CONSTRUCTION QUALITY ASSURANCE
FINAL REPORT

ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM

ON-SITE DISPOSAL FACILITY

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

prepared by

GEOSYNTEC CONSULTANTS

7400 Willey Road
Hamilton, Ohio 45103

under

Fluor Fernald, Inc.
Contract No. 95PS005028

REVISION 0
OCTOBER 2001
VOLUME III

CONSTRUCTION QUALITY ASSURANCE
FINAL REPORT

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VOLUME III

APPENDIX D

APPENDIX D

MATERIALS SUBMITTALS AND LABORATORY TEST RESULTS

ON-SITE SOIL MATERIALS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

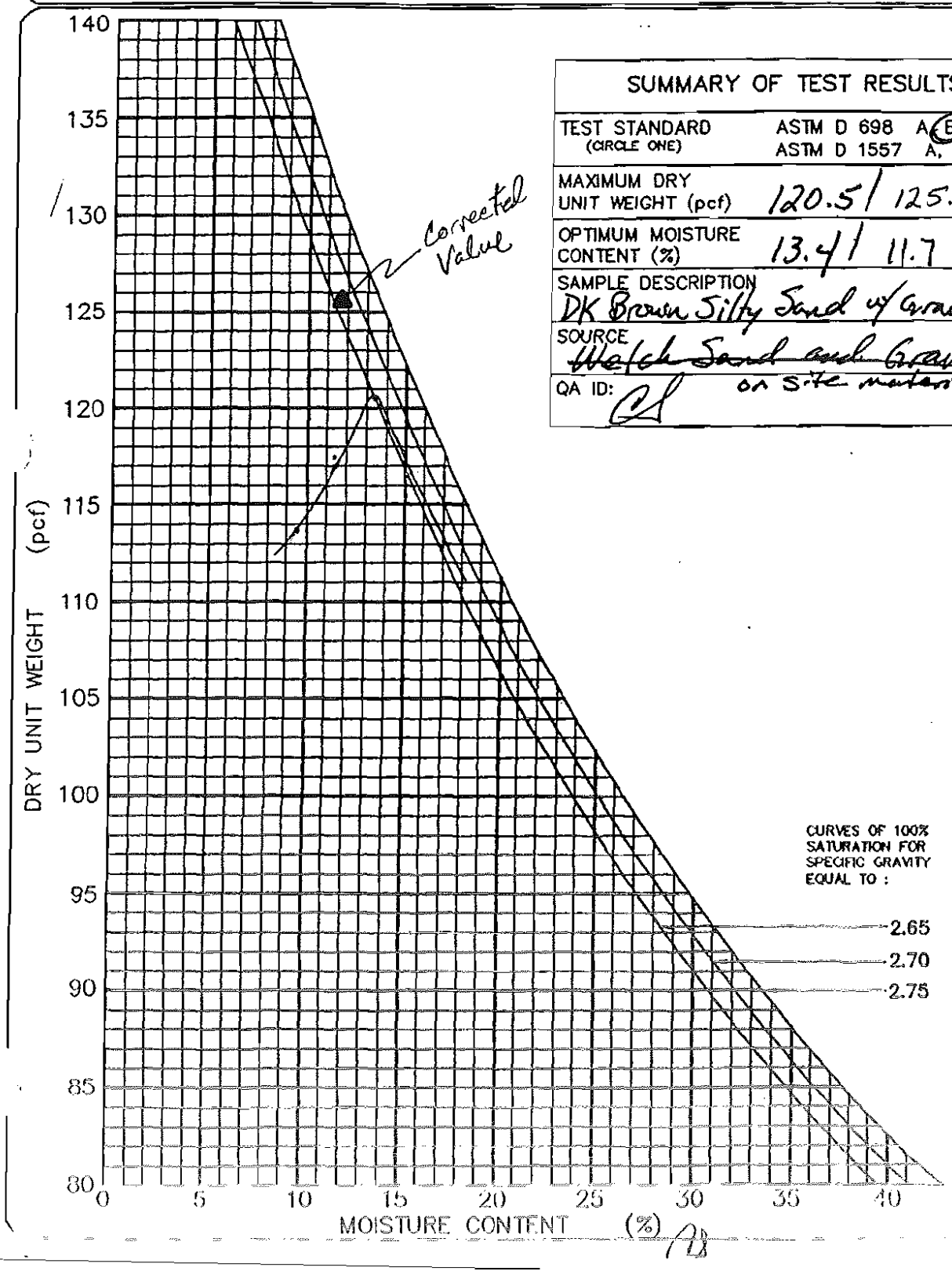
PROJECT NO: ~~GQ0409~~ GQ1029 DLE TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 12 day June month 2000 year

MATERIAL TYPE: TRENCH fill

SAMPLE NO.: EP-5



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	120.5 / 125.6
OPTIMUM MOISTURE CONTENT (%)	13.4 / 11.7
SAMPLE DESCRIPTION	DK Brown Silty Sand w/ Gravel
SOURCE	~~Welch Sand and Gravel~~ on site material
QA ID:	

+3/8 (Stone WT. Dirty 361.5 gm) +3/8 Stone wt Clean

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FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

9573.6 Total WT. of Sample

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: ____ day ____ month ____ year

MATERIAL TYPE: TRENCH FILL SAMPLE NO.: EP-D

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

9212.1 -3/8
361.5 +3/8

COMPACTION OF SOIL

QA ID: DLE

			13.40				
	WATER ADDED	(ml)	3%				
A	WT. OF SOIL & MOLD	(grams)	6078.2				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A - B	(grams)	1869.4				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	123.4				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	114.3				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT - ASTM D 2216

QA ID: ____

	TARE NO.		#28				
F	WT. OF TARE	(grams)	8.3				
G	WT. OF WET SOIL & TARE	(grams)	448.7				
H	WT. OF DRY SOIL & TARE	(grams)	416.0				
I	WT. OF WATER = G - H	(grams)	32.7				
J	WT. DRY SOIL = H - F	(grams)	407.7				
K	MOISTURE CONTENT = (I/J) X 100	(%)	8.0				

GEOSYNTEC CONSULTANTS FILE NO. 2-05-FLC CHECKED BY: ____ SHEET NO. 1 OF 2

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FLUOR DANIEL FERNALD

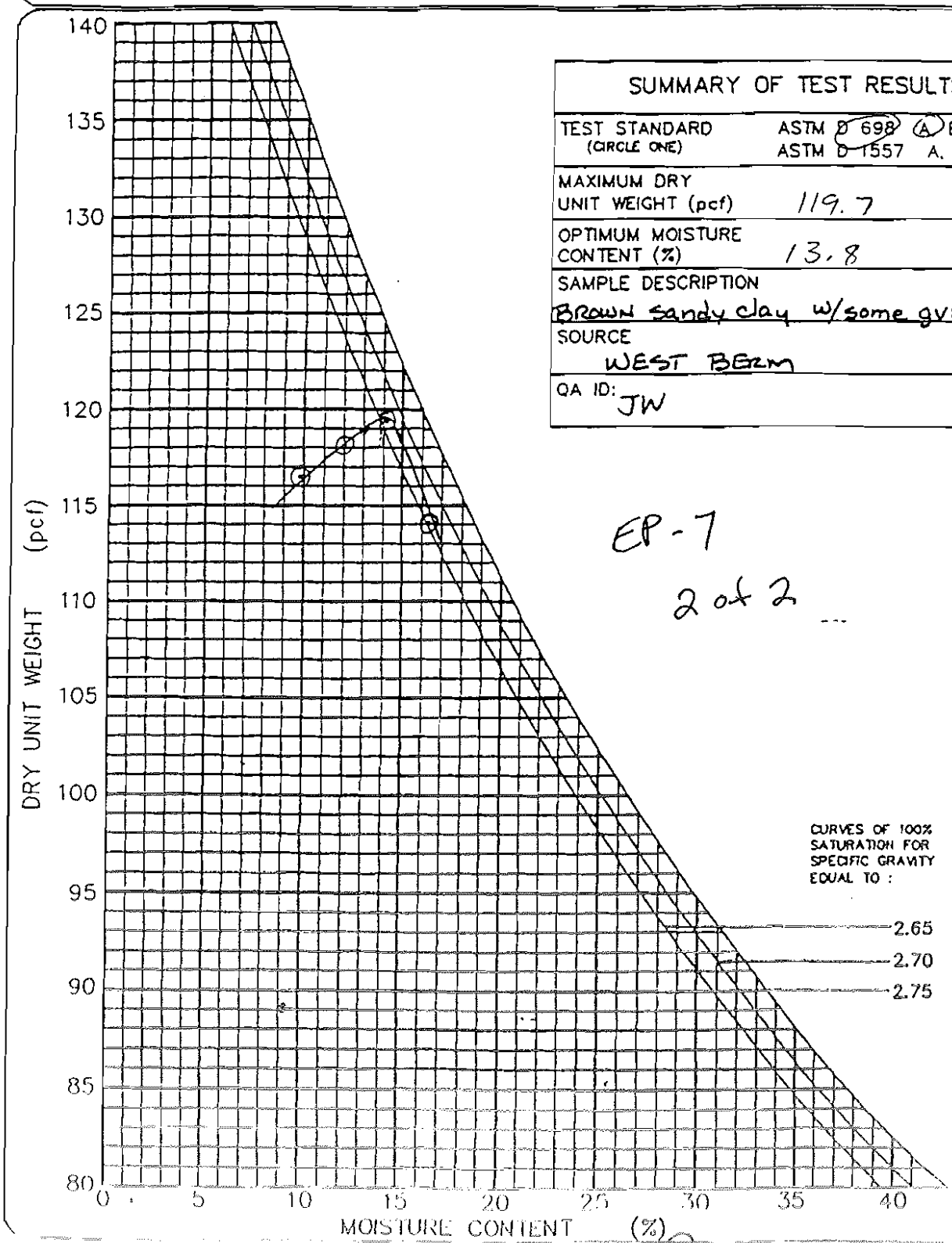
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0166 TASK NO.: 04.1

DESCRIPTION: PHASE I CONSTRUCTION DATE: 26 day 7 month 97 year

MATERIAL TYPE: STRUCTURAL FILL SAMPLE NO.: OSDF-10



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 (A) B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	119.7
OPTIMUM MOISTURE CONTENT (%)	13.8
SAMPLE DESCRIPTION	BROWN sandy clay w/some gvl.
SOURCE	WEST BERM
QA ID:	JW

EP-7

2 of 2

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

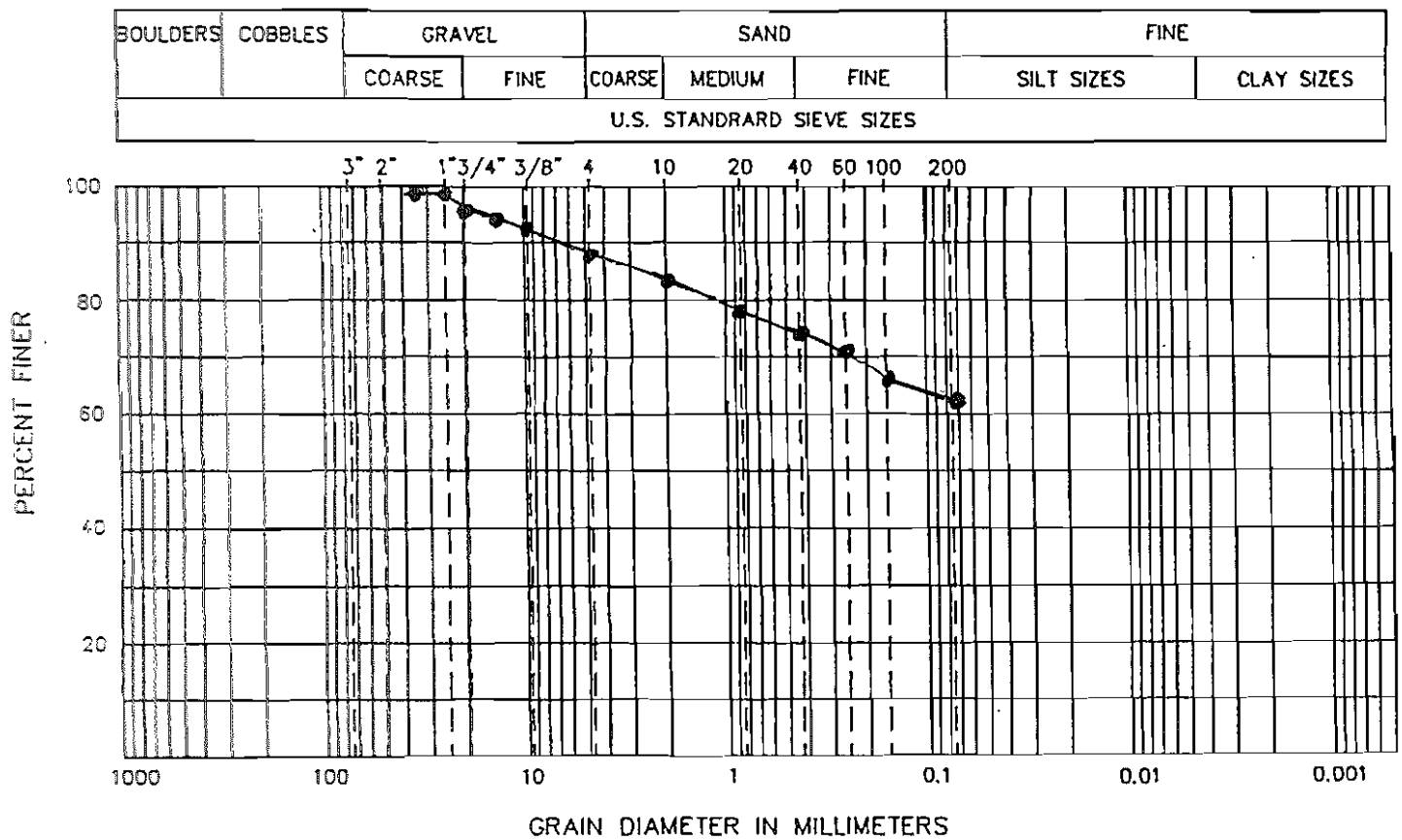
PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO. 69029 TASK NO.: 04.2

DESCRIPTION: Phase II EPLTS — DATE: 29 day June month 2000 year

MATERIAL TYPE: Roadway Fill (D-422) — SAMPLE NO.: EP-8 QA ID: DLE

CURVE COEFFICIENTS: (C_U) ..... (C_C) .....



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	99.4
1-in.	98.4
3/4-in.	96.3
1/2-in.	94.2
3/8-in.	93.4
NO. 4	87.7
NO. 10	83.0
NO. 20	78.6
NO. 40	74.5
NO. 60	71.6
NO. 100	67.9
NO. 200	63.8

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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FLUOR DANIEL FERNALD

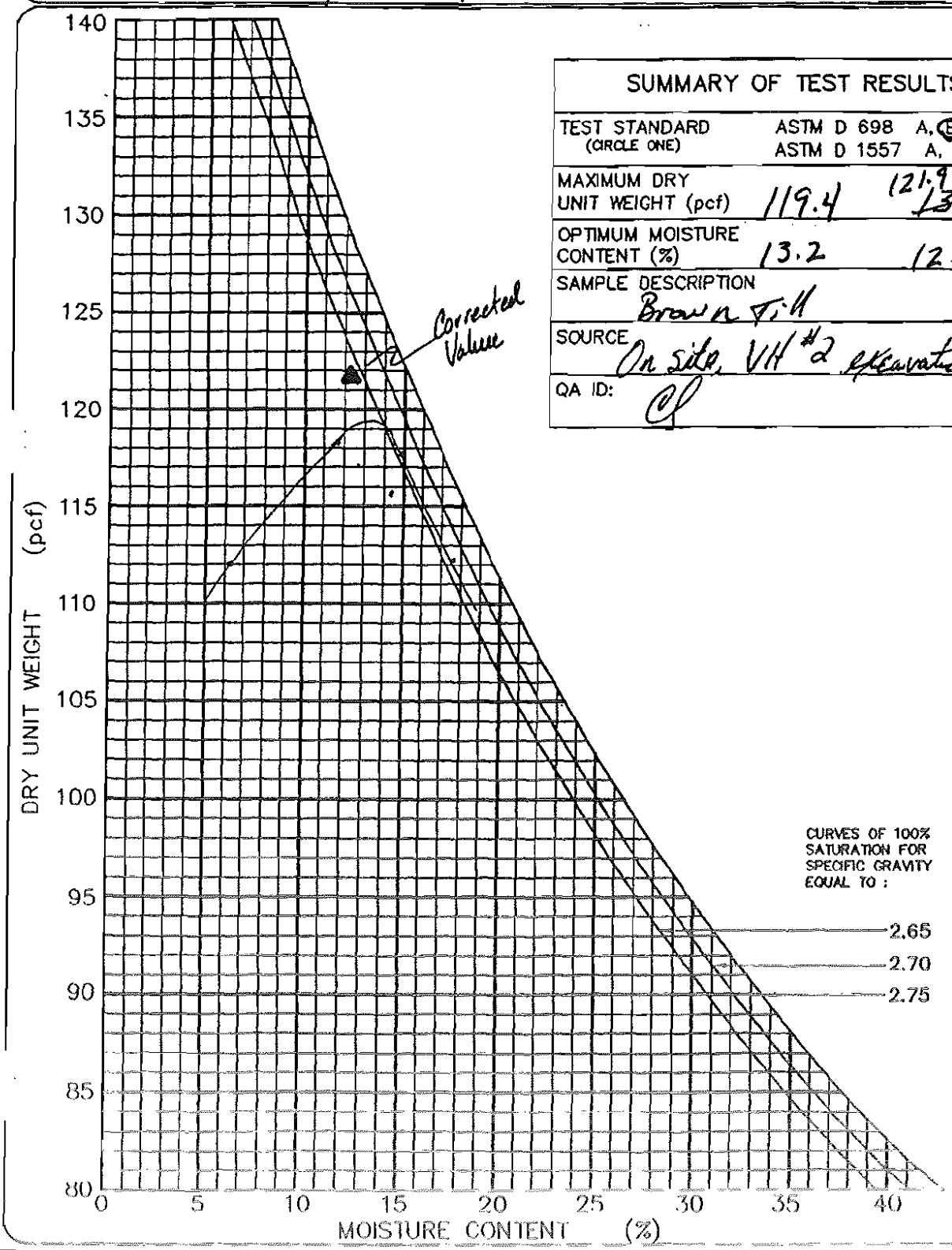
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 5 day July month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP8



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	119.4	121.9 ~~13.2~~
OPTIMUM MOISTURE CONTENT (%)	13.2	12.4
SAMPLE DESCRIPTION	Brown Fill	
SOURCE	On site, VH #2 excavation	
QA ID:		

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FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 1557 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS — DATE: 13 day July month 2000 year

MATERIAL TYPE: Subgrade — SAMPLE NO.: EP-9

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 4-in. (4.75-mm) SIEVE IS GREATER THAN 20%, AND THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 10-lb RAMMER / 18-in. DROP / 5 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: JD/JLE

	WATER ADDED	(ml)	13.36 / 4%				
A	WT. OF SOIL & MOLD	(grams)	6060.1				
B	WT. OF MOLD	(grams)	4208.8		Plots close to OSDF-14 115.9@12.2		
C	WT. OF SOIL = A − B	(grams)	1851.3				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	110.0 / 122.2				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	~~109.7~~				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT — ASTM D 2216

QA ID: JD

	TARE NO.		#225				
F	WT. OF TARE	(grams)	8.3				
G	WT. OF WET SOIL & TARE	(grams)	549.3				
H	WT. OF DRY SOIL & TARE	(grams)	495.1				
I	WT. OF WATER = G − H	(grams)	54.2				
J	WT. DRY SOIL = H − F	(grams)	486.8				
K	MOISTURE CONTENT = (I/J) X 100	(%)	11.1				

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FLUOR DANIEL FERNALD

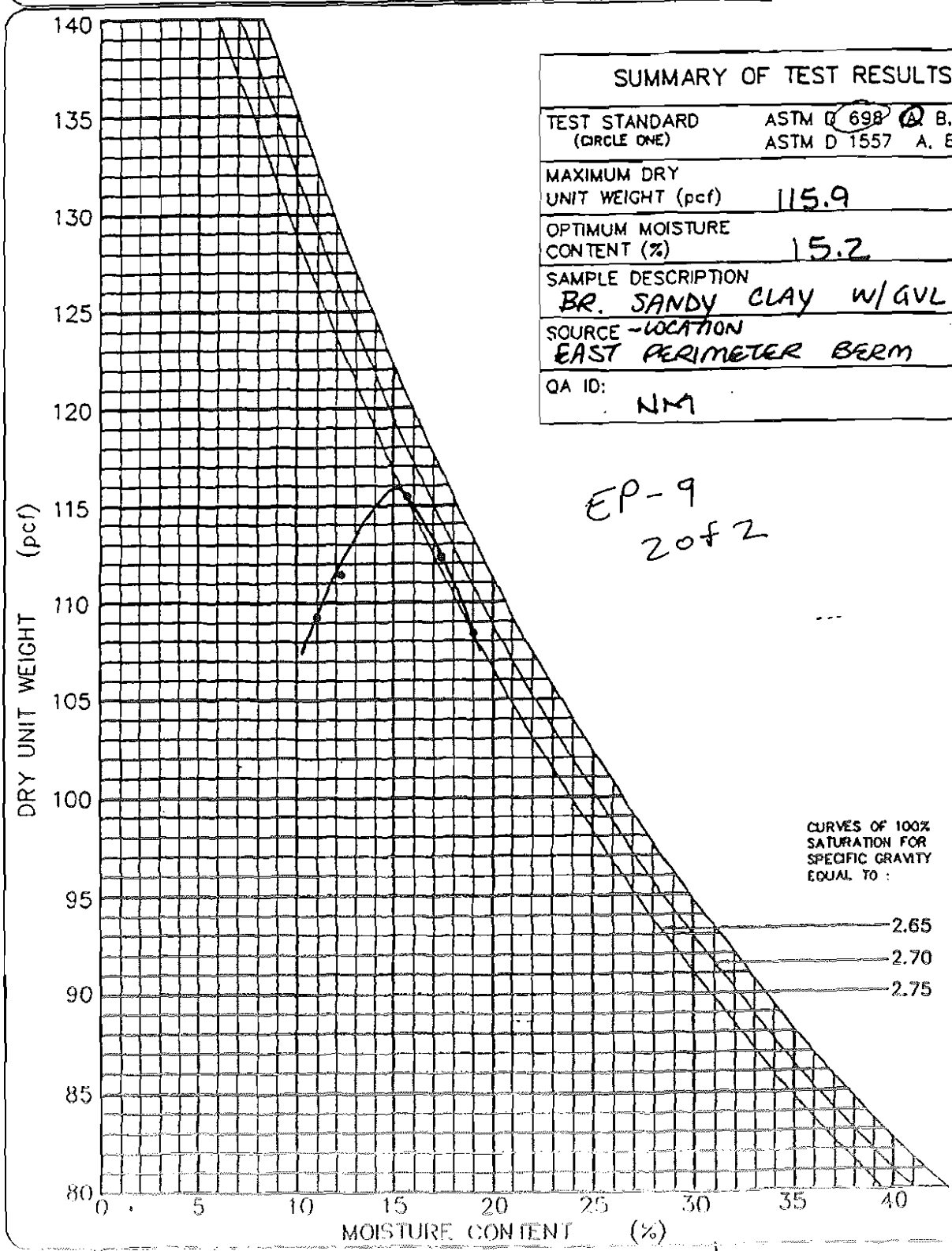
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0166 TASK NO.: 04.1

