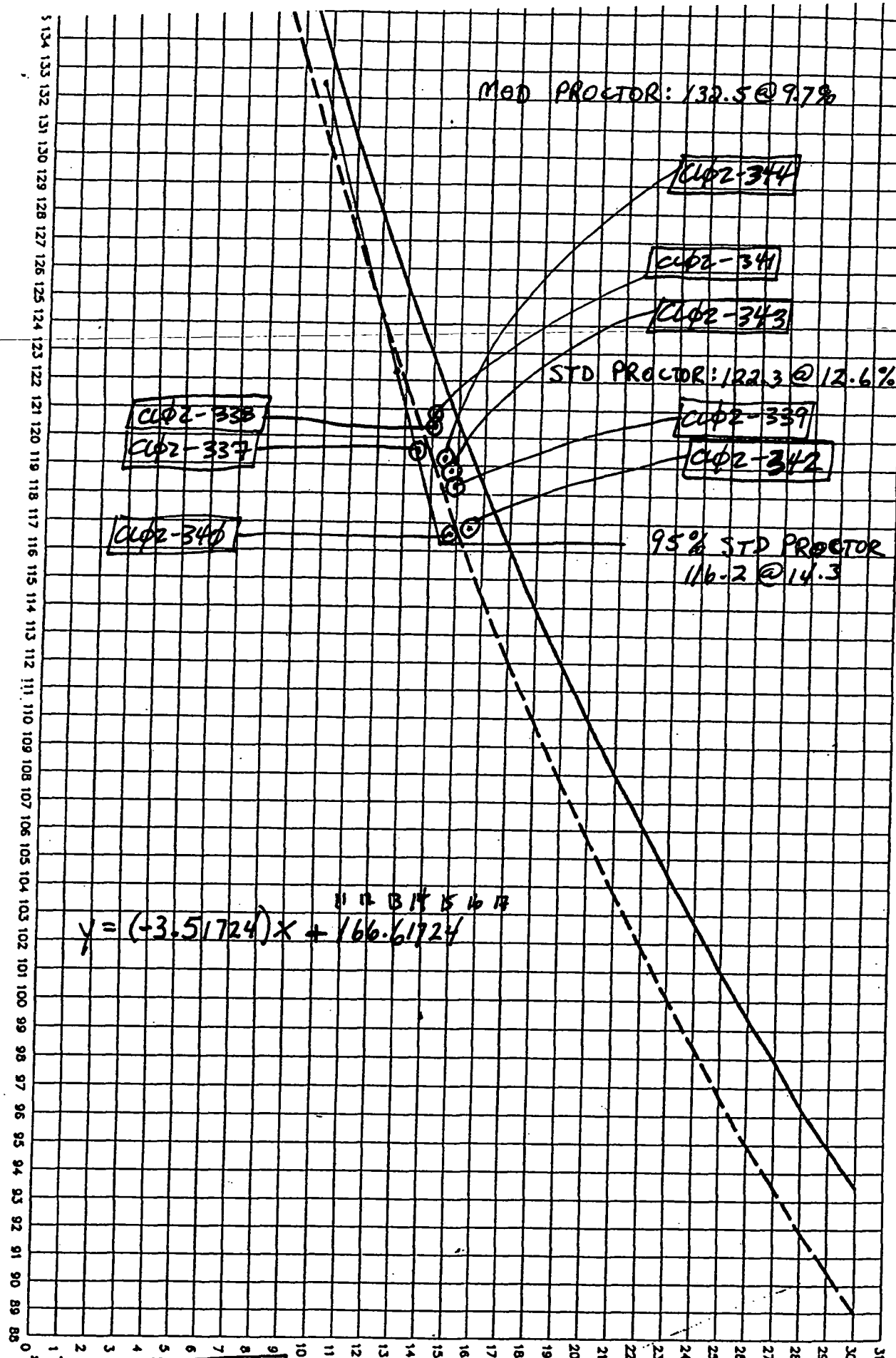
000538

Ø3 JULY 2ØØ2

GQ1341-Ø4.1

SHEET No 5 OF 6

4942



STOCKPILE
01-9

Ø3 JULY 2ØØ2

GQ1341-Ø4.1

000539

SHEET No 6 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 08 day JULY month 2002 year (MONDAY)

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: -0.3 (AP2) LIFT THICKNESS (LOOSE / COMPACTED) ~6"

MATERIAL SOURCE: STOCKPILE 01-9

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: TBD

TEST NO.	TEST LOCATION— (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CU02-345	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	11.7 (13.3)	138.5	122.2	99.9	P	—	—	—	—
CU02-346	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	12.8 (14.2)	138.8	121.5	99.4	P	—	—	—	—
CU02-347	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	11.8 (13.4)	139.1	122.7	100.3	P	—	—	—	—
CU02-348	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	12.9 (14.3)	139.0	121.6	99.4	P	—	—	—	—
CU02-349	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	13.3 (14.6)	135.9	118.6	97.0	P	—	—	—	—
CU02-350	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	12.4 (13.9)	139.3	122.3	100.0	P	—	—	—	—
CU02-351	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	11.0 (12.7)	138.9	123.2	100.8	P	—	—	—	—
CU02-352	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	12.4 (13.9)	139.4	122.4	100.1	P	—	—	—	—
CU02-353	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	12.2 (13.7)	136.2	119.8	97.9	P	—	—	—	—
CU02-354	Cell #5 - S. East End	6"/L-4	01-9	12.6	122.3	11.5 (13.1)	139.8	123.6	101.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4&5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 08 day JULY month 2002 year (MONDAY)

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION (AP2) / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/COMPACTED): ~6"

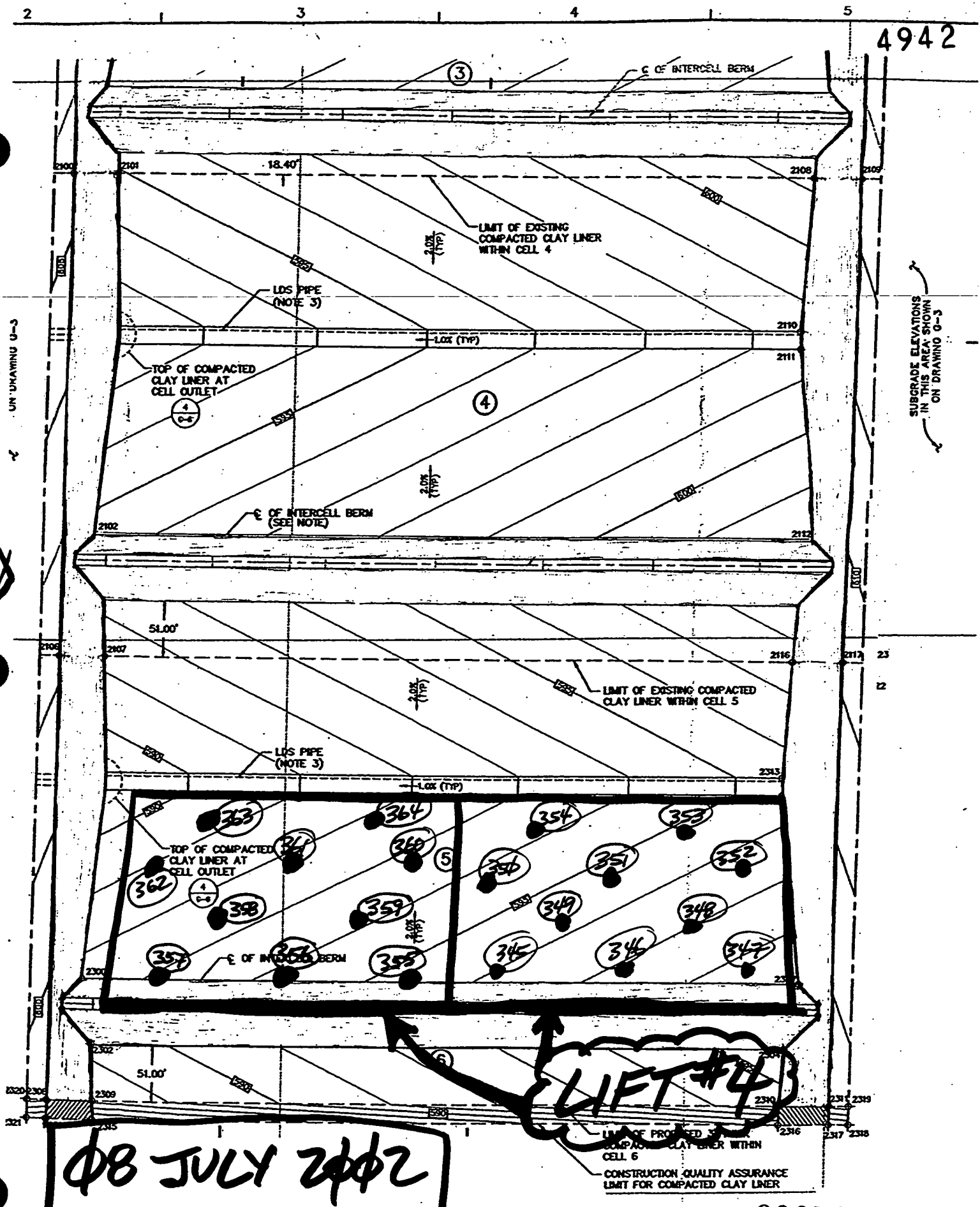
MATERIAL SOURCE: STOCKPILE 01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: TBD

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)		WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
C02-355	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	12.8	14.2	137.5	120.4	98.4	P	—	—	—	—
C02-356	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	12.7	14.1	137.5	120.5	98.5	P	—	—	—	—
C02-357	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	13.4	14.7	134.9	117.6	96.2	P	—	—	—	—
C02-358	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	13.9	15.2	134.5	116.8	95.5	P	—	—	—	—
C02-359	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	14.3	15.5	134.9	116.8	95.5	P	—	—	—	—
C02-360	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	13.9	15.2	137.0	118.9	97.2	P	—	—	—	—
C02-361	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	14.3	15.5	134.3	116.3	95.1	P	—	—	—	—
C02-362	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	14.4	15.6	136.1	117.7	96.3	P	—	—	—	—
C02-363	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	11.1	12.8	139.5	123.7	101.1	P	—	—	—	—
C02-364	CELL #5 - S. WEST END	6"/L-4	01-9	12.6	122.3	12.2	13.7	138.0	121.4	99.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-14 TAKEN AT C02-355 *

4942



Ø8 JULY 2ØØ2

GQ1341-Ø4.1

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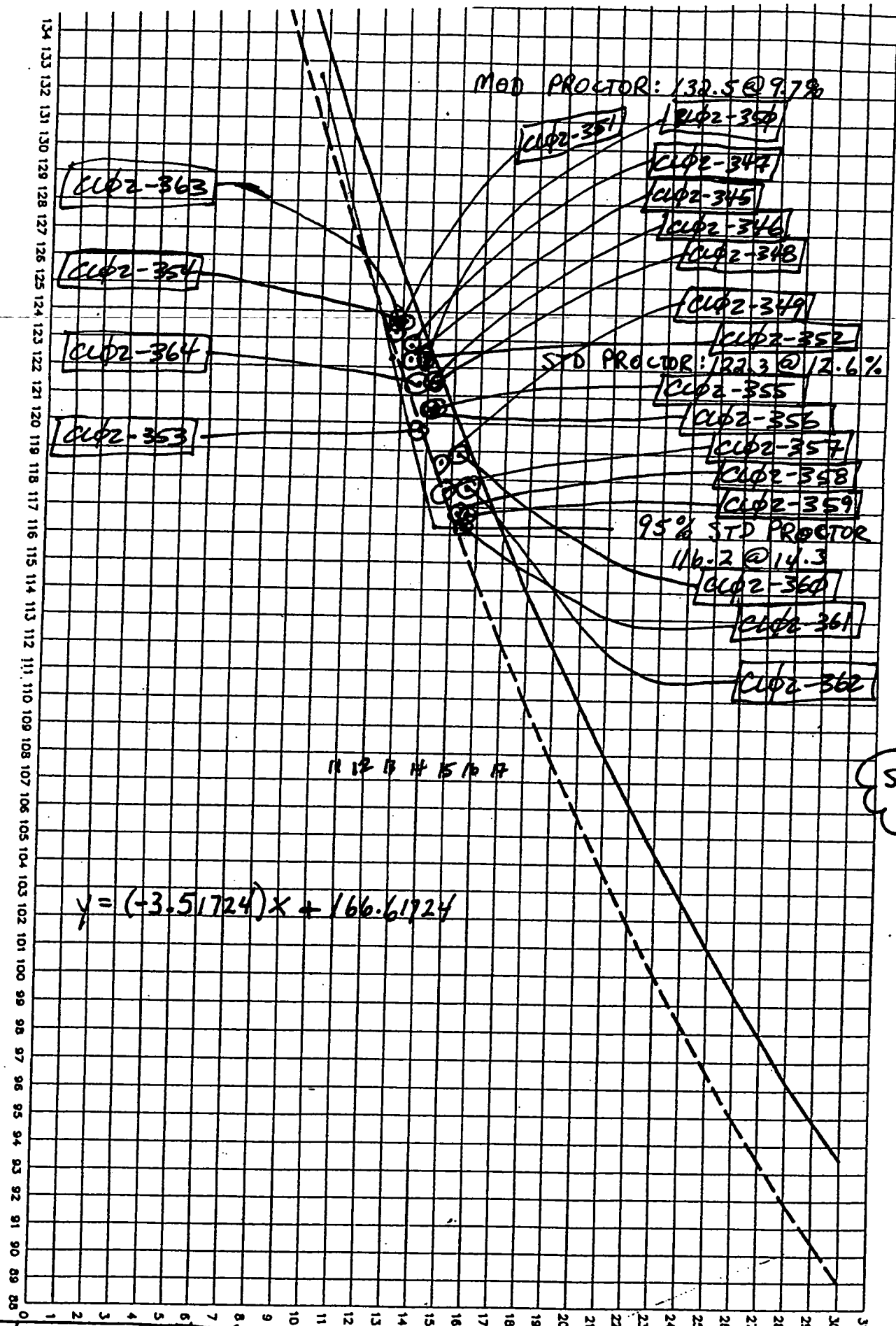
SHEET No. 3 OF 4



STOCKPILE 01-9

ØØ JULY 2ØØ2

GQ1341-Ø4.1

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SHEET No 4 OF 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 09 day JULY month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (APZ) / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-9

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBA)

TEST NO.	TEST LOCATION — (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-365	CELL #4 - PEN. BOX AREA	4"/L-1	01-9	12.6	122.3	14.1 (15.3)	136.7	118.6	97.0	P	—	—	—	—
CU02-366	CELL #5 - EAST SLOPE	6"/L-1	99-4	12.2	122.8	11.1 (12.8)	138.4	122.7	99.9	P	—	—	—	—
CU02-367	CELL #5 - EAST SLOPE	6"/L-1	99-4	12.2	122.8	12.1 (13.6)	137.3	120.9	98.4	P	—	—	—	—
CU02-368	CELL #5 - EAST SLOPE	6"/L-1	99-4	12.2	122.8	12.6 (14.1)	140.3	123.0	100.1	P	—	—	—	—
CU02-369	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	11.9 (13.5)	135.6	119.5	97.7	P	—	—	—	—
CU02-370	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	13.0 (14.4)	137.3	120.0	98.1	P	—	—	—	—
CU02-371	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	12.6 (14.1)	139.3	122.1	99.8	P	—	—	—	—
CU02-372	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	11.0 (12.7)	142.3	126.3	103.2	P	—	—	—	—
CU02-373	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	12.8 (14.2)	138.1	120.9	98.9	P	—	—	—	—
CU02-374	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	12.8 (14.2)	136.2	119.3	97.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 1 OF 6

00544

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 09 day JULY month 2002 year (TUESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-9 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBC) / KS

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-375	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	11.3 (13.0)	137.5	121.7	99.5	P	—	—	—	—
CL02-376	CELL #5 - N. EAST END	6"/L-2	01-9	12.6	122.3	12.3 (13.8)	135.9	119.4	97.6	P	—	—	—	—
CL02-377	CELL #5 - EAST D. CORR.	6"/L-1	01-9	12.6	122.3	13.8 (15.1)	134.3	116.7	95.4	P	—	—	—	—
CL02-378	CELL #5 - EAST D. CORR	6"/L-1	01-9	12.6	122.3	13.3 (14.6)	136.9	119.5	97.7	P	—	—	—	—
CL02-379	CELL #4 - PEN. BOX AREA	6"/L-2	01-9	12.6	122.3	14.1 (15.3)	136.9	118.7	97.1	P	—	—	—	—

000545

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 9 day July month ~~2002~~ year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE Ø1-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x+3.3669 QA ID: CL

TEST NO. CLØ2-	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
380	East Slope - Cell 5	6"/2	Ø1-9	12.6	122.3	~~12.8~~ 14.2	~~134.6~~ 136.4	119.4	97.6	P	—	—	—	—
381	East Bench - Cell 5	6"/2	Ø1-9	12.6	122.3	~~12.3~~ 13.8	136.0	119.5	97.7	P	—	—	—	—
382	East Bench - Cell 5	6"/2	Ø1-9	12.6	122.3	~~14.1~~ 15.3	135.4	117.4	96.0	P	—	—	—	—
383	East Slope - Cell 5	6"/2	Ø1-9	12.6	122.3	~~11.3~~ 13.0	138.3	122.4	100.1	P	—	—	—	—
384	East Slope - Cell 5	6"/2	Ø1-9	12.6	122.3	~~12.4~~ 13.9	138.4	121.5	99.3	P	—	—	—	—
385	East Bench - Cell 5	6"/2	Ø1-9	12.6	122.3	~~13.2~~ 14.6	137.9	120.3	98.4	P	—	—	—	—
386	Drainage Corridor - Cell 5	6"/2	Ø1-9	12.6	122.3	~~13.8~~ 15.1	134.6	116.9	95.6	P	—	—	—	—
387	Drainage Corridor Cell 5	6"/2	Ø1-9	12.6	122.3	~~13.9~~ 15.2	134.2	116.5	95.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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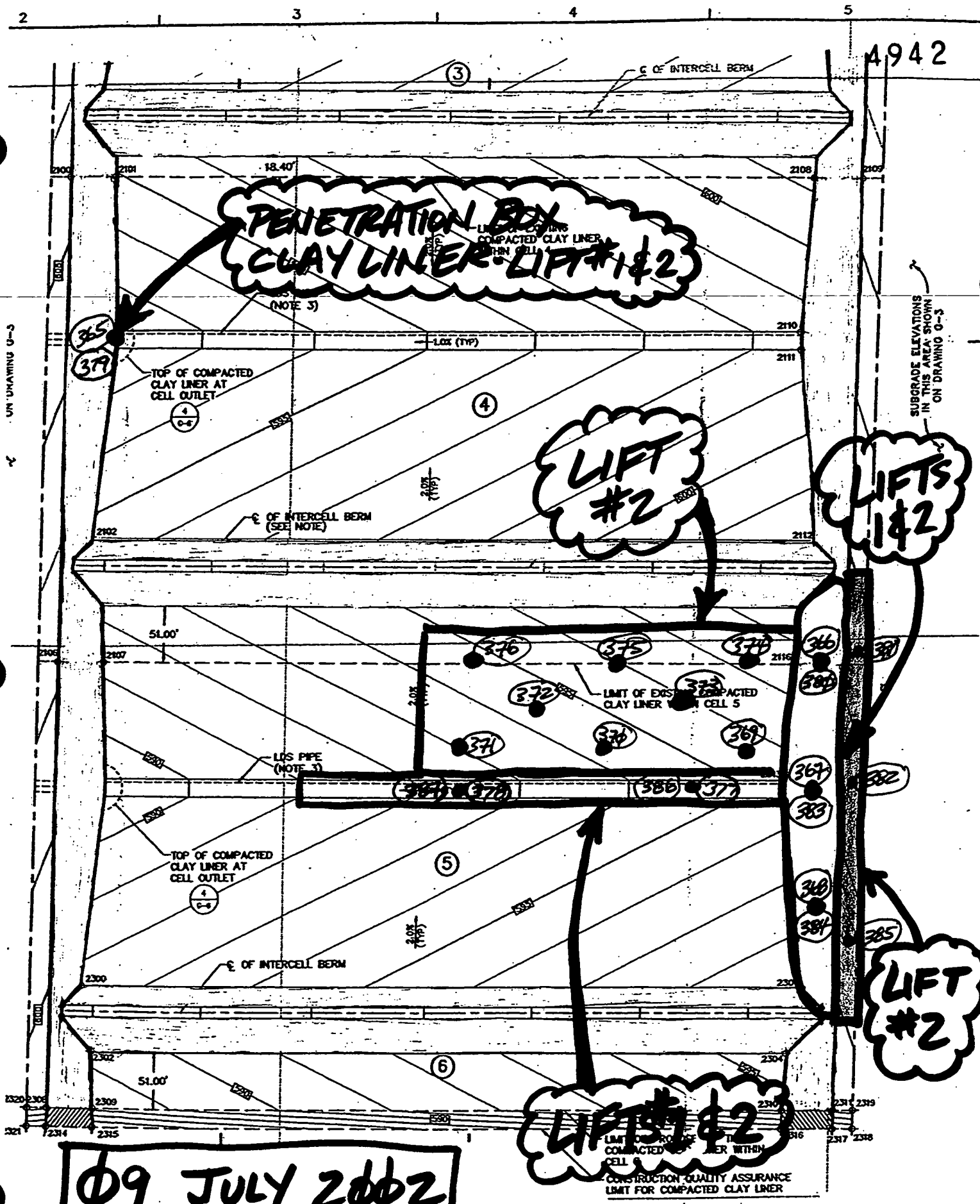

Φ9 JULY 2ΦΦ2

GQ1341-Φ4.1

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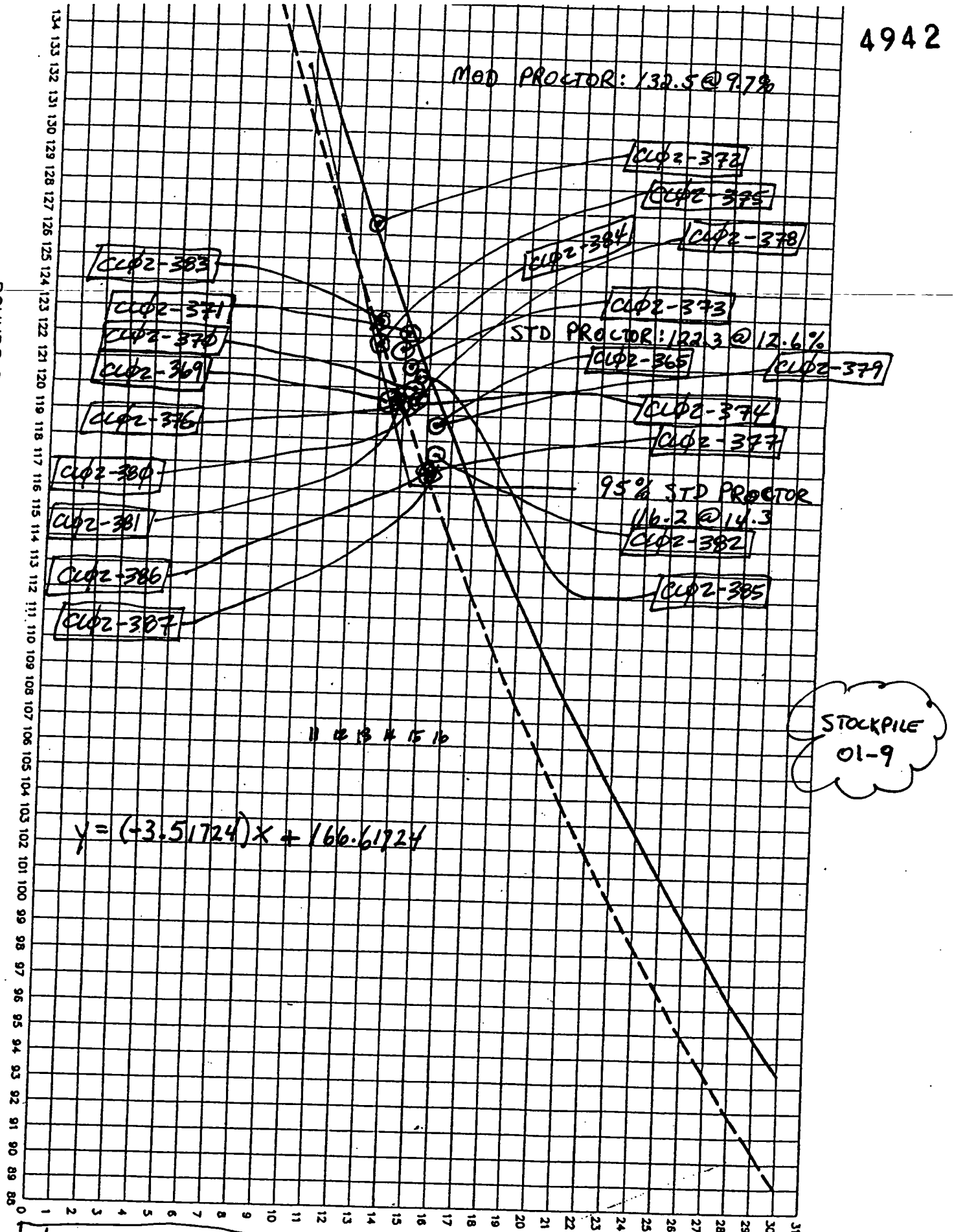
SHEET No 4 OF 6



STOCKPILE 01-9

Ø9 JULY 2ØØ2

GQ1341-Ø4.1

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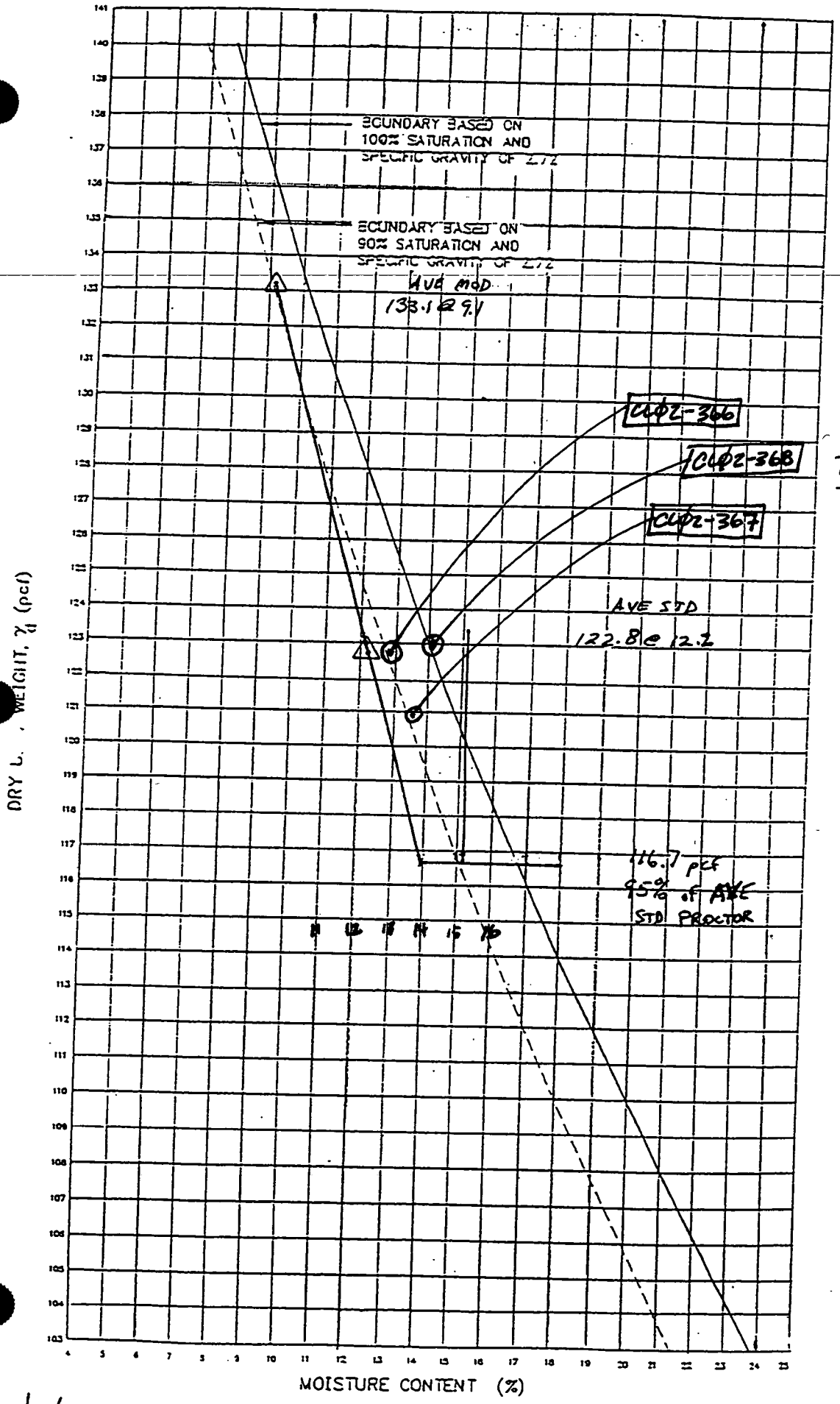
SHEET No 5 OF 6



STOCKPILE
99-4

$$\frac{\%M}{\frac{62.4}{DD} - \frac{1}{2.72}} = 0.9 \text{ (minimum)}$$

Ø9 JULY 2002 GQ1341-Ø4.1

SHEET No 6 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4&5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 10 day (WEDNESDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0.3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-9, 01-10/04 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-388	CELL #5 - N. WEST END	6"/L-2	01-9	12.6	122.3	14.8 (15.9)	134.9	116.4	95.2	—	F	CL02-447	P	—
CL02-389	CELL #5 - N. WEST END	6"/L-2	01-9	12.6	122.3	13.0 (14.4)	136.7	119.5	97.7	P	—	—	—	—
CL02-390	CELL #5 - N. WEST END	6"/L-2	01-9	12.6	122.3	14.6 (15.7)	133.9	115.7	94.6	—	F	CL02-446	P	—
CL02-391	CELL #5 - N. WEST END	6"/L-2	01-9	12.6	122.3	13.9 (15.2)	134.0	116.3	95.1	P	—	—	—	—
CL02-392	CELL #5 - N. WEST END	6"/L-2	01-9	12.6	122.3	13.9 (15.2)	133.4	115.8	94.7	—	F	CL02-444	P	—
CL02-393	CELL #4 - N. EAST END	6"/L-6	99-4	12.2	122.8	11.7 (13.3)	139.1	122.8	100.0	P	—	—	—	—
CL02-394	CELL #4 - N. EAST END	6"/L-6	01-10	13.6	120.7	14.7 (15.8)	133.8	115.5	95.7	P	—	—	—	—
CL02-395	CELL #4 - N. EAST END	6"/L-6	01-10	13.6	120.7	14.5 (15.7)	134.6	116.3	96.4	P	—	—	—	—
CL02-396	CELL #4 - N. EAST END	6"/L-6	01-10	13.6	120.7	12.6 (14.1)	136.5	119.6	99.1	P	—	—	—	—
CL02-397	CELL #4 - N. EAST END	6"/L-6	99-4	12.2	122.8	12.6 (14.1)	138.5	121.4	98.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 10 day JULY month 2002 year (WEDNESDAY)

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION (APZ) / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 99-4/01-10/ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBA)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-398	CELL #4-N. EAST END	6"/L-6	99-4	12.2	122.8	14.0 (15.2)	134.5	116.8	95.1	P	—	—	—	—
CL02-399	CELL #4-N. EAST END	6"/L-6	01-10	13.6	120.7	14.0 (15.2)	136.0	118.1	97.8	P	—	—	—	—
CL02-400	CELL #4-N. EAST END	6"/L-6	01-10	13.6	120.7	12.2 (13.7)	136.9	120.4	99.8	P	—	—	—	—
CL02-401	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	12.1 (13.6)	135.0	118.8	97.2	P	—	—	—	—
CL02-402	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	11.7 (13.3)	137.4	121.3	99.2	P	—	—	—	—
CL02-403	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	12.6 (14.1)	137.5	120.5	98.5	P	—	—	—	—
CL02-404	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	12.2 (13.7)	135.4	119.1	97.4	P	—	—	—	—
CL02-405	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	14.2 (15.4)	134.3	116.4	95.2	P	—	—	—	—
CL02-406	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	13.1 (14.5)	134.8	117.7	96.3	P	—	—	—	—
CL02-407	CELL #5-N. WEST END	6"/L-2	01-9	12.6	122.3	11.7 (13.3)	138.8	122.5	100.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) *DC02-15 TAKEN AT CL02-389*
DC02-16 TAKEN AT CL02-401

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 10 (WEDNESDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (AP2) COMPACTION / MOISTURE RANGE: +0-3 (AP2) LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILES 01-8/01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBR) / KS

TEST NO.	TEST LOCATION – (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-408	CELL #5 - EAST D. CORR	6"/L-3	01-8	12.8	122.4	14.4 (15.6)	132.3	114.4	93.5	–	F	CU02-409	P	–
CU02-409	CELL #5 - EAST D. CORR	6"/L-3	01-8	12.8	122.4	14.0 (15.2)	133.5	115.9	94.7	–	F	CU02-410	P	–
CU02-410	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.6 (14.1)	139.4	122.2	99.9	P	–	–	–	–
CU02-411	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	11.4 (13.0)	137.0	121.2	99.1	P	–	–	–	–
CU02-412	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	11.4 (13.0)	140.9	124.7	102.0	P	–	–	–	–
CU02-413	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.2 (13.7)	134.8	118.6	97.0	P	–	–	–	–
CU02-414	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.0 (13.5)	136.8	120.5	98.5	P	–	–	–	–
CU02-415	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.0 (13.5)	136.8	120.5	98.5	P	–	–	–	–
CU02-416	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.5 (14.0)	137.6	120.7	98.7	P	–	–	–	–
CU02-417	CELL #4 - N. WEST END	6"/L-6	01-9	12.6	122.3	12.8 (14.2)	136.1	119.2	97.5	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

000052 4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 10 (WEDNESDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 1-3 APZ LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBK)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-418	Cell #4 - N. West End	6"/L-6	01-9	12.6	122.3	12.9 (14.3)	137.0	119.9	98.0	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 4 OF 9

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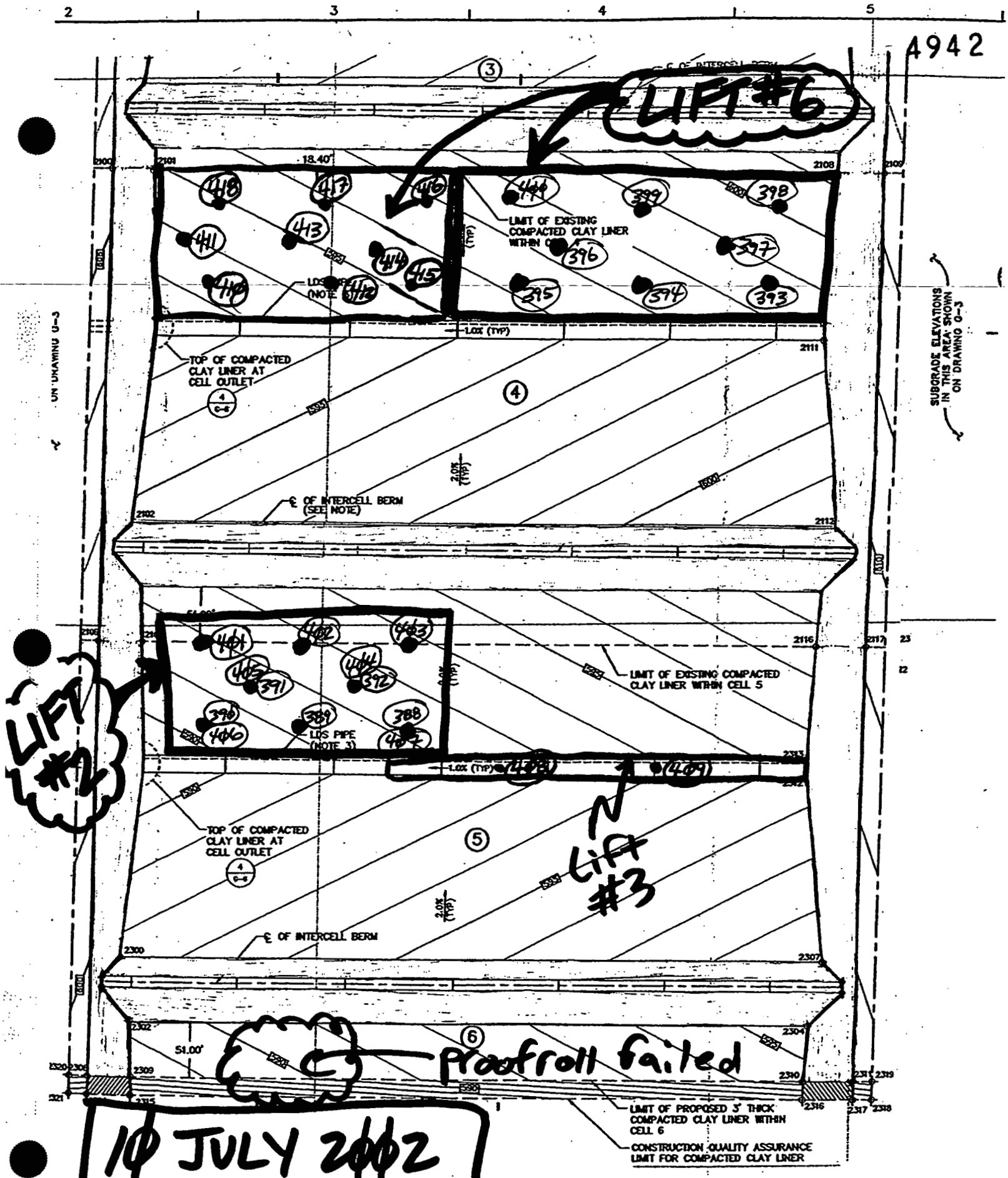

10 JULY 2002

GQ1341-04.1

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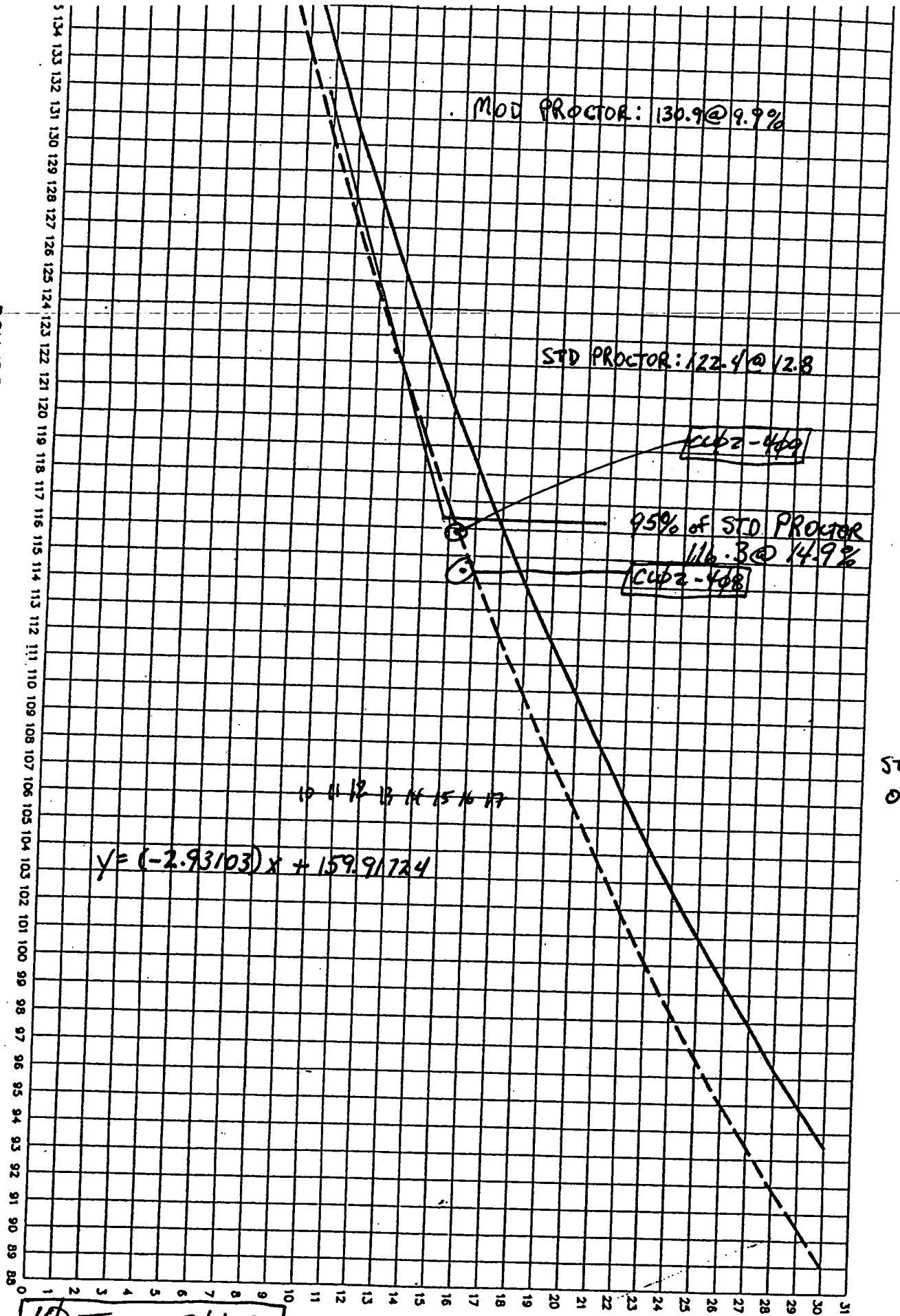
SHEET No 5 OF 9

4942



STOCKPILE
01-8

10 JULY 2002

GQ1341-041

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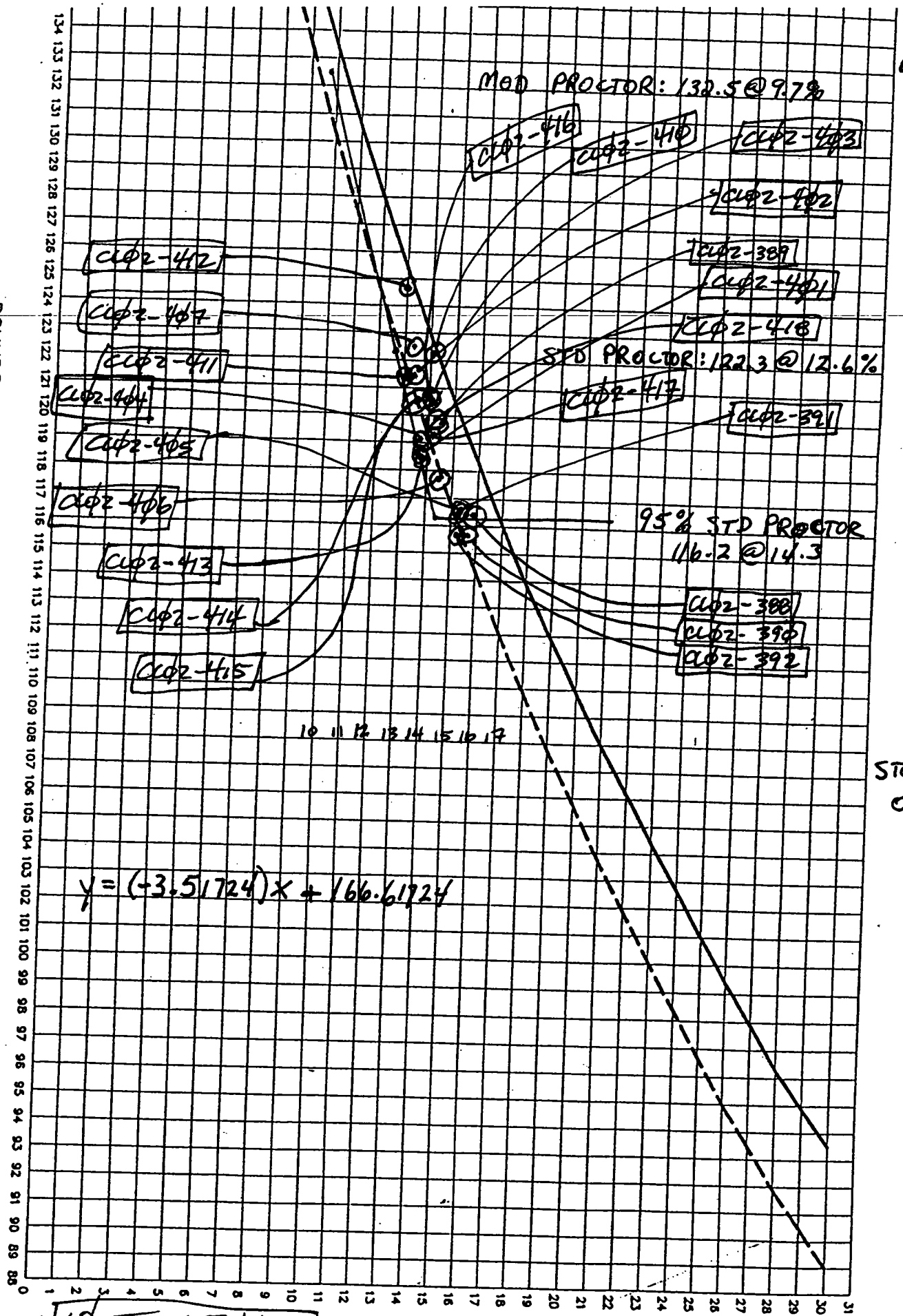
SHEET No 6 OF 9

4942



STOCKPILE
01-9

10 JULY 2002

GQ134-04.1

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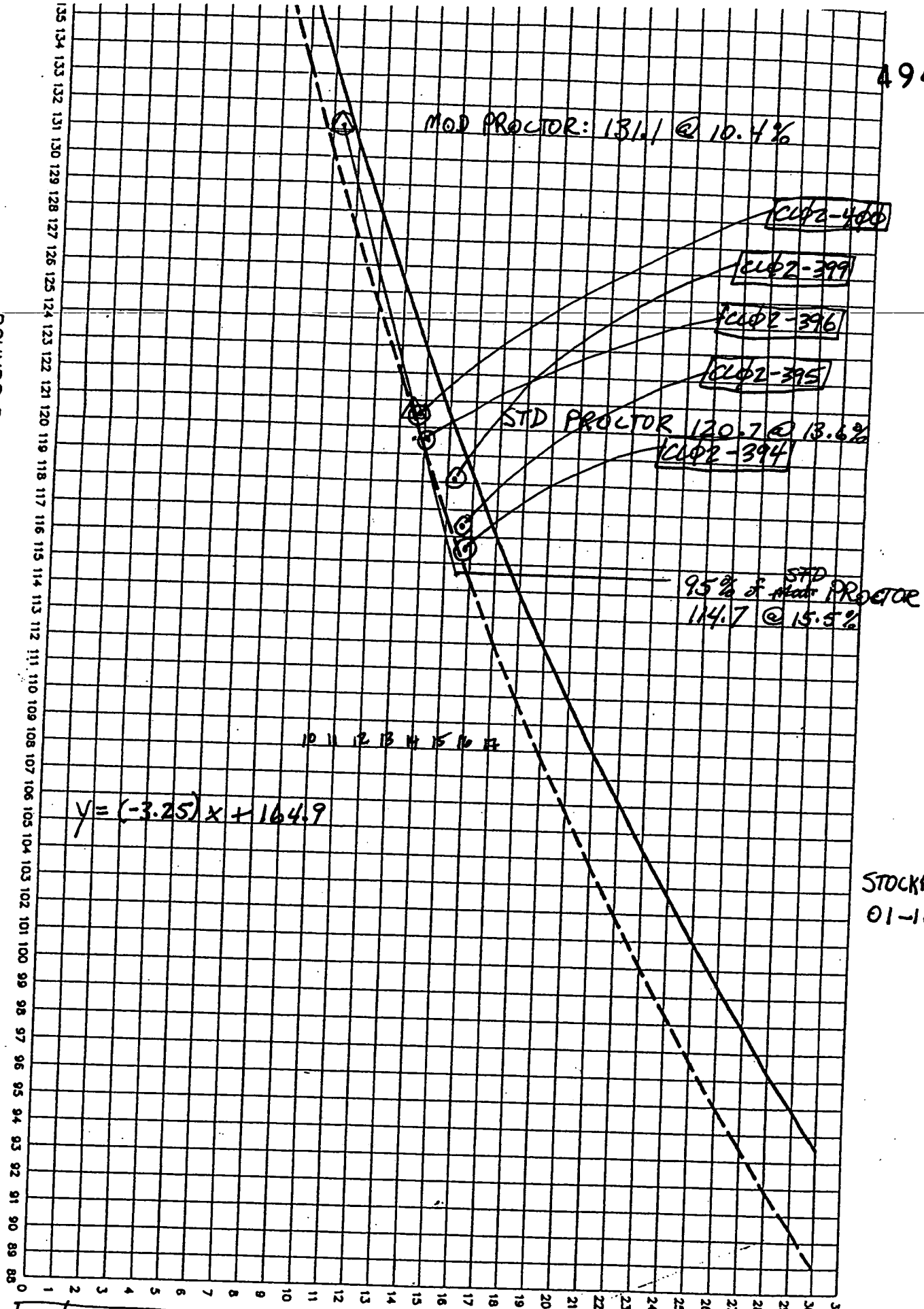
SHEET No 7 OF 9

4942



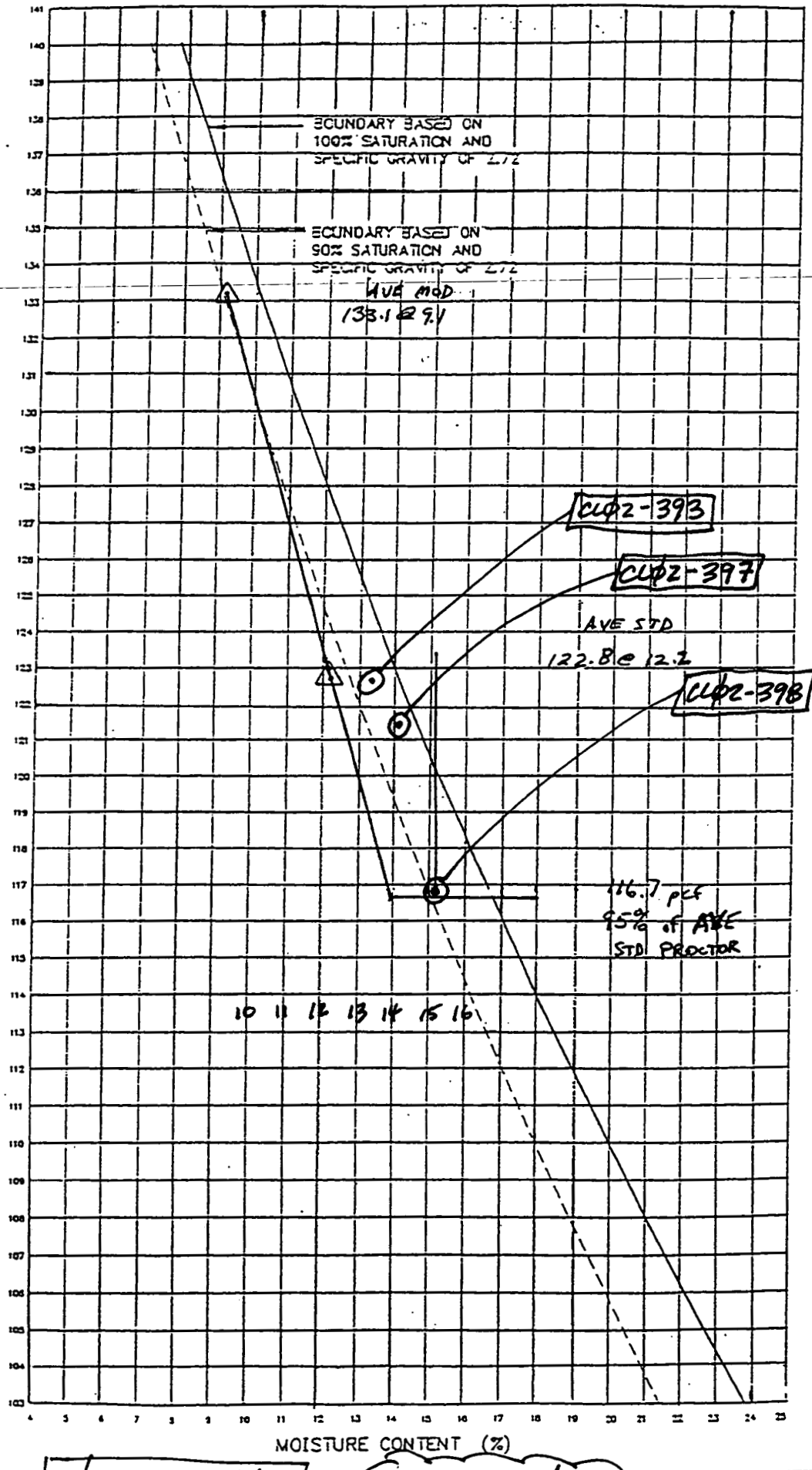
STOCKPILE
01-10

10 JULY 2002

GQ1341-04.1

000557

SHEET No. 8 OF 9



STOCKPILE
99-4

$$\frac{\%m}{\frac{62.4}{DD} - \frac{1}{2.72}} = 0.9 \text{ (minimum)}$$

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10 JULY 2002

GQ1341-04.1

SHEET No 9 OF 9

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04-1

DATE: 11 day JULY month 2002 year
THURSDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"
AP2 AP2

MATERIAL SOURCE: STOCKPILE 01-8

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-419	CELL #5 - EAST D. CORR.	6"/L-3	01-8	12.8	122.4	13.0 (14.4)	137.8	120.5	98.4	P	–	–	–	–
CU02-420	CELL #5 - EAST D. CORR.	6"/L-3	01-8	12.8	122.4	14.1 (15.3)	135.6	117.6	96.1	P	–	–	–	–
CU02-421	CELL #4 - EAST D. CORR	6"/L-6	01-8	12.8	122.4	13.8 (15.1)	135.7	117.9	96.3	P	–	–	–	–
CU02-422	CELL #4 - EAST D. CORR	6"/L-6	01-8	12.8	122.4	13.6 (14.9)	135.0	117.5	96.0	P	–	–	–	–
CU02-423	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.1 (13.6)	138.9	122.3	100.0	P	–	–	–	–
CU02-424	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.9 (14.3)	136.2	119.2	97.4	P	–	–	–	–
CU02-425	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.1 (13.6)	139.2	122.5	100.2	P	–	–	–	–
CU02-426	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	11.7 (13.3)	140.5	124.0	101.4	P	–	–	–	–
CU02-427	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	13.7 (15.0)	137.3	119.4	97.6	P	–	–	–	–
CU02-428	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	14.2 (15.4)	134.4	116.5	95.3	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * DC02-17 TAKEN AT CU02-424 *

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY:

SHEET NO. 1 OF 9

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 11 day (THURSDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ / LIFT THICKNESS (LOOSE / (COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE 01-9

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: 784

TEST NO.	TEST LOCATION - (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-429	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.5 (14.0)	134.8	118.2	96.7	P	—	—	—	—
CL02-430	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.7 (14.1)	138.0	120.9	98.9	P	—	—	—	—
CL02-431	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	11.5 (13.1)	136.5	120.7	98.7	P	—	—	—	—
CL02-432	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	13.5 (14.8)	133.8	116.6	95.3	P	—	—	—	—
CL02-433	CELL #4 - W. DRAIN. CORR.	6"/L-6	01-8	12.8	122.4	12.8 (14.2)	135.1	118.3	96.7	P	—	—	—	—
CL02-434	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.1 (13.6)	138.3	121.7	99.5	P	—	—	—	—
CL02-435	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	13.0 (14.4)	134.6	117.7	96.2	P	—	—	—	—
CL02-436	CELL #4 - S. EAST END	6"/L-6	01-9	12.6	122.3	12.5 (14.0)	135.1	118.5	96.9	P	—	—	—	—
CL02-437	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	12.3 (13.8)	134.6	118.3	96.7	P	—	—	—	—
CL02-438	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	11.6 (13.2)	136.3	120.4	98.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 7

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 11 day JULY month 2002 year (THURSDAY)

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~10-3~~ 2 LIFT THICKNESS (LOOSE / COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-8/01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-439	CELL #4 - S. WEST END	6"/L-6	01-8	12.8	122.4	11.1 (12.8)	138.4	122.7	100.2	P	—	—	—	—
CL02-440	CELL #4 - S. WEST END	6"/L-6	01-8	12.8	122.4	13.3 (14.6)	134.7	117.5	96.0	P	—	—	—	—
CL02-441	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	12.9 (14.3)	134.4	117.6	96.2	P	—	—	—	—
CL02-442	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	13.2 (14.6)	137.1	119.6	97.8	P	—	—	—	—
CL02-443	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	13.0 (14.4)	136.1	119.0	97.3	P	—	—	—	—
CL02-444	CELL #4 - S. WEST END	6"/L-6	01-8	12.8	122.4	12.4 (13.9)	136.0	119.4	97.6	P	—	—	—	—
CL02-445	CELL #4 - S. WEST END	6"/L-6	01-8	12.8	122.4	13.7 (15.0)	135.2	117.6	96.1	P	—	—	—	—
CL02-446	CELL #4 - S. WEST END	6"/L-6	01-9	12.6	122.3	12.7 (14.1)	134.6	118.0	96.5	P	—	—	—	—
CL02-447	CELL #5 - EAST BENCH	6"/L-3	01-8	12.8	122.4	16.3 (17.2)	132.2	112.8	92.2	F	F	CL02-452	P	—
CL02-448	CELL #5 - EAST BENCH	6"/L-3	01-8	12.8	122.4	14.8 (15.9)	133.6	115.3	94.2	—	F	CL02-453	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1344 TASK NO.: 04.1

DATE: 11 day JULY month 2002 year

THURSDAY

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

APZ APZ

MATERIAL SOURCE: Stockpile 01-8, 01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBY)/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-449	CELL #5, EAST BENCH	6" / L-3	01-8	12.8	122.4	~~13.1~~ 14.5	135.2	118.1	96.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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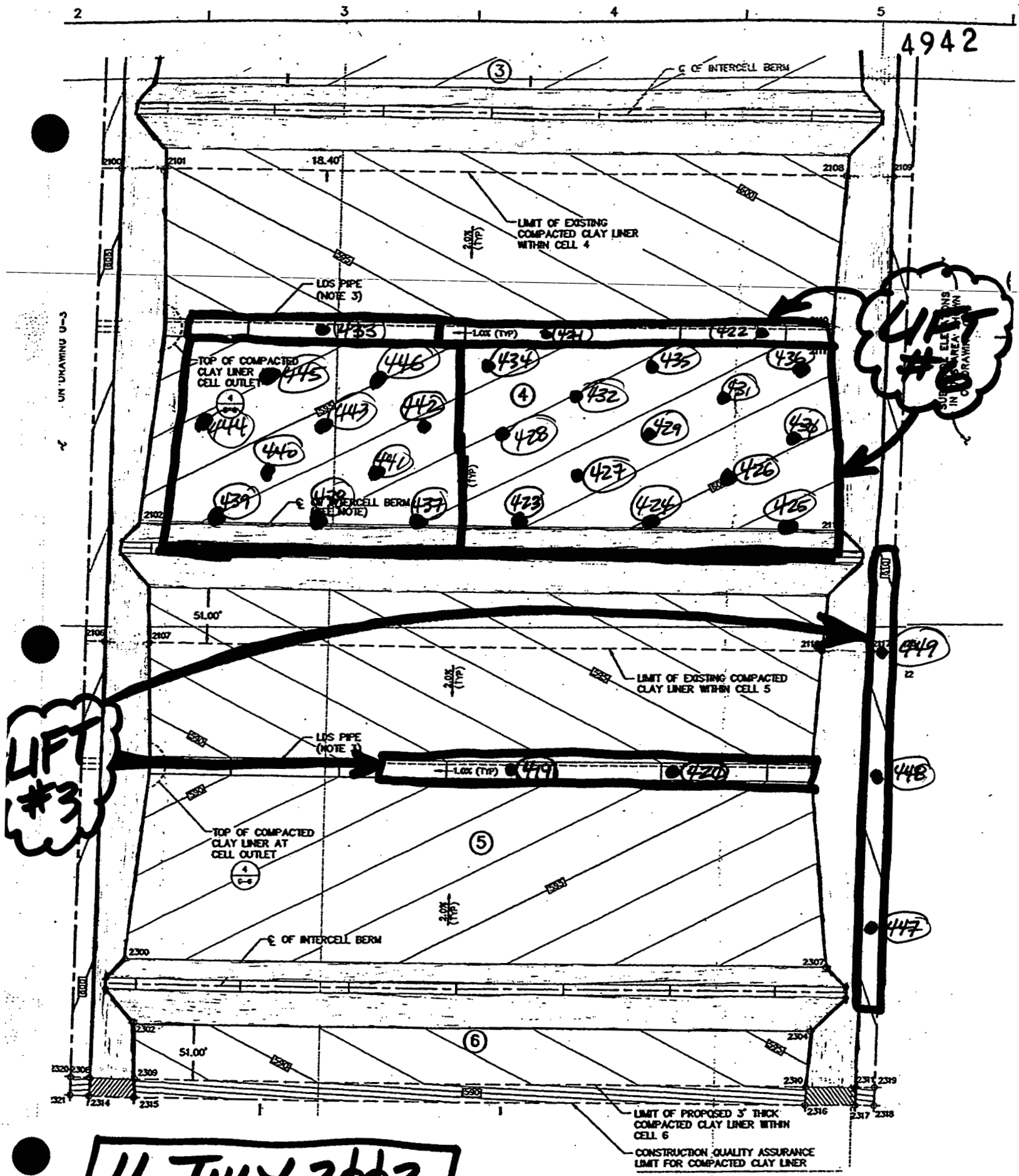

11 JULY 2002

GQ1341-04.1

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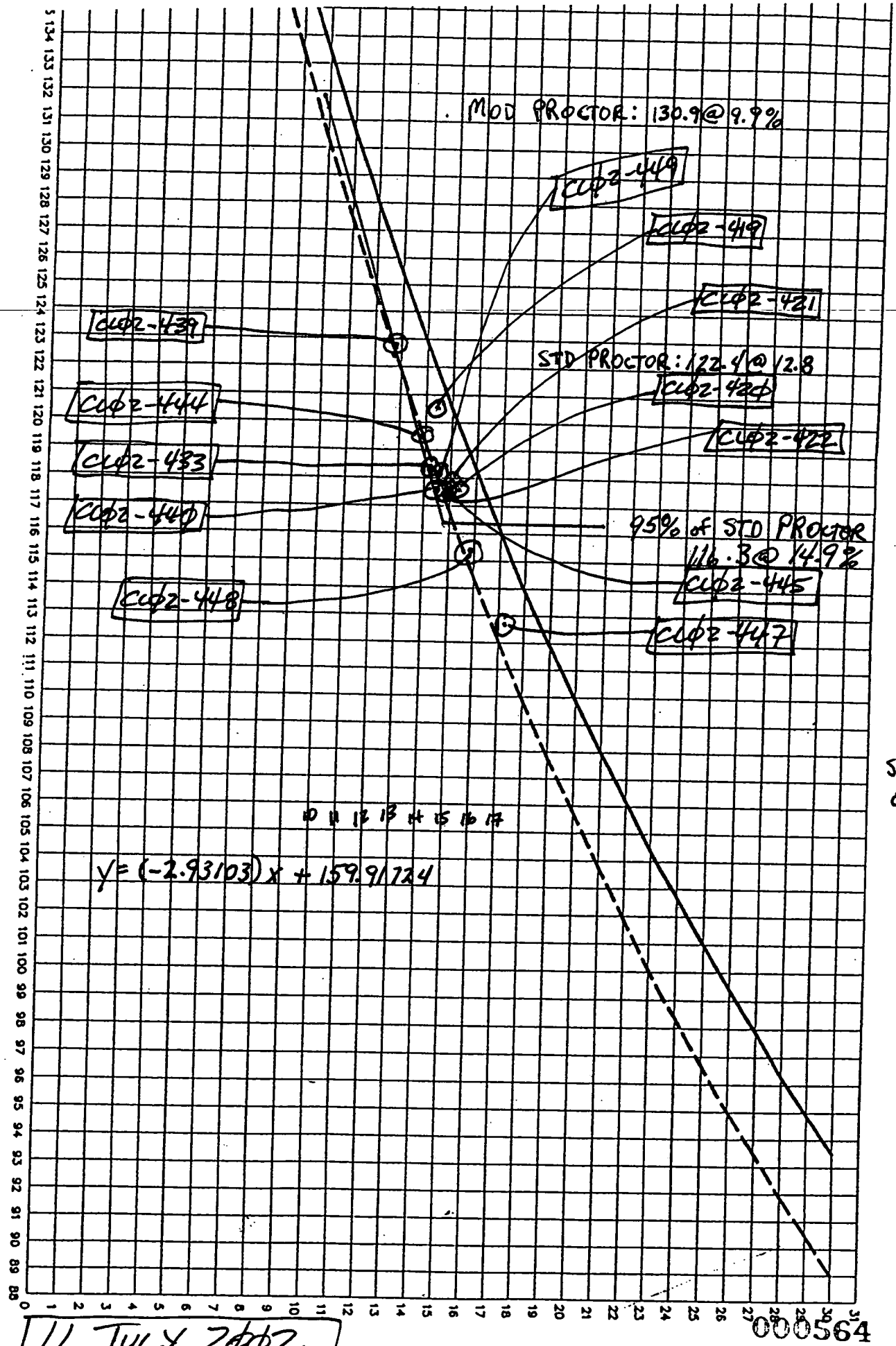
SHEET No 5 OF 7



STOCKPILE
01-8

11 JULY 2002

(GQB41-04.1)

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SHEET No 6 OF 7

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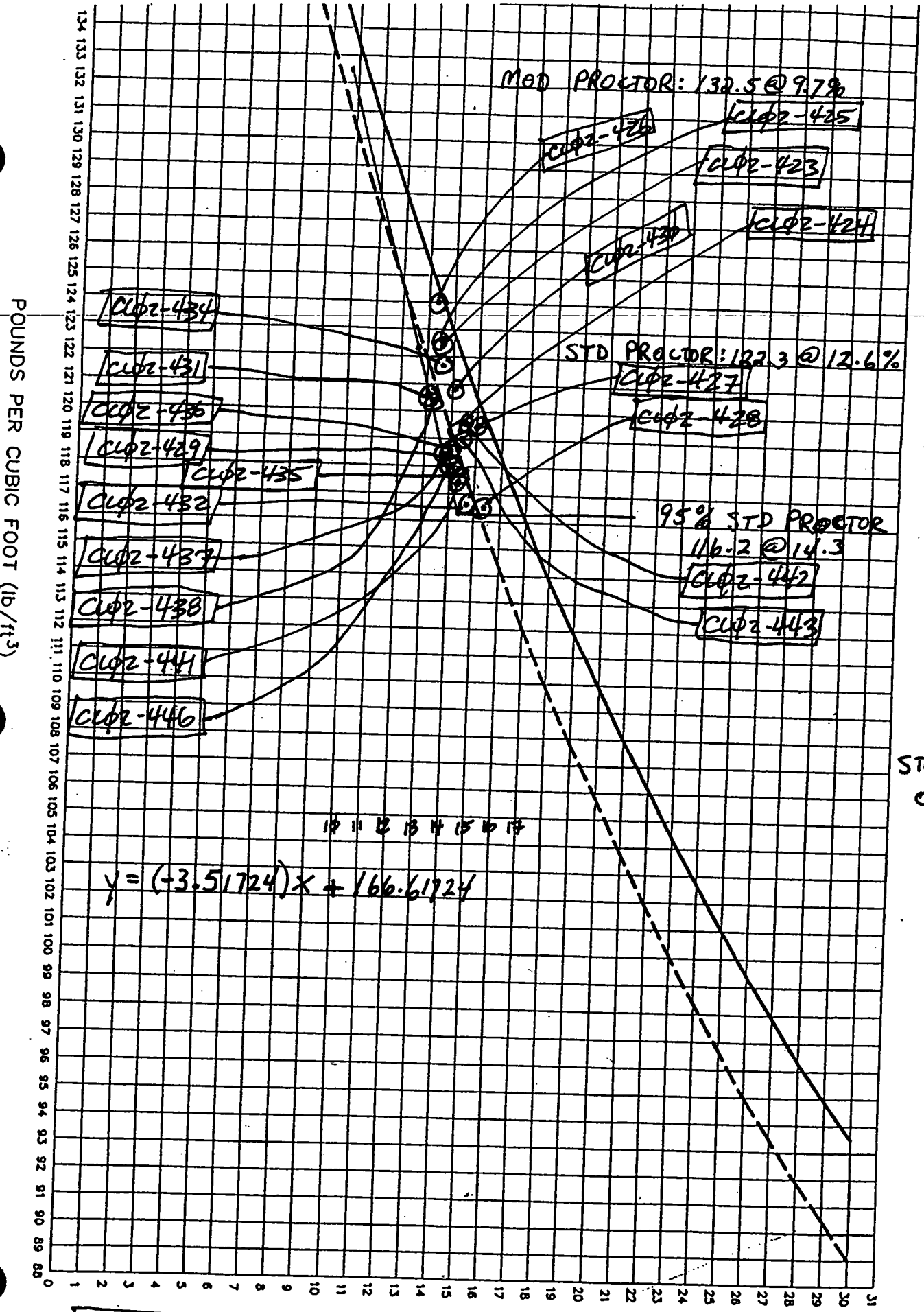

STOCKPILE
01-9

11 JULY 2002

GQ1341-04.1

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SHEET No 7 OF 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 12 day (FRIDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: 4-3 (AP2) LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILES 01-9 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: [illegible]/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-450	Cell #5 - 10:1 Slope	6"/L-3	01-9	12.6	122.3	11.6 (13.2)	137.0	121.0	99.0	P	—	—	—	—
CL02-451	Cell #5 - 10:1 Slope	6"/L-3	01-9	12.6	122.3	12.3 (13.8)	137.3	120.7	98.7	P	—	—	—	—
CL02-452	Cell #5 - East Bench	6"/L-3	01-8	12.8	122.4	13.7 (15.0)	135.5	117.8	96.3	P	—	—	—	—
CL02-453	Cell #5 - East Bench	6"/L-3	01-8	12.8	122.4	14.5 (15.7)	134.9	116.6	95.3	P	—	—	—	—
CL02-454	Cell #5 - 10:1 Slope	6"/L-3	01-9	12.6	122.3	11.2 (12.9)	137.9	122.1	99.9	P	—	—	—	—
CL02-455	Cell #5 - 10:1 Slope	6"/L-3	01-9	12.6	122.3	11.5 (13.1)	138.7	122.6	100.3	P	—	—	—	—
CL02-456	Cell #5 - 10:1 Slope	6"/L-3	01-8	12.8	122.4	11.6 (13.2)	139.8	123.5	100.9	P	—	—	—	—
CL02-457	Cell #5 - East Slope	6"/L-3	01-8	12.8	122.4	11.2 (12.9)	140.9	124.8	102.0	P	—	—	—	—
CL02-458	Cell #5 - East Slope	6"/L-3	01-8	12.8	122.4	12.6 (14.1)	137.2	120.2	98.2	P	—	—	—	—
CL02-459	Cell #5 - East Slope	6"/L-3	01-8	12.8	122.4	12.7 (14.1)	137.8	120.8	98.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

005569

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4&5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 12 (FRIDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (APZ) % COMPACTION / MOISTURE RANGE: +0.3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILES 01-8

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: [illegible]/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-460	CELL #5 - N.E. END	6"/L-3	01-8	12.8	122.4	12.9 / (14.2)	136.6	119.6	97.7	P	—	—	—	—
CL02-461	CELL #5 - N.EAST END	6"/L-3	01-8	12.8	122.4	12.0 / (13.5)	138.7	122.2	99.8	P	—	—	—	—
CL02-462	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	14.0 / (15.2)	134.4	116.7	95.3	P	—	—	—	—
CL02-463	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	13.8 / (15.1)	134.8	117.1	95.7	P	—	—	—	—
CL02-464	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	13.0 / (14.4)	136.3	119.1	97.3	P	—	—	—	—
CL02-465	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	[illegible] / (13.7)	136.5	120.1	98.1	P	—	—	—	—
CL02-466	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	12.1 / (13.6)	136.8	120.4	98.4	P	—	—	—	—
CL02-467	CELL #5 N.EAST END	6"/L-3	01-8	12.8	122.4	12.3 / (13.8)	137.3	120.7	98.6	P	—	—	—	—
CL02-468	CELL #5 N.WEST END	6"/L-3	01-8	12.8	122.4	12.5 / (14.0)	137.3	120.4	98.4	P	—	—	—	—
CL02-469	CELL #5 N.WEST END	6"/L-3	01-8	12.8	122.4	11.2 / (12.9)	139.1	123.2	100.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 2 OF 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 12 day July month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~95~~ APZ % COMPACTION / MOISTURE RANGE: ~~±3~~ APZ LIFT THICKNESS (LOOSE/COMPACTED): ~6"

MATERIAL SOURCE: Stockpile 01-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: TBD/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-470	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	12.8 (13.5)	137.5	121.1	99.0	P	—	—	—	—
CL02-471	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	11.9 (13.5)	136.7	120.4	98.4	P	—	—	—	—
CL02-472	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	13.0 (14.4)	136.1	119.0	97.2	P	—	—	—	—
CL02-473	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	12.6 (14.1)	138.0	120.9	98.8	P	—	—	—	—
CL02-474	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	13.3 (14.6)	136.4	119.0	97.2	P	—	—	—	—
CL02-475	CELL #5 N.WEST END	6" / L-3	01-8	12.8	122.4	13.5 (14.8)	136.5	118.9	97.1	P	—	—	—	—
CL02-476	CELL #5 S EAST END	6" / L-5	01-8	12.8	122.4	12.8 (14.2)	138.0	120.8	98.7	P	—	—	—	—
CL02-477	CELL #5 S EAST END	6" / L-5	01-8	12.8	122.4	11.7 (13.3)	137.4	121.2	99.0	P	—	—	—	—
CL02-478	CELL #5 S EAST END	6" / L-5	01-8	12.8	122.4	13.4 (14.7)	136.2	118.7	97.0	P	—	—	—	—
CL02-479	CELL #5 S EAST END	6" / L-5	01-8	12.8	122.4	14.2 (15.4)	134.3	116.4	95.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: 60134 1 TASK NO.: 04.1

DATE: 12 day July month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~+0~~ -3 APZ LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: Stockpile 01-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBD)/CEFL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-480	CELL #5 SEAST END	6" / L-5	01-8	12.8	122.4	13.3 (14.6)	136.3	118.9	97.1	P	—	—	—	—
CL02-481	CELL #5 SEAST END	6" / L-5	01-8	12.8	122.4	11.8 (13.4)	137.2	121.0	98.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [illegible]

SHEET NO. 4 OF 7

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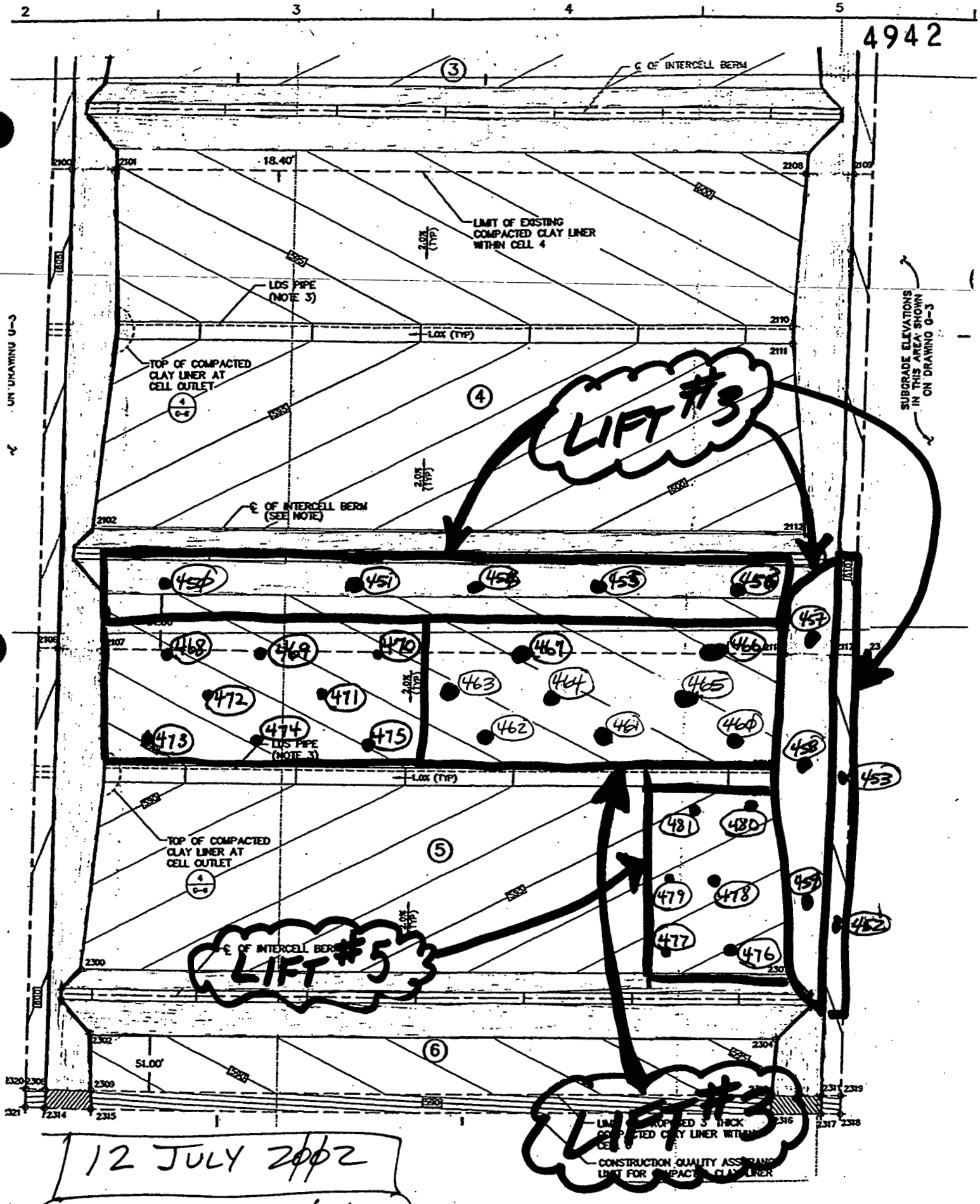

12 JULY 2002

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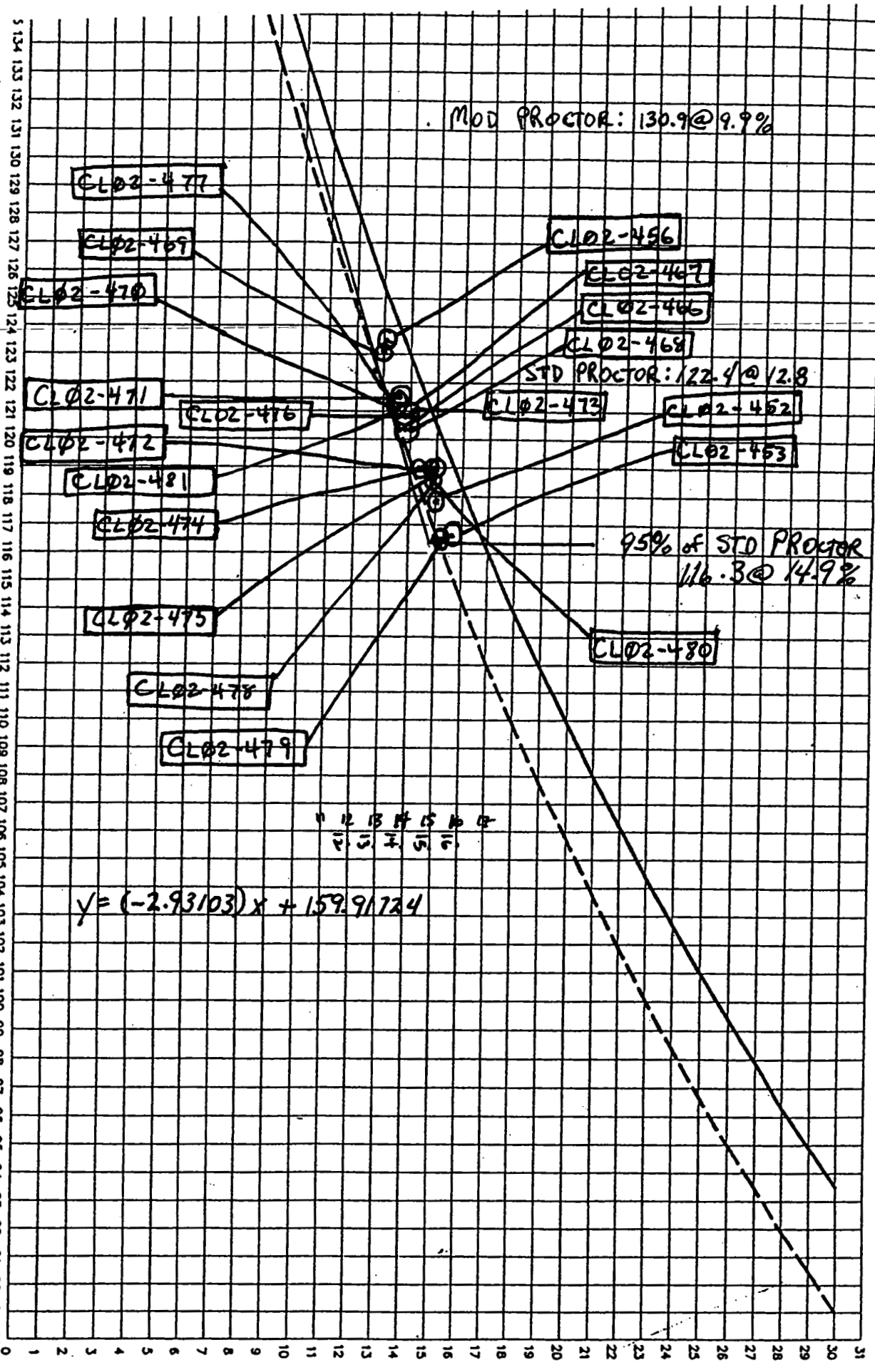
SHEET No 5 OF 7

4942



STOCKPILE
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12 JULY 2002

GQ 1341

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SHEET No. 6 of 7

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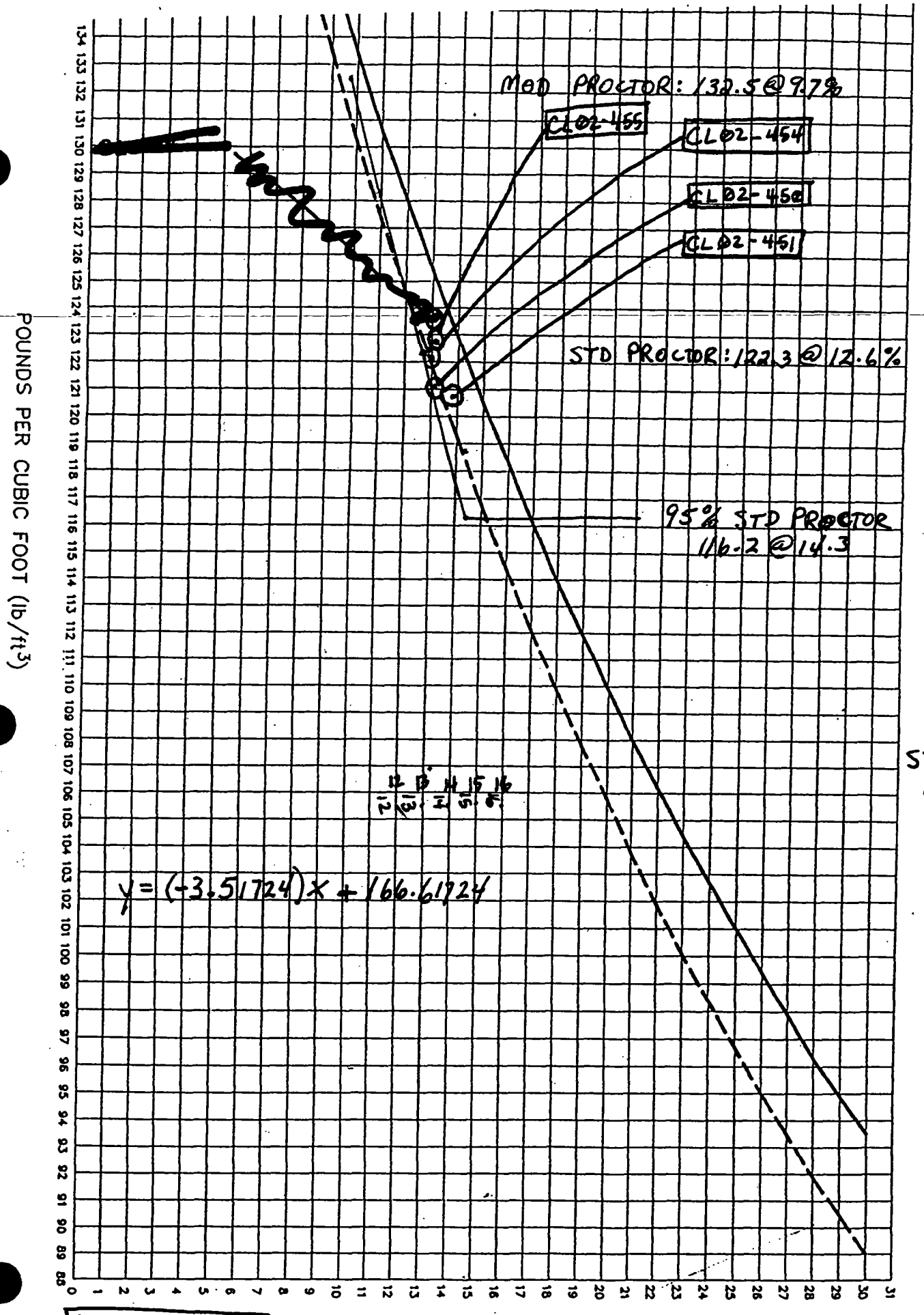

STOCKPILE
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12 July 2002

GQ1341

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SHEET NO. 7 of 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell 4 & 5

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 13 day July month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % ABZ COMPACTION / MOISTURE RANGE: +0-3 ABZ LIFT THICKNESS (LOOSE/(COMPACTED): 6"

MATERIAL SOURCE: Stockpile Ø1-8, Ø1-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: (TBC)/CHW