DESCRIPTION: PHASE I CONSTRUCTION DATE: 5 day 9 month 97 year

MATERIAL TYPE: STRUCTURAL FILL SAMPLE NO.: OSDF-14



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	115.9
OPTIMUM MOISTURE CONTENT (%)	15.2
SAMPLE DESCRIPTION	BR. SANDY CLAY W/GVL
SOURCE - LOCATION	EAST PERIMETER BERM
QA ID:	NM

EP-9
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FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. 69 1029 TASK NO.: 04.2

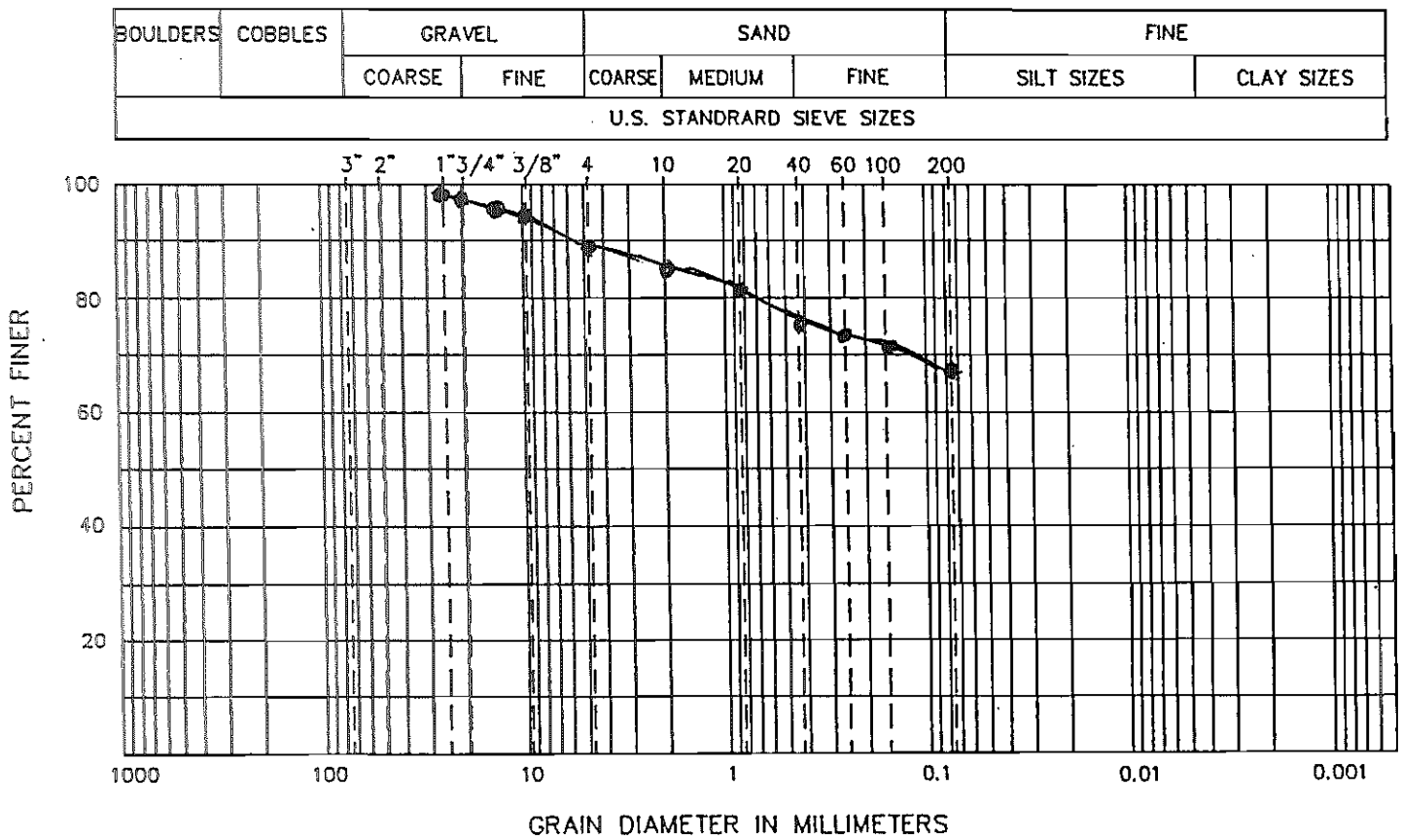
DESCRIPTION: Phase III EPLTS

DATE: 21 day Aug month 2000 year

MATERIAL TYPE: Valve House #5 Excavations (D-422)

SAMPLE NO.: EP-010 QA ID: DLE

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) 33.9

(PL) 16.8

(PI) 17.1

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100.0
2-in.	100.0
1 1/2-in.	100.0
1-in.	99.2
3/4-in.	98.3
1/2-in.	96.1
3/8-in.	95.1
NO. 4	89.6
NO. 10	85.3
NO. 20	81.4
NO. 40	77.7
NO. 60	74.6
NO. 100	70.7
NO. 200	66.3

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

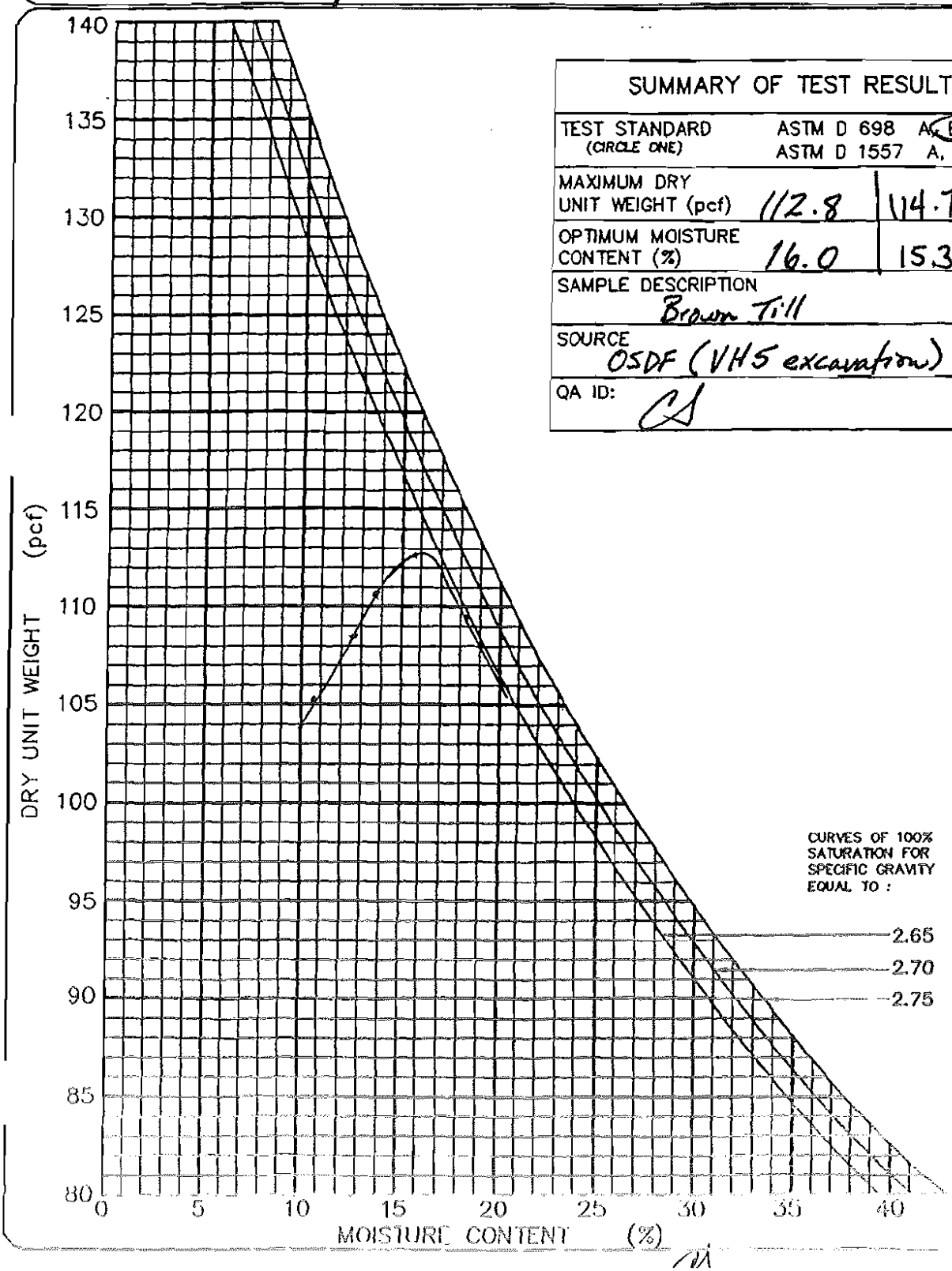
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II EPLTS DATE: 5 day Sept month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP-10



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, B, C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	112.8	114.7
OPTIMUM MOISTURE CONTENT (%)	16.0	15.3
SAMPLE DESCRIPTION	Brown Till	
SOURCE	OSDF (VH5 excavation)	
QA ID:	CS	

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FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1029 TASK NO.: 042

DESCRIPTION: Phase III — DATE: 30 day July month 2000 year

MATERIAL TYPE: Fill, Compacted — SAMPLE NO.: EPT13

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: _____

			13.77	DAY BACK 12.98			
	WATER ADDED	(ml)	0	-0			
A	WT. OF SOIL & MOLD	(grams)	6246.1	5887.7	Plots	close to	
B	WT. OF MOLD	(grams)	4208.8	4208.8		OSDF-11	
C	WT. OF SOIL = A − B	(grams)	2037.3	1678.9			
D	WET UNIT WT.(1) = C X 0.066	(pcf)	134.5	110.8	115.8		
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	115.8	101.6	15.8		

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT — ASTM D 2216

QA ID: _____

			#	#			
	TARE NO.		101	103			
F	WT. OF TARE	(grams)	8.32	8.4			
G	WT. OF WET SOIL & TARE	(grams)	472.32	351.2			
H	WT. OF DRY SOIL & TARE	(grams)	408.1	322.5			
I	WT. OF WATER = G − H	(grams)	64.2	28.70			
J	WT. DRY SOIL = H − F	(grams)	399.8	314.1			
K	MOISTURE CONTENT = (I/J) X 100	(%)	16.1	9.1			

GEOSYNTEC CONSULTANTS FILE NO. 2-05-FLC — CHECKED BY: [illegible] — Matches OSDF-11 — SHEET NO. 1 OF 2

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FLUOR DANIEL FERNALD

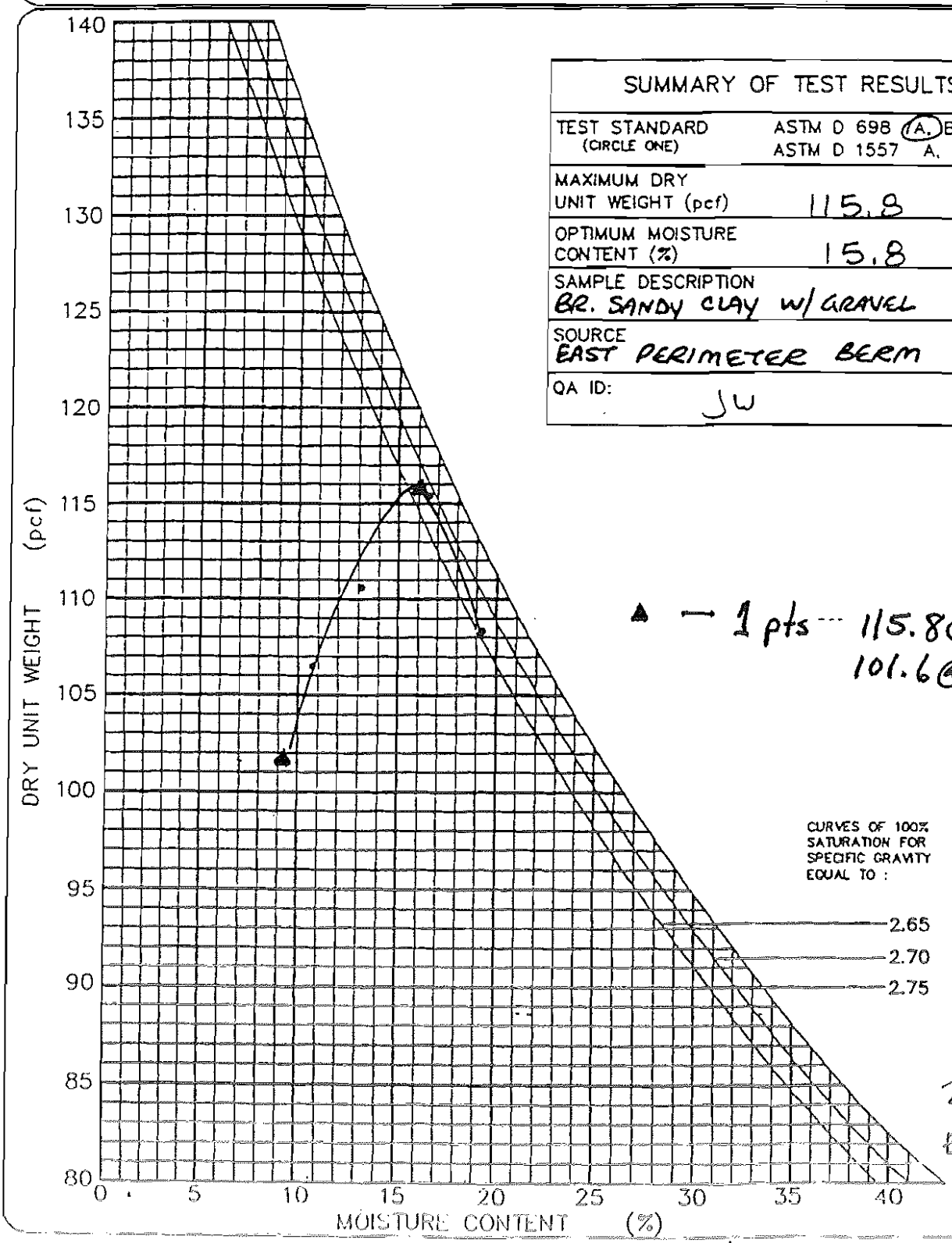
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: G00166 TASK NO.: 04.1

DESCRIPTION: PHASE I CONSTRUCTION DATE: 8 day 1 month 97 year

MATERIAL TYPE: STRUCTURAL FILL SAMPLE NO.: OSDF-11



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 (A.) B. C ASTM D 1557 A. B. C
MAXIMUM DRY UNIT WEIGHT (pcf)	115.8
OPTIMUM MOISTURE CONTENT (%)	15.8
SAMPLE DESCRIPTION	BR. SANDY CLAY w/ GRAVEL
SOURCE	EAST PERIMETER BERM
QA ID:	JW

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EP-13

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FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. GQ 1029 TASK NO.: 04.2

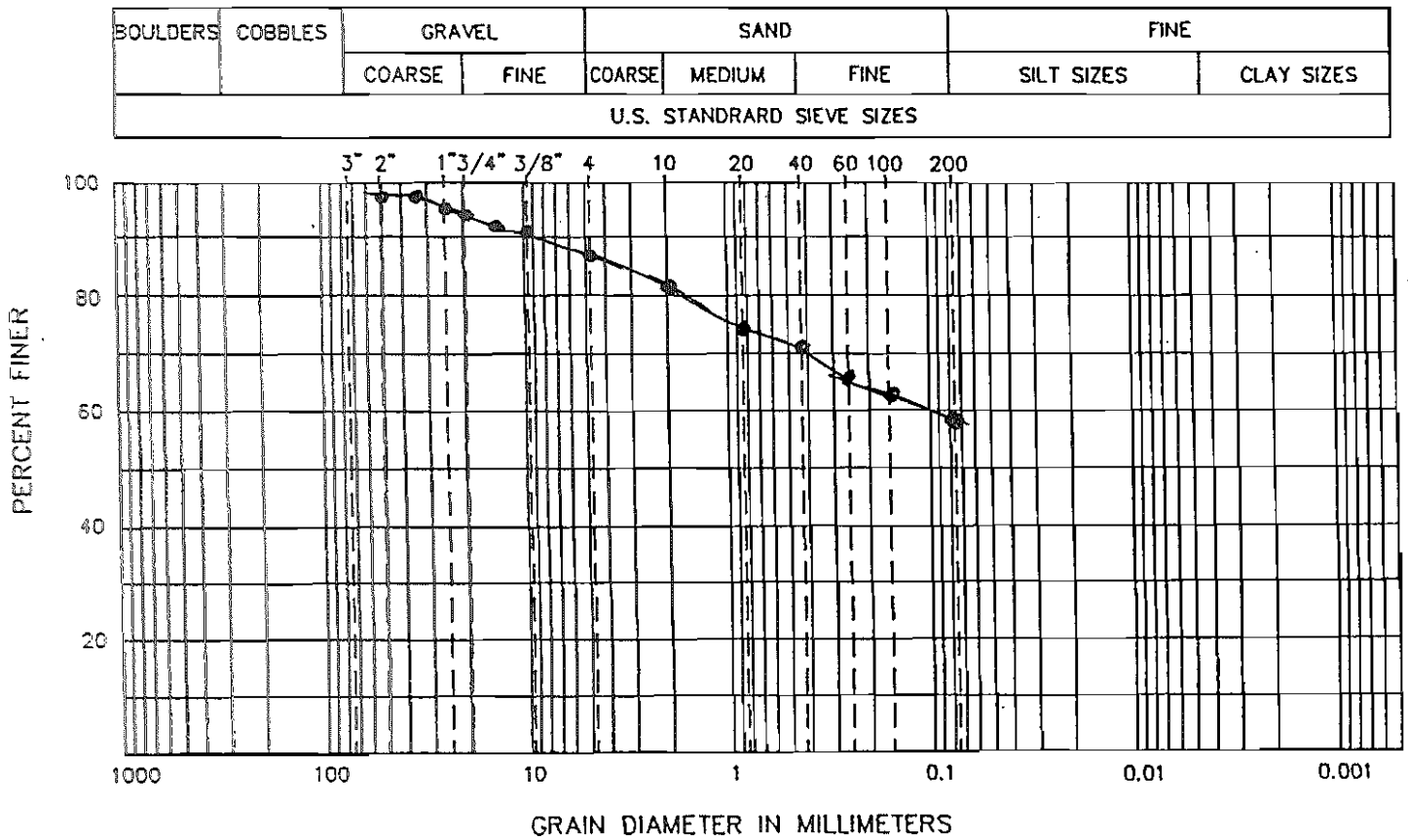
DESCRIPTION: Phase III IEPLTS

DATE: 23 day Oct month 2000 year

MATERIAL TYPE: Compacted F-LC D-422

SAMPLE NO.: EP-14 QA ID: DLE

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER	
3-in.	100	
2-in.	98.6	
1 1/2-in.	98.6	
1-in.	96.4	
3/4-in.	94.4	
1/2-in.	92.0	
3/8-in.	90.7	
NO. 4	87.4	12.6
NO. 10	81.8	18.2
NO. 20	75.7	24.3
NO. 40	70.3	29.7
NO. 60	66.7	56.7
NO. 100	63.0	53.0
NO. 200	59.3	40.7

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

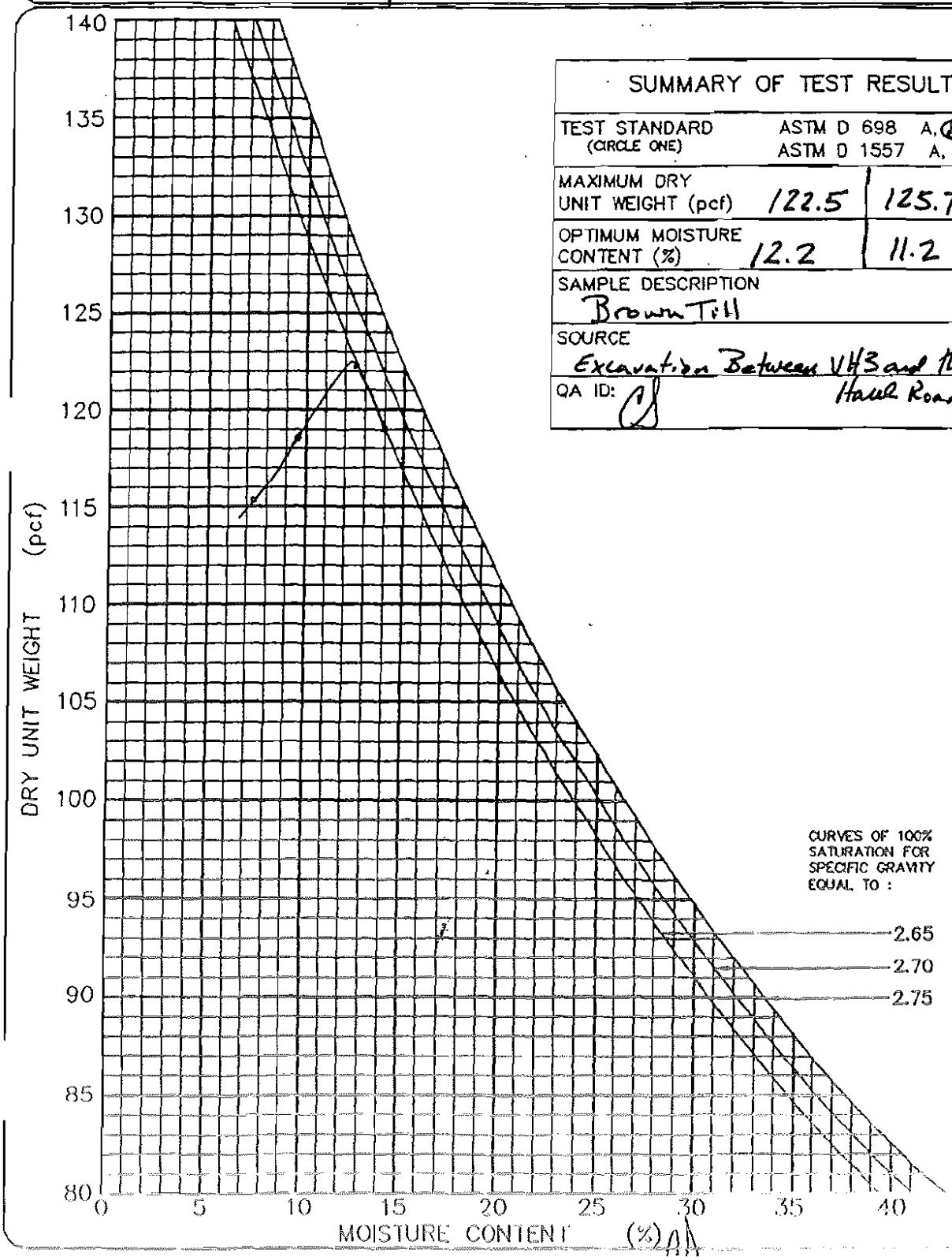
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON–SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II EPLTS DATE: 30 day Oct month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: ~~GC-14~~ EP-14



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	122.5	125.7
OPTIMUM MOISTURE CONTENT (%)	12.2	11.2
SAMPLE DESCRIPTION	Brown Till	
SOURCE	Excavation Between VH3 and the IMP Haul Road.	
QA ID:		

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

ATTERBERG LIMITS TEST (ASTM D 4318)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: 601029 TASK NO.: 04.2

DESCRIPTION: Phase III DATE: 18 day Oct month 2000 year

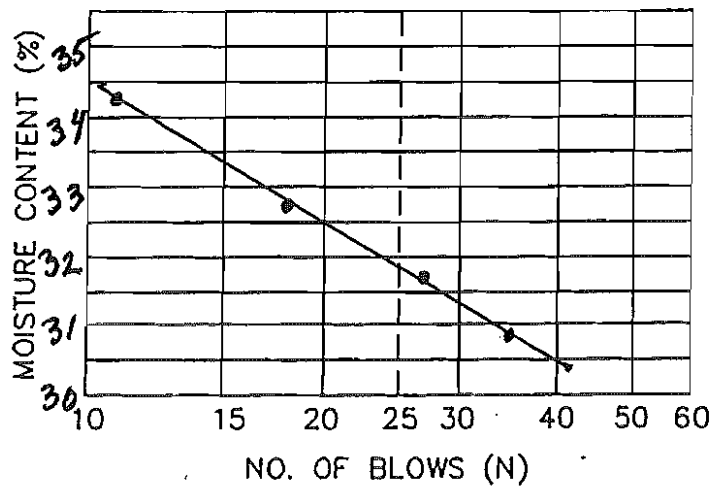
MATERIAL TYPE: Compacted fill SAMPLE NO.: EP-17

LIQUID LIMIT DETERMINATION

QA ID: DLE

	TARE NO.		1.9	2.3	3.1	2.6
A	WT. OF TARE	(grams)	28.55	31.19	28.39	28.55
B	WT. OF WET SOIL & TARE	(grams)	41.99	46.83	43.28	48.89
C	WT. OF DRY SOIL & TARE	(grams)	38.56	42.97	39.69	44.09
D	WT. OF WATER = B-C	(grams)	3.43	3.86	3.59	4.80
E	WT. OF DRY SOIL = C-A	(grams)	10.01	11.78	11.3	15.54
F	MOISTURE CONTENT = (D/E)X100	(%)	34.3	32.8	31.8	30.9
N	NUMBER OF BLOWS		11	18	26	32

DRYING TARE NO.



CURING TARE NO.

PLASTIC LIMIT DETERMINATION

QA ID: _____

	TARE NO.		2.5	1.6		
A	WT. OF TARE	(grams)	28.43	28.86		
B	WT. OF WET SOIL & TARE	(grams)	38.75	40.17		
C	WT. OF DRY SOIL & TARE	(grams)	37.30	38.58		
D	WT. OF WATER = B-C	(grams)	1.45	1.59		
E	WT. OF DRY SOIL = C-A	(grams)	8.87	9.72		
F	MOISTURE CONTENT = (D/E)X100	(%)	16.3 ~~16.4~~	16.4		

LIQUID LIMIT (LL) = 31.9 PLASTIC LIMIT (PL) = 16.4 PLASTICITY INDEX (PI) = 15.5

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

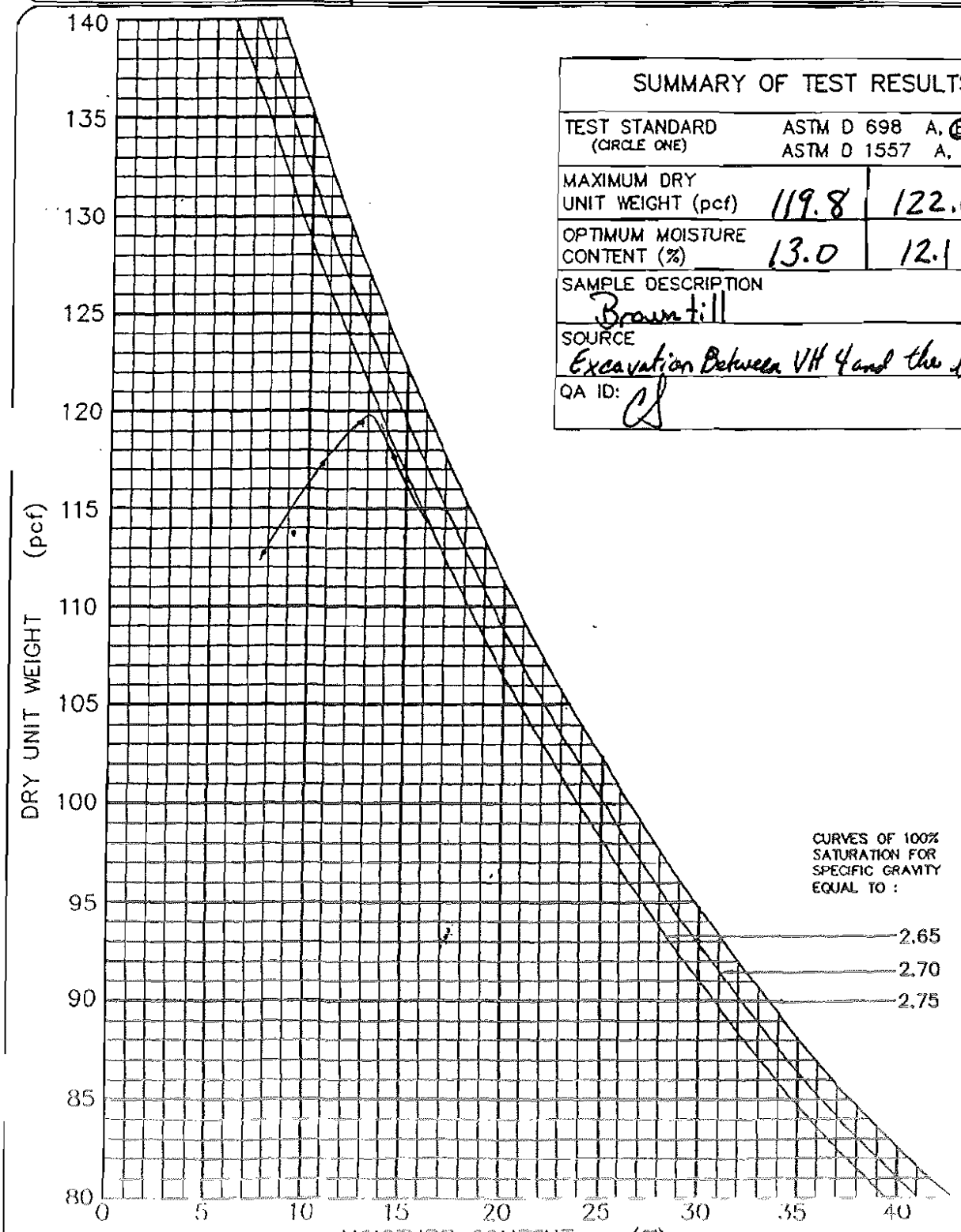
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II/EPLTS DATE: 30 day Oct month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP-17



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	119.8	122.6
OPTIMUM MOISTURE CONTENT (%)	13.0	12.1
SAMPLE DESCRIPTION	Brown till	
SOURCE	Excavation Between VH 4 and the haul road	
QA ID:	CS	

3 of 3

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

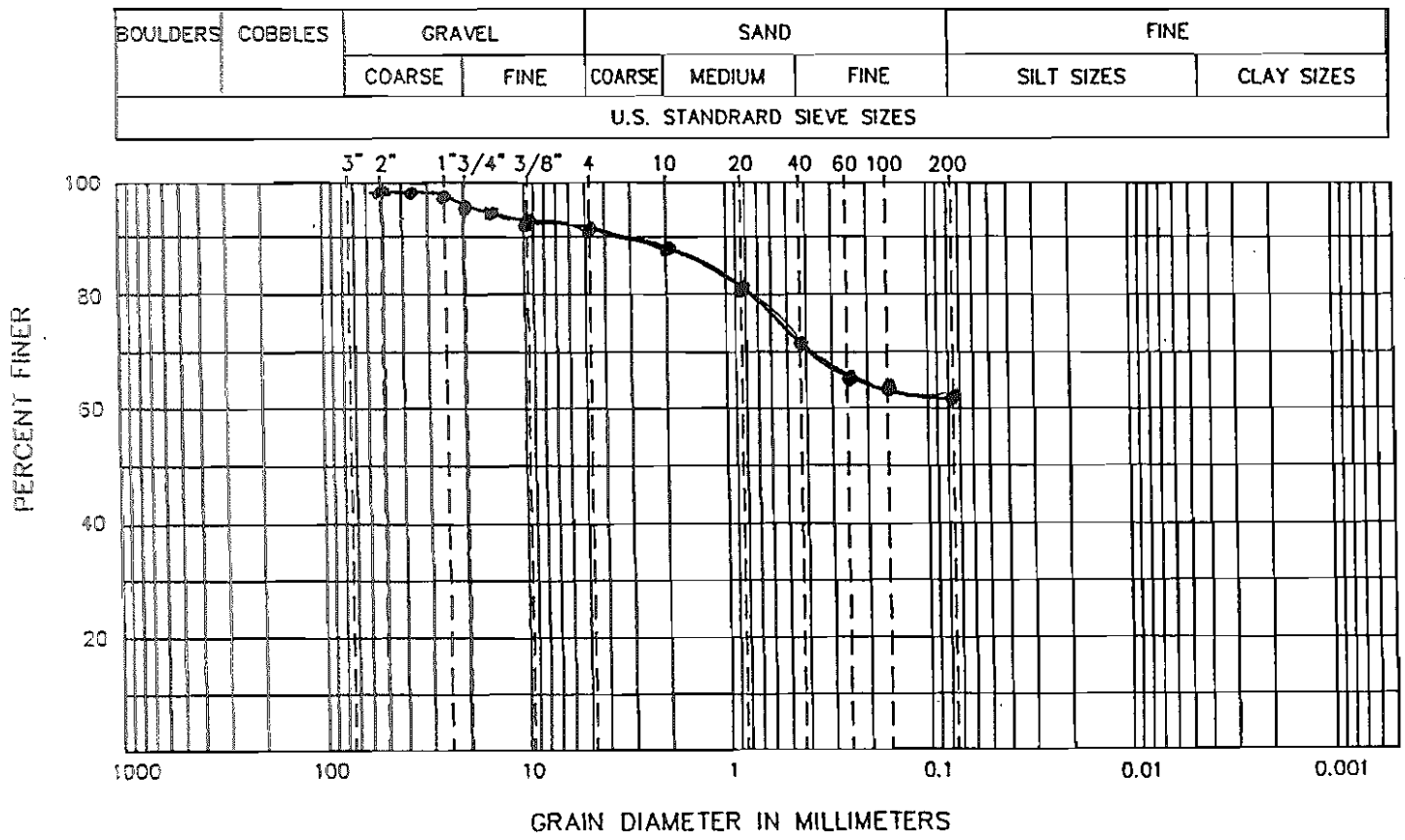
PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 681029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 25 day Oct month 2000 year

MATERIAL TYPE: Compacted Fill (D-422) — SAMPLE NO.: EP-19 QA ID: DLF

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) ... N/A

(PL) ... N/A

(PI) ... N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	98.4
1 1/2-in.	98.1
1-in.	97.0
3/4-in.	96.0
1/2-in.	94.8
3/8-in.	94.1
NO. 4	92.3
NO. 10	88.5
NO. 20	80.3
NO. 40	71.0
NO. 60	66.5
NO. 100	63.5
NO. 200	61.1

7.7
11.5
19.7
29.0
33.5
36.5
38.9

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

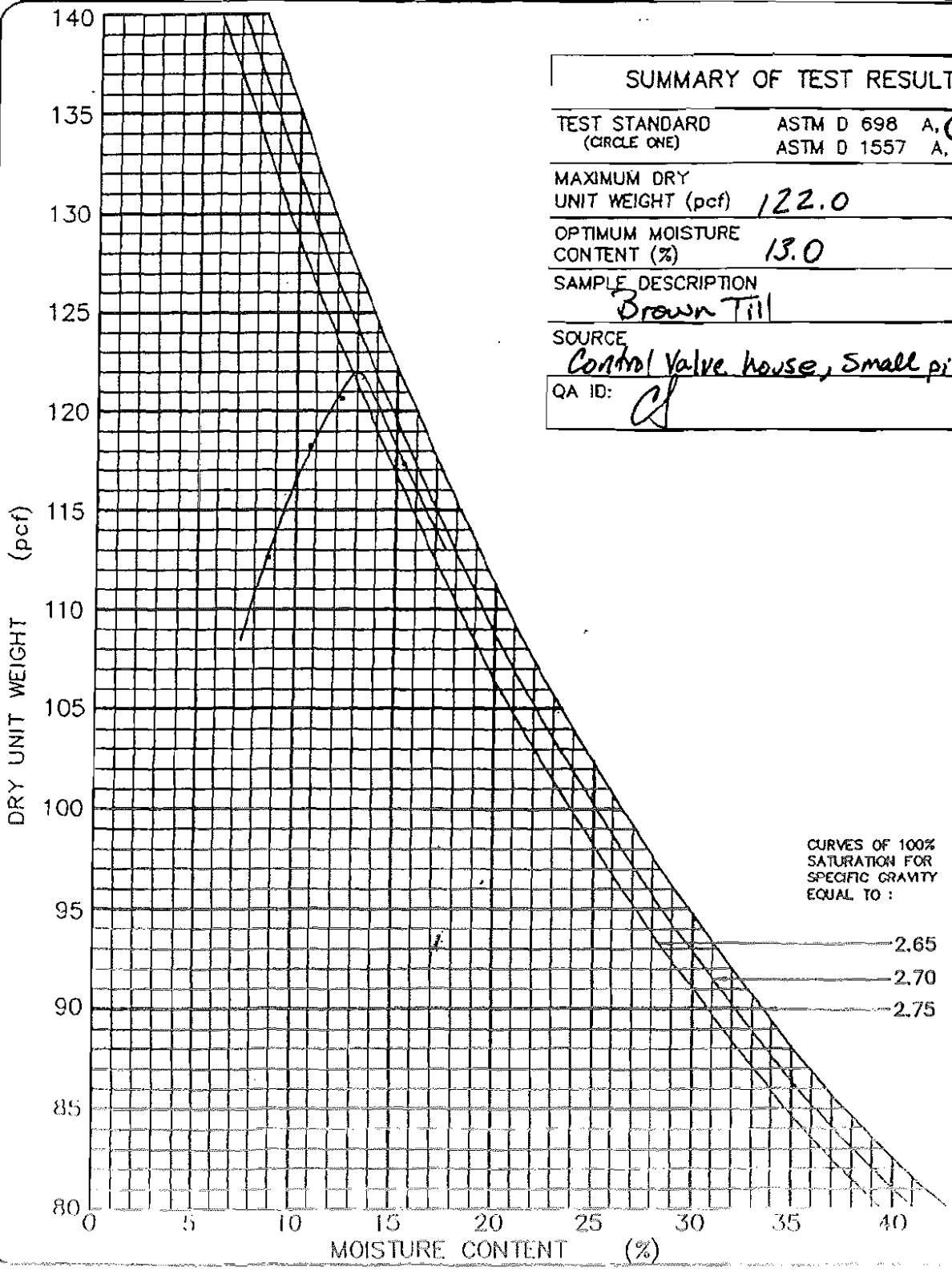
PROJECT NO: ~~CQ0409~~ CQ1029 TASK NO.: 04

DESCRIPTION: EPLTS

DATE: 30 day Oct month 2000 year

MATERIAL TYPE: Compacted Fill

SAMPLE NO.: EP 19



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	122.0
OPTIMUM MOISTURE CONTENT (%)	13.0
SAMPLE DESCRIPTION	Brown Till
SOURCE	Control Valve house, Small pile
QA ID:	

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: 6Q1029 TASK NO.: 04.2

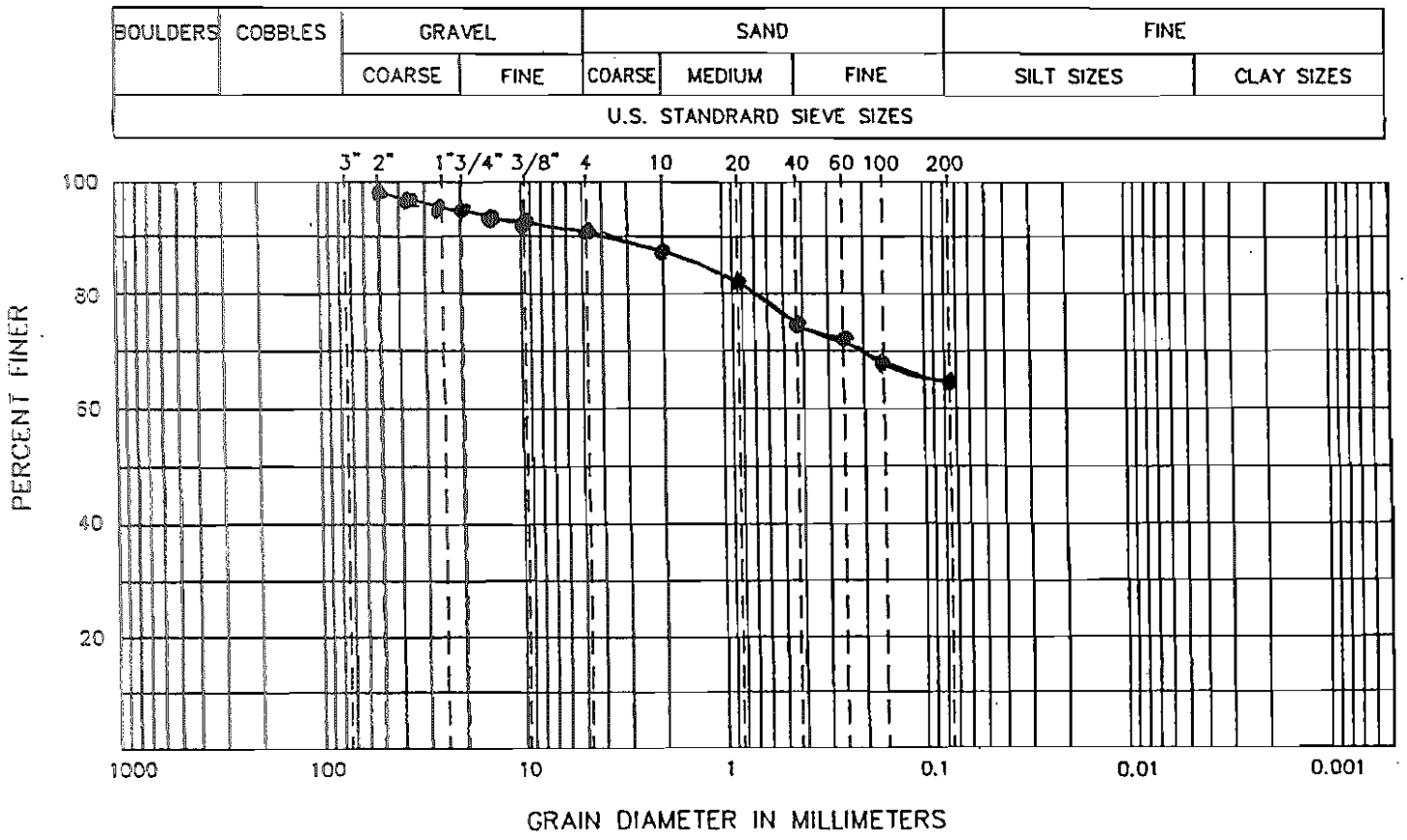
DESCRIPTION: Phase III EPLts

DATE: 26 day Oct month 2000 year

MATERIAL TYPE: Compacted Fill

SAMPLE NO.: EP-20 QA ID: DLF

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) 31.6

(PL) 17.5

(PI) 14.1

SIEVE RESULTS

SIEVE SIZE	% FINER	
3-in.	100	
2-in.	98.0	
1 1/2-in.	97.0	
1-in.	96.4	
3/4-in.	95.8	
1/2-in.	94.4	
3/8-in.	93.7	
NO. 4	91.2	8.8
NO. 10	87.1	12.9
NO. 20	81.5	18.5
NO. 40	75.7	24.3
NO. 60	72.2	27.8
NO. 100	69.2	30.8
NO. 200	65.8	34.2