TEST NO.	TEST LOCATION (See Attached Sketch)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-482	Cell #4 - Pen. Box Area	6"/L-3	Ø1-8	12.8	122.4	9.9 (11.8)	122.5	109.6	89.5	—	F	CLØ2-483	P	—
CLØ2-483	Cell #4 - Pen. Box Area	6"/L-3	Ø1-8	12.8	122.4	12.9 (14.3)	137.Ø	119.9	98.Ø	P	—	—	—	—
CLØ2-484	Cell #4 - Pen. Box Area	6"/L-4	Ø1-8	12.8	122.4	9.8 (11.7)	128.9	115.4	94.3	—	F	CLØ2-486	P	—
CLØ2-485	Cell #5 - S. East End	6"/L-5	Ø1-8	12.8	122.4	14.Ø (15.2)	133.5	115.9	94.7	—	F	CLØ2-505	P	—
CLØ2-486	Cell #5 - S. East End	6"/L-5	Ø1-8	12.8	122.4	15.2 (16.3)	134.7	115.8	94.6	—	F	CLØ2-504	P	—
CLØ2-487	Cell #5 - S. East End	6"/L-5	Ø1-8	12.8	122.4	15.2 (16.3)	133.1	114.4	93.5	—	F	CLØ2-502	P	—
CLØ2-488	Cell #4 - Pen. Box	6"/L-4	Ø1-8	12.8	122.4	13.6 (14.9)	134.7	117.2	95.8	P	—	—	—	—
CLØ2-489	Cell #5 East Bench	6"/L-4	Ø1-7	11.7	124.4	13.Ø (14.4)	136.3	119.1	95.8	P	—	—	—	—
CLØ2-490	Cell #5 East Bench	6"/L-4	Ø1-7	11.7	124.4	13.3 (14.6)	138.1	12Ø.5	96.9	P	—	—	—	—
CLØ2-491	Cell #5 East Bench	6"/L-4	Ø1-7	11.7	124.4	13.4 (14.7)	135.9	118.5	95.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4&5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 13 day (SATURDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3 LIFT THICKNESS (LOOSE/(COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-7/01-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: (RO)/CMW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
C02-492	CELL #4 - PEAT BOX AREA	6" / L-5	01-7	11.7	124.4	15.4 (16.4)	133.4	114.6	92.1	–	F	CL02-506	P	–
L02-493	CELL #5 S. EAST END	6" / L-5	01-8	12.8	122.4	14.8 (15.9)	133.7	115.4	94.2	–	F	CL02-500	P	–
L02-494	CELL #5 S. EAST END	6" / L-5	01-8	12.8	122.4	15.9 (16.8)	131.8	112.7	92.1	–	F	CL02-501	P	–

0000574

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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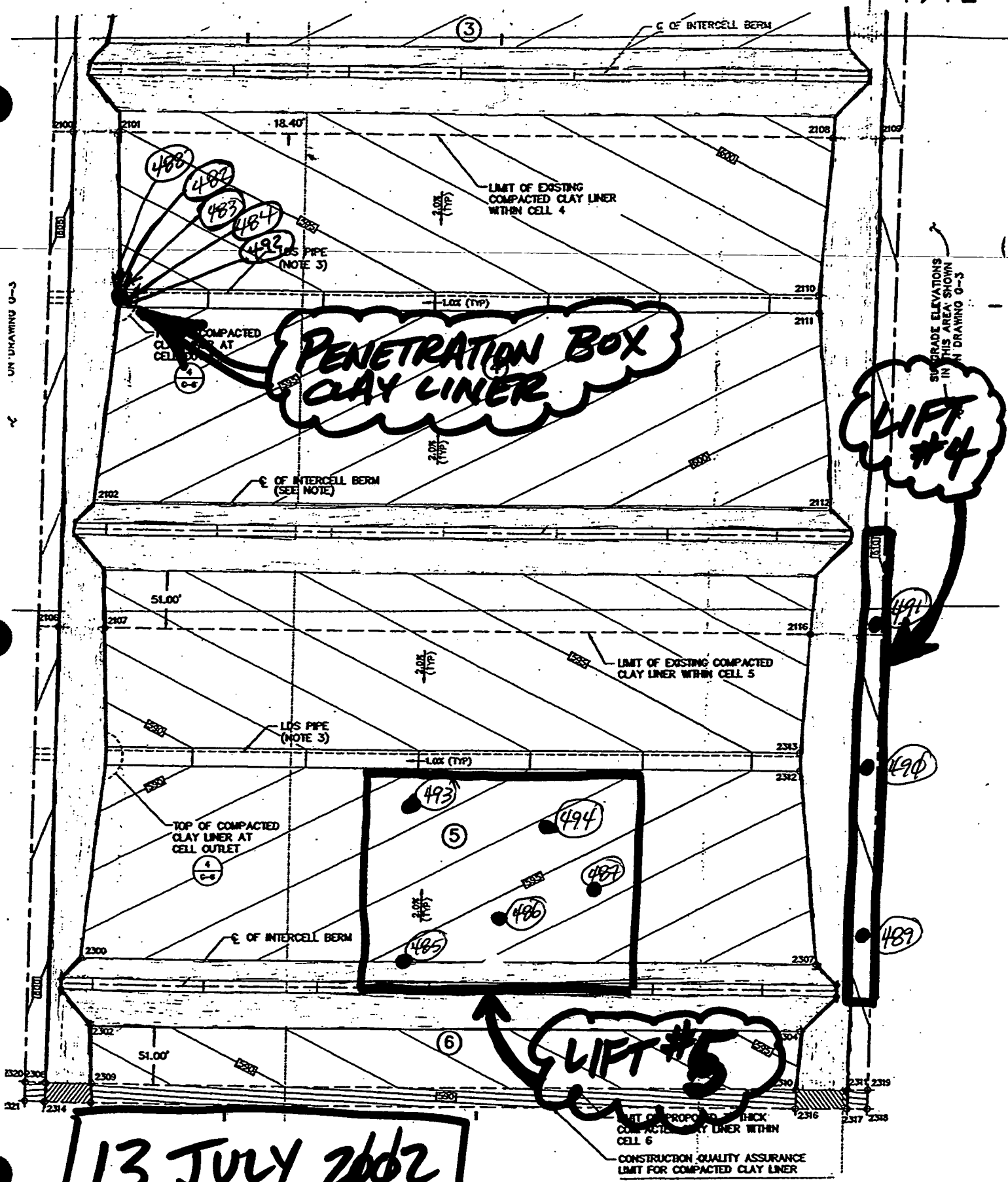
SHEET NO. 2 OF 5

4942



13 JULY 2002

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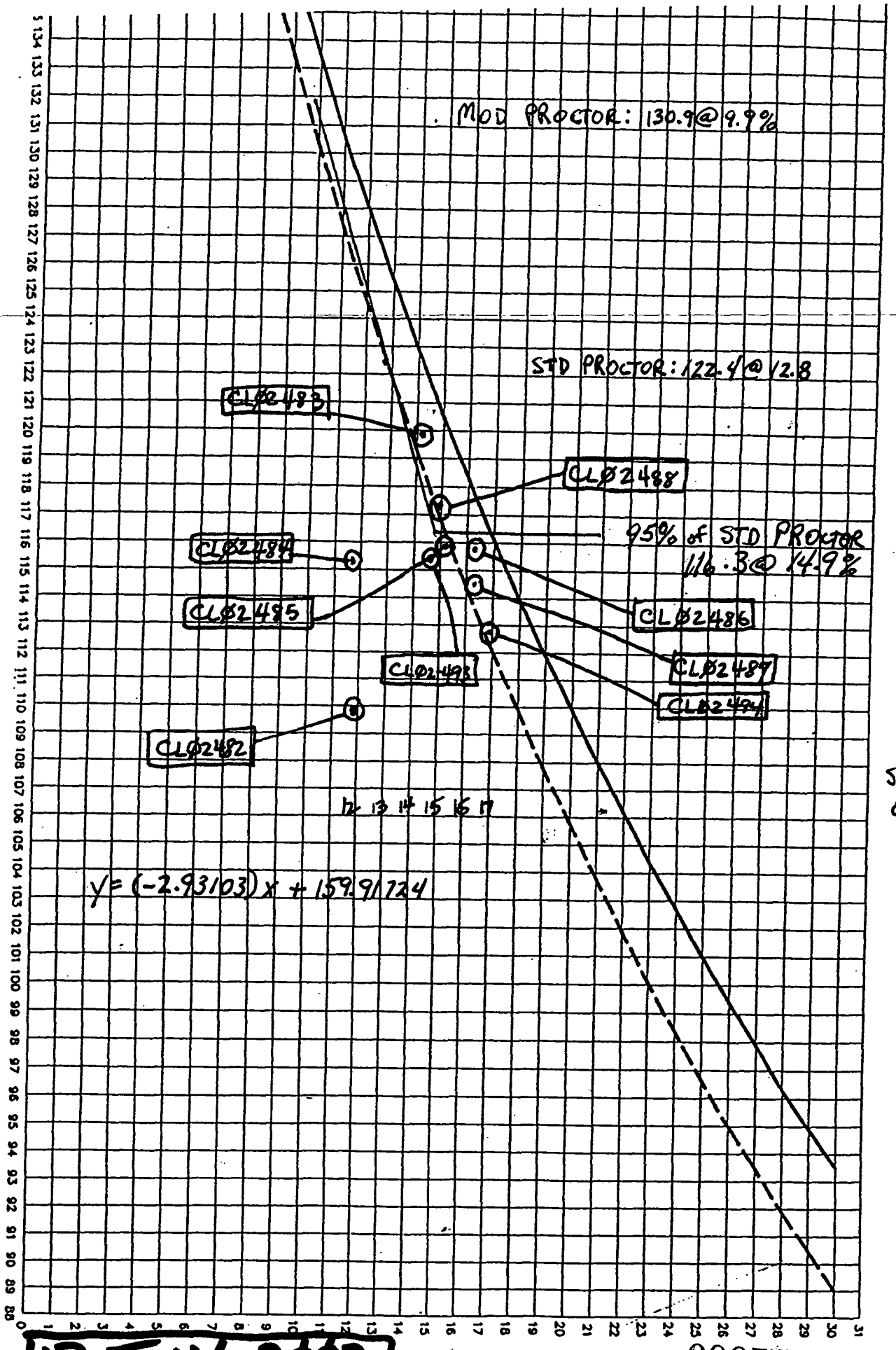
00057 SHEET No. 3 OF 5

4942



STOCKPILE
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13 JULY 2002

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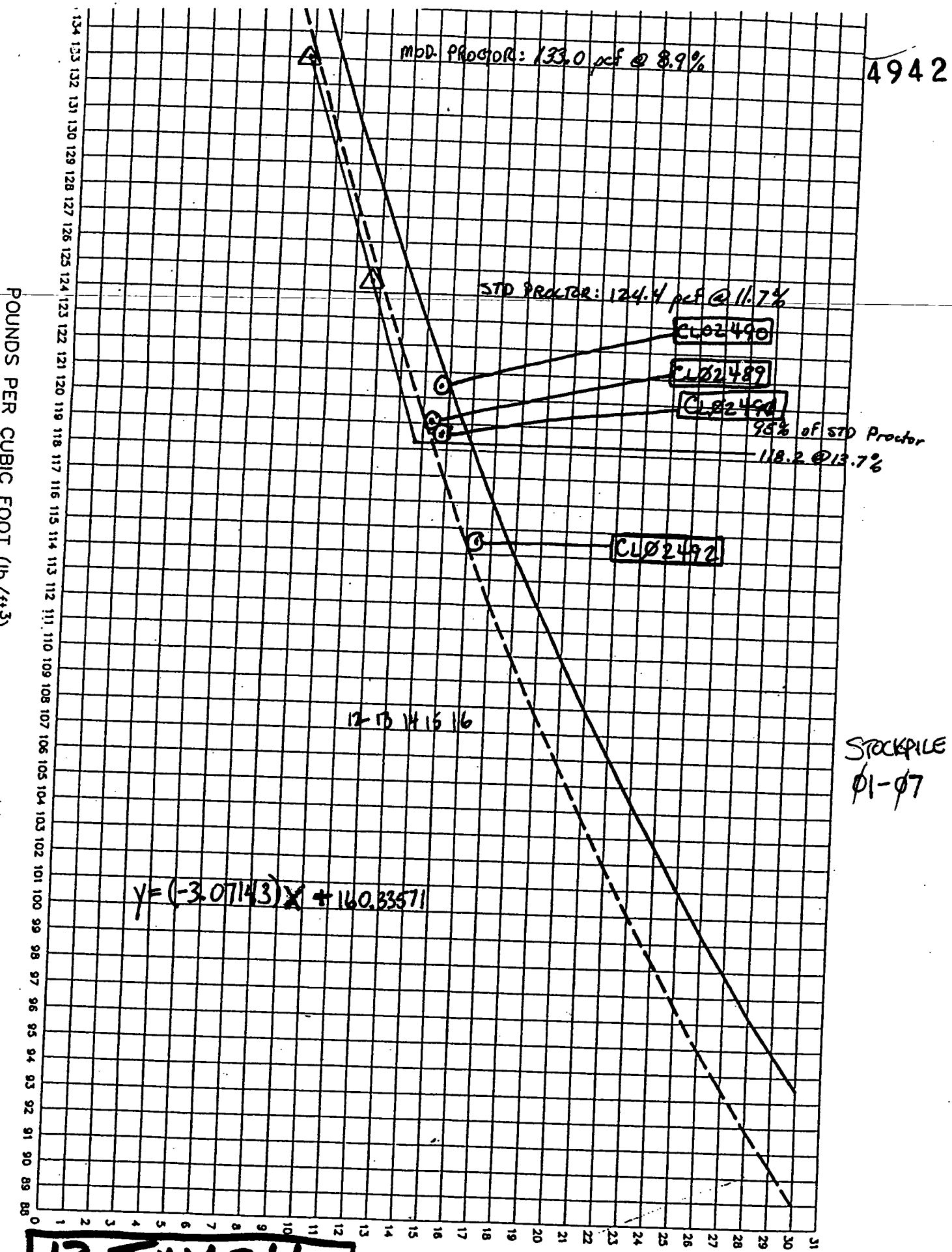
SHEET No 4 OF 5



13 JULY 2002

GQ1341-04.1

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SHEET No 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: ~~13~~ 14 day July month ~~2002~~ year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: STOCKPILES Ø1-7 and Ø1-8 MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)		WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CLØ2-495	Cell 5 east bench	6"/~~4~~ 5	Ø1-7	11.7	124.4	12.3	13.8	136.4	119.9	96.4	P	—	—	—	—
CLØ2-496	Cell 5 east bench	6"/~~4~~ 5	Ø1-7	11.7	124.4	13.1	14.5	135.4	118.3	95.1	P	—	—	—	—
CLØ2-497	Cell 5 east bench	6"/~~4~~ 5	Ø1-7	11.7	124.4	13.2	14.6	136.2	118.8	95.5	P	—	—	—	—
CLØ2-498	Cell 5 east ~~bench~~ slope	6"/4	Ø1-7	11.7	124.4	13.3	14.6	136.2	118.8	95.5	P	—	—	—	—
CLØ2-499	Cell 5 east ~~bench~~ slope	6"/4	Ø1-7	11.7	124.4	13.0	14.4	136.2	118.1 ~~120.5~~	95.7	P	—	—	—	—
CLØ2-500	Cell 5 South ~~Floor~~ Floor	6"/5	Ø1-8	12.8	122.4	12.9	14.3	135.3	118.4	96.7	P	—	—	—	—
CLØ2-501	Cell 5 South Floor	6"/5	Ø1-8	12.8	122.4	13.0	14.4	137.0	119.8	97.8	P	—	—	—	—
CLØ2-502	Cell 5 South Floor	6"/5	Ø1-8	12.8	122.4	12.3	13.8	136.6	120.0	98.1	P	—	—	—	—
CLØ2-503	Cell 5 South Floor	6"/5	Ø1-8	12.8	122.4	12.6	14.1	136.1	119.3	97.5	P	—	—	—	—
CLØ2-504	Cell 5 South Floor	6"/5	Ø1-8	12.8	122.4	13.1	14.5	137.0	119.7	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 60134 TASK NO.: 04.1

DATE: ~~15~~ 14 day July month ~~2002~~ year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: STOCKPILES Ø1-7 & Ø1-8 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20999 CORRECTION FACTOR Y = 0.8481 x + 3.3669 QA ID: CJ

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CUØ2-505	Cell 5 South Floor	6" / 5	Ø1-8	12.8	122.4	12.7 (14.1)	135.4	118.7	97.0	P	—	—	—	—
CUØ2-506	Cell 4 Perc. boxes	6" / ~~1~~ 5	Ø1-7	11.7	124.4	12.7 (14.1)	136.6	119.7	~~124.4~~ 96.2	P	—	—	—	—
CUØ2-507	Cell 5 east slope	6" / 4	Ø1-7	11.7	124.4	12.4 (13.9)	138.3	121.4	97.6	P	—	—	—	—
CUØ2-508	Cell 4 intercell berm	6" / 7	Ø1-7	11.7	124.4	13.2 (14.6)	132.9	116.0	93.2	~~P~~ F	F	CUØ2-513	P	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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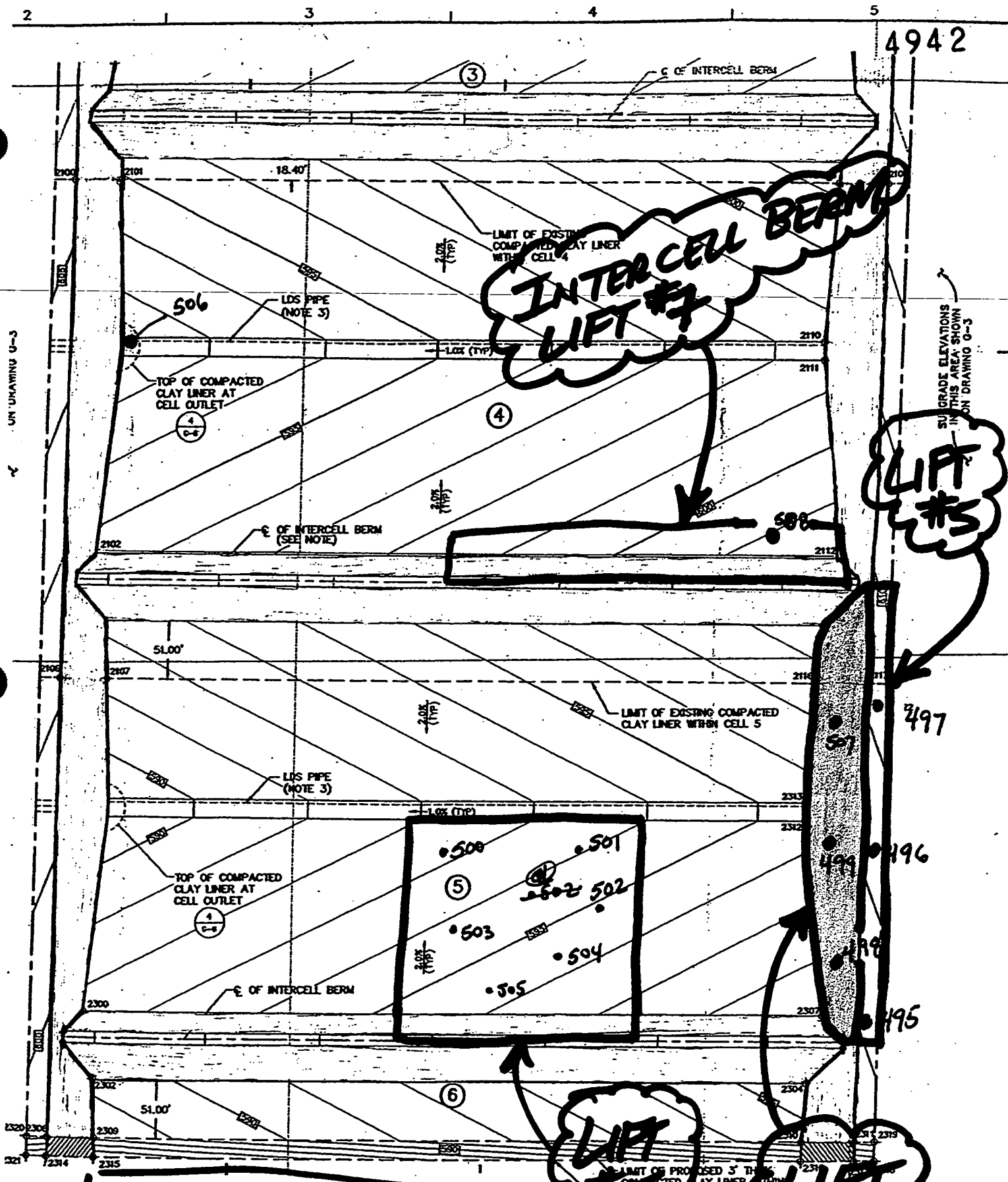

14 JULY 2002

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GQ134-04.1

SHEET No 3 OF 5

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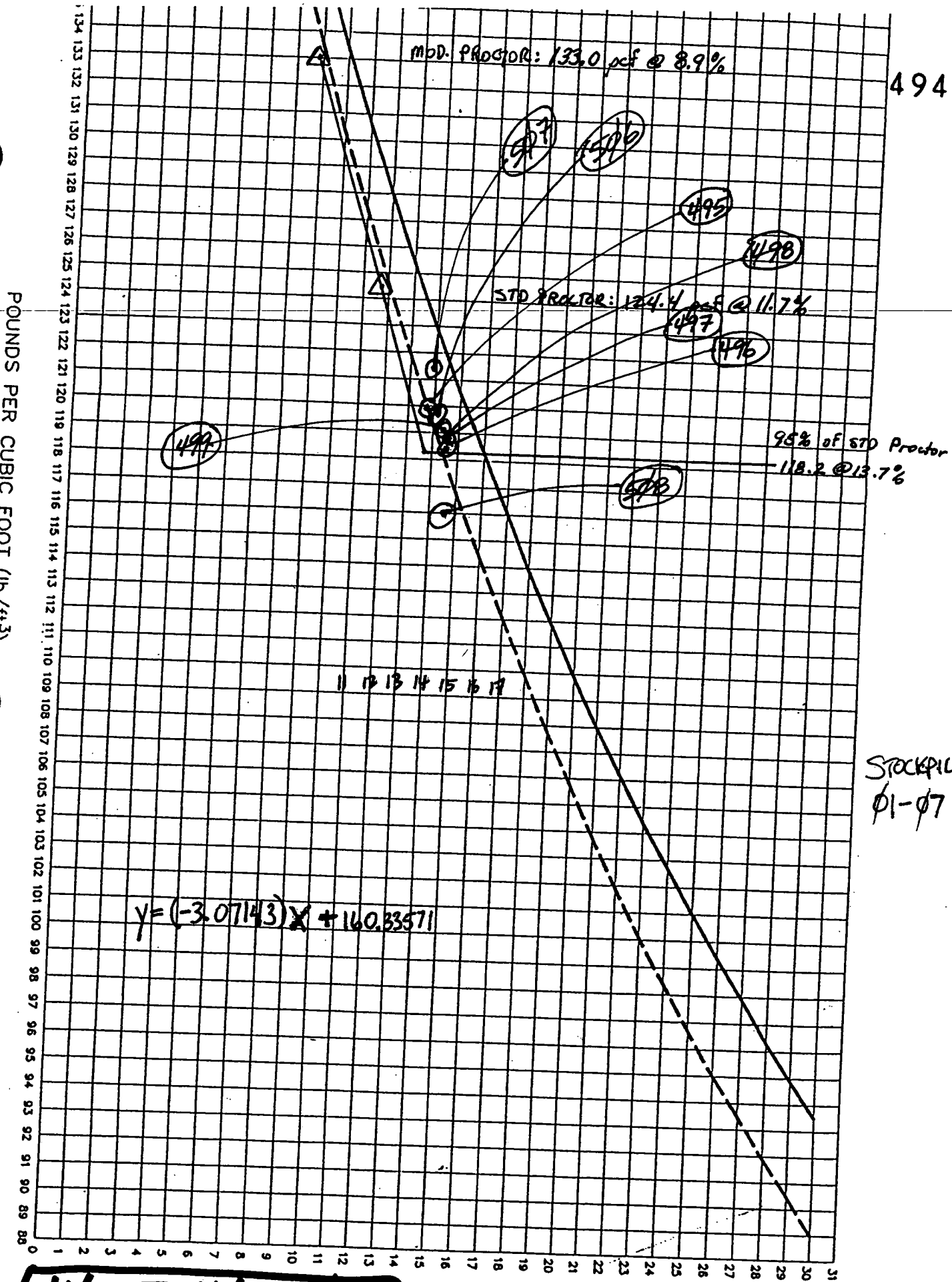

STOCKPILE
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14 JULY 2002

GQ1341-Φ4.1

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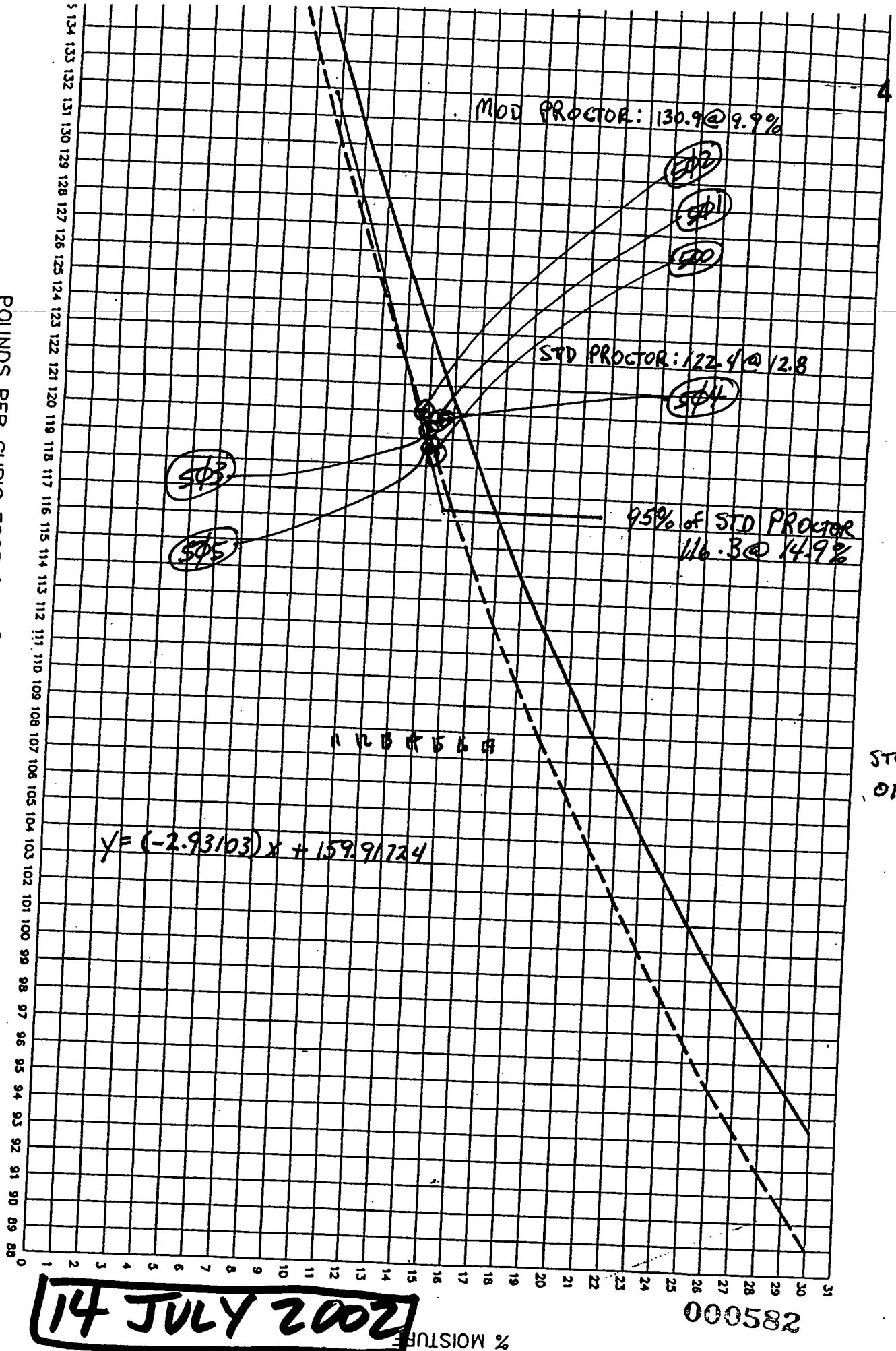
SHEET No 4 of 5

4942



STOCKPILE
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14 JULY 2002

GQ1341-Φ4.1

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SHEET NO 5 OF 5

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 15 (MONDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% (APZ) COMPACTION / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILES 01-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: (TBV)

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
0202-509	CELL #4/5 I.C. BERM	6"/L-7	01-7	11.7	124.4	12.0 (13.5)	136.4	120.2	96.6	P	—	—	—	—
0202-510	CELL 4/5 I.C. BERM	6"/L-7	01-7	11.7	124.4	12.5 (14.0)	136.2	119.5	96.0	P	—	—	—	—
0202-511	CELL 4/5 I.C. BERM	6"/L-7	01-7	11.7	124.4	12.5 (14.0)	137.5	120.6	97.0	P	—	—	—	—
0202-512	CELL 4/5 I.C. BERM	6"/L-7	01-7	11.7	124.4	13.4 (14.7)	136.0	118.6	95.3	P	—	—	—	—
0202-513	CELL 4/5 I.C. BERM	6"/L-7	01-7	11.7	124.4	12.9 (14.3)	136.0	119.0	95.6	P	—	—	—	—
0202-514	CELL 5 - N. EAST END	6"/L-4	01-7	11.7	124.4	12.9 (14.3)	135.3	118.4	95.2	P	—	—	—	—
0202-515	CELL 5 - N. EAST END	6"/L-4	01-7	11.7	124.4	12.3 (13.8)	138.4	121.6	97.8	P	—	—	—	—
0202-516	CELL 5 - N. EAST END	6"/L-4	01-7	11.7	124.4	10.7 (12.4)	138.3	123.0	98.9	P	—	—	—	—
0202-517	CELL 5 - N. EAST END	6"/L-4	01-7	11.7	124.4	11.8 (13.4)	137.9	121.6	97.8	P	—	—	—	—
0202-518	CELL 5 - N. EAST END	6"/L-4	01-7	11.7	124.4	12.1 (13.6)	138.5	121.9	98.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CL

SHEET NO. 1 OF 8

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: Ø4.1

DATE: 15 (MONDAY) day JULY month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +Ø-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE Ø1-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = Ø.8481 X + 3.3669 QA ID: (TBW)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-519	CELL 5 - N. EAST END	6" / L-4	Ø1-7	11.7	124.4	11.7 (13.3)	139.2	122.9	98.8	P	—	—	—	—
CLØ2-52Ø	CELL 5 - N. EAST END	6" / L-4	Ø1-7	11.7	124.4	12.7 (14.1)	136.1	119.3	95.9	P	—	—	—	—
CLØ2-521	CELL 5 - N. EAST END	6" / L-4	Ø1-7	11.7	124.4	12.1 (13.6)	135.7	119.5	96.Ø	P	—	—	—	—
CLØ2-522	CELL 5 - EAST SLOPE	6" / L-5	Ø1-7	11.7	124.4	11.6 (13.2)	137.1	121.1	97.3	P	—	—	—	—
CLØ2-523	CELL 5 - EAST SLOPE	6" / L-5	Ø1-7	11.7	124.4	11.8 (12.7)	139.Ø	123.3	99.1	P	—	—	—	—
CLØ2-524	CELL 5 - EAST SLOPE	6" / L-5	Ø1-7	11.7	124.4	12.8 (14.2)	136.5	119.5	96.1	P	—	—	—	—
CLØ2-525	CELL 5 - 10:1 SLOPE	6" / L-4	Ø1-7	11.7	124.4	12.7 (14.1)	136.6	119.7	96.2	P	—	—	—	—
CLØ2-526	CELL 5 - 10:1 Slope	6" / L-4	Ø1-7	11.7	124.4	15.1 (16.2)	134.1	115.4	92.8	—	F	CLØ2-54Ø	P	—
CLØ2-527	CELL 5 - 10:1 Slope	6" / L-4	Ø1-7	11.7	124.4	13.7 (15.8)	132.8	115.4	92.8	—	F	CLØ2-541	P	—
CLØ2-528	CELL 5 - EAST BENCH	6" / L-6	Ø1-7	11.7	124.4	13.6 (14.9)	134.1	116.7	93.8	—	F	CLØ2-537	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 15 day (MONDAY) JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% (APZ) COMPACTION / MOISTURE RANGE: +0-3% (APZ) LIFT THICKNESS (LOOSE / COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-7

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: TBC/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CU02-529	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	10.5 (12.3)	138.2	123.1	98.9	P	–	–	–	–
CU02-530	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	12.8 (14.2)	137.2	120.1	96.5	P	–	–	–	–
CU02-531	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	12.7 (14.1)	137.9	120.9	97.2	P	–	–	–	–
CU02-532	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	11.1 (12.8)	137.8	122.2	98.2	P	–	–	–	–
CU02-533	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	12.4 (13.9)	137.0	120.3	96.7	P	–	–	–	–
CU02-534	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	10.6 (12.4)	138.7	123.4	99.2	P	–	–	–	–
CU02-535	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	12.7 (14.1)	137.3	120.3	96.7	P	–	–	–	–
CU02-536	Cell 5-N. West End	6"/L-4	01-7	11.7	124.4	12.4 (13.9)	135.7	119.1	95.8	P	–	–	–	–
CU02-537	Cell 5-East Bench	6"/L-6	01-7	11.7	124.4	11.1 (12.8)	136.9	121.4	97.6	P	–	–	–	–
CU02-538	Cell 5-East Bench	6"/L-6	01-7	11.7	124.4	11.7 (13.3)	138.0	121.8	97.9	P	–	–	–	–

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 041

DATE: 15 (MONDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 (AP2) % COMPACTION / MOISTURE RANGE: ~~10-3~~ (AP2) LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: STOCKPILE 01-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TBD)

TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-539	CELL 5 - EAST BENCH	6"/L-6	01-7	11.7	124.4	11.7 (13.3)	139.0	122.7	98.6	P	—	—	—	—
CL02-540	CELL 5 - 10:1 SLOPE	6"/L-4	01-7	11.7	124.4	10.5 (12.3)	138.1	123.0	98.9	P	—	—	—	—
CL02-541	CELL 5 - 10:1 SLOPE	6"/L-4	01-7	11.7	124.4	11.0 (12.7)	136.9	121.5	97.7	P	—	—	—	—
CL02-542	CELL 5 - 10-1 Slope	6"/L-4	01-7	11.7	124.4	13.0 (14.4)	135.9	118.8	95.5	P	—	—	—	—
CL02-543	CELL 5 - 10-1 Slope	6"/L-4	01-7	11.7	124.4	12.1 (13.6)	139.4	122.7	98.6	P	—	—	—	—
CL02-544	CELL 5 - 10-1 Slope	6"/L-4	01-7	11.7	124.4	12.4 (13.9)	136.7	120.0	96.5	P	—	—	—	—
CL02-545	CELL 4/5 I.C. BERM	6"/L-8	01-6	12.5	122.7	12.2 (13.7)	135.4	119.1	97.1	P	—	—	—	—
CL02546	CELL 4/5 I.C. BERM	6"/L-8	01-6	12.5	122.7	13.0 (14.4)	134.4	117.5	95.7	P	—	—	—	—
CL02547	CELL 4/5 I.C. BERM	6"/L-8	01-6	12.5	122.7	13.6 (14.9)	136.6	118.9	96.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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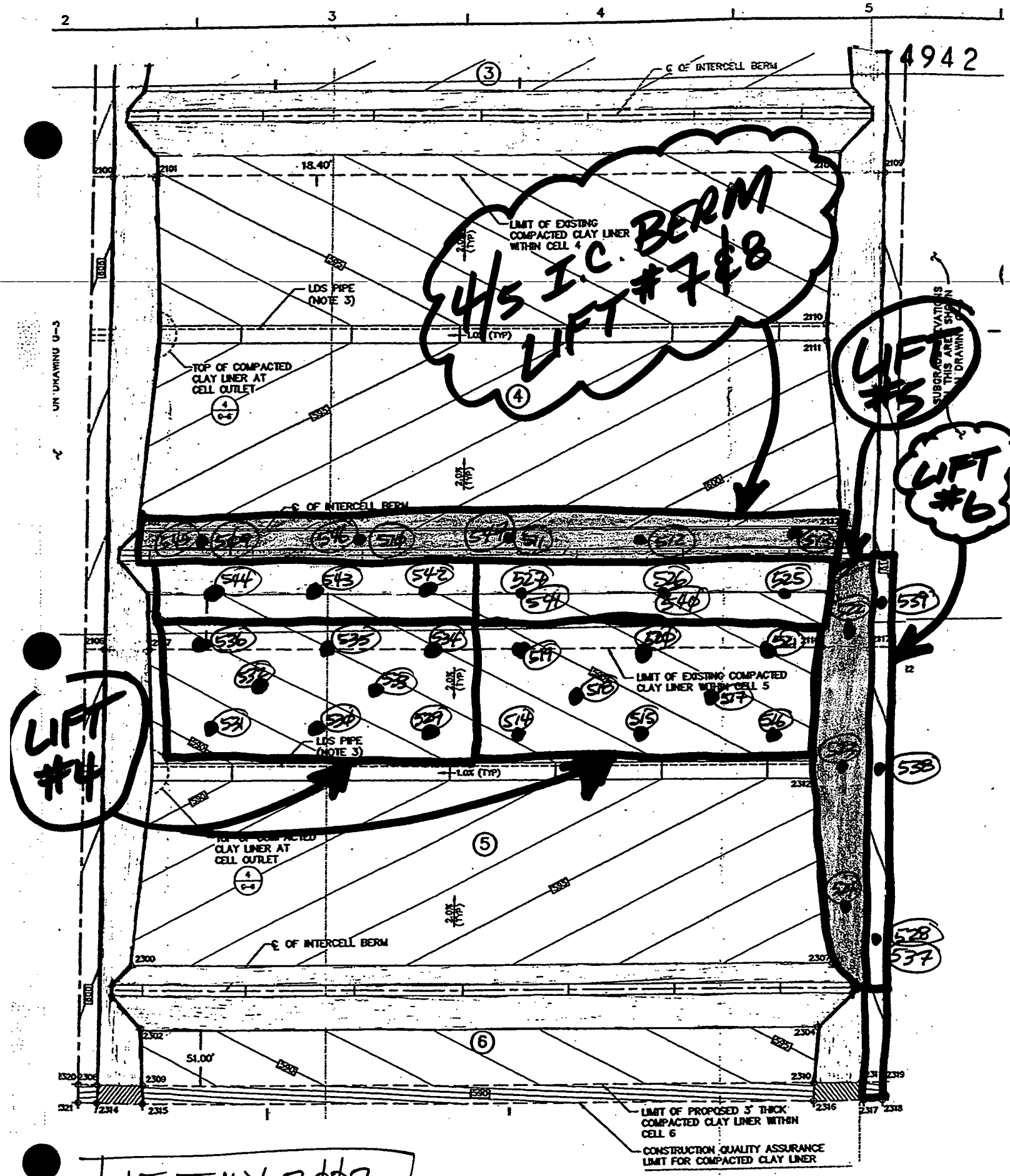

15 JULY 2002

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SHEET No 5 OF 8

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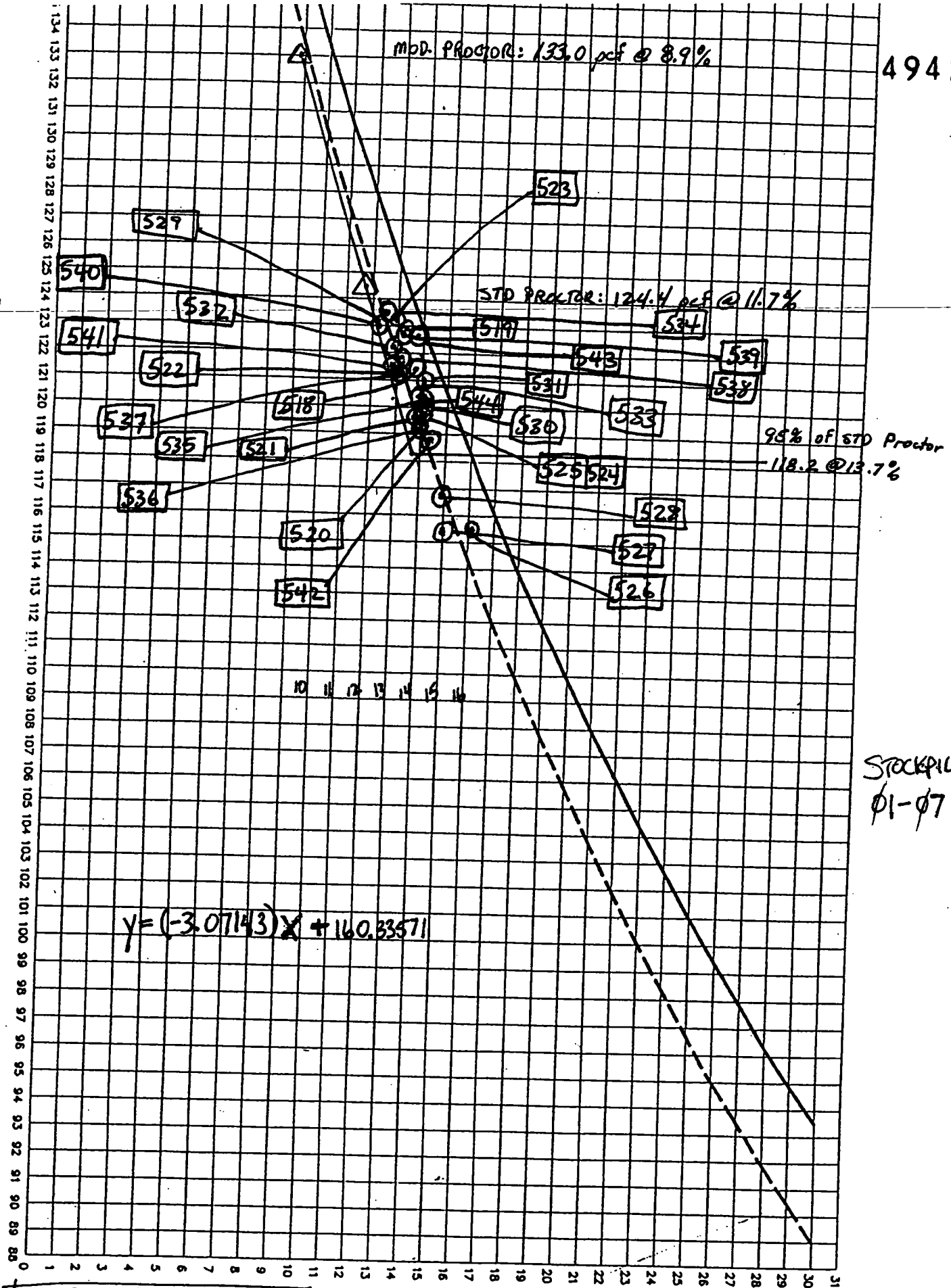

STOCKPILE
01-07

15 JULY 2002

GQ1341-04.1

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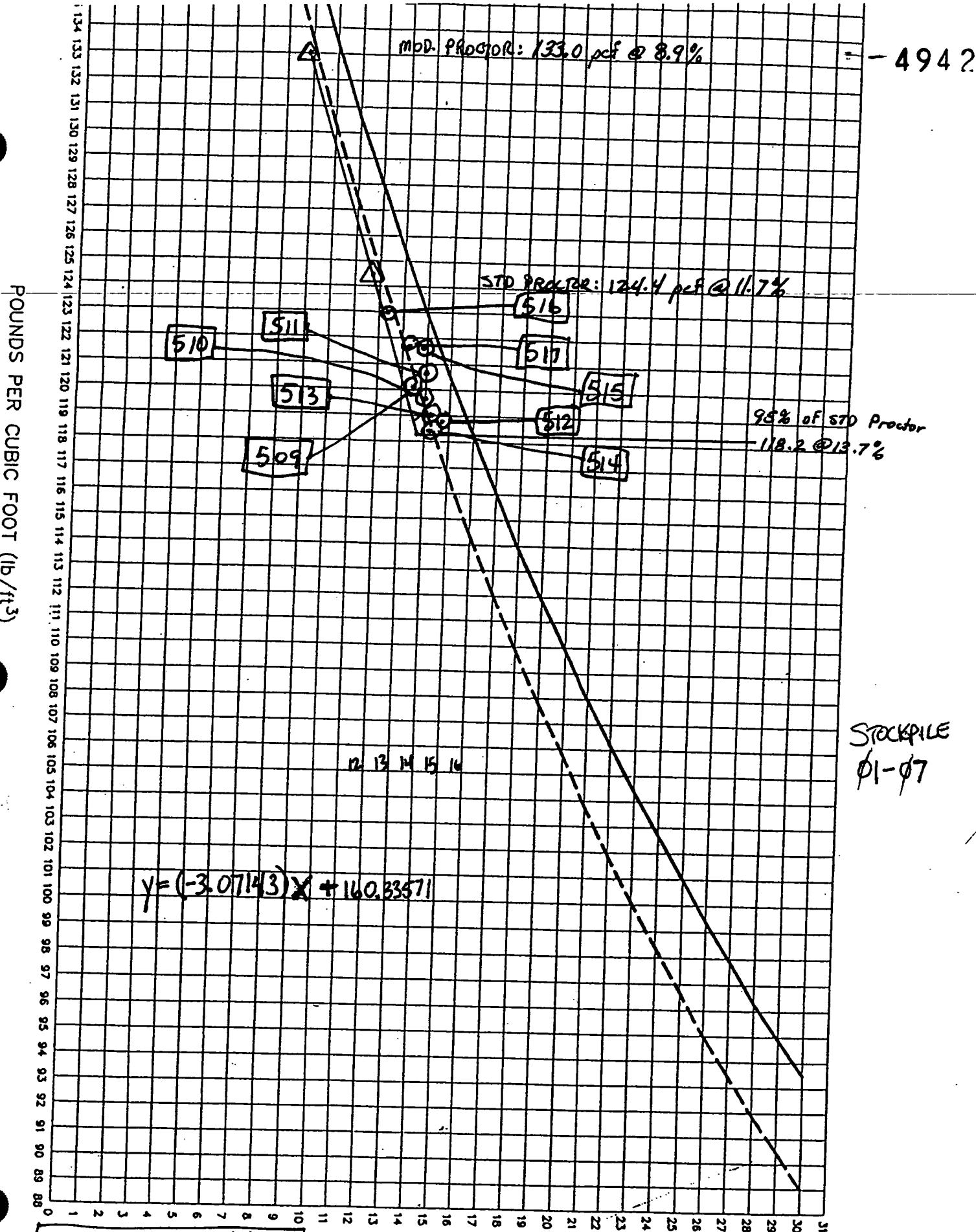
SHEET No 6 OF 8



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STOCKPILE
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SHEET No 7 OF 8

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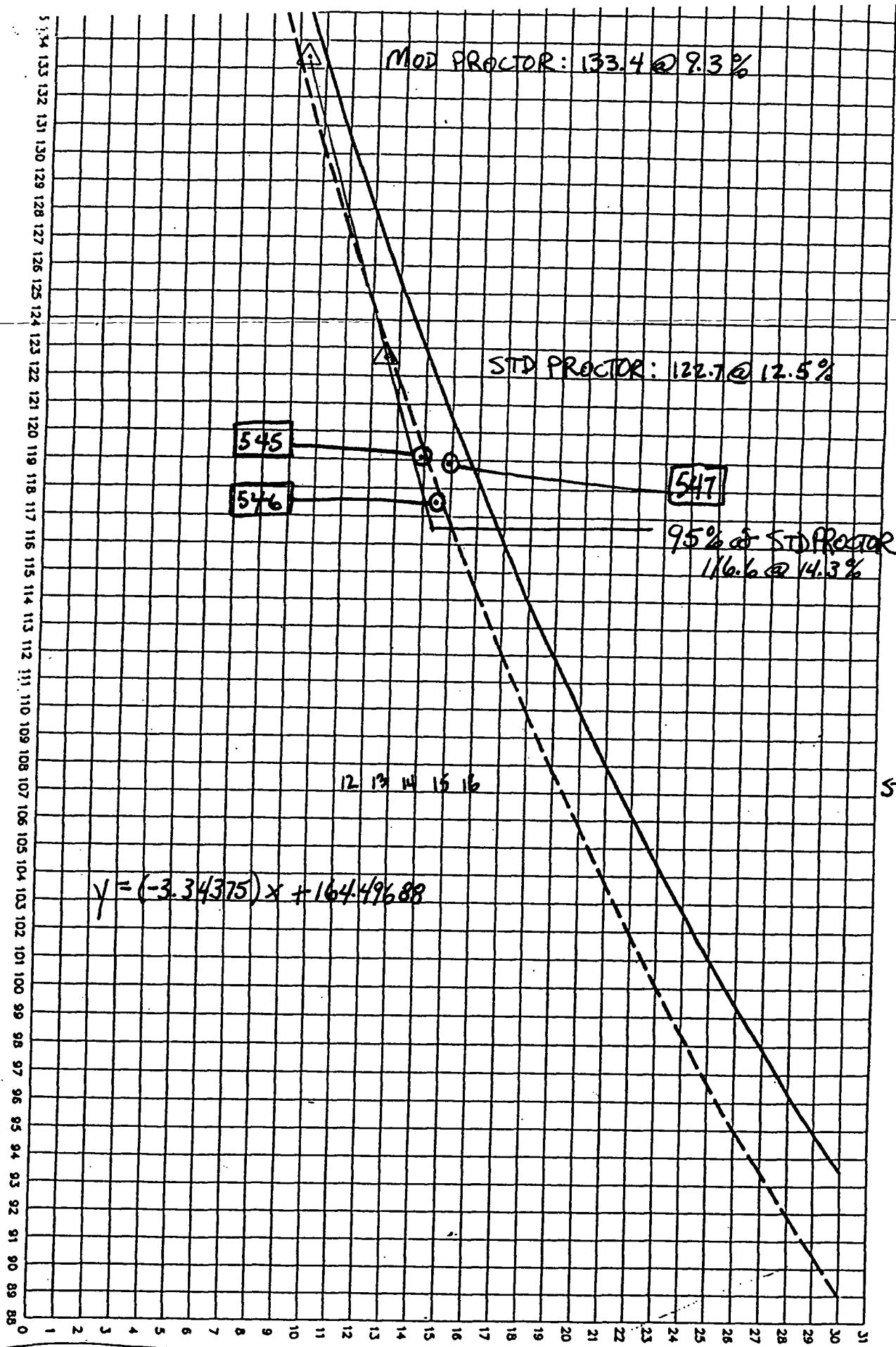

STOCKPILE
01-6

15 JULY 2002

GQ1341-04.1

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SHEET No 8 OF 8

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cells 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 16 (TUESDAY) day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % (APZ) COMPACTION / MOISTURE RANGE: +0-3 (APZ) LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: STOCKPILE

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: (TRW)/CHW

TEST NO.	TEST LOCATION- (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-548	Cell 6 - N. East End	6" / L-1	01-7	11.7	124.4	11.2 (12.9)	139.7	123.7	99.5	P	—	—	—	—
CL02-549	Cell 6 - N. East End	6" / L-1	01-7	11.7	124.4	12.0 (13.5)	138.0	121.6	97.7	P	—	—	—	—
CL02-550	Cell 6 - N. ~~East~~ West End	6" / L-1	01-7	11.7	124.4	12.1 (13.6)	139.3	122.6	98.6	P	—	—	—	—
CL02-551	Cell 6 - N. ~~East~~ West End	6" / L-1	01-7	11.7	124.4	12.9 (14.2)	135.5	118.9	95.4	P	—	—	—	—
CL02-552	Cell 6 - N. ~~East~~ West End	6" / L-1	01-6	12.5	122.7	12.3 (13.8)	134.8	118.5	96.5	P	—	—	—	—
CL02-553	Cell 4/5 I.C. Berm	6" / L-8	01-6	12.5	122.7	14.1 (15.3)	135.2	117.3	95.6	P	—	—	—	—
CL02-554	Cell 4/5 I.C. Berm	6" / L-8	01-6	12.5	122.7	14.2 (15.4)	134.8	116.8	95.2	P	—	—	—	—
CL02-555	Cell 5, East Bench	6" / L-7	01-6	12.5	122.7	12.0 (13.5)	137.0	120.7	98.4	P	—	—	—	—
CL02-556	Cell 5, East Bench	6" / L-7	01-6	12.5	122.7	14.3 (15.5)	134.9	116.8	95.2	P	—	—	—	—
CL02-557	Cell 5, East Bench	6" / L-7	01-6	12.5	122.7	12.5 (14.0)	138.4	121.4	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GØ1341 TASK NO.: Ø4.1

DATE: 16 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~+Ø-3%~~ AP2 LIFT THICKNESS (LOOSE/(COMPACTED)): ~6"

MATERIAL SOURCE: Stockpile Ø1-7 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: (TBO)/CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2-558	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	13.4 (14.7)	136.3	118.8	95.5	P	—	—	—	—
CLØ2-559	CELL 5 N. East End	6" / L-5	Ø1-7	11.7	124.4	11.4 (13.Ø)	140.4	124.2	99.9	P	—	—	—	—
CLØ2-560	CELL 5 N. EAST END.	6" / L-5	Ø1-7	11.7	124.4	13.0 (14.4)	136.Ø	118.9	95.6	P	—	—	—	—
CLØ2-561	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	10.8 (12.5)	140.6	125.Ø	1ØØ.5	P	—	—	—	—
CLØ2-562	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	12.1 (13.6)	139.9	123.2	99.Ø	P	—	—	—	—
CLØ2-563	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	12.8 (14.2)	136.8	119.8	96.3	P	—	—	—	—
CLØ2-564	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	12.9 (14.3)	138.2	120.9	97.2	P	—	—	—	—
CLØ2-565	CELL 5 N. EAST END	6" / L-5	Ø1-7	11.7	124.4	13.2 (14.6)	137.7	120.2	96.6	P	—	—	—	—
CLØ2-566	CELL 5 N. WEST END	6" / L-5	Ø1-6	12.5	122.7	12.7 (14.1)	136.7	119.8	97.6	P	—	—	—	—
CLØ2-567	CELL 5 N WEST END	6" / L-5	Ø1-6	12.5	122.7	11.5 (13.1)	138.0	122.Ø	99.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 16 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: Stockpile 01-6

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02568	CELLS N.WEST END	6"/L-5	01-6	12.5	122.7	11.5 (13.1)	138.0	122.0	99.4	P	—	—	—	—
CL02569	CELLS N.WEST END	6"/L-5	01-6	12.5	122.7	11.7 (13.3)	138.1	121.8	99.3	P	—	—	—	—
CL02570	CELLS N.WEST END	6"/L-5	01-6	12.5	122.7	11.8 (13.4)	136.9	120.7	98.4	P	—	—	—	—
CL02571	CELL 5 N.WEST END	6"/L-5	01-6	12.5	122.7	12.9 (14.3)	138.0	120.7	98.4	P	—	—	—	—
CL02572	CELLS N.WEST END	6"/L-5	01-6	12.5	122.7	11.8 (13.4)	137.9	121.6	99.1	P	—	—	—	—
CL02573	CELLS N.WEST END	6"/L-5	01-6	12.5	122.7	12.4 (13.9)	138.9	121.9	99.4	P	—	—	—	—
CL02574	CELL6 N.EAST END	6"/L-2	01-6	12.5	122.7	12.1 (13.6)	137.6	121.1	98.7	P	—	—	—	—
CL02575	CELL6 N.EAST END	6"/L-2	01-6	12.5	122.7	13.5 (14.8)	135.8	118.3	96.4	P	—	—	—	—
CL02576	CELL6 N.WEST END	6"/L-1	01-6	12.5	122.7	12.8 (14.2)	136.8	119.8	97.6	P	—	—	—	—
CL02577	CELL6 N.WEST END	6"/L-1	01-6	12.5	122.7	12.4 (13.9)	135.6	119.1	97.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELLS 4 & 5

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 16 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/(COMPACTED)): ≈6"

APZ APZ

MATERIAL SOURCE: Stockpile Ø1-6 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: Other

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CLØ2578	CELL 6 N. WEST END	6" / L-2	Ø1-6	12.5	122.7	13.1 (14.5)	135.5	118.3	96.4	P	—	—	—	—
CLØ2579	CELL 6 N. WEST END	6" / L-2	Ø1-6	12.5	122.7	11.7 (13.3)	136.9	120.8	98.5	P	—	—	—	—
CLØ2580	CELL 5 EAST 4:1 SLOPE ~~5 CAST SLO~~	6" / L-6	Ø1-6	12.5	122.7	12.9 (14.3)	137.5	120.3	98.Ø	P	—	—	—	—
CLØ2581	CELL 5 EAST 4:1 SLOPE	6" / L-6	Ø1-6	12.5	122.7	12.8 (14.2)	137.1	12Ø.1	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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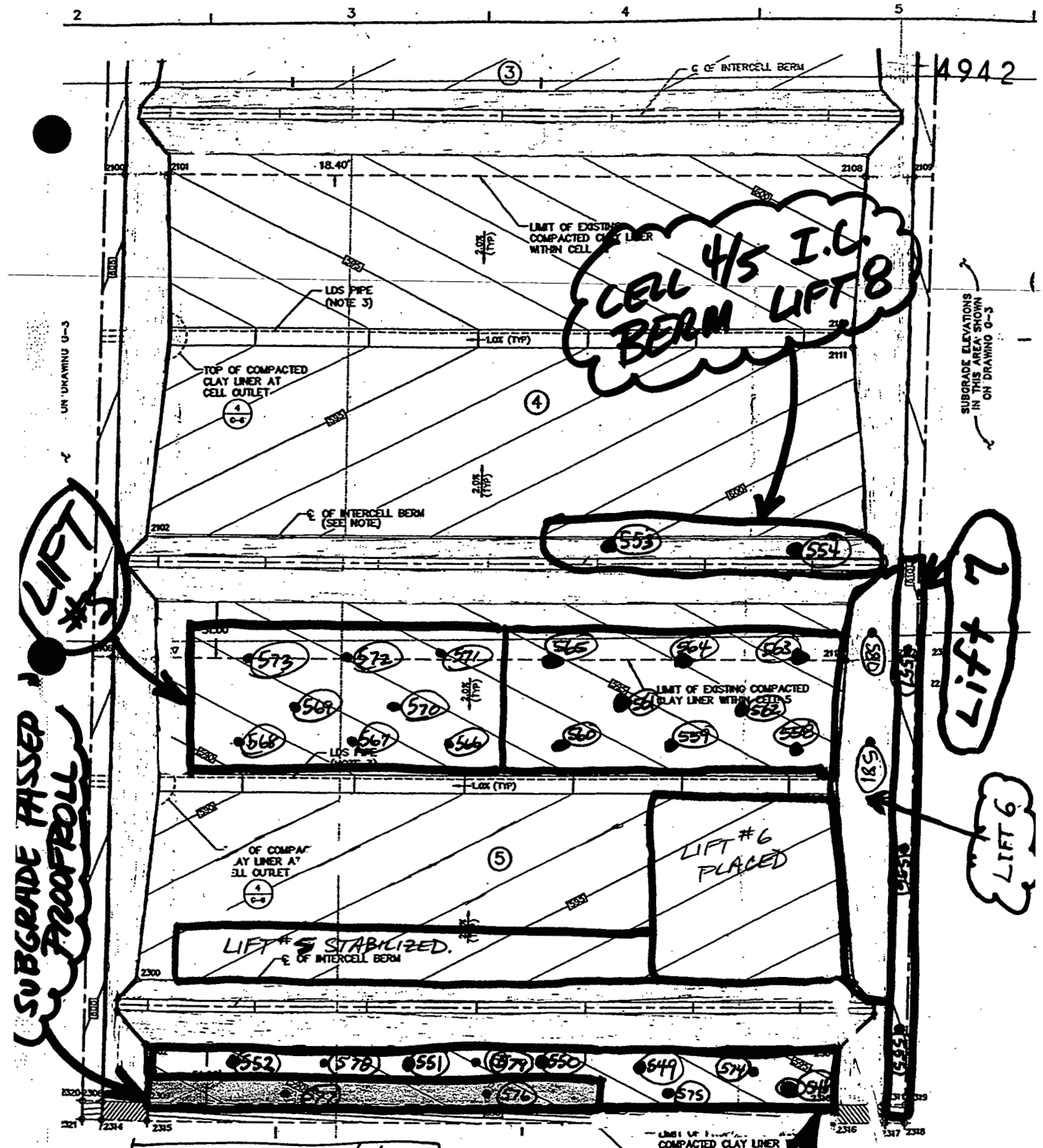

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SHEET No 5 OF 7

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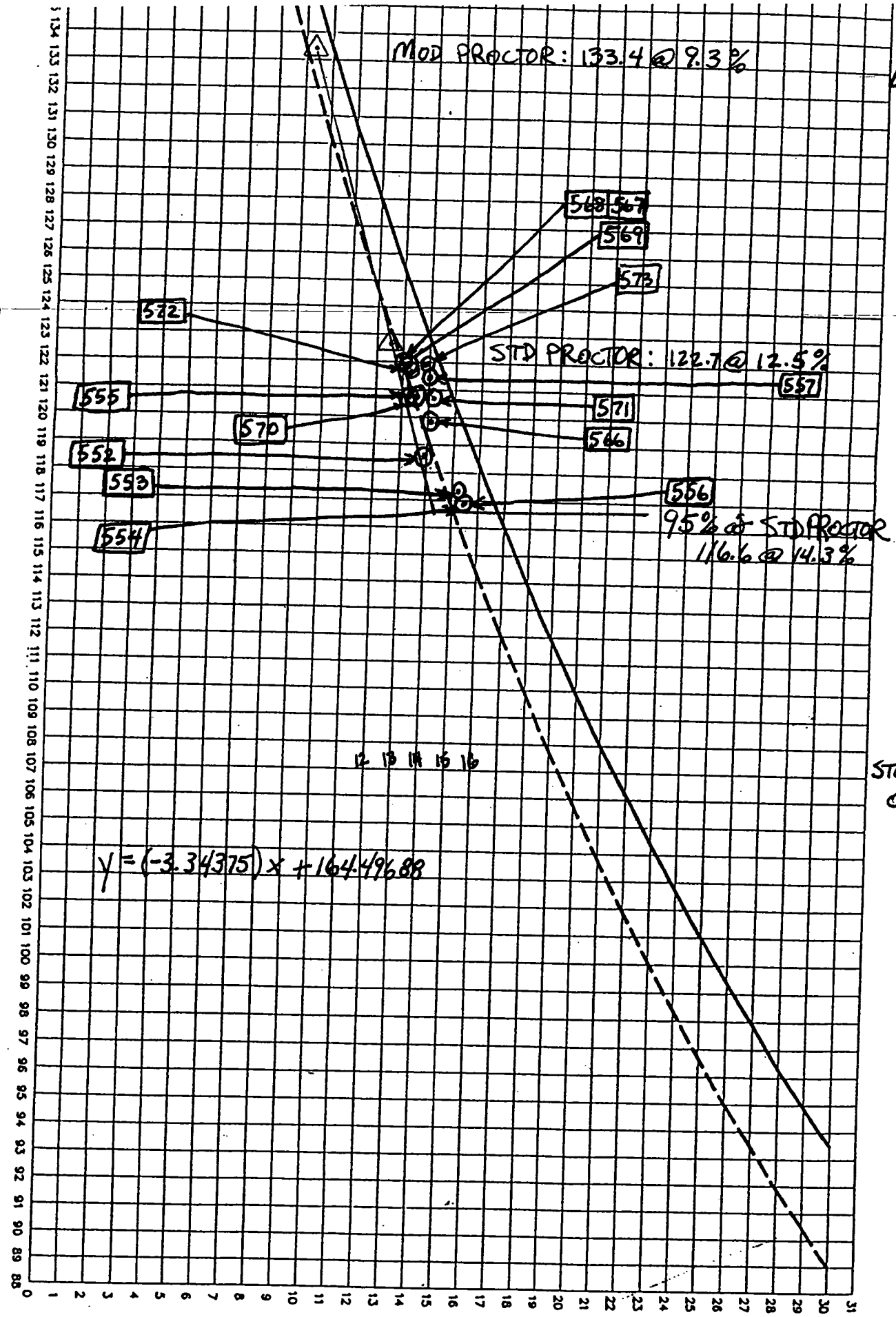

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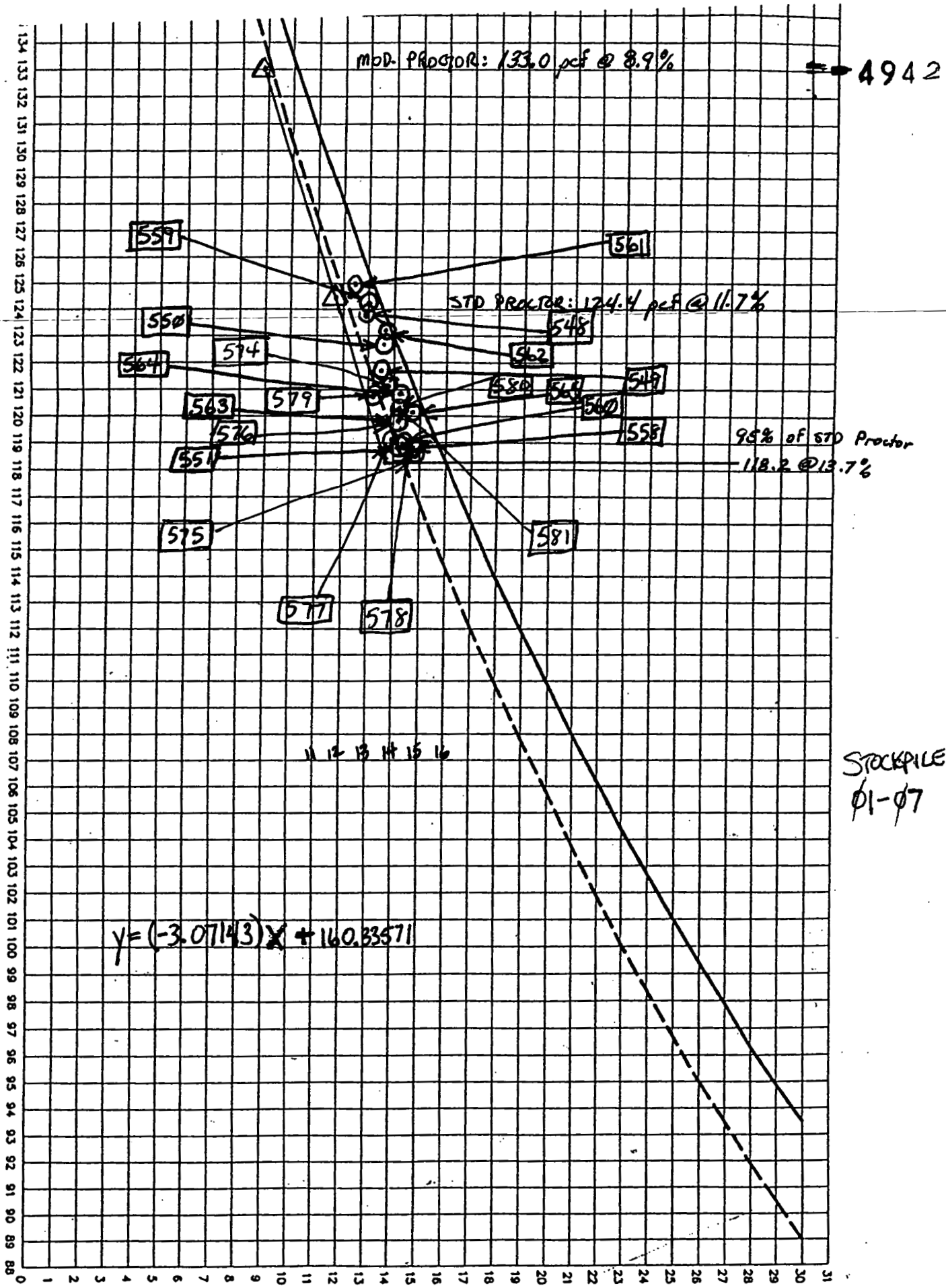

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Sheet No. 7 of 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL 5 & 6

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 17 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481 x + 3.3669 QA ID: GHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2582	Cell 5 S.West End	6" / L-5	Ø1-7	11.7 ~~12.5~~	124.4 ~~122.4~~	12.8	14.2	136.2	119.3	95.9 ~~97.2~~	P	—	—	—
CLØ2583	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.4	10.7	12.4	138.1	122.9	98.8	P	—	—	—
CLØ2584	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.4	11.2	12.9	140.2	124.2	99.8	P	—	—	—
CLØ2585	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.4	12.0	13.5	137.1	120.8	97.1	P	—	—	—
CLØ2586	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	10.6	12.4	140.1	124.6	100.0	P	—	—	—
CLØ2587	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	11.2	12.9	140.5	124.4	99.8	P	—	—	—
CLØ2588	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	10.7	12.4	139.9	124.5	99.9	P	—	—	—
CLØ2589	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	11.Ø	12.7	138.3	122.7	98.5	P	—	—	—
CLØ2-59Ø	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	12.1	13.6	139.3	122.6	98.4	P	—	—	—
CLØ2-591	Cell 5 S.WEST END	6" / L-5	Ø1-7	11.7	124.6	13.0	14.4	136.5	119.3	95.7	P	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell 5 & 6

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 17 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CLØ2-592	CELL 5 S. West End	6" / L-5	Ø1-7	11.7	124.6	13.3 (14.6)	136.7	119.2	95.7	P	—	—	—	—
CLØ2-593	CELL 5 EAST 4:1 Slope	6" / L-6	Ø1-6	12.5	122.7	13.2 (14.6)	137.3	119.8	97.6	P	—	—	—	—
CLØ2-594	CELL 5 EAST BEnch	6" / L-8	Ø1-6	12.5	122.7	12.8 (14.2)	138.8	121.5	99.Ø	P	—	—	—	—
CLØ2-595	CELL 5 EAST BENCH	6" / L-8	Ø1-6	12.5	122.7	12.2 (13.7)	138.8	122.1	99.5	P	—	—	—	—
CLØ2-596	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	14.1 (15.3)	135.Ø	117.1	95.4	P	—	—	—	—
CLØ2-597	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	13.3 (14.6)	136.9	120.8	98.4	P	—	—	—	—
CLØ2-598	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	12.9 (14.3)	138.5	121.2	98.8	P	—	—	—	—
CLØ2-599	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	11.0 (12.7)	140.1	124.3	101.3	P	—	—	—	—
CLØ2600	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	12.8 (14.2)	137.4	120.3	98.Ø	P	—	—	—	—
CLØ2601	CELL 5 10:1 Slope	6" / L-5	Ø1-6	12.5	122.7	12.5 (14.0)	138.4	121.4	98.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 17 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/(COMPACTED)): ≤6"

MATERIAL SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: _____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-602	CELL #6 N. EAST END	6"/L-3	01-6	12.5	122.7	12.4 (13.9)	137.0	120.3	98.0	P	—	—	—	—
CL02603	CELL #6 N. EAST END	6"/L-3	01-6	12.5	122.7	13.6 (14.9)	136.3	118.6	96.7	P	—	—	—	—
CL02 604	CELL #6 N. EAST END	6"/L-3	01-6	12.5	122.7	13.3 (14.6)	136.1	118.8	96.8	P	—	—	—	—
CL02 605	CELL #6 N EAST END	6"/L-3	01-6	12.5	122.7	13.8 (15.1)	136.3	118.4	96.5	P	—	—	—	—
CL02606	CELL #6 N WEST END	6"/L-3	01-6	12.5	122.7	14.6 (15.7)	133.6	115.5	94.1	~~P~~	F	CL02607	P	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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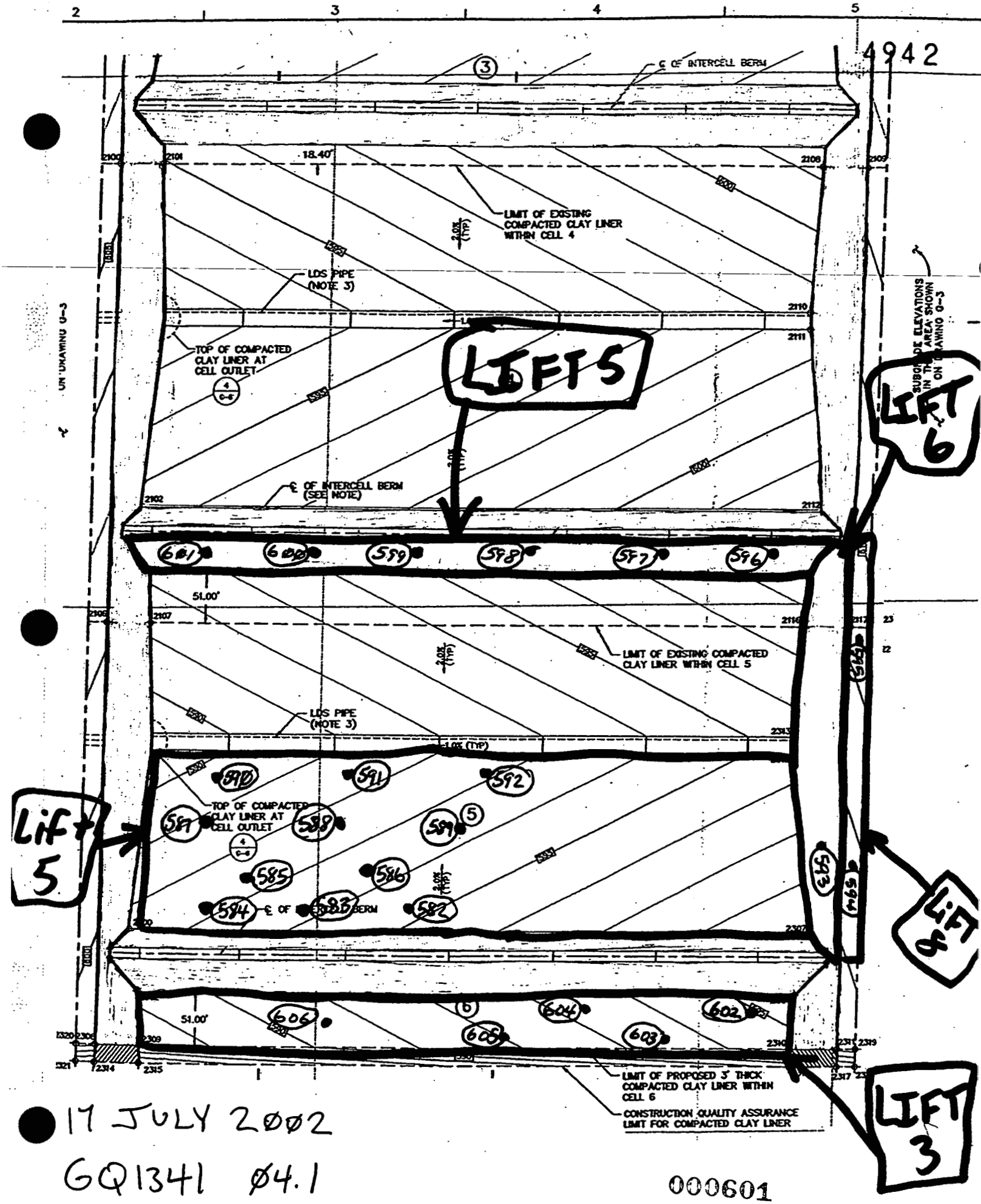

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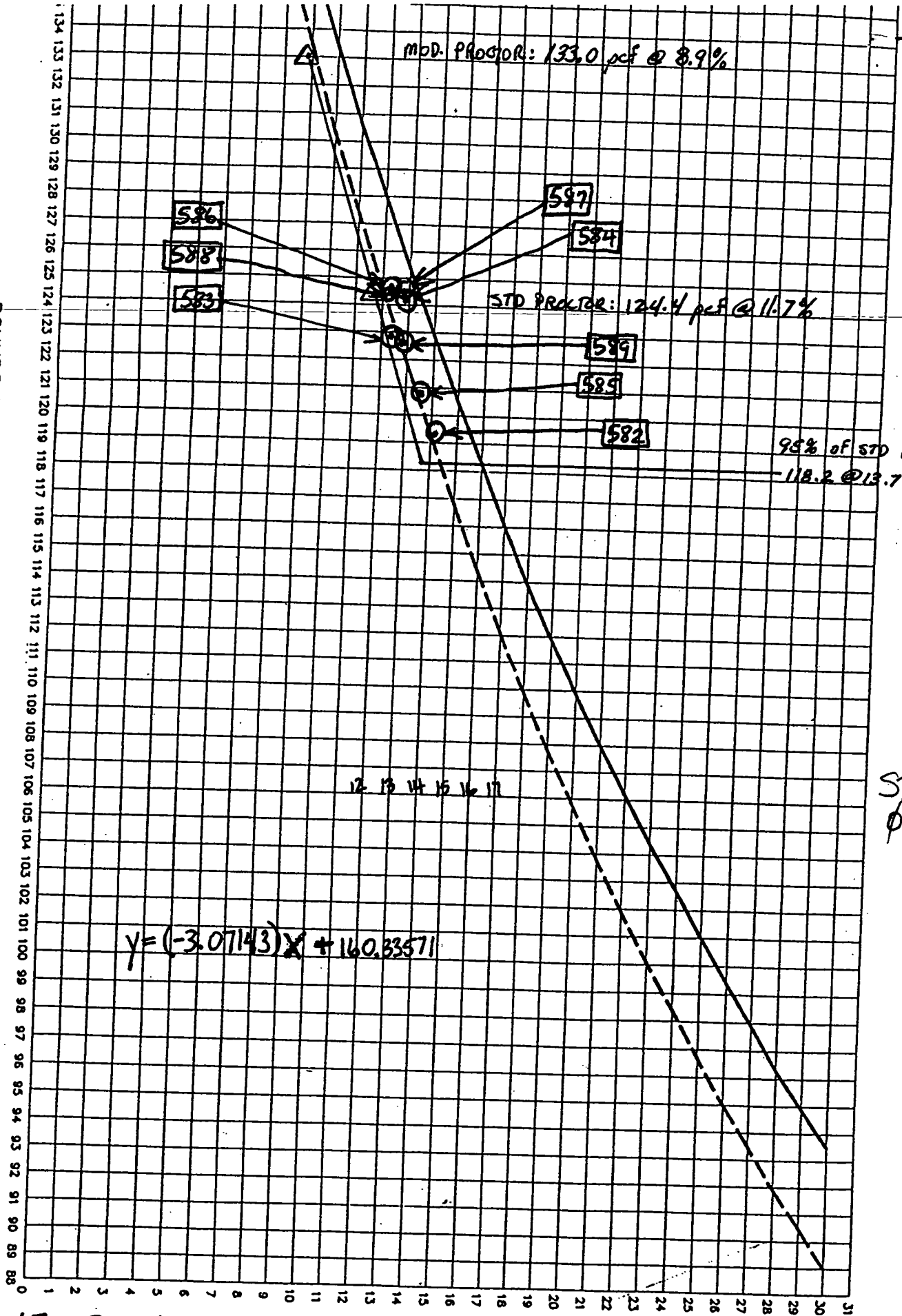

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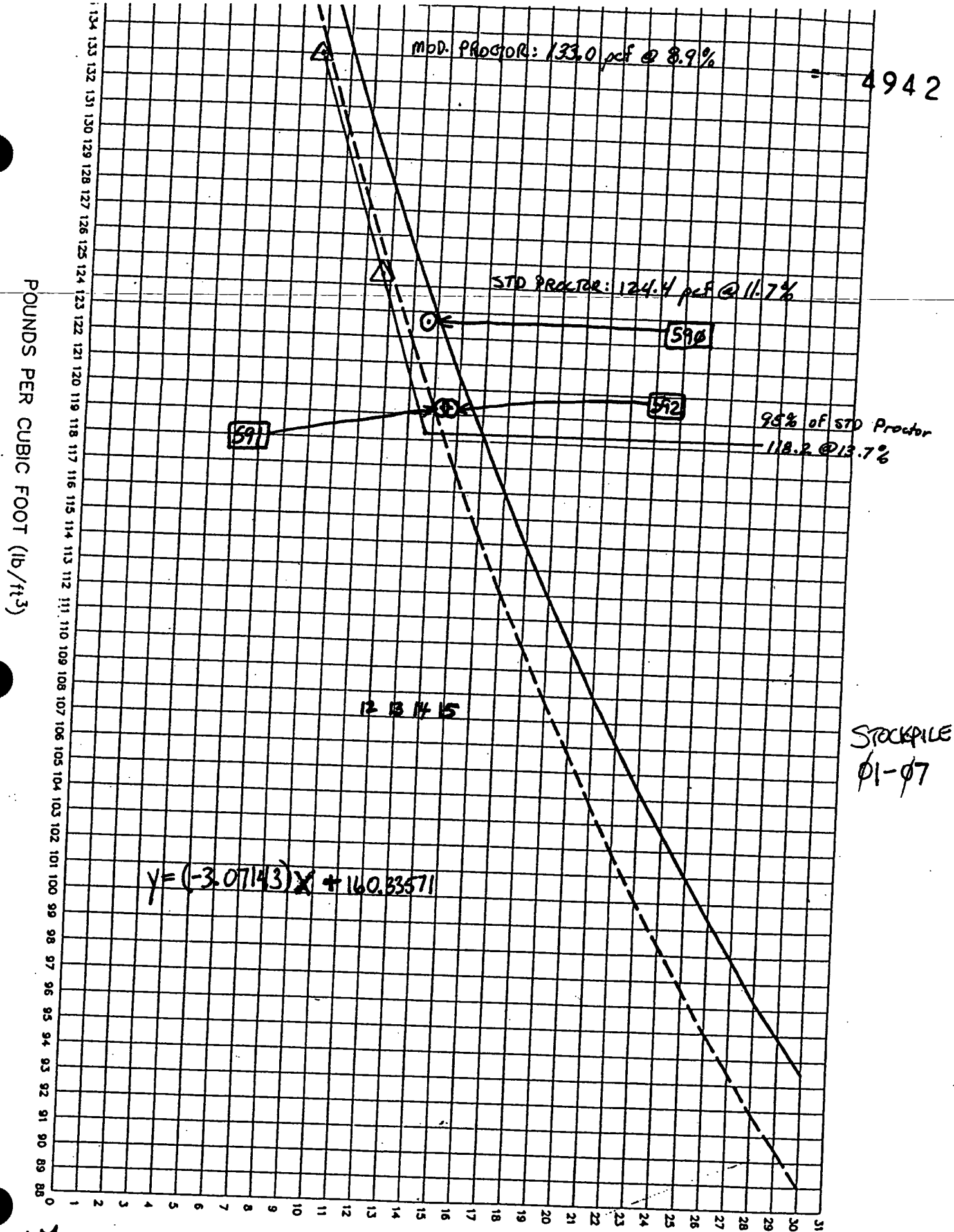
Sheet No. 5 of 8



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Sheet No. 6 of 8

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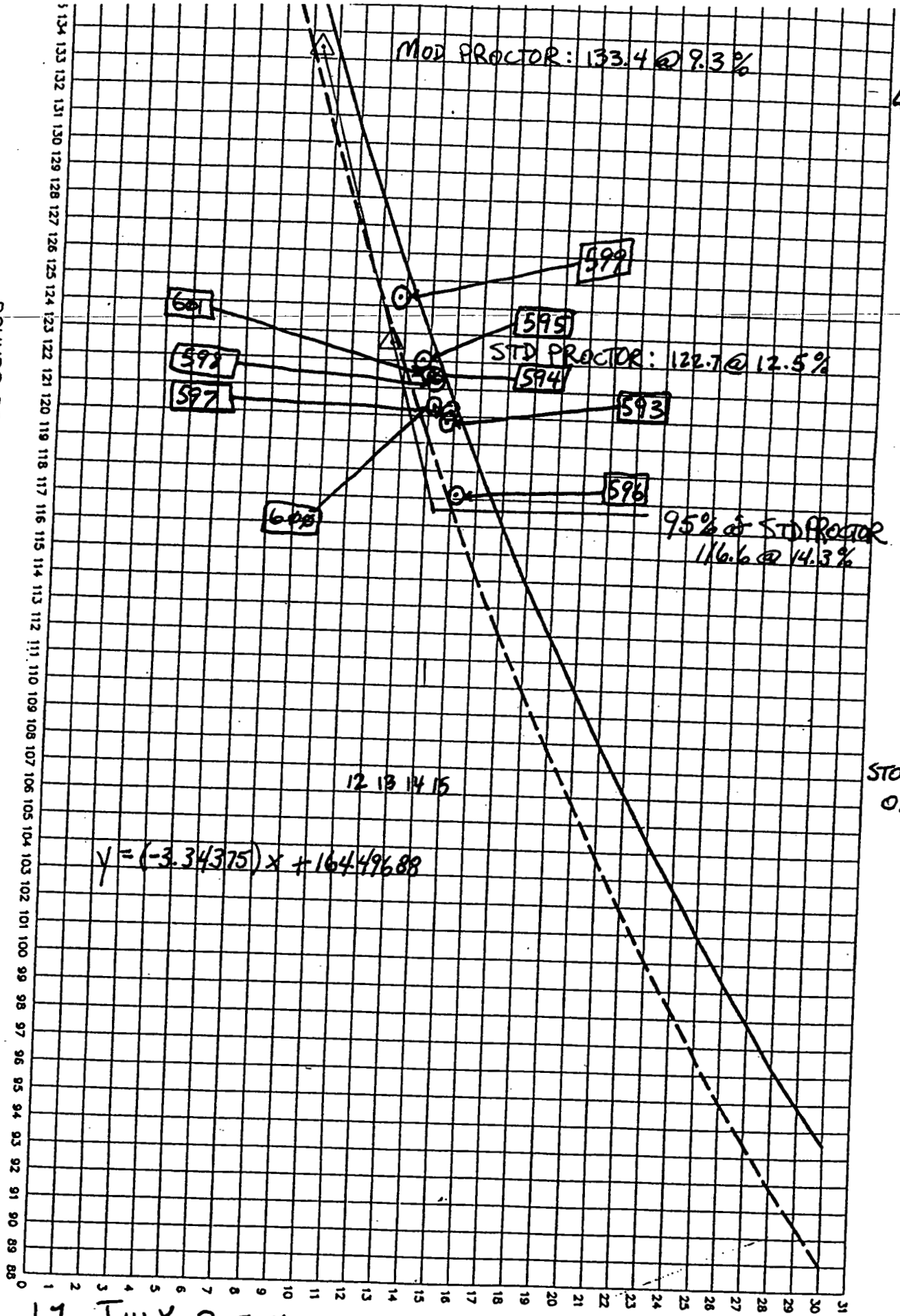