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

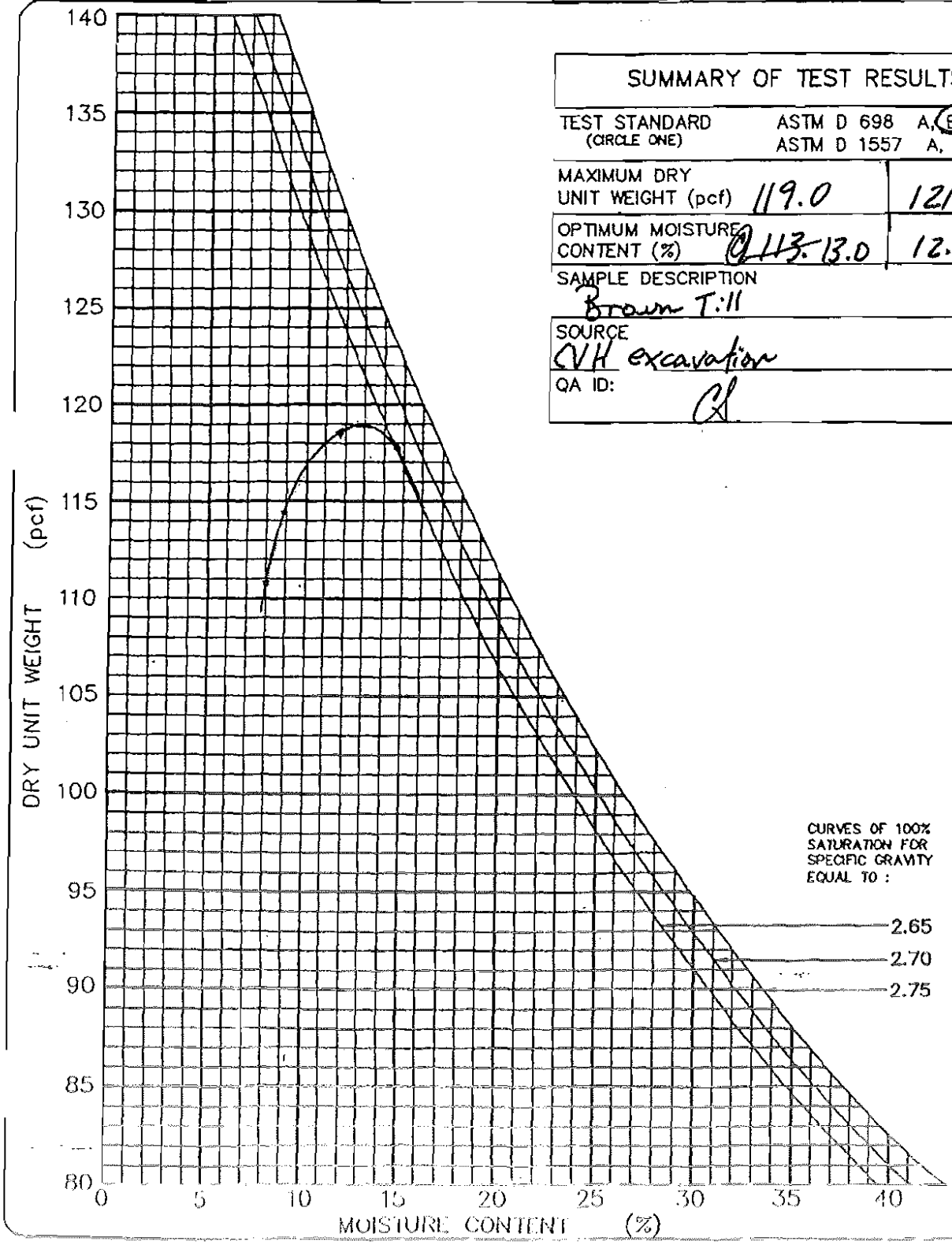
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO: GG1029 TASK NO.: 04.2

DESCRIPTION: Phase III/EPLTS — DATE: 22 day Oct month 2000 year

MATERIAL TYPE: Compacted fill — SAMPLE NO.: EP-20



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	119.0	121.3
OPTIMUM MOISTURE CONTENT (%)	@ 113 13.0	12.3
SAMPLE DESCRIPTION	Brown Till	
SOURCE	CVH excavation	
QA ID:	CL	

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT ~~NO.~~: GQ: — TASK NO.: 04.

DESCRIPTION: PHASE II — DATE: ~~SEP~~ 2 day Nov month 2000 year

MATERIAL TYPE: — SAMPLE NO.: SP23

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: _____

	WATER ADDED	(ml)	13.02 Nat.				
A	WT. OF SOIL & MOLD	(grams)	~~4208.8~~ 5905.9				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A − B	(grams)	1697.1				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	112.0				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	99.9				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT — ASTM D 2216

QA ID: _____

	TARE NO.		24				
F	WT. OF TARE	(grams)	8.3				
G	WT. OF WET SOIL & TARE	(grams)	266.2		1 pt closely matches OSDF-18 106.0@15.8%		
H	WT. OF DRY SOIL & TARE	(grams)	238.3				
I	WT. OF WATER = G − H	(grams)	27.9				
J	WT. DRY SOIL = H − F	(grams)	230.0				
K	MOISTURE CONTENT = (I/J) X 100	(%)	12.1				

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

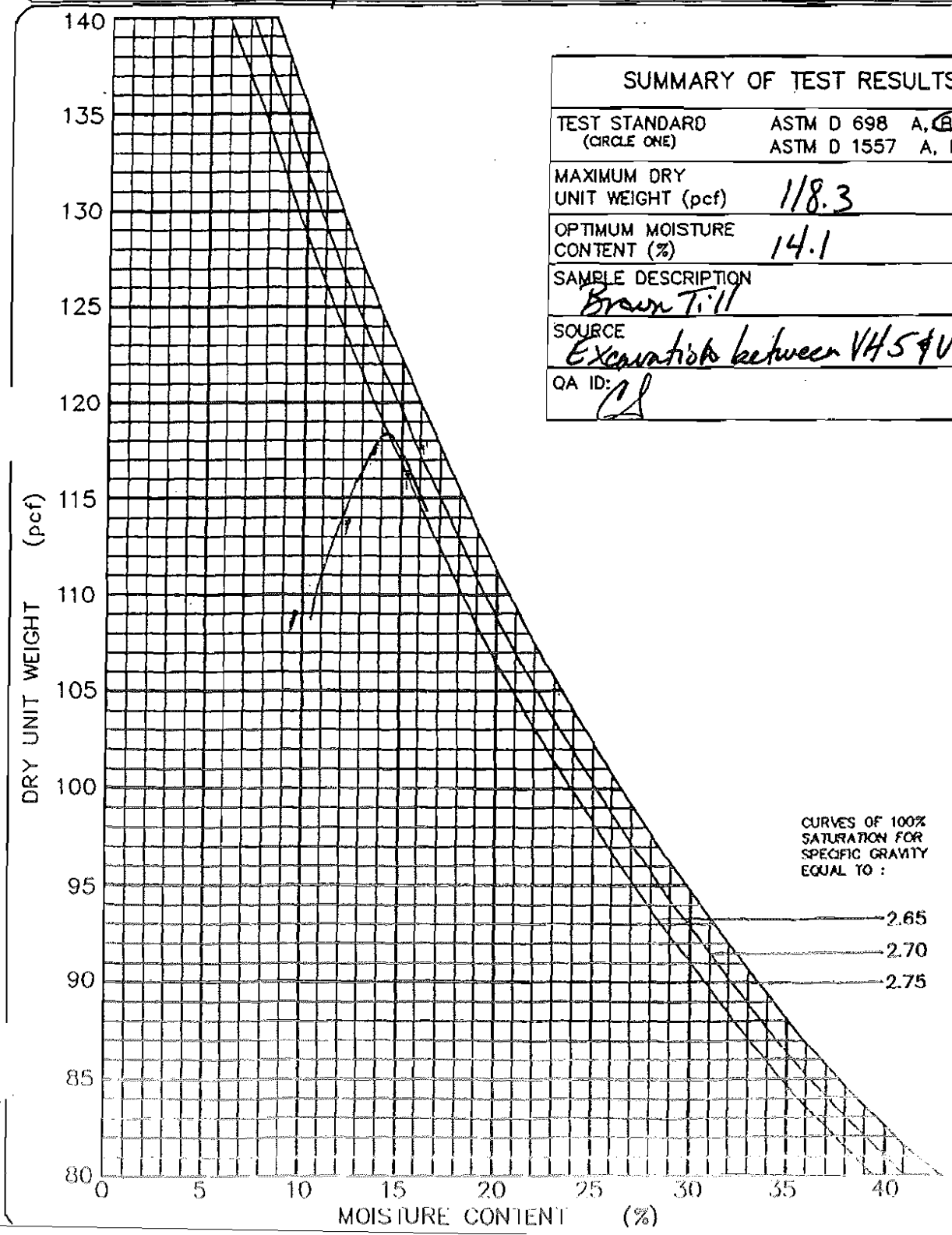
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04·1

DESCRIPTION: EPLTS DATE: 3 day Nov month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP-21



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	118.3
OPTIMUM MOISTURE CONTENT (%)	14.1
SAMPLE DESCRIPTION	Brown Till
SOURCE	Excavation between VH5 & VH-6
QA ID:	

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~C00409~~ 601029 DLE TASK NO.: 04.1

DESCRIPTION: Phase II – EPCTS

DATE: 15 day Nov month ~~1998~~ 2000 DLE year

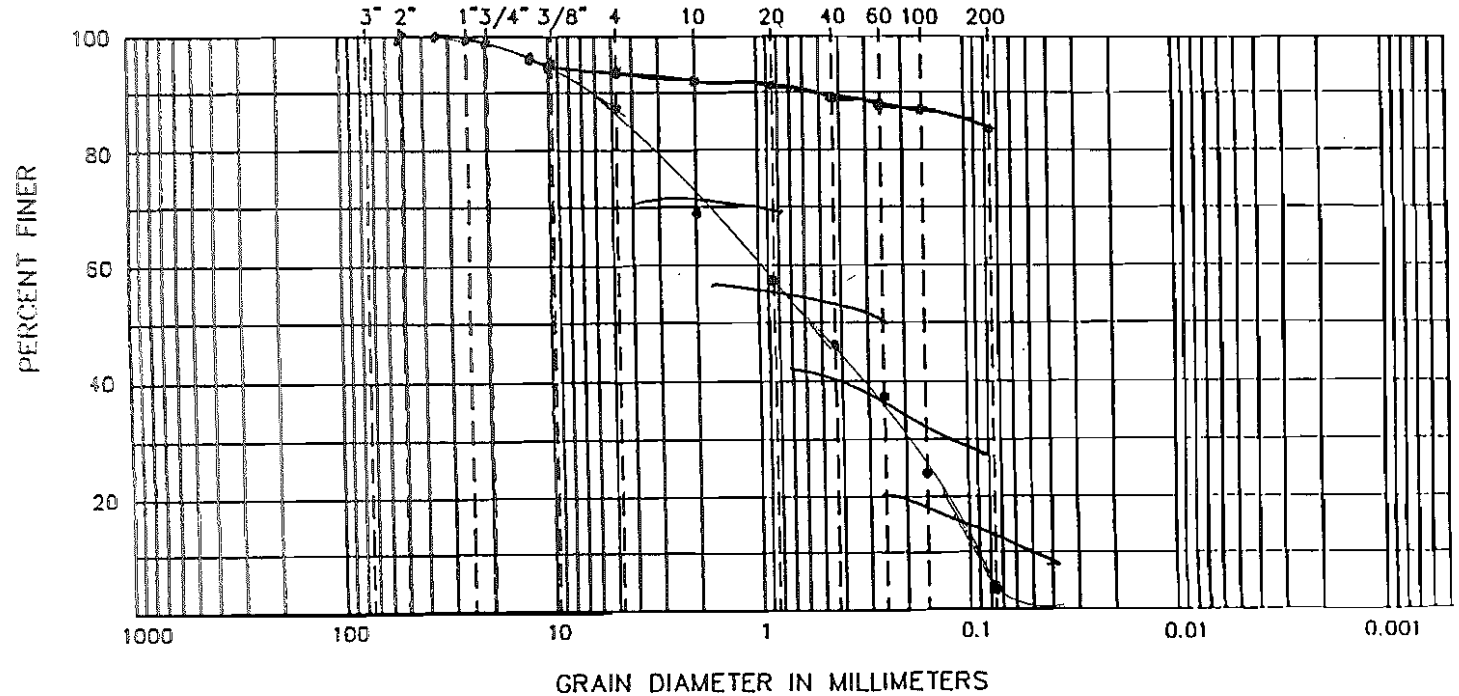
MATERIAL TYPE: Compacted Fill

SAMPLE NO.: EP-24 QA ID: SQ

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES

U.S. STANDRARD SIEVE SIZES



ATTERBERG LIMITS

(LL) .....

(PL) .....

(PI) .....

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100.0
2-in.	100.0
1 1/2-in.	100.0
1-in.	99.7
3/4-in.	98.5
1/2-in.	95.4
3/8-in.	95.0
NO. 4	~~87.2~~ 94.1
NO. 10	~~69.8~~ 92.1
NO. 20	~~57.9~~ 90.6
NO. 40	~~46.3~~ 89.4
NO. 60	~~37.1~~ 88.3
NO. 100	~~32.9~~ 86.6
NO. 200	~~31.0~~ 84.3

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Lean Clay with Sand

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SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

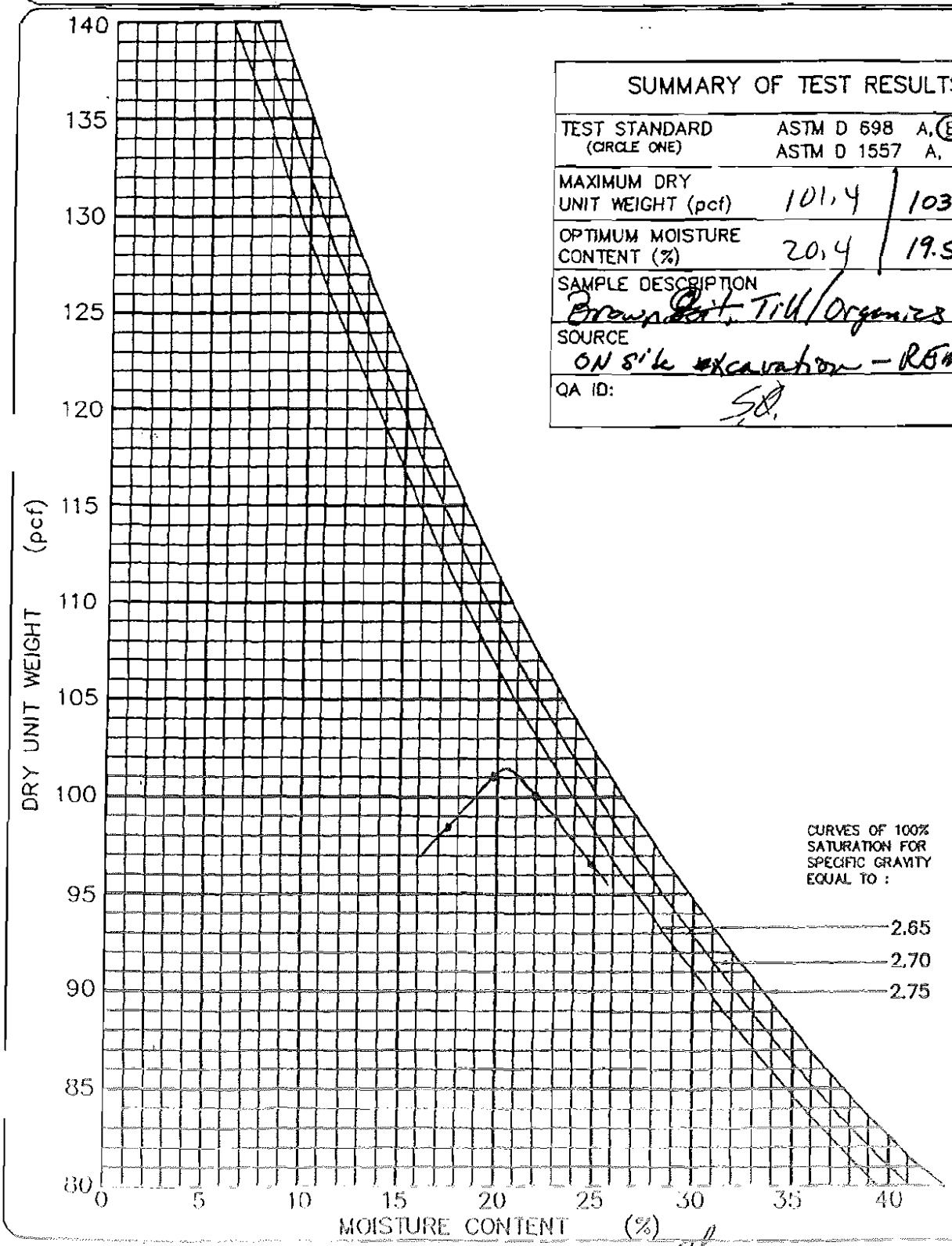
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON–SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ1029 TASK NO.: 04,2

DESCRIPTION: PHASE II – EPLTS DATE: 15 day NOV month 2000 year

MATERIAL TYPE: SAMPLE NO.: EP-24



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	101.4	103.5
OPTIMUM MOISTURE CONTENT (%)	20.4	19.5
SAMPLE DESCRIPTION	Brown Silt, Till/Organics	
SOURCE	ON site excavation – REMA	
QA ID:	SD	

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-24
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

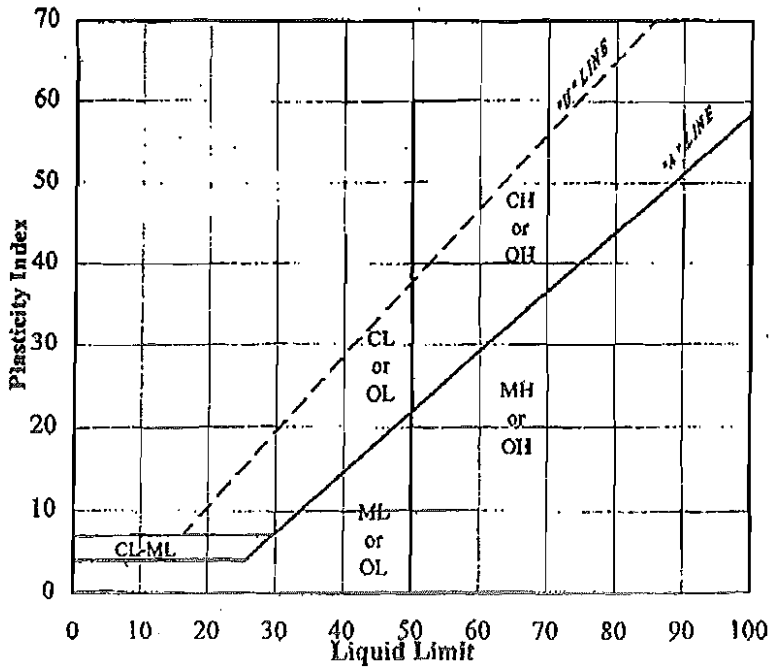
ASTM D 2974
Organic Content (%): 3.3

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %):
Plastic Limit (PL, %):
Plasticity Index (PI):



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-24	3753						3.3				

Note(s):

SD 11/12/00 BS 11-17-00

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-24(Oven Dried)
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

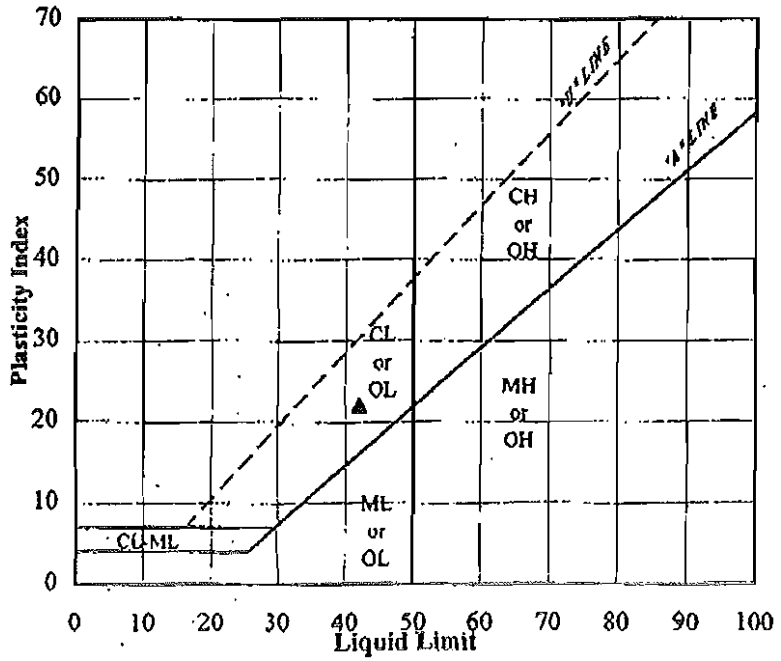
ASTM D 2974
Organic Content (%):

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %): 42
Plastic Limit (PL, %): 20
Plasticity Index (PI): 22



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-24(Oven Dried)	3825.1								42	20	22

Note(s):

SD 11/27/00 BES 11-27-00

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-24(Air Dried)
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

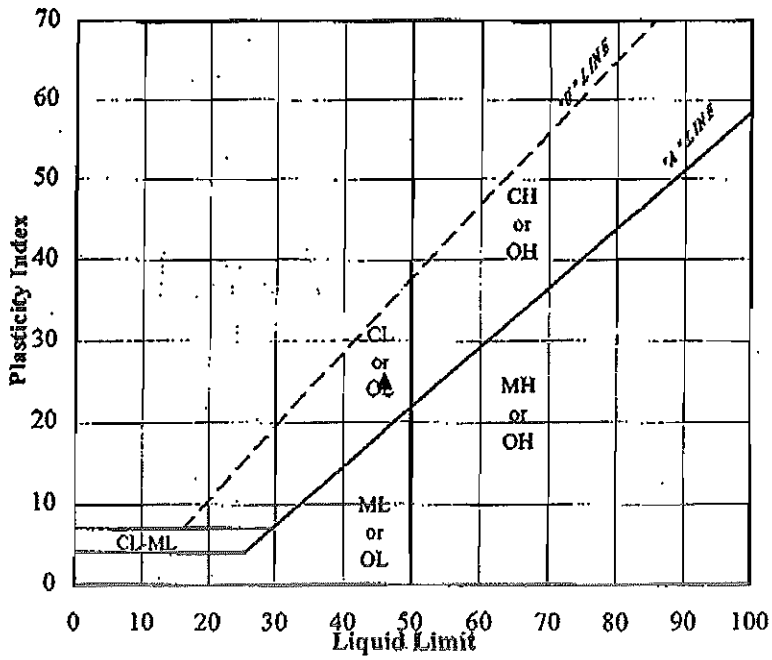
ASTM D 2974
Organic Content (%):

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %): 46
Plastic Limit (PL, %): 21
Plasticity Index (PI): 25



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-24(Air Dried)	3825.2								46	21	25

Note(s):

SD 11/27/00 BG 11-27-00

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~C00409~~ G01029 DLE TASK NO.: 04.1

DESCRIPTION: Phase II

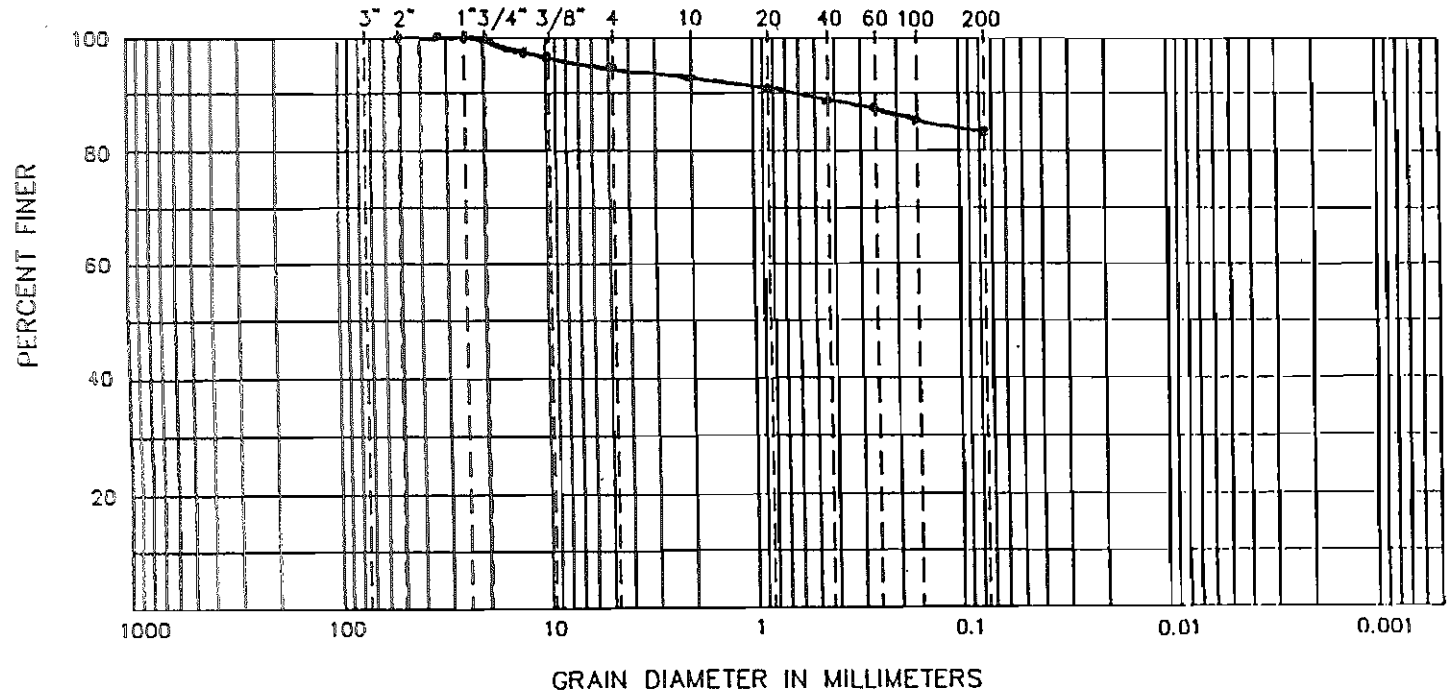
DATE: 15 day NOV month ~~1998~~ 2000 DLE year

MATERIAL TYPE: Compacted Fill (D-422)

SAMPLE NO.: EP-25 QA ID: SQ

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDRARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) .....

(PL) .....

(PI) .....

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100.0
2-in.	100.0
1 1/2-in.	100.0
1-in.	100.0
3/4-in.	99.4
1/2-in.	96.9
3/8-in.	96.3
NO. 4	94.9
NO. 10	92.5
NO. 20	90.5
NO. 40	88.7
NO. 60	87.4
NO. 100	85.7
NO. 200	83.4

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Lean clay w/ sand

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

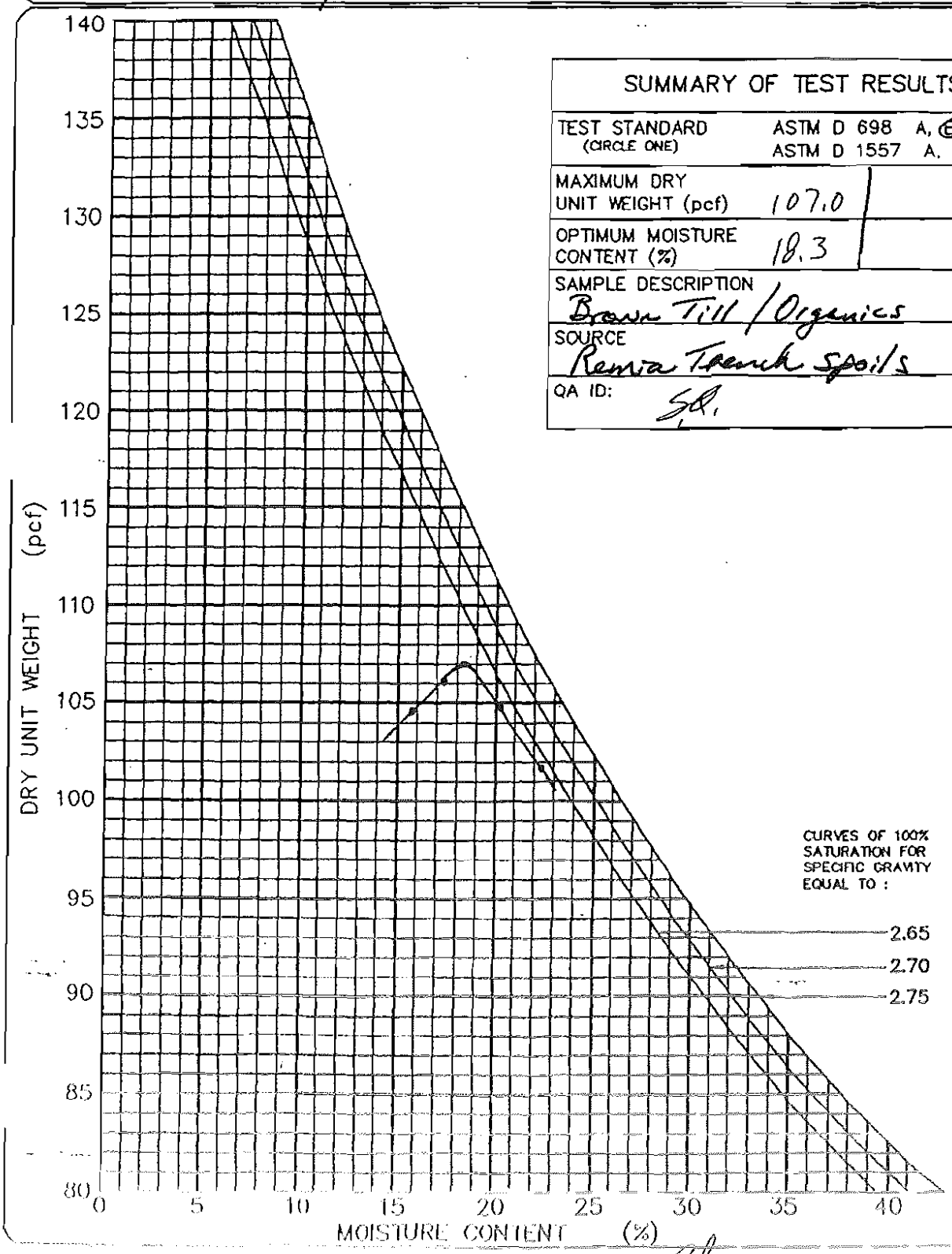
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ1029 TASK NO.: 04.2

DESCRIPTION: PHASE II - EPCTS DATE: 15 day NOV month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP-25



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	107.0	
OPTIMUM MOISTURE CONTENT (%)	18.3	
SAMPLE DESCRIPTION	Brown Till / Organics	
SOURCE	Remia Trench Spoils	
QA ID:	SQ.	

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-25
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

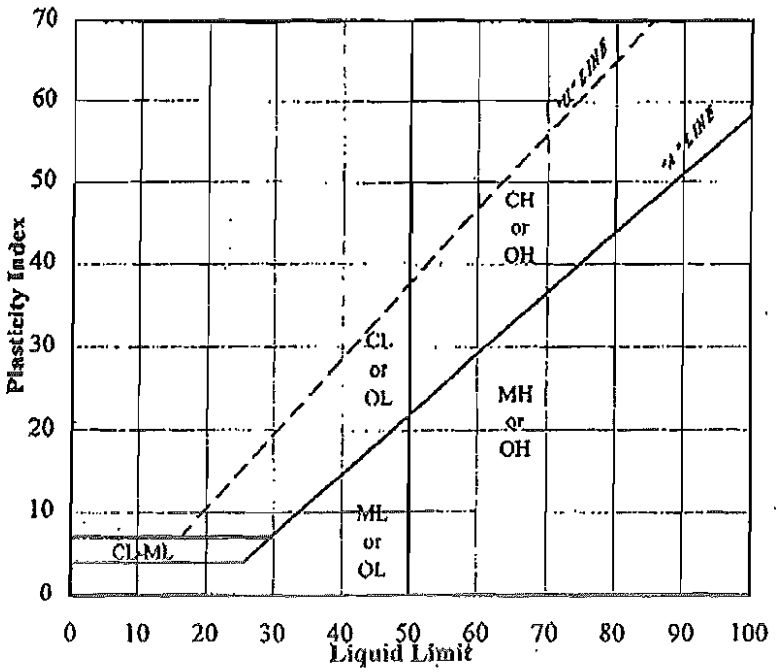
ASTM D 2974
Organic Content (%): 2.4

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %):
Plastic Limit (PL, %):
Plasticity Index (PI):



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-25	3754						2.4				

Note(s):

SD 11/17/00 BJS 11-17-00

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-25(Oven Dried)
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

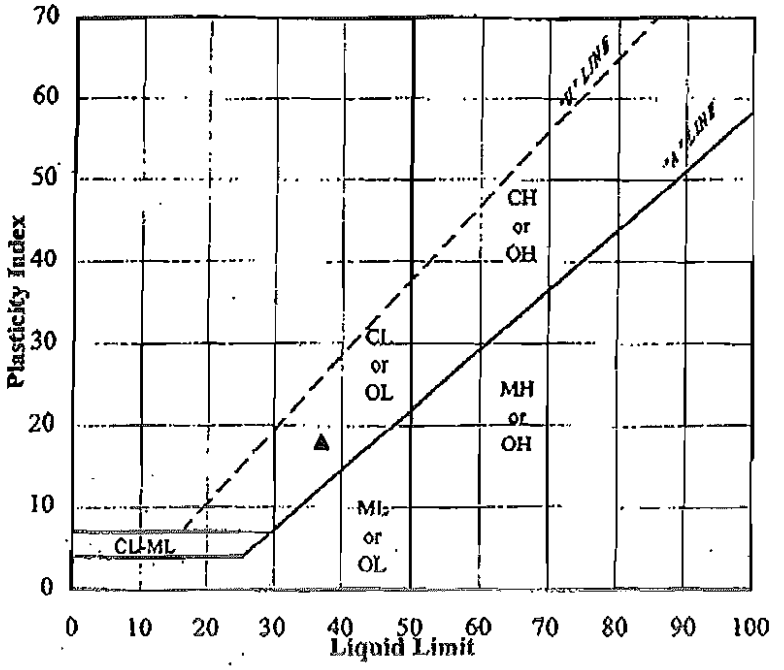
ASTM D 2974
Organic Content (%):

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %): 37
Plastic Limit (PL, %): 19
Plasticity Index (PI): 18



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-25(Oven Dried)	3826.1								37	19	18

Note(s):

SD 11.22.00 BES 11-27-00

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-25(Air Dried)
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%):

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

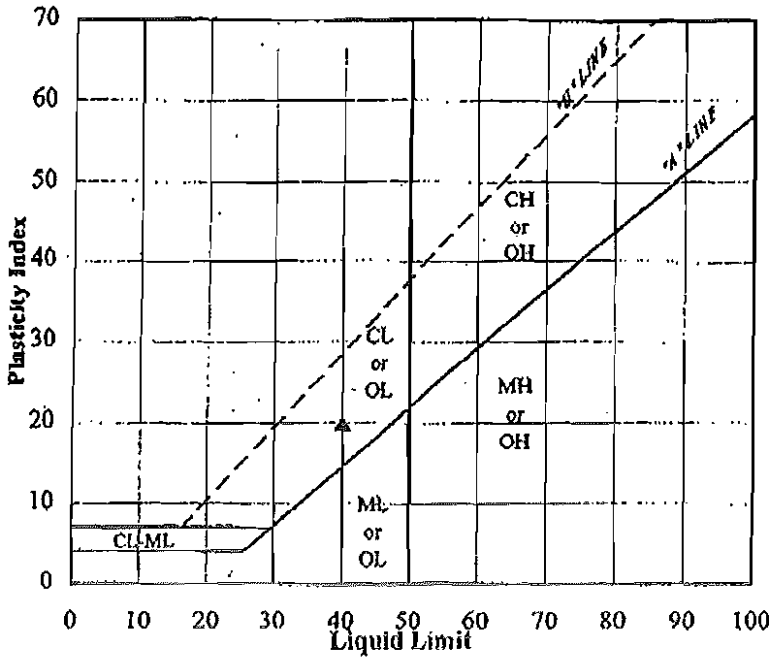
ASTM D 2974
Organic Content (%):

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %): 40
Plastic Limit (PL, %): 20
Plasticity Index (PI): 20



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	PL (%)	PI (-)
EP-25(Air Dried)	3826.2								40	20	20

Note(s):

11/27/00 11-27-00

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: G01029 TASK NO.: 04

DESCRIPTION: PHASE II - EPLTS — DATE: 17 day NOV month 2000 year

MATERIAL TYPE: EPLTS — SAMPLE NO.: EP-26

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

Sample Size 37.85
+3/8" = 1.27 lbs
3.4%

COMPACTION OF SOIL

QA ID: SQ

	WATER ADDED	(ml)	10%				
A	WT. OF SOIL & MOLD	lbs/(grams)	13.40/6078.2				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A - B	(grams)	1869.4				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	123.4				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	110.0				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT - ASTM D 2216

QA ID: SQ

	TARE NO.		Z2				
F	WT. OF TARE	(grams)	8.34				
G	WT. OF WET SOIL & TARE	(grams)	419.0				
H	WT. OF DRY SOIL & TARE	(grams)	377.64				
I	WT. OF WATER = G - H	(grams)	41.36				
J	WT. DRY SOIL = H - F	(grams)	369.30				
K	MOISTURE CONTENT = (I/J) X 100	(%)	11.2				

GEOSYNTEC CONSULTANTS FILE NO. 2-05-FLC CHECKED BY: [illegible]

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1029 TASK NO.: 04

DESCRIPTION: PHASE II - EPLTS — DATE: 17 day NOV month 2000 year

MATERIAL TYPE: EPLTS — SAMPLE NO.: EP-26

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: SP

	WATER ADDED	(ml)	12%				
A	WT. OF SOIL & MOLD	lbs/ (grams)	13.57/6155.4				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A - B	(grams)	1946.6				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	128.5				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	113.1				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT - ASTM D 2216

QA ID: SP

	TARE NO.		215				
F	WT. OF TARE	(grams)	8.29				
G	WT. OF WET SOIL & TARE	(grams)	391.45				
H	WT. OF DRY SOIL & TARE	(grams)	345.59				
I	WT. OF WATER = G - H	(grams)	45.86				
J	WT. DRY SOIL = H - F	(grams)	337.30				
K	MOISTURE CONTENT = (I/J) X 100	(%)	13.6				

Closely Resembles OSDF-12 114.5 @ 15%

GEOSYNTEC CONSULTANTS FILE NO. 2-05-FLC — CHECKED BY: [illegible] — SHEET NO. 2 OF 3

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

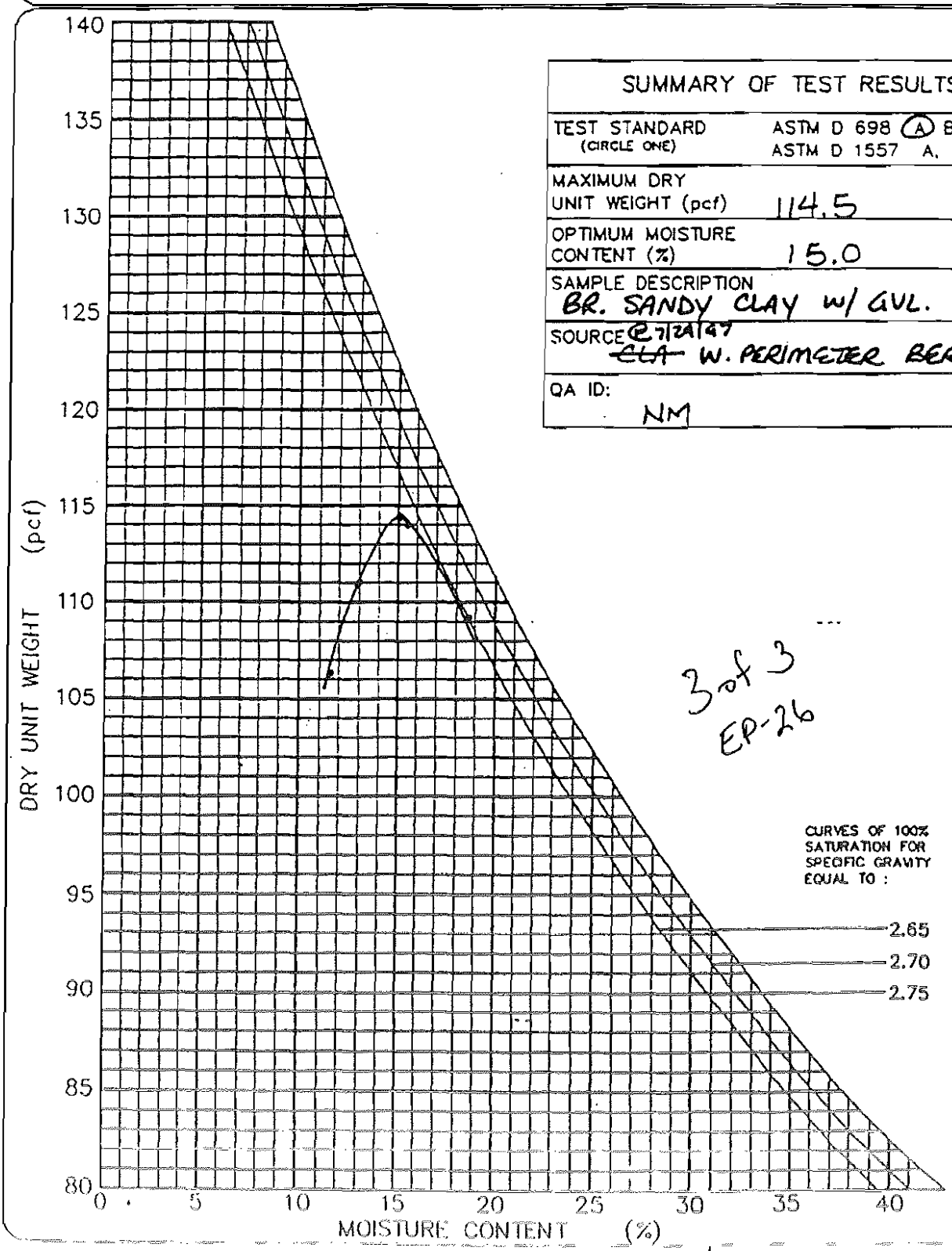
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0166 TASK NO.: 04.1