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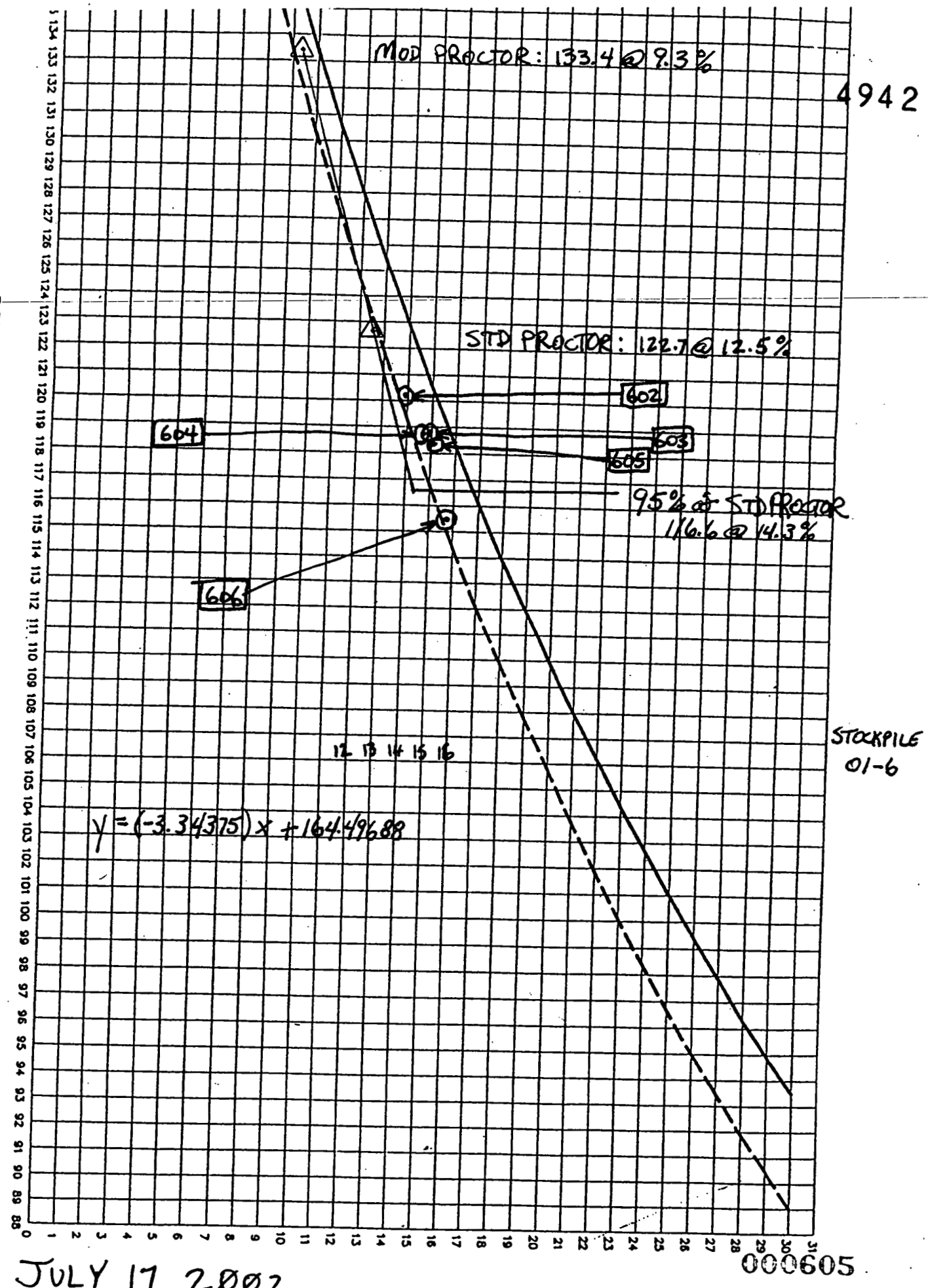

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell 4,5 & 6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/COMPACTED): ≈6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-607	CELL #6 N. WEST END	6" / L-3	01-6	12.5	122.7	13.3 (14.6)	136.3	118.9	96.9	P	—	—	—	—
CL02-608	CELL #6 N. WEST END	6" / L-3	01-6	12.5	122.7	12.3 (13.8)	135.7	119.2	97.2	P	—	—	—	—
CL02-609	CELL #5 S. EAST END	6" / L-6	01-6	12.5	122.7	11.1 (12.8)	138.9	123.1	100.4	P	—	—	—	—
CL02-610	CELL #5 S. EAST END	6" / L-6	01-6	12.5	122.7	11.0 (12.7)	138.1	122.5	99.9	P	—	—	—	—
CL02-611	CELL #5 S. EAST END	6" / L-6	01-6	12.5	122.7	11.4 (13.0)	140.9	124.7	101.6	P	—	—	—	—
CL02-612	CELL #5 S. WEST END	6" / L-6	01-5	13.1	121.3	13.9 (15.2)	133.1	115.5	95.2	P	—	—	—	—
CL02-613	CELL #5 S. WEST END	6" / L-6	01-2	15.5	115.3	15.3 (16.3)	132.9	114.3	99.1	P	—	—	—	—
CL02-614	CELL #5 S. WEST END	6" / L-6	01-6	12.5	122.7	12.8 (14.2)	137.7	120.6	98.0	P	—	—	—	—
CL02-615	CELL #4 Penetration Box Pad	6" / L-6	01-5	13.1	121.3	13.0 (14.4)	136.1	119.0	98.1	P	—	—	—	—
CL02-616	CELL #5 Drainage Corridor	6" / L-4	01-6	12.5	122.7	12.0 (13.5)	138.4	121.9	99.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 7

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL 4, 5 & 6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 18 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/(COMPACTED))

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-617	CELL #5 Drainage Corridor	6" / L-4	01-6	12.5	122.7	14.0 (15.2)	135.2	117.4	95.7	P	—	—	—	—
CL02-618	CELL #5 Drainage Corridor	6" / L-4	01-6	12.5	122.7	12.5 (14.0)	137.7	120.8	98.4	P	—	—	—	—
CL02-619	CELL #5 Drainage Corridor	6" / L-4	01-2	15.5	115.3	15.8 (16.8)	131.3	112.4	97.5	P	—	—	—	—
CL02-620	CELL #6 EAST BENCH	6" / L-3	01-1	13.3	121.1	13.9 (15.2)	139.5	121.1	100.0	P	—	—	—	—
CL02-621	CELL #6 4:1 SLOPE	6" / L-1	01-1	13.3 ~~12.9~~	121.1	12.9 (14.3)	138.3	121.0	99.9	P	—	—	—	—
CL02-622	CELL #6 4:1 SLOPE	6" / L-1	01-1	13.3 ~~12.9~~	121.1	13.1 (14.5)	136.1	118.9	98.2	P	—	—	—	—
CL02-623	CELL #6 4:1 SLOPE	6" / L-1	01-1	13.3	121.1	12.4 (13.9)	137.0	120.3	99.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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PENETRATION BOX PAD FINAL LIFT

LIFT 4

LIFT 5

LIFT 1

LIFT 3

℄ OF INTERCELL BERM

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM (SEE NOTE)

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 5

LDS PIPE (NOTE 3)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

℄ OF INTERCELL BERM

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING G-3

18 JULY 2002

GQ1341 04.1

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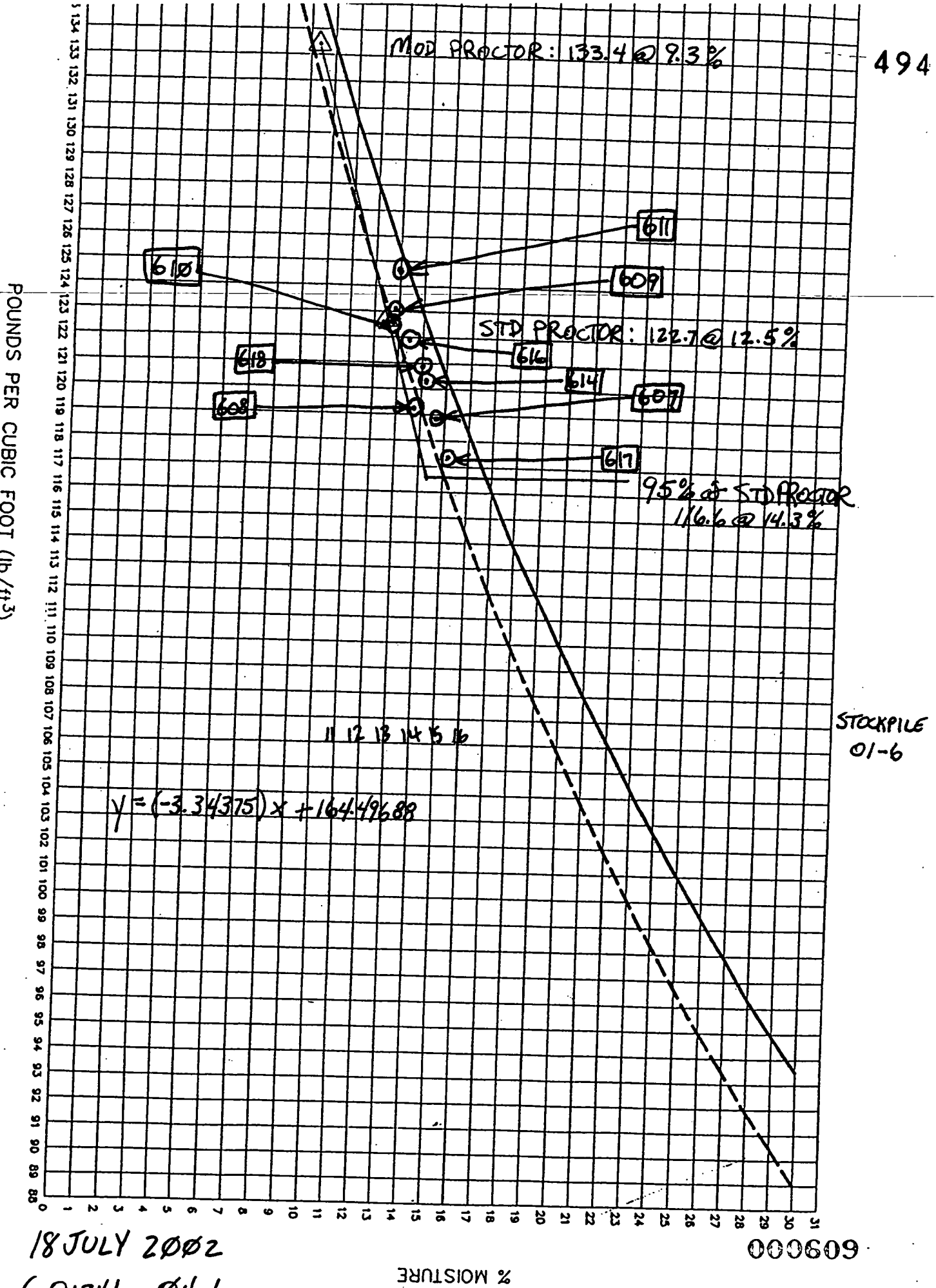

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18 JULY 2002

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Sheet No. 4 of 7

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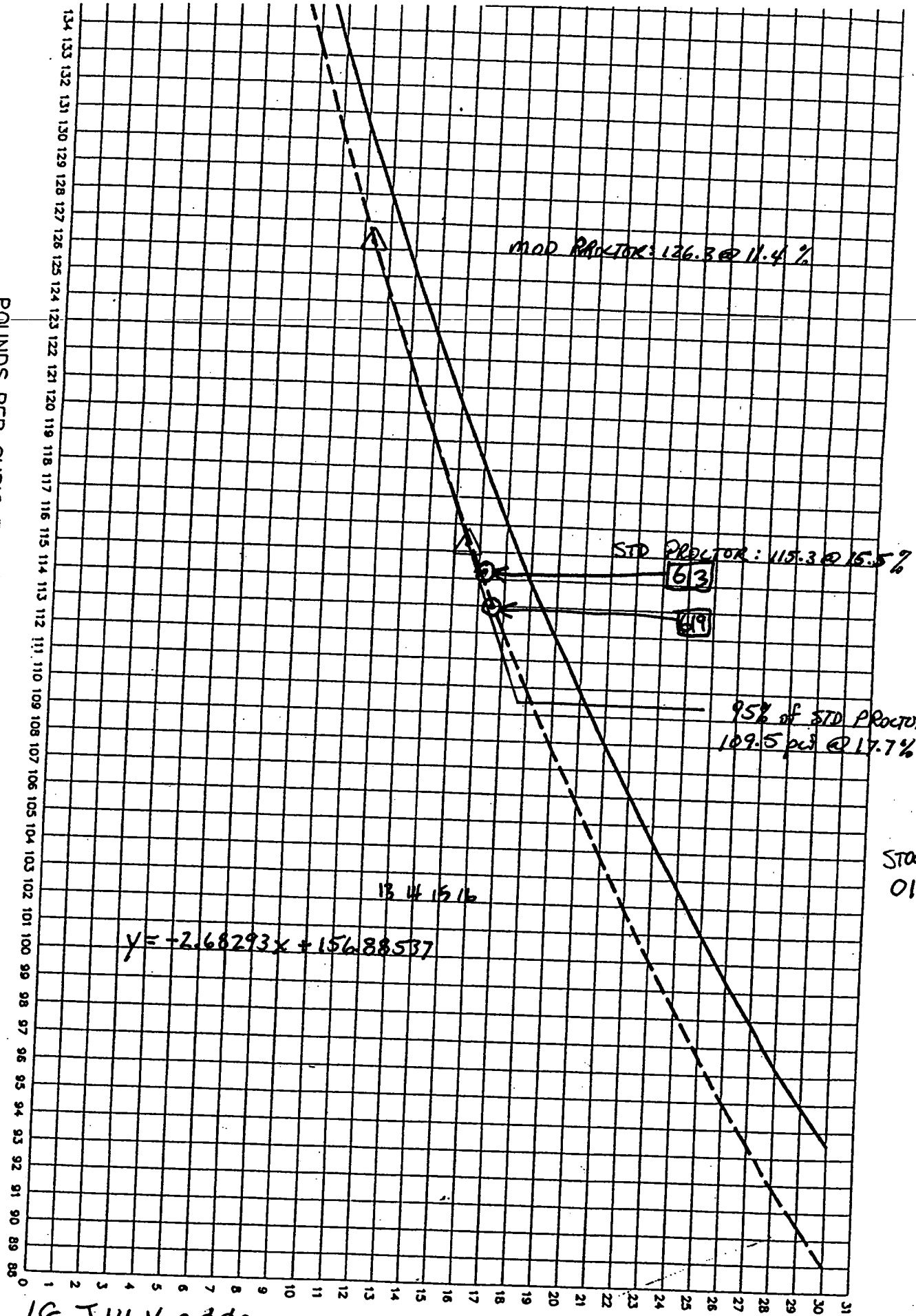

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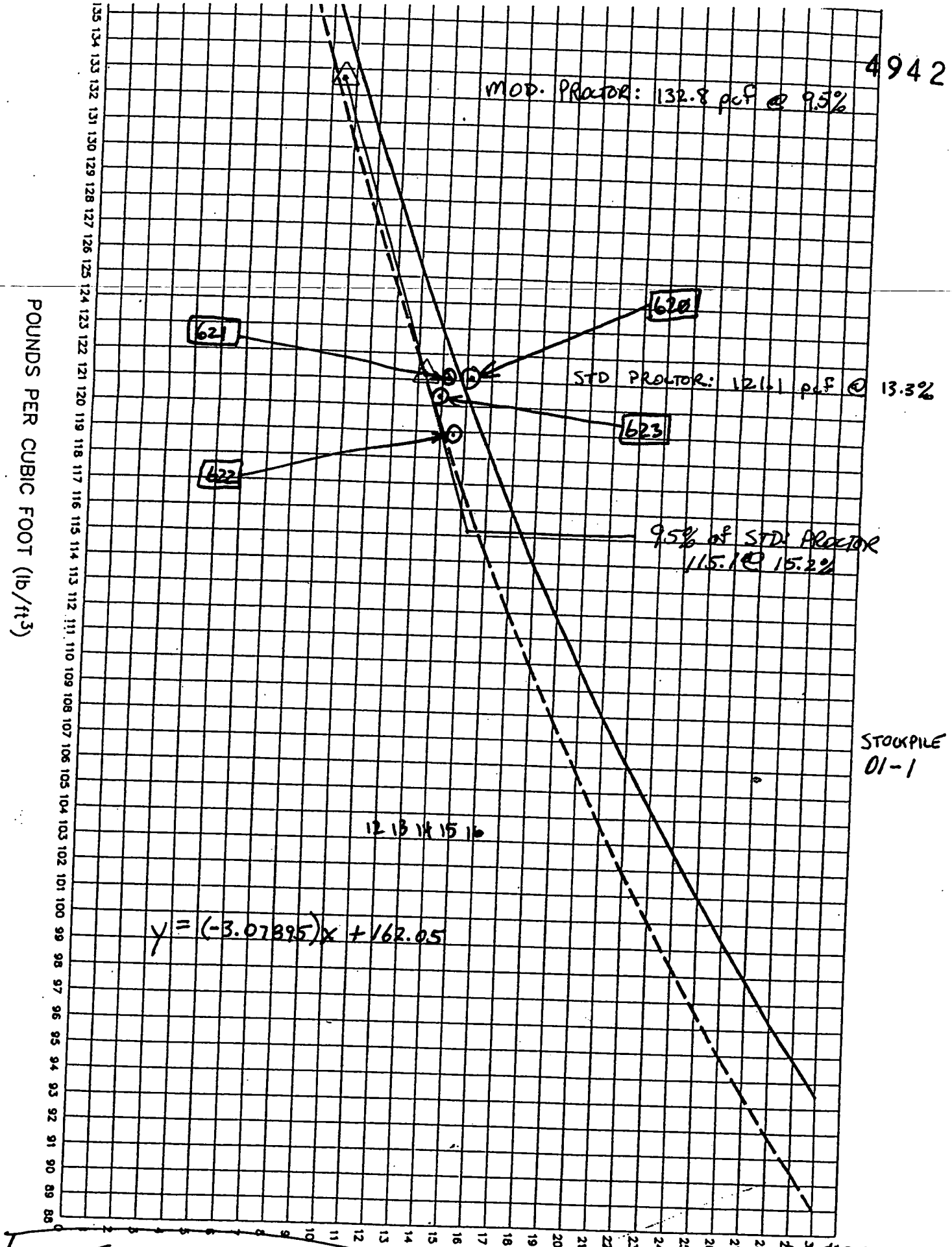

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18 JULY 2002
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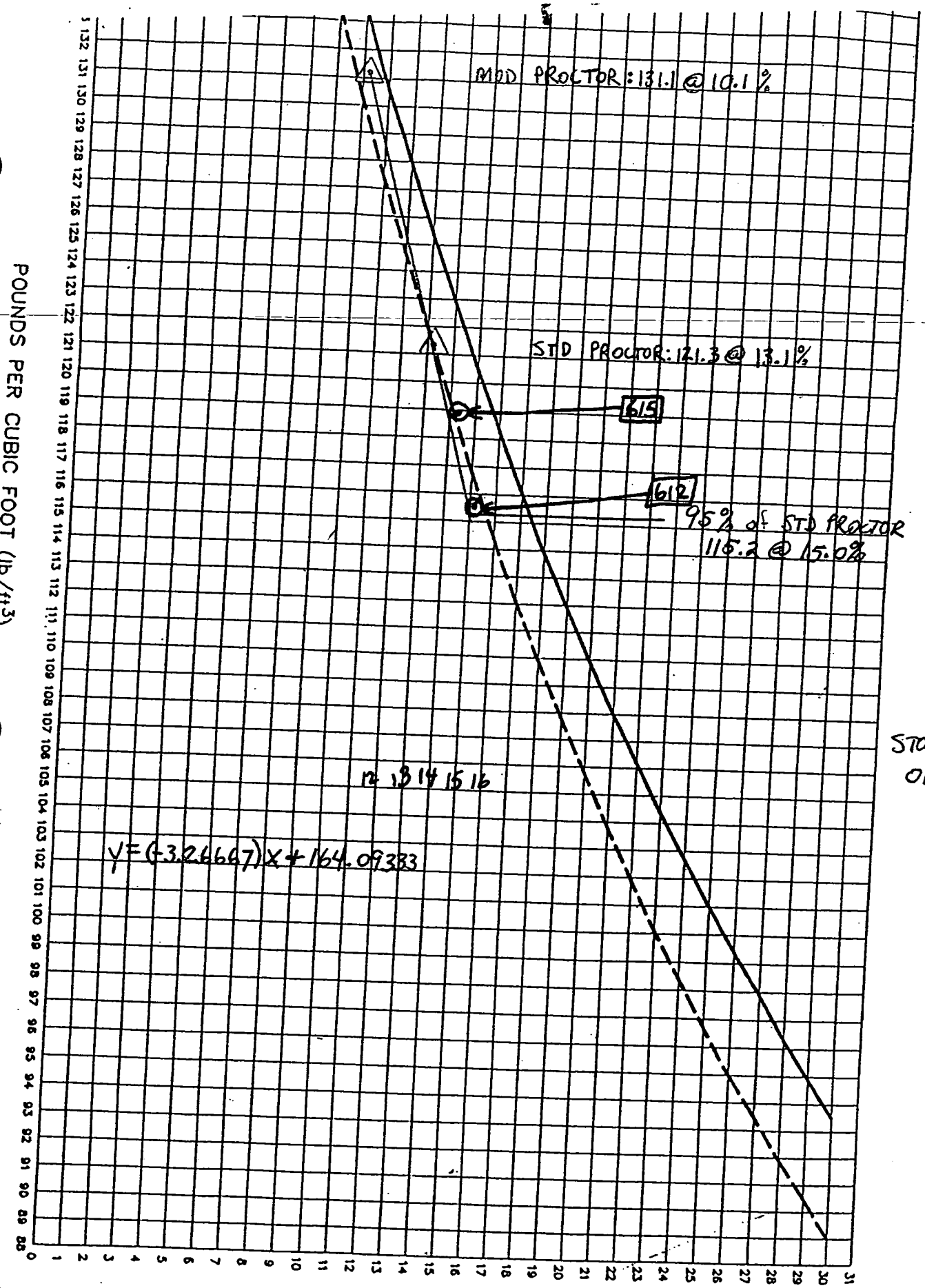

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18 JULY 2002

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Sheet No. 1 of 1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL 5 & 6

PROJECT NO.: G01341 TASK NO.: 04-1

DATE: 19 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE/COMPACTED) ≈6"

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-624	CELL #5 Drainage Corridor	6" / L-5	Ø1-1	13.3	121.1	14.7 (15.8)	134.9	116.5	96.2	P	—	—	—	—
CL02-625	CELL #5 Drainage Corridor	6" / L-5	Ø1-1	13.3	121.1	13.5 (14.8)	134.0	116.7	96.4	P	—	—	—	—
CL02-626	CELL #5 Drainage Corridor	6" / L-5	Ø1-1	13.3	121.1	13.4 (14.7)	135.8	118.4	97.8	P	—	—	—	—
CL02-627	CELL #5 Drainage Corridor	6" / L-5	Ø1-1	13.3	121.1	13.5 (14.8)	135.8	118.3	97.7	P	—	—	—	—
CL02 628	CELL #5 10:1 Slope	6" / L-6	Ø1-2	15.5	115.3	13.3 (14.6)	131.4	114.7	99.5	~~P~~	F	CL02 634	P	—
CL02 629	CELL #5 10:1 Slope	6" / L-6	Ø1-5	13.1	121.3	12.0 (13.5)	138.4	121.9	100.5	P	—	—	—	—
CL02 630	CELL #5 10:1 Slope	6" / L-6	Ø1-5	13.1	121.3	12.0 (13.5)	138.2	121.8	100.4	P	—	—	—	—
CL02 631	CELL #6, 4:1 Slope	6" / L-1	Ø1-1	13.3	121.1	14.4 (15.6)	134.8	116.6	96.3	P	—	—	—	—
CL02 632	CELL #5 10:1 Slope	6" / L-6	Ø1-5	13.1	121.3	12.7 (14.1)	135.1	118.4	97.6	P	—	—	—	—
CL02 633	CELL #5 10:1 Slope	6" / L-6	Ø1-1	13.3	121.1	12.3 (13.8)	137.1	120.5	99.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL 5 & 6

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 19 day July month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE / COMPACTED): ≈6"

APZ APZ

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 28979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 634	CELL #5 10:1 Slope	6"/L-6	Ø1-2	15.5	115.5	15.9 (16.9)	131.4	112.4	97.3	P	—	—	—	—
CLØ2 635	CELL #6 4:1 Slope	6"/L-1	Ø1-1	13.3	121.1	13.4 (14.7)	136.9	119.4	98.6	P	—	—	—	—
CLØ2 636	CELL #6 4:1 Slope	6"/L2	Ø1-1	13.3	121.1	11.2 (12.9)	129.3	114.5	94.5	—	F	CLØ2638	P	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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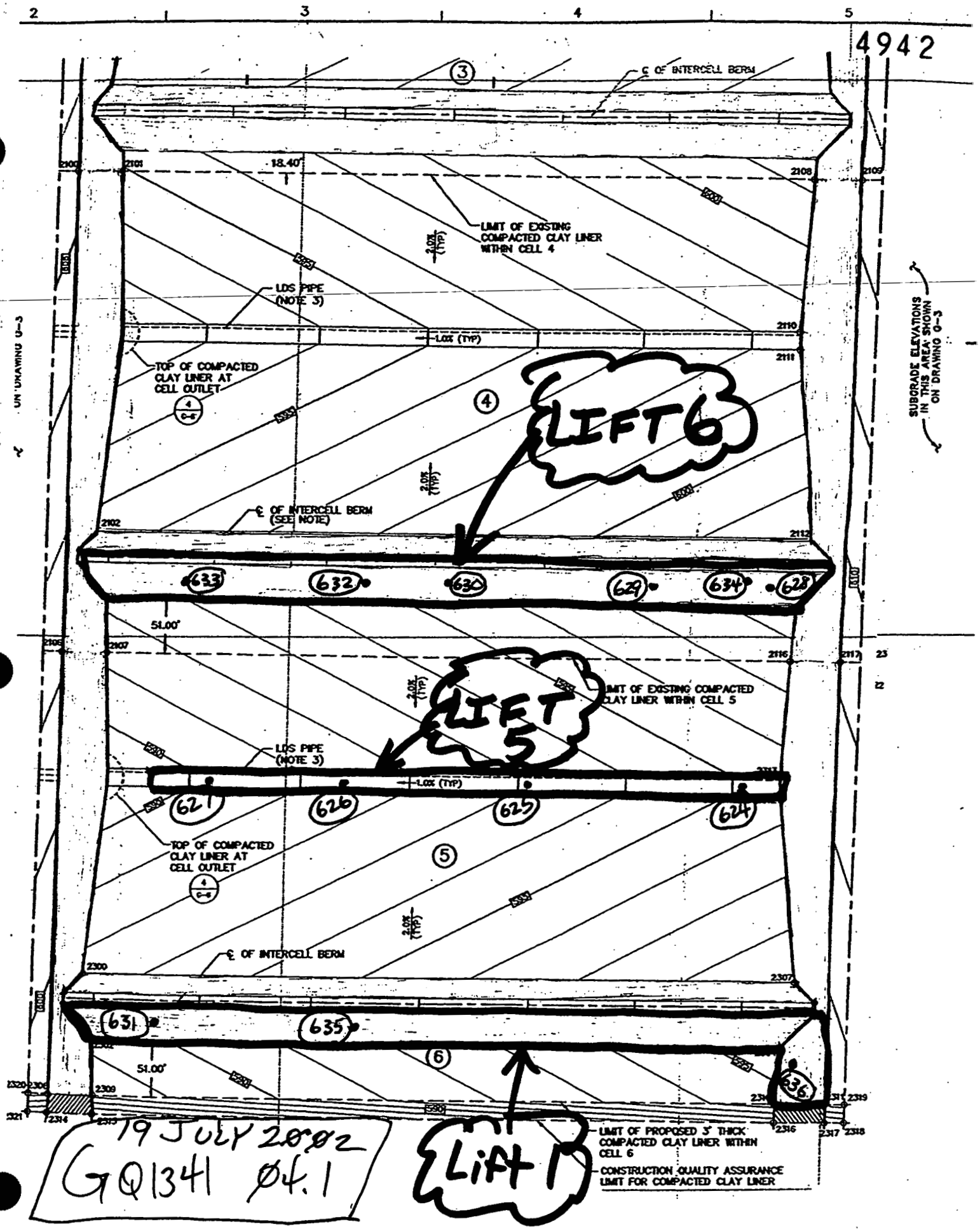

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GQ1341 Ø4.1

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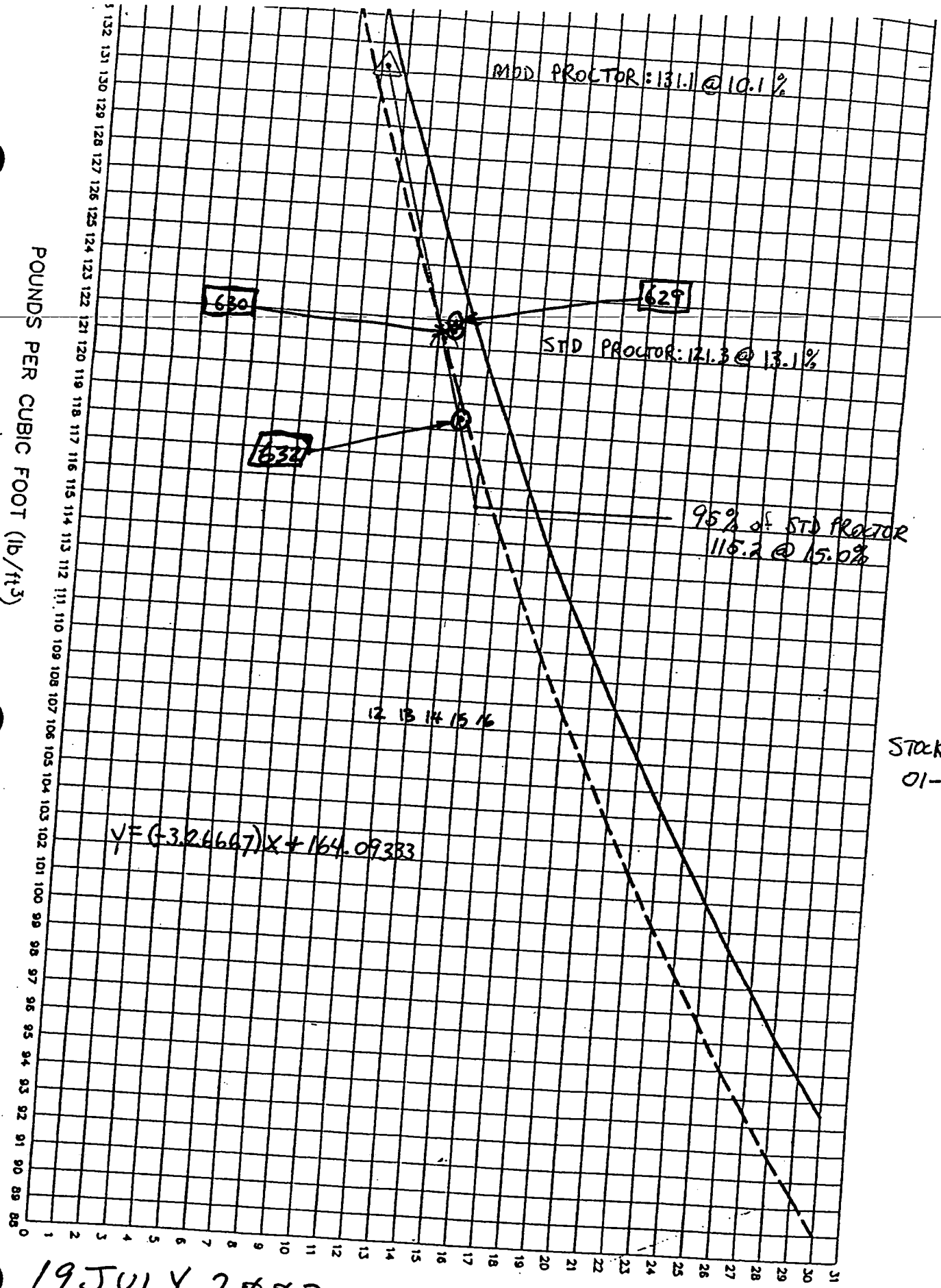

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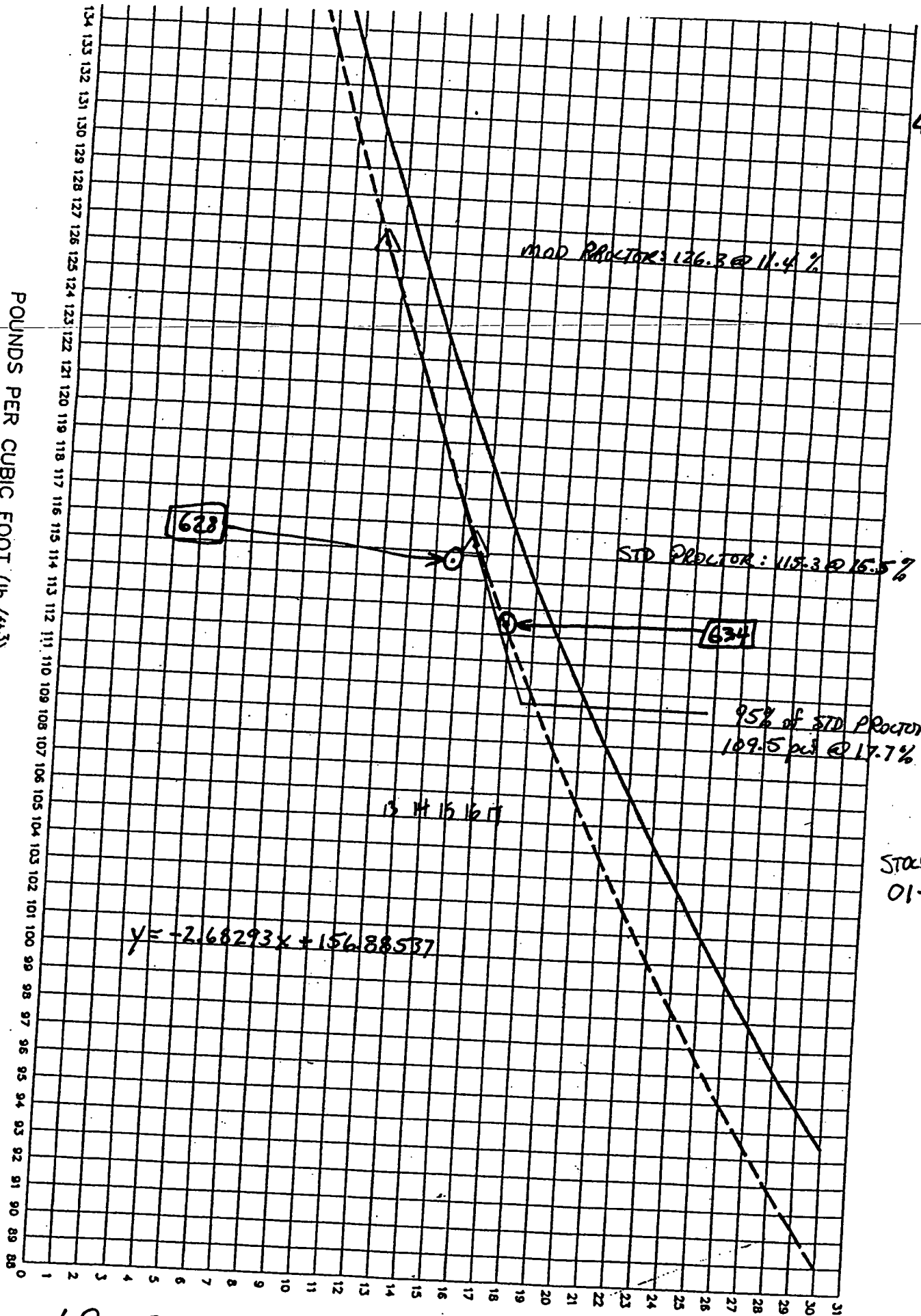

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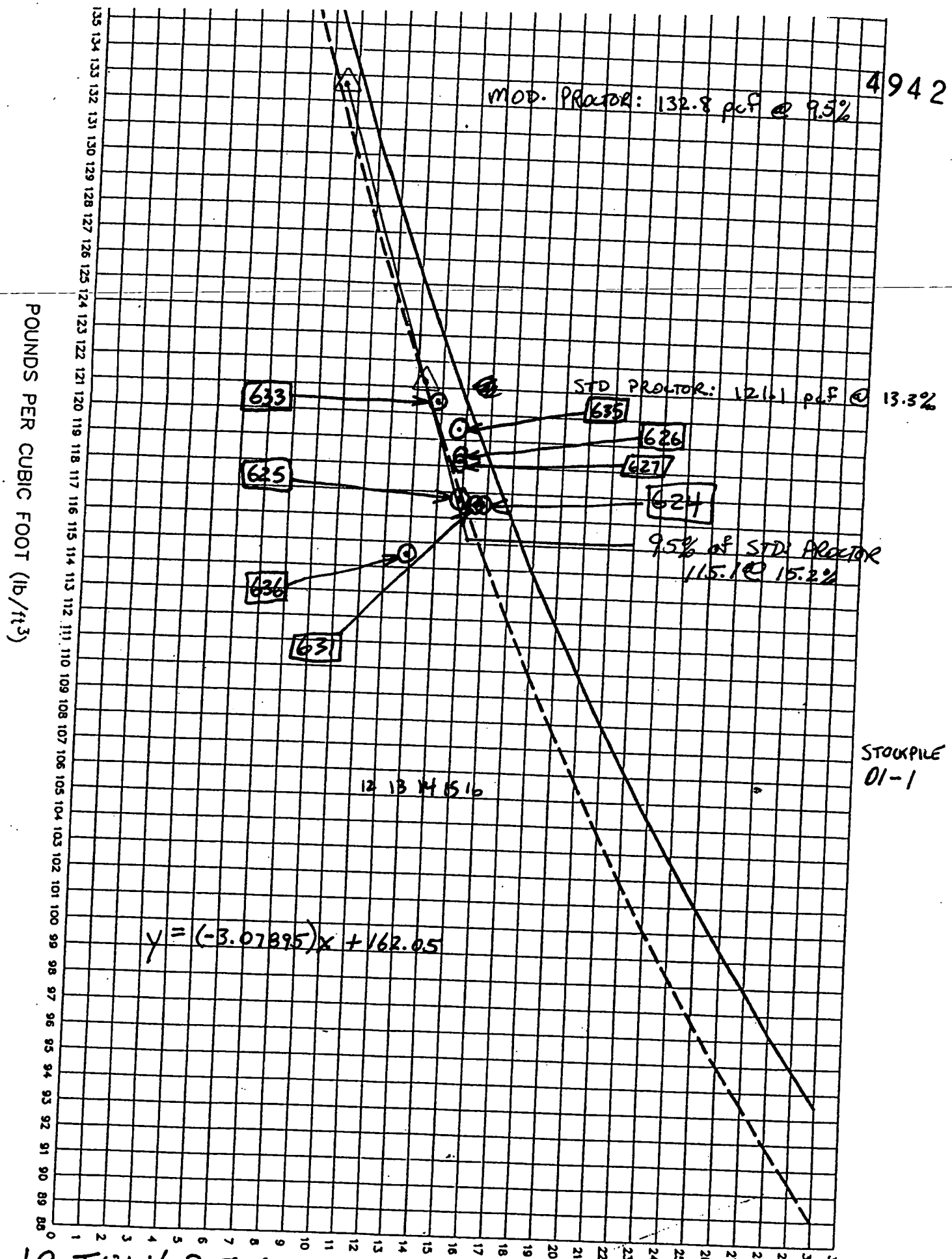

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 20 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/(COMPACTED)): ≈6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481 X + 3.3669

QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 637	CELL #6 EAST BENCH	6" / L-4	01-1	13.3	121.1	14.3 (15.5)	136.3	118.0	97.4	P	—	—	—	—
CL02 638	CELL #6 4:1 Slope	6" / L-2	01-1	13.3	121.1	12.9 (14.3)	135.3	118.4	97.8	P	—	—	—	—
CL02 639	CELL #6 4:1 Slope	6" / L-2	01-1	13.3	121.1	13.2 (14.6)	135.8	118.5	97.9	P	—	—	—	—
CL02 640	CELL #6 4:1 Slope	6" / L-2	01-1	13.3	121.1	12.4 (13.9)	136.0	119.4	98.6	P	—	—	—	—
CL02 641	CELL #6 4:1 Slope	6" / L-2	01-1	13.3	121.1	13.5 (14.8)	135.1	117.9	97.2	P	—	—	—	—
CL02 642	CELL #6 4:1 Slope	6" / L-2	01-1	13.3	121.1	13.9 (15.2)	133.9	116.2	96.0	P	—	—	—	—
CL02 643	CELL #5 S.WEST END	6" / L-6	01-2	15.5	115.3	14.4 (15.6)	133.0	115.3	99.8	P	—	—	—	—
CL02 644	CELL #5 S. EAST END	6" / L-6	01-2	15.5	115.3	14.6 (15.7)	136.9	118.3	102.6	P	—	—	—	—
CL02 645	CELL #5 S.EAST END	6" / L-6	01-2	15.5	115.3	15.2 (16.3)	134.5	115.6	100.3	P	—	—	—	—
CL02 646	CELL #5 S.EAST END	6" / L-6	01-2	15.5	115.3	15.3 (16.3)	133.6	114.9	99.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 20 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE / (COMPACTED)): 6"

APZ APZ

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 647	CELL #5 S. WEST END	6" / L-6	01-2	15.5	115.3	15.6 (16.6)	133.1	114.2	99.0	P	—	—	—	—
CL02 648	CELL #6 EAST BENCH	6" / L-5	01-4	13.3	121.1	14.7 (15.8)	134.3	116.0	95.8	P	—	—	—	—
CL02 649	CELL #6 4:1 SLOPE	6" / L-3	01-1	13.3	121.1	14.7 (15.8)	133.6	115.4	95.3	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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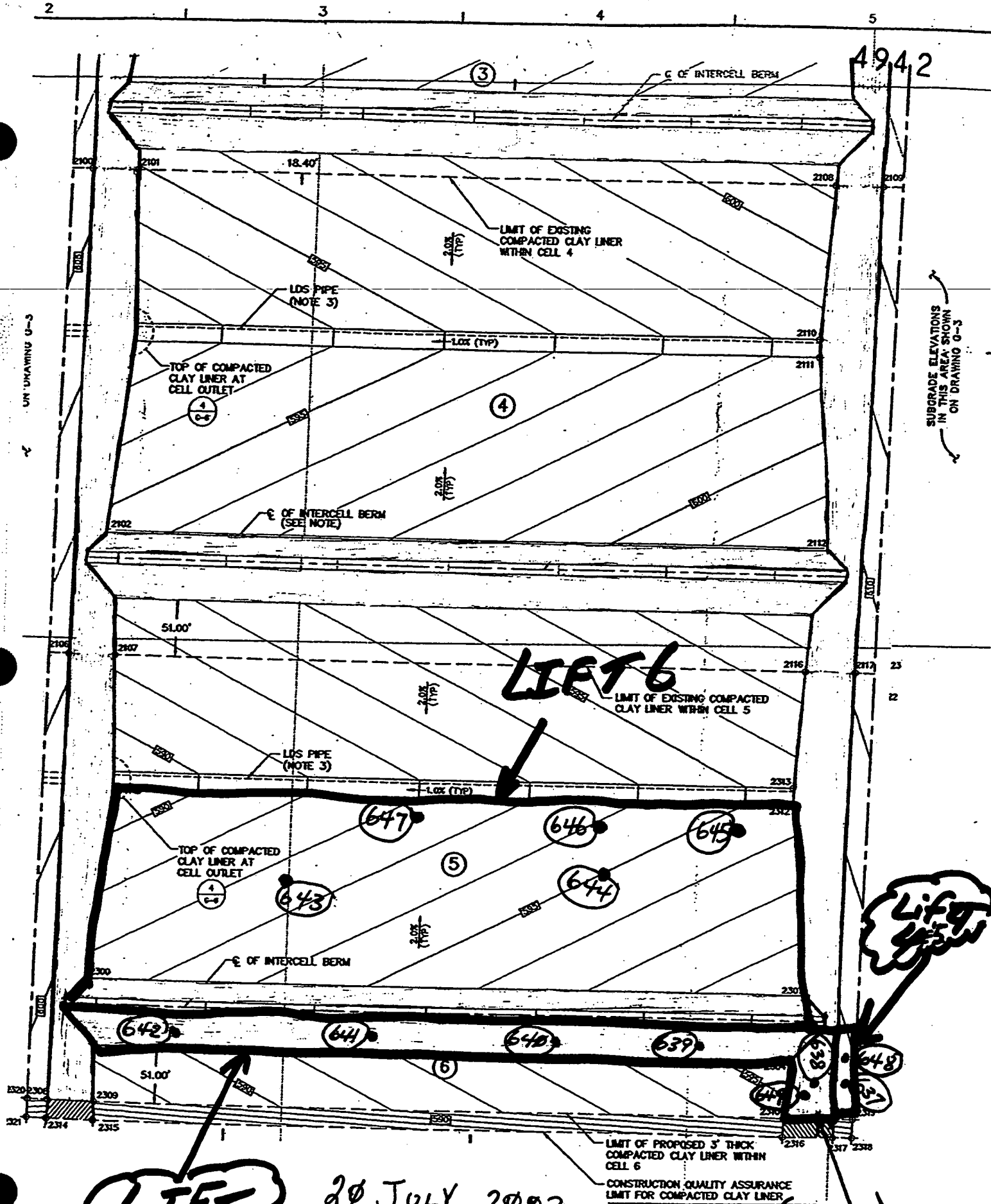

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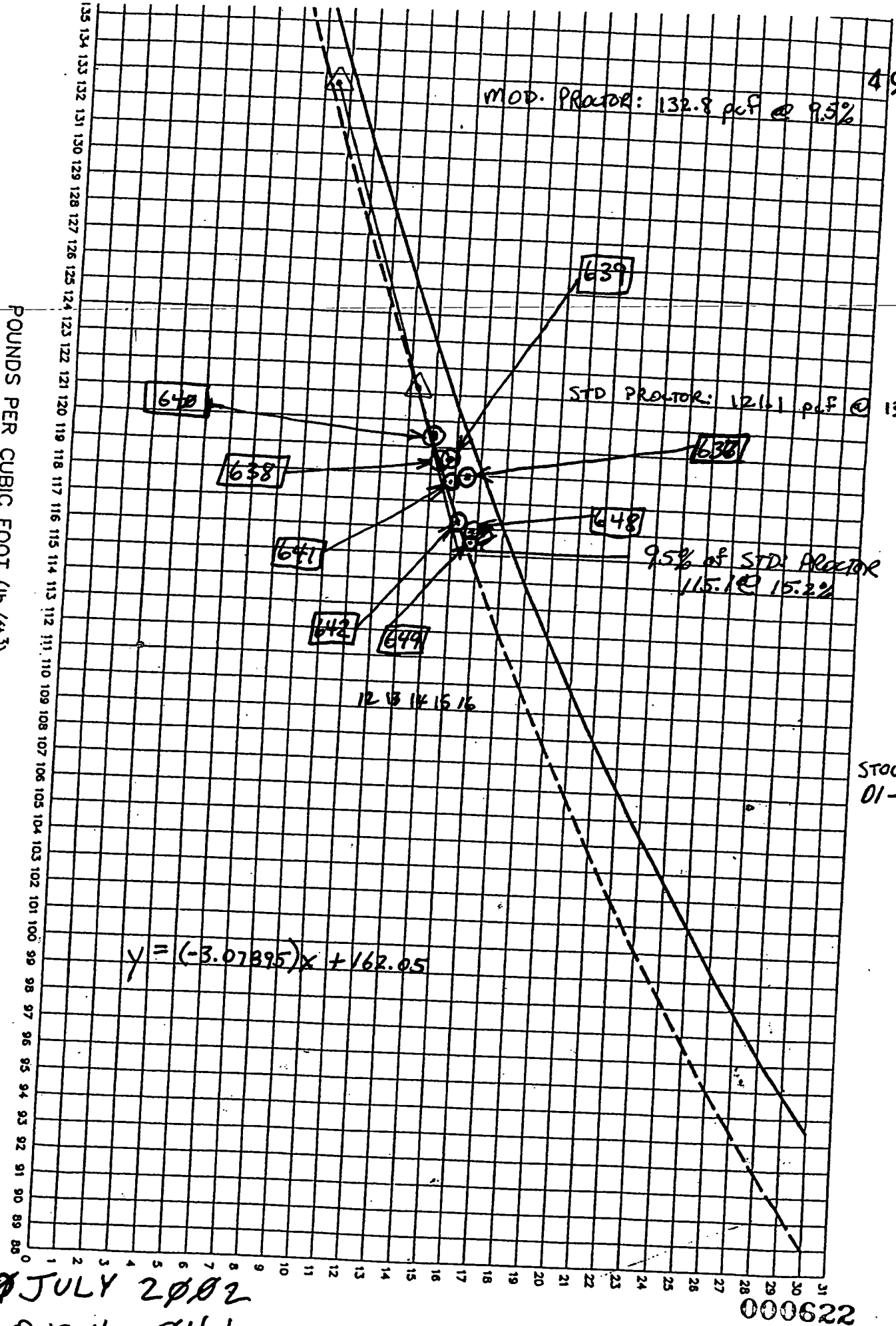

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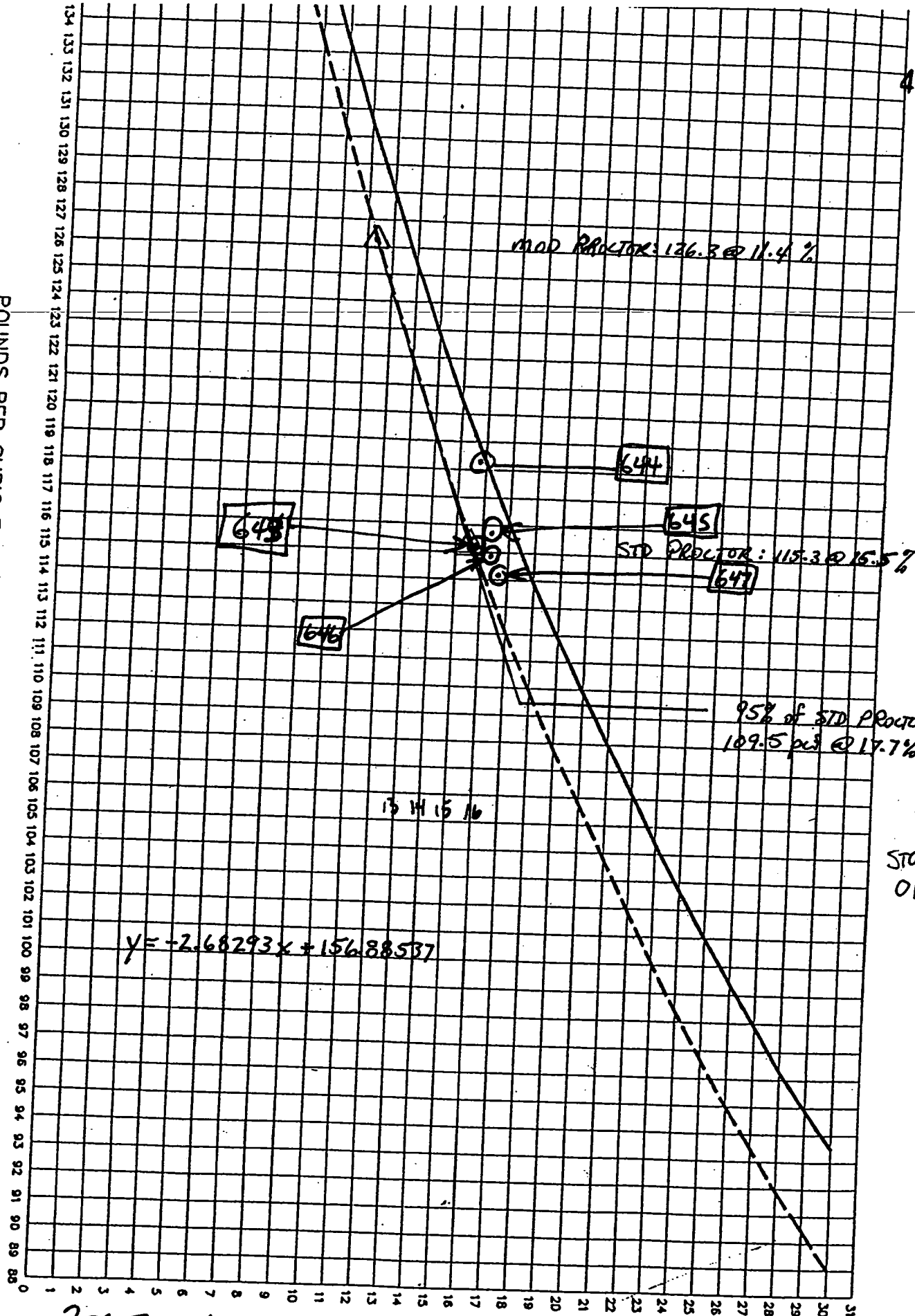

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell # 5 & #6

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 22 day JULY month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE / (COMPACTED)): 6"

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = Ø.8481 X + 3.3669 QA ID: GHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 650	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.6 (15.7)	135.5	117.1	96.7	P	—	—	—	—
CLØ2 651	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.1 (15.3)	137.5	119.3	98.5	P	—	—	—	—
CLØ2 652	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.8 (15.9)	132.9	114.7	94.7	F	F	CLØ2 653	P	—
CLØ2 653	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.7 (15.8)	135.3	116.8	96.4	P	—	—	—	—
CLØ2 654	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	12.3 (13.8)	138.4	121.6	100.4	P	—	—	—	—
CLØ2 655	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.6 (15.7)	135.4	117.Ø	96.7	P	—	—	—	—
CLØ2 656	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	14.1 (15.3)	133.Ø	115.4	95.3	P	—	—	—	—
CLØ2 657	CELL #5, N. EAST END	6" / L-6	Ø1-1	13.3	121.1	13.7 (15.Ø)	134.8	117.2	96.8	P	—	—	—	—
CLØ2 658	CELL #6, 4:1 Slope	6" / L-3	Ø1-1	13.3	121.1	12.6 (14.1)	138.9	121.7	1ØØ.5	P	—	—	—	—
CLØ2 659	CELL #6, 4:1 SLOPE	6" / L-3	Ø1-1	13.3	121.1	13.5 (14.8)	135.3	117.9	97.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell #5 & #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 22 day July month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/(COMPACTED): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 660	CELL #6, 4:1 SLOPE	6" / L-3	01-1	13.3	121.1	12.5 (14.0)	136.4	119.6	98.8	P	—	—	—	—
CL02 661	CELL #5, S. WEST END	6" / L-6	01-2	15.5	115.3	16.6 (17.4)	131.1	111.7	96.9	P	—	—	—	—
CL02 662	CELL #5, S. WEST END	6" / L-6	01-2	15.5	115.3	14.9 (16.0)	133.4	115.0	99.7	P	—	—	—	—
CL02 663	CELL #5 S. WEST END	6" / L-6	01-1	13.3	121.1	12.9 (14.3)	136.8	119.7	98.8	P	—	—	—	—
CL02 664	CELL #5 S. WEST END	6" / L-6	01-1	13.3	121.1	13.4 (14.7)	135.4	118.0	97.4	P	—	—	—	—
CL02 665	CELL #5 S. WEST END	6" / L-6	01-2	13.1	121.3	13.9 (15.2)	137.3	119.2	98.3	P	—	—	—	—
CL02 666	CELL #5 S. WEST END	6" / L-6	01-2	15.3	115.3	14.9 (16.0)	133.9	115.4	100.1	P	—	—	—	—
CL02 667	CELL #5 Drainage Corridor	6" / L-5	01-1	13.3	121.1	13.[illegible] (15.2)	134.8	117.0	96.6	P	—	—	—	—
CL02 668	CELL #5 Drainage Corridor	6" / L-5	01-1	13.3	121.1	13.8 (15.1)	133.5	116.0	95.9	P	—	—	—	—
CL02 669	CELL #5 Drainage Corridor	6" / L-5	01-1	13.3	121.1	15.0 (16.5)	134.5	115.8	95.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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CL02 670 CELL #5 EAST BENCH 6" L-6 01-1 13.3 121.1 13.9/14.4 136.7 119.5 98.3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell #5 & #6

PROJECT NO.: G0134 TASK NO.: 04.1

DATE: 22 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 x +3.3669 QA ID: HW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02 678	CELL #6 EAST BENCH	6" / L-6	01-1	13.3	121.1	13.0 (14.4)	136.7	119.5	98.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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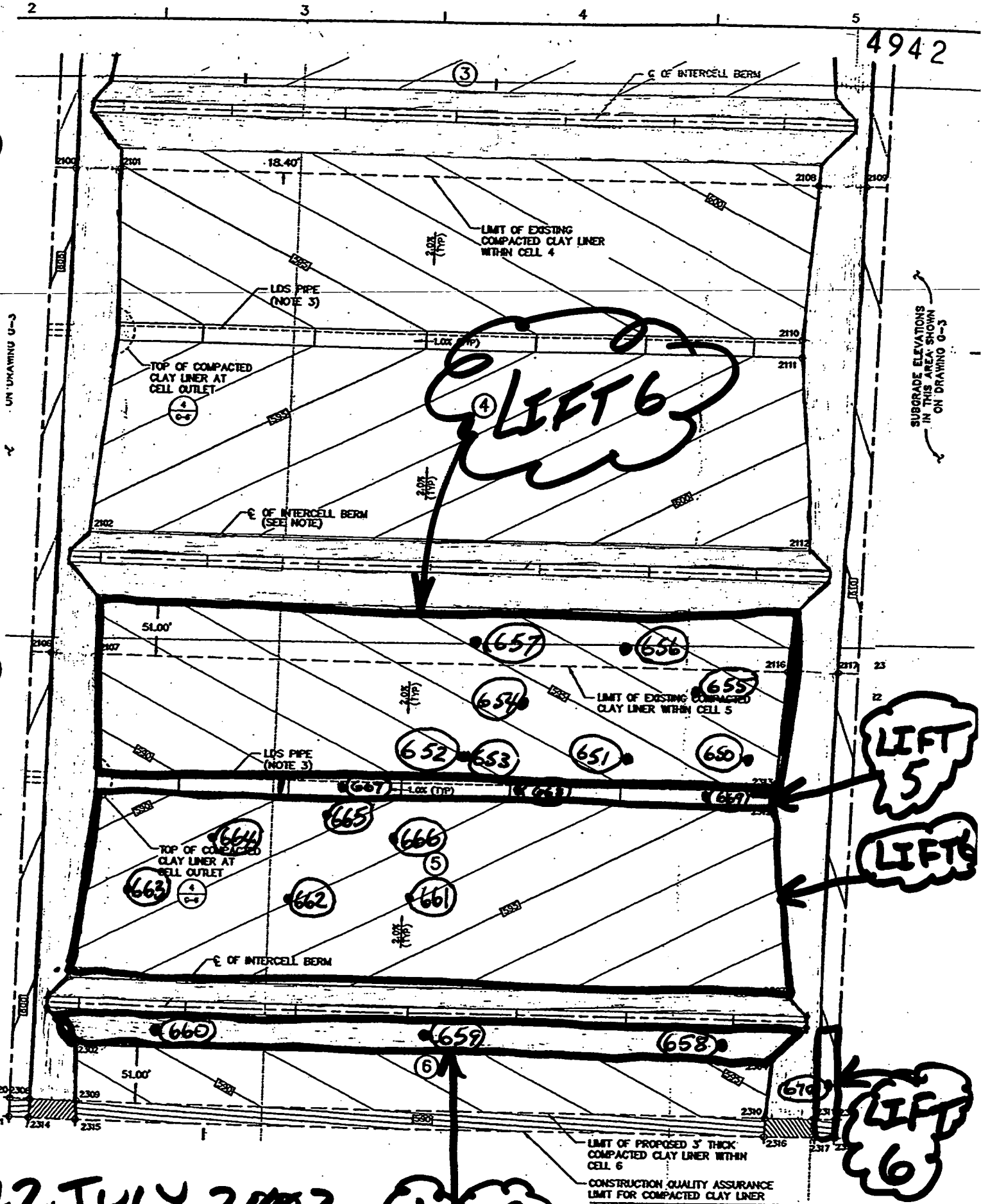

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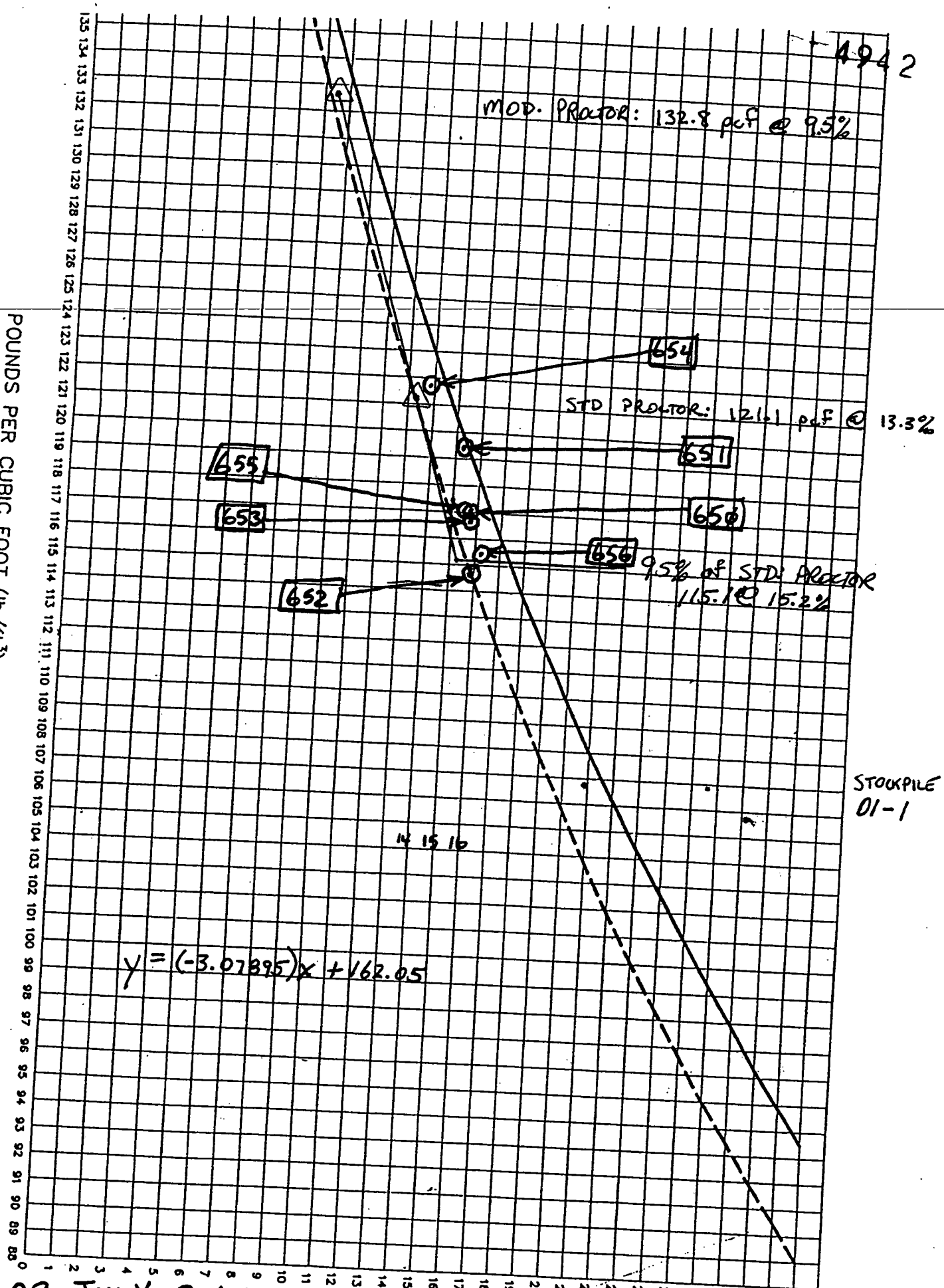

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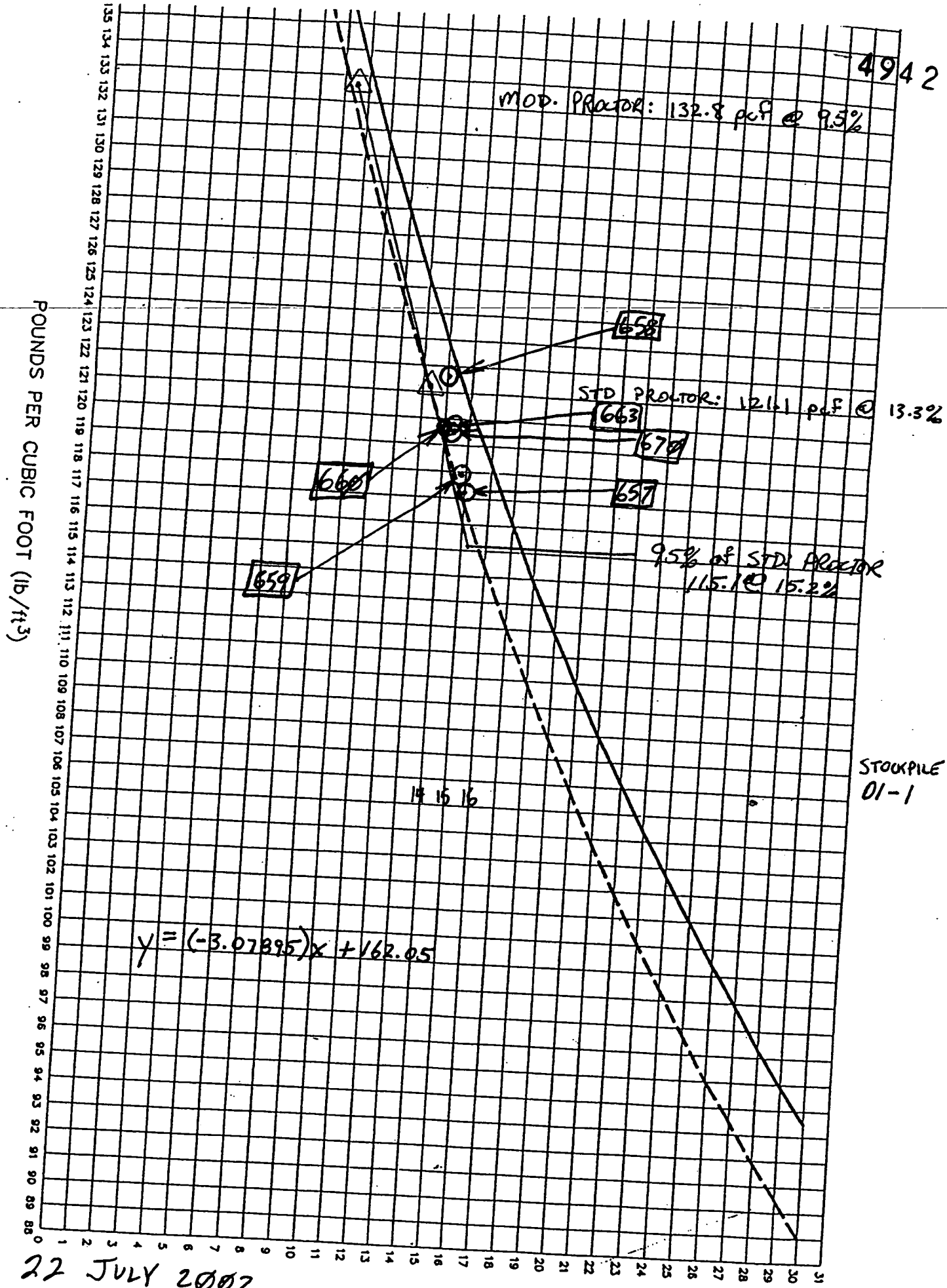

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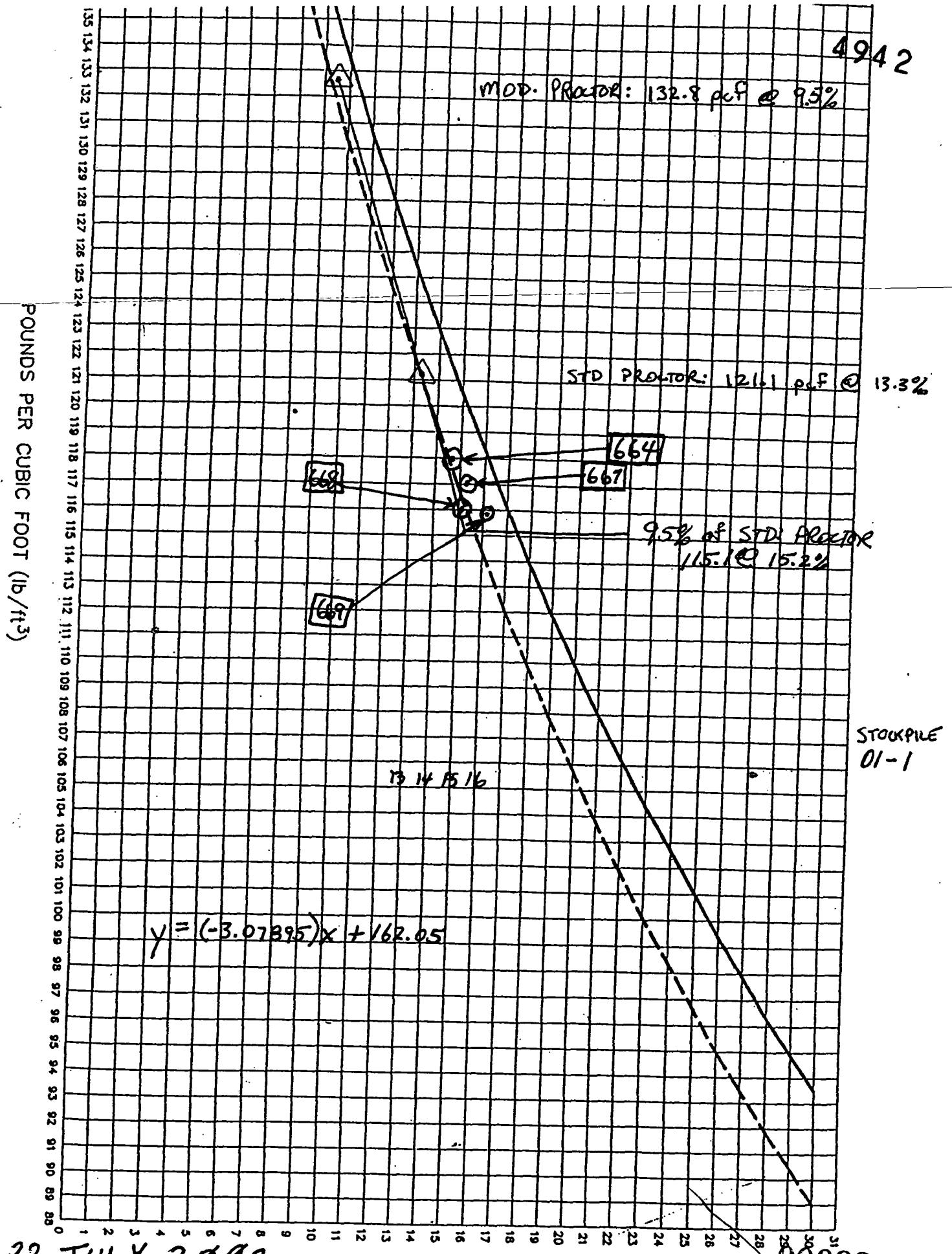

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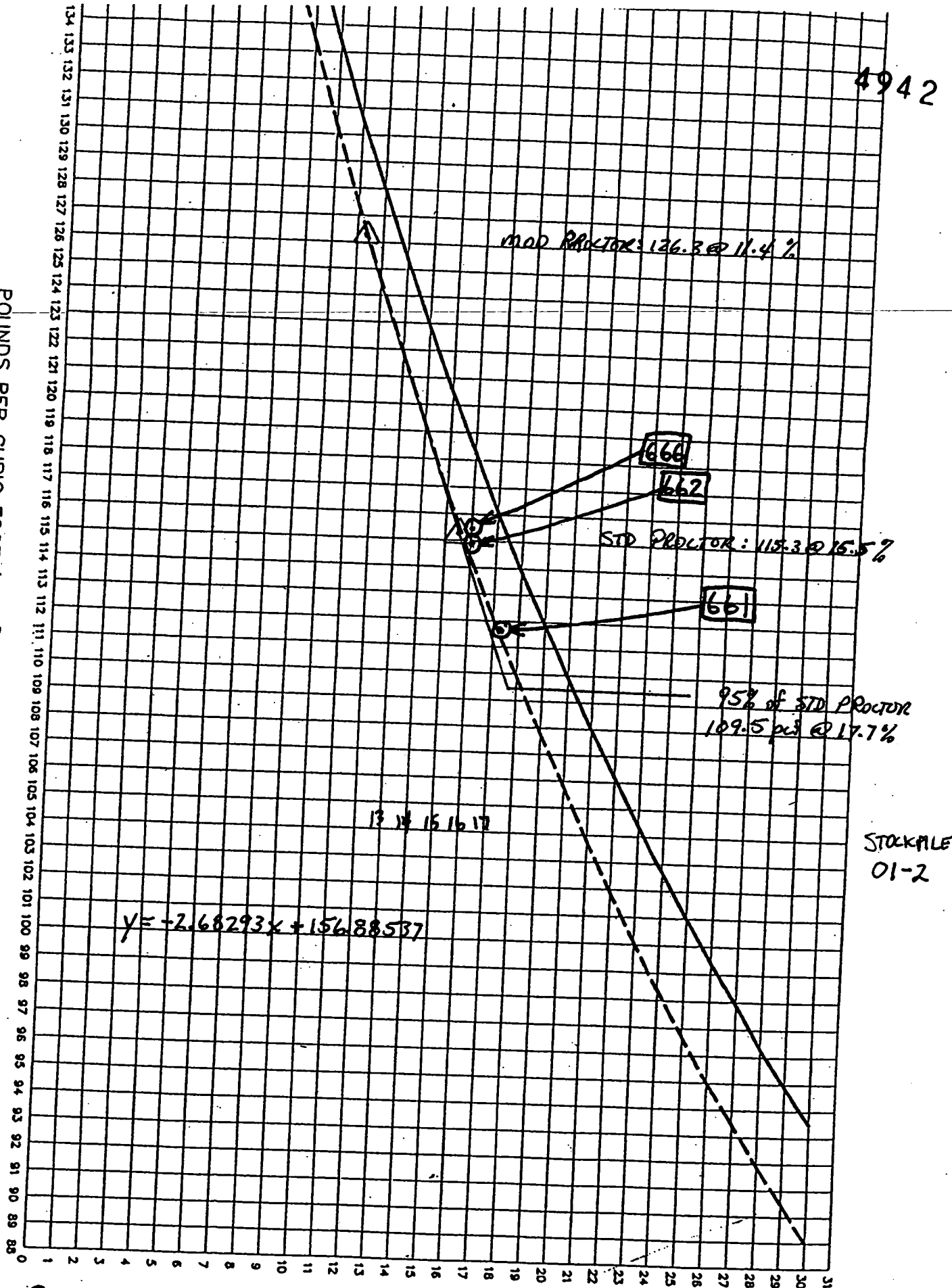

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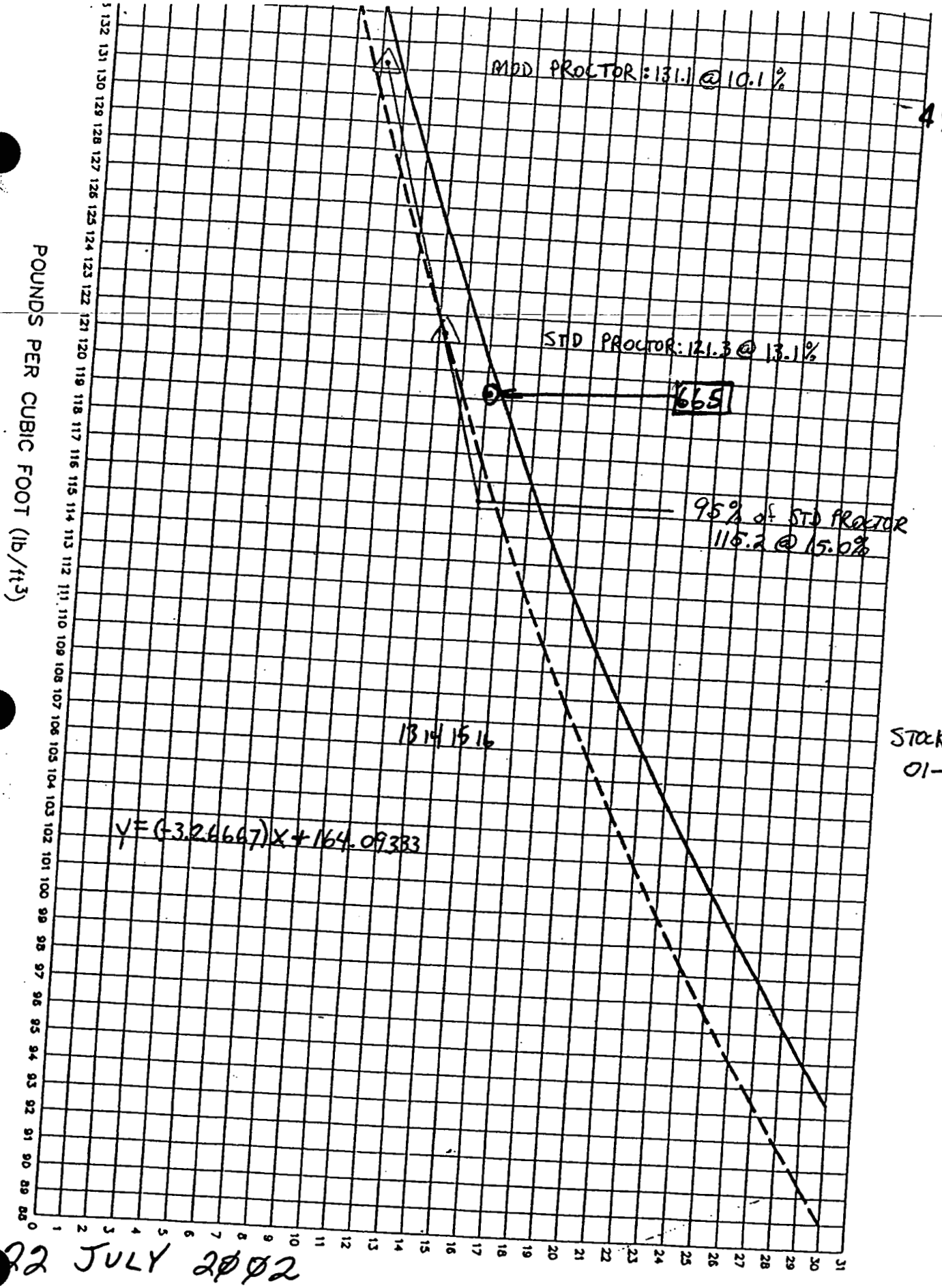

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Sheet No. 9 of 9

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell #5 & #6

PROJECT NO.: GQ134 / TASK NO.: 04.1

DATE: 23 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/COMPACTED): ____

APZ APZ

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 671	CELL #5→#6 I.C. BERM	6" / L-1	01-1	13.3	121.1	12.3 (13.8)	136.8	120.2	99.3	P	—	—	—	—
CL02 672	CELL #5→#6 I.C. BERM	6" / L-1	01-1	13.3	121.1	13.7 (15.0)	135.9	118.2	97.6	P	—	—	—	—
CL02 673	CELL #5→#6 I.C. BERM	6" / L-1	01-1	13.3	121.1	12.1 (13.6)	137.7	121.2	100.1	P	—	—	—	—
CL02 674	CELL #5, S. West End	6" / L-6	01-2	15.5	115.5	14.9 (16.0)	135.4	116.7	101.0	P	—	—	—	—
CL02 675	CELL #5, S. WEST END	6" / L-6	01-2	13.1	121.3	13.0 (14.4)	135.5	118.4	97.6	P	—	—	—	—
CL02 676	CELL #5, N. WEST END	6" / L-6	01-1	13.3	121.1	14.1 (15.3)	133.1	115.4	95.3	P	—	—	—	—
CL02 677	CELL #5, N. WEST END	6" / L-6	01-1	13.3	121.1	13.5 (14.8)	135.7	118.2	97.6	P	—	—	—	—
CL02 678	CELL #5, N. WEST END	6" / L-6	01-1	13.3	121.1	13.1 (14.5)	137.0	119.7	98.8	P	—	—	—	—
CL02 679	CELL #5 N. West END	6" / L-6	01-1	13.3	121.1	14.4 (15.6)	134.2	116.1	95.9	P	—	—	—	—
CL02 680	CELL #5 N. WEST END	6" / L-6	01-1	13.3	121.1	14.5 (15.7)	135.1	116.8	96.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 7

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell #5 & #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 23 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: D-3% LIFT THICKNESS (LOOSE/COMPACTED): ≈6"
APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 681	CELL #5, N.WEST END	6" / L-6	01-1	13.3	121.1	13.0 (14.4)	136.6	119.4	98.6	P	—	—	—	—
CL02 682	CELL #5, N.WEST END	6" / L-6	01-1	13.3	121.1	13.7 (15.0)	135.3	117.7	97.2	P	—	—	—	—
CL02 683	CELL #5, N WEST END	6" / L-6	01-1	13.3	121.1	13.6 (14.9)	134.8	117.3	96.9	P	—	—	—	—
CL02 684	CELL #5 → #6 I.C. BERM	6" / L-2	01-1	13.3	121.1	13.7 (15.0)	137.0	119.1	98.3	P	—	—	—	—
CL02 685	CELL #5 → #6 I.C. BERM	6" / L-2	01-1	13.3	121.1	12.8 (14.2)	136.4	119.4	98.6	P	—	—	—	—
CL02 686	CELL #5 → #6 I.C. BERM	6" / L-2	01-1	13.3	121.1	12.7 (14.1)	135.3	118.6	97.9	P	—	—	—	—
CL02 687	CELL #6 4:1 SLOPE	6" / L-4	01-1	13.3	121.1	15.1 (16.2)	134.6	115.8	95.6	P	—	—	—	—
CL02 688	CELL #6 4:1 SLOPE	6" / L-4	01-1	13.3	121.1	13.3 (14.6)	135.7	118.4	97.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 7

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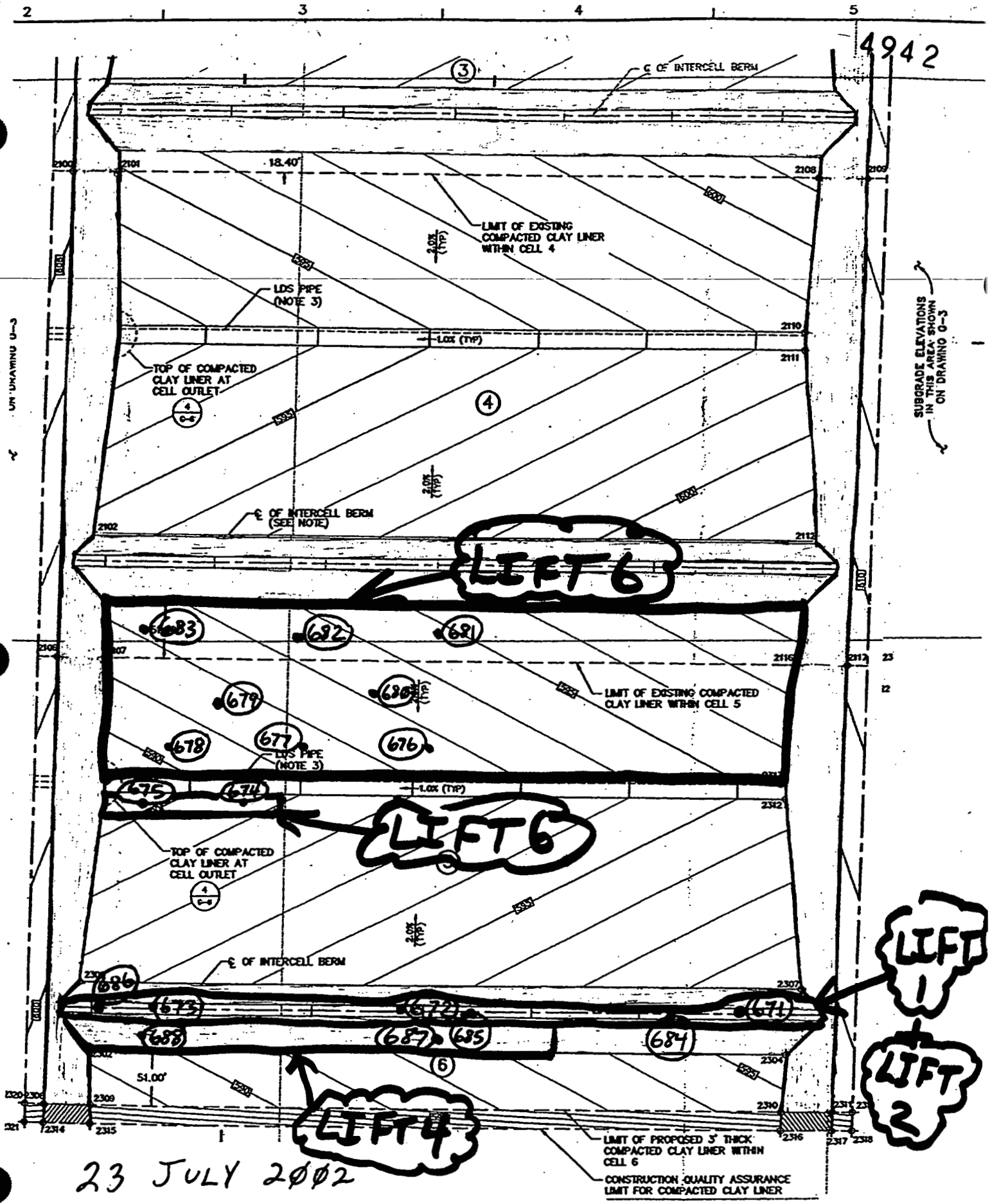

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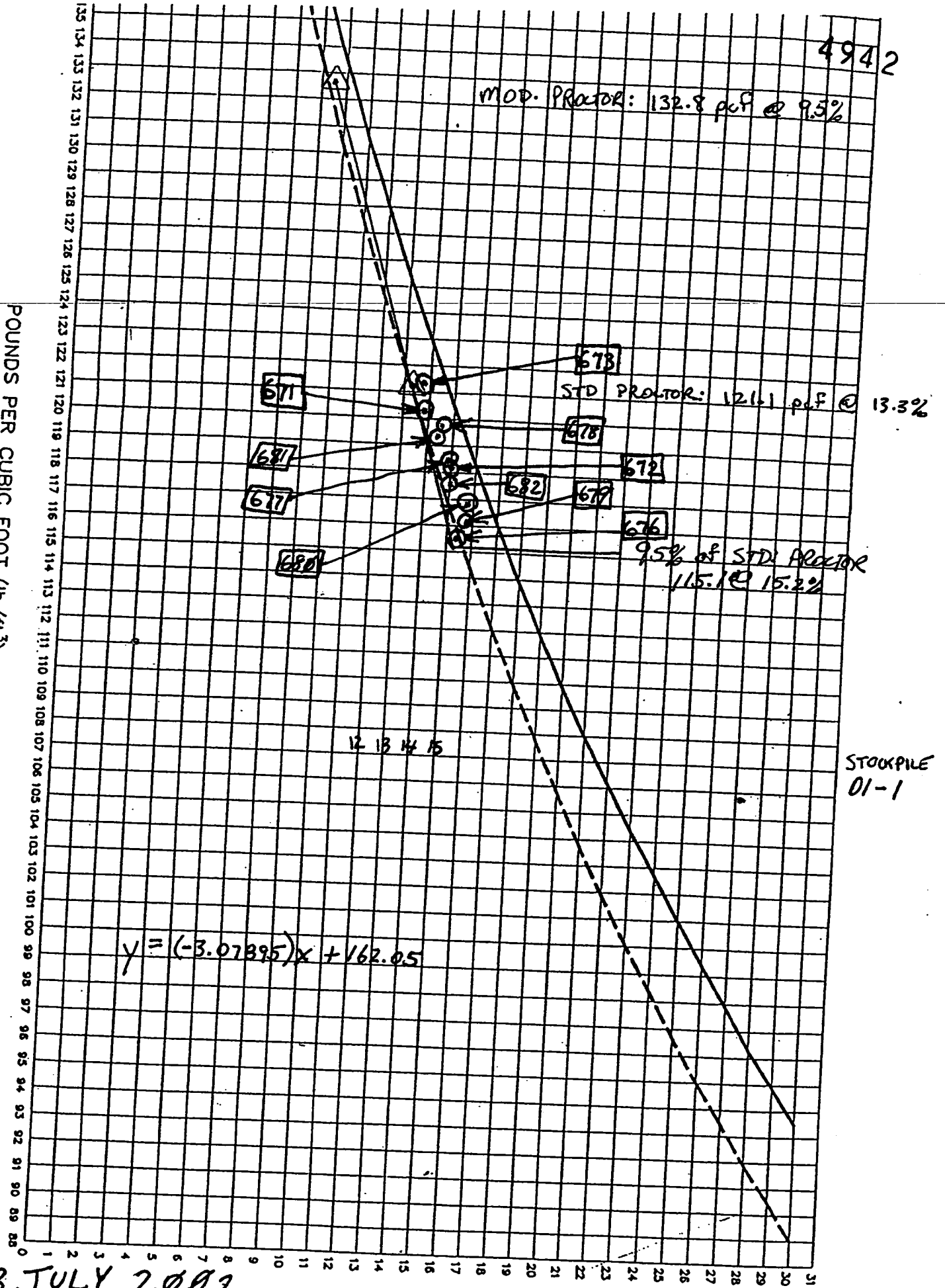
Sheet No. 3 of 7