DESCRIPTION: PHASE I CONSTRUCTION DATE: 8 day 3 month 97 year

MATERIAL TYPE: STRUCTURAL FILL SAMPLE NO.: OSDF-12



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 (A) B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	114.5
OPTIMUM MOISTURE CONTENT (%)	15.0
SAMPLE DESCRIPTION	BR. SANDY CLAY w/ GVL.
SOURCE	@ 7/24/97 ~~CLA~~ W. PERIMETER BERM
QA ID:	NM

3 of 3
EP-26

GEOSYNTEC CONSULTANTS FILE NO. 2-12-MDR CHECKED BY: RBN SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q1029 TASK NO.: 04-2

DESCRIPTION: Phase III — DATE: 27 day Nov month 2004 year

MATERIAL TYPE: Trench Fill / Brown Till (tan) — SAMPLE NO.: EP-27

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: DLE

	WATER ADDED	(ml)	13.56 10% 250 ml				
A	WT. OF SOIL & MOLD	(grams)	6150.8				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A − B	(grams)	1942.0		Closely Matches LCS-14	111.0 @ 17.2%	
D	WET UNIT WT.(1) = C X 0.066	(pcf)	128.2				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	109.7				

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL, THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT – ASTM D 2216

QA ID: DLE

	TARE NO.		#8				
F	WT. OF TARE	(grams)	8.3				
G	WT. OF WET SOIL & TARE	(grams)	524.0				
H	WT. OF DRY SOIL & TARE	(grams)	449.3				
I	WT. OF WATER = G − H	(grams)	74.7				
J	WT. DRY SOIL = H − F	(grams)	441.0				
K	MOISTURE CONTENT = (I/J) X 100	(%)	16.9				

GEOSYNTEC CONSULTANTS FILE NO. 2-05-FLC (1169) CHECKED BY: [illegible]

SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

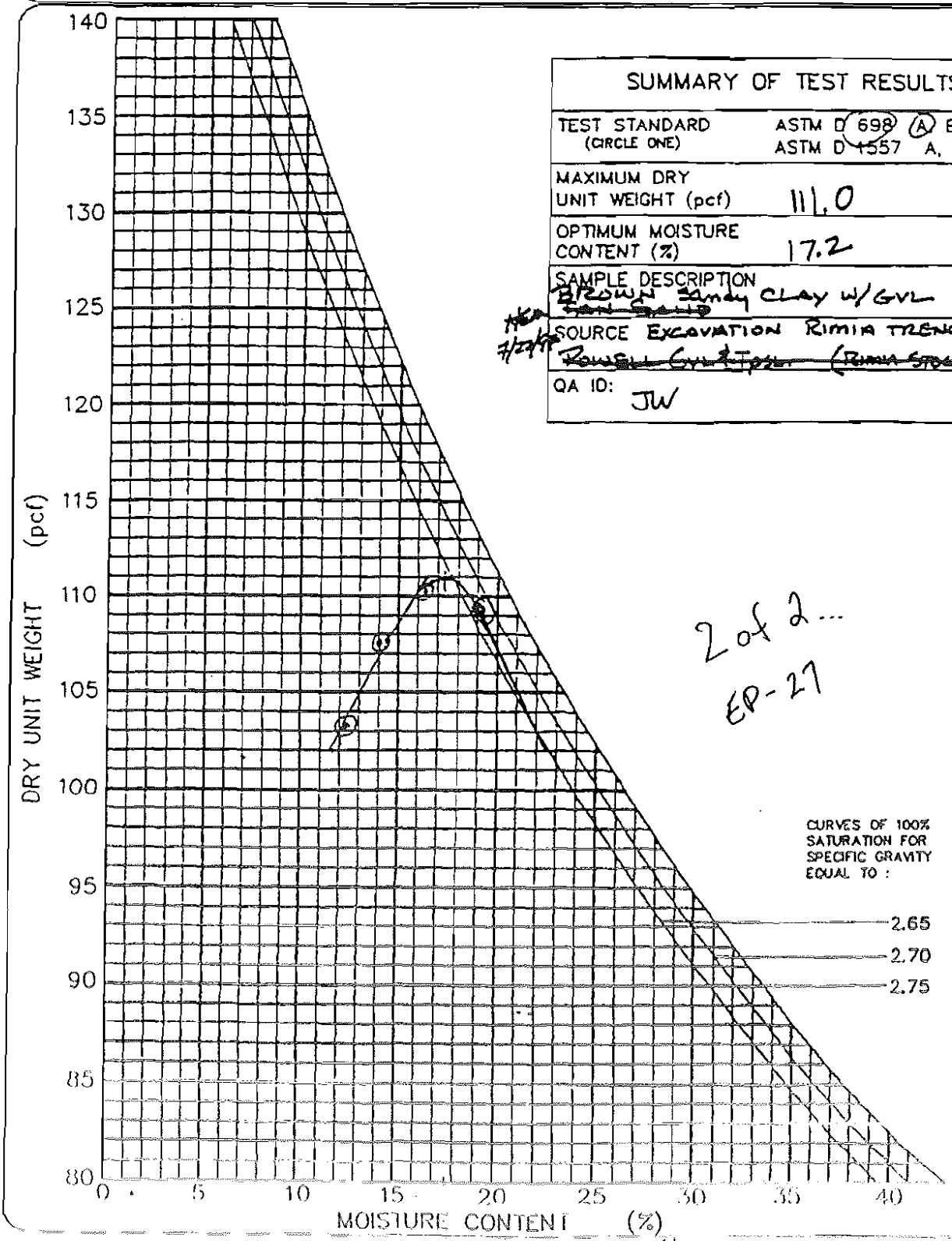
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0166 TASK NO.: 04.1

DESCRIPTION: LCS CONSTRUCTION DATE: 30 day 7 month 97 year

MATERIAL TYPE: TRENCH BACKFILL SAMPLE NO.: LCS-14



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 (A) B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	111.0
OPTIMUM MOISTURE CONTENT (%)	17.2
SAMPLE DESCRIPTION	BROWN Sandy CLAY w/GVL ~~TAN SAND~~
SOURCE	EXCAVATION RIMIA TRENCH ~~ROWELL GVL & TOPSOIL (RIMIA STOCKPILE)~~
QA ID:	JW

HKB 7/22/97

2 of 2...

EP-27

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD LABORATORY COMPACTION TEST (ASTM D 698 METHOD B)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: Phase III — DATE: 27 day Nov month 2000 year

MATERIAL TYPE: TRENCH FILL / BROWN FILL (PARK) — SAMPLE NO.: EP-28

THIS METHOD WILL BE USED IF THE MATERIAL RETAINED ON THE NO. 3/4-in. (19-mm) SIEVE IS LESS THAN 30%, IF THE MATERIAL RETAINED ON THE NO. 4 (4.75-mm) SIEVE IS GREATER THAN 20%, AND IF THE MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS LESS THAN 20%.
ALL MATERIAL RETAINED ON THE NO. 3/8-in. (9.5-mm) SIEVE IS DISCARDED.
USE OVERSIZE CORRECTION IF MORE THAN 5% IS DISCARDED ACCORDING TO ASTM D 4718.
USE A 4-in. DIAMETER MOLD / 5.5-lb RAMMER / 12-in. DROP / 3 LAYERS / 25 BLOWS PER LAYER.

COMPACTION OF SOIL

QA ID: DLE

			13.73				
	WATER ADDED	(ml)	10% 250ml				
A	WT. OF SOIL & MOLD	(grams)	6227.9				
B	WT. OF MOLD	(grams)	4208.8				
C	WT. OF SOIL = A − B	(grams)	2019.1				
D	WET UNIT WT.(1) = C X 0.066	(pcf)	133.3				
E	DRY UNIT WT. = D / [1 + (K/100)]	(pcf)	116.1				

Closely Matches OSDF-6 116.9 @ 15.1

NOTE: IF CALIBRATED MOLD OF 1/30 FT^3 IS USED, THE WET DENSITY IS CALCULATED FROM THE WEIGHT OF SOIL. THE VOLUME OF THE MOLD AND THE CONVERSION FROM GRAMS TO POUNDS (I.E., CONVERSION FACTOR = (30 / 453.6) = 0.066). THE MOLD MUST BE CALIBRATED TO VERIFY A CAPACITY OF 1/30 ± 0.0005 FT^3 ON INTERVALS NOT TO EXCEED 1000 TIMES THAT THE MOLD IS FILLED.

MOISTURE CONTENT — ASTM D 2216

QA ID: DLE

	TARE NO.		#18				
F	WT. OF TARE	(grams)	8.4				
G	WT. OF WET SOIL & TARE	(grams)	460.0				
H	WT. OF DRY SOIL & TARE	(grams)	401.9				
I	WT. OF WATER = G − H	(grams)	58.1				
J	WT. DRY SOIL = H − F	(grams)	393.5				
K	MOISTURE CONTENT = (I/J) X 100	(%)	14.8				

CHECKED BY: CB

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

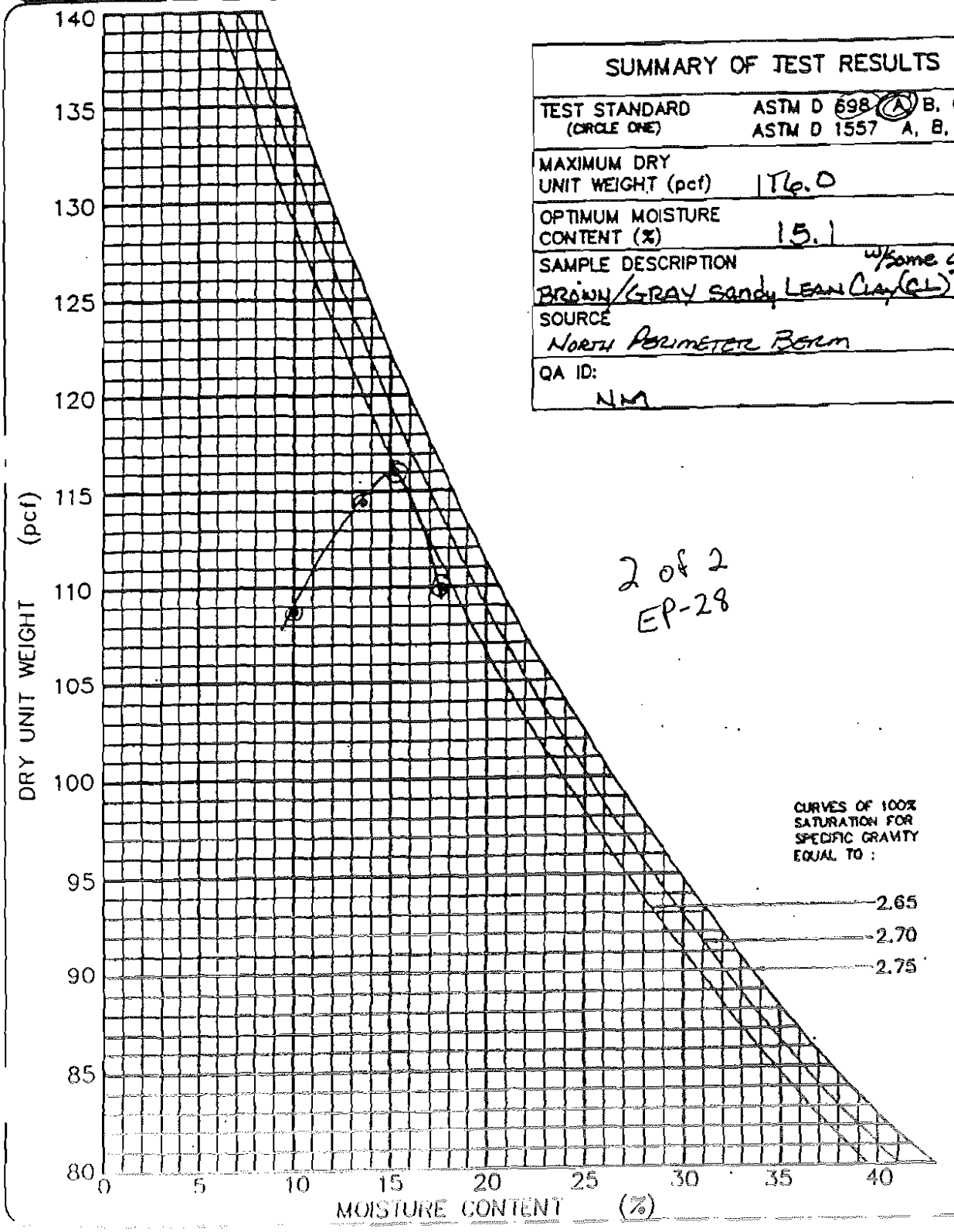
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO: GQ0166 — TASK NO.: 04

DESCRIPTION: PHASE II CONSTRUCTION — DATE: 19 day 7 month 97 year

MATERIAL TYPE: STRUCTURAL FILL — SAMPLE NO.: OSDF-06



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 (A) B, C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	116.0
OPTIMUM MOISTURE CONTENT (%)	15.1
SAMPLE DESCRIPTION	BROWN/GRAY sandy LEAN CLAY (CL) w/some gvl.
SOURCE	NORTH PERIMETER BERM
QA ID:	NM

2 of 2
EP-28

OFF-SITE SOIL MATERIALS

- Compacted Fill
- Embedment Fill
- Aggregate Base
- Riprap

COMPACTED FILL

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. GB1029 TASK NO.: 042

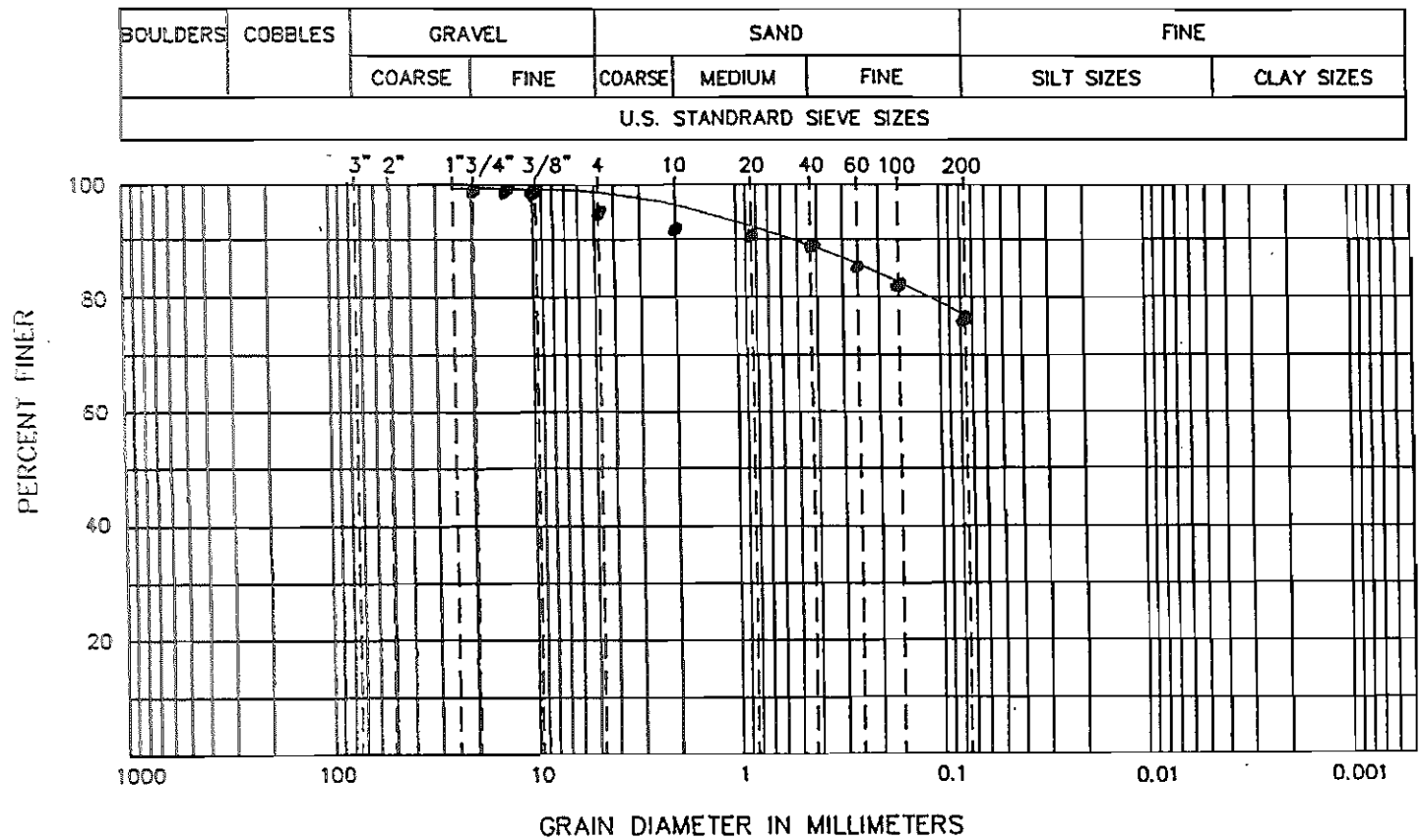
DESCRIPTION: Phase II

DATE: 24 day JAN month 2000 year

MATERIAL TYPE: TRENCH FILL D-422

SAMPLE NO.: EPA 1 QA ID: DLE

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) 36.2

(PL) 19.9

(PI) 16.3

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	99.9
1/2-in.	99.9
3/8-in.	99.9
NO. 4	94.2
NO. 10	92.7
NO. 20	91.4
NO. 40	89.1
NO. 60	86.4
NO. 100	83.1
NO. 200	77.4

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Lean Clay w/ Sand

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

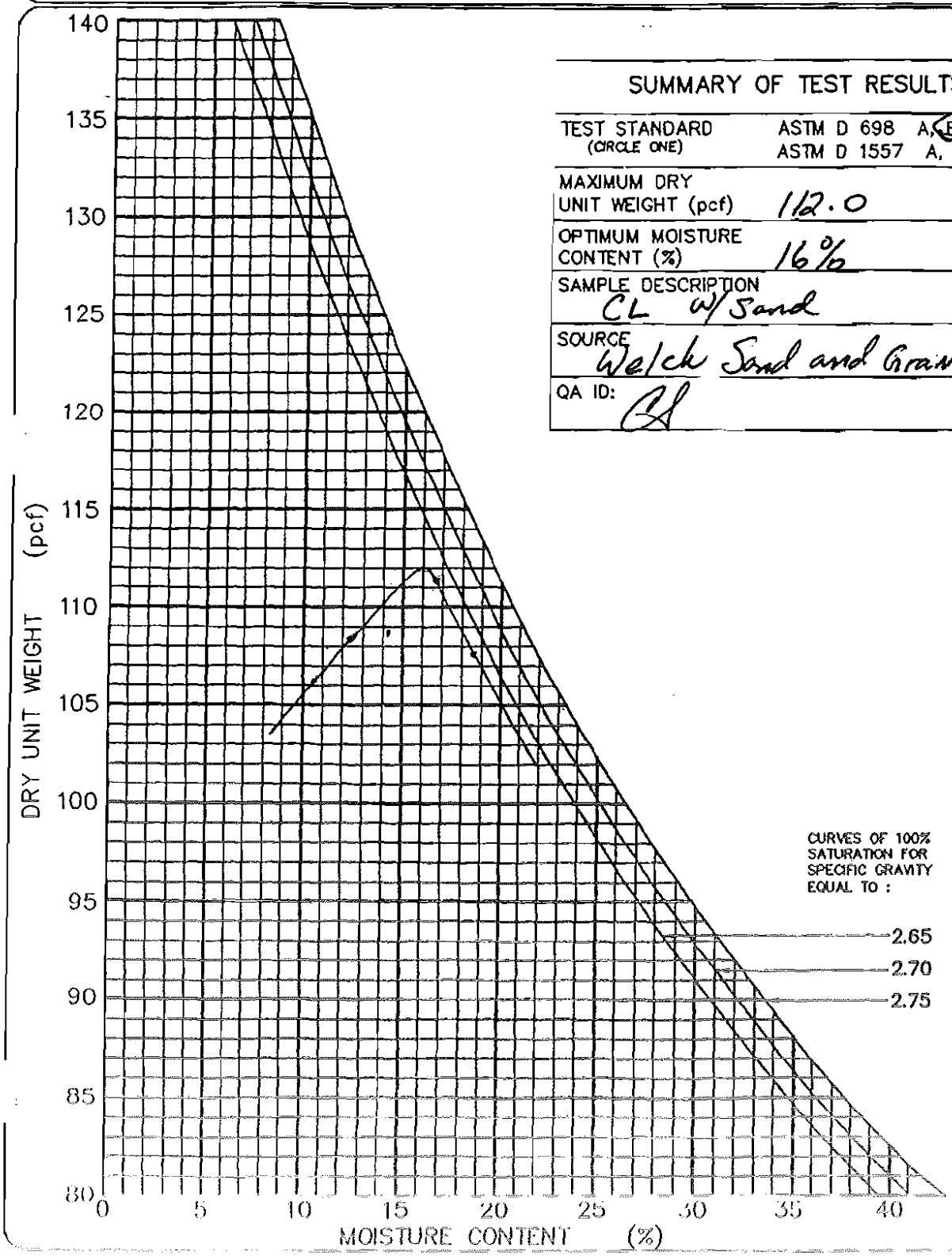
MOISTURE-DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO OHIO — PROJECT NO: GQ0409 TASK NO.: 04.2

DESCRIPTION: ~~FRENCH~~ FILL EPLTS — DATE: 06 day June month 2000 year

MATERIAL TYPE: TRENCH FILL — SAMPLE NO.: EP-1



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	112.0
OPTIMUM MOISTURE CONTENT (%)	16%
SAMPLE DESCRIPTION	CL w/ Sand
SOURCE	Welch Sand and Gravel
QA ID:	GS

GeoTesting Express, Inc.
Geotechnical and Geosynthetic Testing Services

Sample ID: EP-2
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%): **11.7**

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

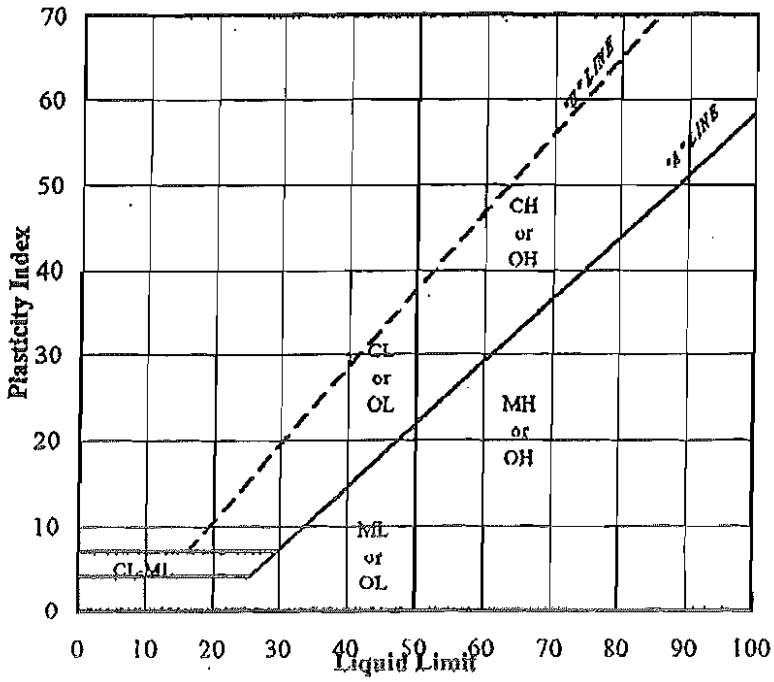
ASTM D 2974
Organic Content (%): **2.2**

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %):
Plastic Limit (PL, %):
Plasticity Index (PI):



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	Atterberg Limits PL (%)	Atterberg Limits PI (-)
EP-2	2588	11.7					2.2				

Note(s):

GeoTesting Express, Inc.

Geotechnical and Geosynthetic Testing Services

Sample ID: EP-3
Project Name: FLUOR FERNALD
Project No.: GTX-G0076

SOIL INDEX PROPERTIES

AS-RECEIVED MOISTURE CONTENT

ASTM D 2216 ☐
ASTM D 4643 ☐
Moisture Content (%): 2.3

DRY UNIT WEIGHT OF UNDISTURBED SAMPLE

ASTM D 2937
Dry Unit Weigh (γ_d, pcf):

SPECIFIC GRAVITY

ASTM D 854 ☐
ASTM C 127 ☐
Specific Gravity (-):

SOIL pH

ASTM D 4972 ☐
EPA MET. 9045 ☐
pH: (with distilled-deionized water)
pH: (with 0.01 M $CaCl_2$ solution)

SOIL ORGANIC CONTENT

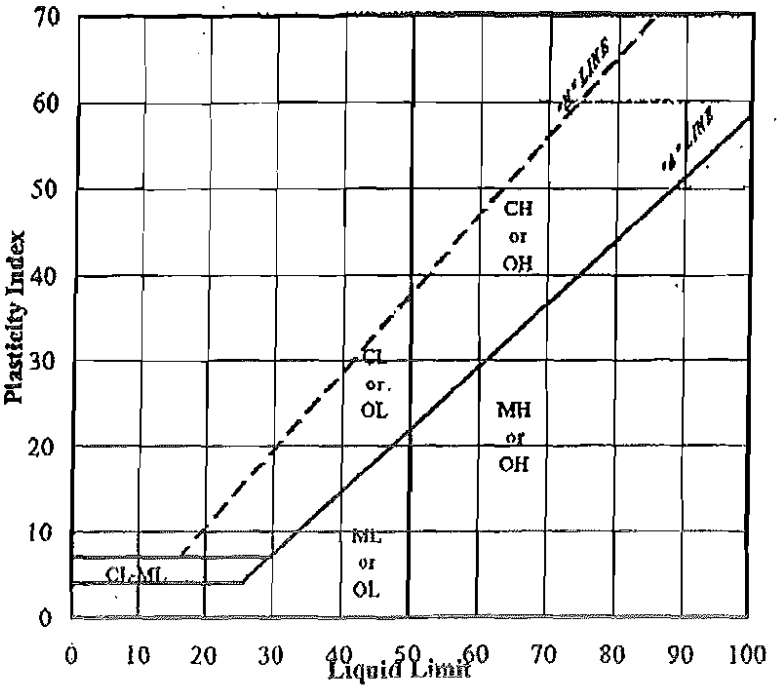
ASTM D 2974
Organic Content (%): 1.9

CARBONATE CONTENT

ASTM D 4373 ☐
ASTM D 3042 ☐ (see figures)
Carbonate Content (%):

ATTERBERG LIMITS

ASTM D 4318
Liquid Limit (LL, %):
Plastic Limit (PL, %):
Plasticity Index (PI):



Sample ID	Lab Sample Number	Moisture Content (%)	Dry Unit Weight (pcf)	Specific Gravity (-)	Soil pH (water) (-)	Soil pH ($CaCl_2$) (-)	Organic Content (%)	Carbonate Content (%)	Atterberg Limits LL (%)	PL (%)	PI (-)
EP-3	2589	2.3					1.9				

Note(s):

BS 6-5-00

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ0409 TASK NO.: 04

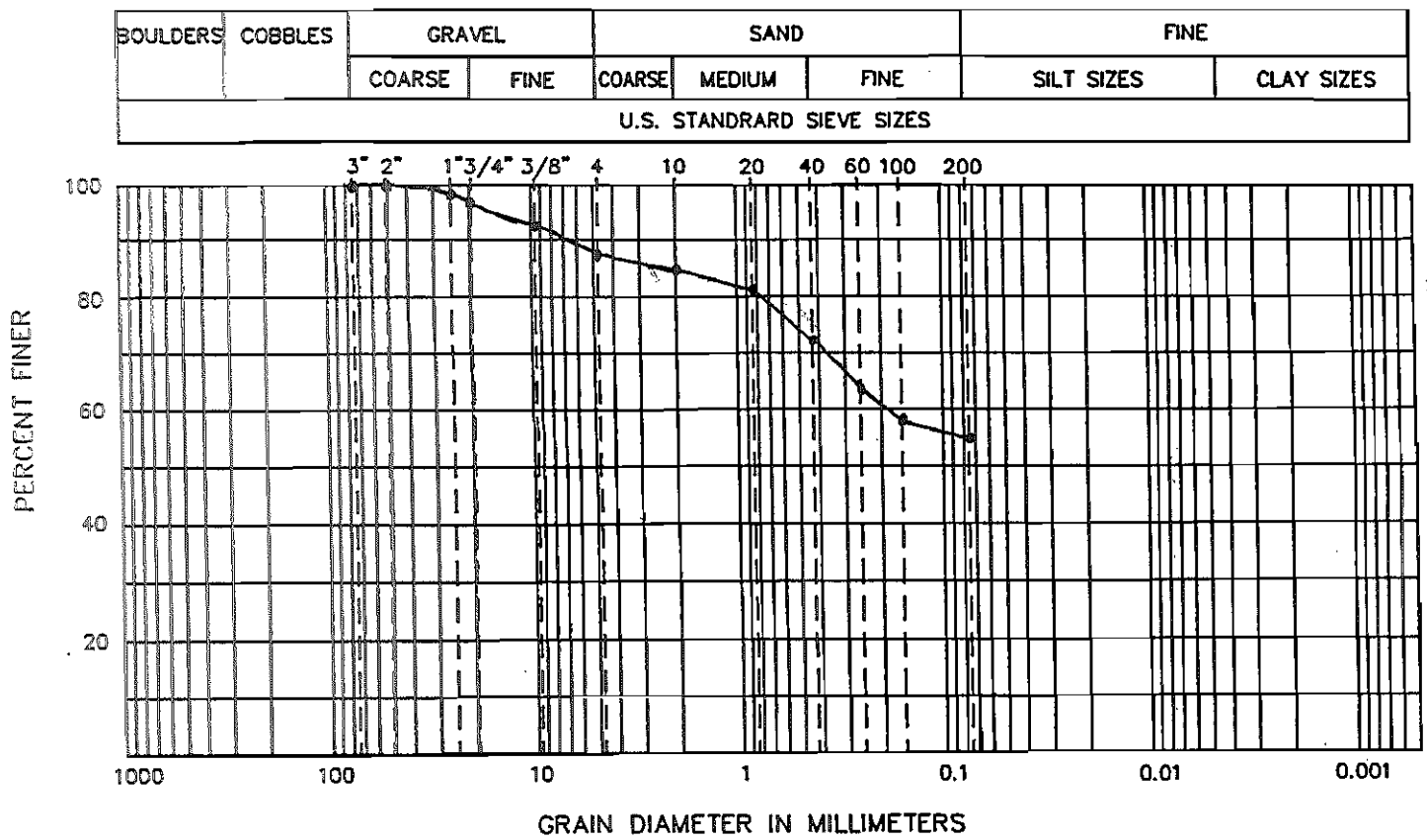
DESCRIPTION: EPLTS

DATE: 21 day 6 month 2000 year

MATERIAL TYPE: Trench Fill (D 422)

SAMPLE NO.: EP-6 QA ID: DLE

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) 34.0

(PL) 19.5

(PI) 14.5

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	98.8
3/4-in.	97.1
1/2-in.	94.8
3/8-in.	93.5
NO. 4	88.9
NO. 10	85.1
NO. 20	81.0
NO. 40	71.9
NO. 60	64.3
NO. 100	59.0
NO. 200	55.4

HYDROMETER RESULTS

PARTICLE DIA.	% FINER
N/A	N/A

SOIL CLASSIFICATION (ASTM D 2487): Sandy Lean Clay

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CHECKED BY: _____

SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

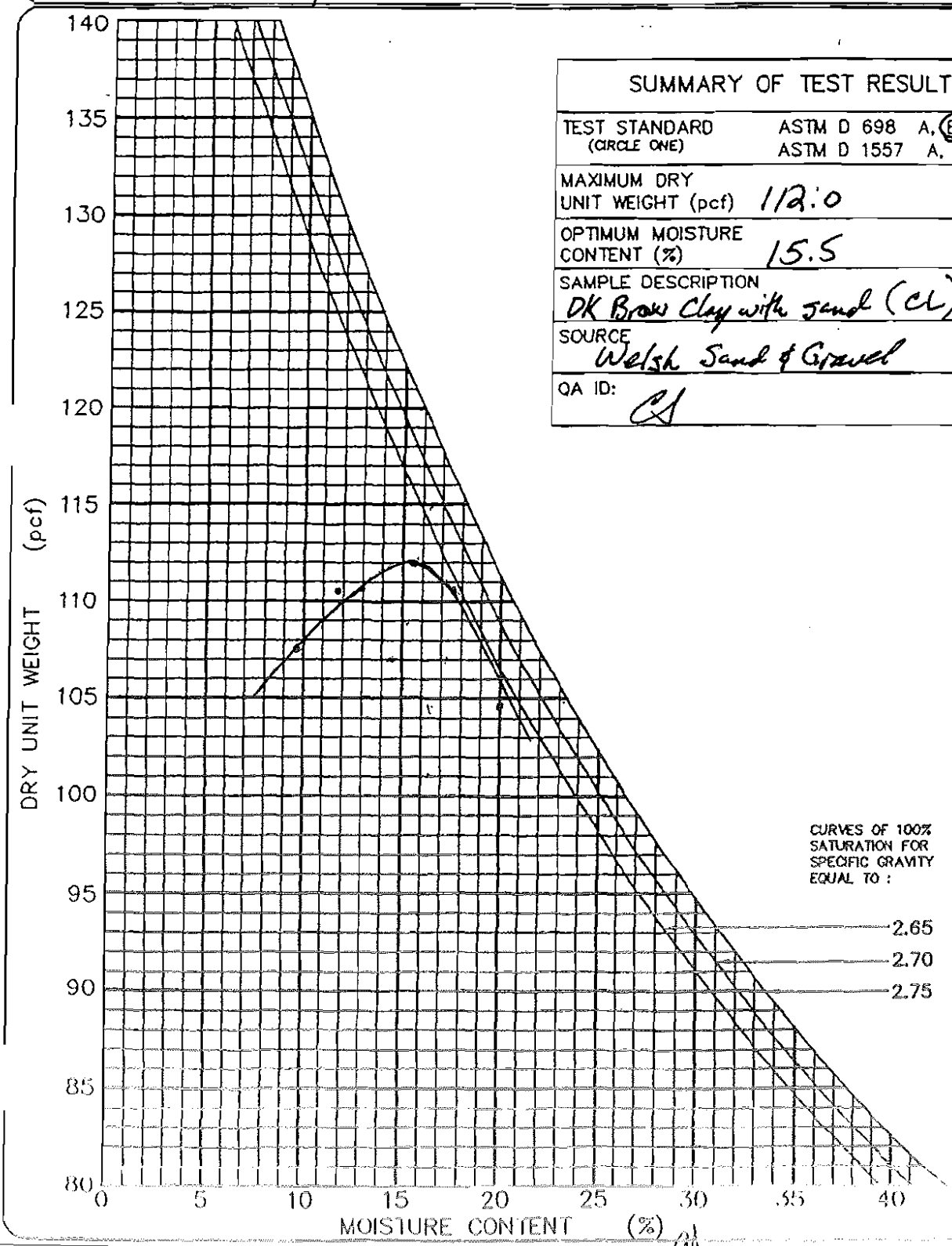
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 19 day June month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP-6



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	112.0
OPTIMUM MOISTURE CONTENT (%)	15.5
SAMPLE DESCRIPTION	DK Brown Clay with sand (CL).
SOURCE	Welsh Sand & Gravel
QA ID:	CS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

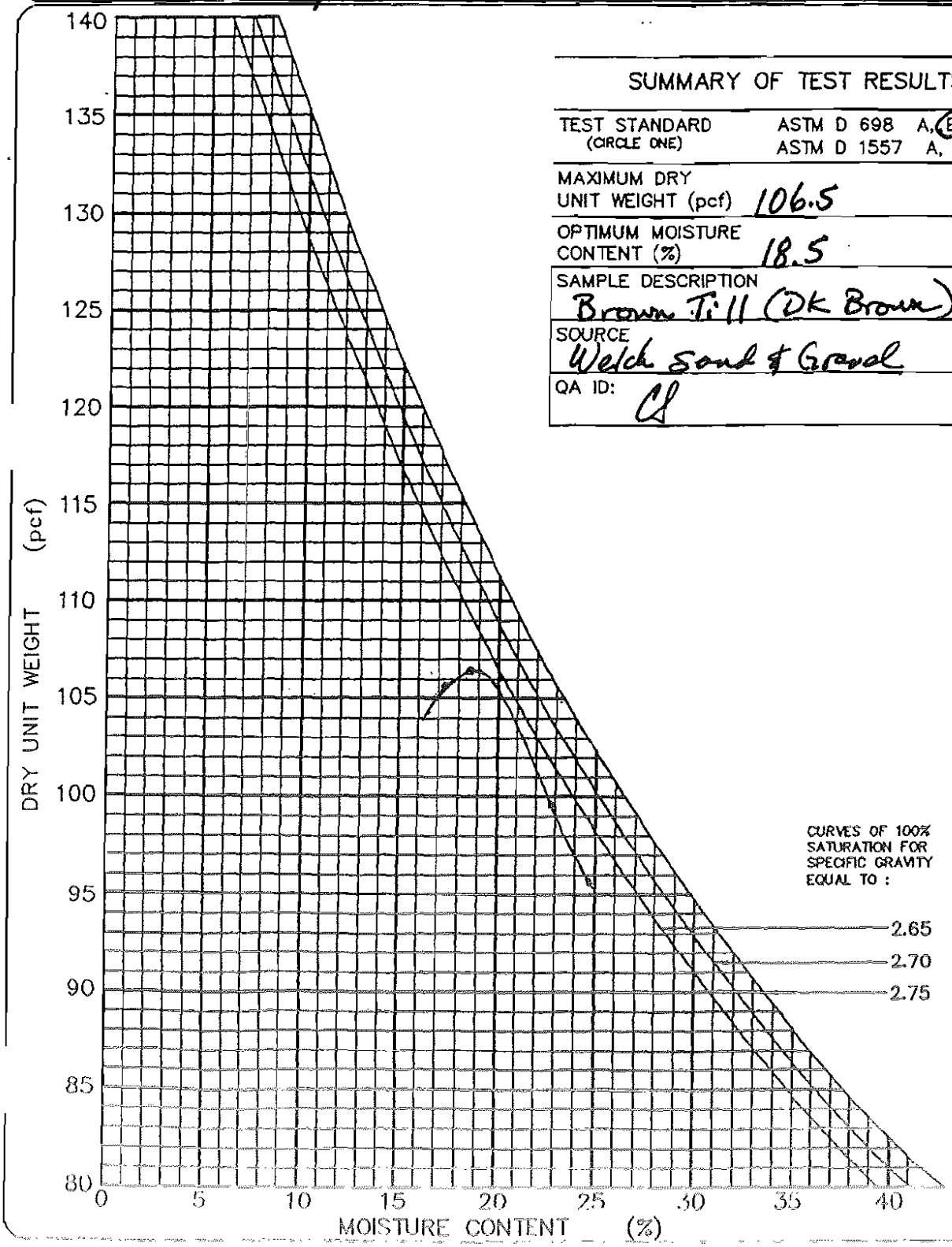
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II / EPLTS DATE: 20 day Dec month 2000 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP 31



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	106.5
OPTIMUM MOISTURE CONTENT (%)	18.5
SAMPLE DESCRIPTION	Brown Till (Dk Brown)
SOURCE	Welch Sand & Gravel
QA ID:	CS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~G00409~~ G01029 DLE TASK NO.: 04.D

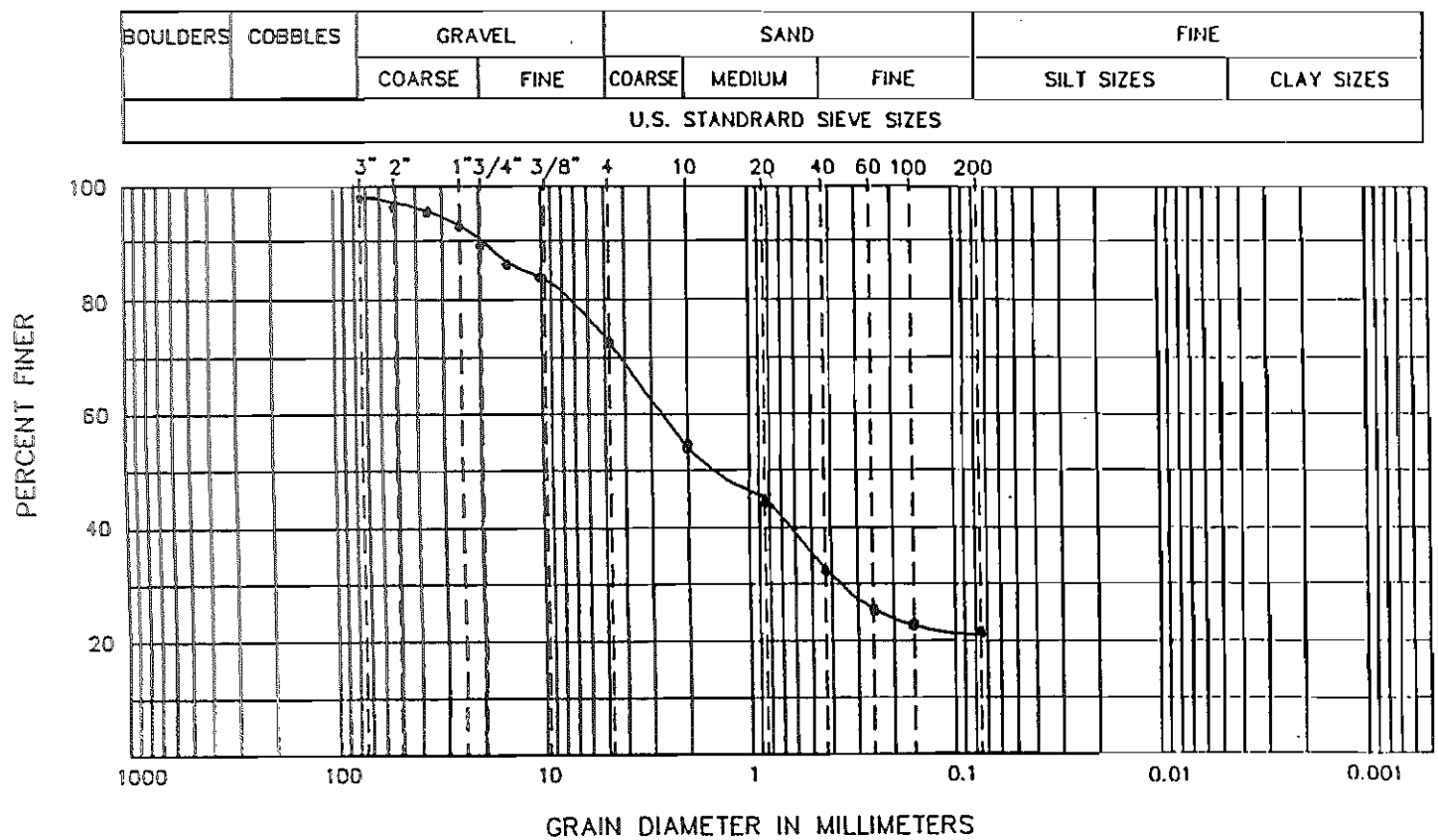
DESCRIPTION: ~~Phase II~~ KS EPLTS

DATE: 9 day Jan month ~~1999~~ 2001 year KS DLE

MATERIAL TYPE: backfill

SAMPLE NO.: EP-32 QA ID: KS

CURVE COEFFICIENTS: (C_u) ..... (C_c) .....