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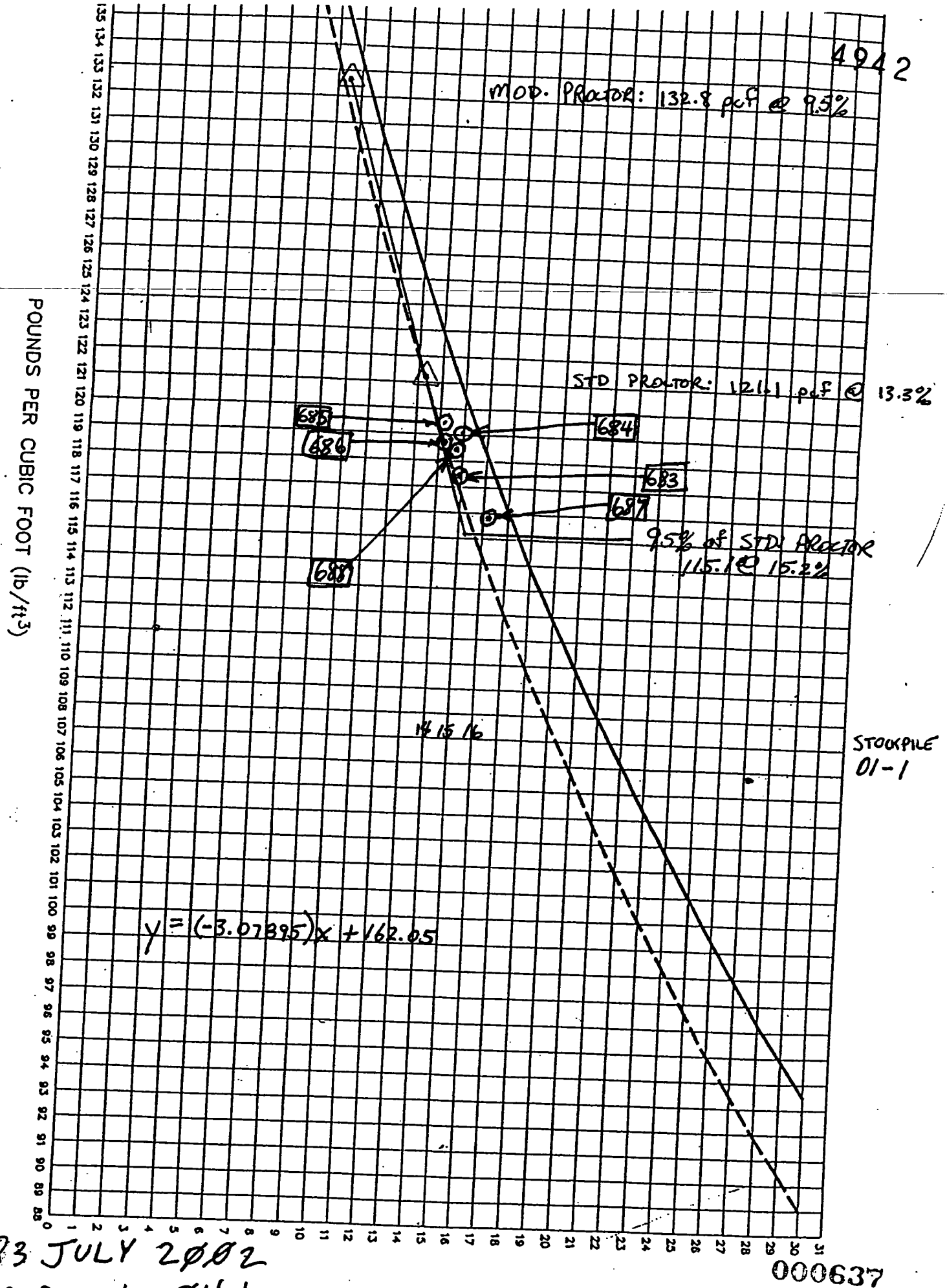

23 JULY 2002

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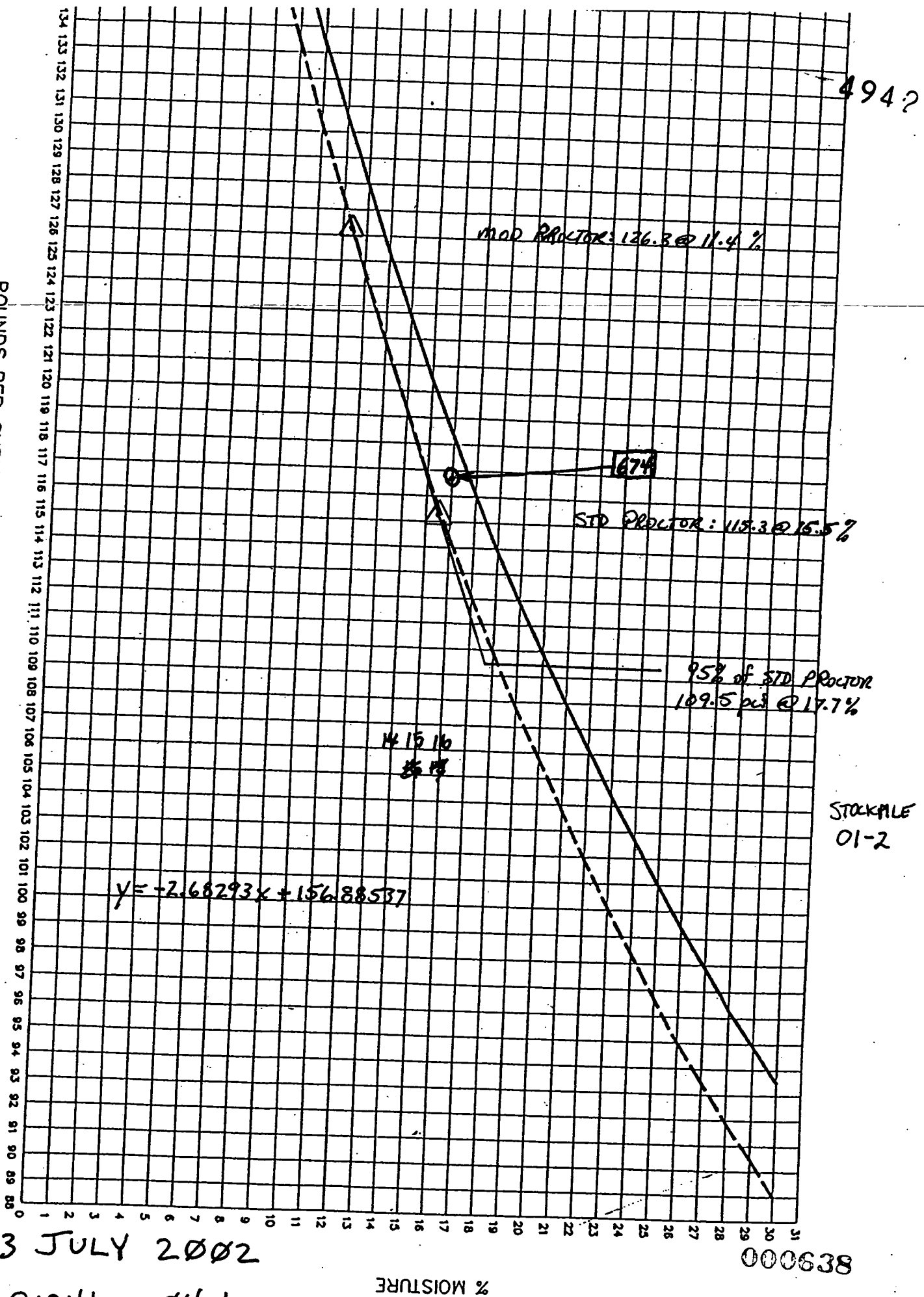

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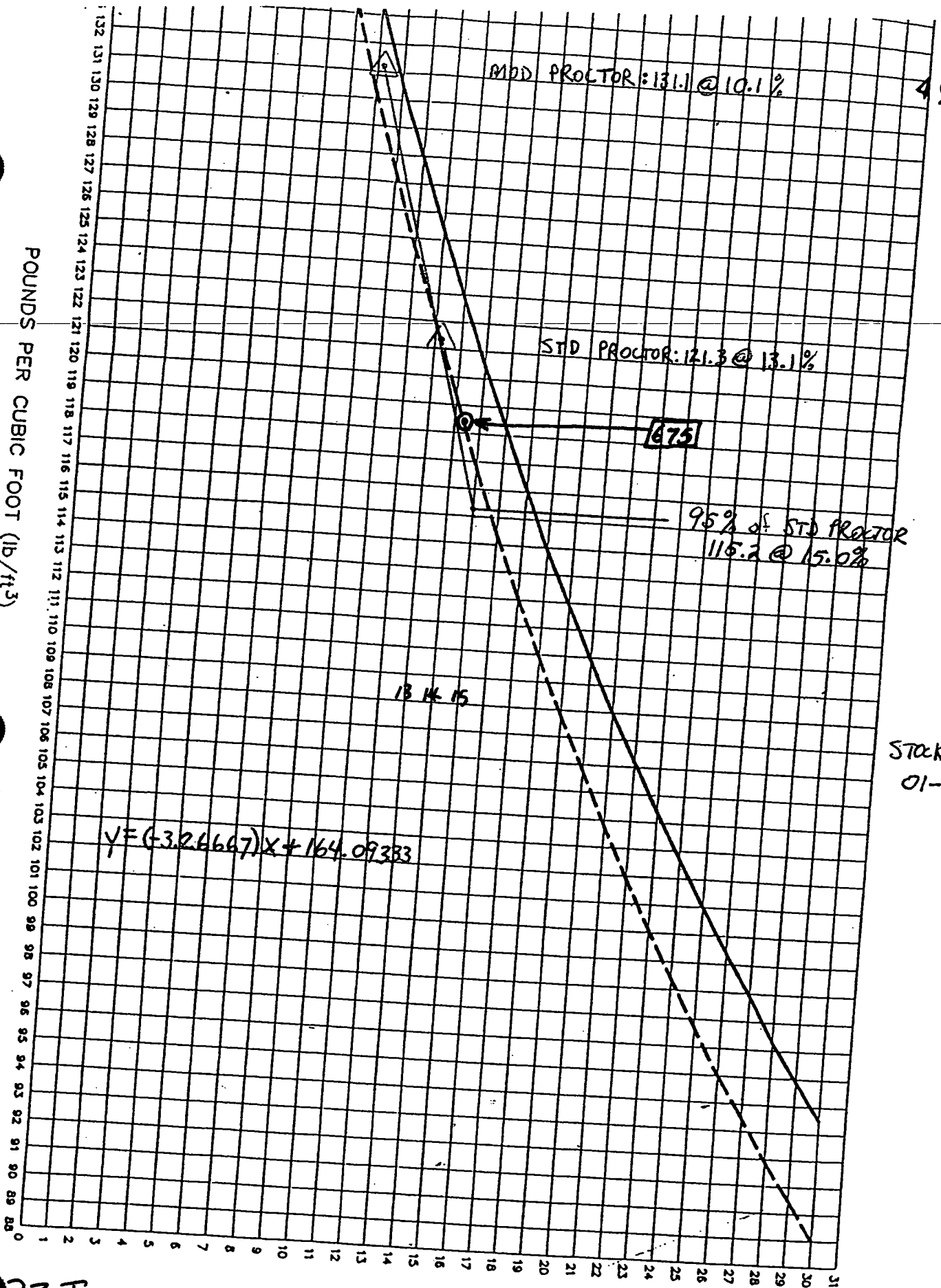

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23 JULY 2002

GQ1341 04.1

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Sheet No. 7 of 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: GQ1341 TASK NO.: Ø4.1

DATE: 24 day JULY month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/COMPACTED): ≈6"

APZ APZ

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 689	CELL #5, Drainage Corridor	6" / L-6	Ø1-1	13.3	121.1	13.5 (14.8)	134.Ø	116.7	96.4	P	—	—	—	—
CLØ2 69Ø	CELL #5, Drainage Corridor	6" / L-6	Ø1-1	13.3	121.1	14.1 (15.3)	134.3	116.5	96.2	P	—	—	—	—
CLØ2 691	CELL #5, Drainage Corridor	6" / L-6	Ø1-1	13.3	121.1	14.2 (15.4)	132.8	115.1	95.Ø	P	—	—	—	—
CLØ2 692	CELL #6 4:1 SLOPE	6" / L-4	Ø1-1	13.3	121.1	12.6 (14.1)	137.1	120.2	99.3	P	—	—	—	—
CLØ2 693	CELL #6 4:1 SLOPE	6" / L-4	Ø1-1	13.3	121.1	13.4 (14.7)	134.8	117.5	97.Ø	P	—	—	—	—
CLØ2 694	CELL #5→#6, I.C. BERM	6" / L-3	Ø1-1	13.3	121.1	14.Ø (15.2)	133.4	115.8	95.6	P	—	—	—	—
CLØ2 695	CELL #5→#6, I.C. BERM	6" / L-3	Ø1-1	13.3	121.1	15.4 (16.4)	132.6	113.9	94.1	~~P~~ F	—	CLØ2 697	P	—
CLØ2 696	CELL #5→#6 I.C. BERM	6" / L-3	Ø1-1	13.3	121.1	14.7 (15.8)	133.4	115.2	95.1	P	—	—	—	—
CLØ2 697	CELL #5→#6 I.C. BERM	6" / L-3	Ø1-1	13.3	121.1	13.1 (14.5)	134.8	117.7	97.2	P	—	—	—	—
CLØ2 698	CELL #5→#6 I.C. BERM	6" / L-3	Ø1-1	13.3	121.1	11.7 (13.3)	137.3	121.2	100.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell #5 & #6

PROJECT NO.: GO1341 TASK NO.: 04.1

DATE: 24 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 29979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 699	Cell #6, 4:1 Slope	6" / L-5	01-5	13.1	121.3	13.6 (14.9)	135.7	118.1	97.4	P	—	—	—	—
CL02 700	Cell #6, 4:1 Slope	6" / L-5	01-5	13.1	121.3	12.4 (13.9)	135.2	118.7	97.9	P	—	—	—	—
CL02 701	Cell #6, 4:1 Slope	6" / L-5	01-5	13.1	121.3	14.5 (15.7)	134.5	116.2	95.8	P	—	—	—	—
CL02 702	Cell #6, 4:1 Slope	6" / L-5	01-5	13.1	121.3	11.6 (13.2)	138.8	122.6	101.1	P	—	—	—	—
CL02 703	Cell #6, 4:1 Slope	6" / L-4	01-5	13.1	121.3	12.1 (13.6)	137.4	120.9	99.7	P	—	—	—	—
CL02 704	Cell #5 & I.C. Berm	6" / L-4	01-5	13.1	121.3	13.8 (15.1)	133.9	116.3	95.9	P	—	—	—	—
CL02 705	Cell #5 & I.C. Berm	6" / L-4	01-5	13.1	121.3	12.5 (14.8)	138.9	121.8	100.4	P	—	—	—	—
CL02 706	Cell #5 & I.C. Berm	6" / L-4	01-5	13.1	121.3	12.1 (13.6)	137.6	121.1	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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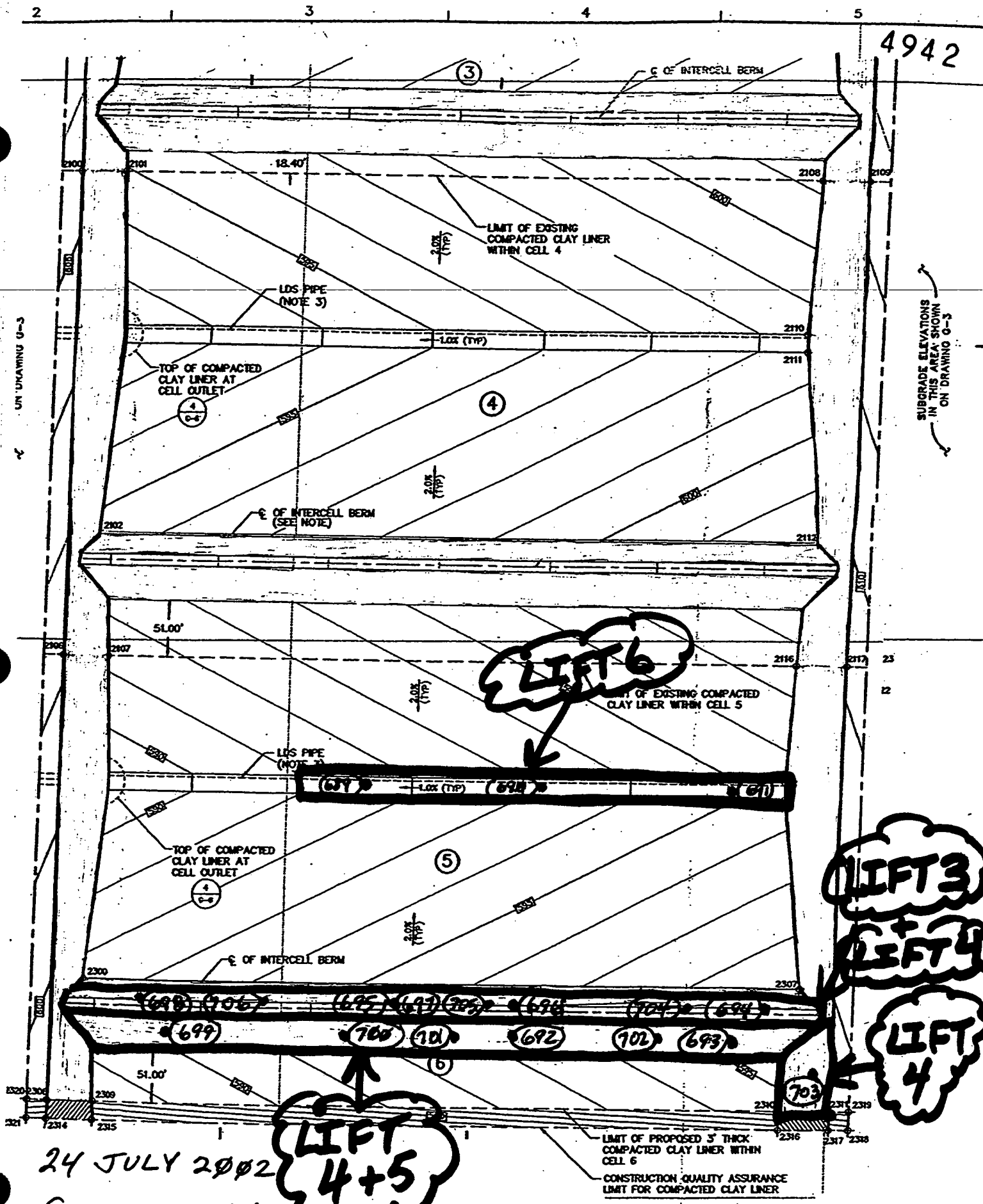

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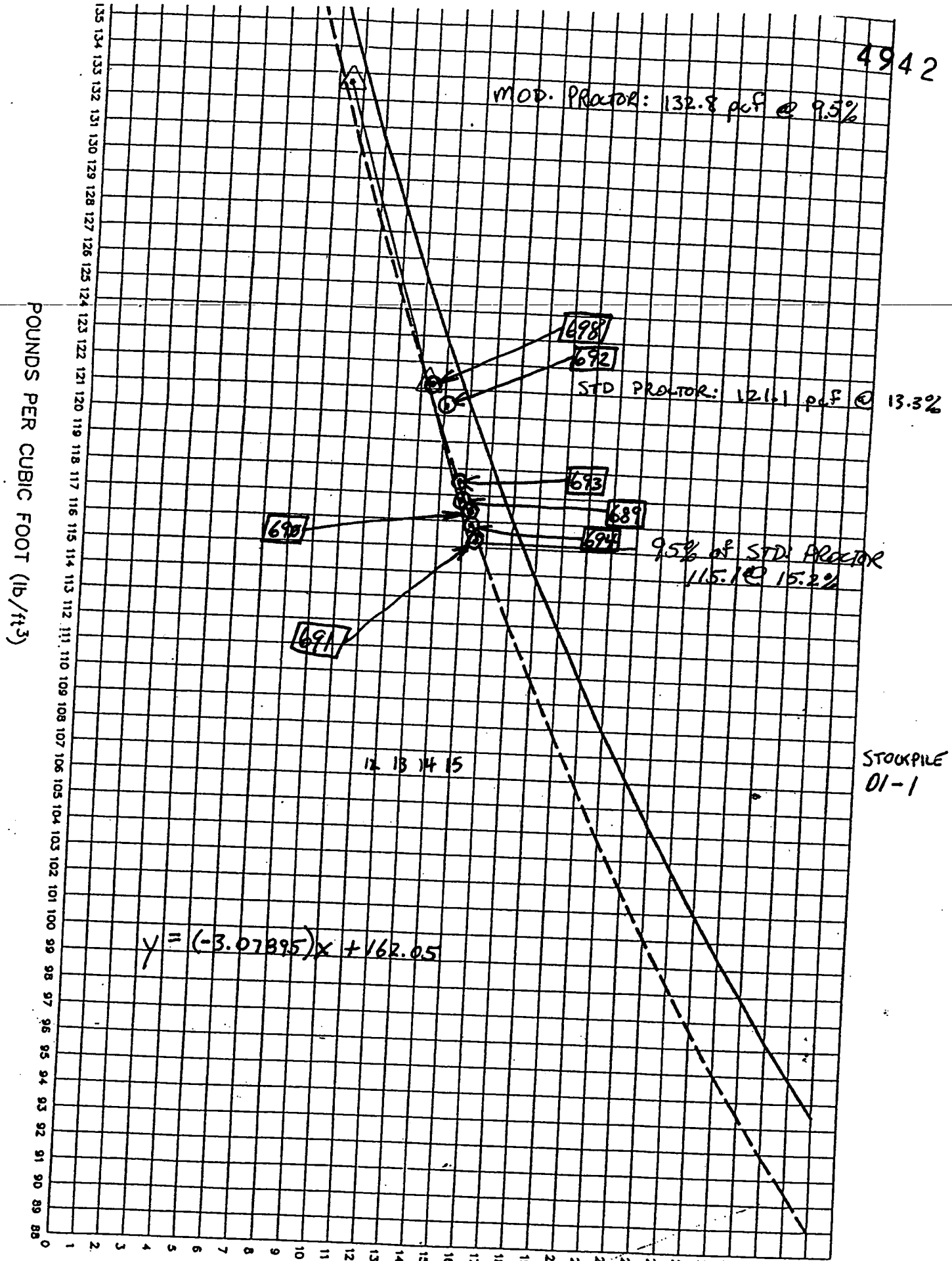
Sheet No. 3 of 6



24 JULY 2002

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Sheet No. 4 of 6

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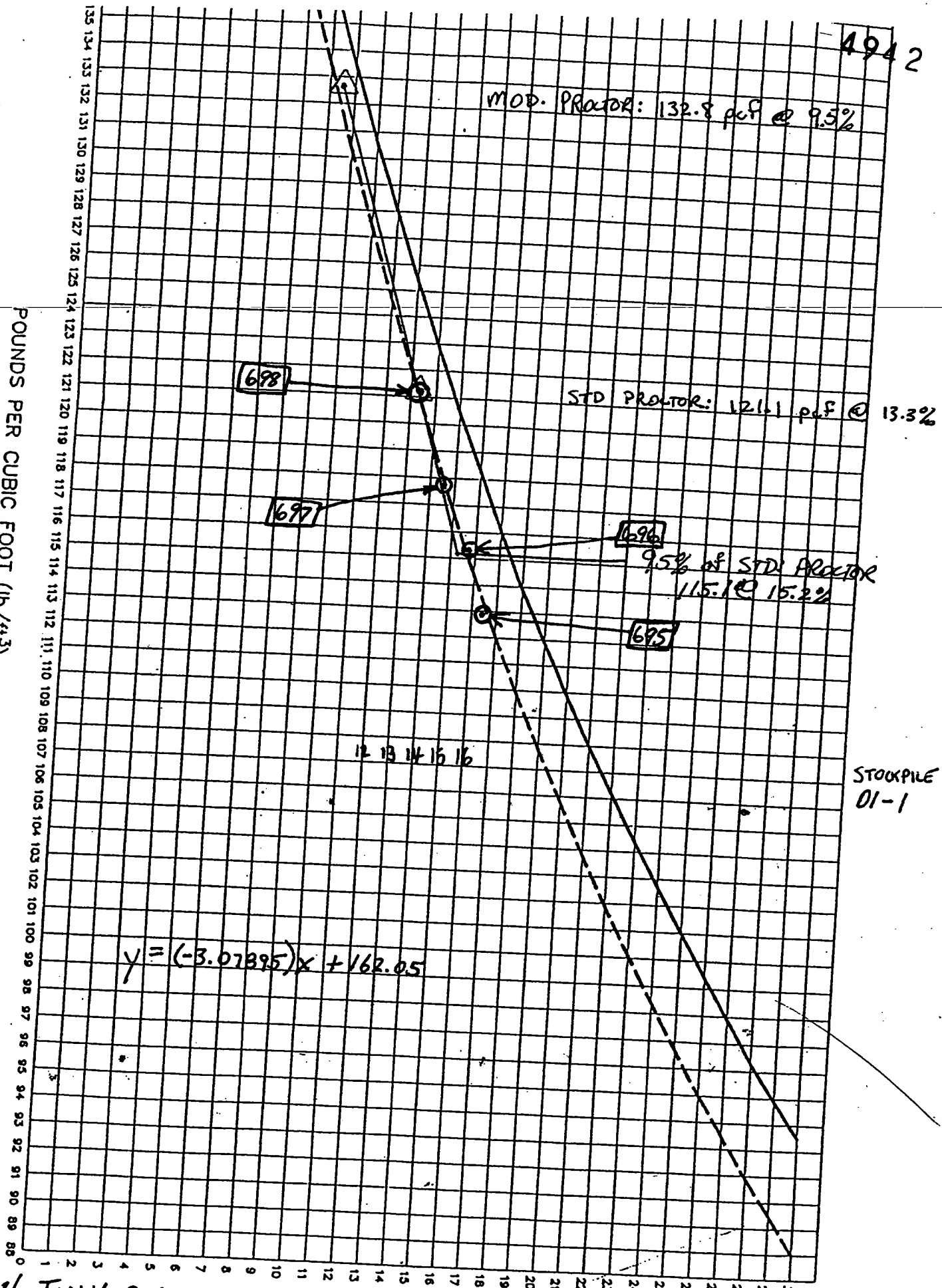

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Sheet No. 5 of 6

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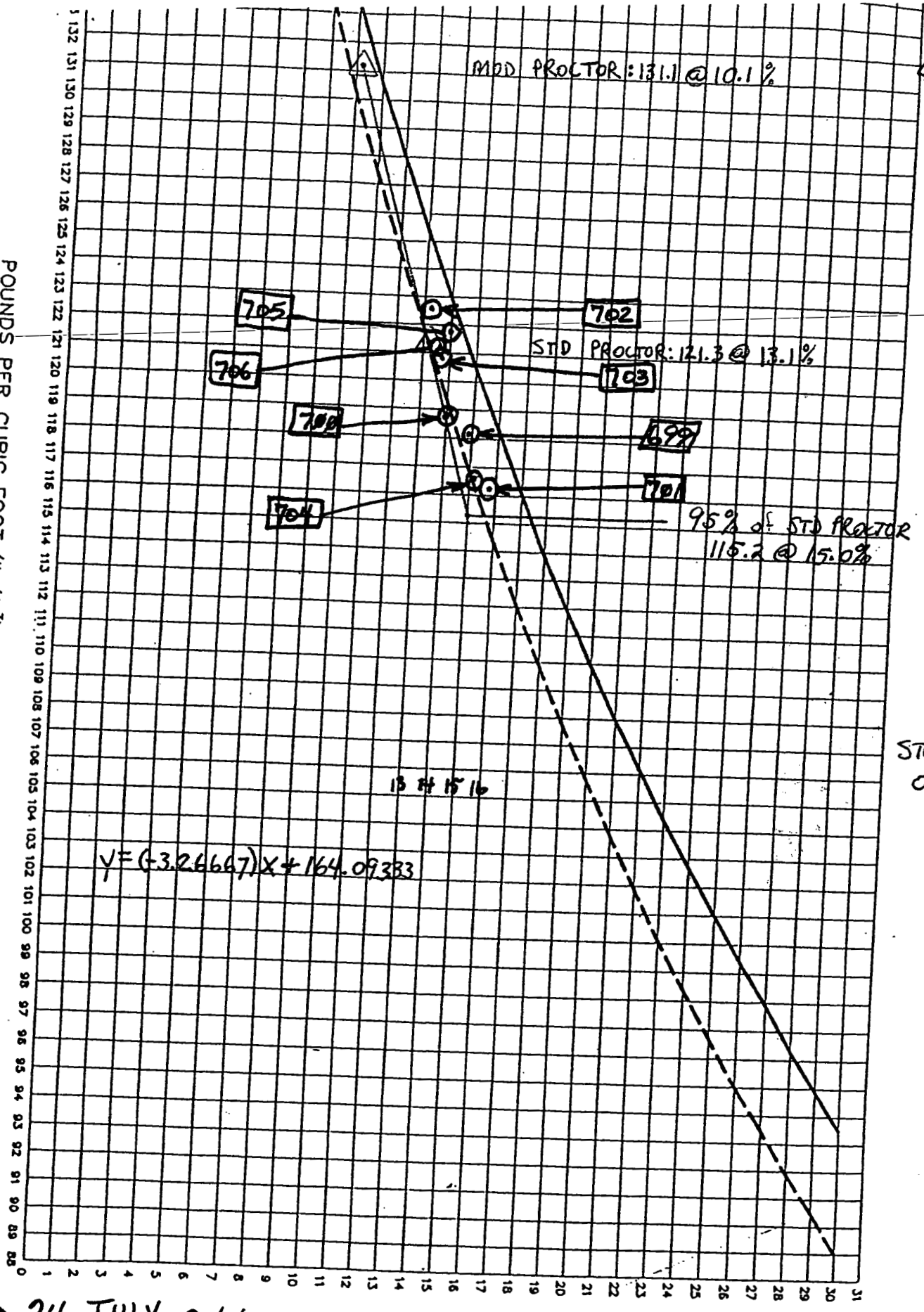

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 25 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% AP2 COMPACTION / MOISTURE RANGE: 0-3% AP2 LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 707	CELL #5→#6, I.C. BERM	6" / L-5	01-4	14.1	118.8	13.2 / 14.6	135.0	117.8	99.2	P	—	—	—	—
CL02 708	CELL #5→#6, I.C. BERM	6" / L-5	01-4	14.1	118.8	14.4 / 15.6	135.4	117.1	98.6	P	—	—	—	—
CL02 709	CELL #5→#6, I.C. BERM	6" / L-5	01-4	14.1	118.8	13.3 / 14.6	138.1	120.5	101.4	P	—	—	—	—
CL02 710	CELL #6, 4:1 SLOPE	6" / L-5	01-4	14.1	118.8	15.9 / 16.9	132.5	113.3	95.4	P	—	—	—	—
CL02 711	CELL #5, WEST BENCH	6" / L-1	01-4	14.1	118.8	12.6 / 14.1	135.5	118.8	100.0	P	—	—	—	—
CL02 712	CELL #5, WEST BENCH	6" / L-1	01-4	14.1	118.8	15.4 / 16.4	132.9	114.2	96.1	P	—	—	—	—
CL02 713	CELL #5, WEST BENCH	6" / L-1	01-4	14.1	118.8	14.9 / 16.0	132.7	114.4	96.3	P	—	—	—	—
CL02 714	CELL #5, DRAINAGE CORRIDOR	6" / L-4	01-4	14.1	118.8	13.3 / 14.6	136.5	119.1	100.3	P	—	—	—	—
CL02 715	CELL #5→#6 I.C. BERM	6" / L-6	01-3	13.9	118.9	12.5 / 14.0	139.5	122.4	102.9	P	—	—	—	—
CL02 716	CELL #5→#6 I.C. BERM	6" / L-6	01-6	12.5	122.7	14.1 / 15.3	134.9	117.0	95.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #5 & #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 25 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 718	CELL #5 & #6 I.C. BERM	6" / L-6	01-6	12.5	122.7	11.9 (13.5)	137.5	121.1	98.7	P	—	—	—	—
CL02 718	CELL #6, 4:1 SLOPE	6" / L-6	01-6	12.5	122.7	13.8 (15.1)	136.2	118.3	96.4	P	—	—	—	—
CL02 719	CELL #5, WEST BENCH	6" / L-2	01-6	12.5	122.7	12.8 (14.2)	133.6	117.0	95.4	P	—	—	—	—
CL02 720	CELL #5, WEST BENCH	6" / L-2	01-6	12.5	122.7	13.7 (15.0)	136.4	118.6	96.7	P	—	—	—	—
CL02 721	CELL #5, WEST BENCH	6" / L-2	01-6	12.5	122.7	13.5 (14.8)	134.3	117.0	95.4	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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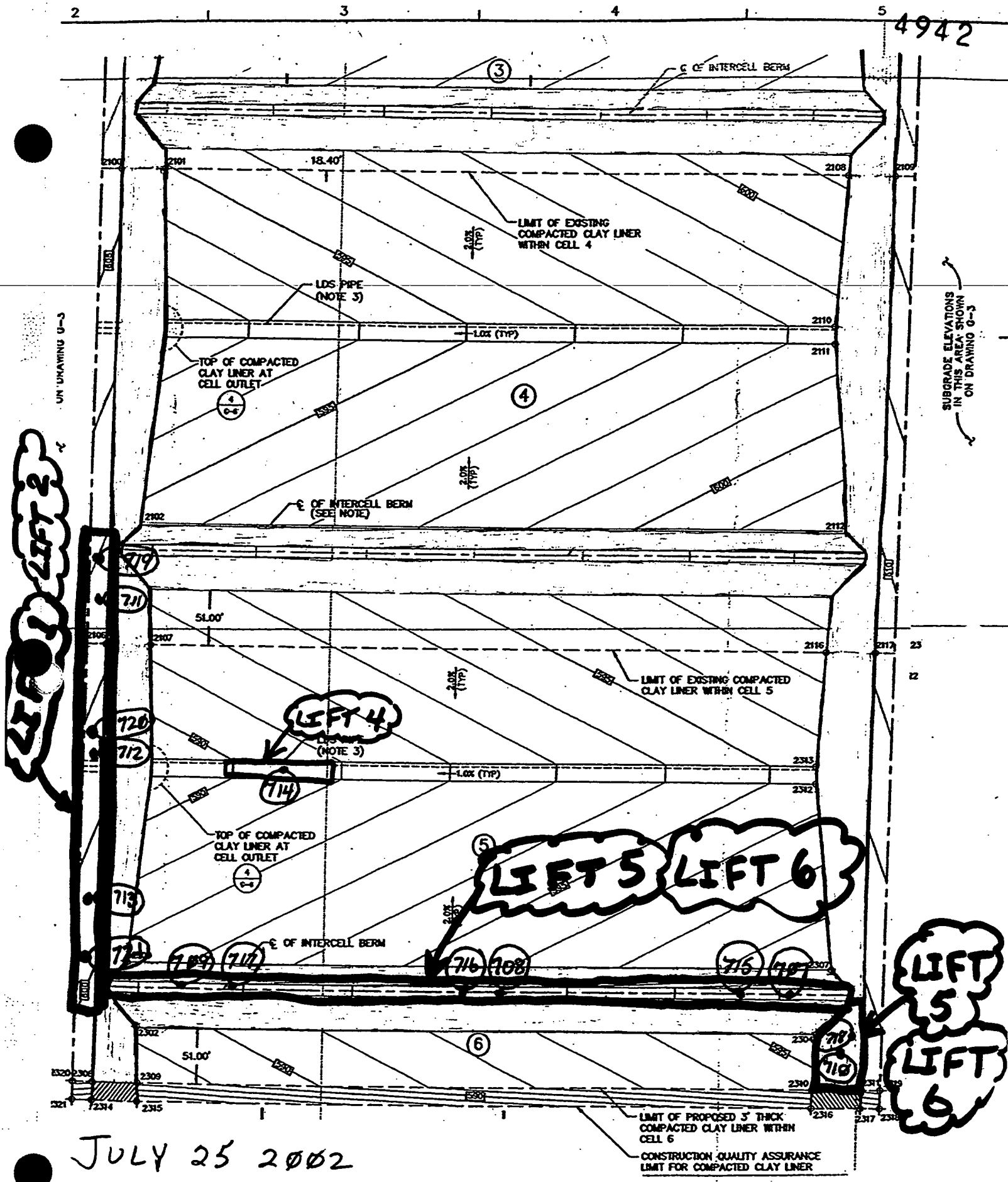

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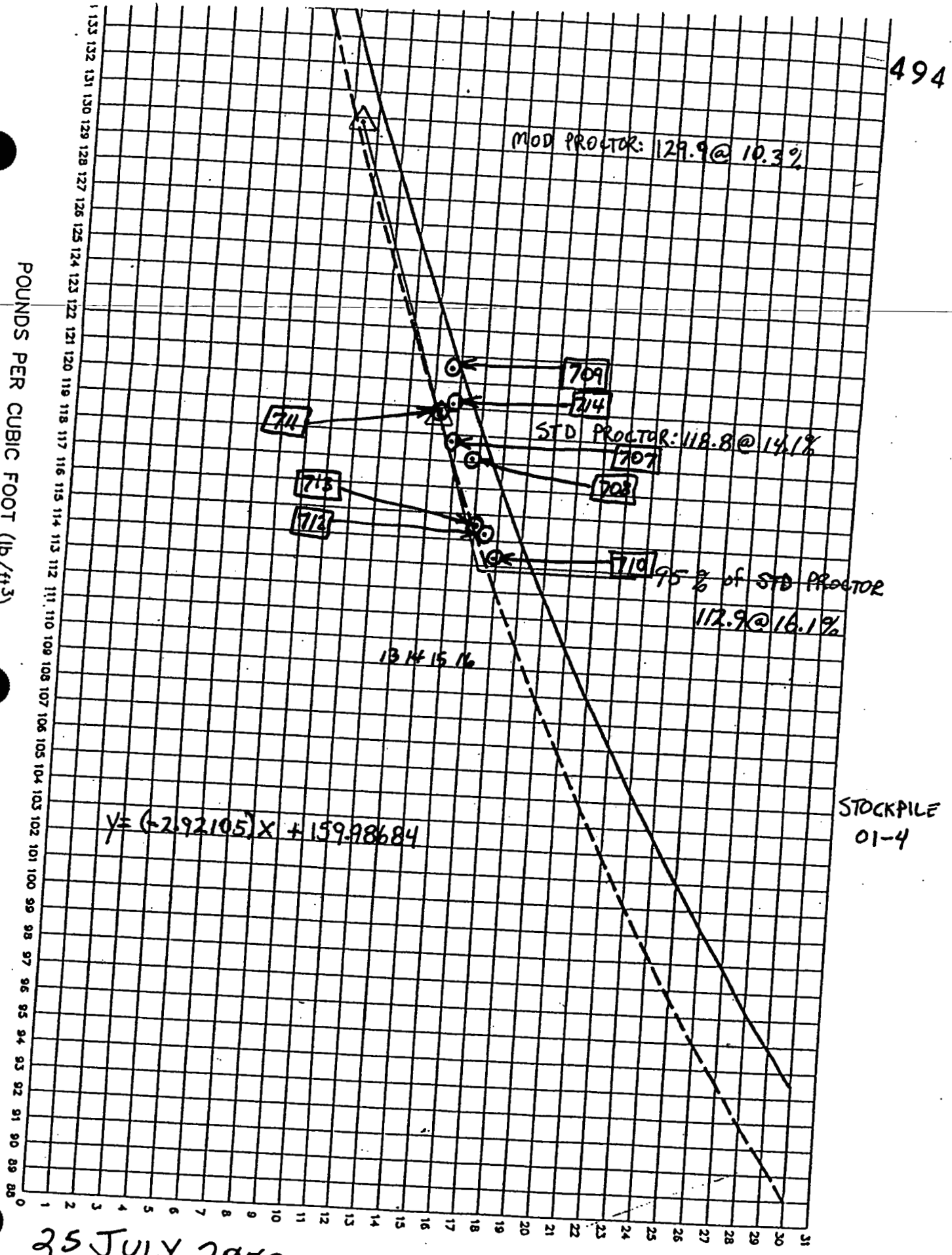

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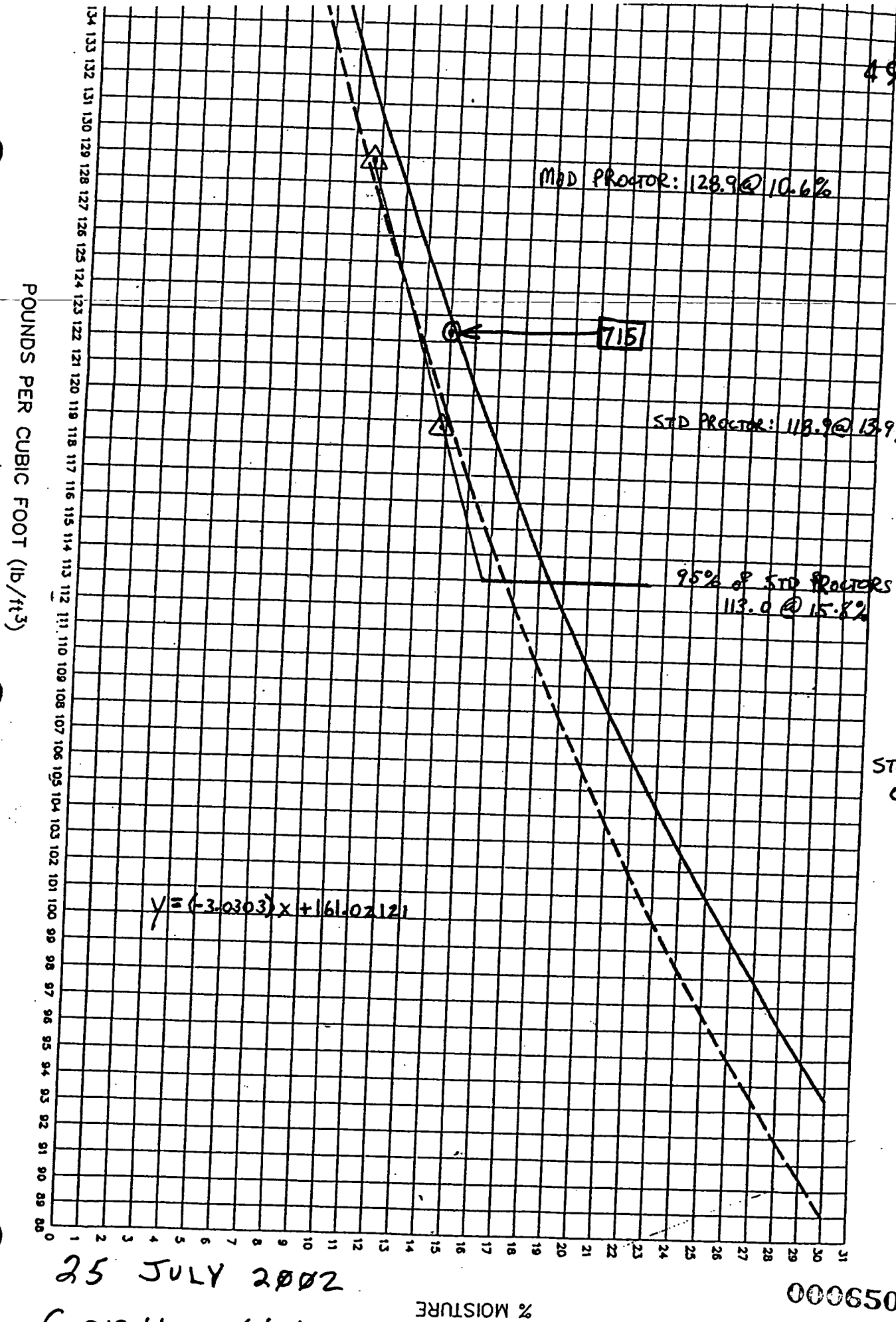

STOCKPILE
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25 JULY 2002

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GQ1341 04.1

Sheet No. 5 of 6

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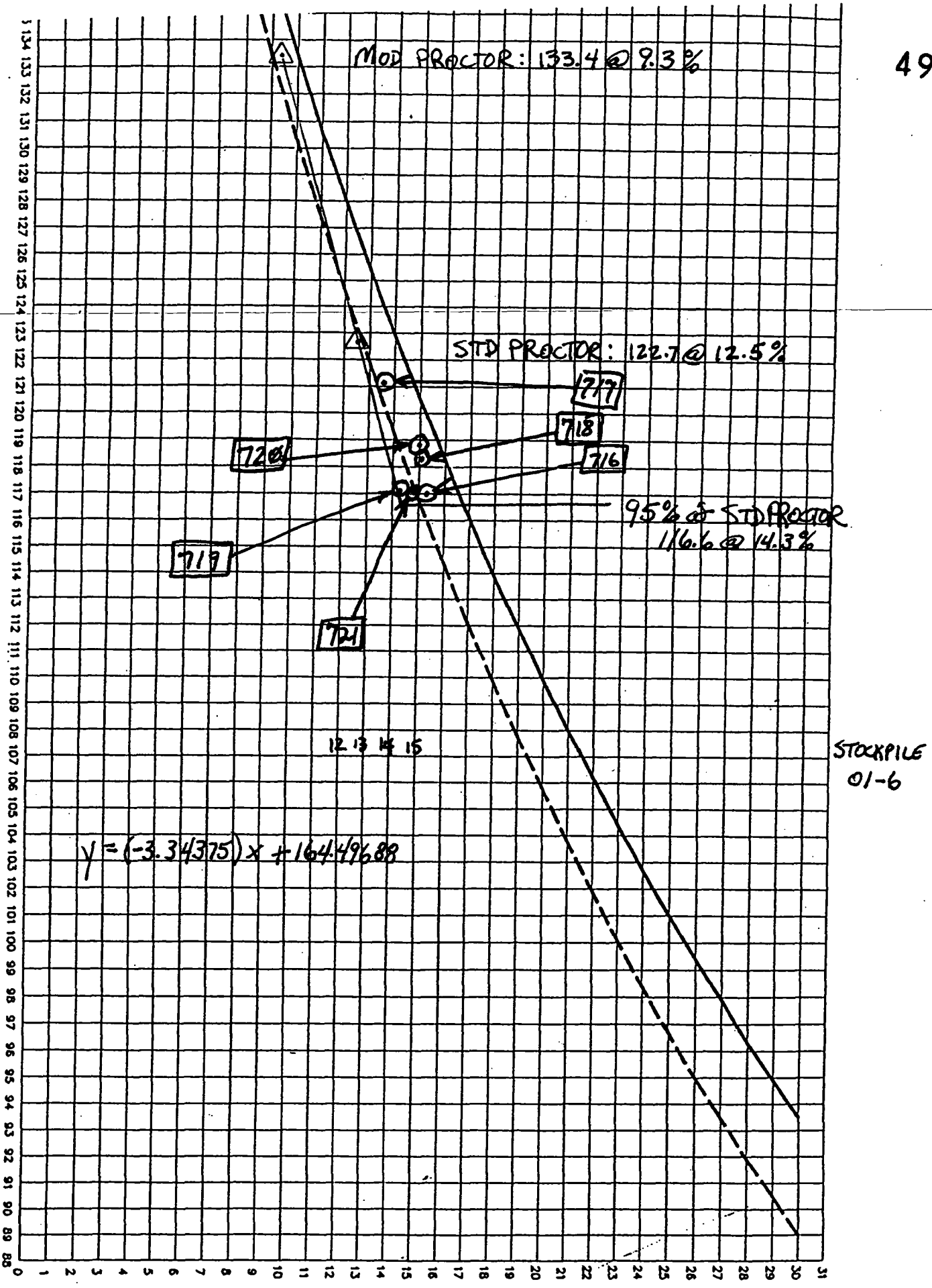

25 JULY 2002

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Sheet No. 6 of 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: CELL #4, #5, #6

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 26 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% APZ LIFT THICKNESS (LOOSE/COMPACTED): ≈6"

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 722	CELL #6, 4:1 SLOPE	6" / L-6	Ø1-6	12.5	122.7	11.5 (13.1)	136.8	119.6	97.5	P	—	—	—	—
CL02 723	CELL #5→#6 I.C. BERM	6" / L-7	Ø1-6	12.5	122.7	13.8 (15.1)	135.1	117.4	95.7	P	—	—	—	—
CL02 724	CELL #6 4:1 SLOPE	6" / L-6	Ø1-6	12.5	122.7	14.1 (15.3)	136.9	118.7	96.7	P	—	—	—	—
CL02 725	CELL #5→#6 I.C. BERM	6" / L-7	Ø1-6	12.5	122.7	13.Ø (14.4)	135.2	118.2	96.3	P	—	—	—	—
CLØ2 726	CELL #6, 4:1 SLOPE	6" / L-6	Ø1-6	12.5	122.7	11.7 (13.3)	136.4	120.4	98.1	P	—	—	—	—
CLØ2 727	CELL #5→#6, I.C. BERM	6" / L-7	Ø1-6	12.5	122.7	11.3 (13.Ø)	137.2	121.4	98.9	P	—	—	—	—
CLØ2 728	CELL #4, WEST BENCH	6" / L-1	Ø1-6	12.5	122.7	14.2 (15.4)	134.9	116.9	95.3	P	—	—	—	—
CLØ2 729	CELL #5, WEST BENCH	6" / L-3	Ø2-1	15.3	115.5	17.Ø (17.8)	129.Ø	109.5	94.8	—	F	CLØ2 732	P	—
CLØ2 73Ø	CELL #5, WEST BENCH	6" / L-3	Ø2-1	15.3	115.5	17.6 (18.3)	128.6	108.7	94.1	—	F	CLØ2 733	P	—
CLØ2 731	CELL #5, WEST BENCH	6" / L-3	Ø2-1	15.3	115.5	14.6 (15.7)	134.4	116.2	100.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GØ1341 TASK NO.: Ø4.1

DATE: 26 day JULY month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: Ø-3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

APZ APZ

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 732	CELL #5 WEST BENCH	6" / L-3	Ø2-1	15.3	115.5	15.8 (16.8)	131.4	112.5	97.4	P	—	—	—	—
CLØ2 733	CELL #5 WEST BENCH	6" / L-3	Ø2-1	15.3	115.5	16.4 (17.3)	129.9	110.7	95.8	P	—	—	—	—
CLØ2 734	CELL #5 Drainage Corridor	6" / L-1	Ø1-6	12.5	122.7	12.7 (14.1)	135.2	118.5	96.6	P	—	—	—	—
CLØ2 735	CELL #6 Drainage Corridor	6" / L-2	Ø1-6	12.5	122.7	13.8 (15.1)	135.6	117.8	96.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 5

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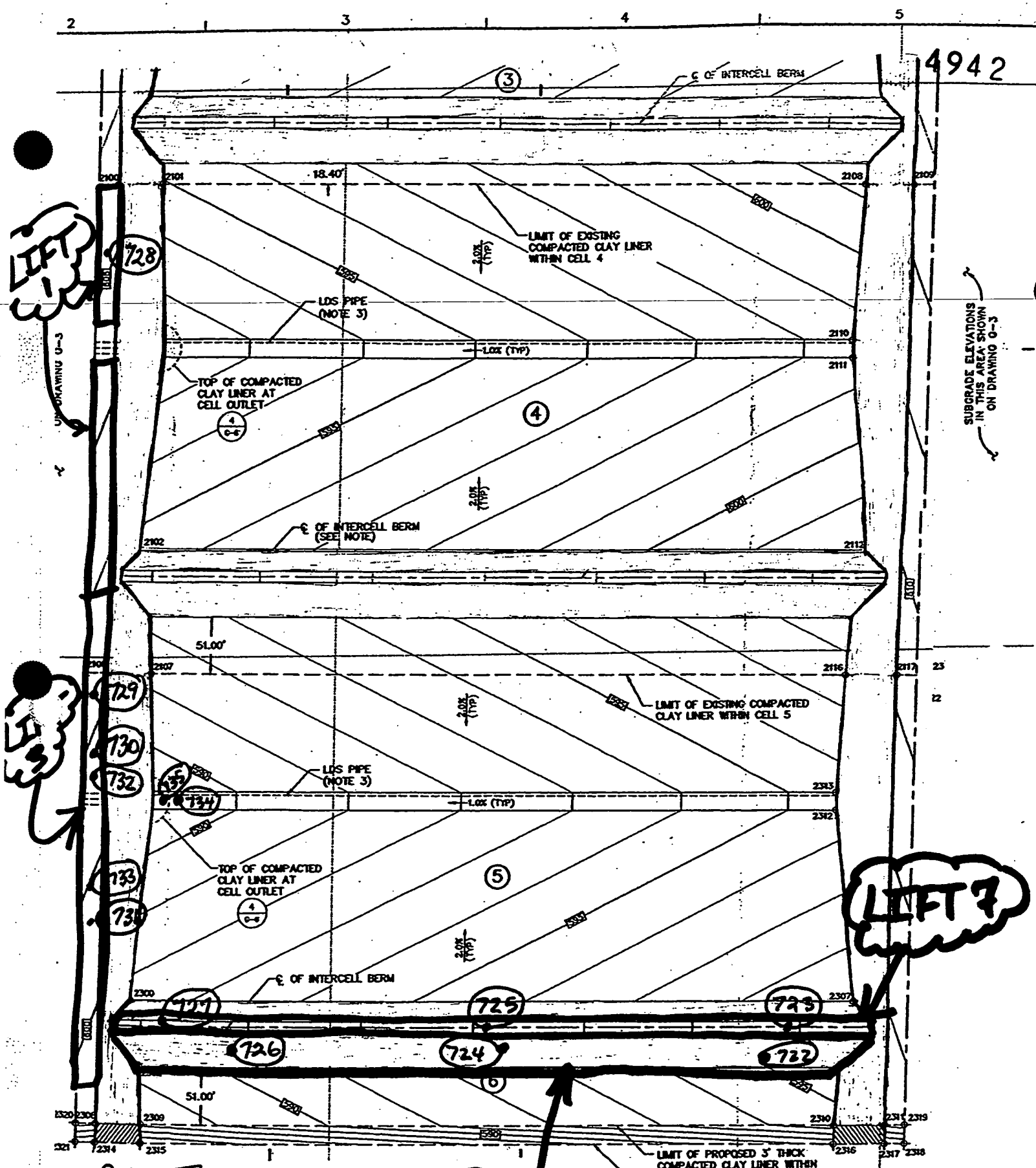

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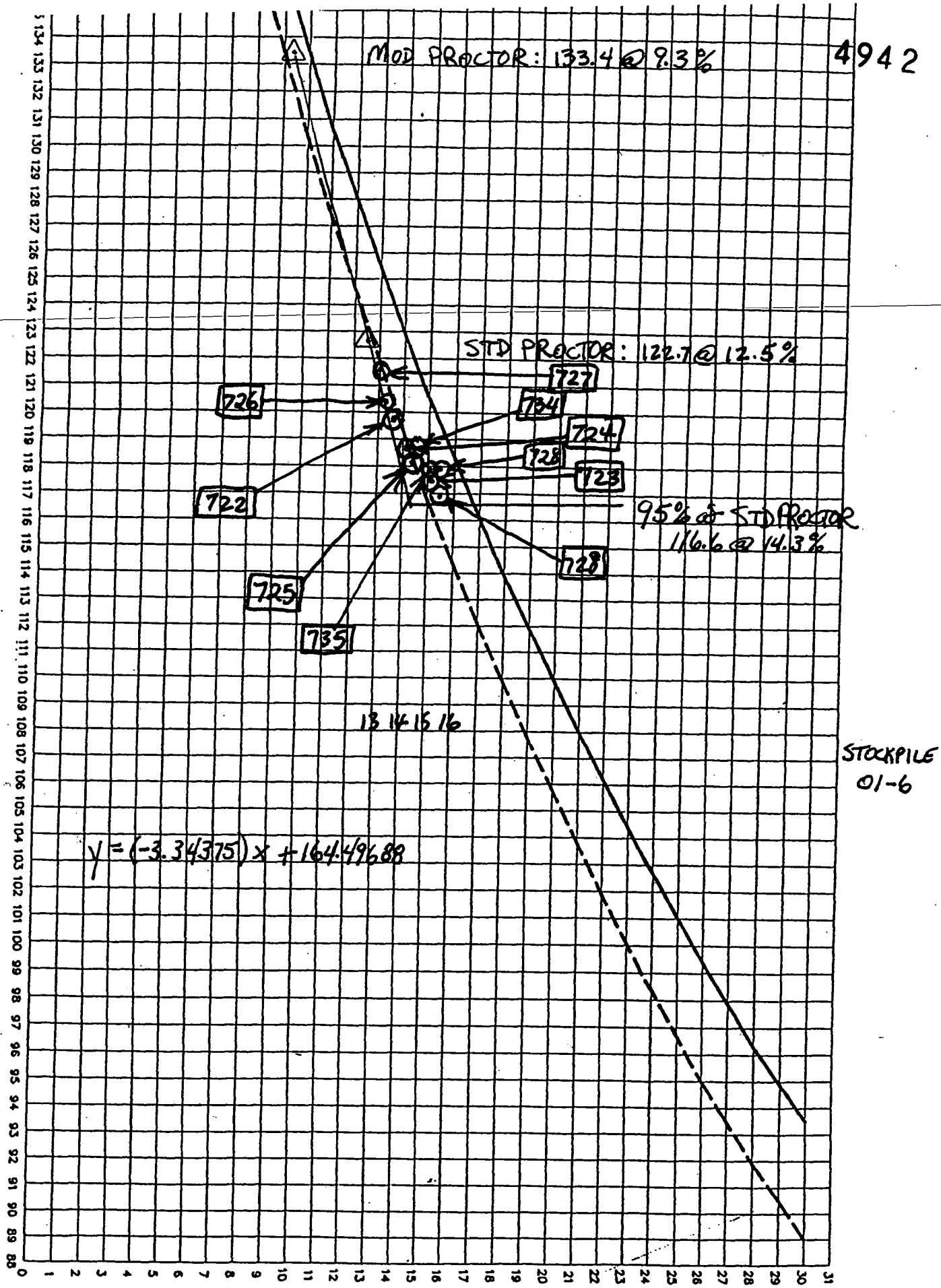

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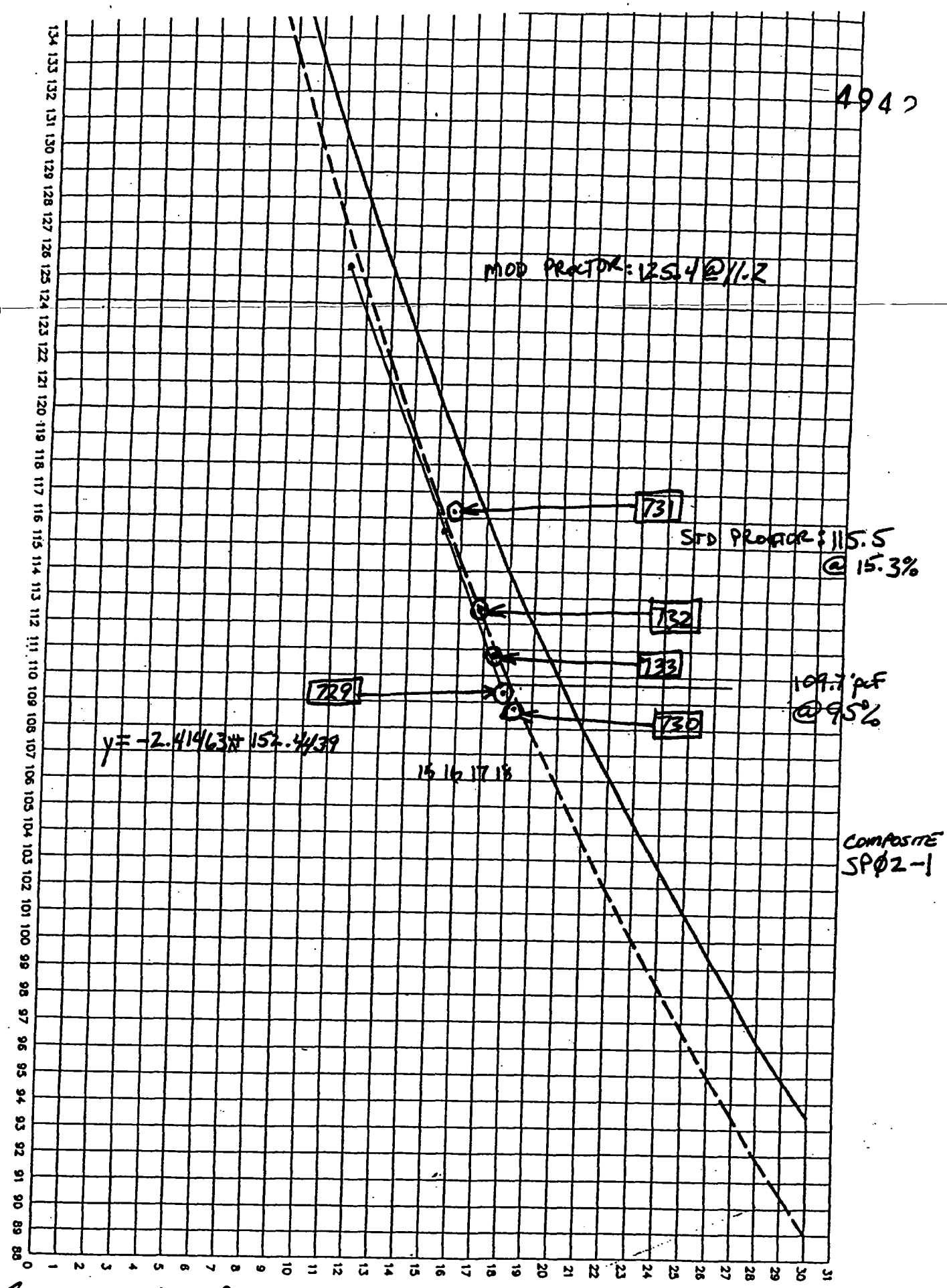
Sheet No. 4 of 5



GQ1341 04.1

26 July 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: G0134 TASK NO.: 04.1

DATE: 27 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% APZ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 736	CELL #4, West 4:1 Slope	6" / L-1	01-4	14.1	118.8	12.7 (14.1)	137.9	120.8	101.7	P	—	—	—	—
CL02 737	CELL #4, WEST 4:1 Slope	6" / L-1	01-4	14.1	118.8	13.8 (15.1)	136.0	118.2	99.5	P	—	—	—	—
CL02 738	Penetration Box Cell #5 Pad	6" / L-1	02-1	15.3	115.5	14.8 (15.9)	127.2	109.7	~~94.9~~ 95.0	—	F	CL02 740	P	—
CL02 739	CELL #4 WEST 4:1 SLOPE	6" / L-1	01-4	14.1	118.8	14.1 (15.3)	134.8	116.9	98.4	P	—	—	—	—
CL02 740	Penetration Box, Cell #5 Pad	6" / L-1	02-1	~~14.1~~ 15.3	115.5	16.1 (17.0)	133.3	113.9	98.6	P	—	—	—	—
CL02 741	CELL #5, Drainage Corridor	6" / L-3	02-1	15.3	115.5	14.2 (15.4)	133.4	115.6	100.1	P	—	—	—	—
CL02 742	CELL #6 Floor N. East END	6" / L-4	01-6	12.5	122.7	13.7 (15.0)	134.7	117.1	95.4	P	—	—	—	—
CL02 743	CELL #6 Floor N. EASTEND	6" / L-4	01-6	12.5	122.7	13.5 (14.8)	135.5	118.0	96.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 6

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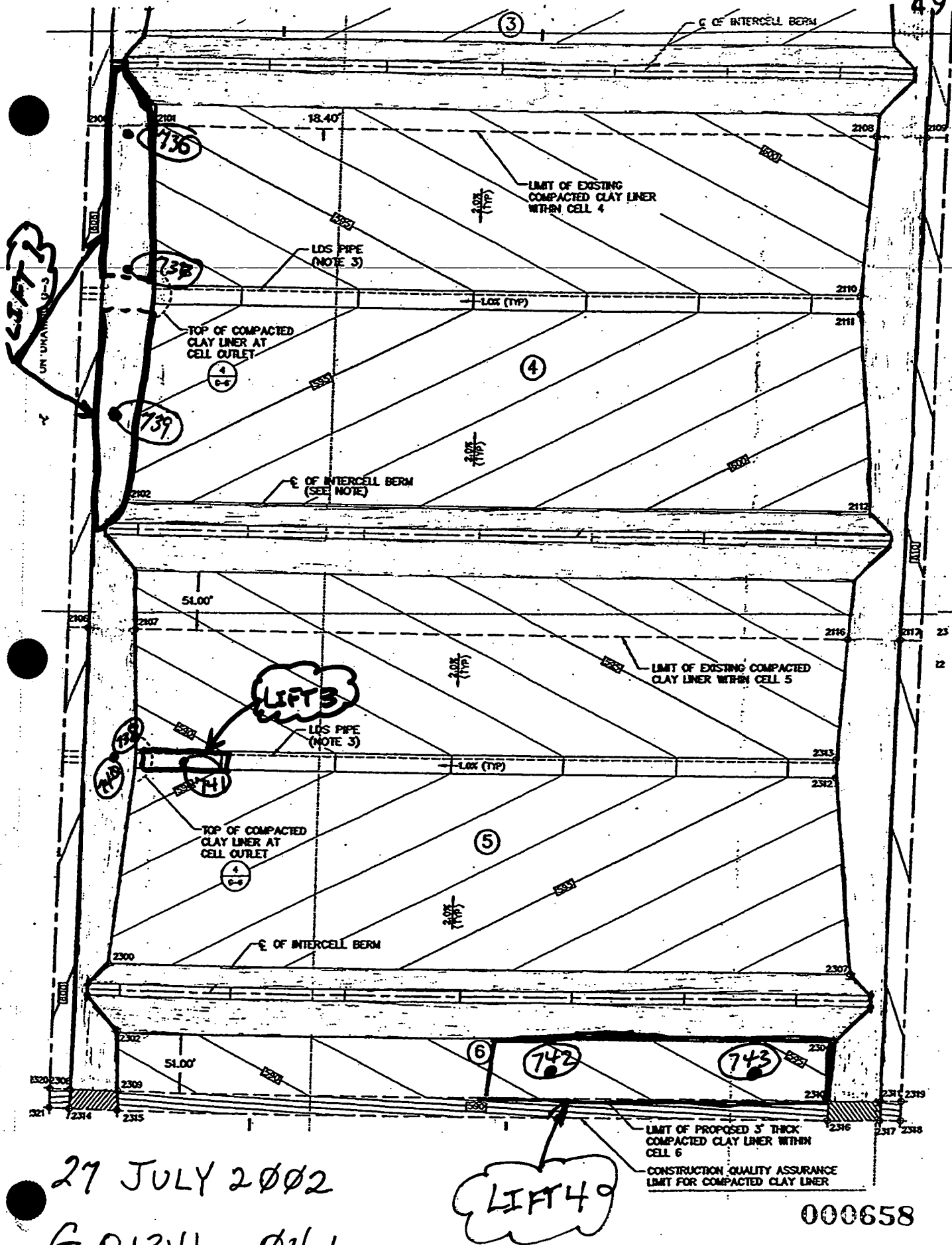

27 JULY 2002

GQ1341 04.1

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Sheet No. 2 of 6

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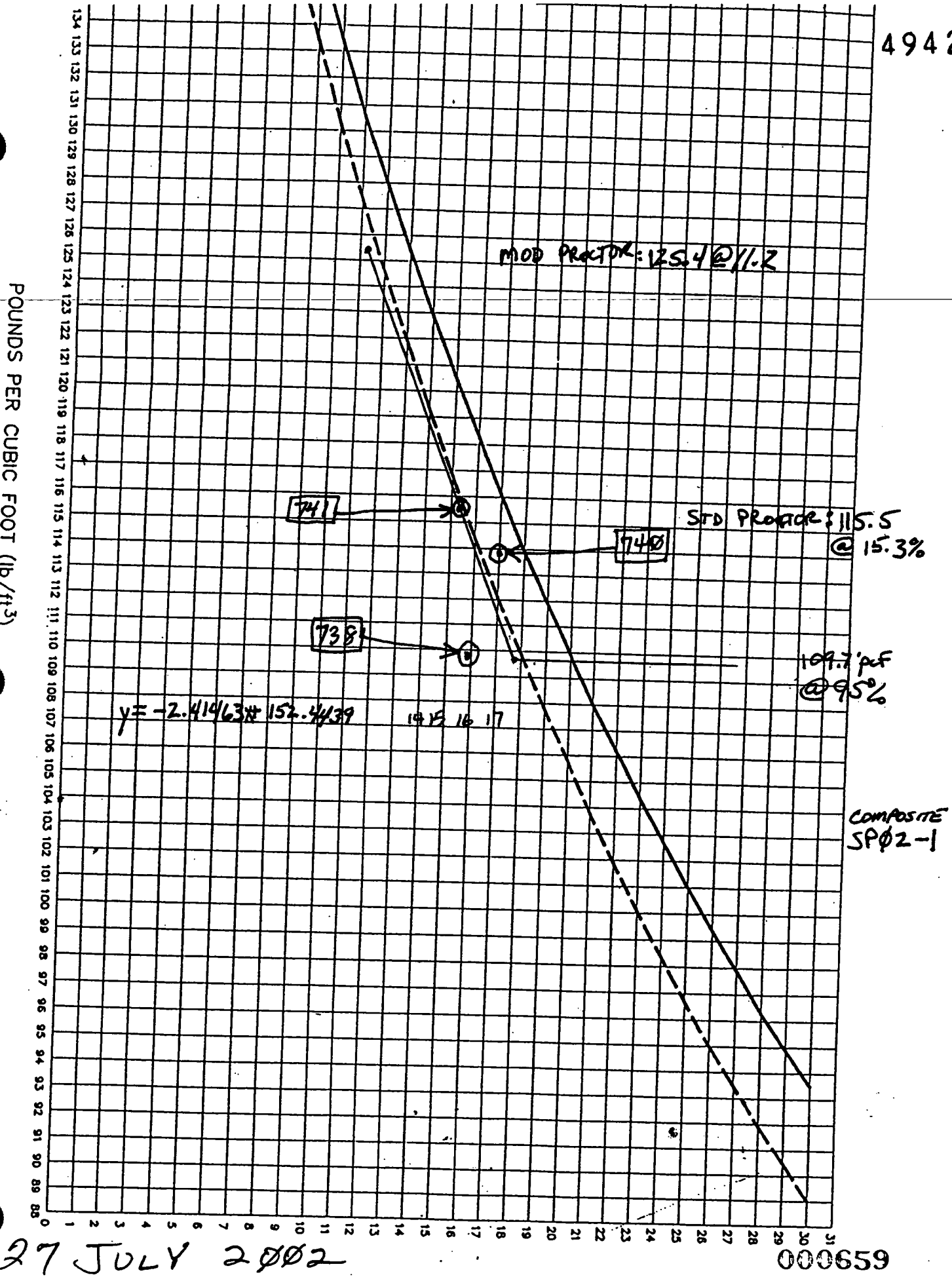

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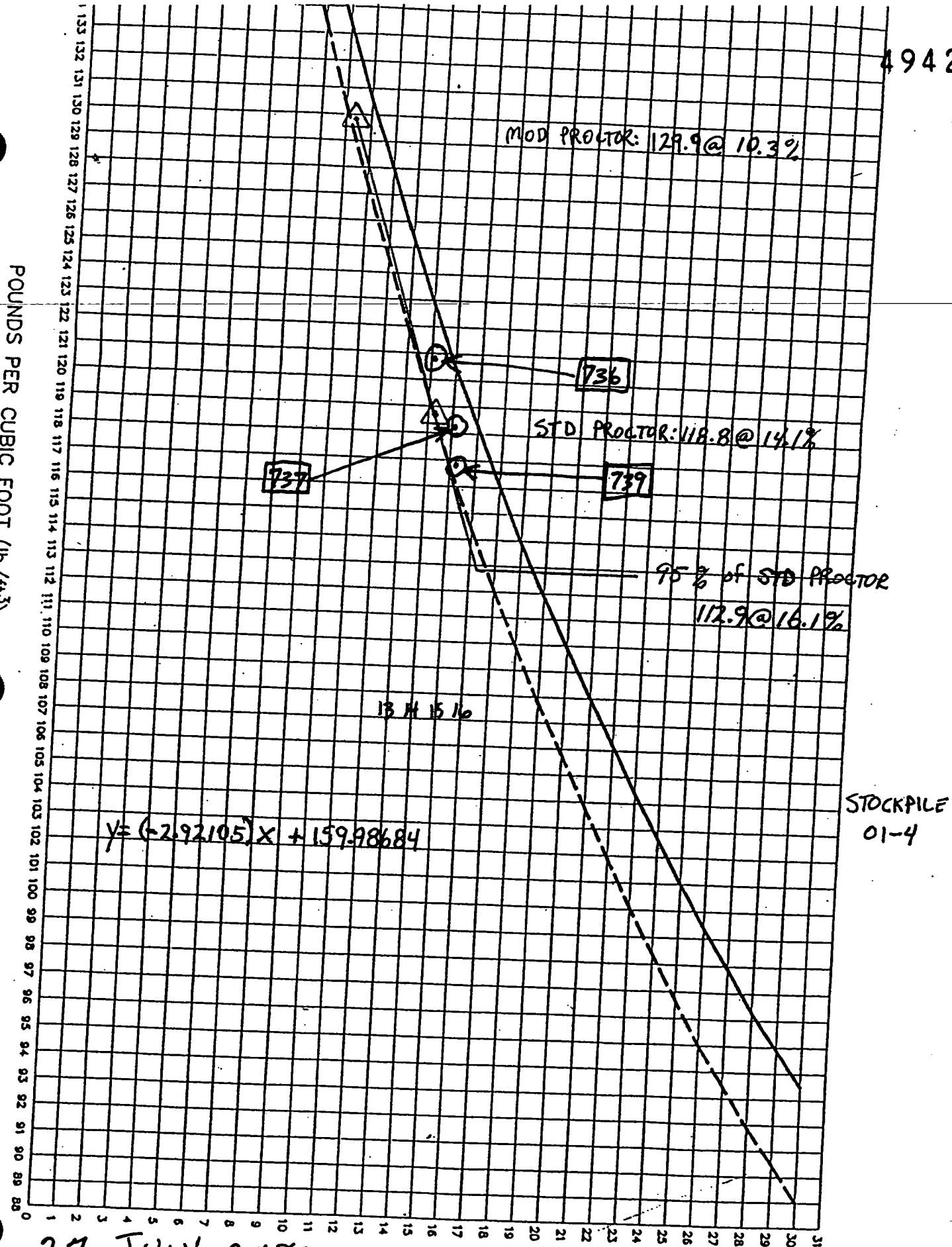

27 JULY 2002

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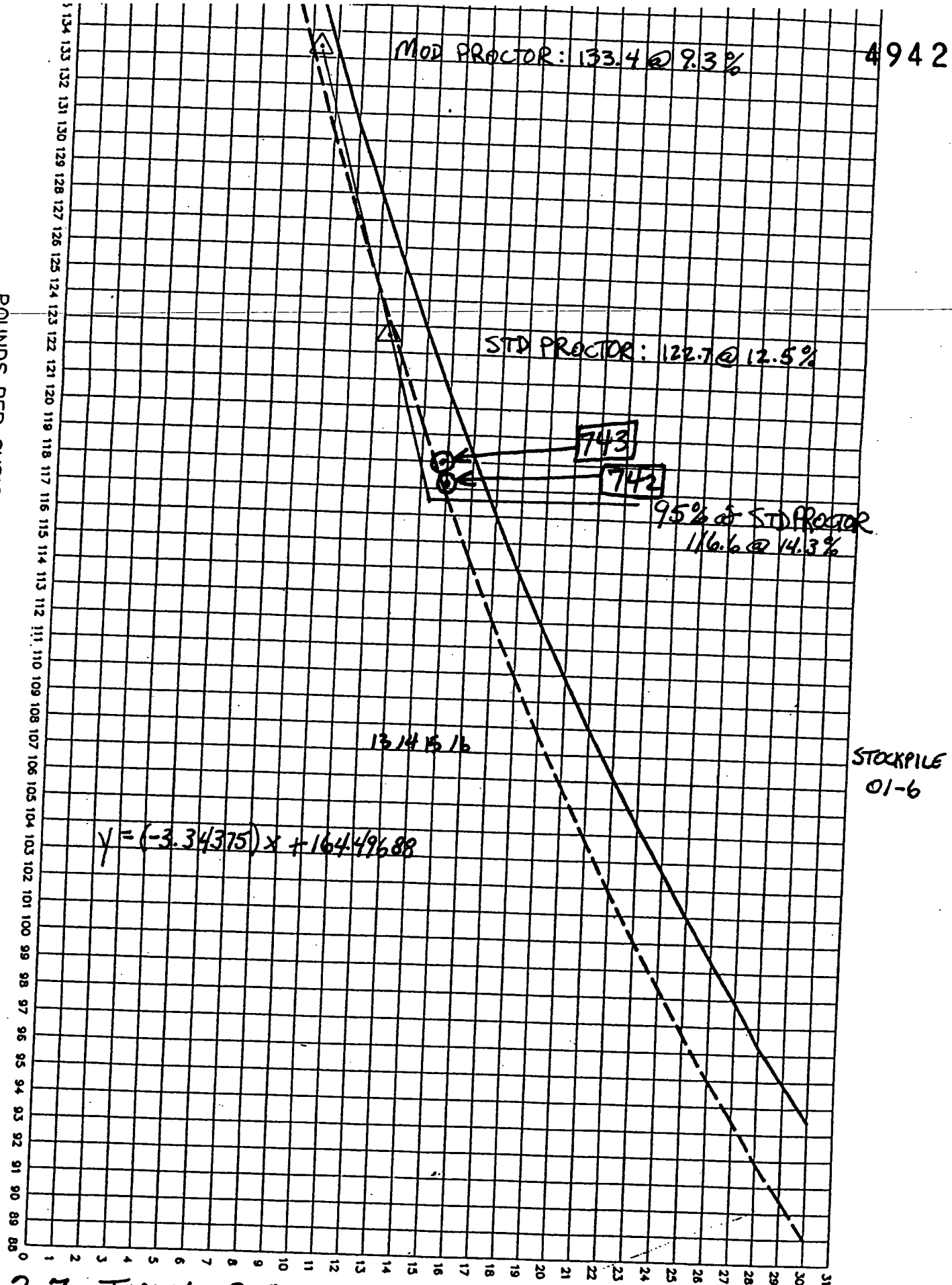
Sheet No 4 of 6



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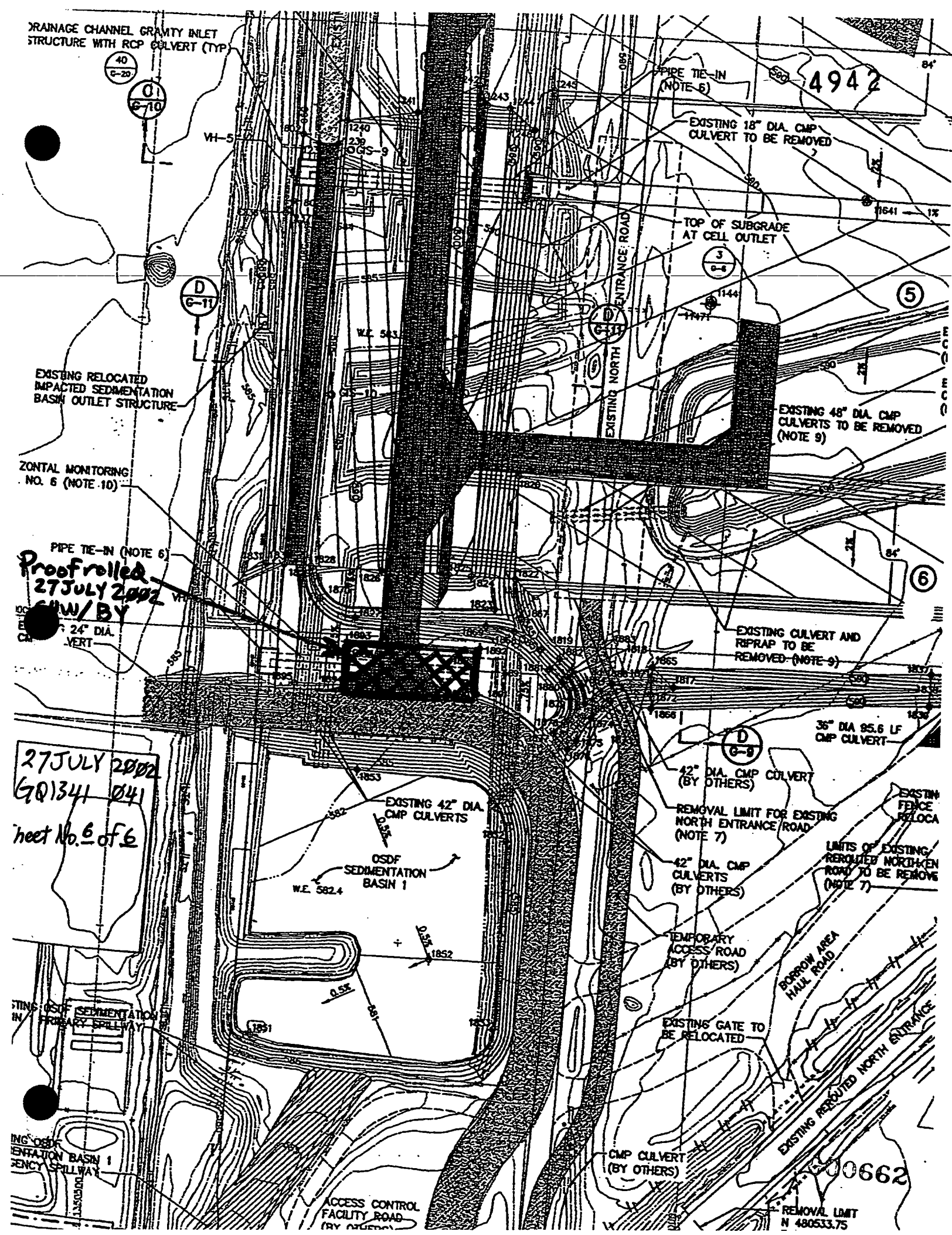
27 JULY 2002

GQ1341 04.1

Sheet No. 5 of 6


DRAINAGE CHANNEL GRAVITY INLET STRUCTURE WITH RCP CULVERT (TYP)
PIPE TIE-IN (NOTE 6)
EXISTING 18" DIA. CMP CULVERT TO BE REMOVED
TOP OF SUBGRADE AT CELL OUTLET
EXISTING NORTH ENTRANCE ROAD
EXISTING RELOCATED IMPACTED SEDIMENTATION BASIN OUTLET STRUCTURE
EXISTING 48" DIA. CMP CULVERTS TO BE REMOVED (NOTE 9)
ZONTAL MONITORING NO. 6 (NOTE 10)
PIPE TIE-IN (NOTE 6)
Proofrolled 27JULY2002 SHW/BY
EXISTING CULVERT AND RIPRAP TO BE REMOVED (NOTE 9)
36" DIA 95.6 LF CMP CULVERT
42" DIA. CMP CULVERT (BY OTHERS)
27JULY2002 GQ1341 041
Sheet No. 6 of 6
EXISTING 42" DIA. CMP CULVERTS
REMOVAL LIMIT FOR EXISTING NORTH ENTRANCE ROAD (NOTE 7)
OSDF SEDIMENTATION BASIN 1
W.E. 582.4
42" DIA. CMP CULVERTS (BY OTHERS)
LIMITS OF EXISTING REROUTED NORTH ENTRANCE ROAD TO BE REMOVED (NOTE 7)
TEMPORARY ACCESS ROAD (BY OTHERS)
BORROW AREA HAUL ROAD
EXISTING GATE TO BE RELOCATED
EXISTING REROUTED NORTH ENTRANCE
CMP CULVERT (BY OTHERS)
ACCESS CONTROL FACILITY ROAD
REMOVAL LIMIT N 480533.75
00662

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 041

DATE: 29 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 744	CELL #5, Penetration Box Pad	6" / L-2	02-1	15.3	115.5	15.3 (16.3)	133.8	115.0	99.6	P	—	—	—	—
CL03 745	CELL #6, N. West END	6" / L-4	01-6	12.5	122.7	11.7 (13.3)	140.1	123.7	100.8	P	—	—	—	—
CL02 746	CELL #6, N. WEST END	6" / L-4	01-6	12.5	122.7	12.2 (13.7)	137.2	120.7	98.4	P	—	—	—	—
CL02 747	CELL #6, N. WEST END	6" / L-4	01-6	12.5	122.7	13.6 (14.9)	134.2	116.8	95.2	P	—	—	—	—
CL02 748	CELL #5, Penetration Box Pad	6" / L-3	02-1	15.3	115.5	14.6 (15.7)	134.0	115.8	100.3	P	—	—	—	—
CL02 749	CELL #4, WEST 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	14.1 (15.3)	134.0	116.2	100.6	P	—	—	—	—
CL02 750	CELL #4, WEST BENCH	6" / L-2	02-1	15.3	115.5	15.3 (16.3)	132.4	113.8	98.5	P	—	—	—	—
CL02 751	CELL #4, WEST 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	14.3 (15.5)	135.1	117.0 ~~116.9~~ CHW	101.3	P	—	—	—	—
CL02 752	CELL #4, West 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	14.7 (15.8)	136.1	117.5	101.7	P	—	—	—	—
CL02 753	CELL #4 WEST BENCH	6" / L-2	02-1	15.3	115.5	15.8 (16.8)	133.7	114.5	99.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CA

SHEET NO. 1 OF 6

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GØ1341 TASK NO.: Ø4.1

DATE: 29 day JULY month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = Ø.8481X+3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 754	CELL #5, Drainage Corridor	6" / L-4	Ø2-1	15.3	115.5	13.5 (14.8)	128.2	111.7	96.7	—	F	CLØ2-755	P	—
CLØ2 755	CELL #5, Drainage Corridor	6" / L-4	Ø2-1	15.3	115.5	16.5 (17.4)	129.6	11Ø.4	95.6	P	—	—	—	—
CLØ2 756	CELL #5, Penetration Box Pad	6" / L-4	Ø2-1	15.3	115.5	16.7 (17.5)	13Ø.6	111.1	96.2	P	—	—	—	—
CLØ2 757	CELL #5, Penetration Box Pad	6" / L-5	Ø2-1	15.3	115.5	14.9 (16.Ø)	133.7	115.3	99.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 2 OF 6

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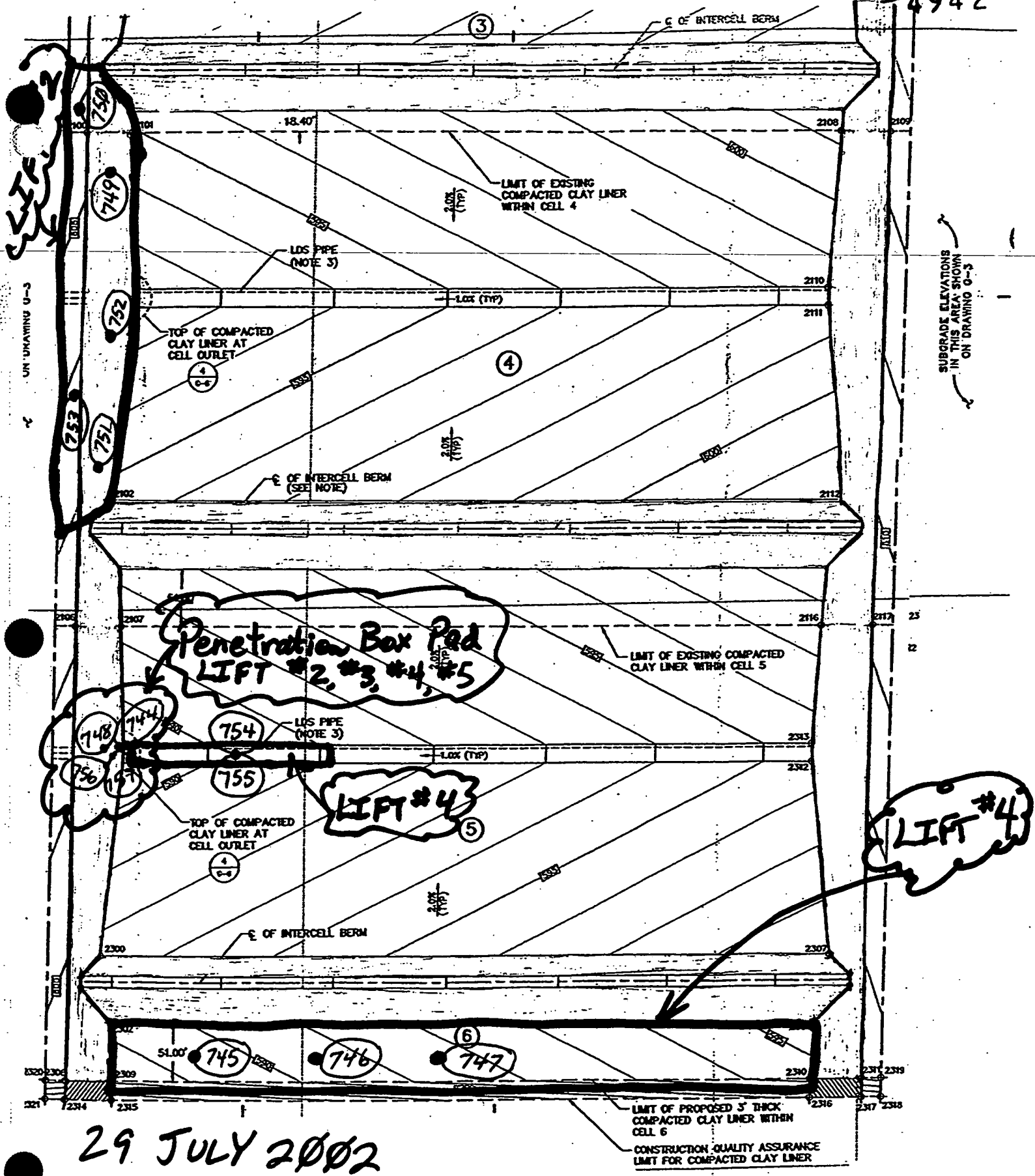

29 JULY 2002

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Sheet No. 3 of 6

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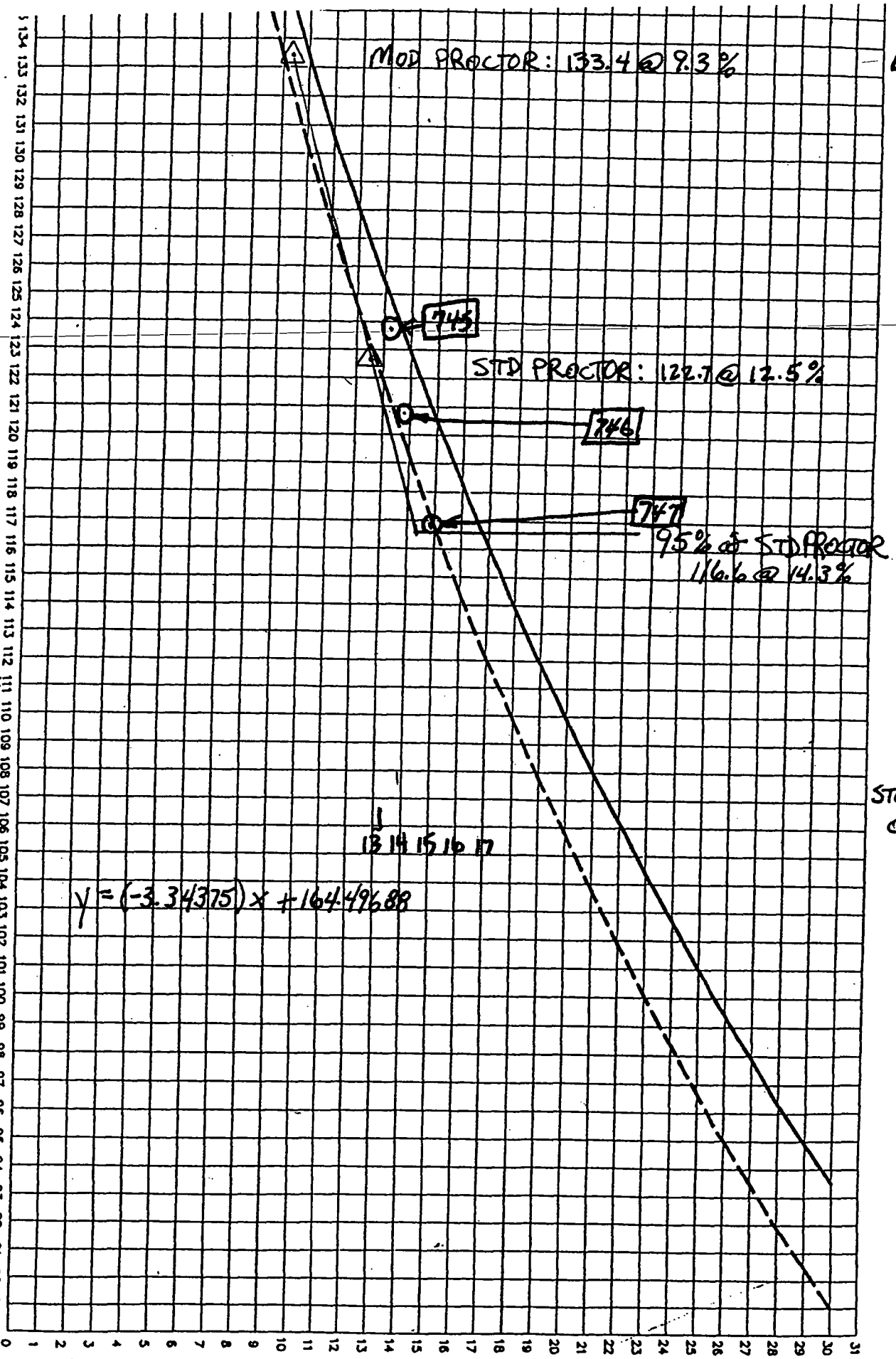

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29 JULY 2002

GQ1341 04.1

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Sheet No. 4 of 6

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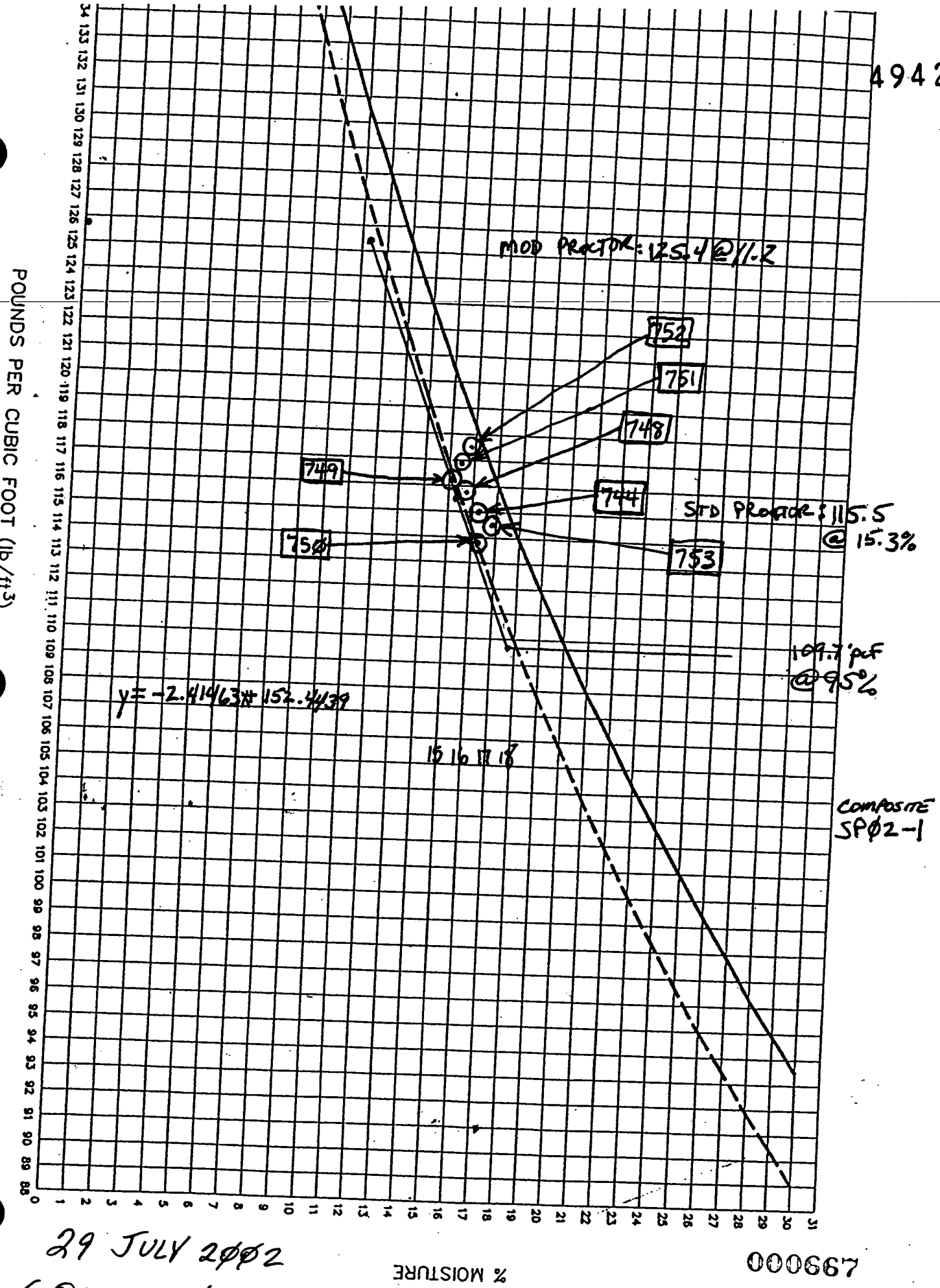

29 JULY 2002

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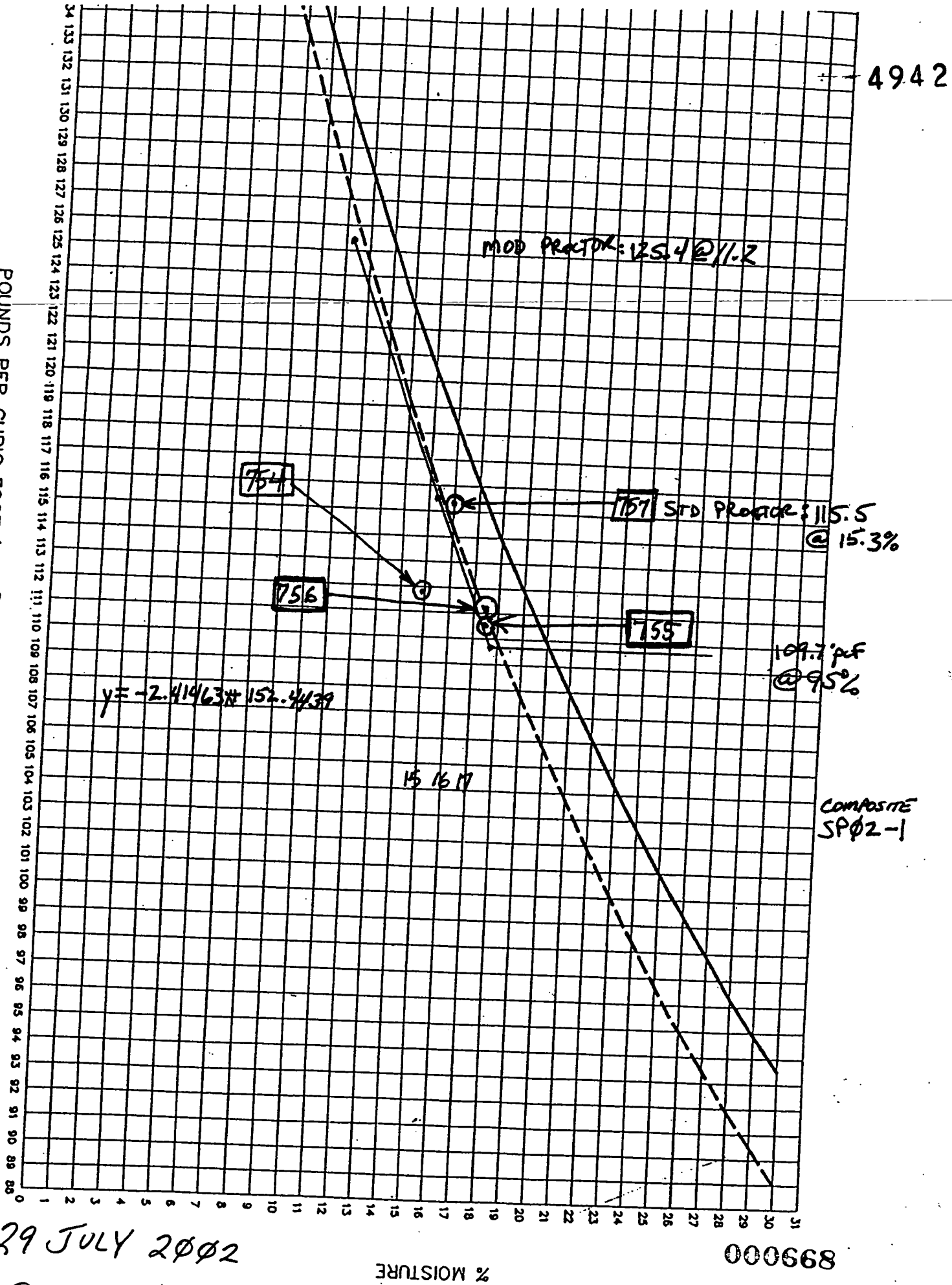
Sheet No. 5 of 6



29 JULY 2ØØ2

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Sheet No. 6 of 6

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G0134 TASK NO.: 04.1

DATE: 31 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02 758	CELL #4, West 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	14.3 (15.5)	133.0	115.2	99.7	P	—	—	—	—
CL02 759	CELL #4, WEST BENCH	6" / L-3	02-1	15.3	115.5	16.5 (17.4)	130.2	110.9	96.0	P	—	—	—	—
CL02 760	CELL #4 WEST 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	15.8 (16.8)	132.0	113.0	97.8	P	—	—	—	—
CL02 761	CELL #6, N. East End	6" / L-5	02-1	15.3	115.5	14.9 (16.0)	133.4	115.0	99.6	P	—	—	—	—
CL02 762	CELL #6 N EAST END	6" / L-5	02-1	15.3	115.5	15.0 (16.1)	132.3	114.0	98.7	P	—	—	—	—
CL02 763	CELL #6 N. WEST END	6" / L-5	02-1	15.3	115.5	15.0 (16.1)	135.1	116.4	100.8	P	—	—	—	—
CL02 764	CELL #5, Drainage Corridor	6" / L-5	02-1	15.3	115.5	17.3 (18.0)	129.5	109.7	95.0	P	—	—	—	—
CL02 765	CELL #5, West 4:1 Slope	6" / L-1	02-1	15.3	115.5	14.8 (15.9)	134.2	115.8	100.3	P	—	—	—	—
CL02 766	CELL #4 West 4:1 Slope	6" / L-4	02-1	15.3	115.5	15.5 (16.5)	131.5	112.9	97.7	P	—	—	—	—
CL02 767	CELL #4 West Bench	6" / L-4	02-1	15.3	115.5	14.3 (15.5)	132.8	115.0	99.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 1 OF 7

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 31 day JULY month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/(COMPACTED): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02 768	CELL#4 West 4:1 Slope	6" / L-4	02-1	15.3	115.5	14.3 / (15.5)	136.8	118.4	102.5	P	—	—	—	—
CL02 769	CELL#4 WEST BENCH	6" / L-4	02-1	15.3	115.5	15.8 / (16.8)	131.8	112.8	97.7	P	—	—	—	—
CL02 770	CELL#4 WEST 4:1 Slope	6" / L-4	02-1	15.3	115.5	15.3 / (16.3)	131.9	113.4	98.2	P	—	—	—	—
CL02 771	CELL#4 WEST 4:1 SLOPE	6" / L-5	02-1	15.3	115.5	15.5 / (16.5)	131.3	112.7	97.6	P	—	—	—	—
CL02 772	CELL#4 WEST 4:1 SLOPE	6" / L-5	02-1	15.3	115.5	14.1 / (15.3)	135.5	117.5	101.7	P	—	—	—	—
CL02 773	CELL#4 WEST BENCH	6" / L-5	02-1	15.3	115.5	14.1 / (15.3)	134.1	116.3	100.7	P	—	—	—	—
CL02 774	CELL#5 WEST BENCH	6" / L-4	02-1	15.3	115.5	15.4 / (16.4)	132.7	114.0	98.7	P	—	—	—	—
CL02 775	CELL#5 WEST BENCH	6" / L-4	02-1	15.3	115.5	16.0 / (16.9)	132.1	113.0	97.8	P	—	—	—	—
CL02 776	CELL#4 WEST BENCH	6" / L-5	02-1	15.3	115.5	15.8 / (16.8)	130.9	112.1	97.1	P	—	—	—	—
CL02 777	CELL#4 WEST 4:1 SLOPE	6" / L-5	02-1	15.3	115.5	14.5 / (15.7)	132.8	114.8	99.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: CH

SHEET NO. 2 OF 7

4942

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cells #4, #5, #6

PROJECT NO.: GQ1341 TASK NO.: 004.1

DATE: 31 day JULY month 2002 year

SPECIFICATION REQUIREMENTS (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/(COMPACTED): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20929 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 778	CELL #5 West 4:1 SLOPE	6"/L-1	02-1	15.3	115.5	14.9 (16.0)	137.4	118.4	102.5	P	—	—	—	—
CL02 779	CELL #5 WEST 4:1 SLOPE	6"/L-2	02.1	15.3	115.5	14.9 (16.0)	134.1	115.6	100.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 3 OF 7

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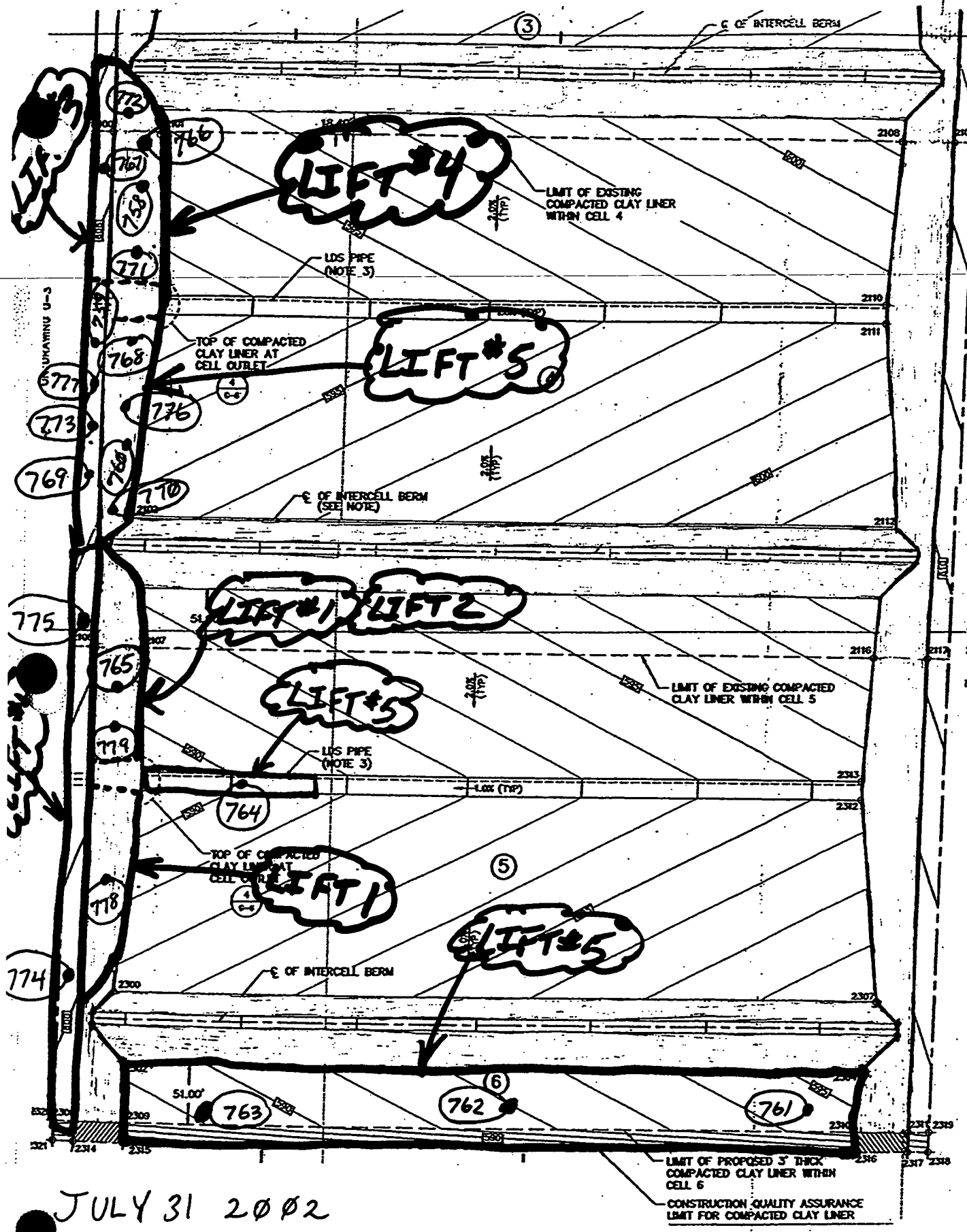

JULY 31 2002

GQ1341 04.1

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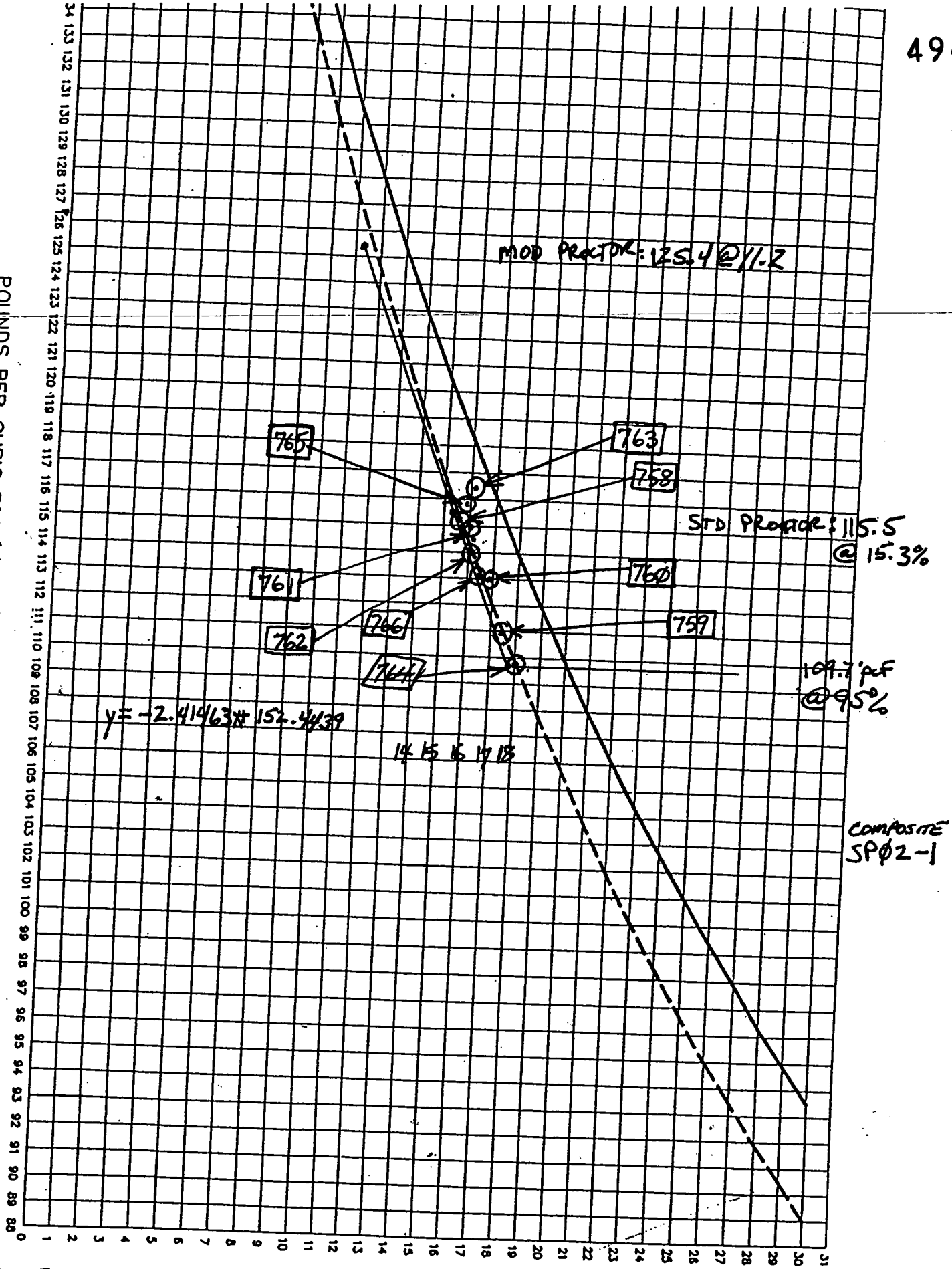

31 JULY 2002

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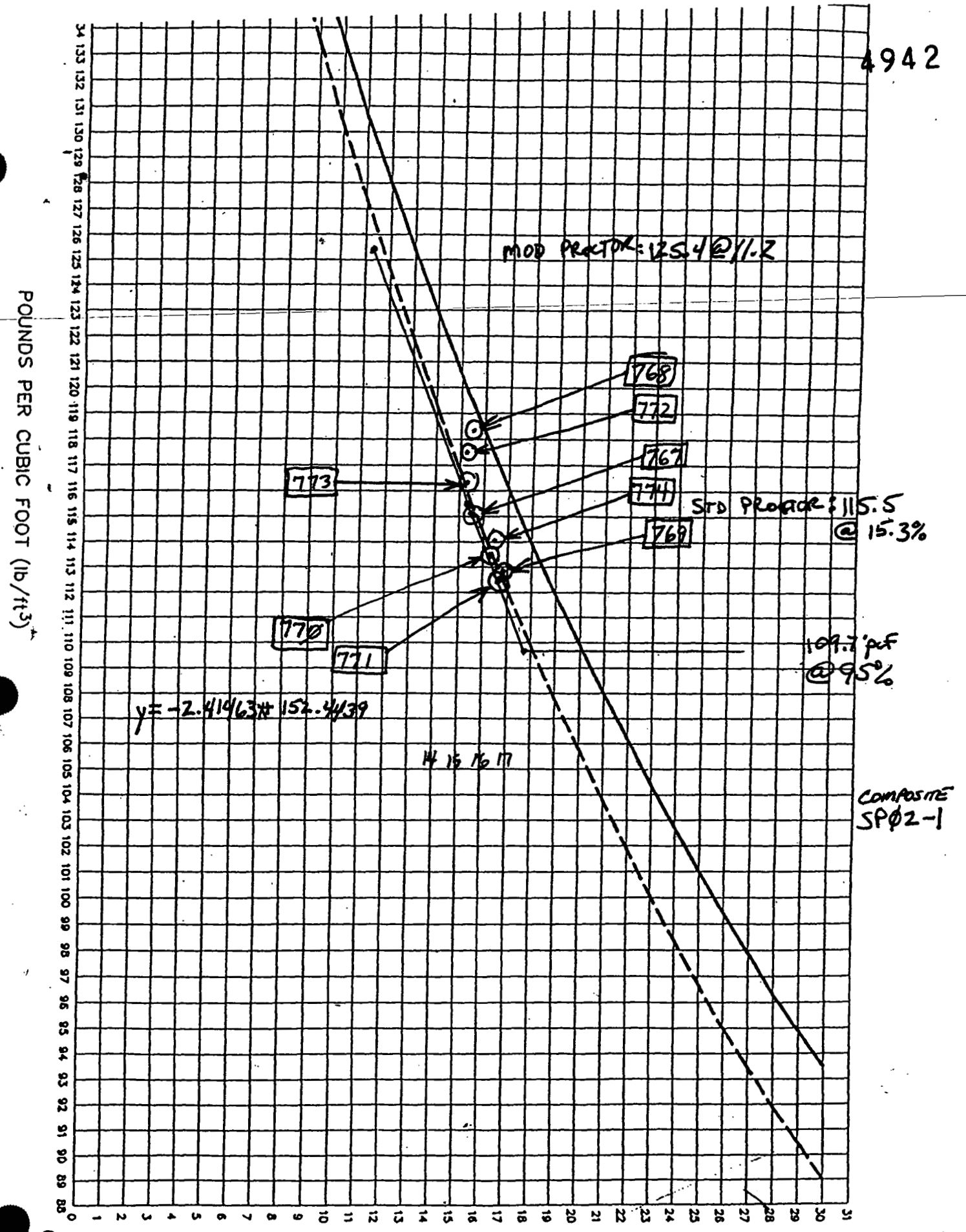

31 JULY 2002

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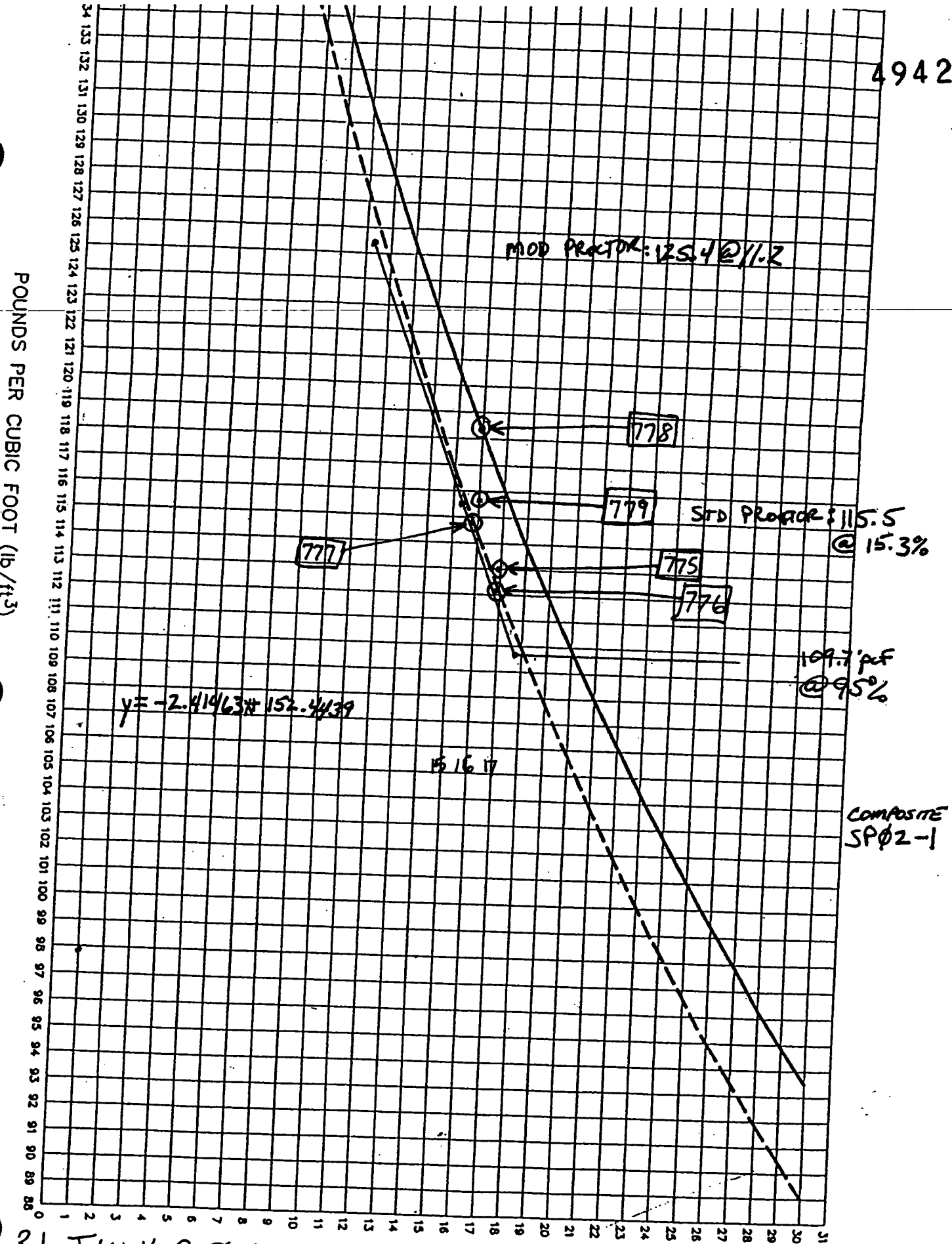

31 JULY 2ØØ2

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Sheet No. 7 of 7

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, 5, #6

PROJECT NO.: 601341 TASK NO.: 041

DATE: 1 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE (COMPACTED): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 780	CELL #6 N. EAST END	6" / L-6	02-1	15.3	115.5	16.0 (16.9)	129.9	111.1	96.2	—	F	CL02-782	P	—
CL02 781	CELL #6 N. EAST END	6" / L-6	02-1	15.3	115.5	14.3 (15.5)	133.1	115.2	99.7	P	—	—	—	—
CL02 782	CELL #6 N. EAST END	6" / L-6	02-1	15.3	115.5	15.9 (16.9)	130.9	112.0	97.0	P	—	—	—	—
CL02 783	CELL #6 N. WEST END	6" / L-6	02-1	15.3	115.5	15.8 (16.8)	131.6	112.7	97.6	P	—	—	—	—
CL02 784	CELL #6 N. WEST END	6" / L-6	02-1	15.3	115.5	15.0 (16.1)	132.8	114.4	99.0	P	—	—	—	—
CL02 785	CELL #5 WEST 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	15.8 (16.8)	130.8	112.0	97.0	P	—	—	—	—
CL02 786	CELL #5 WEST 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	14.6 (15.7)	133.8	115.6	100.1	P	—	—	—	—
CL02 787	CELL #5 WEST 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	15.8 (16.8)	131.4	112.5	97.4	P	—	—	—	—
CL02 788	CELL #5 WEST 4:1 SLOPE	6" / L-3	02-1	15.3	115.5	15.6 (16.6)	131.2	112.5	97.4	P	—	—	—	—
CL02 789	CELL #5 WEST 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	15.2 (16.3)	132.2	113.7	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 6

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 1 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE (COMPACTED)): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 790	CELL #5 WEST 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	14.4 (15.6)	133.7	115.7	100.2	P	—	—	—	—
CL02 791	CELL #5 WEST 4:1 SLOPE	6" / L-2	02-1	15.3	115.5	14.0 (13.2)	133.4	115.8	100.3	—	F	CL02-796	P	—
CL02 792	CELL #4 WEST BENCH	6" / L-6	02-1	15.3	115.5	15.3 (16.3)	133.7	115.0	99.6	P	—	—	—	—
CL02 793	CELL #4 WEST BENCH	6" / L-6	02-1	15.3	115.5	14.8 (15.9)	132.4	114.2	98.9	P	—	—	—	—
CL02 794	CELL #4 WEST BENCH	6" / L-6	02-1	15.3	115.5	16.4 (17.3)	131.4	112.0	97.0	P	—	—	—	—
CL02 795	CELL #5 Drainage Corridor	6" / L-6	02-1	15.3	115.5	15.8 (15.9)	133.0	114.8	99.4	P	—	—	—	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 6

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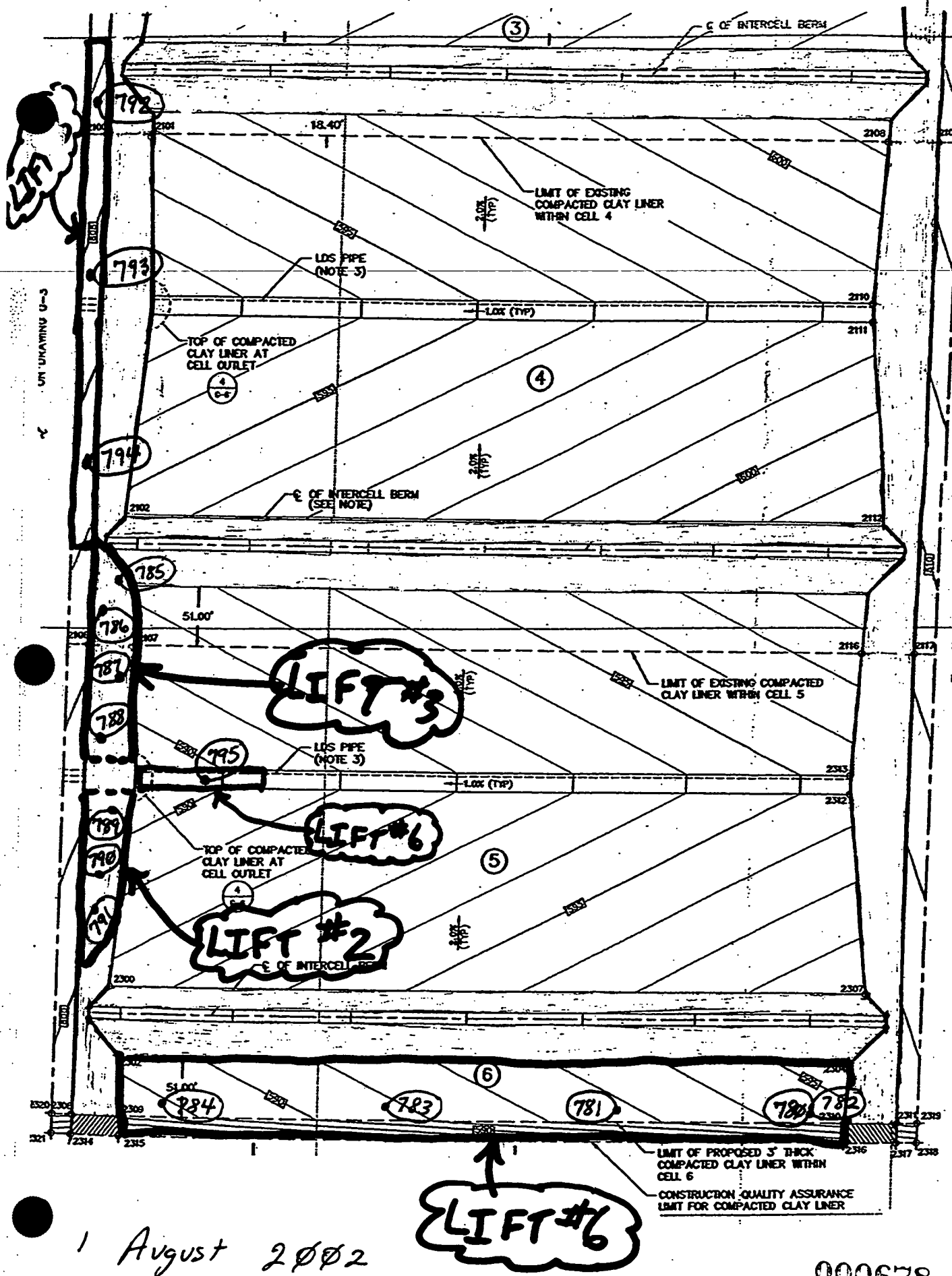

1 August 2002

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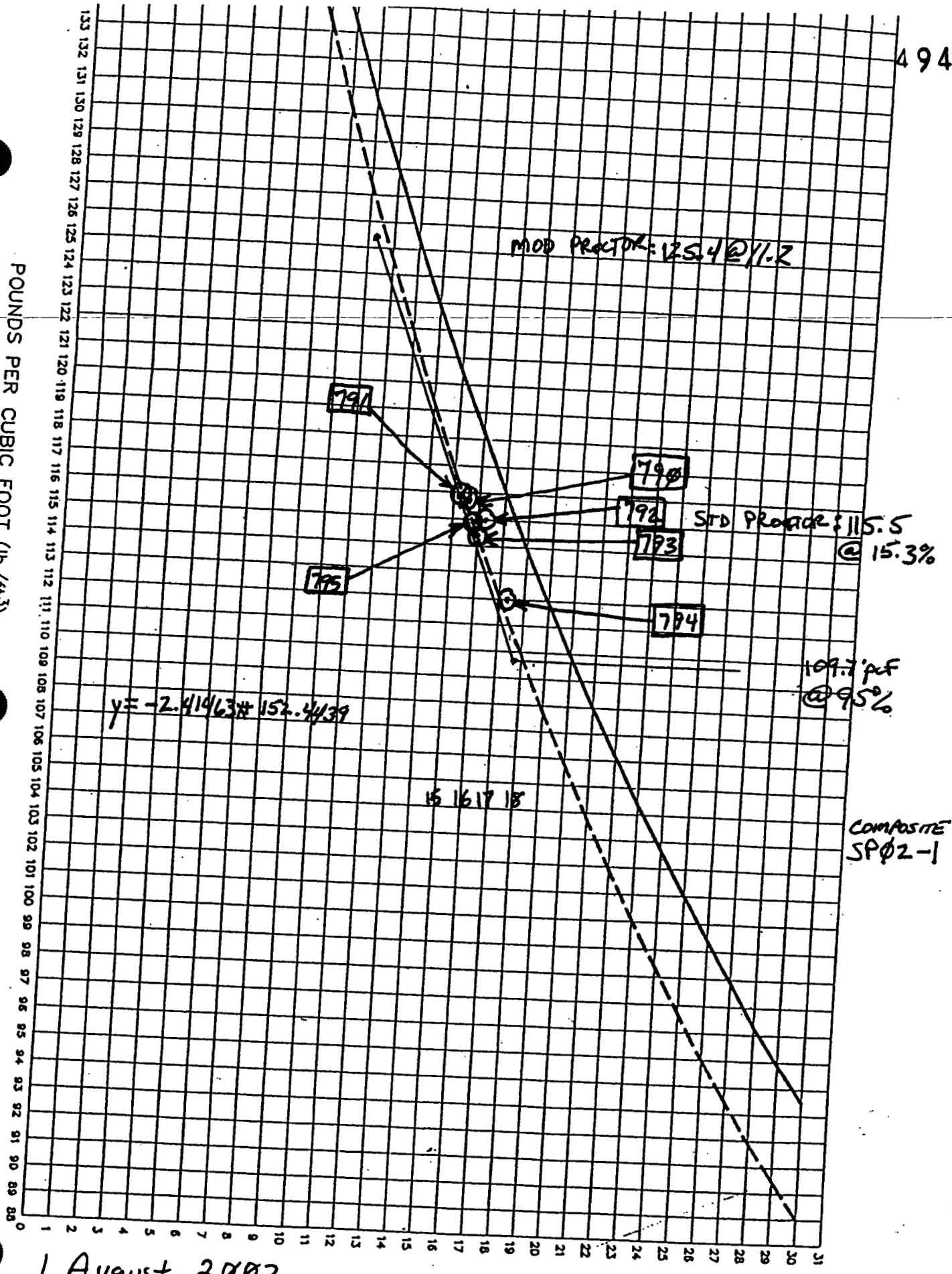

1 August 2002

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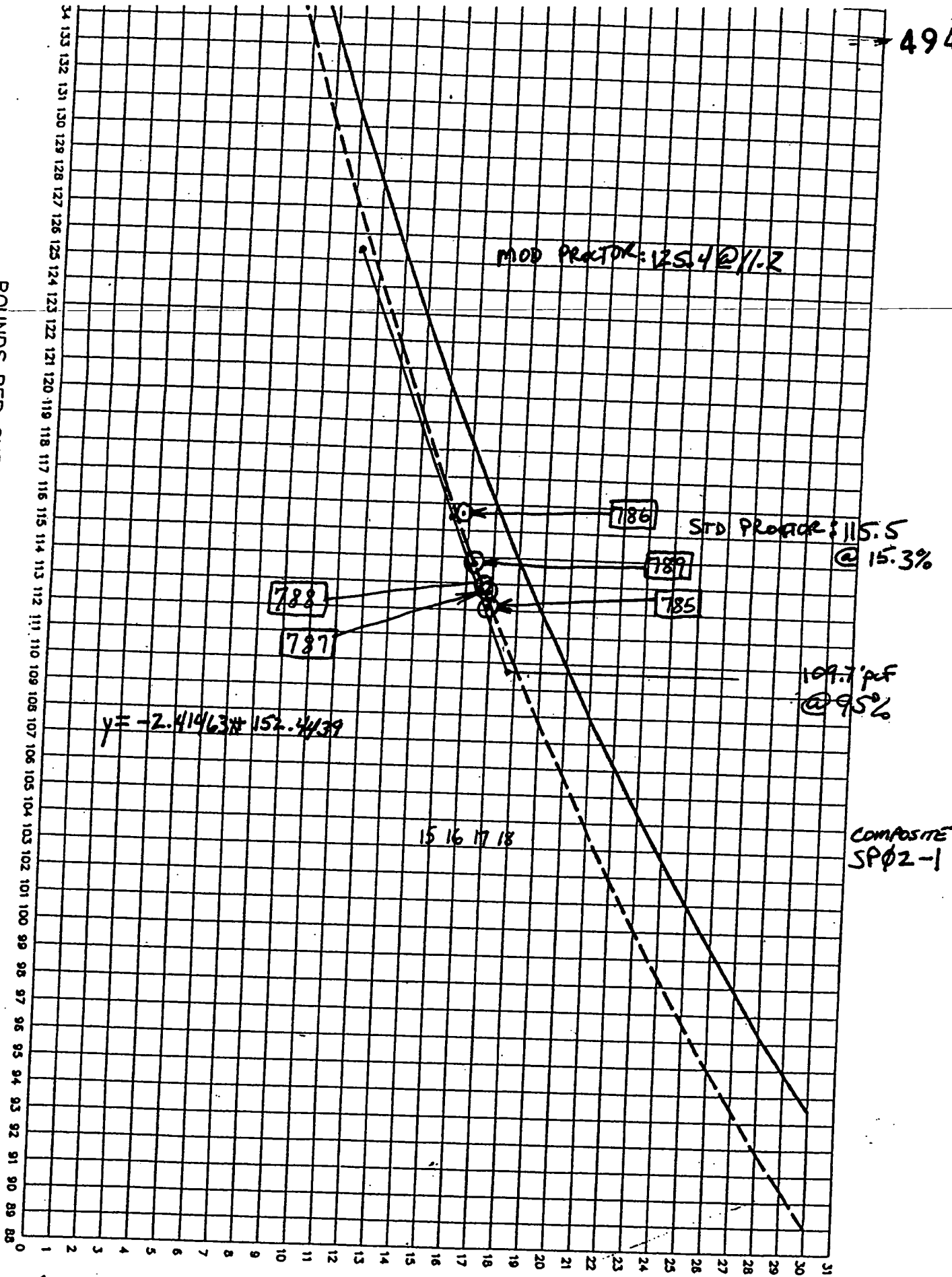

1 August 2ØØ2

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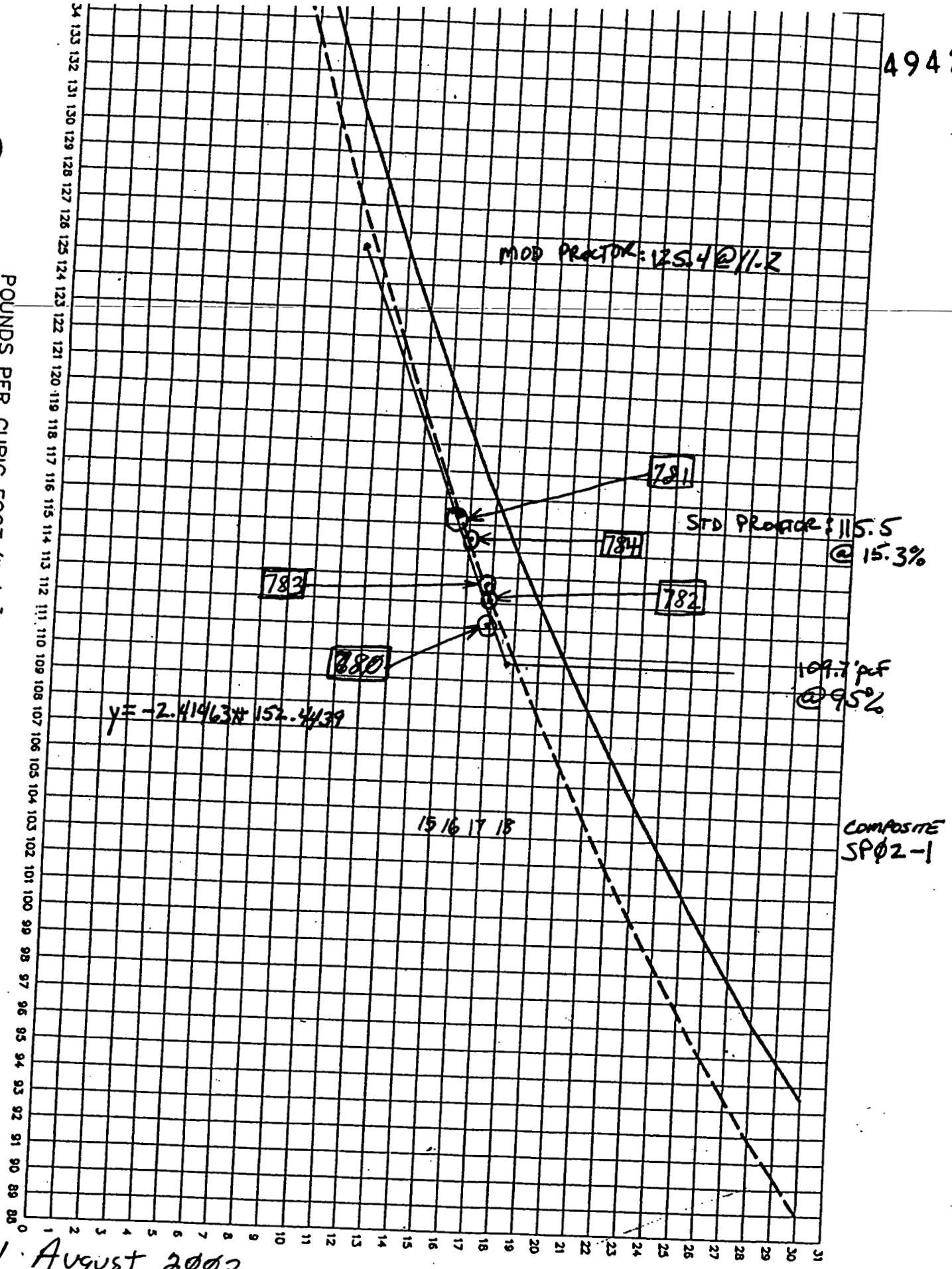

1 August 2ØØ2

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Sheet No. 6 of 6

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: GO1341 TASK NO.: Ø4.1

DATE: 2 day August month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +Ø-3% LIFT THICKNESS (LOOSE/(COMPACTED): 6"

APZ APZ

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 344Ø GAUGE SERIAL NO. 2Ø979 CORRECTION FACTOR Y = Ø.848 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CLØ2 796	CELL #5 WEST 4:1 SLOPE	6" / L-2	Ø2-1	15.3	115.5	16.2 (17.1)	131.5	112.3	97.2	P	—	—	—	—
CLØ2 797	CELL #5 WEST 4:1 SLOPE	6" / L-4	Ø2-1	15.3	115.5	15.Ø (16.1)	134.8	116.1	100.5	P	—	—	—	—
CLØ2 798	CELL #5 WEST 4:1 SLOPE	6" / L-4	Ø2-1	15.3	115.5	16.4 (17.3)	131.4	112.Ø	97.Ø	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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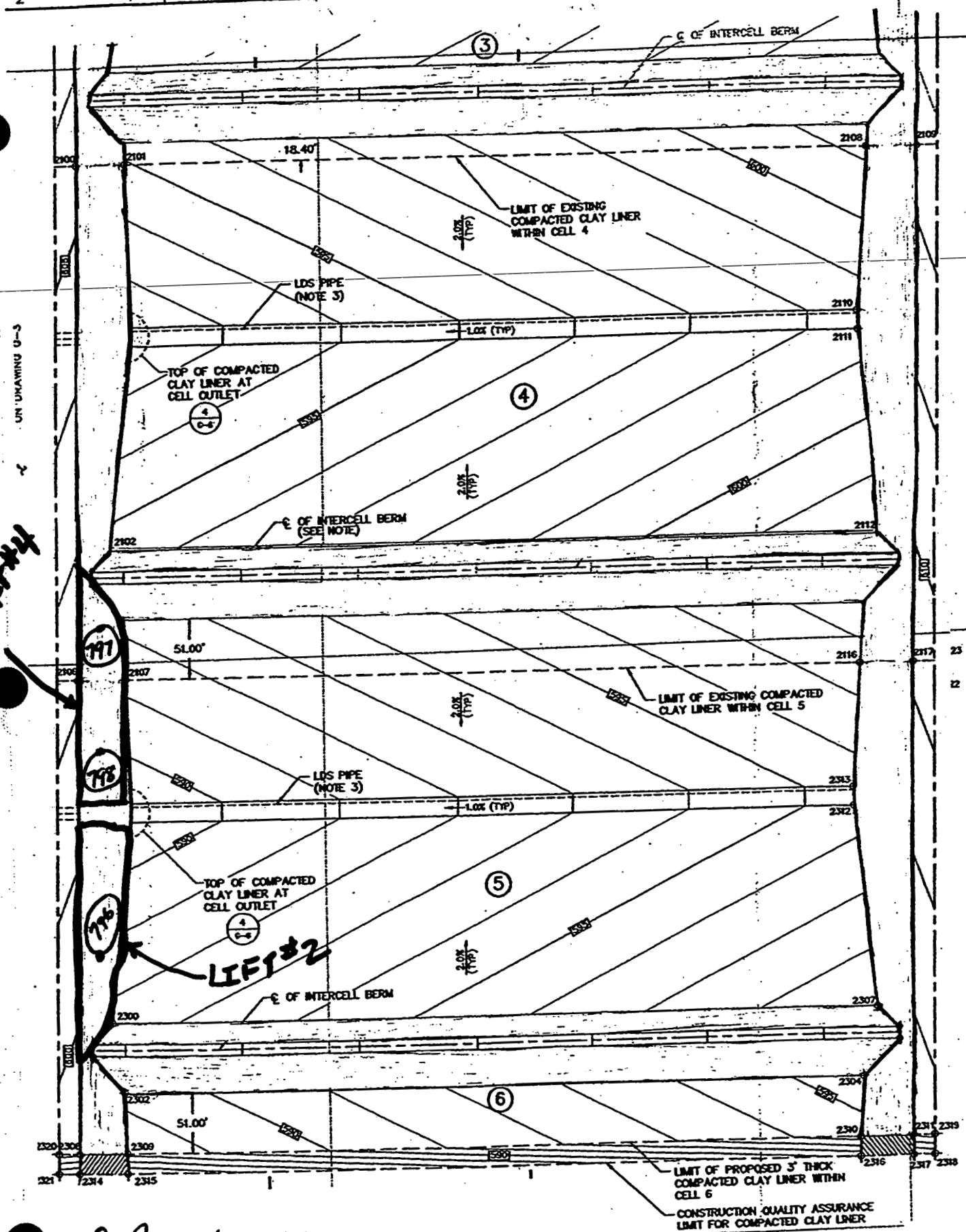

2 August 2002

GQ1341 04.1

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Sheet No. 2 of 3

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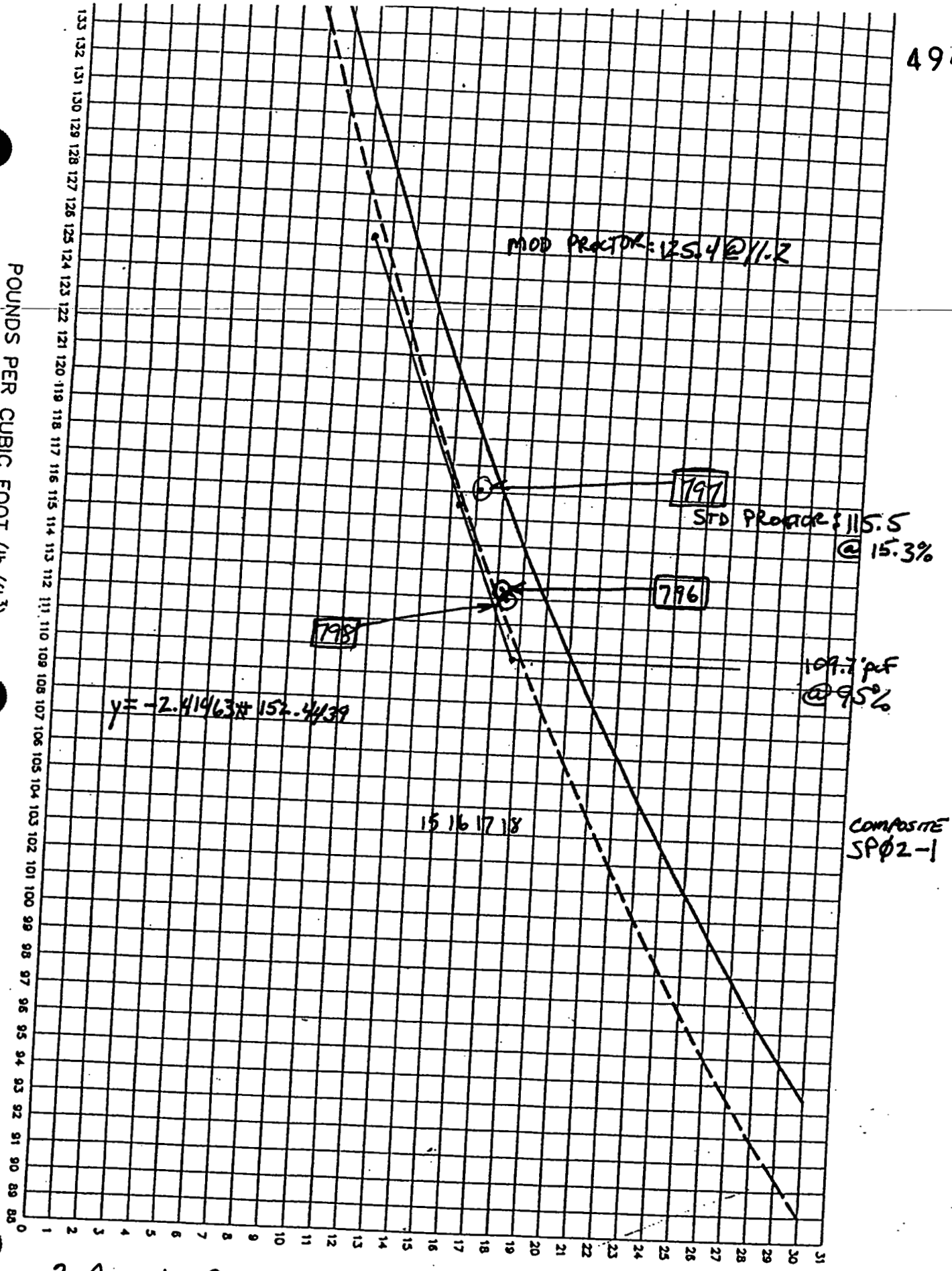

2 August 2ØØ2

GQ1341 Ø4.1

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 05 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±0-3% LIFT THICKNESS (LOOSE/(COMPACTED): 6" / 4"

APZ APZ

MATERIAL SOURCE: On Site Placed Material MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: Other

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 799	Cell #4 Penetration Box	6" / L-5	02-1	15.3	115.5	16.1 (17.0)	132.7	113.4	98.2	P	—	—	—	—
CL02 800	Cell #4 Penetration Box	6" / L-5	02-1	15.3	115.5	16.1 (17.0)	132.7	113.4	98.2	P	—	—	—	—
CL02 801	Cell #4 Penetration Box	8" / L-7	02-1	15.3	115.5	14.6 (15.7)	133.6	115.5	100.0	P	—	—	—	—
CL02 802	Cell #4 Penetration Box	6" / L-8	02-1	15.3	115.5	14.1 (15.3)	136.7	~~118.7~~ 118.5 (1)	~~103.8~~ 102.6 (1)	P	—	—	—	—
CL02 803	Cell #4 Penetration Box	6" / L-8	02-1	15.3	115.5	15.8 (16.8)	132.5	113.4	98.2	P	—	—	—	—
CL02 804	Cell #4 Penetration Box	6" / L-9	02-1	15.3	115.5	16.2 (17.1)	131.5	~~113.2~~ 112.3 (1)	~~98.0~~ 97.2 (1)	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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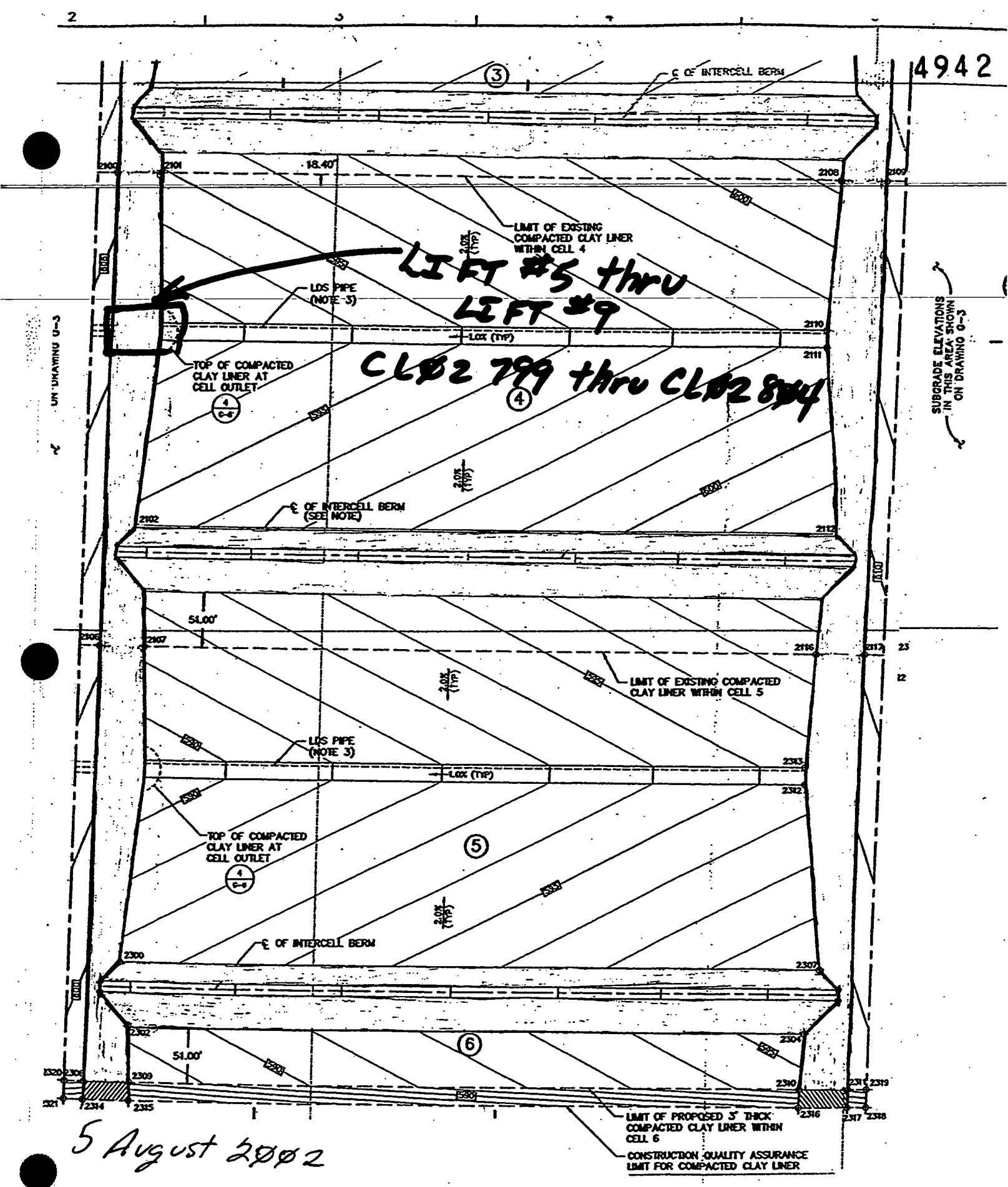

5 August 2002

GQ1341 04.1

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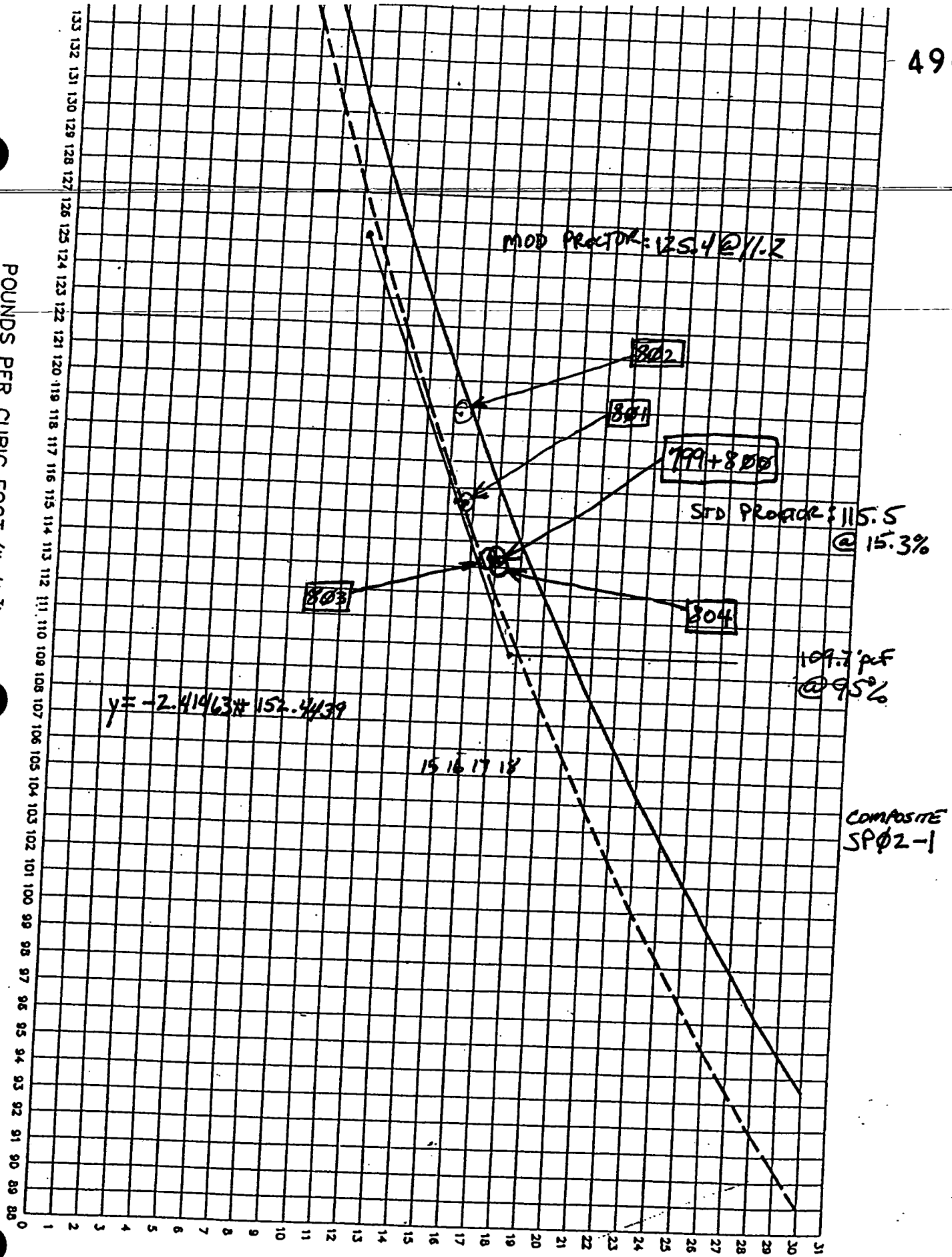

August 2002

GQ1341 04.1

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 6 day August month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 805	Cell #4, Penetration Box	6" / L-10	02-1	15.3	115.5	15.6 (16.6)	132.5	113.6	98.4	P	—	—	—	—
CL02 806	Cell #4, Penetration Box	6" / L-11	02-1	15.3	115.5	16.1 (17.0)	130.8	111.8	96.8	P	—	—	—	—
CL02 807	Cell #4, Penetration Box	6" / L-12	02-1	15.3	115.5	16.7 (17.5)	131.5	111.9	96.9	P	—	—	—	—
CL02 808	Cell #4, Penetration Box	6" / L-13	02-1	15.3	115.5	17.0 (17.8)	130.3	110.6	95.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 3

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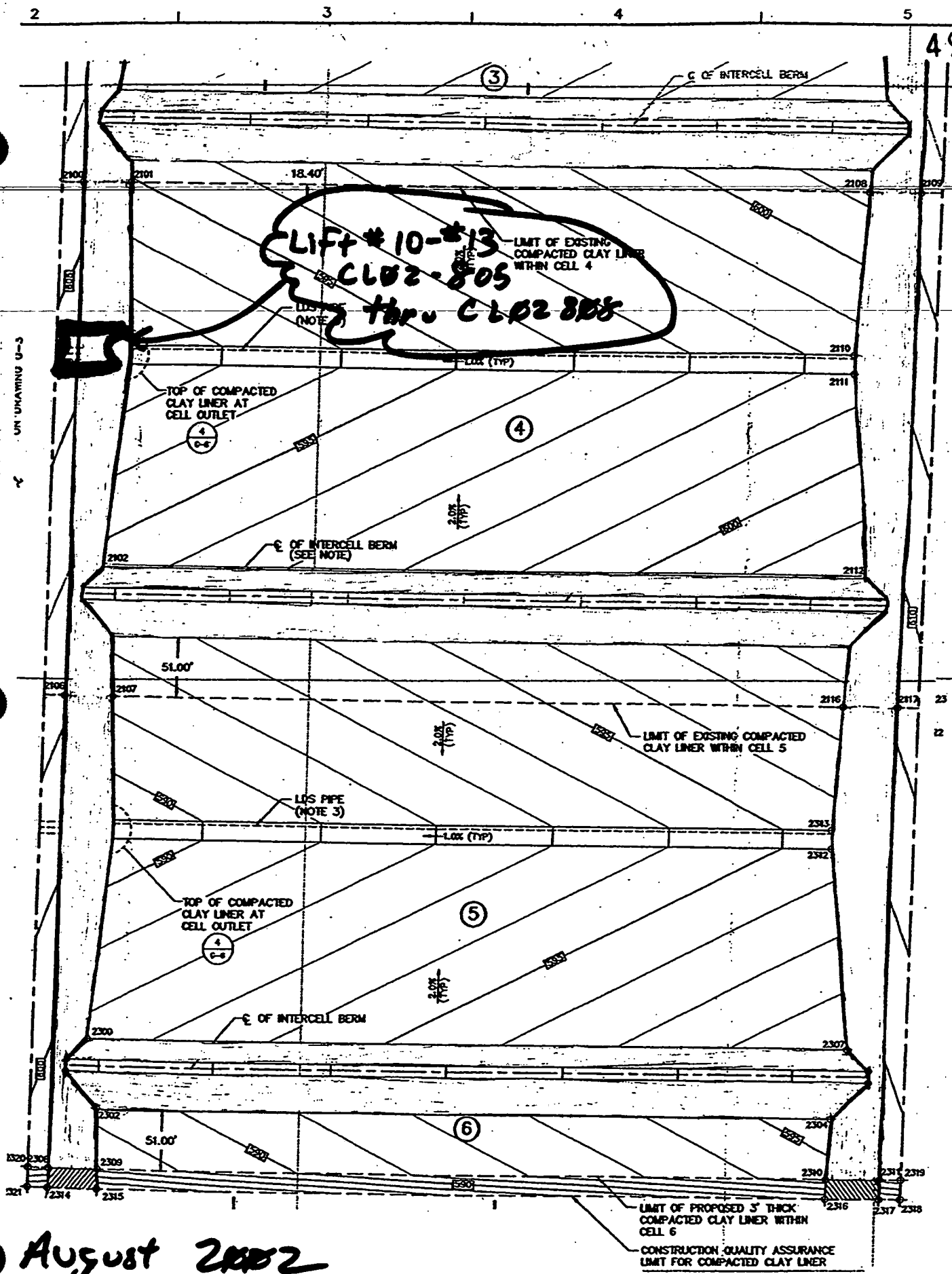

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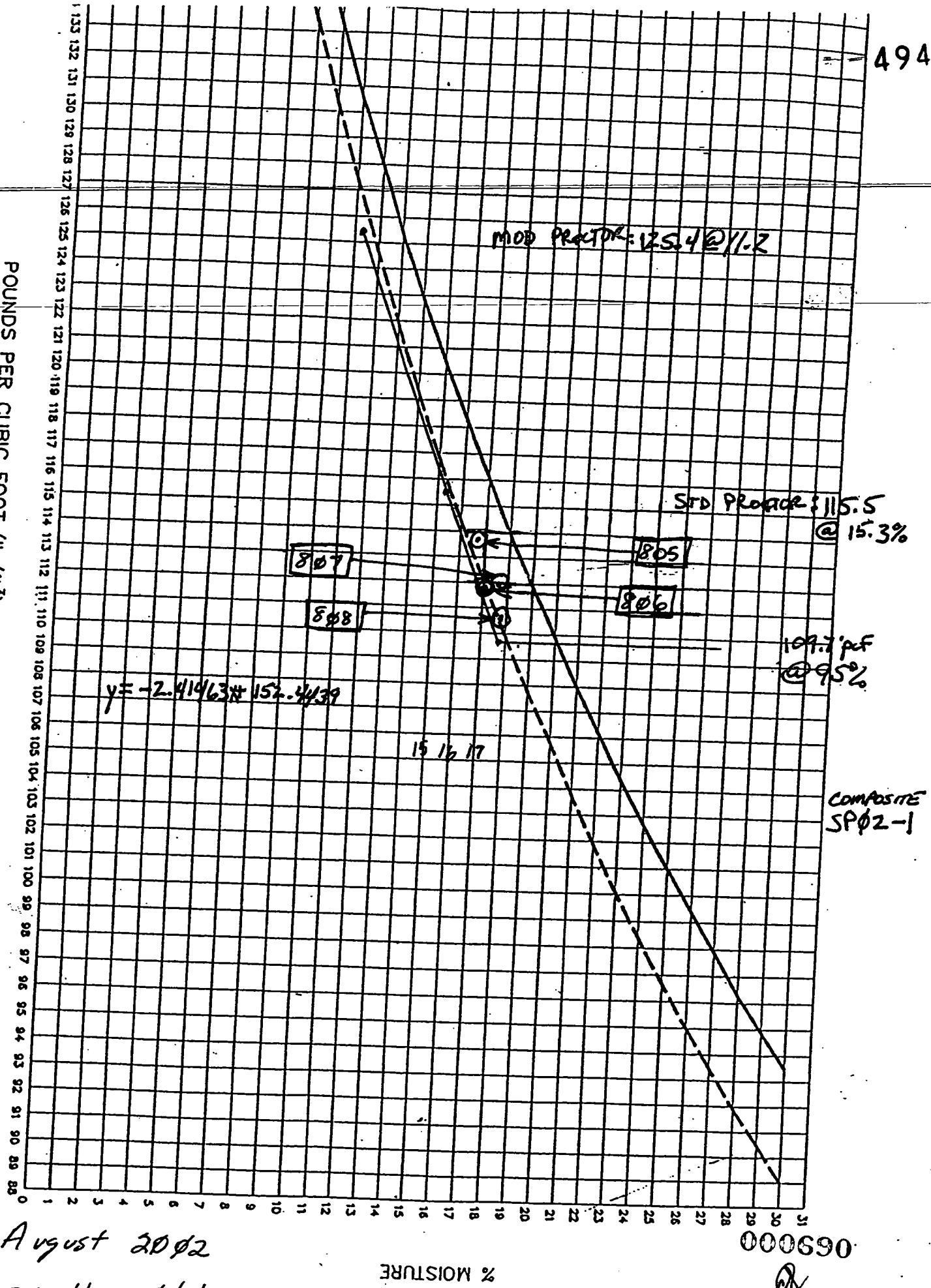
Sheet No. 2 of 3



August 2002

GQ1341 04.1

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 9 day August month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / COMPACTED): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: AP2 AP2
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 809	CELL #4 W. Bench	6" / L-7	02-3	12.4	121.6	15.1 (16.2)	135.9	117.0	96.2	—	F	CL02 812	P	—
CL02 810	CELL #4 W. Bench	6" / L-7	02-3	12.4	121.6	15.5 (16.5)	135.4	116.2	95.6	—	F	CL02 811	P	—
CL02 811	CELL #4 W. Bench	6" / L-7	02-3	12.4	121.6	13.6 (14.9)	138.4	120.5	99.1	P	—	—	—	—
CL02 812	CELL #4 W. Bench	6" / L-7	02-3	12.4	121.6	12.7 (14.1)	138.0	120.9	99.4	P	—	—	—	—
CL02 813	CELL #4 W. Bench	6" / L-5	02-3	12.4	121.6	12.9 (14.3)	134.2	117.4	96.5	P	—	—	—	—
CL02 814	CELL #4 WEST 4:1 SLOPE	6" / L-6	02-3	12.4	121.6	13.4 (14.7)	135.5	118.1	97.1	P	—	—	—	—
CL02 815	CELL #4, WEST 4:1 SLOPE	6" / L-6	02-3	12.4	121.6	13.8 (15.1)	136.1	118.2	97.2	P	—	—	—	—
CL02 816	CELL #4 WEST 4:1 SLOPE	6" / L-6	02-3	12.4	121.6	13.5 ~~137.1~~ (14.8)	137.7	119.9	98.6	P	—	—	—	—
CL02 817	CELL #4 WEST 4:1 SLOPE	6" / L-6	02-3	12.4	121.6	12.8 (14.2)	136.6	119.6	98.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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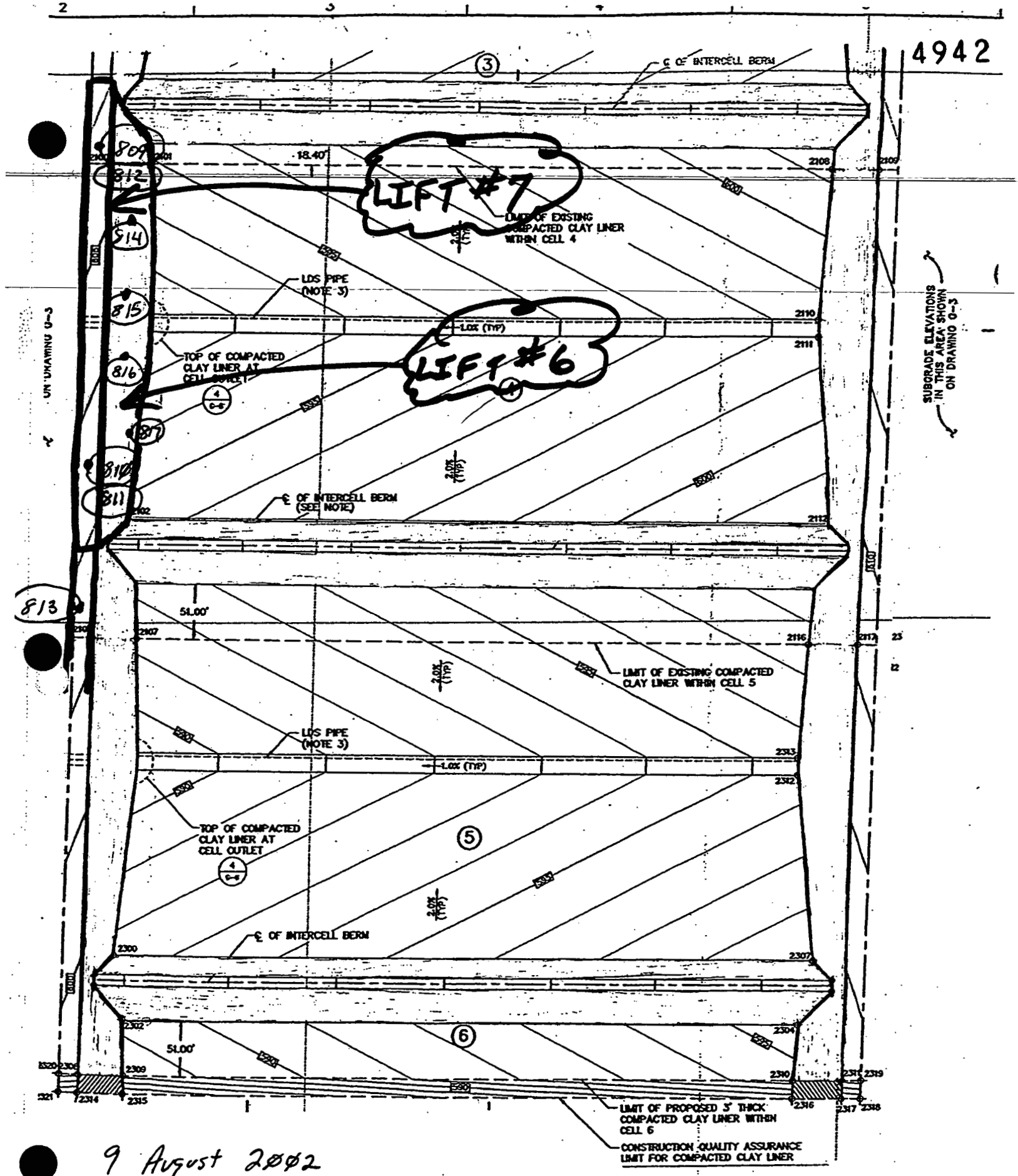

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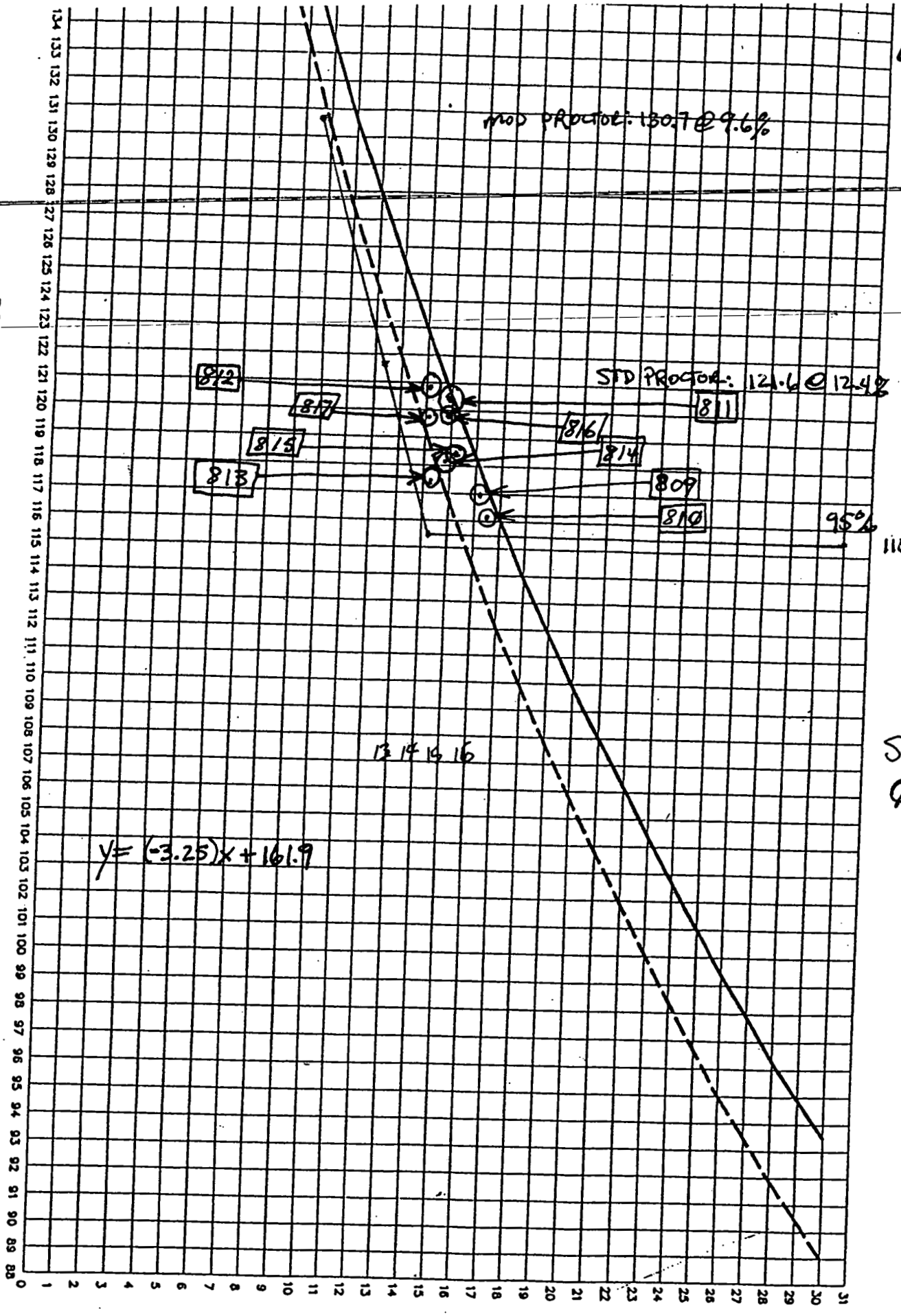

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 10 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: STOCKPILE

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

AP2 AP2

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 818	CELL #5 West 4:1 SLOPE	6" / L-5	02-3	12.4	121.6	12.2 / 13.7	137.4	120.8	99.3	P	—	—	—	—
CL02 819	CELL #5 West 4:1 SLOPE	6" / L-5	02-3	12.4	121.6	12.2 / 13.7	134.4	118.2	97.2	P	—	—	—	—
CL02 820	CELL #4 WEST BENCH	6" / L-8	02-3	12.4	121.6	13.1 / 14.5	138.0	120.5	99.1	P	—	—	—	—
CL02 821	CELL #4 WEST BENCH	6" / L-8	02-3	12.4	121.6	11.6 / 13.2	138.2	122.1	100.4	P	—	—	—	—
CL02 822	CELL #4 WEST 4:1 SLOPE	6" / L-7	02-3	12.4	121.6	12.7 / 14.1	138.4	121.3	99.8	P	—	—	—	—
CL02 823	CELL #4 WEST 4:1 SLOPE	6" / L-7	02-3	12.4	121.6	12.5 / 14.0	139.2	122.1	100.4	P	—	—	—	—
CL02 824	CELL #5 WEST BENCH	6" / L-5	02-3	12.4	121.6	12.5 / 14.0	139.7	122.5	100.7	P	—	—	—	—
CL02 825	CELL #5 WEST BENCH	6" / L-5	02-3	12.4	121.6	13.7 / 15.0	134.9	117.3	96.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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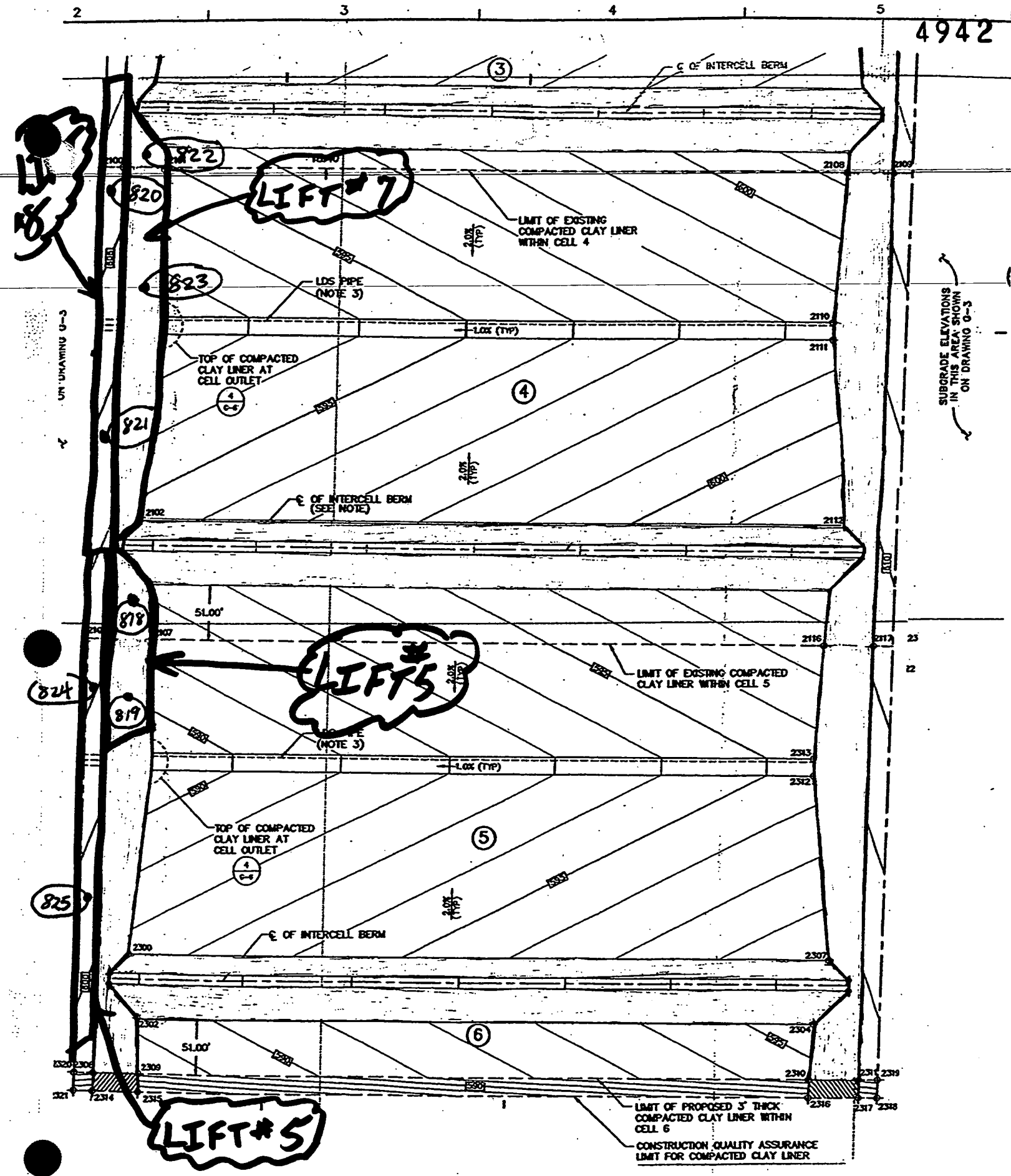

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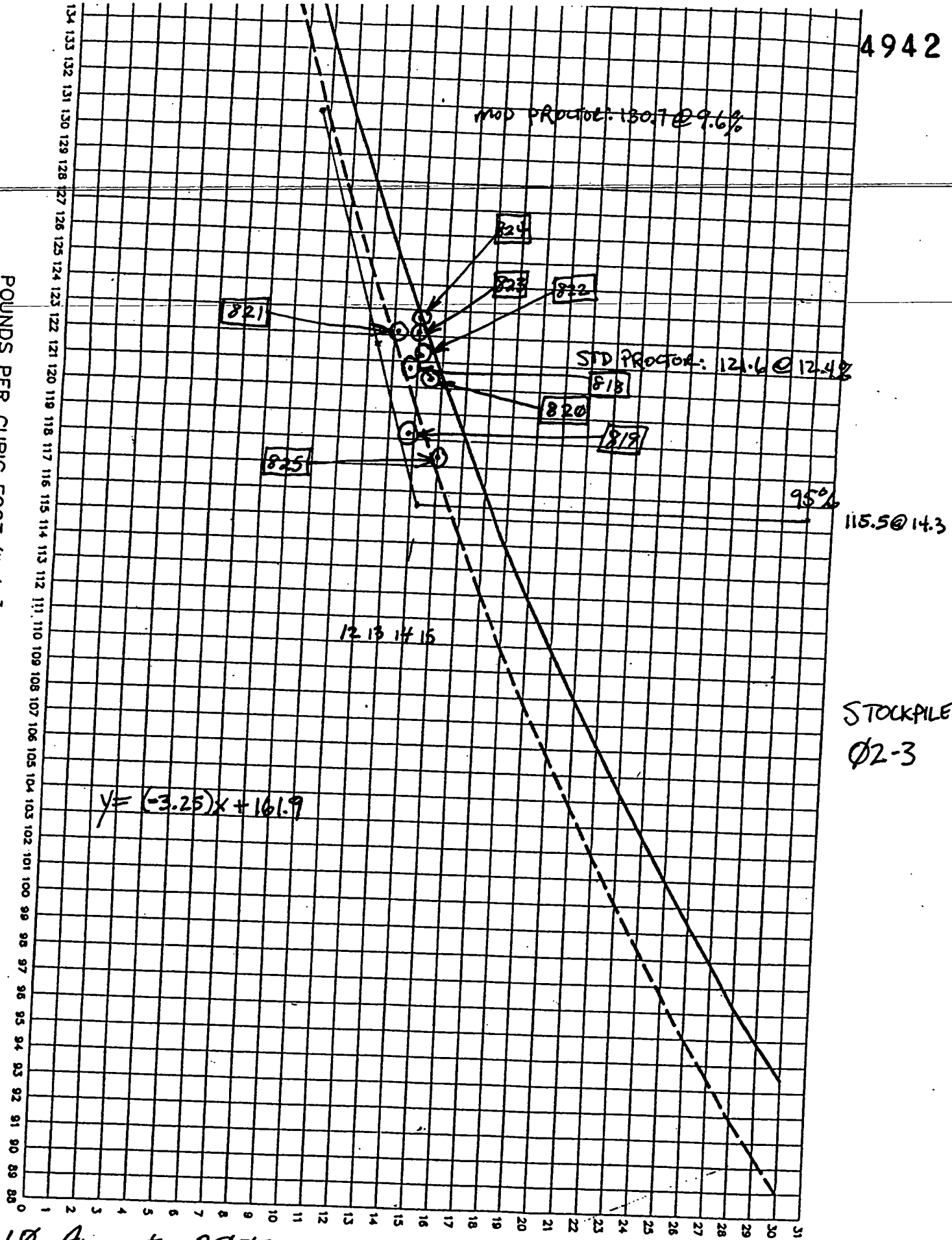

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10 August 2002

GQ1341 04.1

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 12 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TRAXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 826	CELL #5, West 4:1 Slope	6" / L-6	02-3	12.4	121.6	10.8 (12.5)	138.7	123.3 ~~123.0~~	101.4 ~~101.2~~	P	—	—	—	—
CL02 827	Cell #5, West 4:1 Slope	6" / L-6	02-3	12.4	121.6	13.6 (14.9)	135.2	117.7	96.8	P	—	—	—	—
CL02 828	Cell #5, West Bench	6" / L-6	02-3	12.4	121.6	13.6 (14.9)	137.0	119.2	98.0	P	—	—	—	—
CL02 829	Cell #5, West Bench	6" / L-6	02-3	12.4	121.6	12.9 (14.3)	137.4	120.2	98.8	P	—	—	—	—
CL02 830	Cell #5 West 4:1 Slope	6" / L-7	02-3	12.4	121.6	14.3 (15.5)	133.7	115.8	95.2	—	F	CL02 832	—	—
CL02 831	Cell #5 West Bench	6" / L-7	02-3	12.4	121.6	11.3 (13.0)	140.5	124.3	102.2	P	—	—	—	—
~~CL02 832~~		/												
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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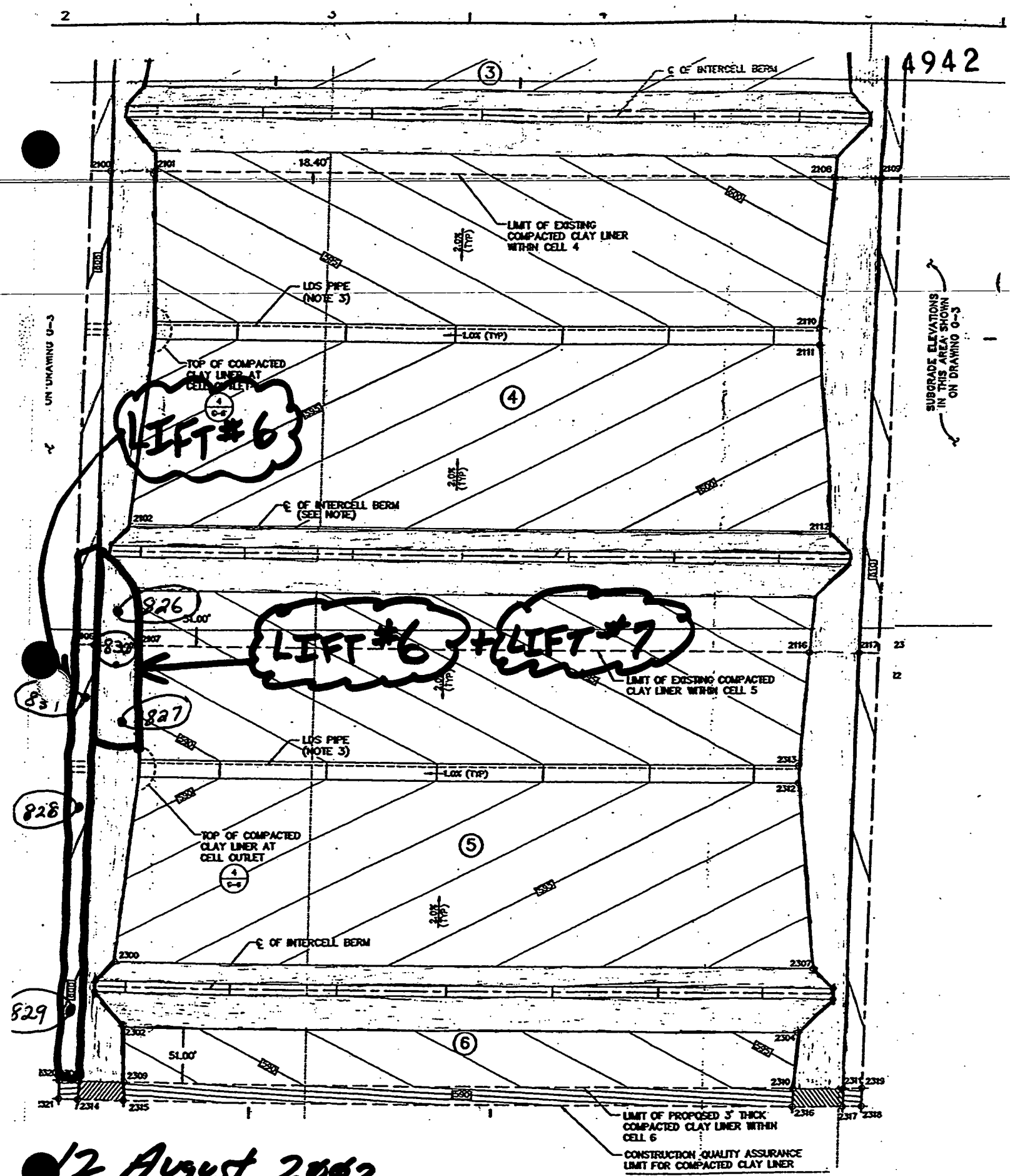

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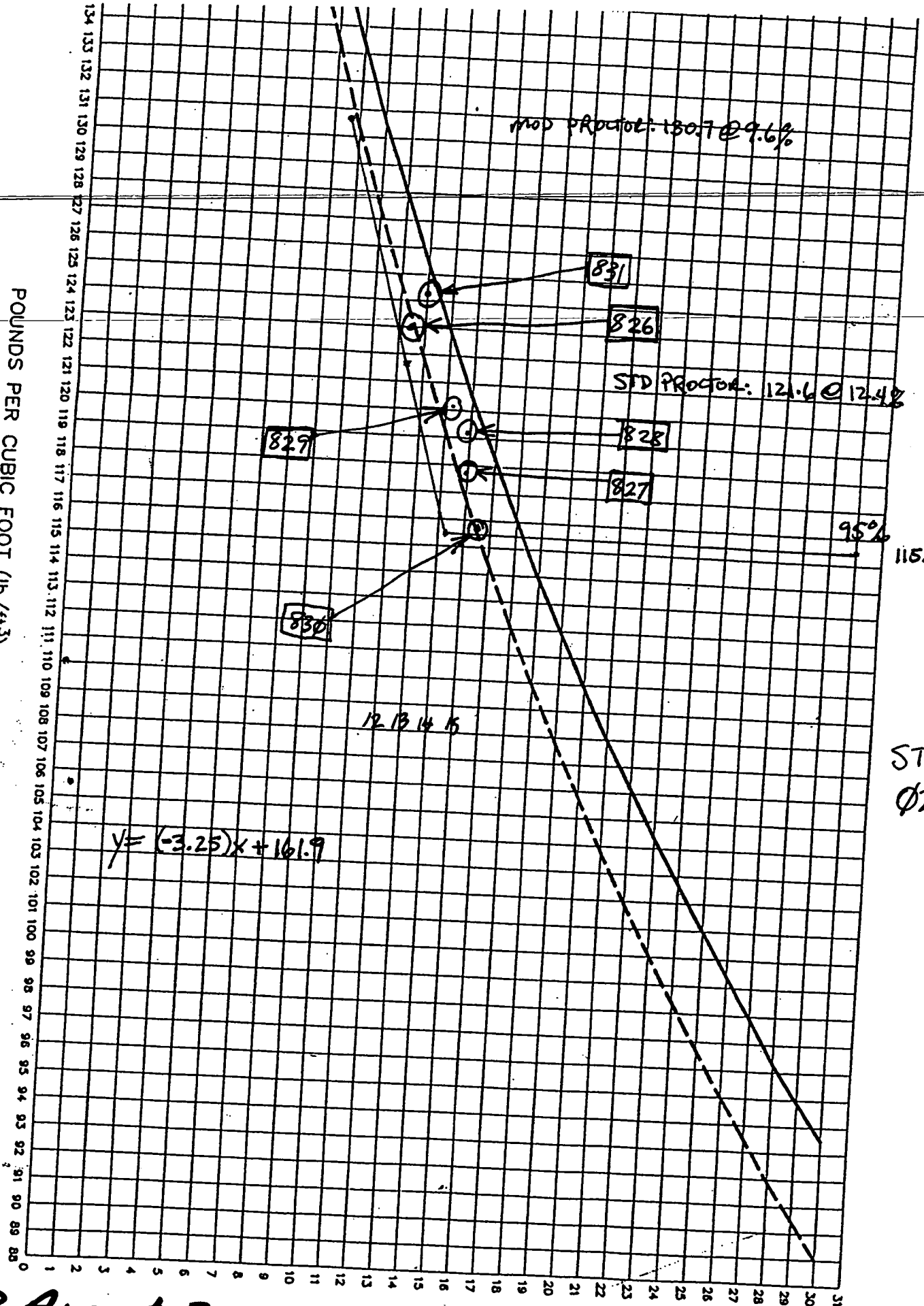

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell # 4, #5, #6

PROJECT NO.: GD1341 TASK NO.: Ø4.1

DATE: 13 day August month 2ØØ2 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = Ø.8481x + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CLØ2 832	CELL #5, West 4:1 SLOPE	6" / L-7	Ø2-3	12.4	121.6	13.5 (14.8)	137.8	12Ø.Ø	98.7	P	—	—	—	—
CLØ2 833	CELL #5, WEST 4:1 SLOPE	6" / L-7	Ø2-3	12.4	121.6	14.Ø (15.2)	134.9	117.1	96.3	P	—	—	—	—
CLØ2 834	CELL #5, WEST 4:1 SLOPE	6" / L-4	Ø2-3	12.4	121.6	12.Ø (13.5)	138.4	121.9	1ØØ.2	P	—	—	—	—
CLØ2 835	CELL #5, WEST 4:1 SLOPE	6" / L-4	Ø2-3	12.4	121.6	12.5 (14.Ø)	138.8	121.8	1ØØ.2	P	—	—	—	—
CLØ2 836	CELL #5, WEST BENCH	6" / L-7	Ø2-3	12.4	121.6	11.9 (13.5)	137.6	121.2	99.7	P	—	—	—	—
CLØ2 837	CELL #5, WEST ~~4:1 SLOPE~~ BENCH	6" / L-7	Ø2-3	12.4	121.6	12.1 (13.6)	136.9	12Ø.5	99.1	P	—	—	—	—
CLØ2 838	CELL #5, WEST 4:1 SLOPE	6" / L-5	Ø2-3	12.4	121.6	11.Ø (12.7)	139.4	123.7	101.7	P	—	—	—	—
CLØ2 839	CELL #5, WEST 4:1 SLOPE	6" / L-5	Ø2-3	12.4	121.6	12.5 (14.Ø)	135.4	118.8	97.7	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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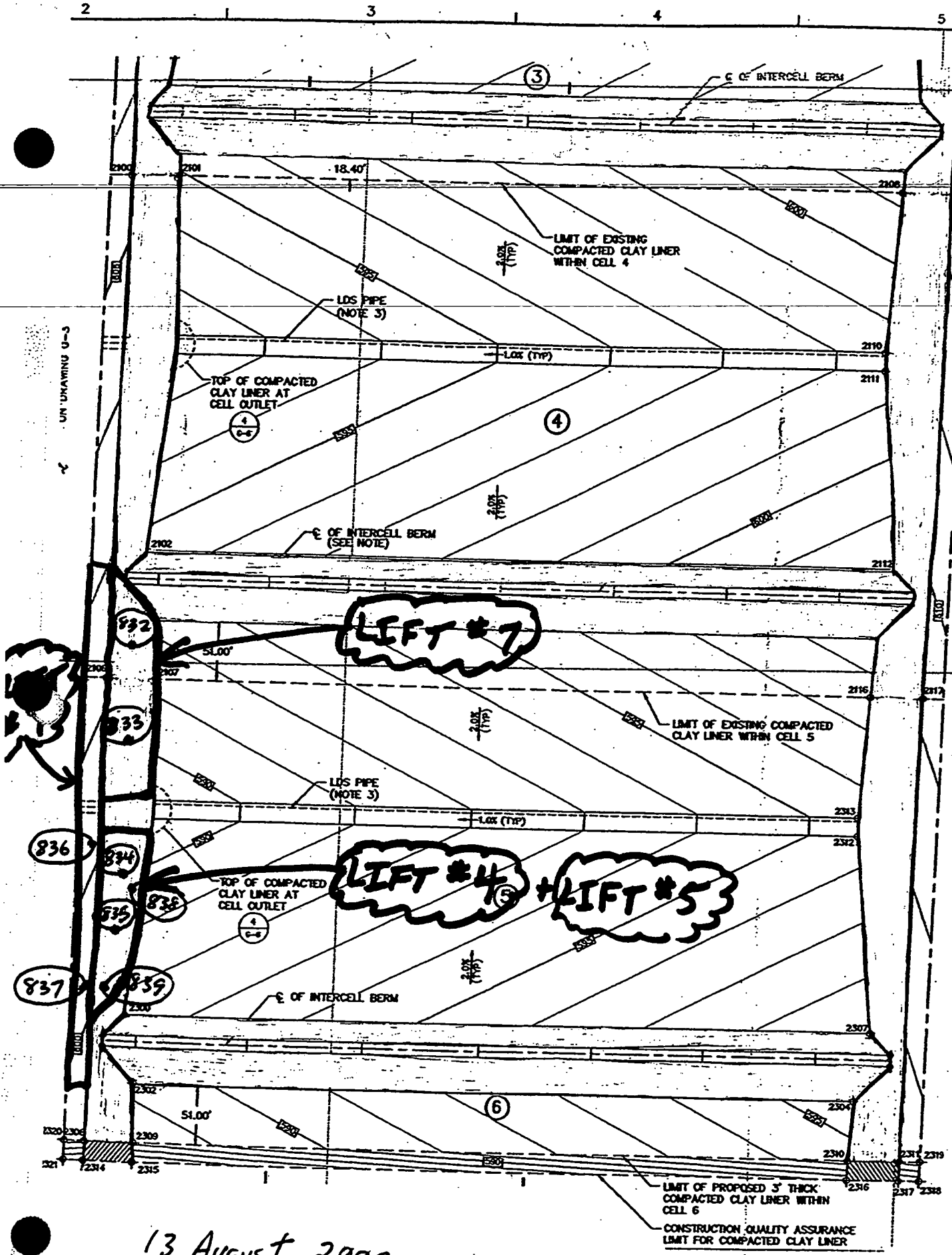

13 August 2002

GQ1341 04.1

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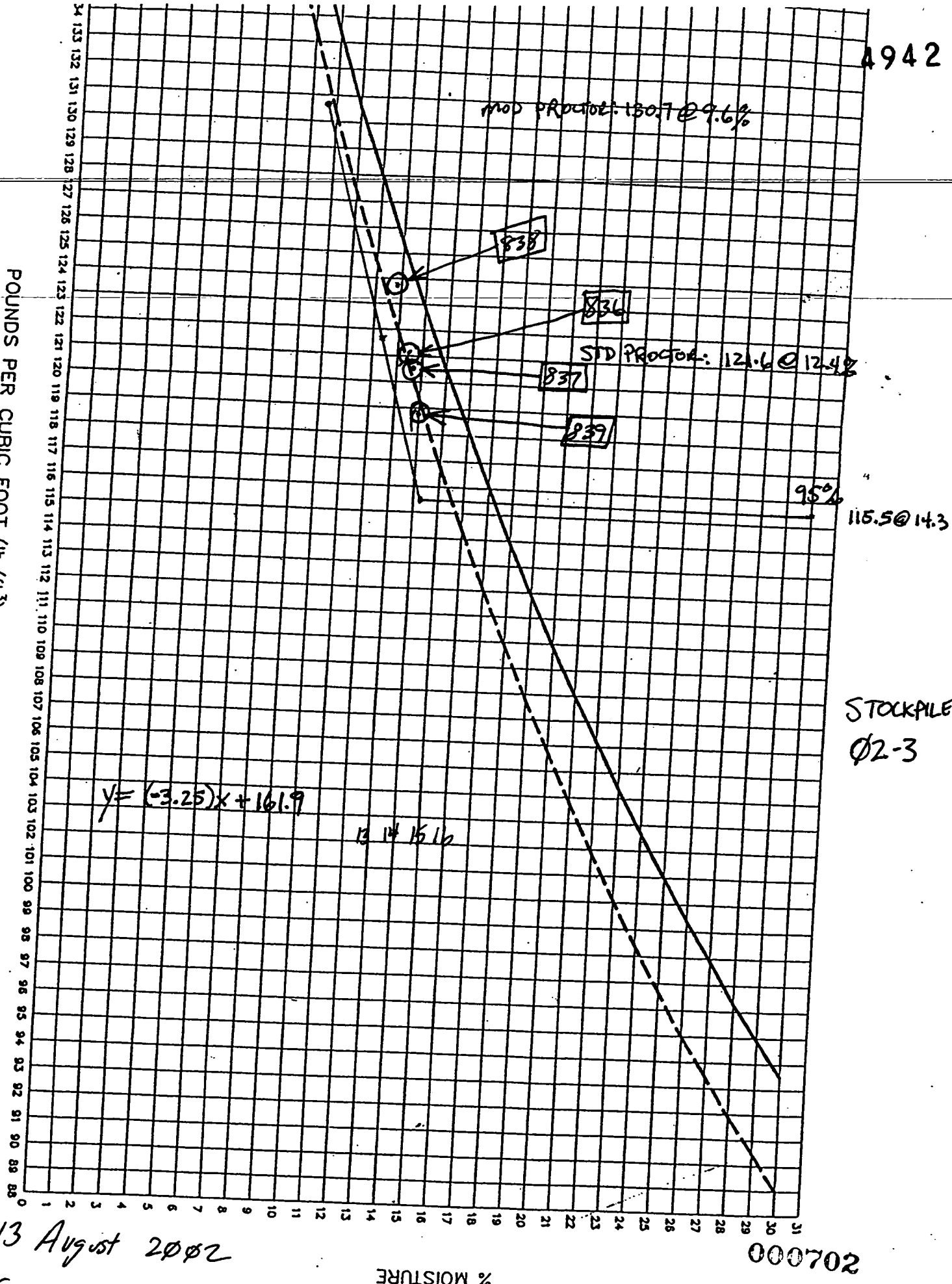

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Sheet #3 of 4

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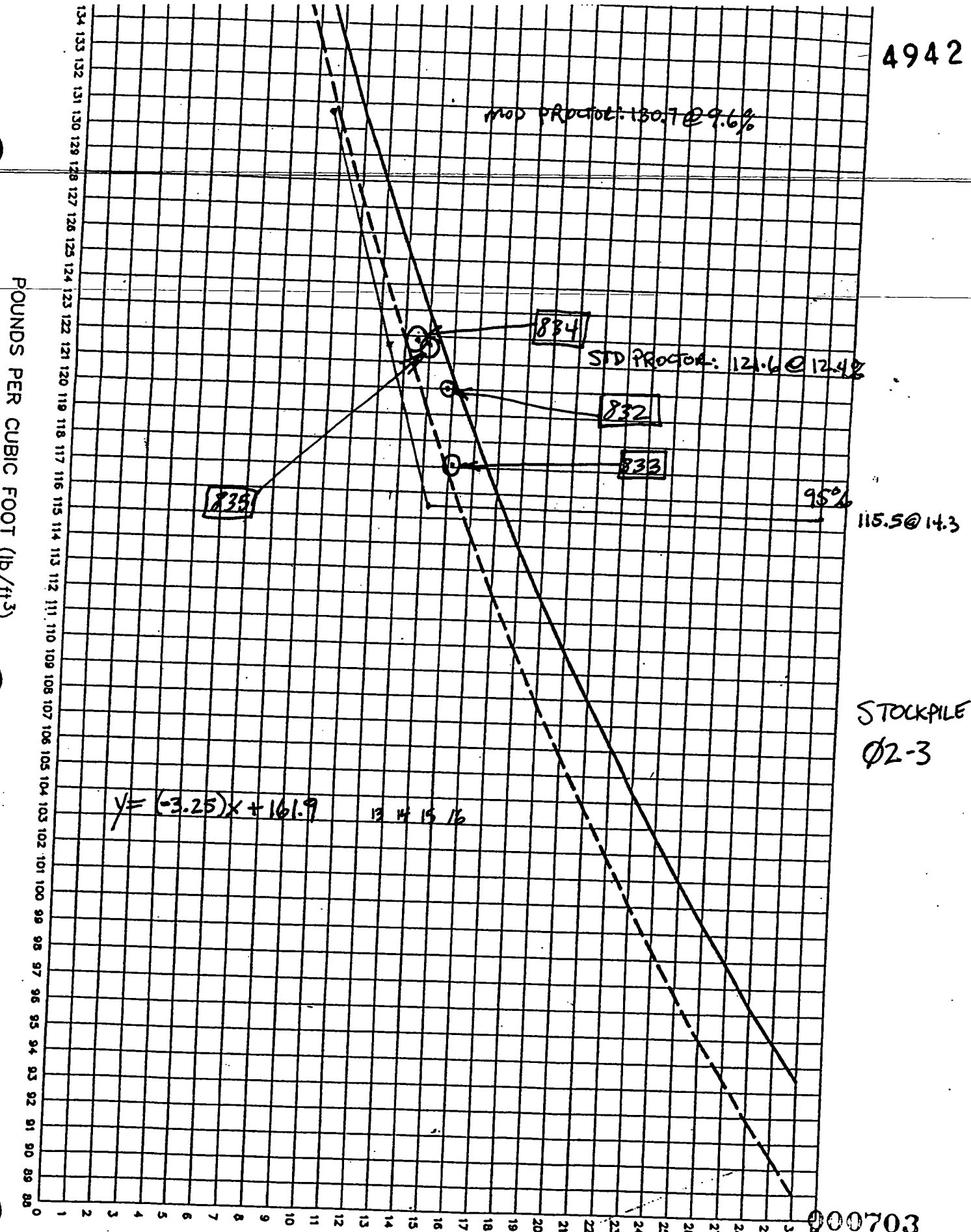

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13 August 2ØØ2

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Sheet # 4 of 4

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV - Cells 4, 5, & 6

PROJECT NO.: 6Q1341 TASK NO.: 04.1

DATE: 14 day Aug month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-3% LIFT THICKNESS (LOOSE / (COMPACTED): ~6"

MATERIAL SOURCE: Stockpile 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02-840	Cell #5-West 4:1 Slope	6"/L-6	02-3	12.4	121.6	11.0 / 12.7	137.7	122.2	100.5	P	—			
CL02-841	Cell #5-West 4:1 Slope	6"/L-6	02-3	12.4	121.6	10.9 / 12.6	137.5	122.1	100.4	P	—			

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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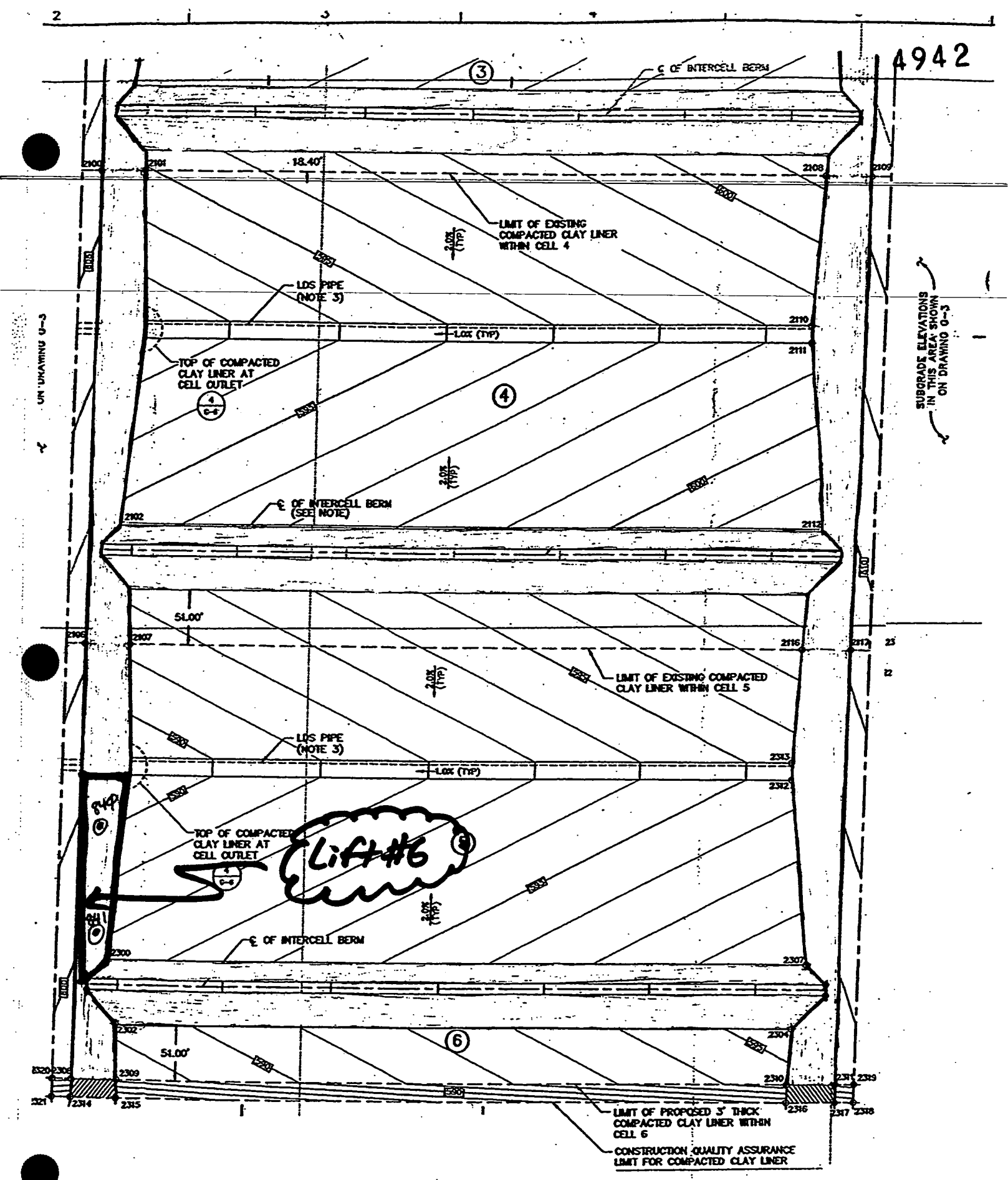

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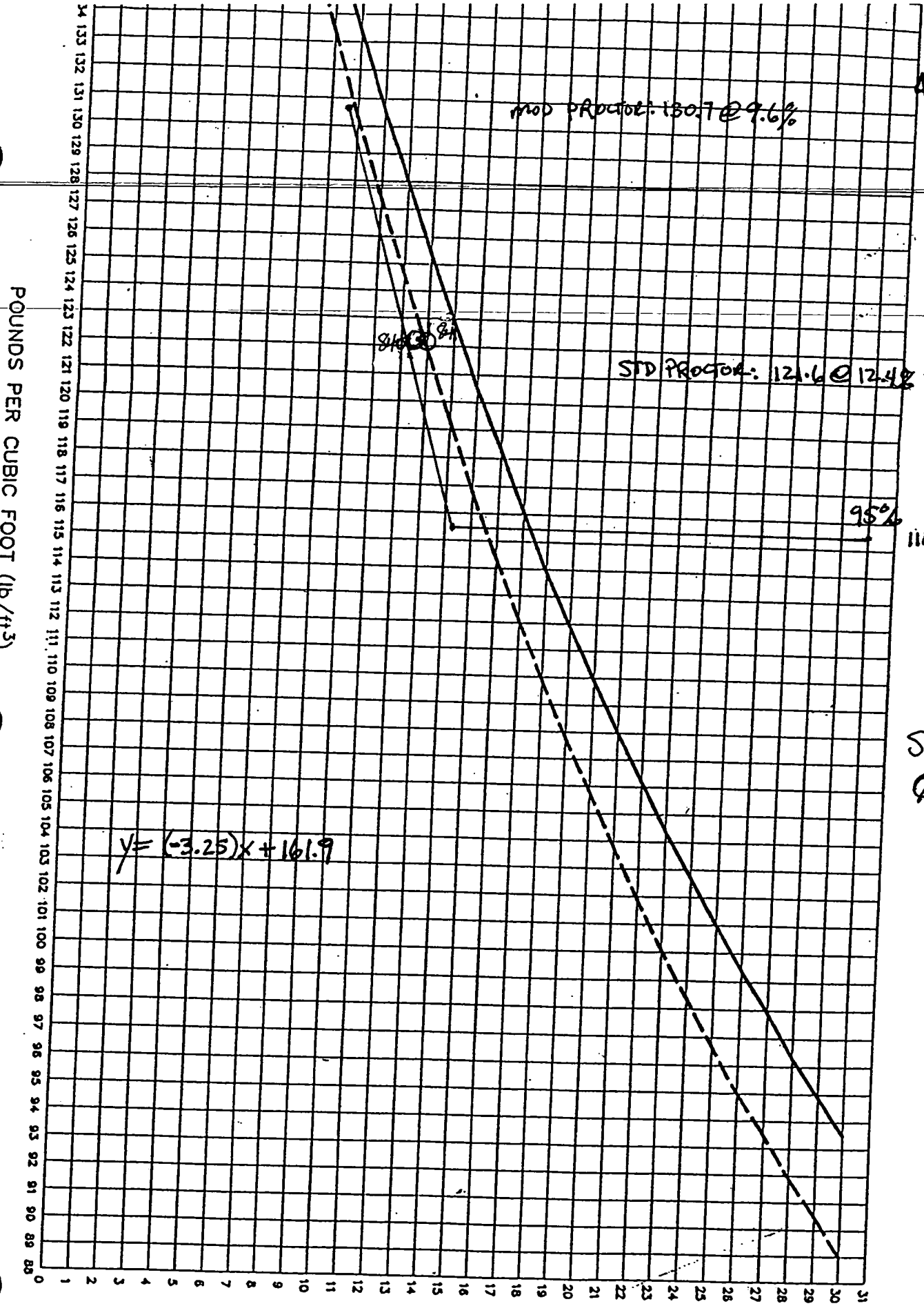

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase III Cell # 4, #5, #6

PROJECT NO.: G0134 TASK NO.: 04.1

DATE: 15 day August month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / COMPACTED): 24"

MATERIAL SOURCE: Stockpile/Spoils from floor MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 842	Cell #5, Penetration Box	4" / L-1	02-3	12.4	121.6	14.1 / (15.3)	134.6	116.7	96.0	P	—	—	—	—
CL02 843	Cell #5 Penetration Box	8" / L-4	02-3	12.4	121.6	13.4 / (14.7)	135.9	118.5	97.5	P	—	—	—	—
CL02 844	Cell #5 Penetration Box	8" / L-6	02-3	12.4	121.6	13.6 / (14.9)	134.3	116.9	96.1	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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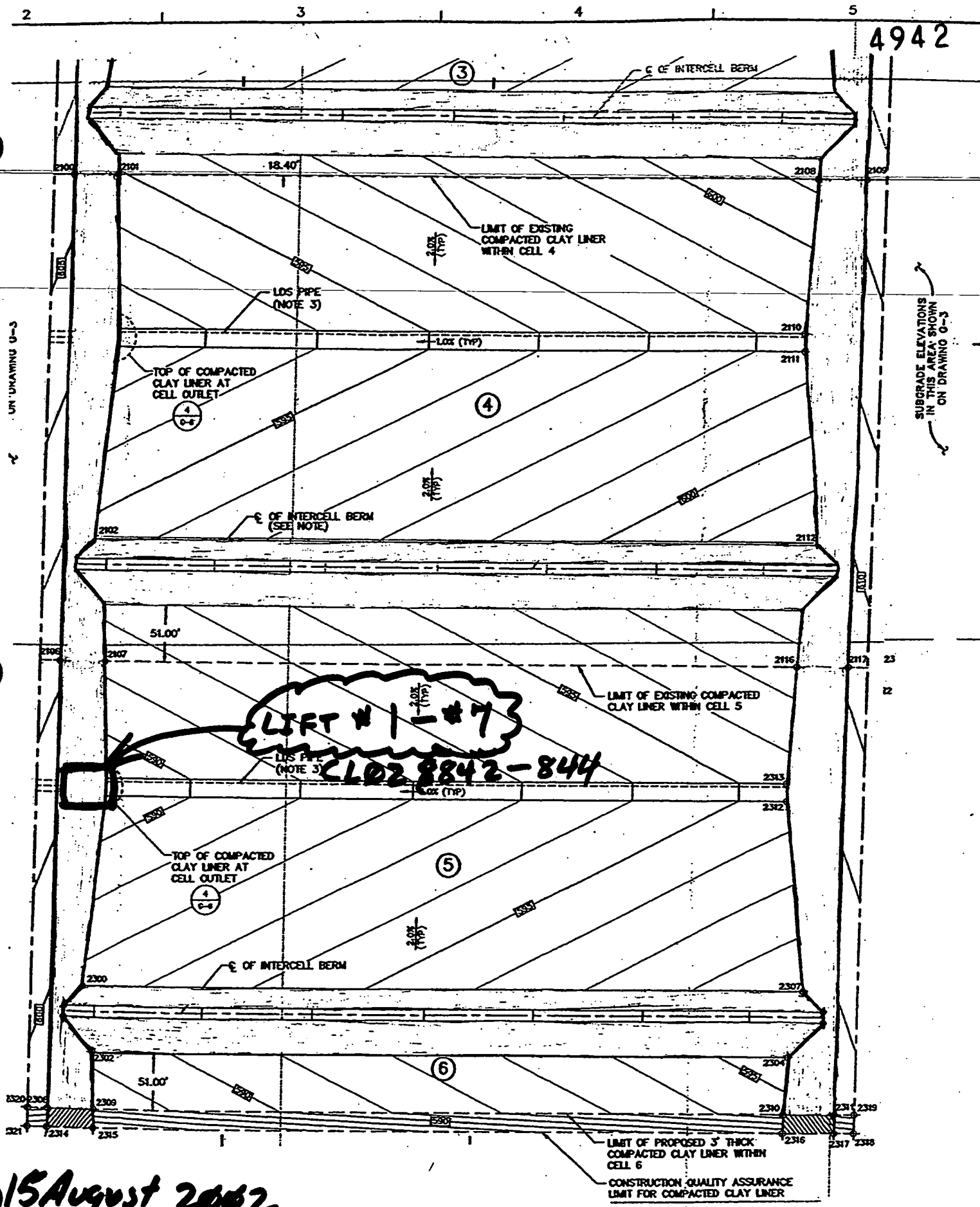

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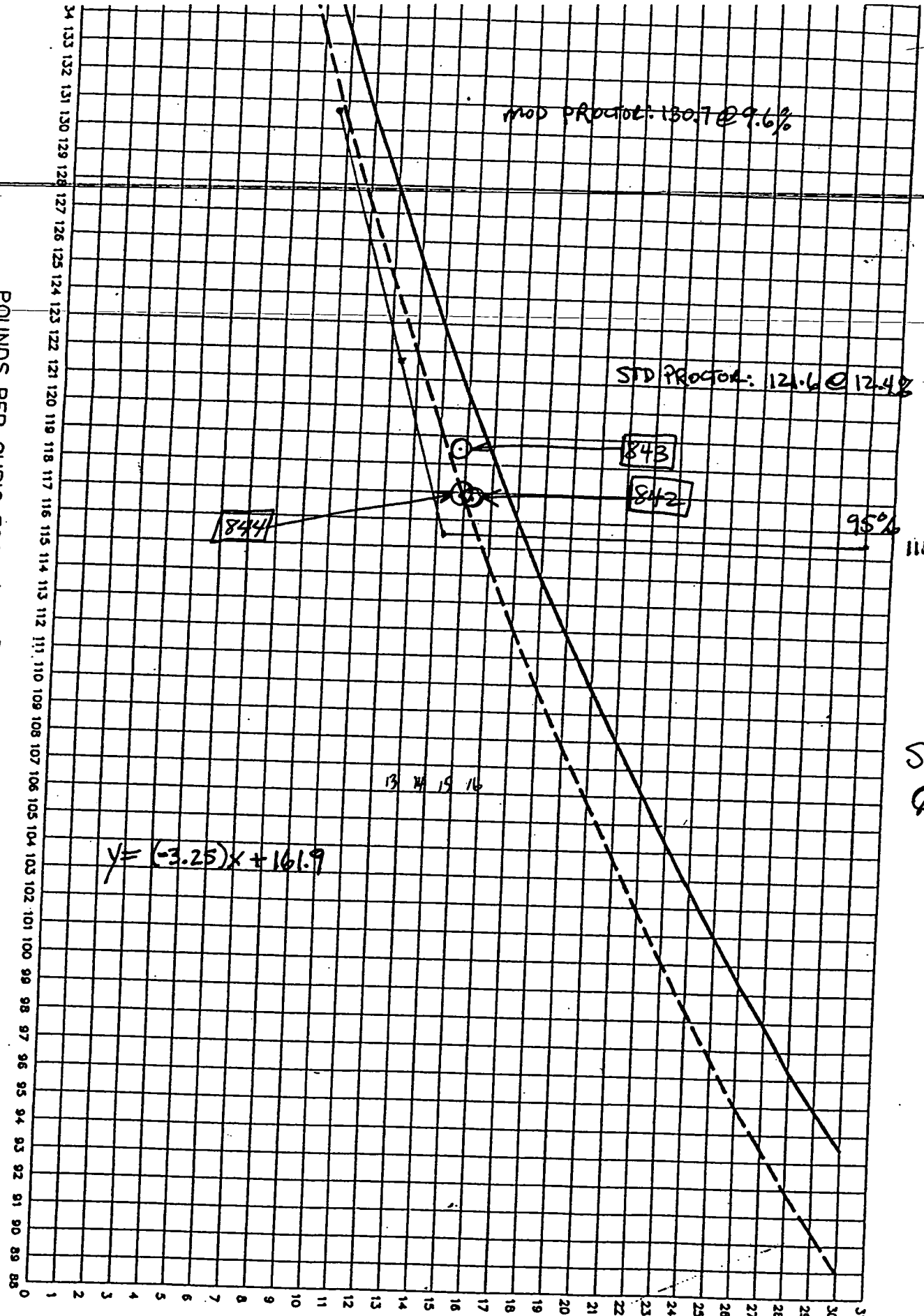

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 16 day August month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Stockpile + Spoils MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	FIELD TEST RESULTS PASS	FIELD TEST RESULTS FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 845	Cell #5 Penetration Box	10" / L-11	02-3	12.4	121.6	13.7 / 15.8	136.2	118.4	97.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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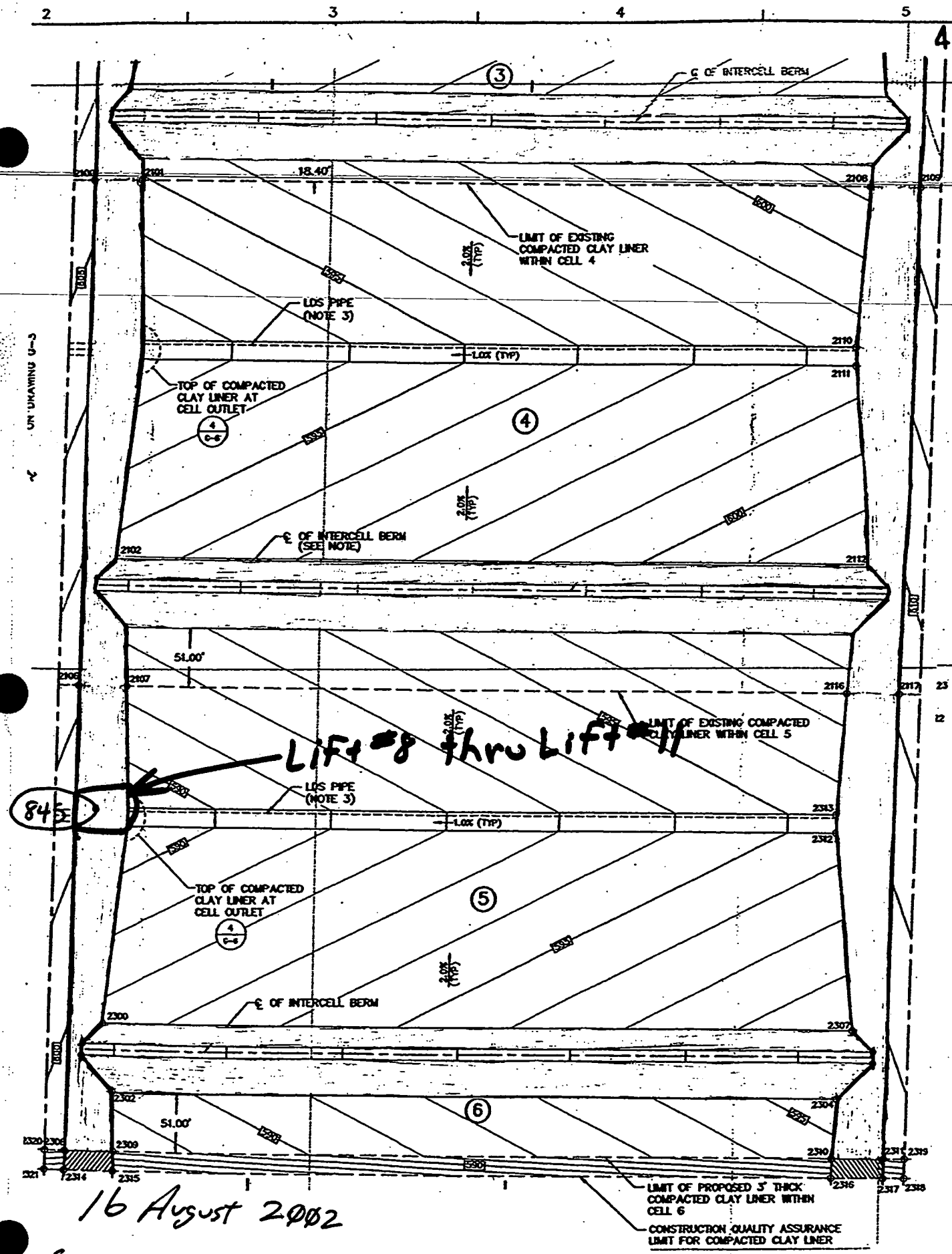

16 August 2002

GQ1341 04.1

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Sheet No. 2 of 3

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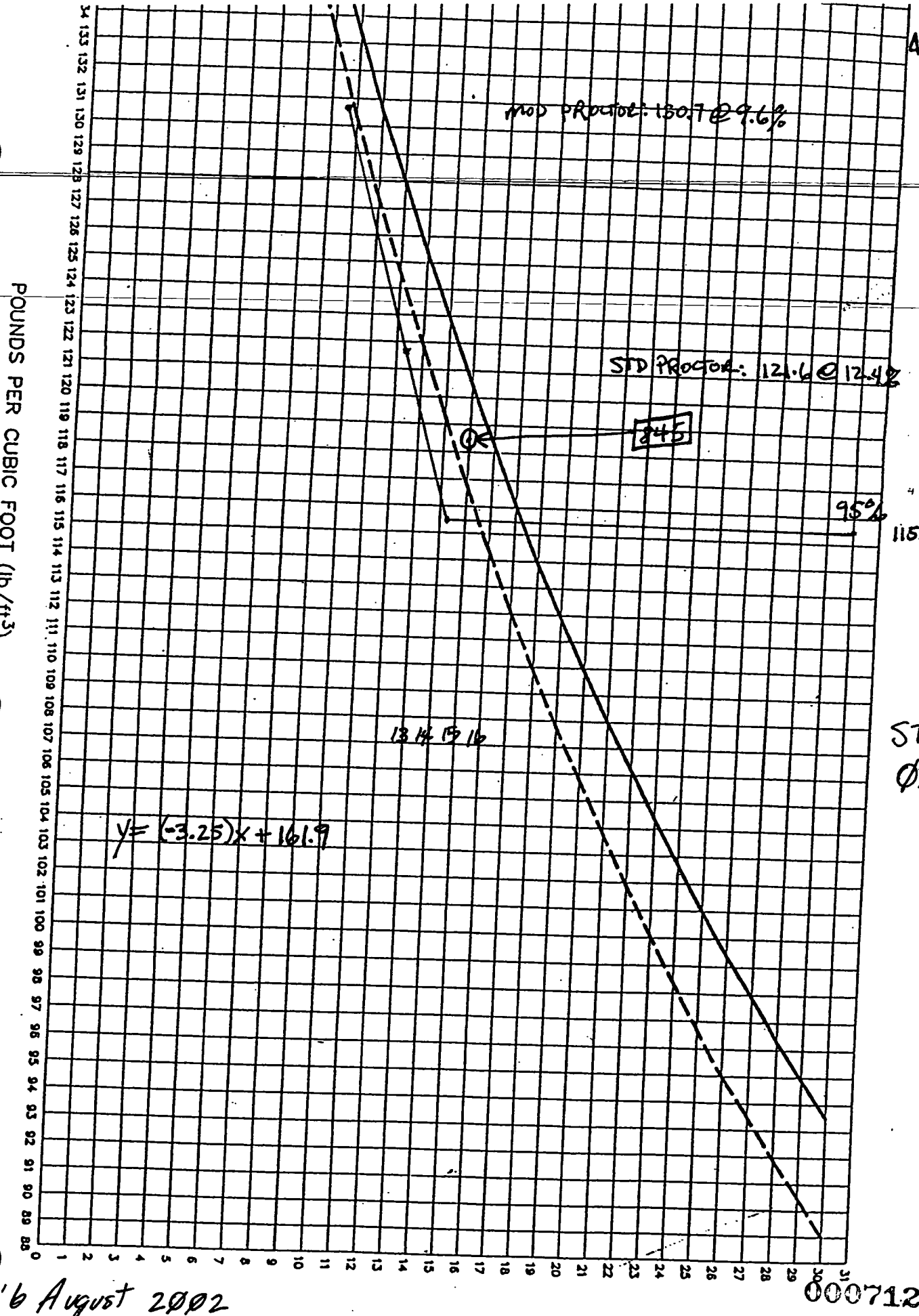

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Sheet No. 3 of 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4, #5, #6

PROJECT NO.: G01341 TASK NO.: 041

DATE: 17 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): ~6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: APZ APZ

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 846	CELL 6, Northwest Corner	6" / L-1	02-3	12.4	121.6	14.1 / 15.3	133.6	115.9	95.3	P	—	—	—	—
CL02 847	CELL 6, Northwest Corner	6" / L-2	02-3	12.4	121.6	13.5 / 14.8	137.5	119.8	98.5	P	—	—	—	—
CL02 848	CELL 6 Northwest Corner	6" / L-3	02-3	12.4	121.6	13.7 / 15.0	136.4	118.6	97.5	P	—	—	—	—
CL02 849	CELL #6, Northwest Corner	6" / L-4	02-3	12.4	121.6	12.7 / 14.1	138.5	121.4	99.8	P	—	—	—	—
	~~CELL #6 Northwest Corner~~	~~6" / L-4~~	~~02-3~~	~~12.4~~	~~121.6~~ CHW									
		/												
		/												
		/												
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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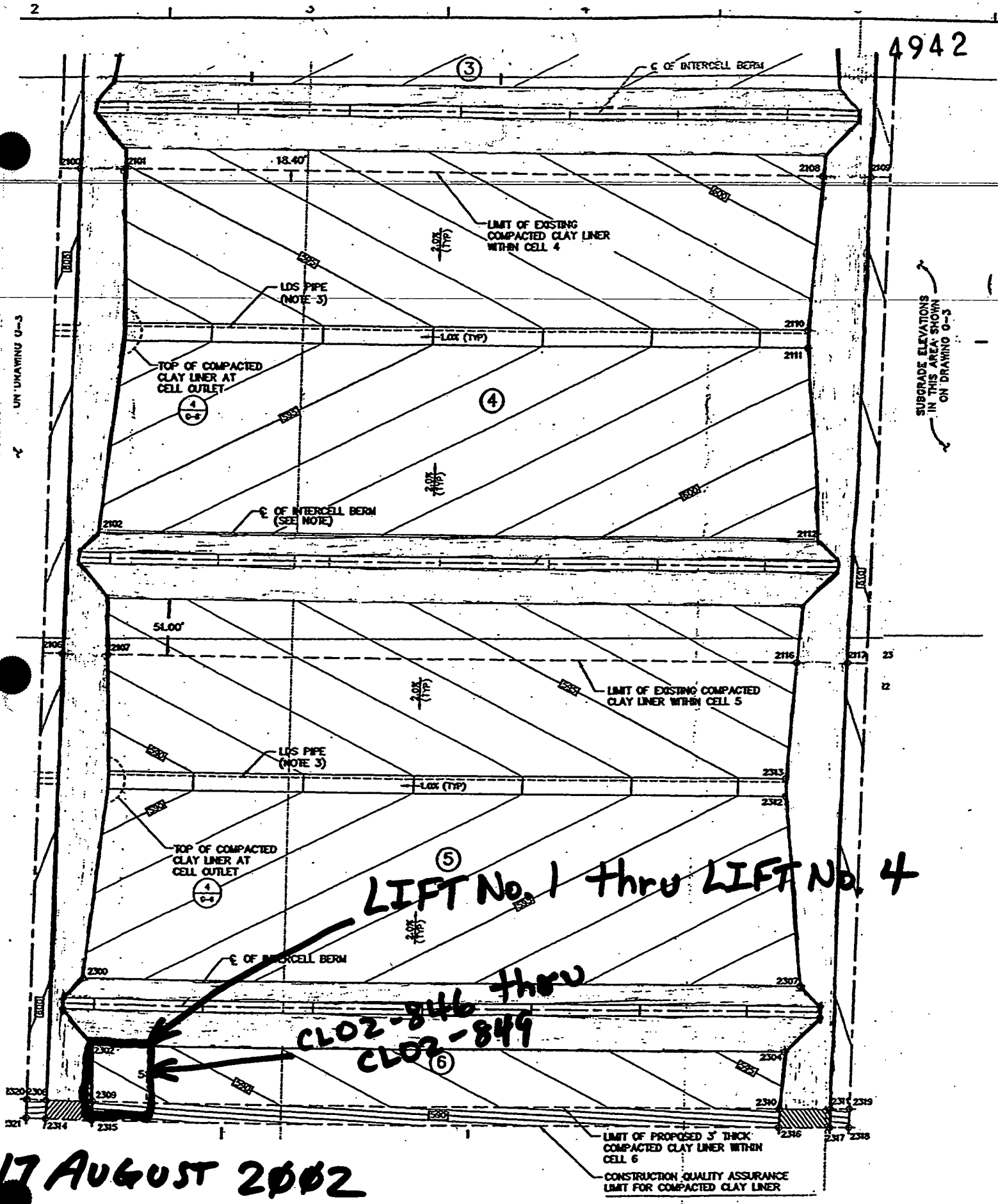

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G01341 04.1

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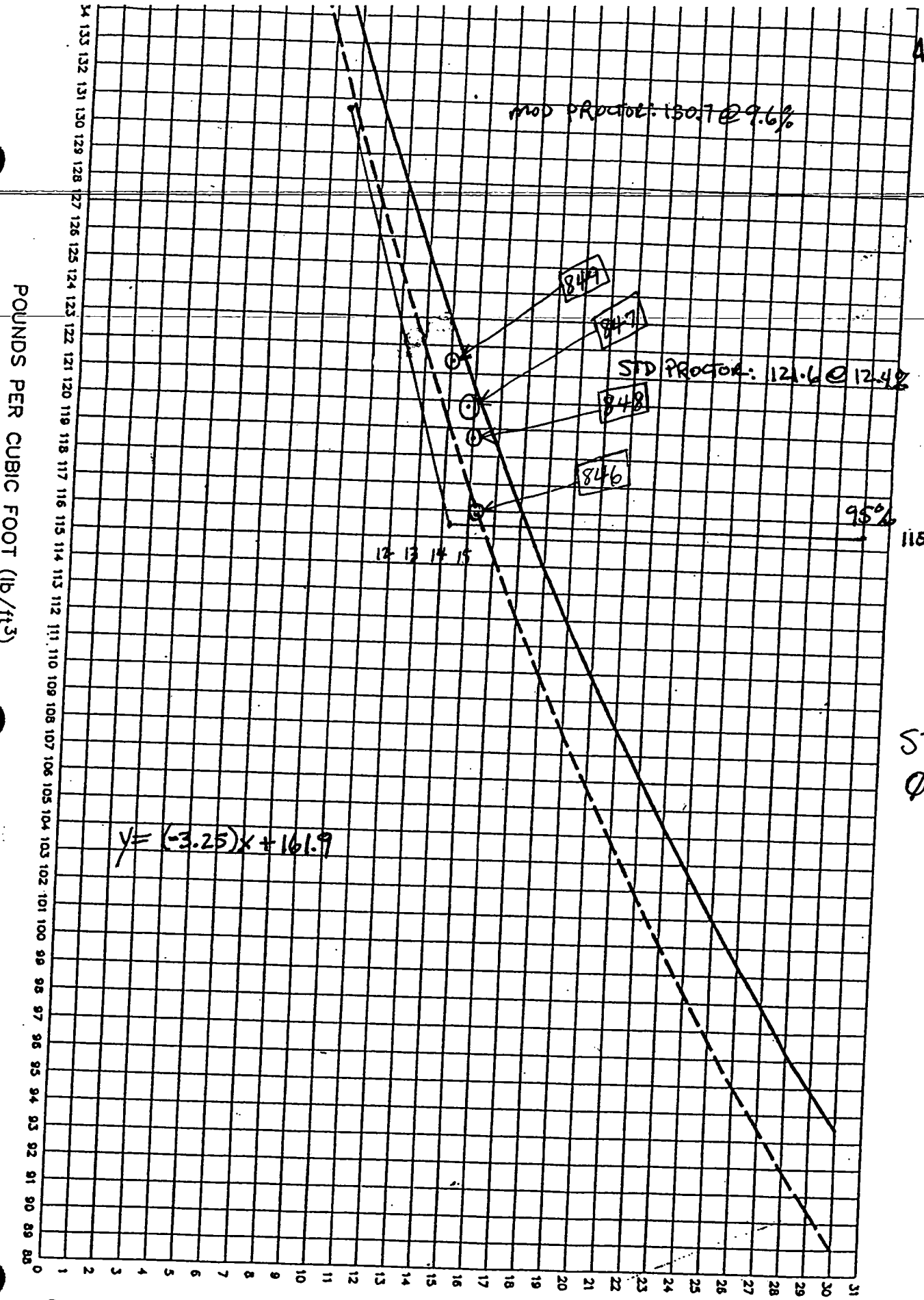

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17 August 2002

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GQ1341 04.1

Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 20 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

AP2 AP2

MATERIAL SOURCE: Stockpile MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 850	Cell #5 Penetration Boxes	10" / L-13	02-3	12.4	121.6	12.3 (13.8)	137.8	121.1	99.6	P	—	—	—	—
CL02 851	Cell #5 Penetration Boxes	12" / L-13	02-3	12.4	121.6	12.3 (13.8)	140.9	123.8	101.8	P	—	—	—	—
CL02 852	Cell #6 Northwest Corner	6" / L-5	02-3	12.4	121.6	14.1 (15.3)	137.1	118.9	97.8	P	—	—	—	—
CL02 853	Cell #5 WEST 4:1 SLOPE	6" / L-5	02-3	12.4	121.6	12.5 (14.0)	136.7	119.9	98.6	P	—	—	—	—
CL02 854	Cell #5 WEST 4:1 SLOPE	6" / L-5	02-3	124	121.6	12.3 (13.8)	136.6	120.0	98.7	P	—	—	—	—
855	Cell #4, ≈10' E. of Penetration Boxes	10" / L-3	02-3	12.4	121.6	11.5 (13.1)	136.8	121.0	99.5	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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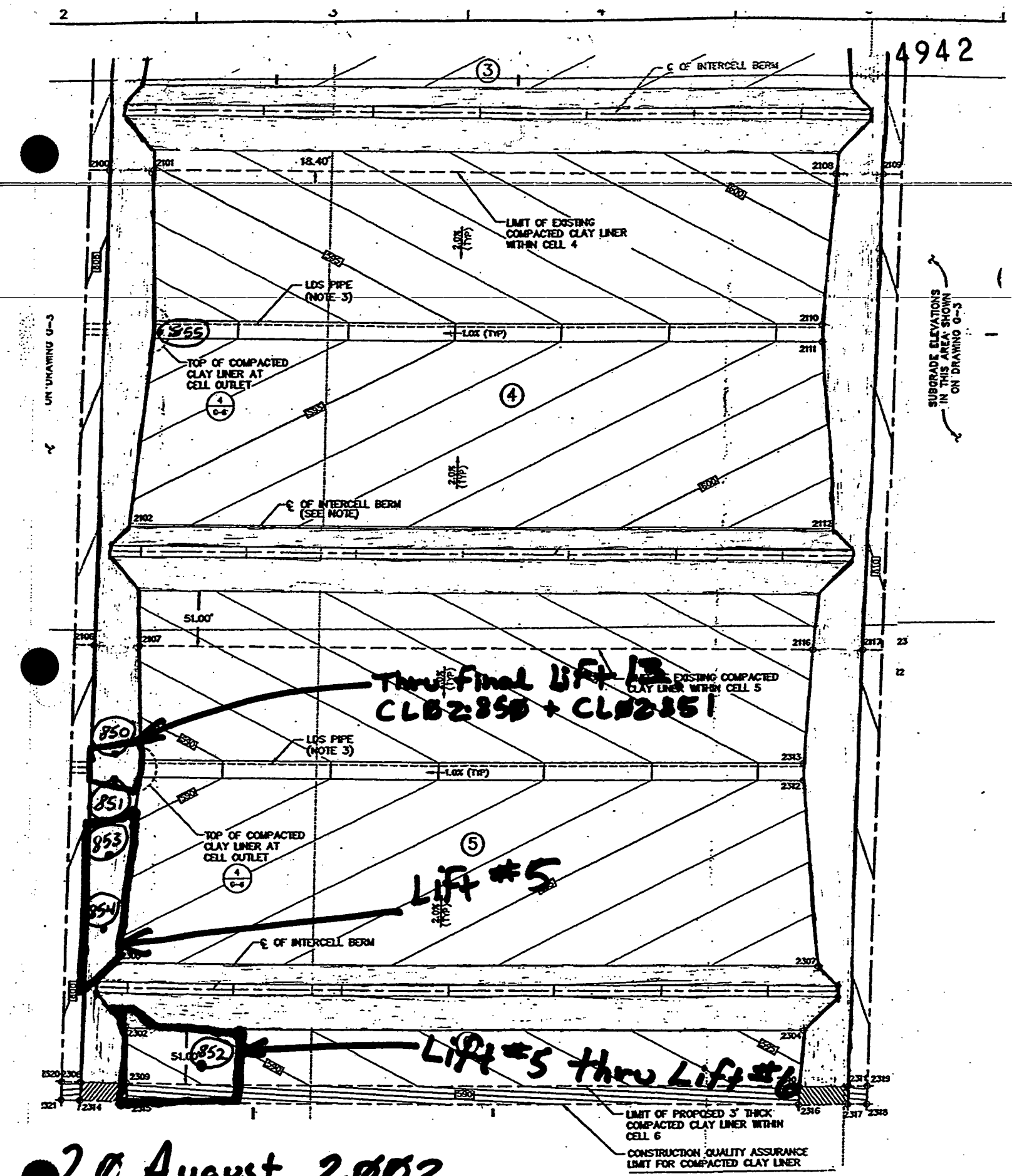

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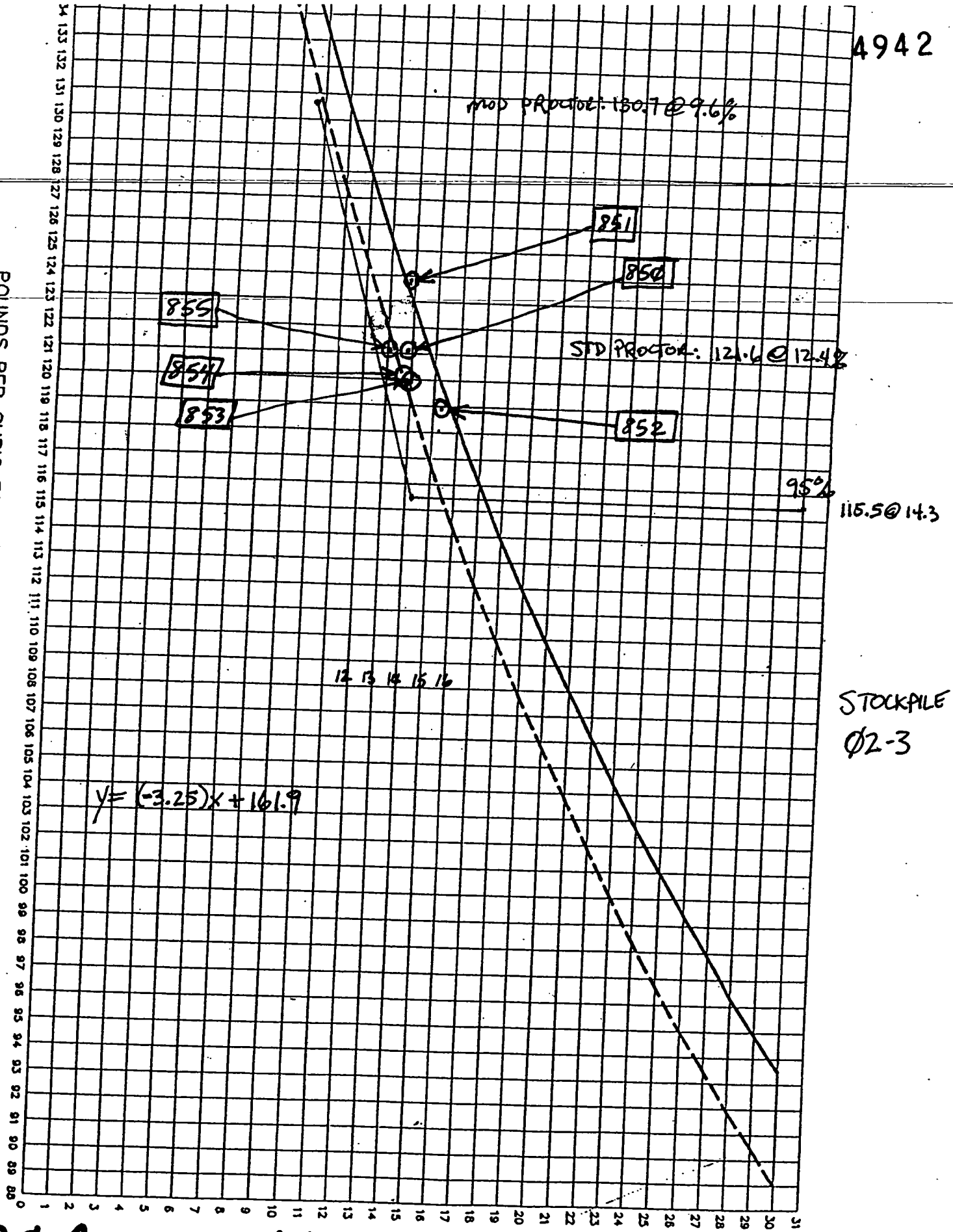

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase III

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 21 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 ~~95~~ 92 % COMPACTION / MOISTURE RANGE: ~~0-+3%~~ 2 LIFT THICKNESS (LOOSE/(COMPACTED)): 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: CHW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02 856	Cell #6, Northwest Corner	6" / L-6	02-3	12.4	121.6	11.4 (13.0)	139.8	123.7	101.7	P	—	—	—	—
CL02 857	Cell #5, ≈20' East of Penetration Boxes	10" / L-3	02-3	12.4	121.6	10.8 (12.5)	136.8	121.6	100.0	P	—	—	—	—
CL02 858	Cell #6 West 4:1 Slope	6" / L-3	02-3	12.4	121.6	13.0 (14.4)	135.5	118.4	97.4	P	—	—	—	—
CL02 859	Cell #5→#6 I.C. Berm	6" / L-3	02-3	12.4	121.6	11.6 (13.2)	138.3	122.2	100.5	P	—	—	—	—
CL02 860	Cell #5, West 4:1 Slope	6" / L-6	02-3	12.4	121.6	11.5 (13.1)	137.2	121.3	99.8	P	—	—	—	—
CL02 861	Cell #6 West 4:1 Slope	6" / L-5	02-3	12.4	121.6	12.4 (13.9)	137.2	120.5	99.1	P	—	—	—	—
CL02 862	Cell #6, West 4:1 Slope	12" / L-5	02-3	12.4	121.6	11.9 (13.5)	137.9	121.5	99.9	P	—	—	—	—
CL02 863	Cell #5→#6 I.C. Berm	12" / L-6	02-3	12.4	121.6	11.6 (13.2)	135.4	119.6	98.4	P	—	—	—	—
CL02 864	Cell #6, West 4:1 Slope	6" / L-6	02-3	12.4	121.6	13.6 (14.9)	133.1	115.8	95.2	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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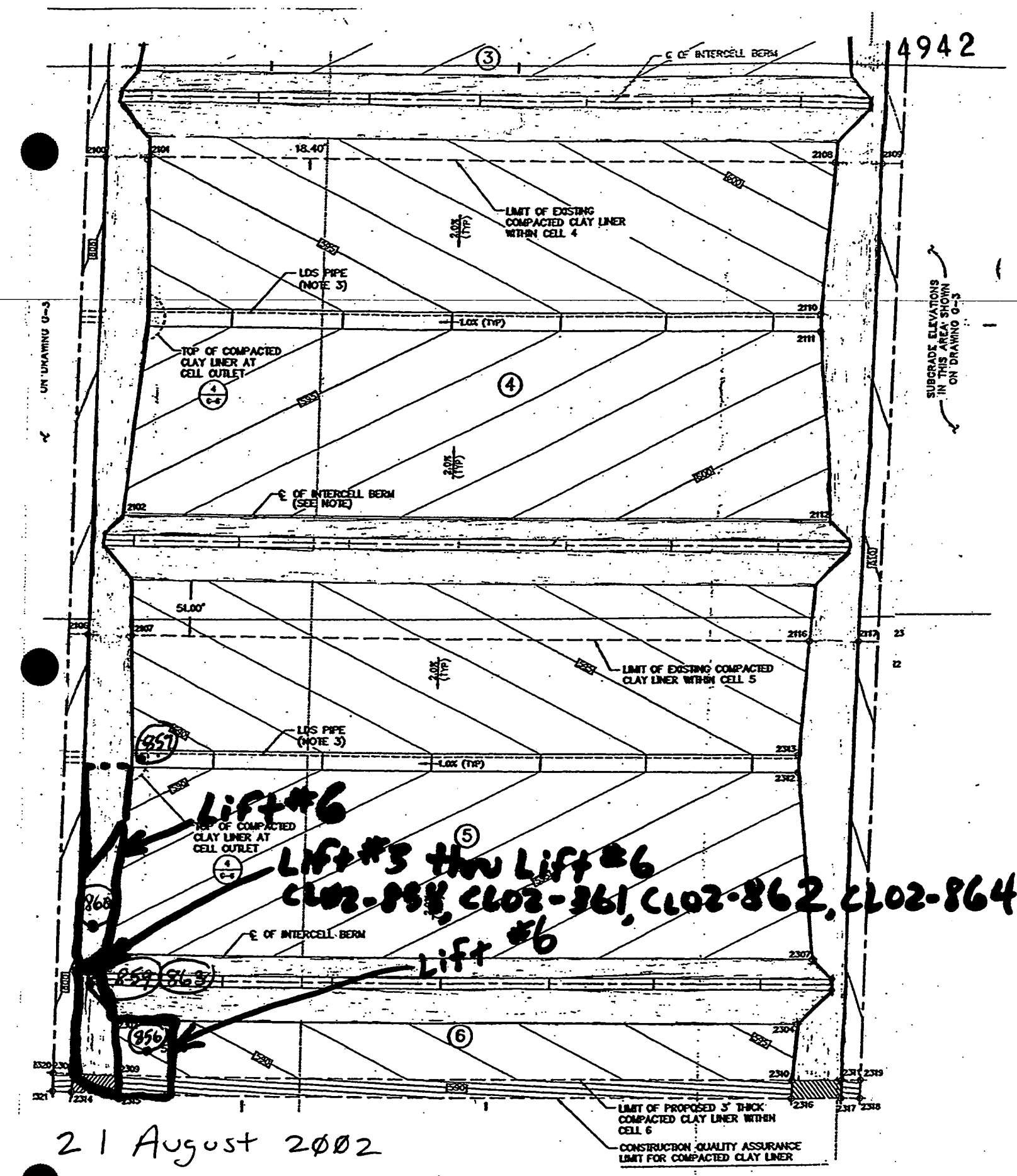

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Sheet No. 2 of 3

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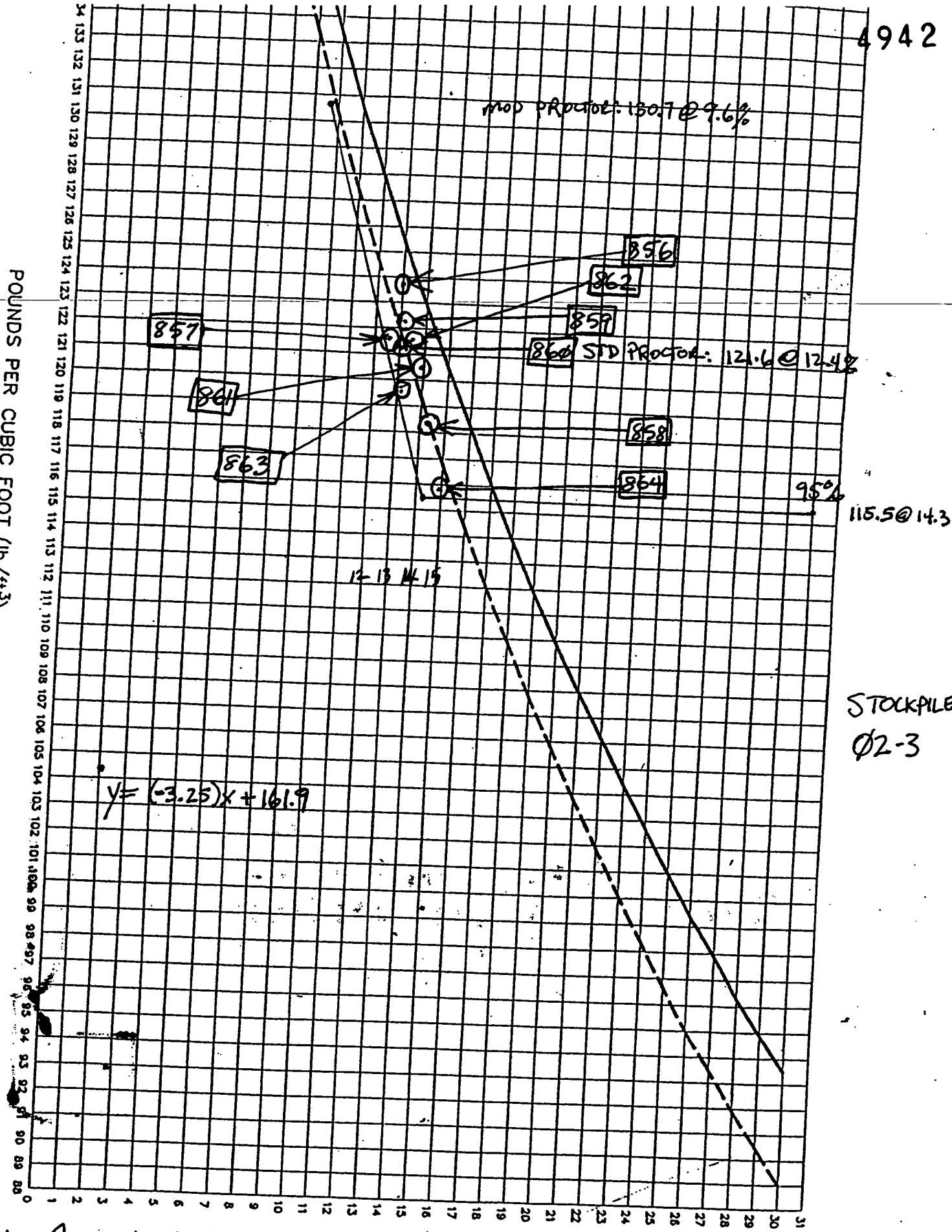

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV

PROJECT NO.: 601341 TASK NO.: 04.1

DATE: 22 day August month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE / (COMPACTED) 6"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: CHa

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CL02 865	Cell #6, West 4:1 Slope	L-7 / 8"	02-3	12.4	121.6	11.2 (12.9)	137.4	121.7	100.1	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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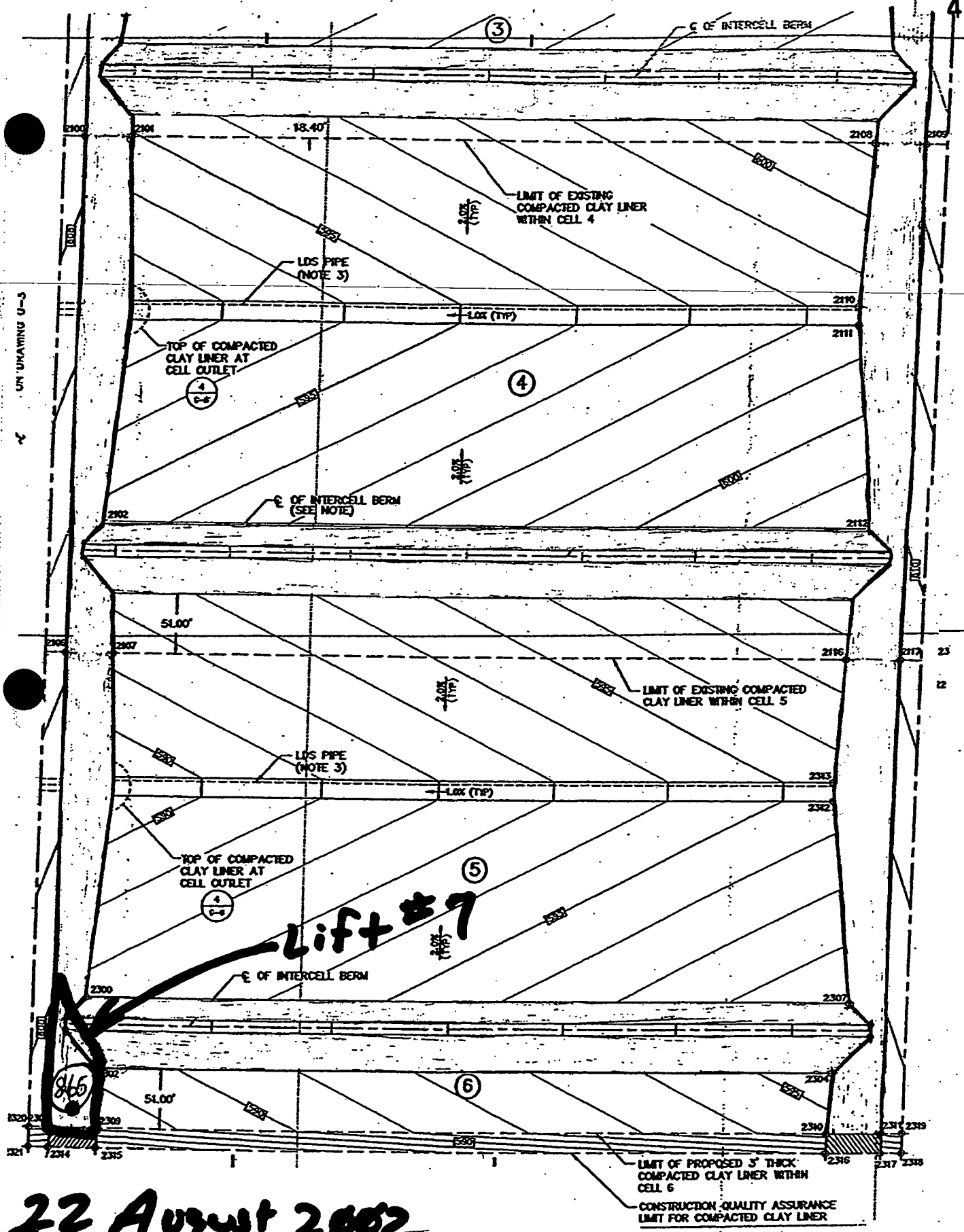

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Sheet No. 2 of 3

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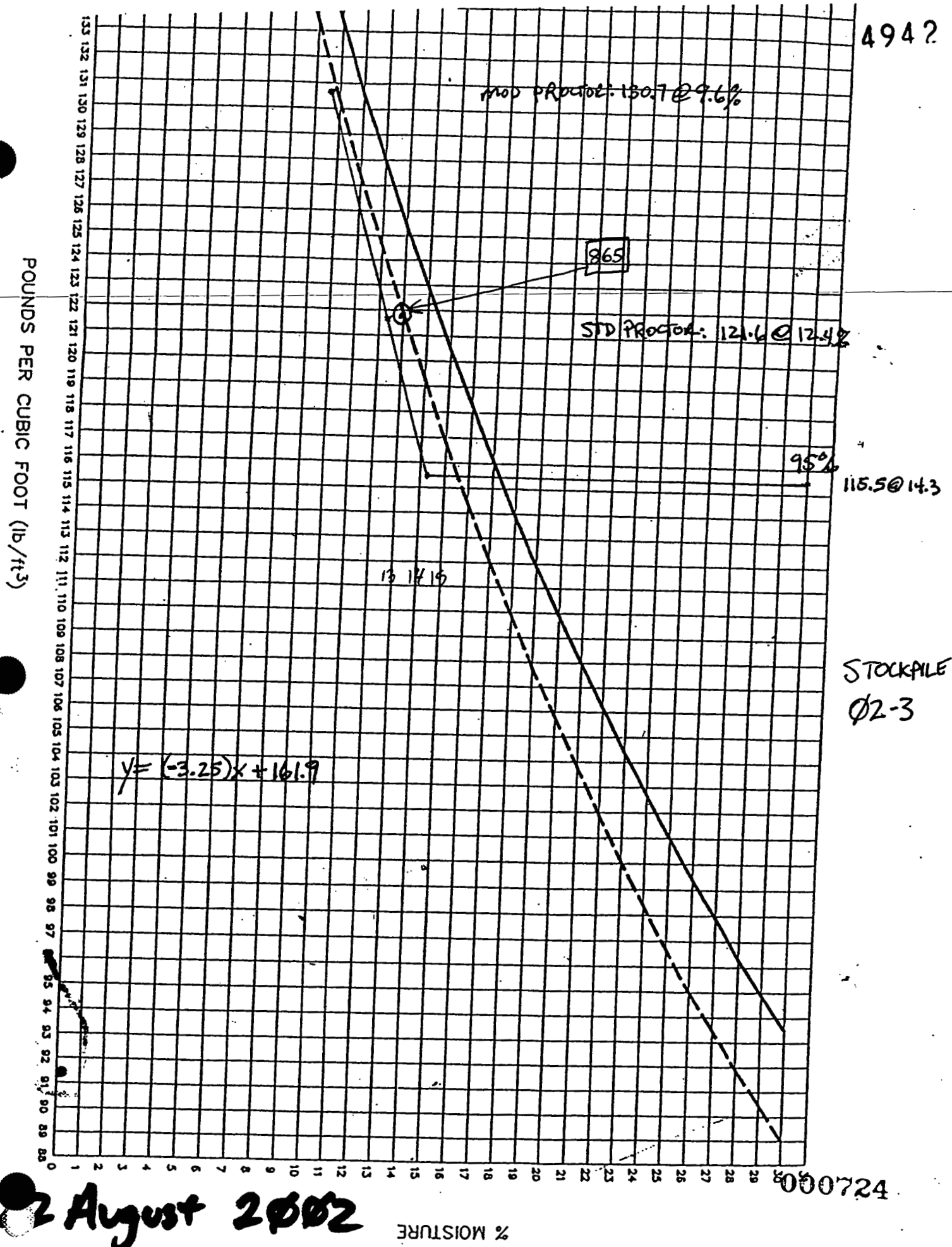

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Sheet No. 3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4/5 CLAY LINER

PROJECT NO.: 6A1341 TASK NO.: 4.1

DATE: 29 day AUG month 02 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE 0-+3 OF OPTIMUM LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. 2979

CORRECTION FACTOR Y = .8481X + 3.3669

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
866	CELL 5 PENETRATION BOXES	6" / 1	02-3	12.4	121.6	13.8 / 15.1	136.1	118.2	97	P	–	–		
867		6" / 2	02-3	12.4	121.6	12.3 / 13.8	137.9	121.1	99.6	P	–	–		
868		6" / 3	02-3	12.4	121.6	13.0 / 14.4	134.6	117.6	97	P	–	–		
869		6" / 4	02-3	12.4	121.6	12.7 / 14.1	137.1	120.2	98	P	–	–		
870		6" / 5	02-3	12.4	121.6	13.2 / 14.6	134.3	117.2	96	P	–	–		
871		6" / 6	02-3	12.4	121.6	13.8 / 15.1	136.0	118.1	97	P	–	–		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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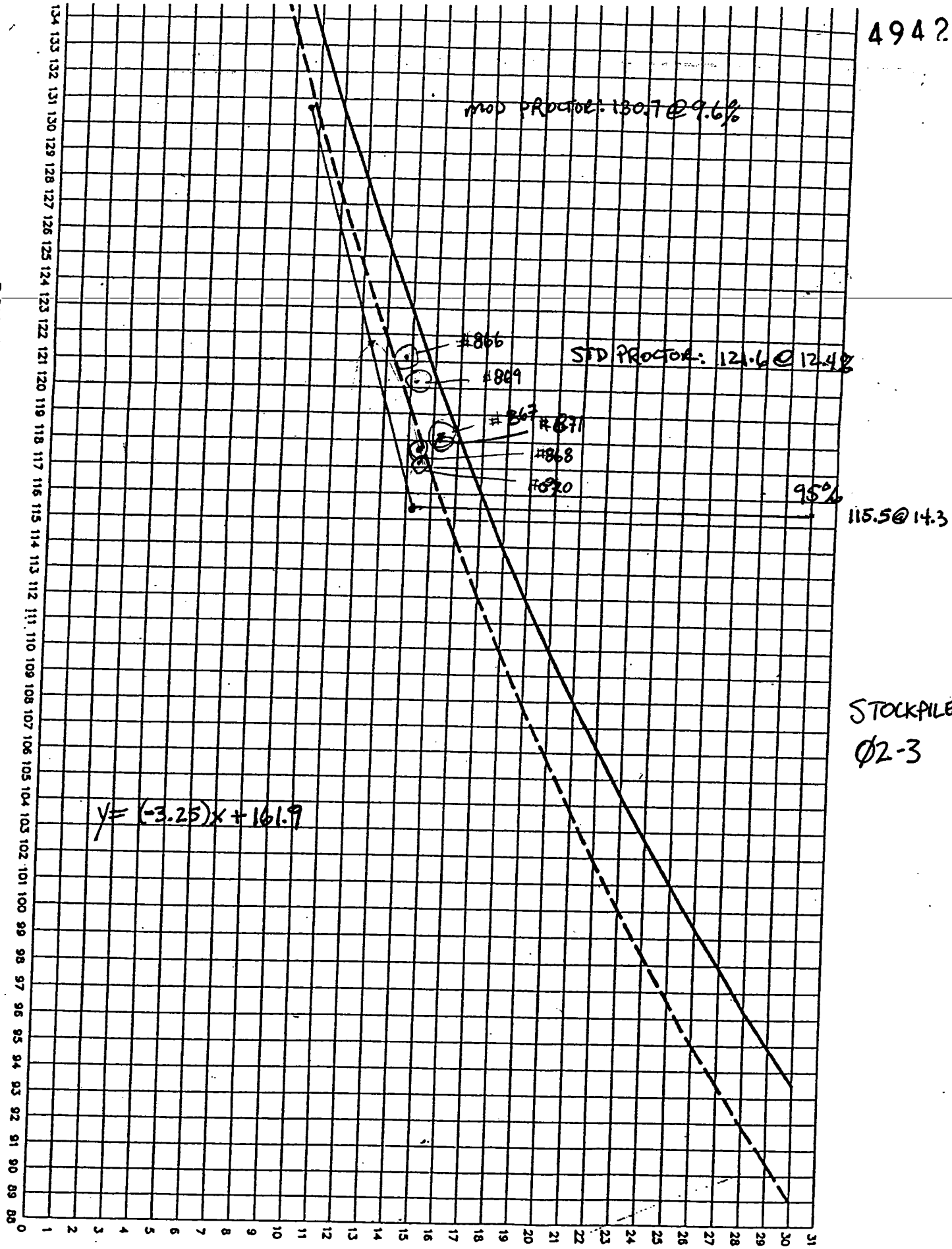

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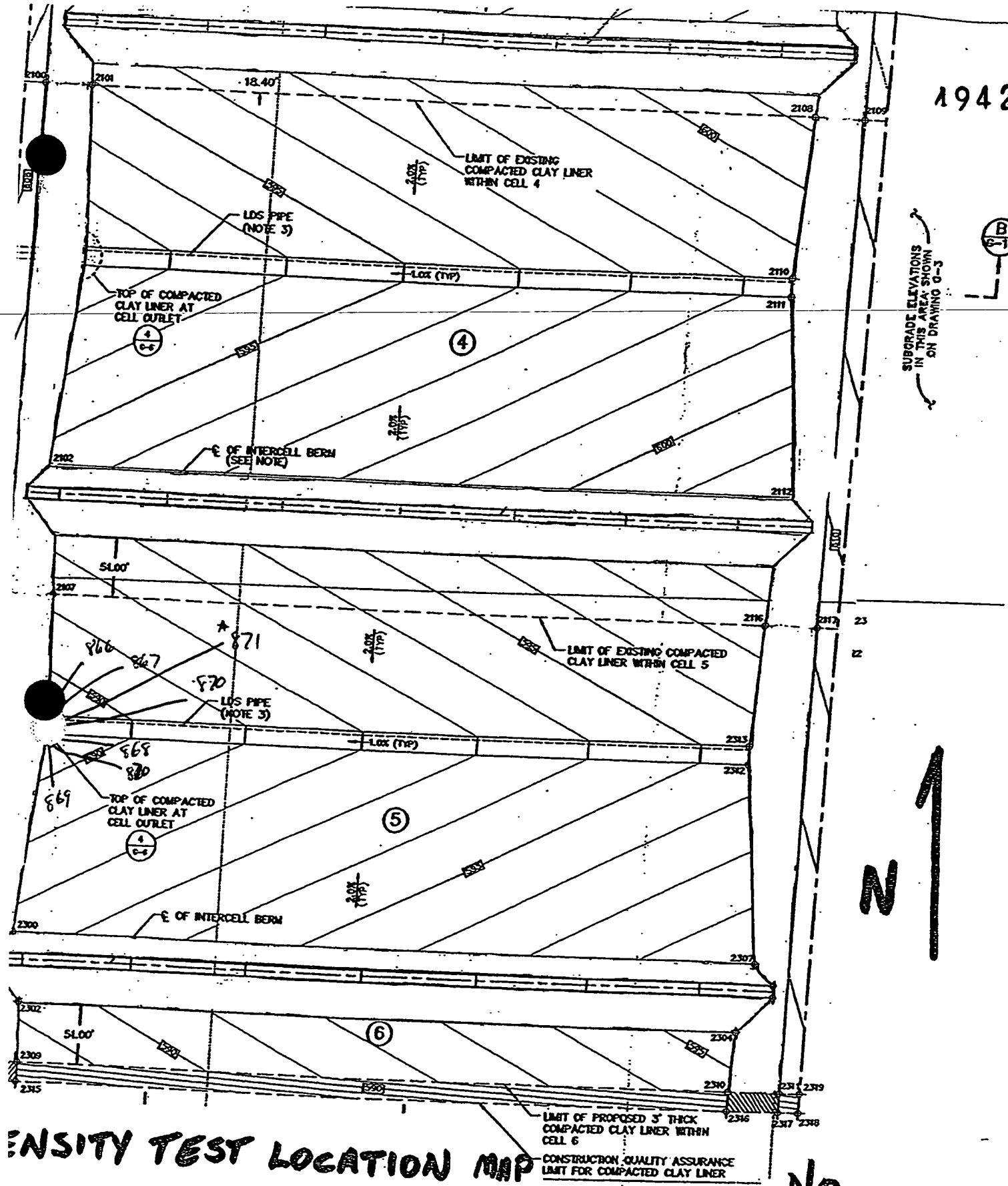

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ENSITY TEST LOCATION MAP

29 DAY Aug Month 02 YEAR

No SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION:

PROJECT NO.: 6a1341 TASK NO.: 4.1

DATE: 30 day AUG month 02 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0 - +3 OPTIMUM LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCK PILE 02-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: 3440 GAUGE SERIAL NO. 2929 CORRECTION FACTOR Y = .848/X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
872	PAD 5 PENETRATION BOXES	8"/ #7	02-3	12.4	121.6	12.0 / 13.5	137.1	120.8	99.3	✓	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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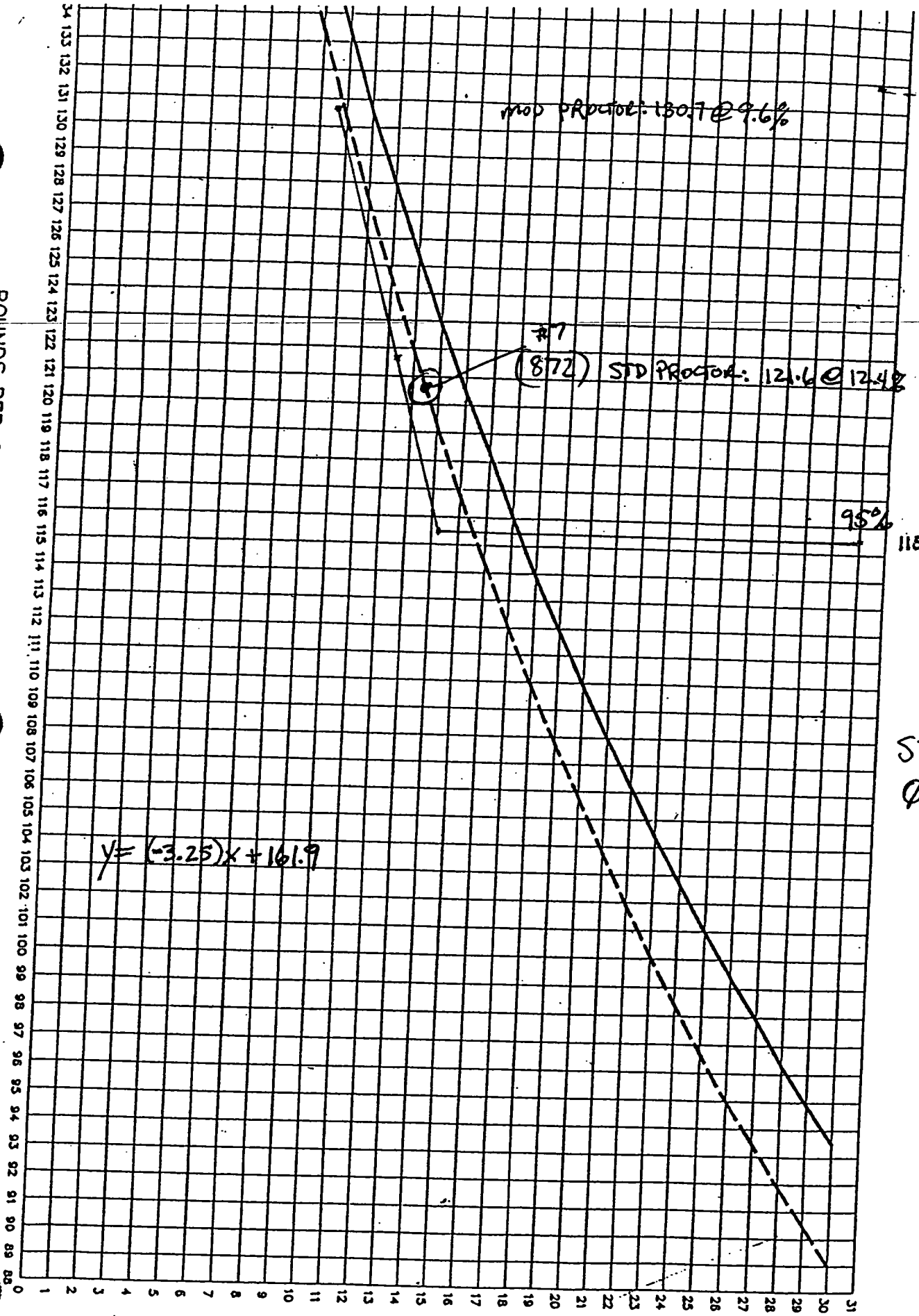

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STOCKPILE
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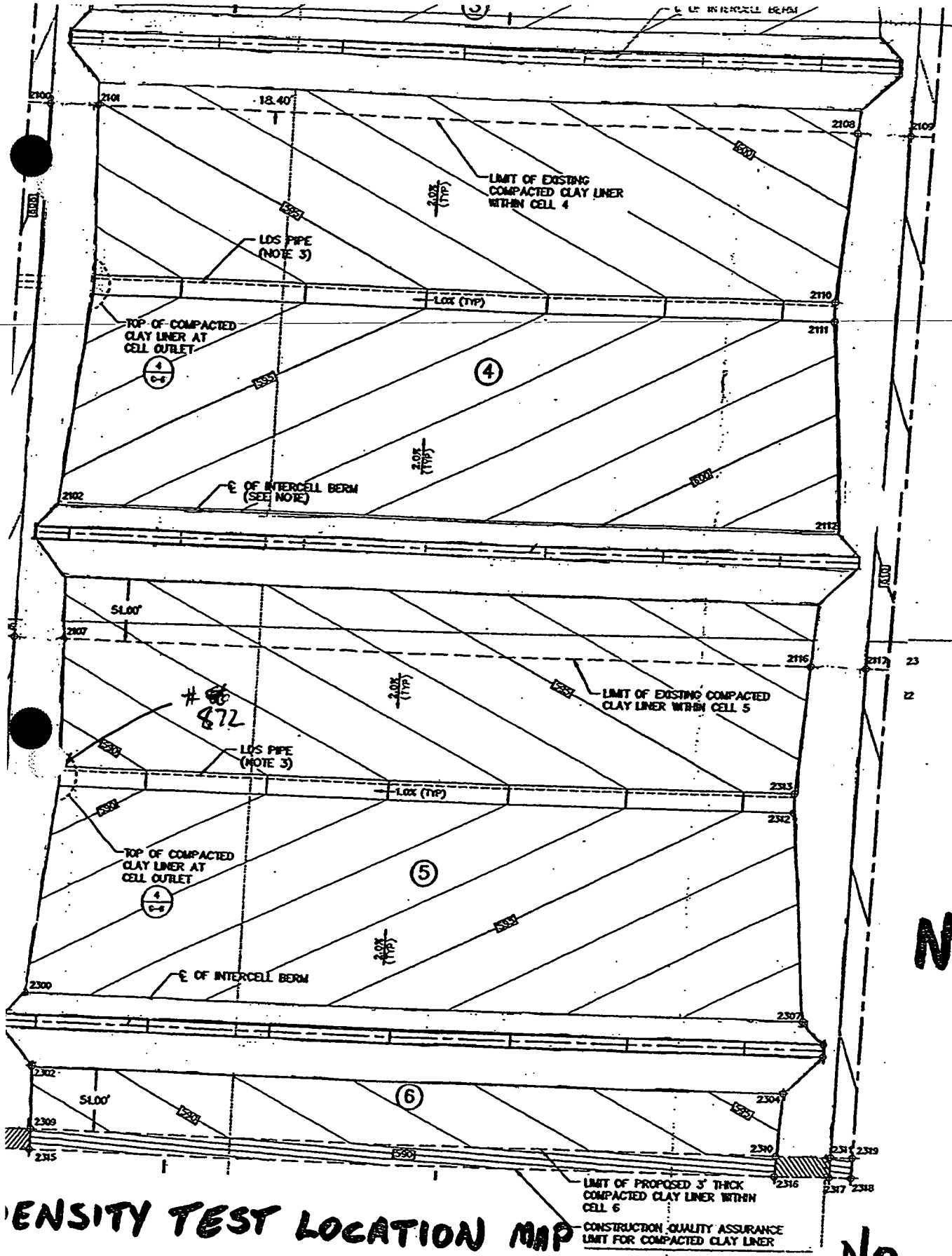

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ENSITY TEST LOCATION MAP

30 DAY Aug MONTH 02 YEAR

NO SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5 CLAY LINER

PROJECT NO.: 681341 TASK NO.: 4.1

DATE: 3 day SEPT month 02 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3 OPTIMUM LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: ~~2979~~ 3440 GAUGE SERIAL NO. 2979 CORRECTION FACTOR Y = .8481X + 3.669 QA ID: JGW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
873	PENETRATION BOX CELL 5	4"/12	02-3	12.4	121.6	11.9 / 13.5	134.2	118.2	97	P	–	–		
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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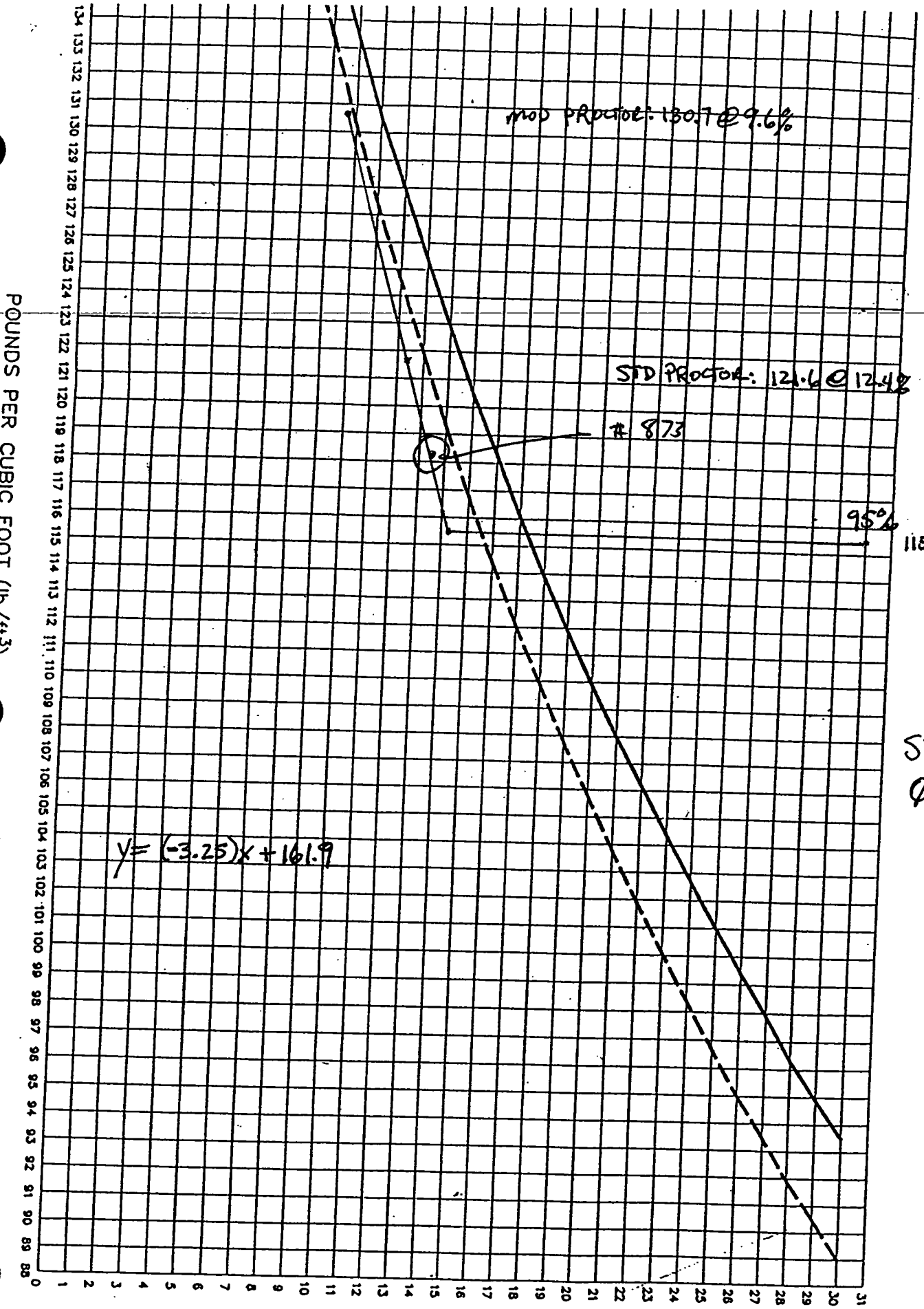

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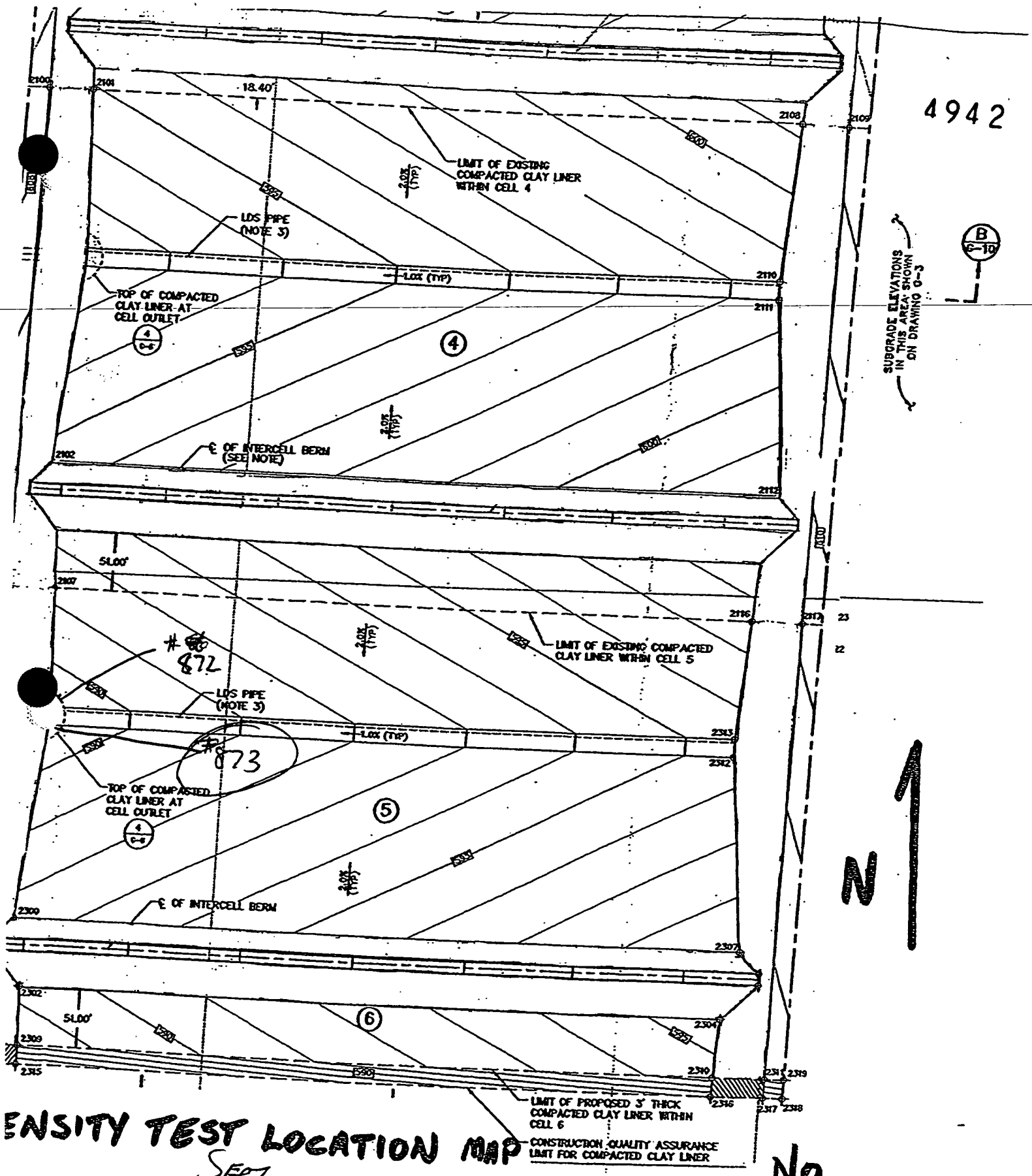

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ENSITY TEST LOCATION MAP

30 DAY ~~Aug~~ Sept Month 02 YEAR

No SCALE

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5

PROJECT NO.: 691341 TASK NO.: 4.1

DATE: 9 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM (D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3 OPTIMUM LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: STOCK PILE 03

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
874	CELL 5/6 BERM EAST SIDE	6" / K1	02-3	12.4	121.6	13.4 / 14.7	136.3	118.8	97.7	P	–	–		
875	CELL 5 EAST SIDE	6" / 1	02-3	12.4	121.6	13.9 / 15.1	134.0	116.4	95.7	P	–	–		
876	CELL 5 EAST SIDE	6 / 2	02-3	12.4	121.6	13.7 / 14.9	133.3	116.0	95.4	P	–	–		

000734

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 1

4942

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4+5

PROJECT NO.: 6Q1341 TASK NO.: 9.1

DATE: 10 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM D (698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3 OPTIMUM LIFT THICKNESS (LOOSE / COMPACTED): 8"

MATERIAL SOURCE: STOCKPICE 03

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: MW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
877	CELL 5 EAST SIDE	8" / 3	02-3	12.4	121.6	12.4 (JW)	139.0	~~121.8~~ 122.1	100.4 (JW)	P	–	–		
878	CELL 5 EAST SIDE	6" / 4	02-3	12.4	121.6	11.6 (JW)	139.1	122.8	100.0	P	–	–		
879	CELL 5 EAST SIDE	6" / 5	02-3	12.4	121.6	11.5 (JW)	136.6	120.7 (JW)	99.3 (JW)	P	–	–		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 415

PROJECT NO.: GQ 1341 TASK NO.: 4.1

DATE: 11 day Oct month 02 year

SPECIFICATION REQUIREMENTS: ASTM D (698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-2% OF OPTIMUM LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCK PILE 03 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.669 QA ID: JW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
880	CELL 6 AREA 5 OF 5/6 2S BERM	6" / 6	02-3	12.4	121.6	12.6 ~~14.3~~ 14.0	138.7	121.6	100.0 ~~99.7~~	P	–	–		

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 1

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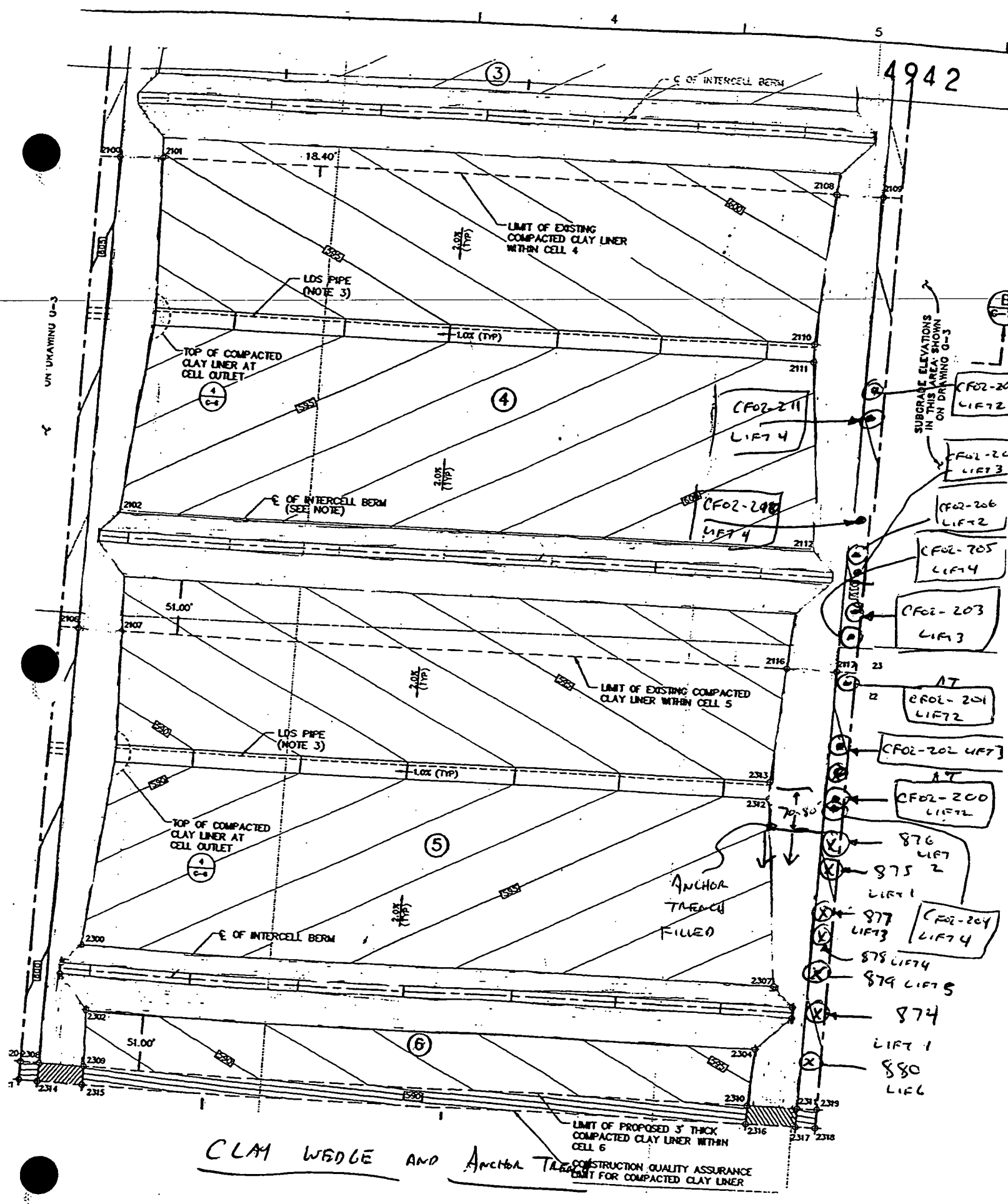

CLAY WEDGE AND ANCHOR TRENCH

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL #4, #5, and #6

PROJECT NO.: 62134 TASK NO.: 04.1

DATE: 12 day 09 month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~±0.3%~~ ±2 LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 26979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: D-6

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
881	CELL 5 EAST WEDGE	6" / L-2	02-3	12.4	121.6	12.2 (13.7)	135.1	118.8	97.7	P	—	—	—	—
882	CELL 5 EAST WEDGE	6" / L-2	02-3	12.4	121.6	12.2 (13.7)	139.8	122.9	101.1	P	—	—	—	—
883	CELL 4 EAST WEDGE	6" / L-2	02-3	12.4	121.6	11.4 (13.0)	138.5	122.5	100.8	P	—	—	—	—
884	CELL 4 EAST WEDGE	6" / L-2	02-3	12.4	121.6	12.4 (13.9)	138.0	121.1	99.6	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 3

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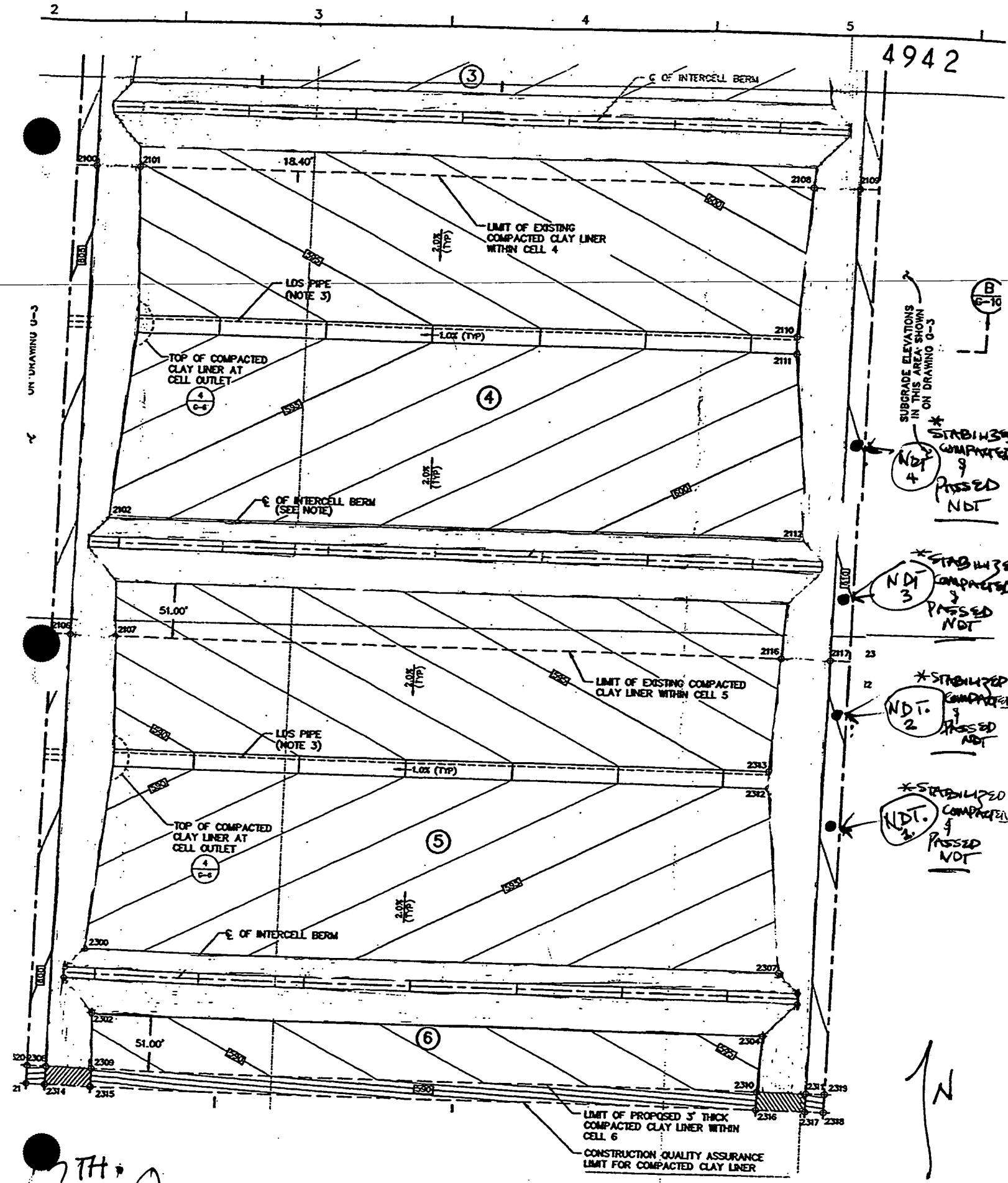
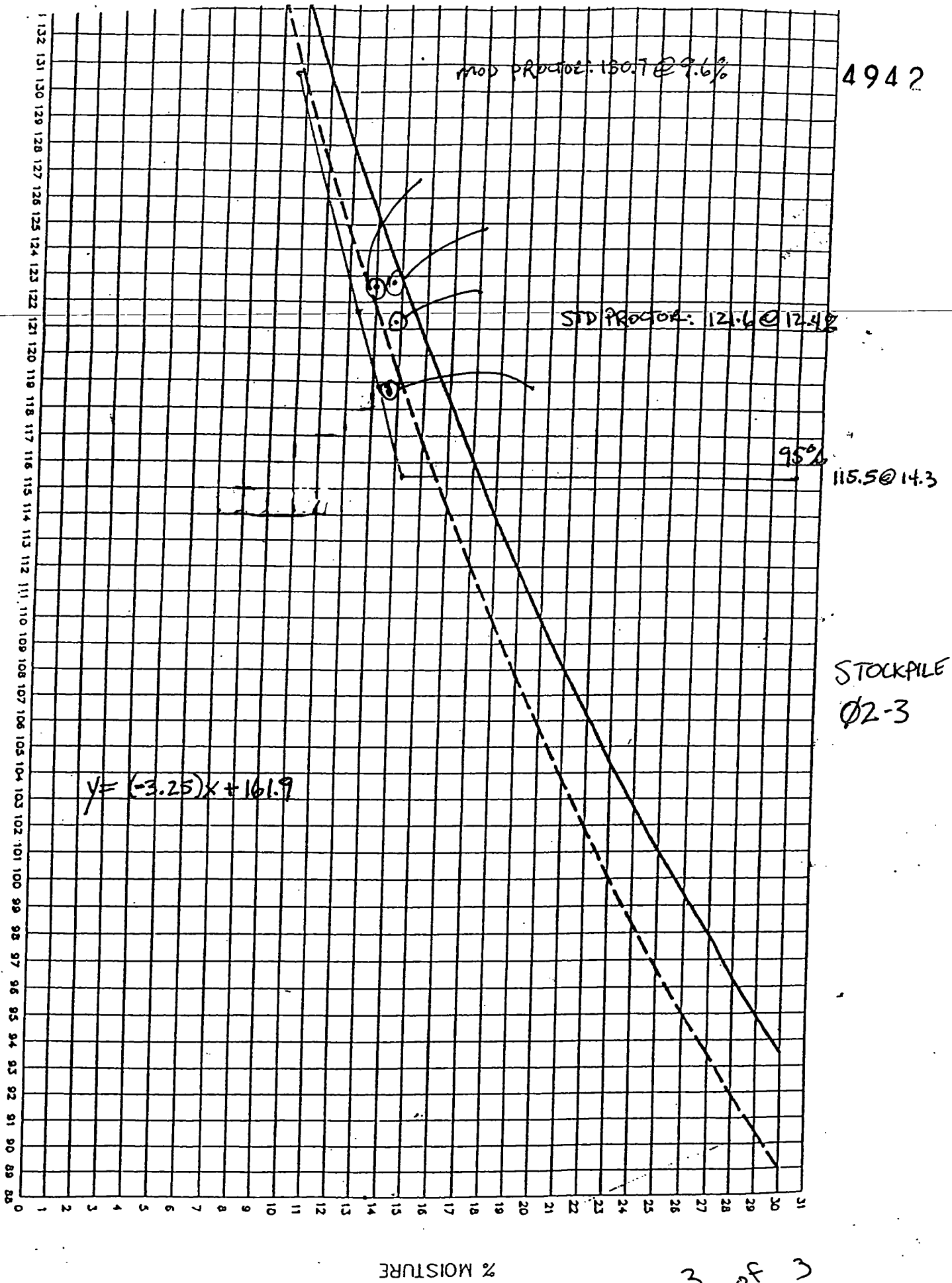


7TH OCTOBER 2002

SATURDAY

000739 NO SCALE

2 of 3



000740 3 of 3

12 OCTOBER 2002
GQ341-Ø4·1

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL #4 & 5

PROJECT NO.: 60134 TASK NO.: 04-1

DATE: 15th day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95% COMPACTION / MOISTURE RANGE: ~~±0-3%~~ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481+3.3669

QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
885	CELL 5 EAST WEDGE	6" / L-5	02-3	12.4	121.6	11.5 (13.1)	138.4	122.3	100.6	P	—	—	—	—
886	CELL 5 EAST WEDGE	6" / L-5	02-3	12.4	121.6	11.7 (13.3)	141.2	124.6	102.4	P	—	—	—	—
887	CELL 4 EAST EDGE	6" / L-5	02-3	12.4	121.6	11.5 (13.1)	139.4	123.2	101.3	P	—	—	—	—
888	CELL 4 EAST EDGE	6" / L-5	02-3	12.4	121.6	12.5 (14.0)	136.7	119.9	98.6	P	—	—	—	—
889	CELL 5 EAST WEDGE	6" / L-6	02-3	12.4	121.6	11.6 (13.2)	139.5	123.2	101.3	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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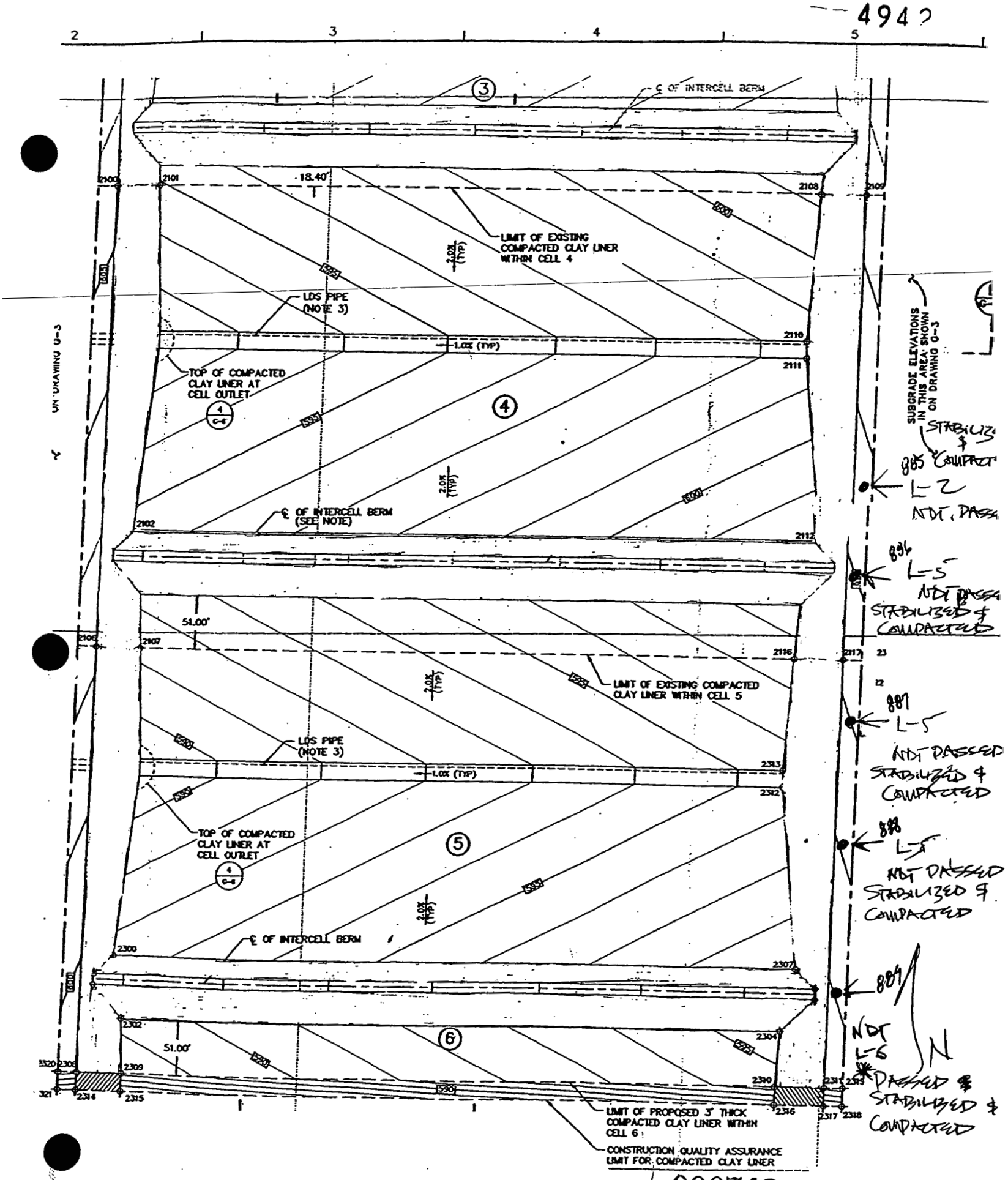

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15TH OCTOBER 2002
TUESDAY

NO SCALE

2 of 3

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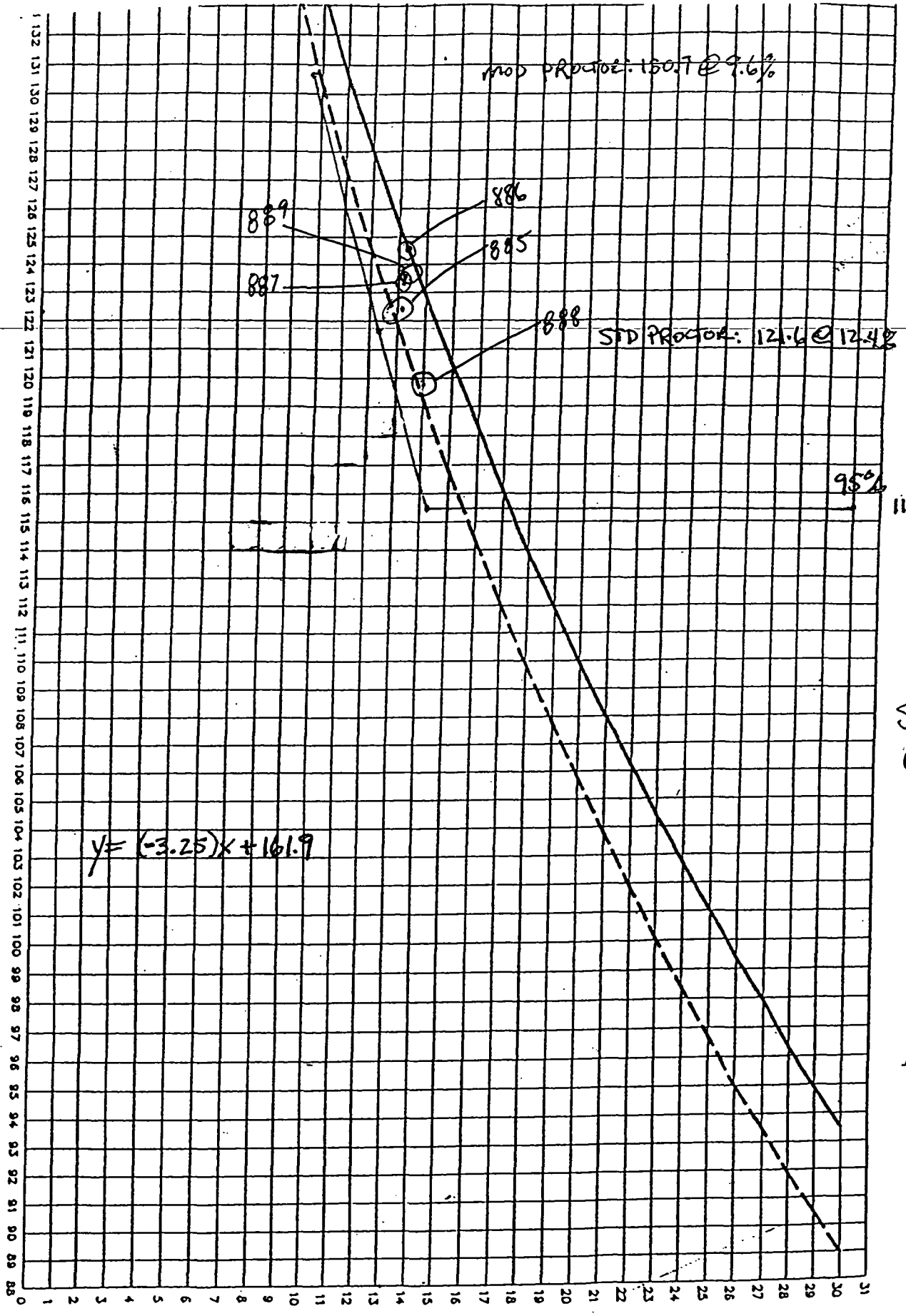

STOCKPILE
Ø2-3
GQ1341

000743

15TH OCTOBER 2002
TUESDAY

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL # 4 & 5

PROJECT NO.: 00134 1 TASK NO.: 04-1

DATE: 16TH day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-3 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481+3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	LAB RESULTS OMC (%)	LAB RESULTS MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	FIELD TEST RESULTS WET UNIT WT (PCF)	FIELD TEST RESULTS DRY UNIT WT (PCF)	FIELD TEST RESULTS PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
890	CELL 4 EASTWEDGE	6" / L-3	02-3	12.4	121.6	12.2 (13.1)	137.1	120.5	99.1	P	—	—	—	—
891	CELL 5 EASTWEDGE	6" / L-7	02-3	12.4	121.6	11.3 (13.0)	143.5	126.9	104.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 2

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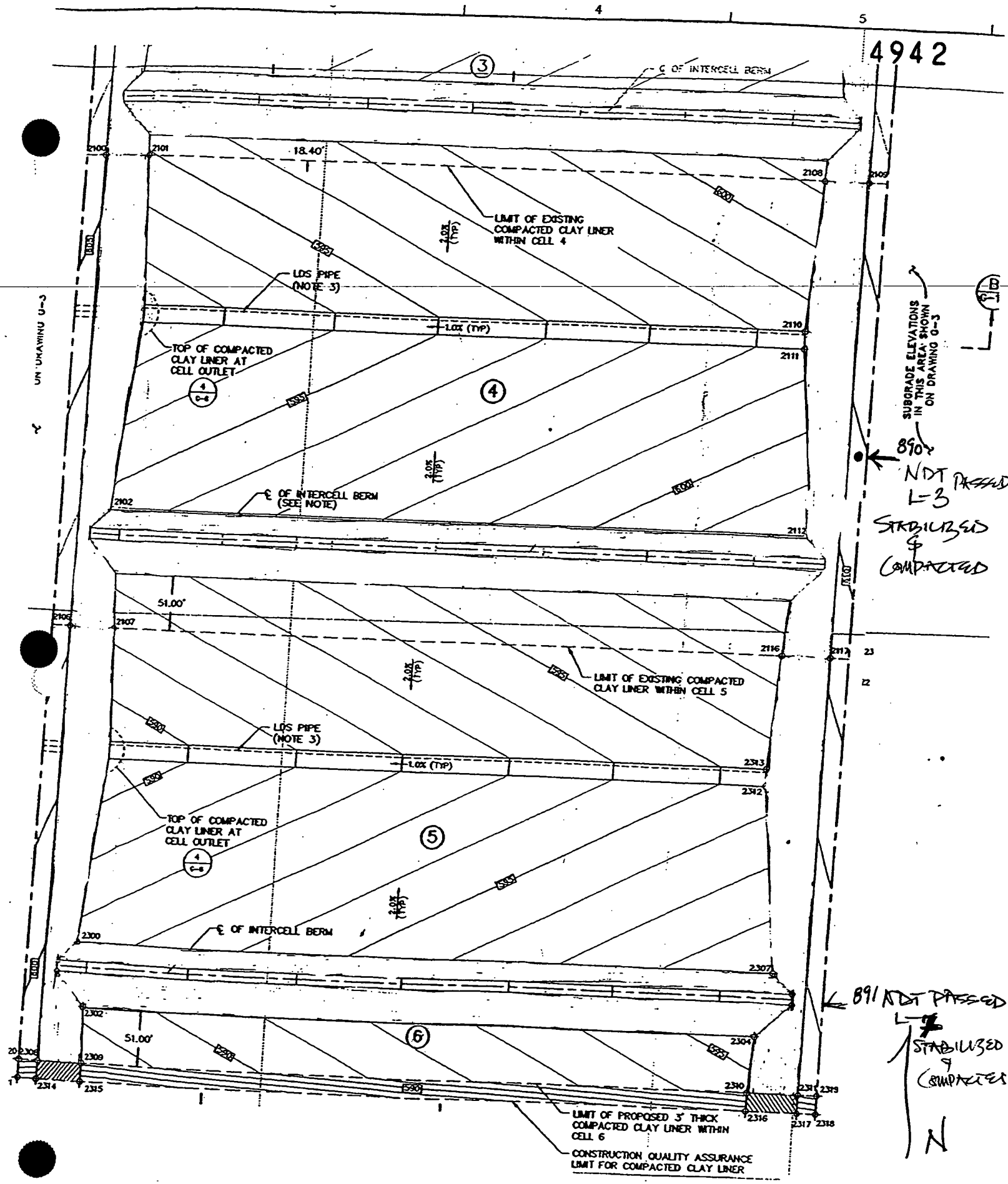


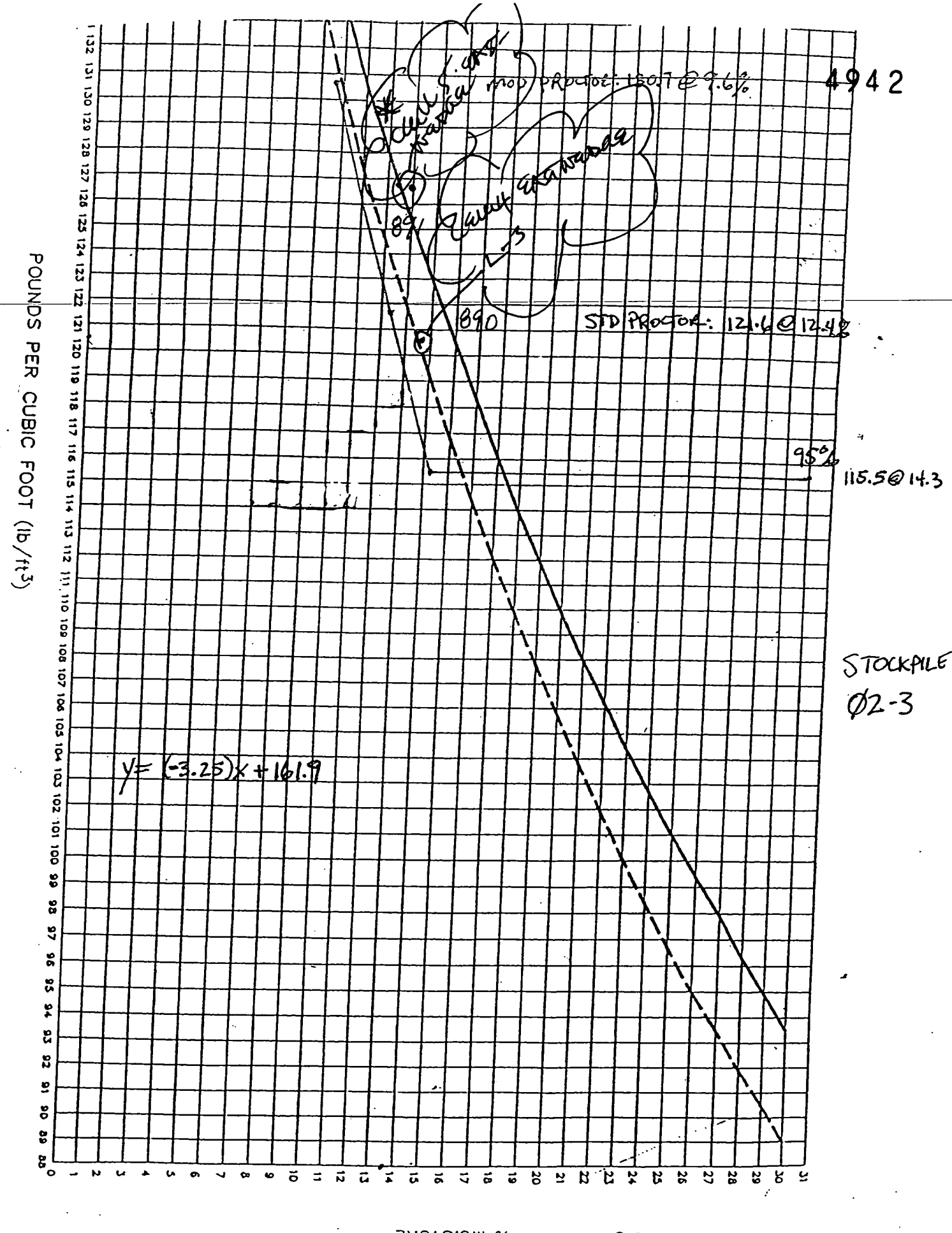
16TH OCTOBER 2002
WED.

000745

NO SCALE

2 of 3

4942



STOCKPILE
Ø2-3

000746

OCTOBER 16TH 2002
GQ 1341

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4 & 5

PROJECT NO. (60134) TASK NO.: 04.1

DATE: 18th day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~10-3%~~ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: D-0

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
892	CELL 4 ~~EAST~~ INTERIOR	6" / L4	02-2	13.4	119.9	14.1								
893	CELL 4 ~~EAST~~ INTERIOR	6" / L6	02-2	13.4	119.9	11.8 (15.3)	134.2	116.3	97.0	P	—	—	—	—
		/				1 (13.4)	141.2	124.5	103.8	P	—	—	—	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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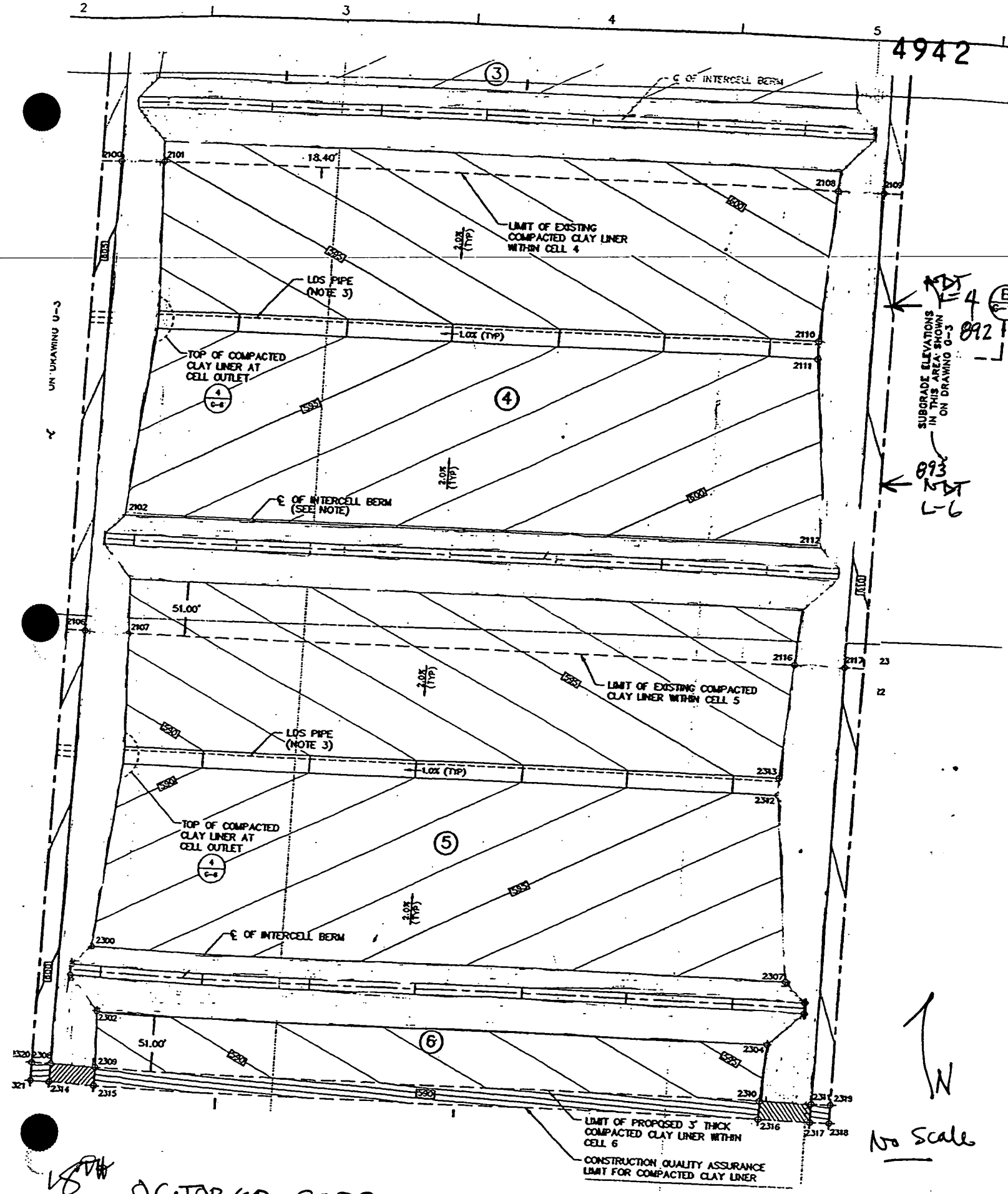

OCTOBER 2002

FRIDAY

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2 of 3

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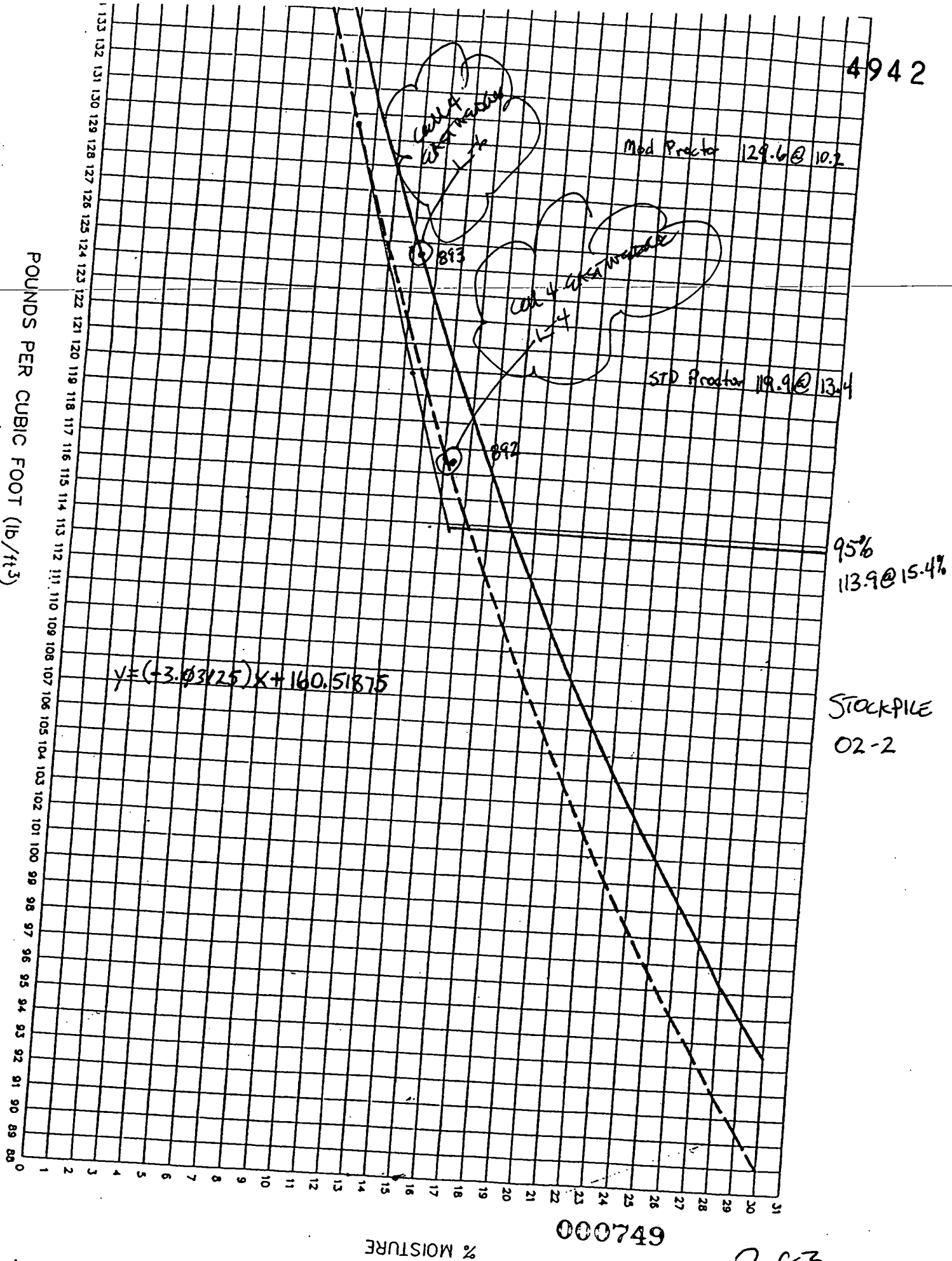

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18TH OCTOBER 2002

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE III CELL #4 & #5

PROJECT NO. 021341 TASK NO. 04.1

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): ___

DATE: 21 day OCT month 2002 year

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: [illegible]

TEST NO. CL-02	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
894	CELL 4 EAST AVERAGE	6" / L-5	022	13.4	119.9	14.4	135.8	117.4	97.8	P	—	—	—	—
						(15.6)		117.5	98.0					

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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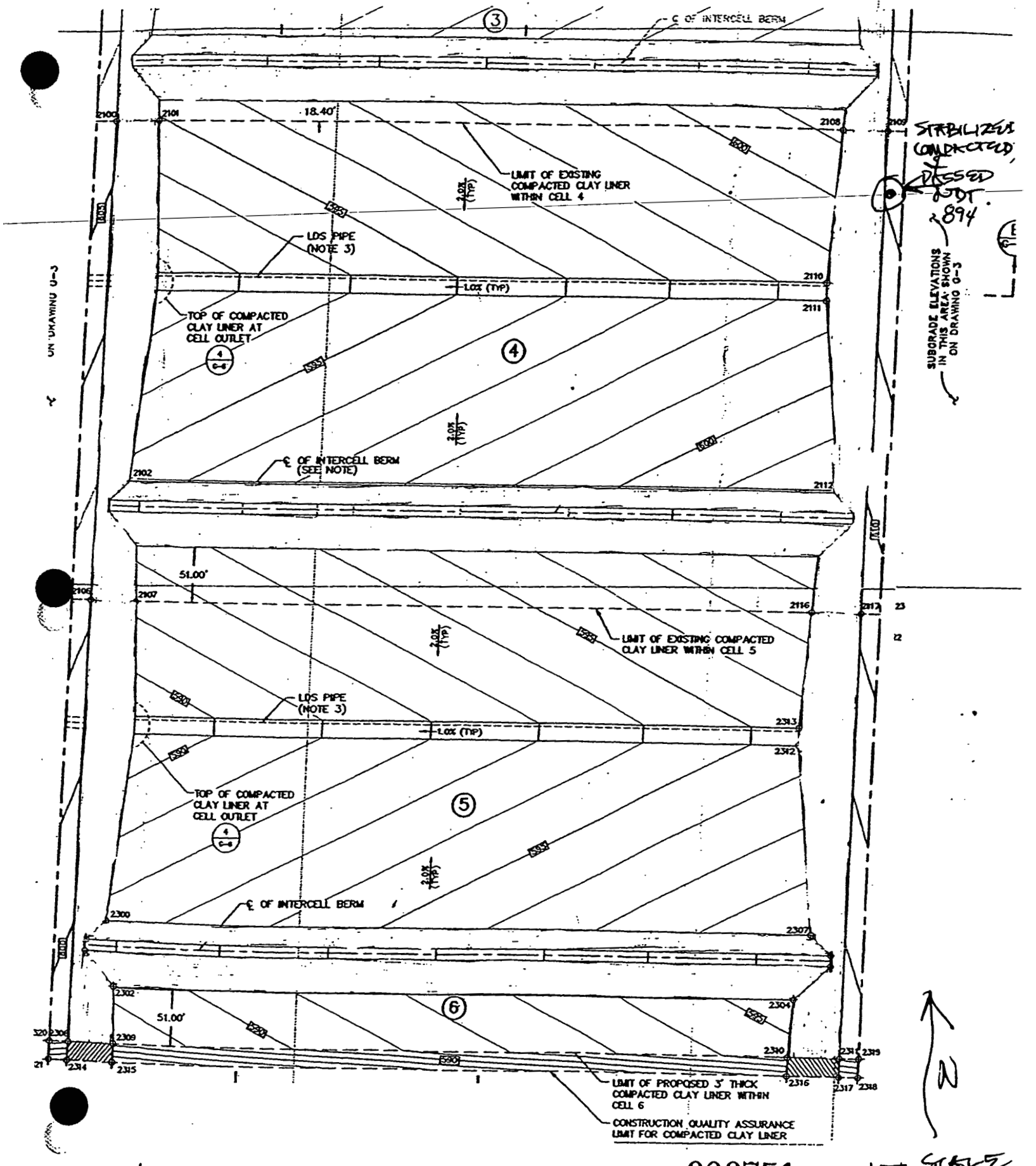

STABILIZED CONDUCTED, PASSED GDT 894

21 OCTOBER, 2002

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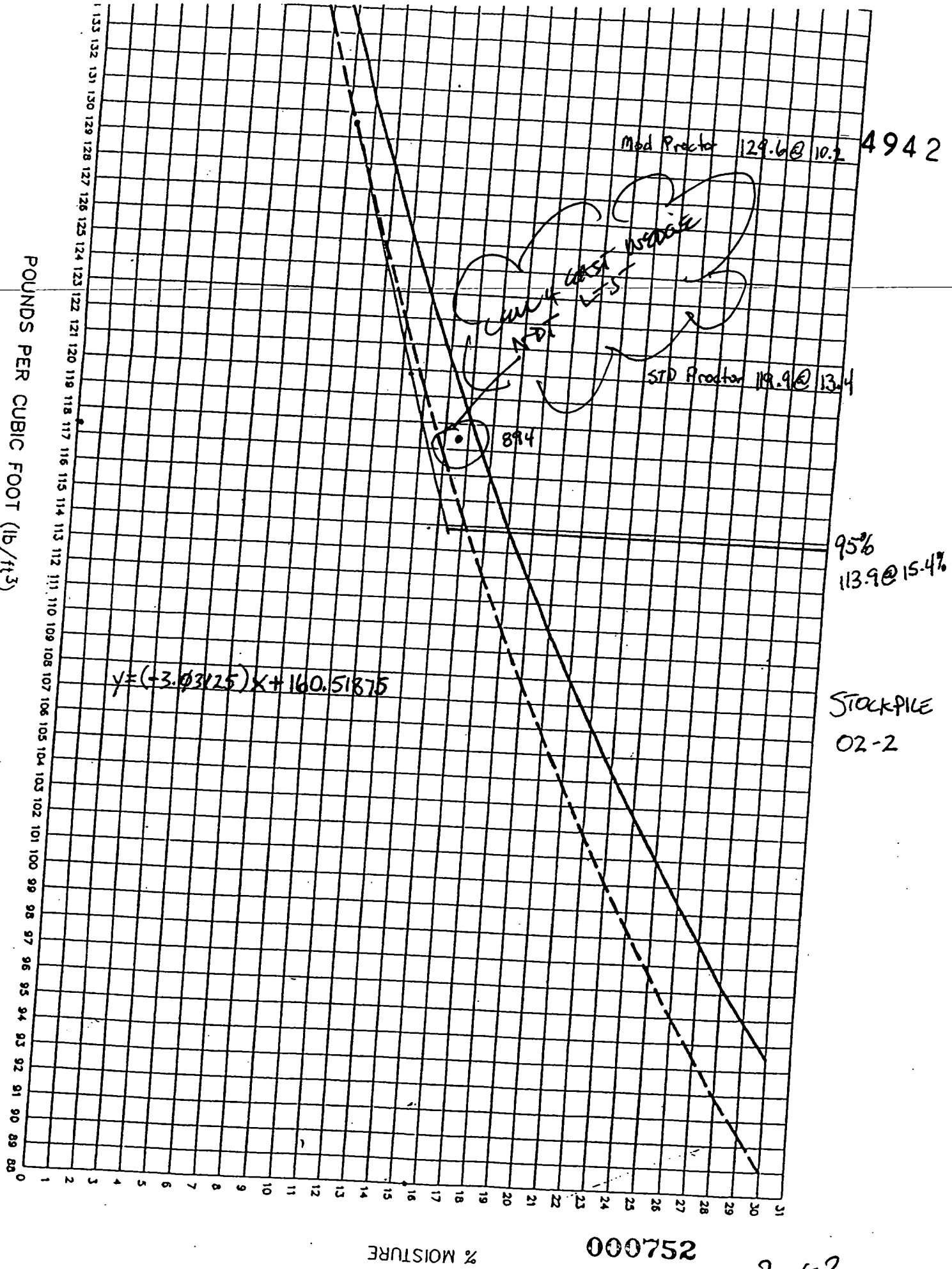
NO SCALE

2 of 3



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21 OCTOBER 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL # 4 & 5

PROJECT NO.: 60134 TASK NO.: 24.1

DATE: 14th day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: +0-3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-3

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481+3.3669 QA ID: Dm

TEST NO. C002	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)		WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
895	CELL 5 EAST INSIDE	6" / L3	02-3	12.4	121.6	11.9	13.5	134.5	118.5	97.4	P	—	—	—	—
896	CELL 4 EAST INSIDE	6" / L3	02-3	12.4	121.6	11.3	13.0	137.4	121.5	99.9	P	—	—	—	—
897	CELL 5 EAST INSIDE	6" / L4	02-3	12.4	121.6	10.8	12.5	137.3	122.0	100.3	P	—	—	—	—
898	CELL 4 EAST INSIDE	6" / L4	02-3	12.4	121.6	12.0	13.5	139.4	122.8	101.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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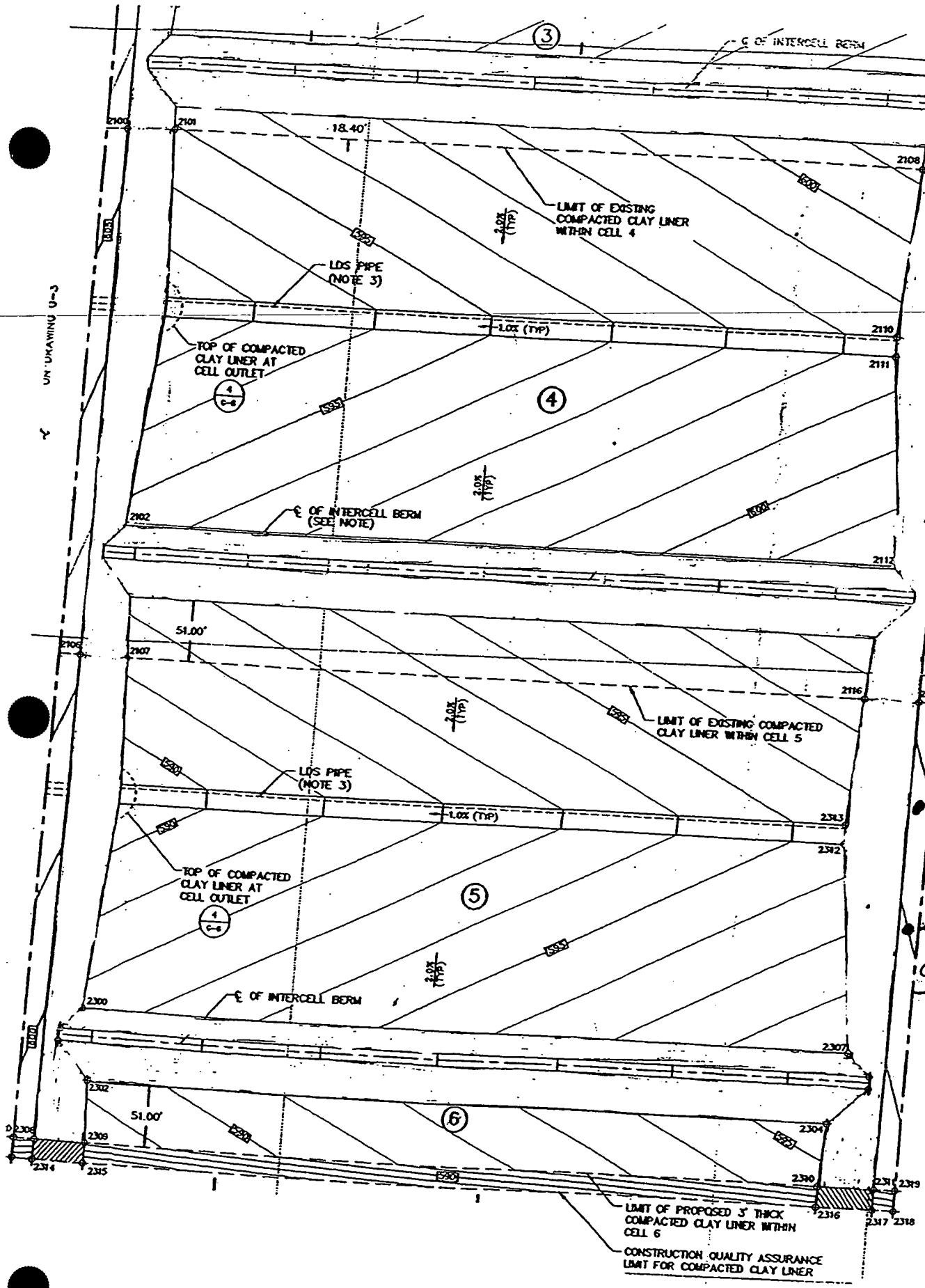

14TH OCTOBER 2002
MONDAY

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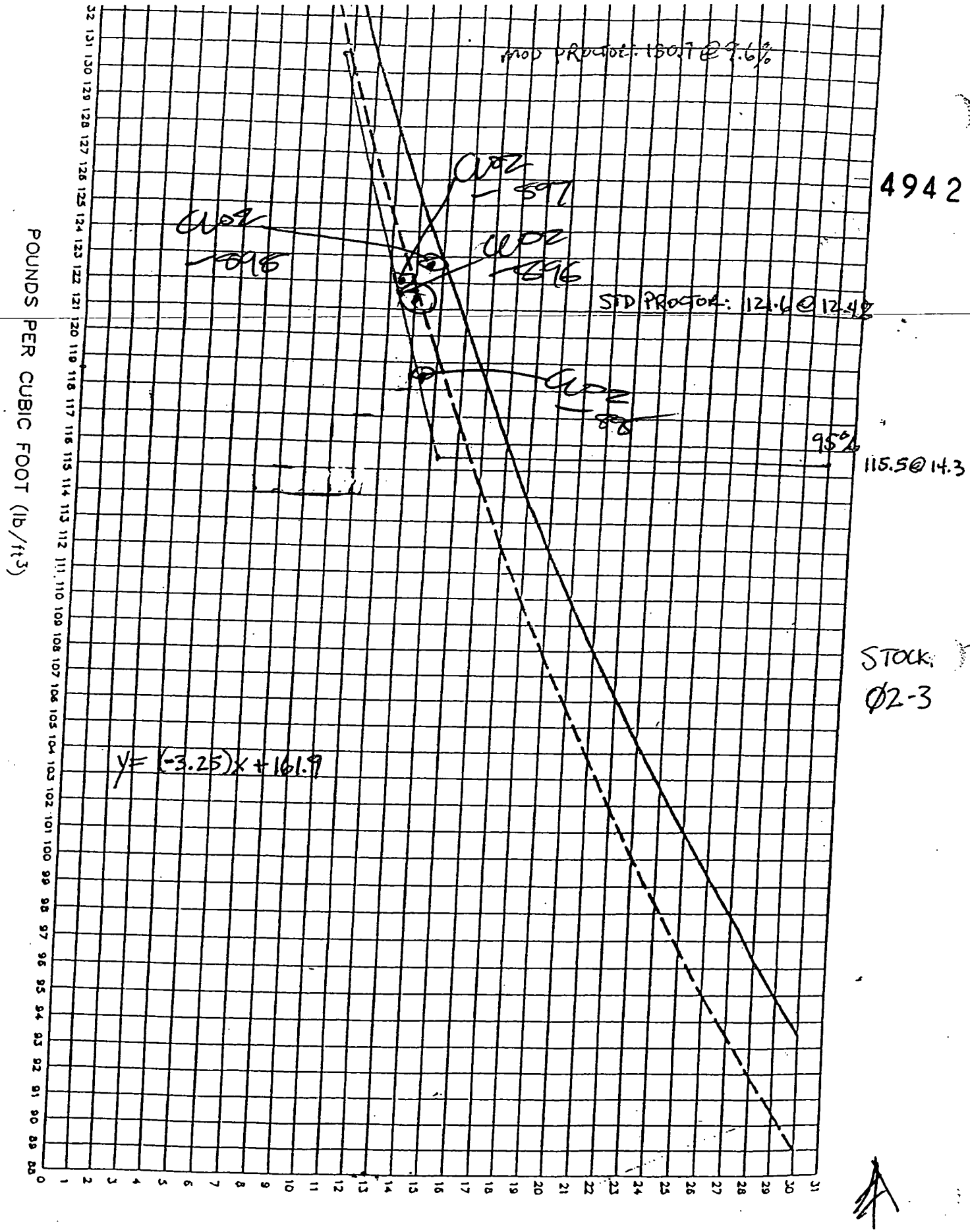
NO SCALE

2 of 3



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STOCK: Ø2-3

OG - 14TH

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GR1324

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4 & 5

PROJECT NO.: GR1341 TASK NO.: 041

DATE: 17th day OCT month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ~~10-3%~~ LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3469 QA ID:

TEST NO. 402	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
899	* CELL 5 EAST WEDGE	6" / L-6	02-3	12.4	121.6	11.8 (13.4)	138.9	122.4	100.7	P	—	—	—	—
900	CELL 5 EAST WEDGE	6" / L-6	02-3	12.4	121.6	11.8 (13.4)	135.4	119.4	98.1	P	—	—	—	—
901	CELL 4 EAST WEDGE	6" / L-6	02-3	12.4	121.6	12.9 (14.3)	134.8	117.9	97.0	P	—	—	—	—
902	CELL 4 EAST WEDGE	6" / L-4	02-3	12.4	121.6	11.6 (13.2)	137.1	121.1	99.6	P	—	—	—	—
903	CELL 4 EAST WEDGE	6" / L-2	02-3	12.4	121.6	12.6 (14.1)	133.7	117.1	96.3	P	—	—	—	—
904 *	CELL 5 EAST WEDGE	6" / L-7	02-3	12.4	121.6	11.9 —	133.5	119.3	98.1	P	—	—	—	—
905 *	CELL 5 EAST WEDGE	6" / L-7	02-3	12.4	121.6	11.8 —	130.4	116.8	96.0	P	—	—	—	—
906	CELL 4 EAST WEDGE	6" / L-3	02-2	13.4	119.9	11.8 (13.4)	140.0	123.4	102.9	P	—	—	—	—
907	CELL 4 EAST WEDGE	6" / L-5	02-2	13.4	119.9	12.6 (13.5)	138.8	122.2	101.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y) * ~~Surf~~ Sacrificial layer above clay cap

GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 2

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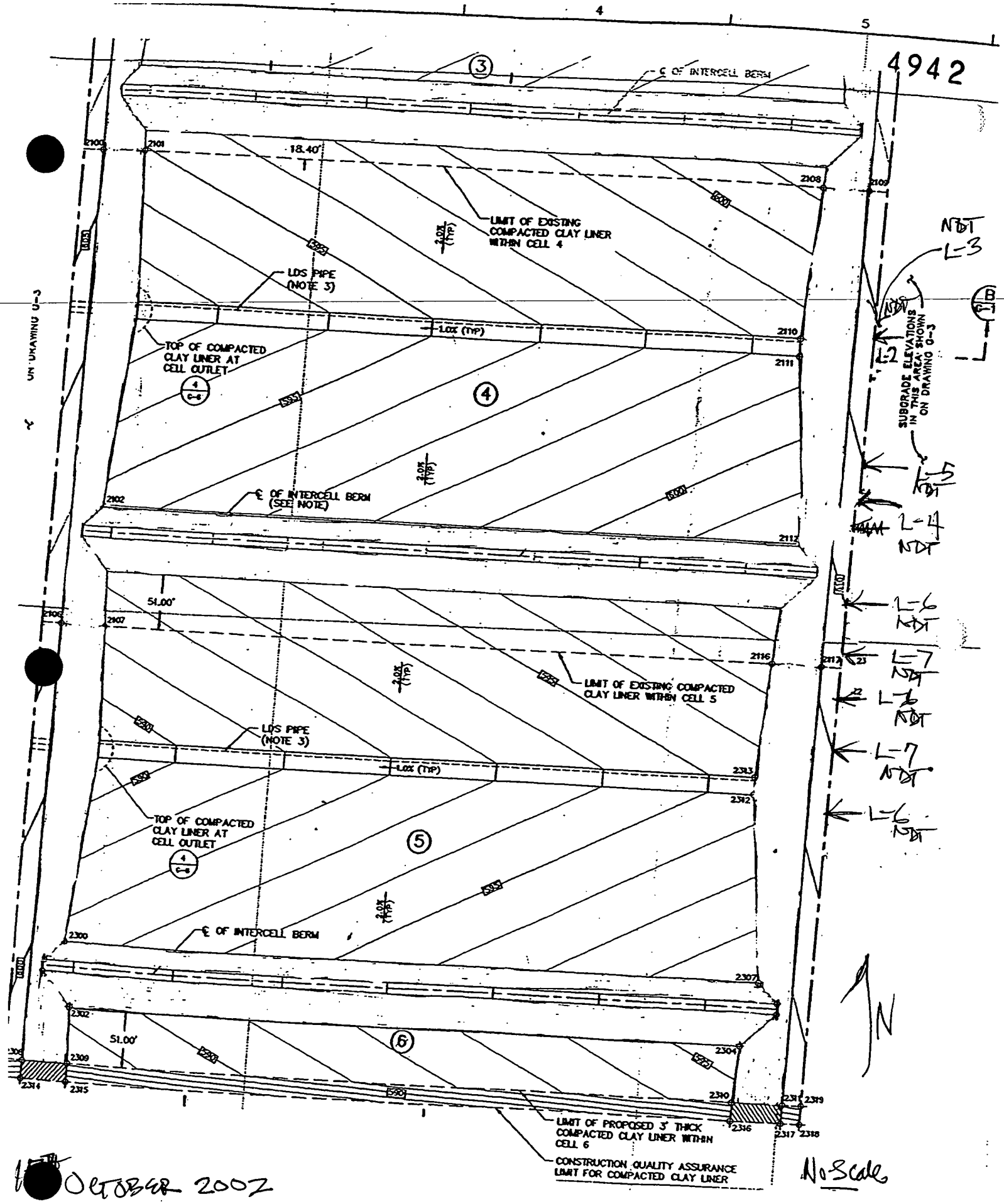

OCTOBER 2002

THURSDAY

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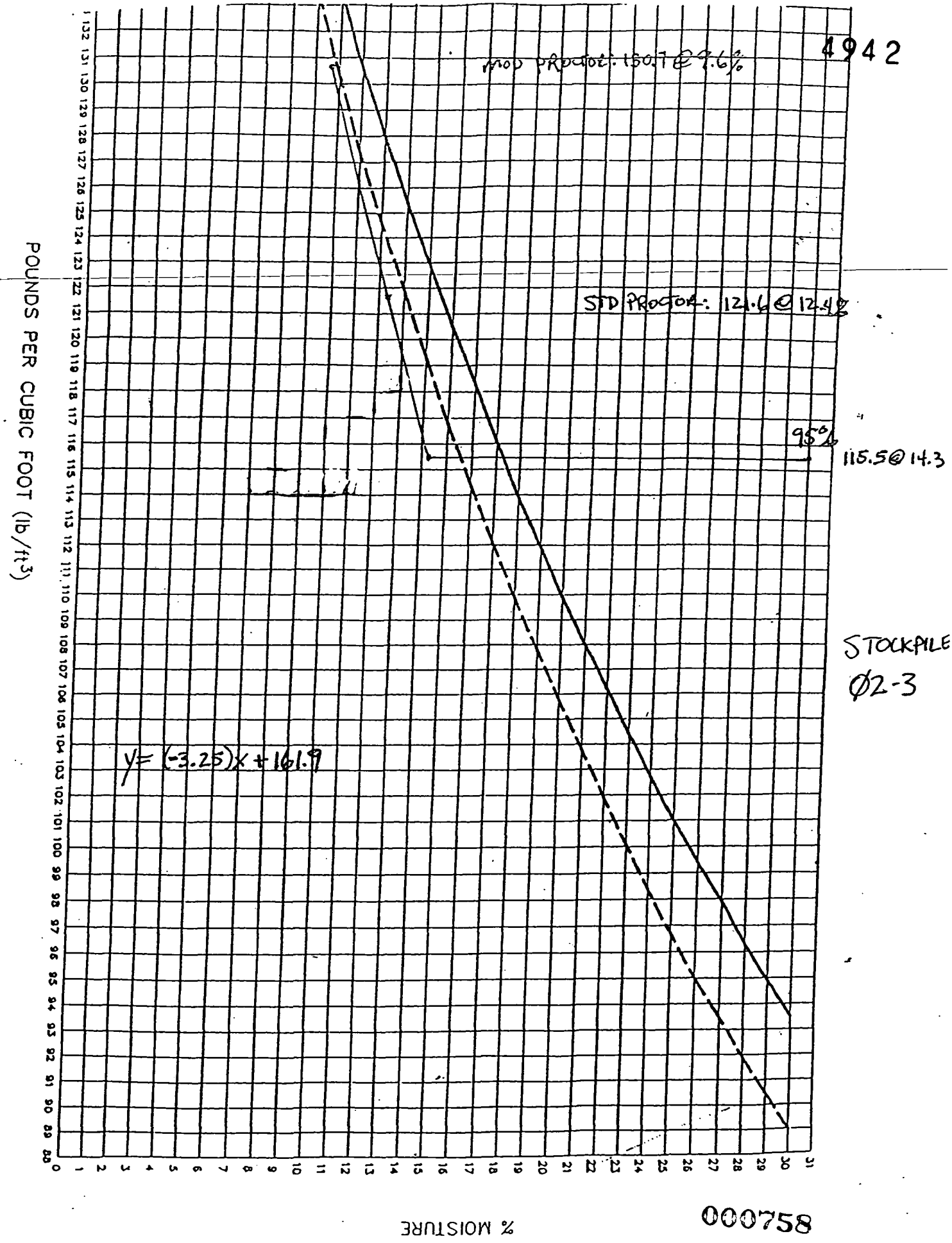
4942
MOD PROCTOR: 150.7 @ 7.6%
STD PROCTOR: 121.6 @ 12.4%
95%
115.5 @ 14.3
STOCKPILE
Ø2-3
Y= (-3.25)X + 161.9
POUNDS PER CUBIC FOOT (lb/ft³)
% MOISTURE
000758

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4 FS

PROJECT NO. 001341 TASK NO.: 04-1

DATE: 02 day NOV month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ___ % COMPACTION / MOISTURE RANGE: ___ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ___

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: DG

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS / FAIL
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		
908	Cell 4 West Wall	6" / L-2	02-2	13.4	119.9	12.6 / 13.5	136.0	121.6	101.4	P	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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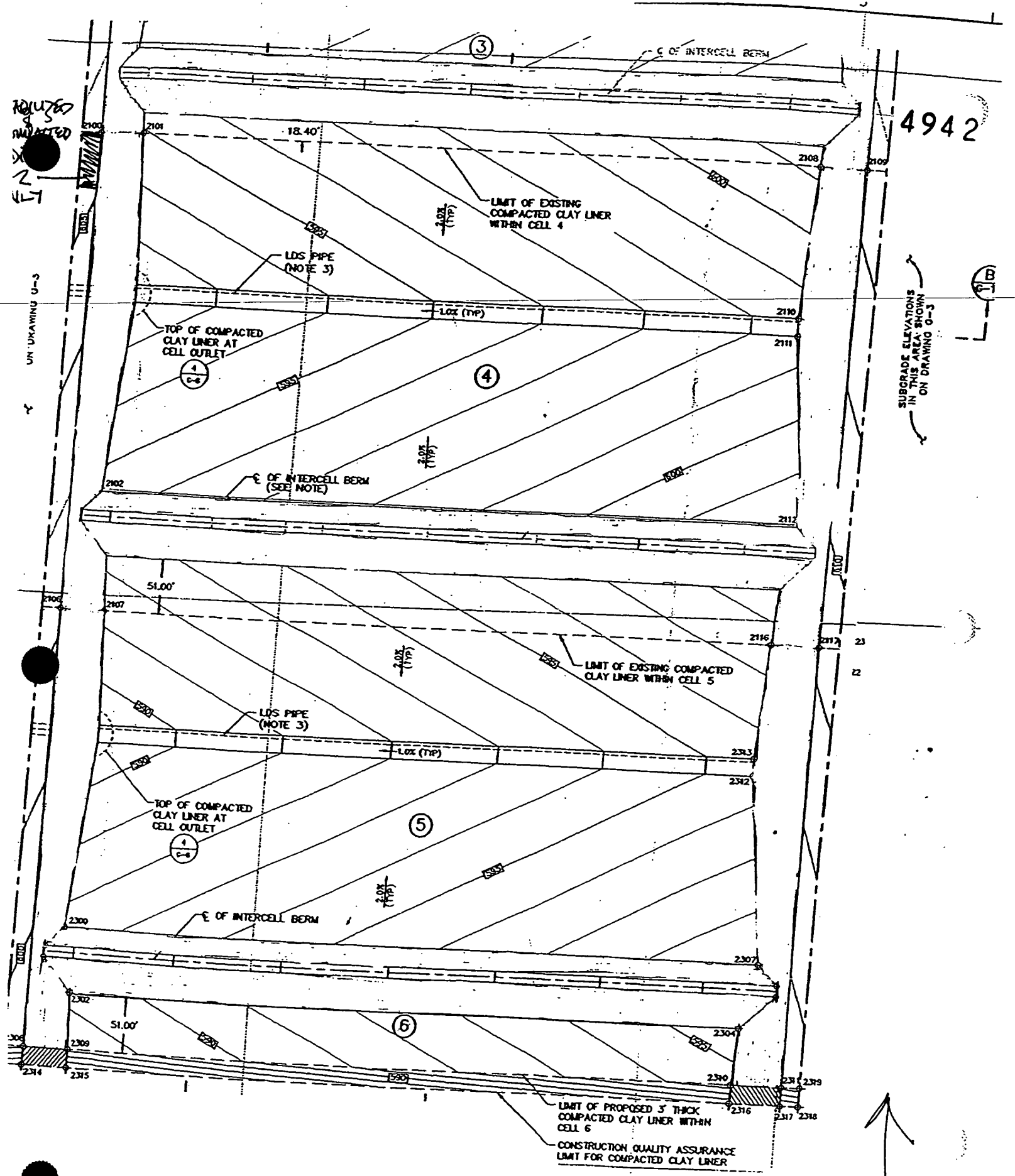

2 NOVEMBAR 2002

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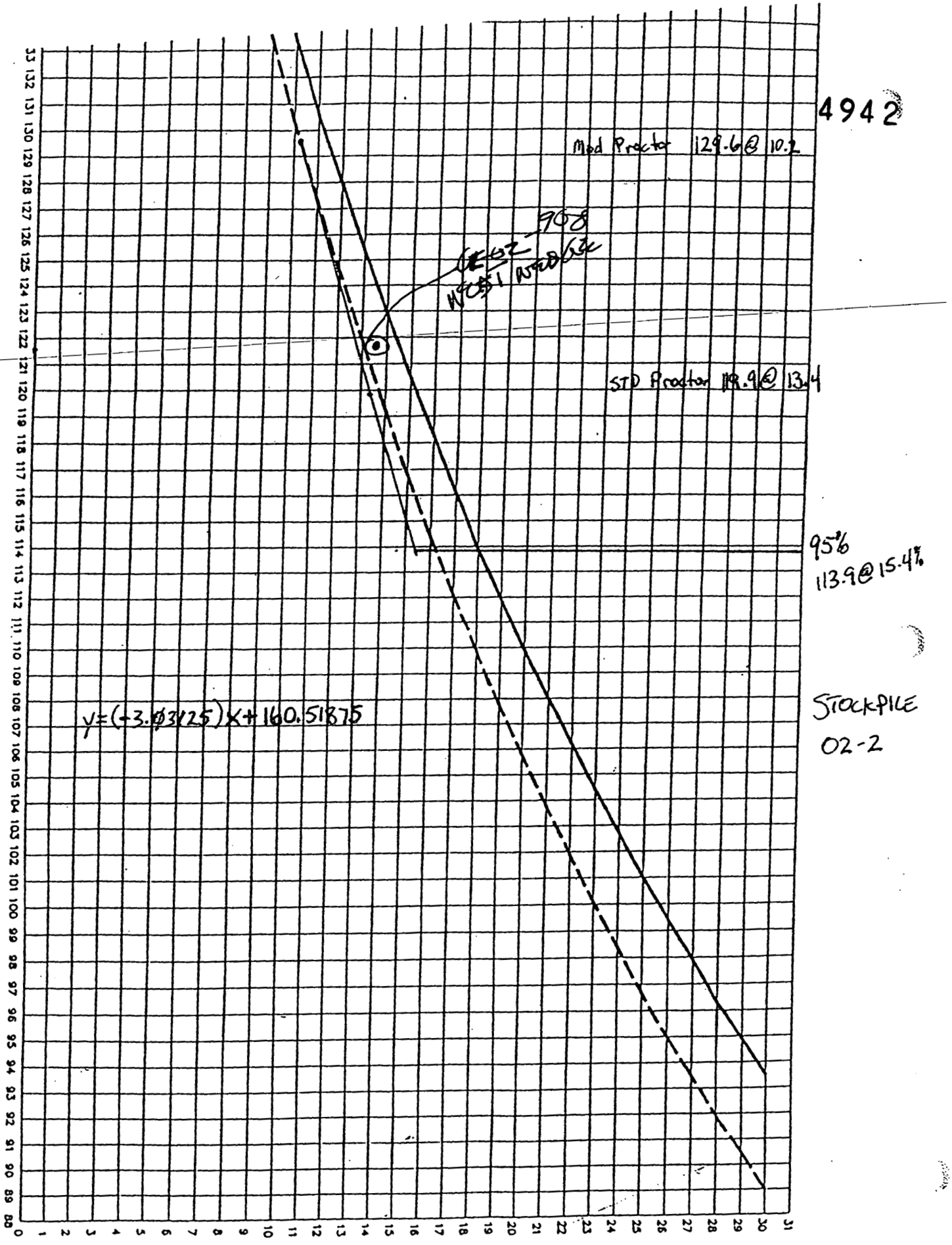
No Scale

2 of 3

20J.no# — 60134



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NOV. 2ND 2002

OJ GQ134

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & #5

PROJECT NO.: GE1341 TASK NO.: 04.1

DATE: 3 day Nov month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED):

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 X + 3.3669 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
CD02-909	West Wedge, Cell #4	6" / 2	02-2	13.4	119.9	13.6 / 14.9	137.8	119.9	100.0	P	—	—	—	—
CD02-910	West Wedge, Cell #4	6" / 3	02-2	13.4	119.9	12.4 / 13.9	135.8	119.2	99.4	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 2 OF 4

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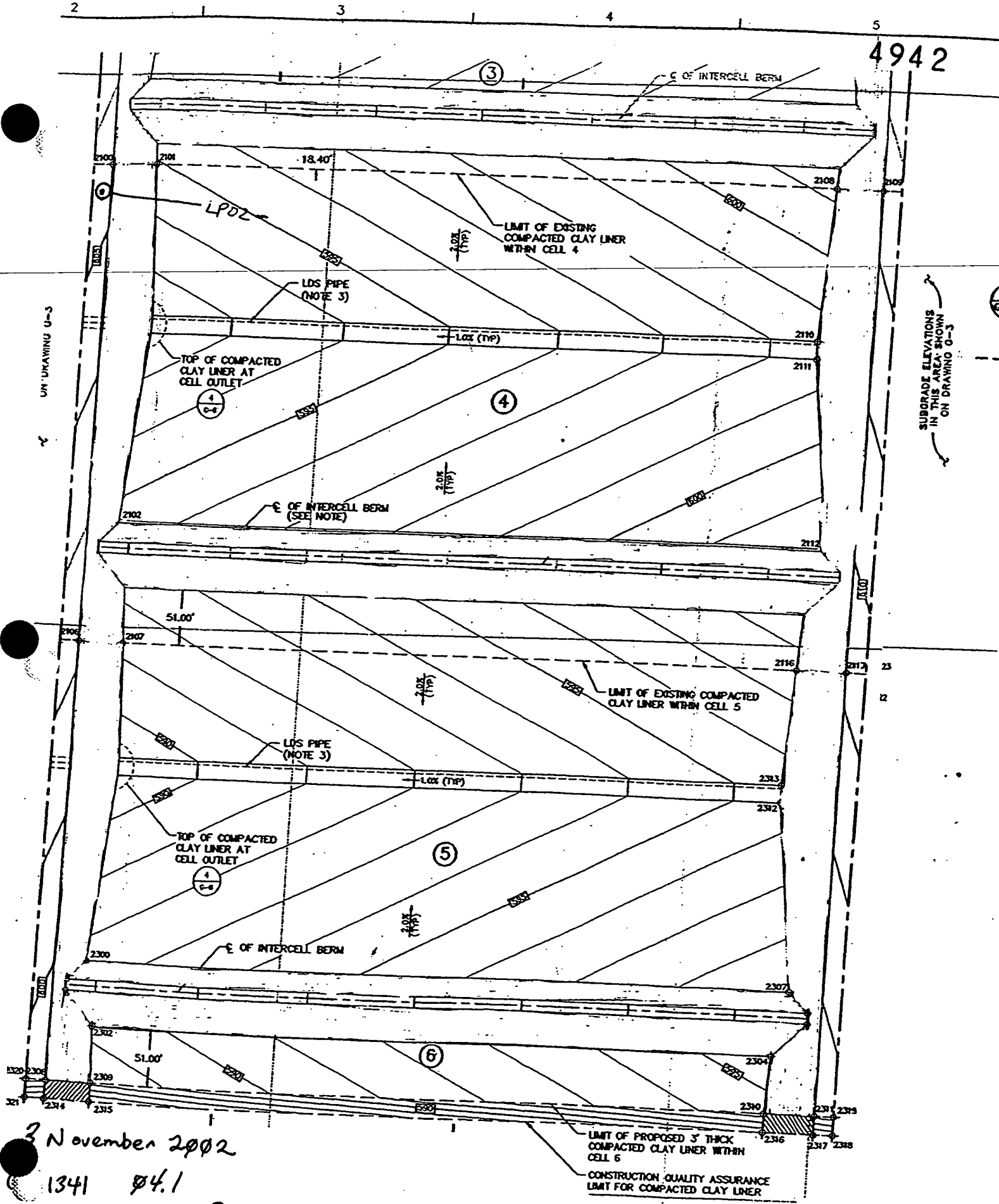

3 November 2002

1341 04.1

Sheet No. 3 of 4

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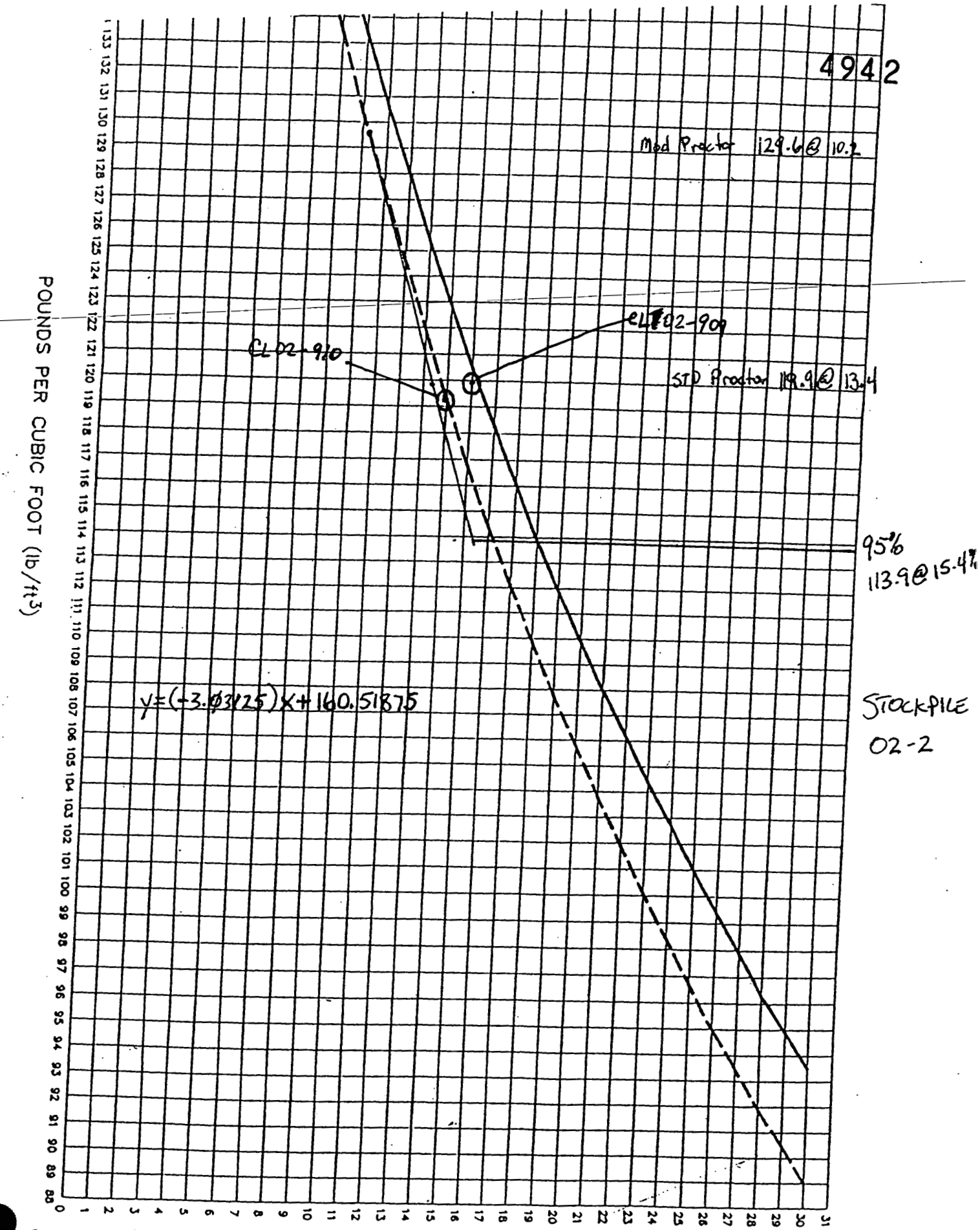

3 November 2002

GQ1341 04.1

Sheet No. 4 of 4

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV CELL 4&5

PROJECT NO.: (0131) TASK NO.: (04)

DATE: 2/12 day NOV month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE +0.3 LIFT THICKNESS (LOOSE/COMPACTED): ___

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: WEST INTERCEPTOR CONSTRUCTION

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
002	CELL 4 W. INTERCEPTOR	6" / L-2	02-2	13.4	119.9	14.3								
002	CELL 4 W. INTERCEPTOR	6" / L-4	02-2	13.4	119.9	15.5	136.4	118.5	98.8	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 3

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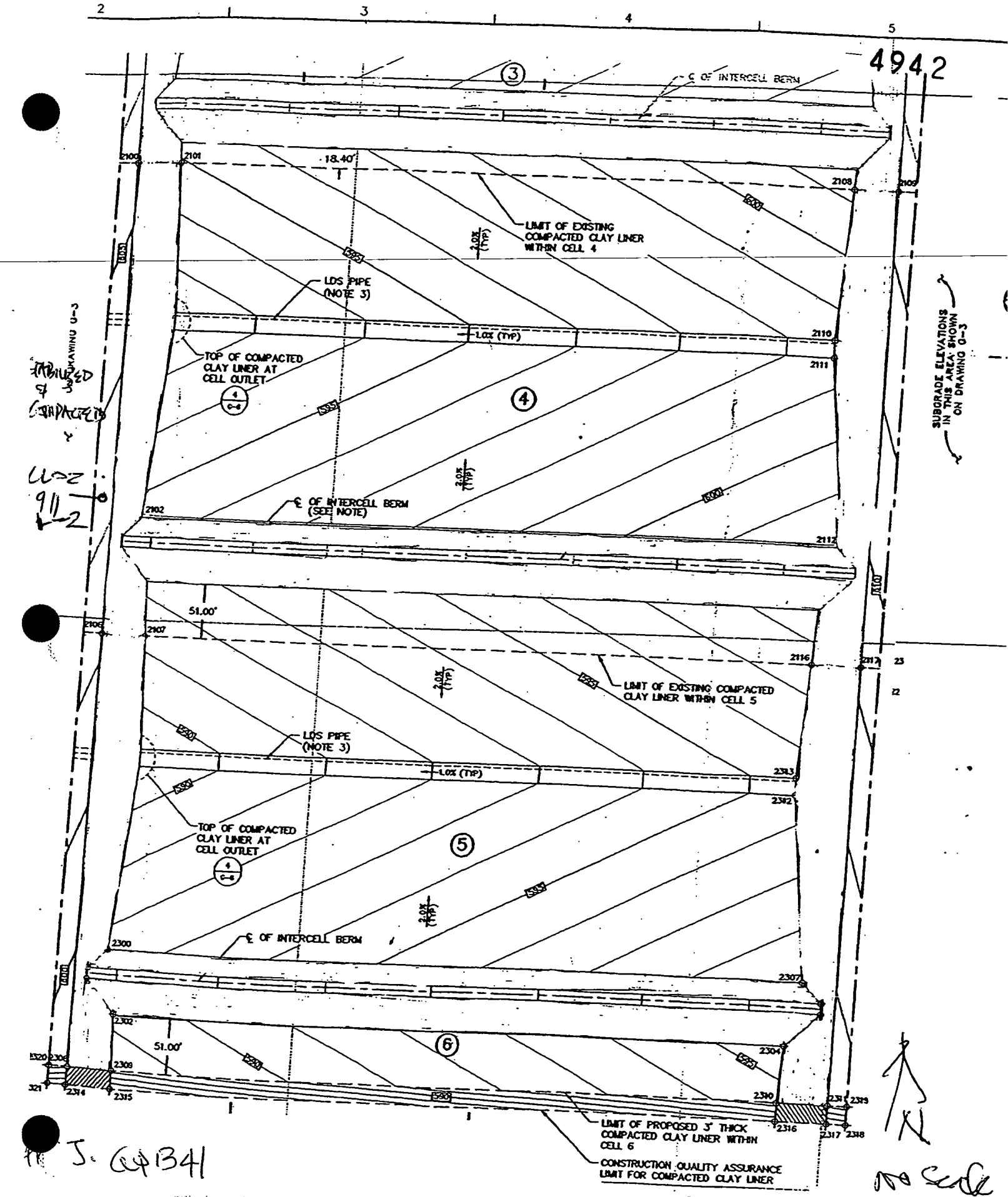

J. C. 1341

NOVEMBER 4th 2002

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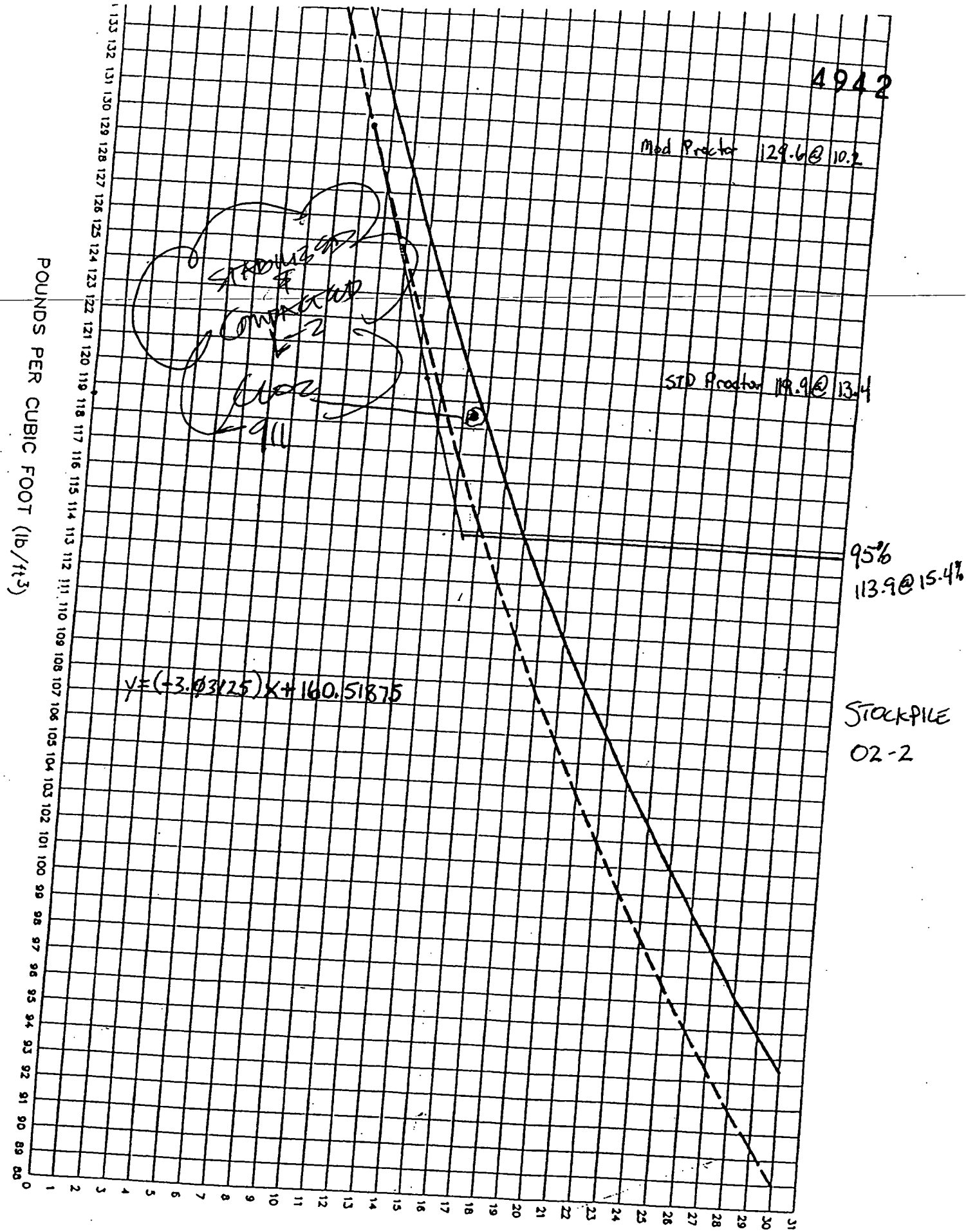

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6Q134 4th NOVEMBER 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV

PROJECT NO. 02134 TASK NO. 04-1

DATE: 5th day Nov month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: WEST (NEEDED CLAY)

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.369 QA ID:

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
912 915	Cell 4 West Needed	6" / L5	02-2	13.4	119.9	12.0	134.1	121.7	101.5	P	—	—	—	—
913 916	Cell 4 W. Needed	6" / L6	02-2	13.4	119.9	12.5 (13.5) (14.0)	139.4	122.3	102.0	P	—	—	—	—
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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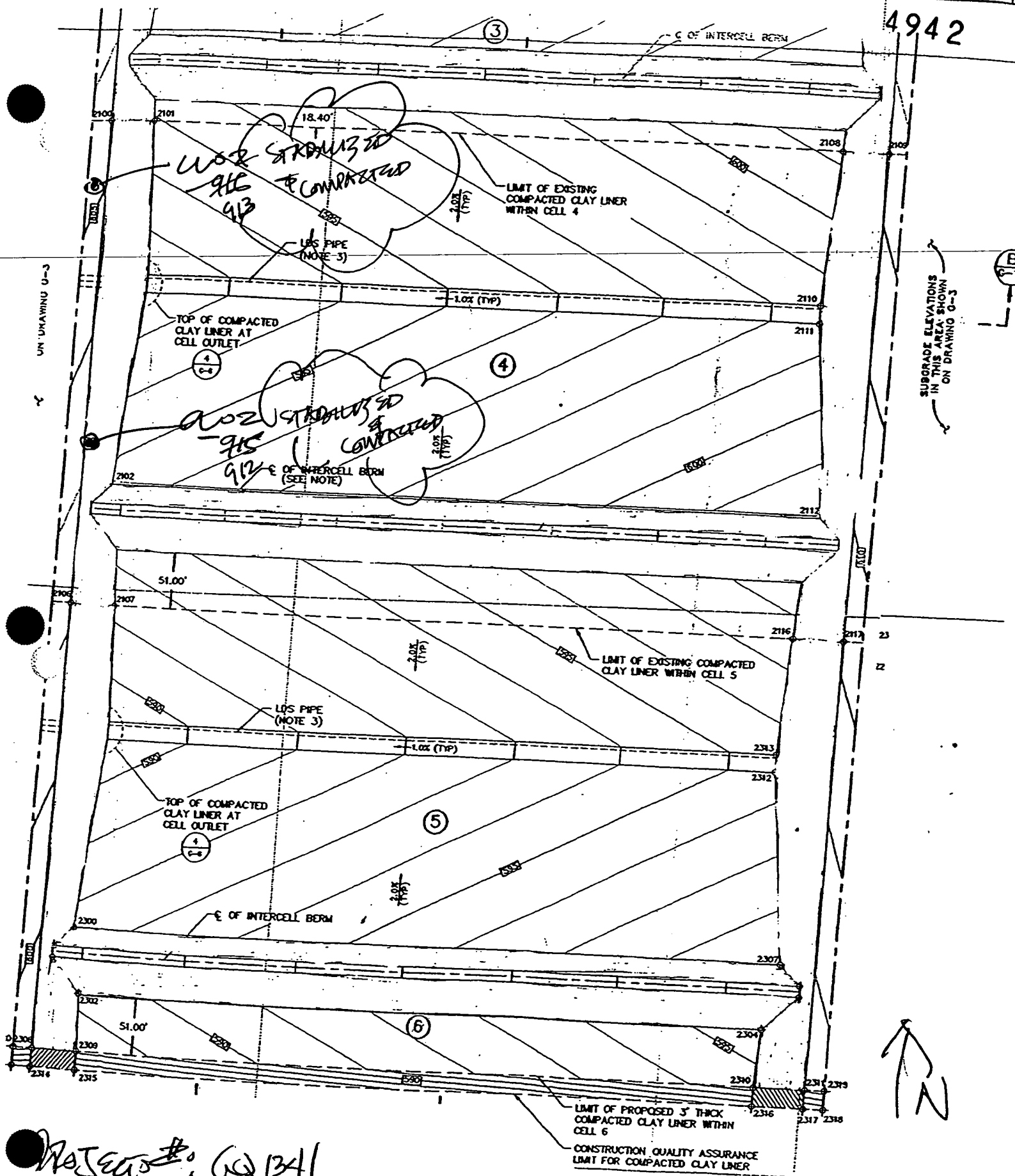

Project #: GQ1341

November 5th 2002

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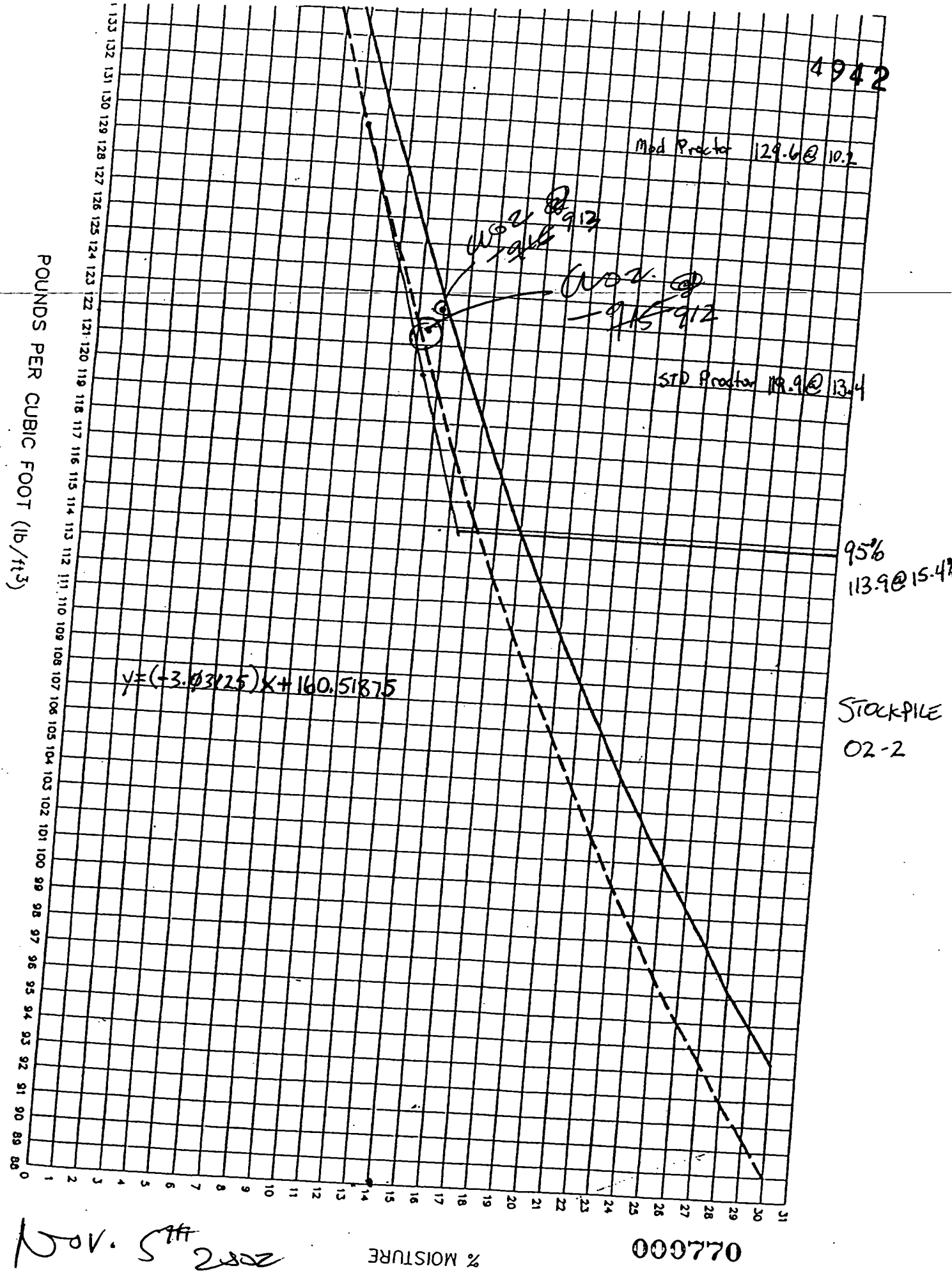
2 of 3



Nov. 5th 2002

Proj. 6Q1341

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell 4 & 5

PROJECT NO.: 60134.1 TASK NO.: 04.1

DATE: 6th day Nov month 2001 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): 8 in

MATERIAL SOURCE: STOCKPILE 022

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER: Clay Needed

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20974 / 26711 CORRECTION FACTOR Y = 0.8481 + 3.3569 QA ID: DL

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	FIELD TEST RESULTS: PASS	FIELD TEST RESULTS: FAIL	RETEST NO.	RETEST: PASS	RETEST: FAIL
914 ~~917~~	Cell 4 West Needed	6" / L6	022	13.4	119.9	15.1	138.7	117.1	97.7	P	—	—	—	—
915 ~~918~~	Cell 4 West Needed	6" / L7	022	13.4	119.9	13.3 (16.2) (14.6)	138.7	121.0	100.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

MAY SHOW EVIDENCE OF STOCKPILE CHANGE B/W DD: 117.1 VS 121.0

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SHEET NO. 1 OF 3

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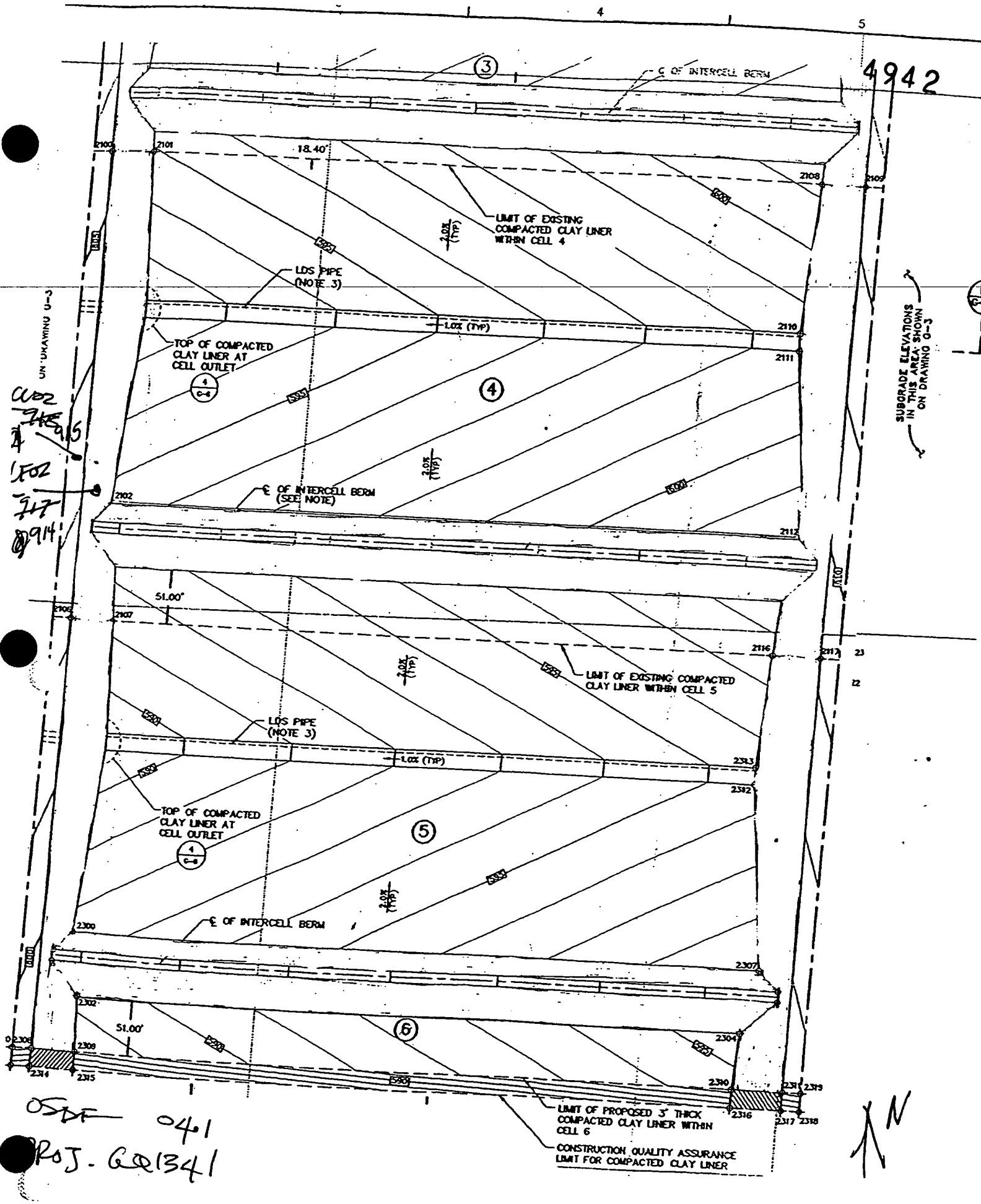

OSDF 041

PROJ. 001341

6th November 2002

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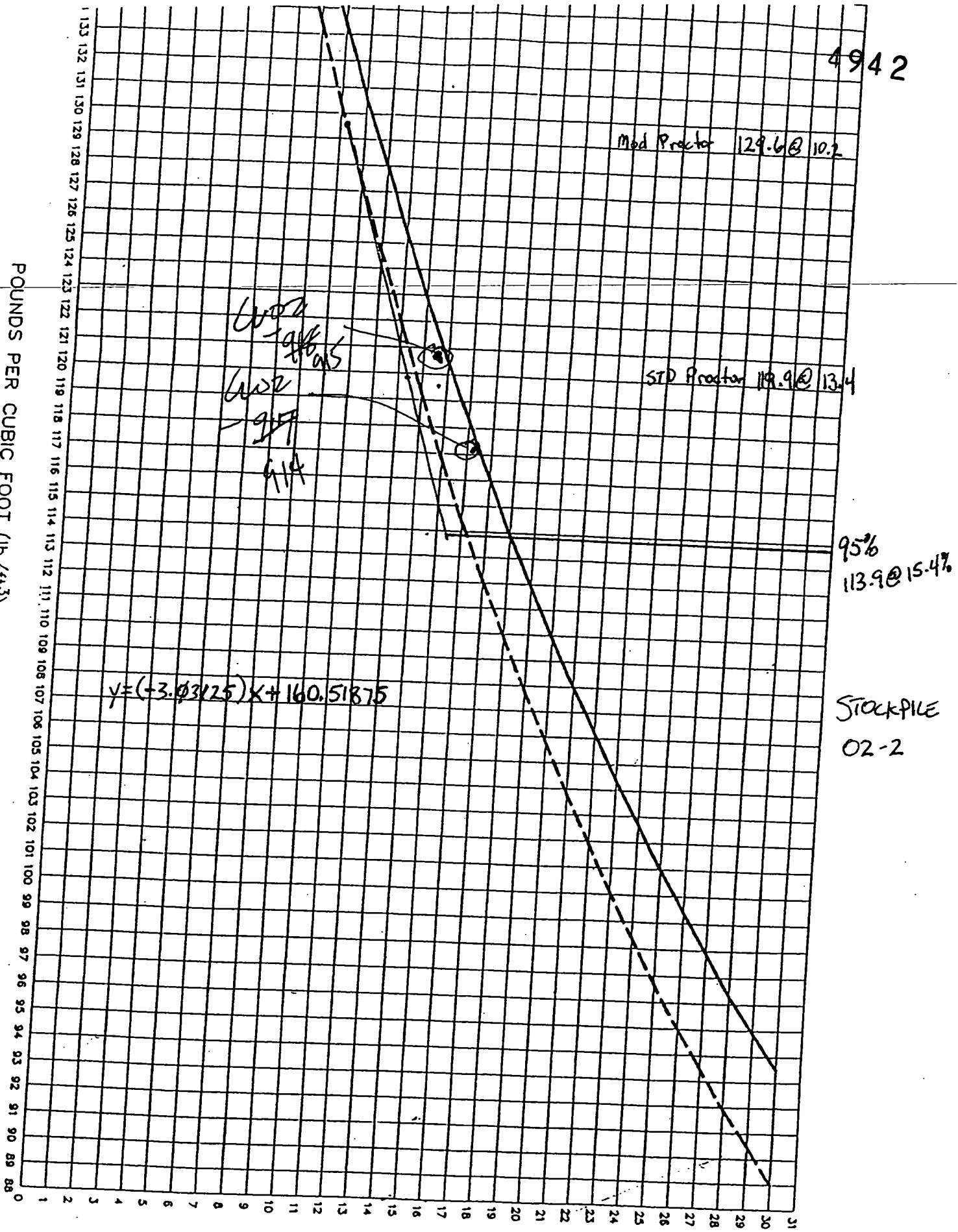
2 of 3



6th November 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Cell 4 & 5

PROJECT NO.: 60134/ TASK NO.: 04-1

DATE: Nov day 7th month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: ±3 LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 26711 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: [illegible]

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
916 U02 +919	Cell 4 West Wedge	6" / L-8	02-2	13.4	119.9	13.2	136.7	119.3	99.5	P	–	–	–	–
917 -920	Cell 4 West Wedge	6" / L-8	02-2	13.4	119.9	12.7 (14.6)	136.7	119.8	99.9	P	–	–	–	–
		/				(14.1)								
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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℄ OF INTERCELL BERM

18.40'

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 4

2.0% (TYP)

LDS PIPE (NOTE 3)

1.0% (TYP)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 C-6

SUBGRADE ELEVATIONS IN THIS AREA SHOWN ON DRAWING G-3

℄ OF INTERCELL BERM (SEE NOTE)

51.00'

LIMIT OF EXISTING COMPACTED CLAY LINER WITHIN CELL 5

LDS PIPE (NOTE 3)

1.0% (TYP)

TOP OF COMPACTED CLAY LINER AT CELL OUTLET

4 C-6

℄ OF INTERCELL BERM

51.00'

LIMIT OF PROPOSED 3' THICK COMPACTED CLAY LINER WITHIN CELL 6

CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY LINER

N

DSJ. RX1341

November 17th 2002

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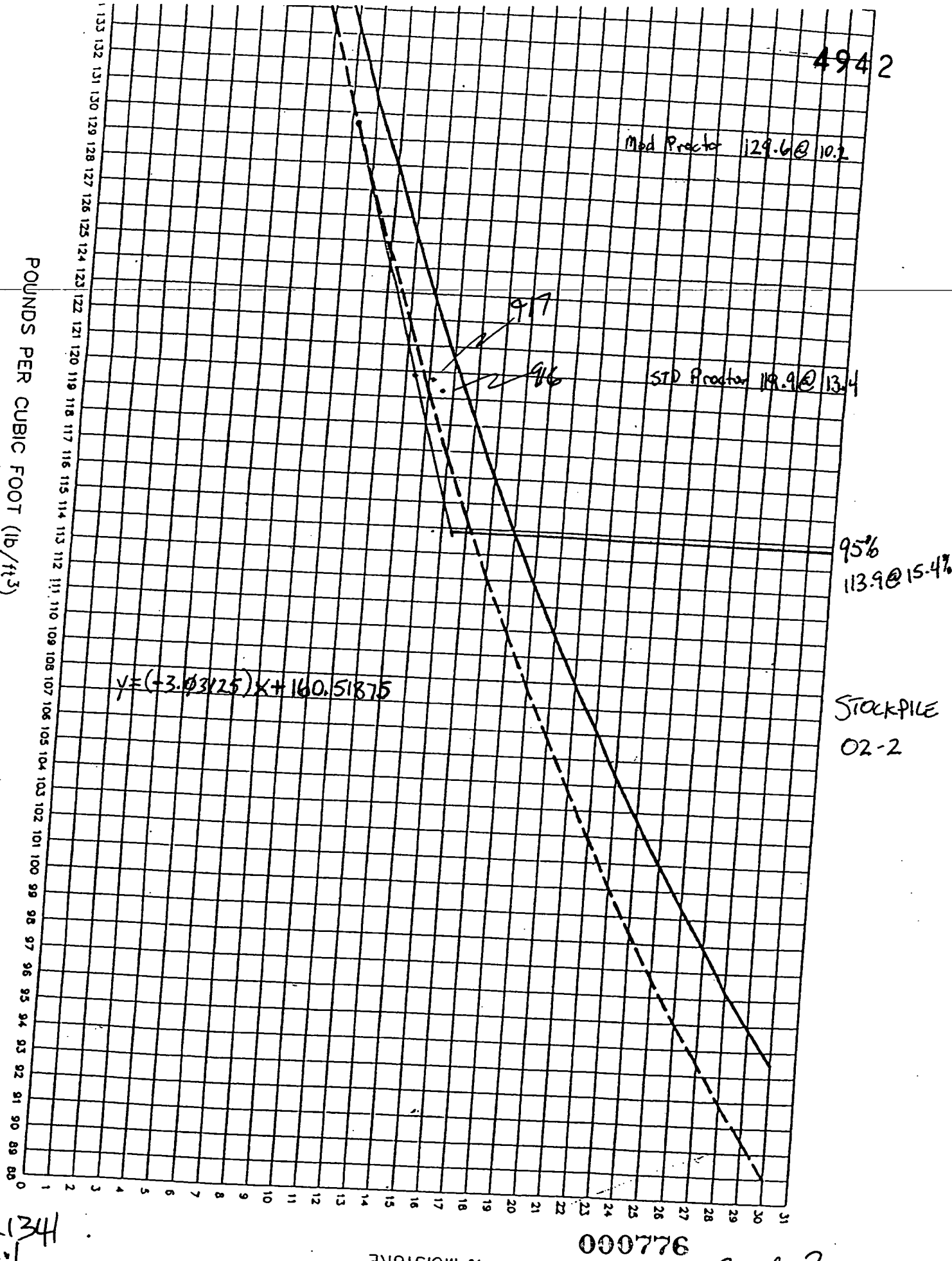

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NOVEMBER 7th 2002

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: cell 4 & 5

PROJECT NO.: 2034 TASK NO. 04.1

DATE: 5th Nov day month 2002 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~95~~ 92 % COMPACTION / MOISTURE RANGE: ____ LIFT THICKNESS (LOOSE/COMPACTED): ____

MATERIAL SOURCE: Stockpile 02-2 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ____

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481 + 3.3669 QA ID: Dwa

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
918 ~~921~~	Cell 5 NW quadrant	6" / L-2	02-2	13.4	119.9	14.07 (15.8)	136.4	117.8	98.2	P	—	—	—	—
919 ~~922~~	Cell 5 NW quadrant	6" / L-3	02-2	13.4	119.9	13.8 (15.1)	136.5	118.5	99.0	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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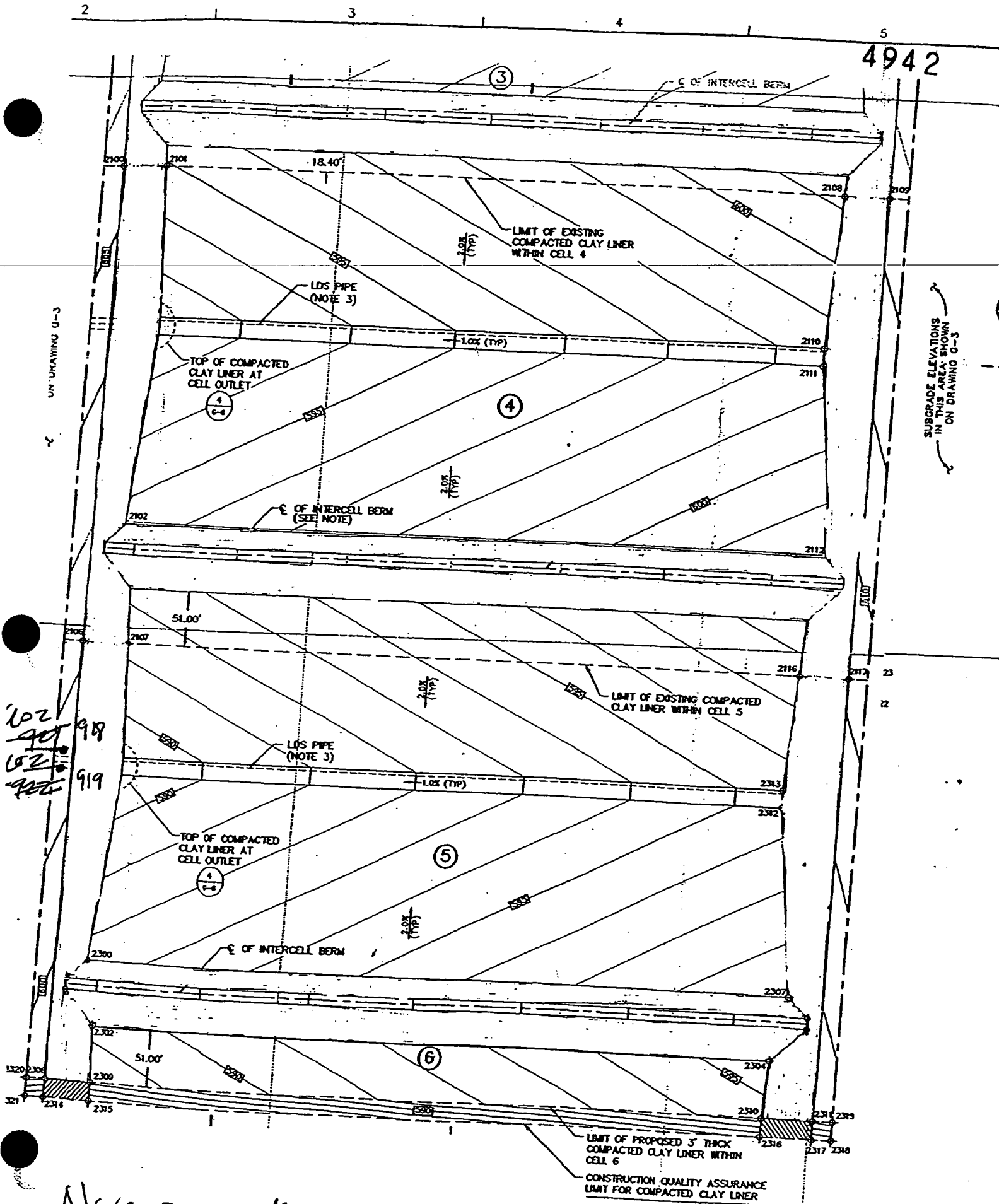
SHEET NO. 1 OF 3



'02 907 918
'02 922 919

November 8th 2002

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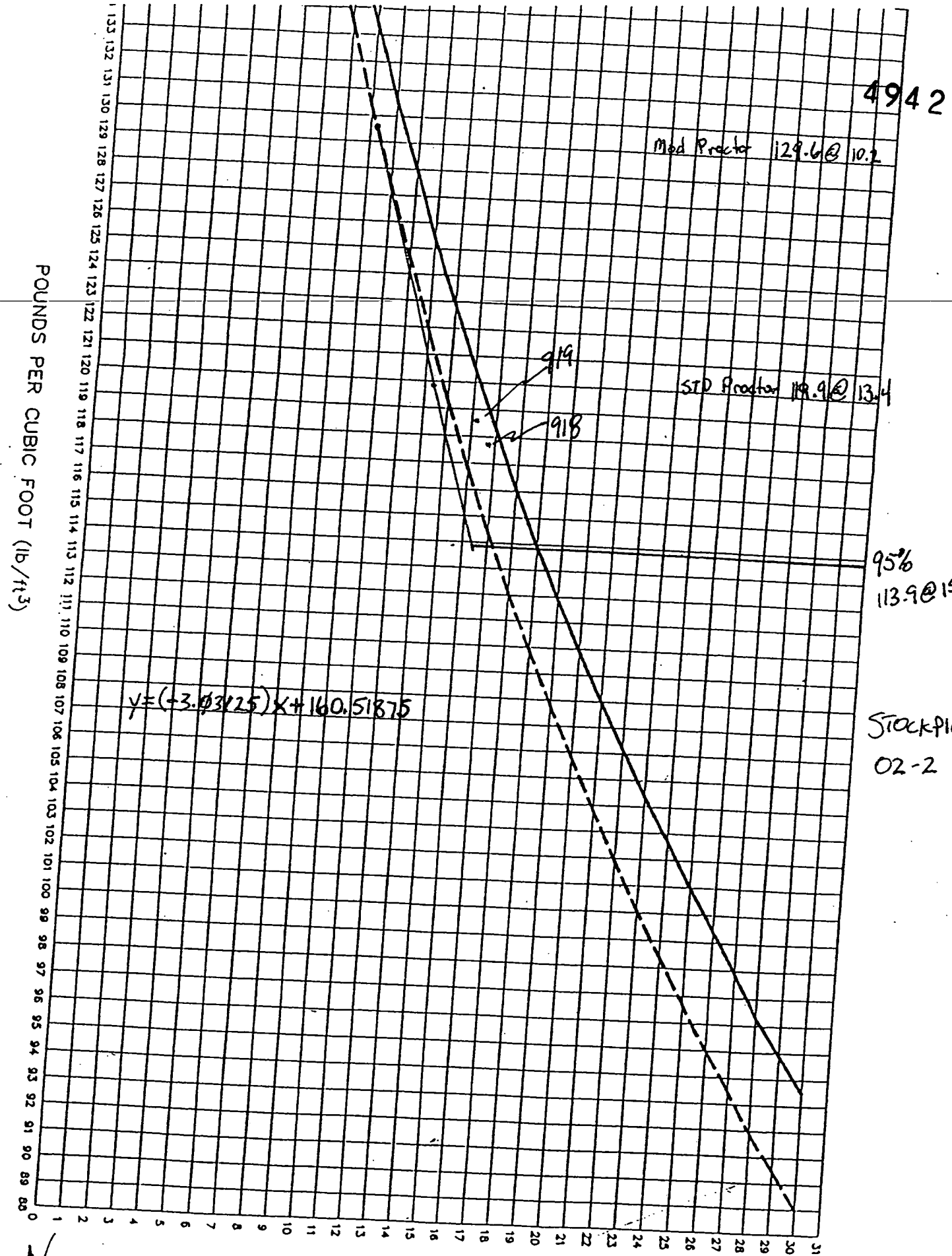

November 8th 2002

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV - Cell 4 & 5 Construction

PROJECT NO.: GQ1341 TASK NO.: 04.1

DATE: 9 day Nov month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95% + APZ COMPACTION / MOISTURE RANGE: ± 3% + APZ LIFT THICKNESS (LOOSE / COMPACTED): 6"

MATERIAL SOURCE: Stockpile 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = .08481 + 3.3669 QA ID: KS

TEST NO. CL02-	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
920 ~~923~~	Cell #5 W. Wedge	8"/L-4	022	13.4	119.9	13.6 (14.9)	135.5	117.9	98.4	P	—	—	—	—
921 ~~924~~	Cell #5 W. Wedge	6"/L-2	022	13.4	119.9	13.1 (14.5)	136.3	119.0	99.3	P	—	—	—	—
922 ~~925~~	Cell #5 W Wedge	6"/L-5	022	13.4	119.9	13.9 (15.2)	136.3	118.3	98.6	P	—	—	—	—
923 ~~926~~	Cell #5 W Wedge	6"/L-3	022	13.4	119.9	13.5 (14.4)	138.7	121.2	101.1	P	—	—	—	—
924 ~~927~~	Cell #5 W Wedge	6"/L-2	022	13.4	119.9	15.3 (16.5)	134.2	115.4	96.2	P	—	—	—	—
		/												
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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 2

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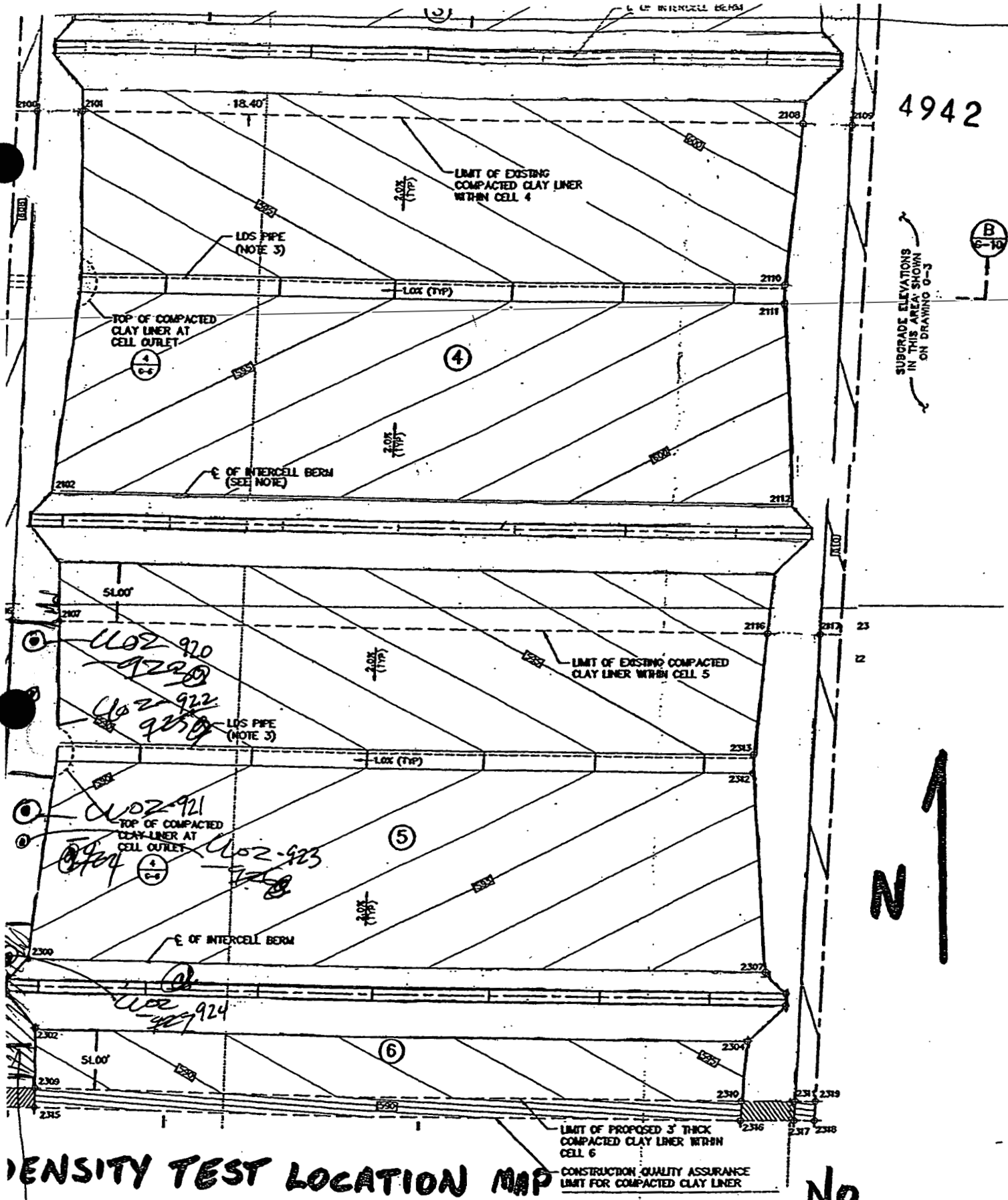

DENSITY TEST LOCATION MAP

9 DAY Nov MONTH 2002 YEAR

NO SCALE

000781

* DIFFERENT COLORS DENOTE SEPARATE LIFT-PROGRESSIONS *

2 of 2

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 & Cell #5

PROJECT NO.: G01341 TASK NO.: 04.1

DATE: 4 day November month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 20979 CORRECTION FACTOR Y = 0.8481X + 3.3669 QA ID: CKW

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
925 CL02-912	West Wedge, Cell #4	6" / L-4	02-2	13.4	119.9	12.4 / 13.9	138.6	121.7	101.5	P	—	—	—	—
926 CL02-913	West Wedge, Cell #5	6" / L-4	02-2	13.4	119.9	12.6 / 14.1	137.9	120.9	100.8	P	—	—	—	—
927 CL02-914	West Wedge, Cell #4	6" / L-5	02-2	13.4	119.9	12.0 / 13.5	138.2	121.8	101.6	P	—	—	—	—

287000

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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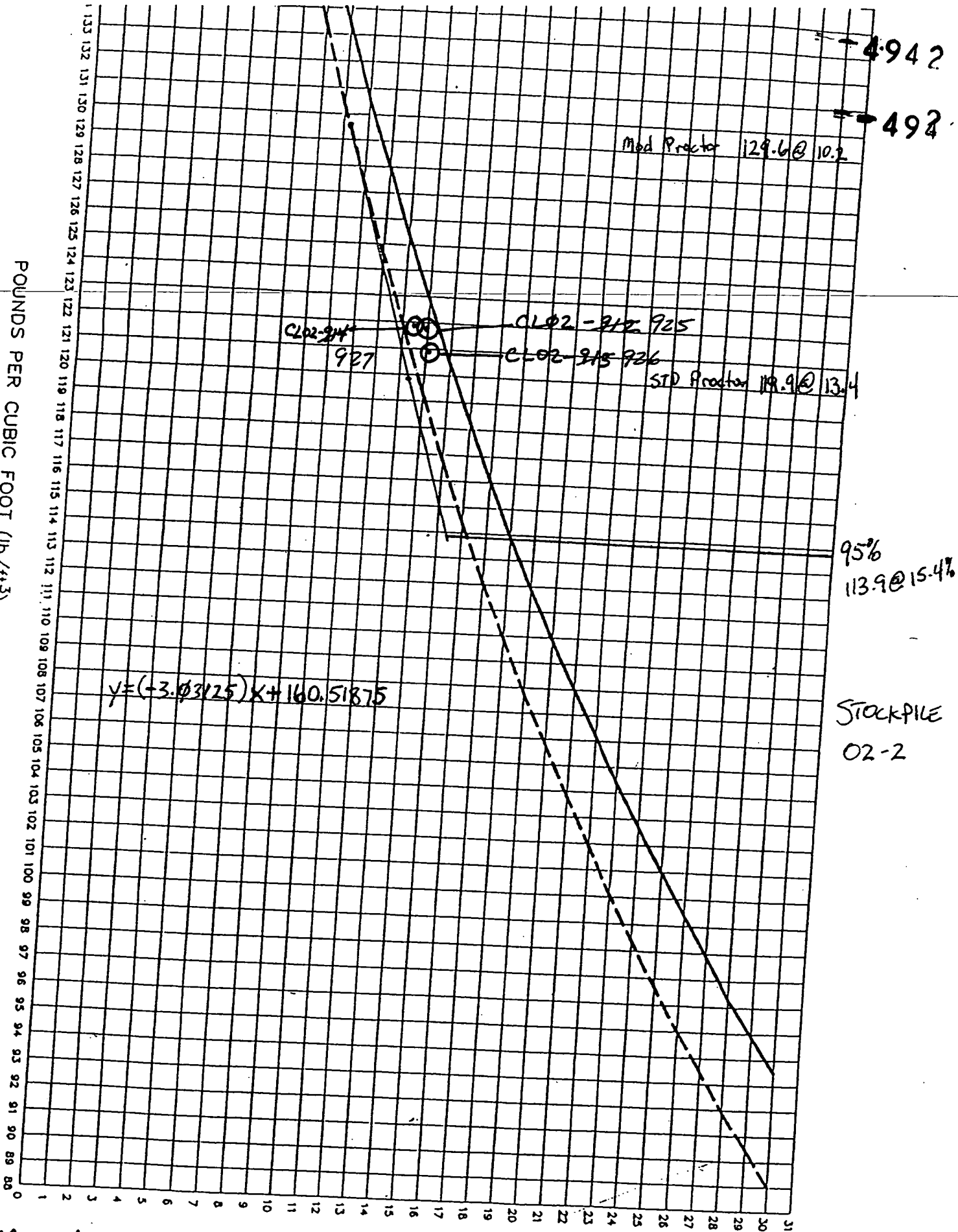
CHECKED BY: CK

SHEET NO. ~~2~~ 1 OF ~~4~~ 3



November 2002
GQ1341 04.1
Sheet No. 3 of 4

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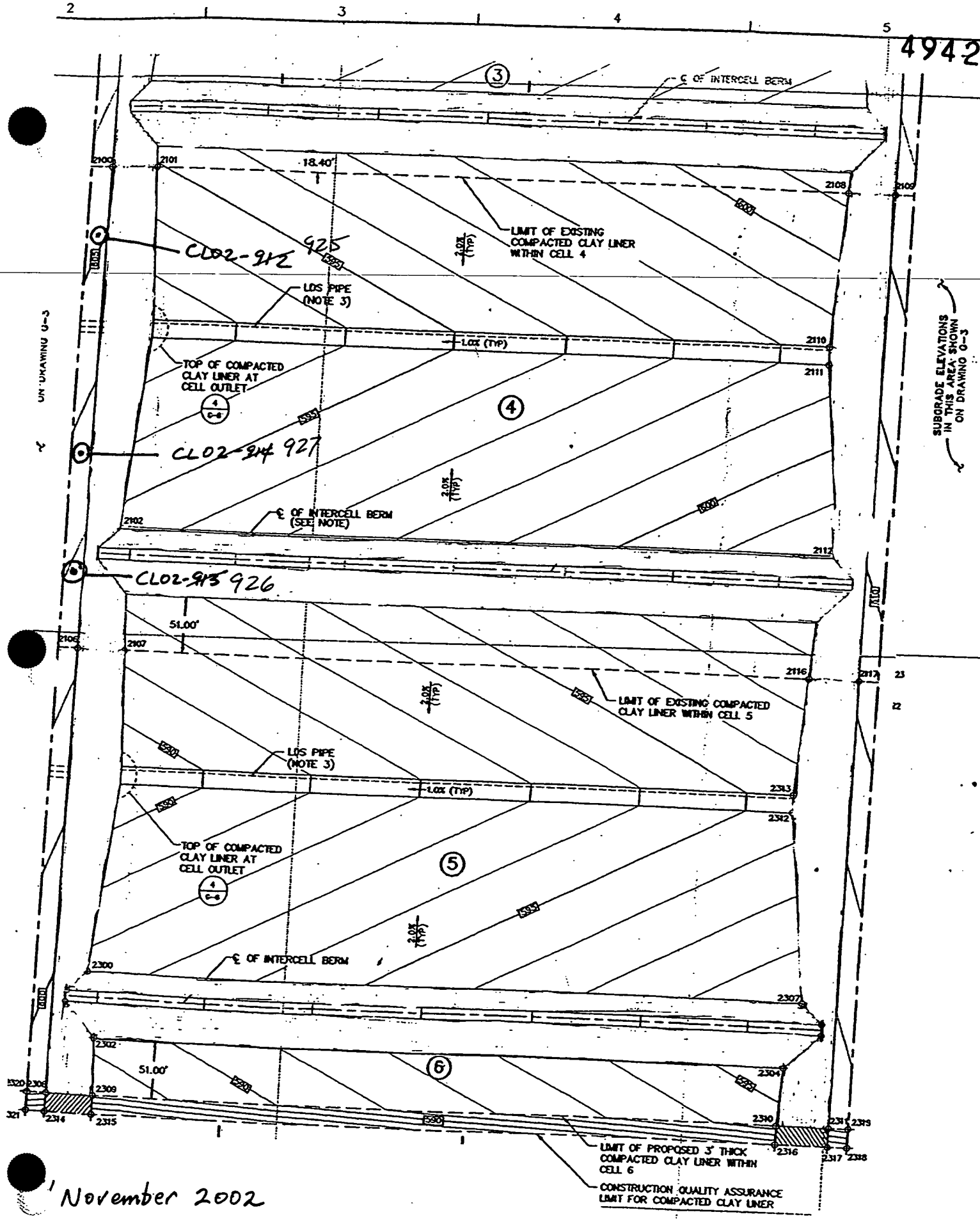

November 2002

GQ1341 84.1

Sheet No. ~~4~~ 3 of ~~4~~ 3

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GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: Phase IV Cell #4 and Cell #5

PROJECT NO.: GQ1341 TASK NO.: 04.1

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 0-+3% LIFT THICKNESS (LOOSE/COMPACTED): 8"

DATE: 12 day November month 2002 year

MATERIAL SOURCE: Stockpile

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) / OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481 X + 3.3669

QA ID: (CHW)

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
CL02-928	West Wedge Cell #5	6" / L-7	02-2	13.4	119.9	14.9 / 16.8	134.1	115.6	96.4	P	—	—	—	—
CL02-929	West Wedge Cell #5	6" / L-4	02-2	13.4	119.9	12.9 / 14.3	138.3	121.0	100.9	P	—	—	—	—
CL02-930	West Wedge Cell #6	6" / L-4	02-2	13.4	119.9	12.6 / 14.1	137.6	120.6	100.6	P	—	—	—	—

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COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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SHEET NO. 1 OF 3

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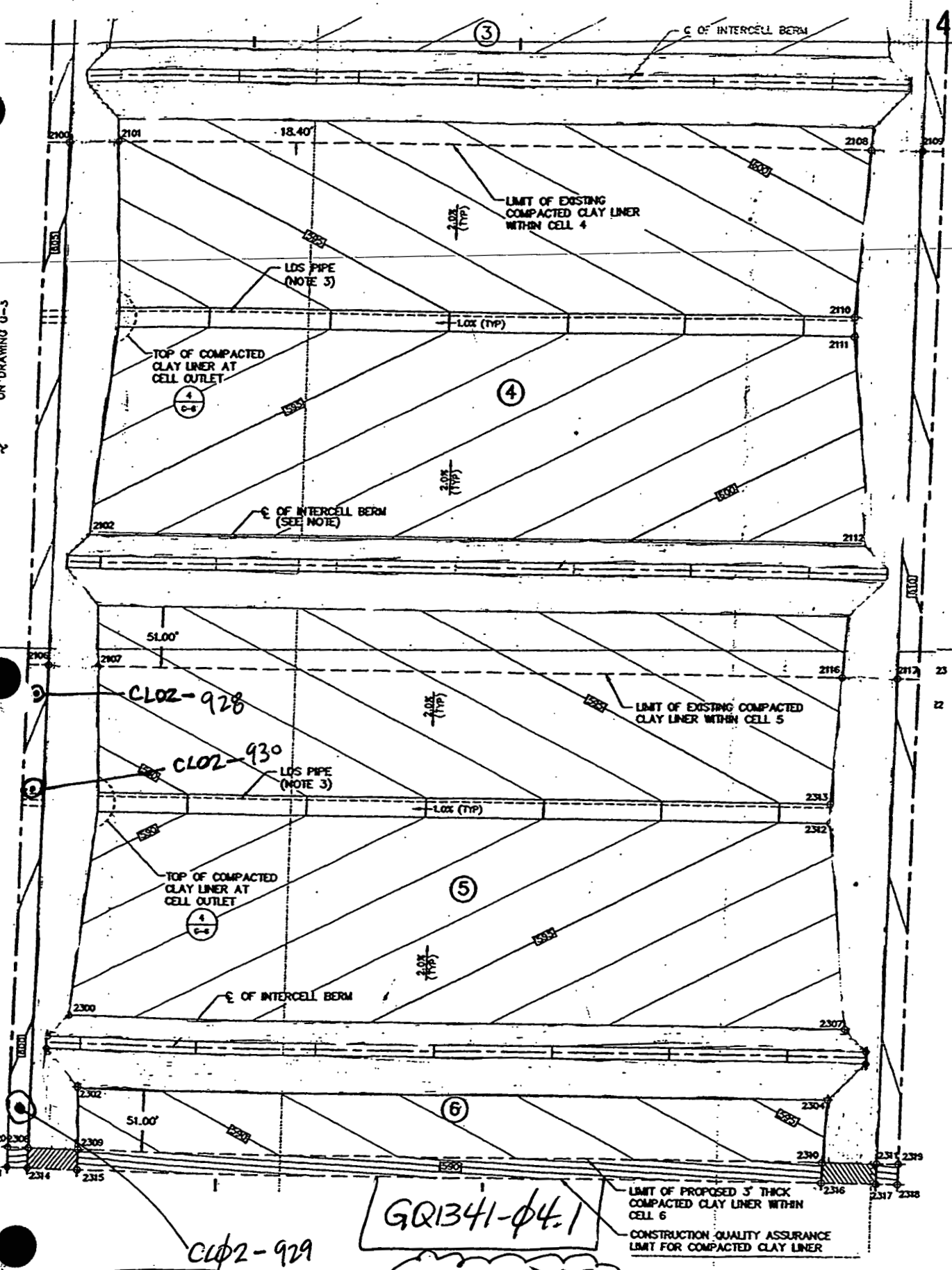

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CLAY WEDGE NDTs

12 Nov 2002

TUESDAY

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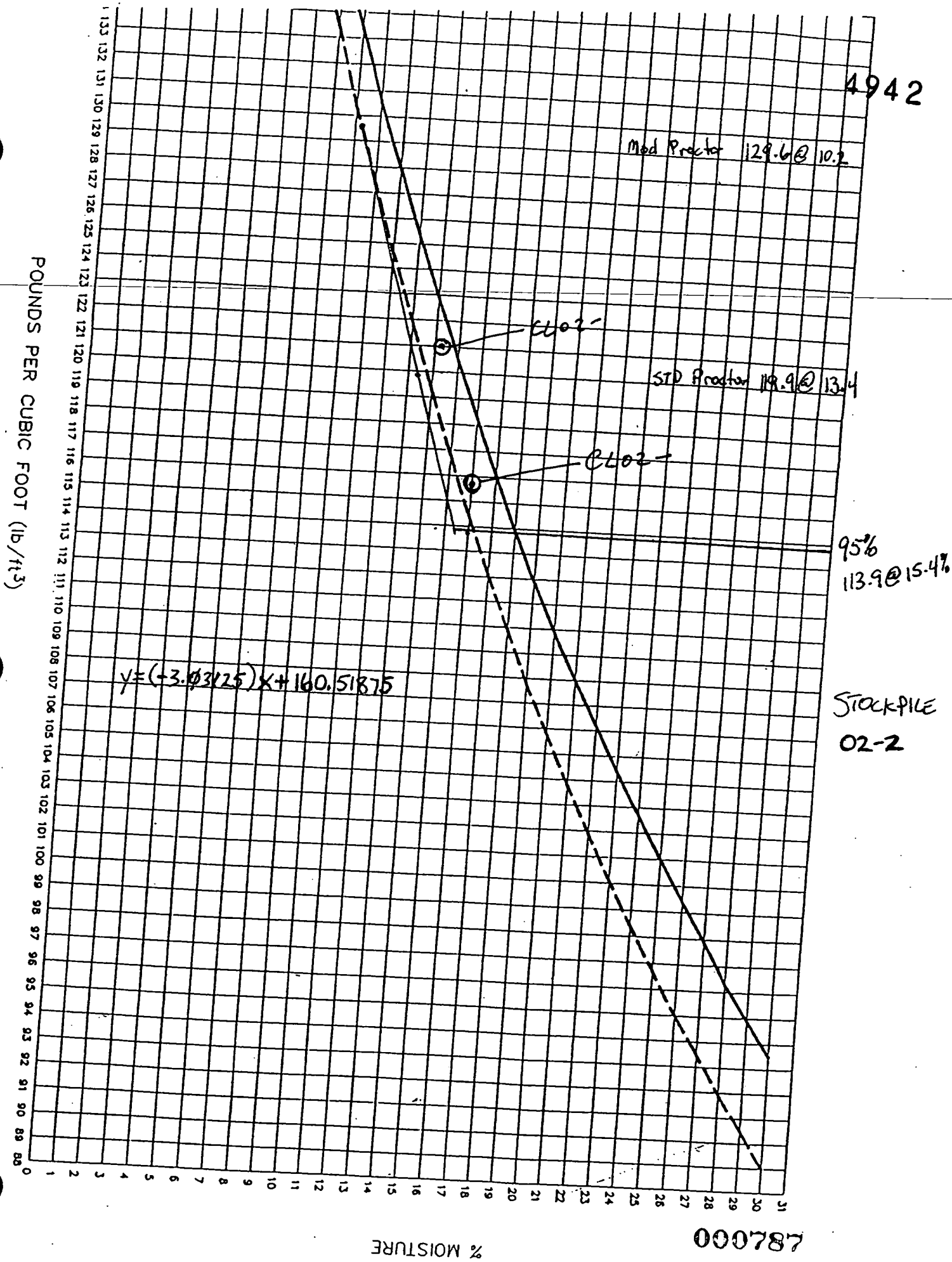

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SHEET NO. 3 OF 3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG

(ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

DESCRIPTION: PHASE IV, CELLS 4 & 5

PROJECT NO.: GQ134 TASK NO.: 04.1

DATE: 13 day (WEDNESDAY) Nov month 2002 year

SPECIFICATION REQUIREMENTS: (ASTM D 698) / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: 10-32 LIFT THICKNESS (LOOSE/(COMPACTED): 6"

MATERIAL SOURCE: STOCKPILE 02-2

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / (CLAY) OTHER:

NUCLEAR GAUGE TYPE: TROXLER 3440

GAUGE SERIAL NO. 20979

CORRECTION FACTOR Y = 0.8481X + 3.3669

QA ID: (TBK)

	TEST NO.	TEST LOCATION (SEE ATTACHED SKETCH)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
1	CL02-931	CELL5 - WEST CLAY WEDGE	6"/L-5	02-2	13.4	119.9	11.9 (13.5)	139.2	122.6	102.3	P	—	—	—	—
2	CL02-932	CELL6 - WEST CLAY WEDGE	6"/L-5	02-2	13.4	119.9	13.0 (14.4)	137.4	120.1	100.2	P	—	—	—	—
3	CL02-933	CELL6 - WEST CLAY WEDGE	6"/L-6	02-2	13.4	119.9	15.0 (16.1)	133.5	115.0	95.9	P	—	—	—	—

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

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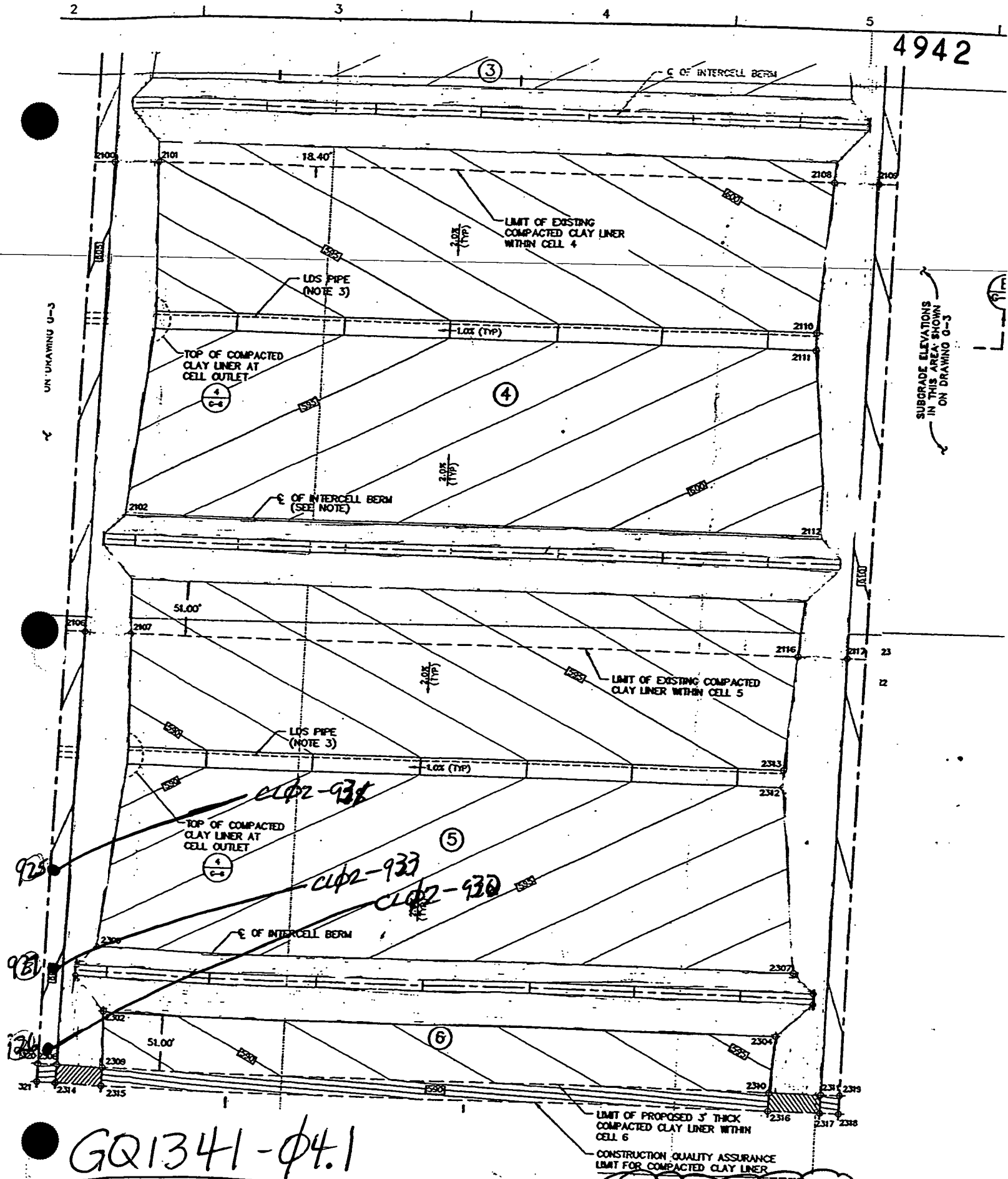

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13 NOV 2002 WEDNESDAY

CLAY WEDGE NDTs

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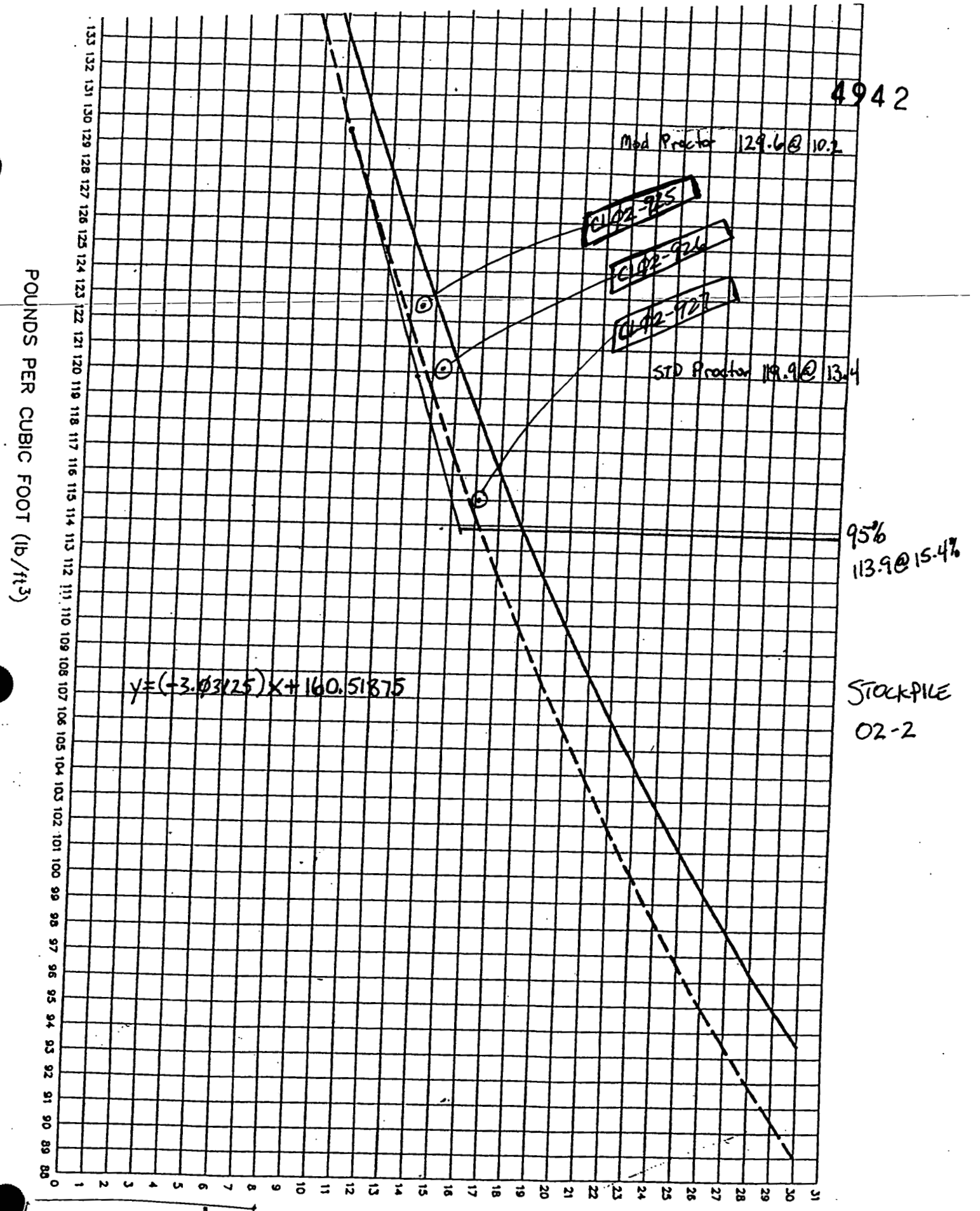
SHEET No 2 OF 3



13 Nov 2002
WEDNESDAY

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