ATTERBERG LIMITS

(LL) 21.0

(PL) 16.0

(PI) 5.0

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	98.3
2-in.	97.6
1 1/2-in.	95.7
1-in.	92.3
3/4-in.	89.5
1/2-in.	86.2
3/8-in.	84.1
NO. 4	72.2
NO. 10	56.3
NO. 20	44.3
NO. 40	32.5
NO. 60	27.2
NO. 100	23.8
NO. 200	21.1

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): SC-SM Clayey Silty Sand w/gravel

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SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

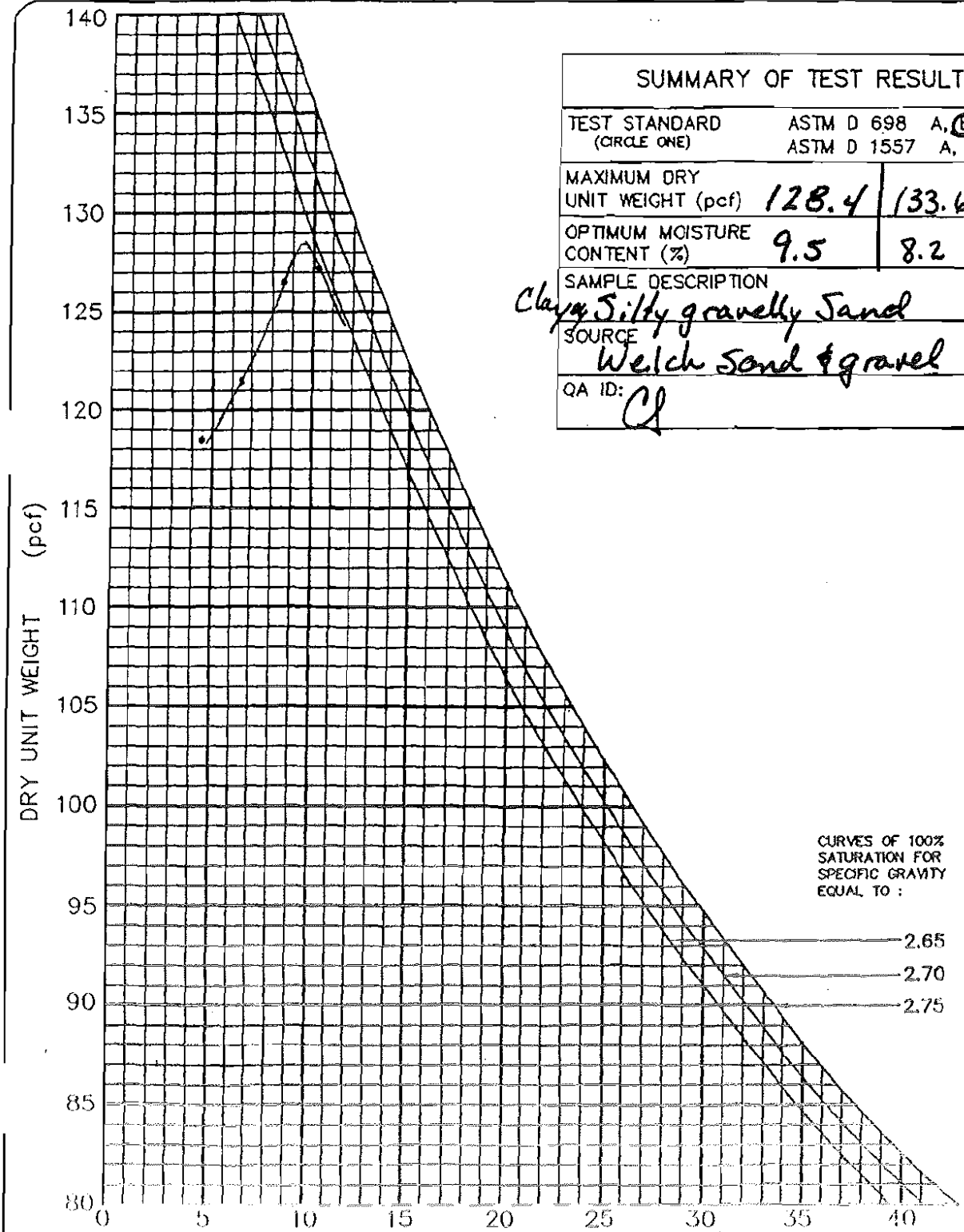
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 4 day Jan month 2001 year

MATERIAL TYPE: ~~Sandy Clay~~ Compacted fill SAMPLE NO.: EP-32



SUMMARY OF TEST RESULTS		
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C	
MAXIMUM DRY UNIT WEIGHT (pcf)	128.4	133.6
OPTIMUM MOISTURE CONTENT (%)	9.5	8.2
SAMPLE DESCRIPTION	Clayey Silty gravelly Sand	
SOURCE	Welch Sand & gravel	
QA ID:	CL	

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO. GQ1029 TASK NO.: 04.2

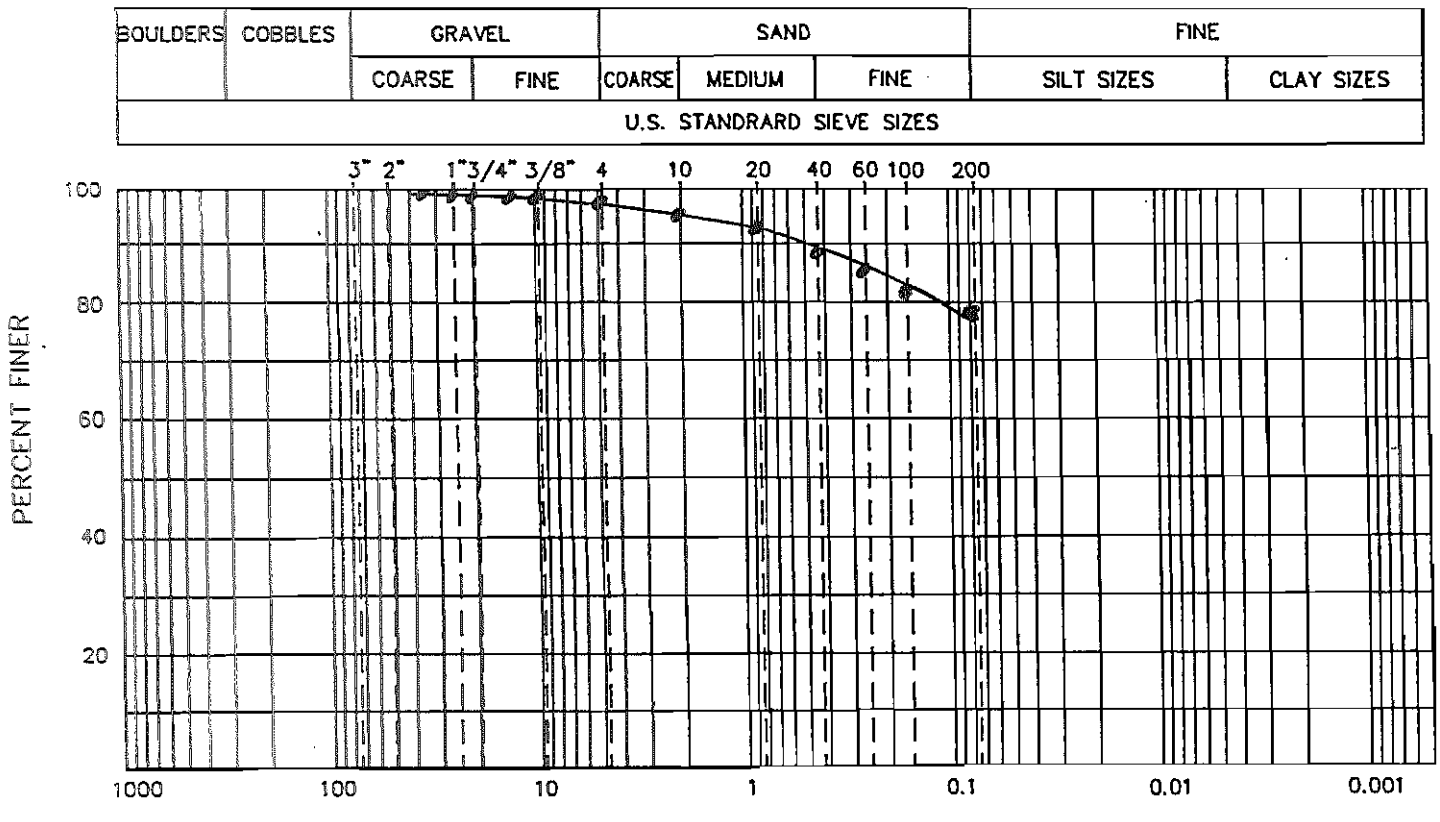
DESCRIPTION: Phase II

DATE: 24 day April month 2001 year

MATERIAL TYPE: Compacted fill

SAMPLE NO.: EP-33 QA ID: DLF

CURVE COEFFICIENTS: (C_U) ..... (C_C) .....



ATTERBERG LIMITS

(LL) 39.3

(PL) 18.1

(PI) 21.2

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	0
2-in.	0
1 1/2-in.	99.9
1-in.	99.85
3/4-in.	99.78
1/2-in.	99.69
3/8-in.	99.59
NO. 4	98.9
NO. 10	95.7
NO. 20	92.6
NO. 40	88.3
NO. 60	85.0
NO. 100	81.7
NO. 200	78.1

HYDROMETER RESULTS

PARTICLE DIA.	% FINER
	N/A

SOIL CLASSIFICATION (ASTM D 2487): CL ~~Sandy lean clay~~ Lean Clay w/Sand ~~w/ Gravel~~

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CHECKED BY:

SHEET NO. 2 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

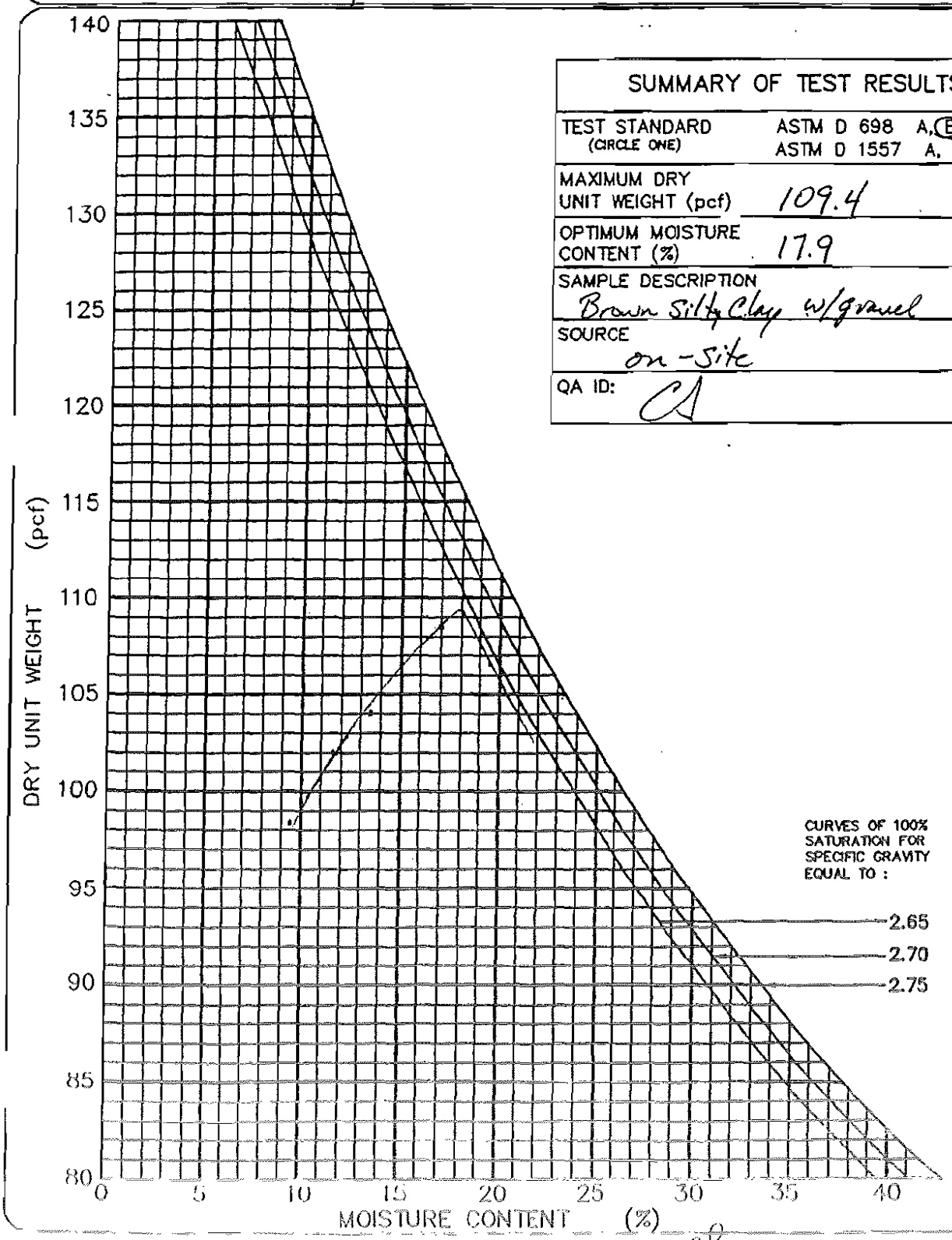
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 1 day Feb month 2001 year

MATERIAL TYPE: Compacted Fill SAMPLE NO.: EP 33



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, (B) C ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	109.4
OPTIMUM MOISTURE CONTENT (%)	17.9
SAMPLE DESCRIPTION	Brown Silty Clay w/gravel
SOURCE	on-site
QA ID:	CA

EMBEDMENT FILL

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT ID: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02215-002	REV: 0	DATE: 08-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 6/8/00

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
3	641-02215-002	0						X			Certification Sand		X		02215	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Tom Escue	52-0				
Rob Cheep	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Tweneboah	104				

RECEIVED
JUN 12 2000

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

RECEIVED BY: [signature] DATE 6/13/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

WELCH
SAND & GRAVEL, INC.
10217 COLUMBIA STREET, HARRISON, OHIO 45030 (513) 353-3220

June 8, 2000

The Staver Group
Fernald, Ohio

Attn: Mr. Ron Woods

Dear Ron:

Please be advised that Welch Sand & Gravel's submittal given to your company on 05/18/00 for the Fernald Leachate Project was a gradation analysis for ODOT 304 aggregate. Welch will be supplying this 304 product from our Ross location to this leachate project.

If there are any questions on this ODOT gradation please call as soon possible.

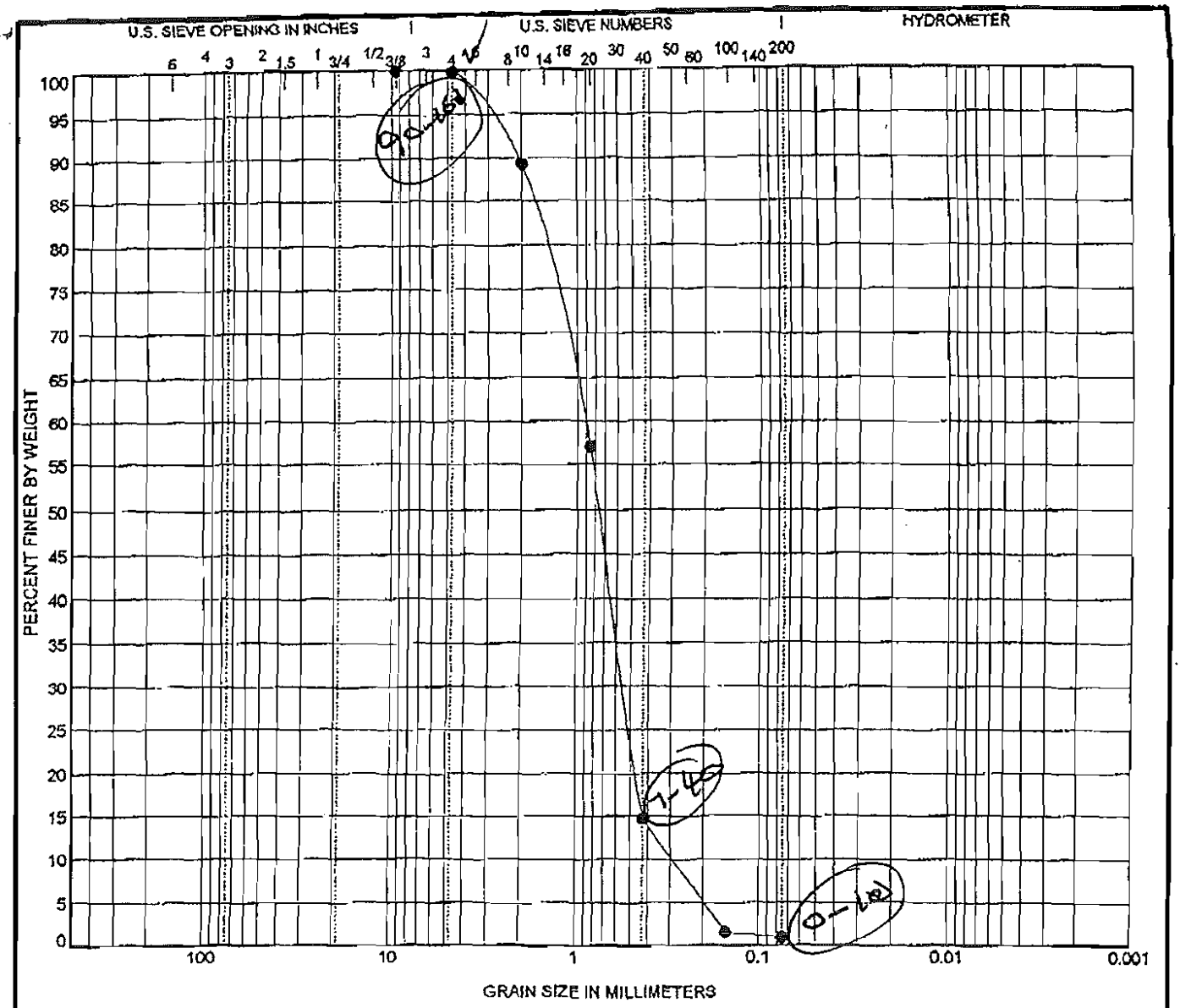
Welch will also be supplying Type A-3 sand to this job from our Ross plant location. This sand has also been tested in accordance with ASTMD 2487 and ASTMC136 procedures. Please find these results enclosed.

Sincerely,

Gene Gillespie
Manager, Aggregate Sales

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641 02215-002
Reviewed By: DW
Date: 6/06/00



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● Sample One	0.0	SAND (SP) (ASTM C-136 & D 2487)				1.07	2.92

Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● Sample One	0.0	9.5	0.954	0.578	0.326	0.2	98.8	1.0	

JS GRAIN SIZE 17837-05.GPJ US LAB.GDT 6/7/00

ATC Engineering Services of Ohio LP
11121 Canal Road
Cincinnati Ohio 45241
Telephone: 513-771-2112
Fax: 513-782-6908

GRAIN SIZE DISTRIBUTION

Project: Leachate Transmission System

Location:

Number: 72.17837.0005

SUPPLIER DOCUMENT SUBMITTAL

PROD #7284 Vol. 3

FDF PRC NO: 20111	CONTRACT NO: FSC - 6	SUBMITTAL NO: 02215-001	REV: 0	DATE: 18-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE: 5/19/00

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	641- 02215-001	0						X			Type A-3 Sand		X		02215			X
	1.04 A																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Tom Escue	520				
Rob Kneip	525				
Scott Wheeler	525				
Geo Sutec (Tweneboah)	164				

RECEIVED
MAY 23 2000

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

Section 02215 Part 1.04 A requires source; written certification and test results per ASTM C136 and 50-lb sample. These are needed for certification report

RECEIVED BY: [signature] DATE 5/24/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

... SAND & GRAVEL, INC.

AGGREGATE TEST DATA AND RESULTS

PROJECT NO. Fernald Leachate

COUNTY Hamilton

Date 05/18/00

Contractor Staver

Plant Location Ross #3

Coarse Agg. Size/Type _____ Source _____ Sample No. _____

Fine Agg. Size/Type Type A - 3 Sand Source Stockpile Sample No. _____

COARSE AGGREGATE SIEVE ANALYSIS

*Sieve Sizes	Grams Retained	Percent Retained	Percent Passing	Specifications
2 1/2"				
2"				
1 1/2"				
1"				
3/4"				
1/2"				
3/8"				
No. 4				
No. 8				
No. 16				
No. 100				
PAN			xxxxx	xxxxx
TOTAL			xxxxx	xxxxx

FINE AGGREGATE SIEVE ANALYSIS

*Sieve Sizes	Grams Retained	Percent Retained	Percent Passing	Specifications
3/8"				
No. 4	158	5.8	94.2	90-100 ✓
No. 8				
No. 16				
No. 30				
No. 50	1681	61.9	32.3	7-40 ✓
No. 100				
No. 200	842	31.0	1.3	0-10 ✓
PAN	31	1.3	xxxxx	xxxxx
TOTAL	2712	100.0	xxxxx	xxxxx

FINENESS MODULUS (F.M.) =

OTHER TESTS OR REMARKS:

Note: Other sieve sizes may be written in if needed.

Material okay but we need to follow submittal requirements per Specs.
LOBT
5/24/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER #7052

Submittal # 641-02215-301
Reviewed By: RW
Date: 5/18/00

Sample Tested by: [signature]

Certification No. 1276

(SAND)

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422) (C-136)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GO 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 07 day June month 2000 year

MATERIAL TYPE: Pipe Embedment Fill SAMPLE NO.: EP. 4

1009.4 Extra Sample

SOIL SAMPLE SIZE Total Sample wt. 1991.65

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		BEFORE WASH	AFTER WASH
TARE NO.		L-4	L-2
WT. OF DRY SAMPLE PLUS TARE	(grams)	1154.20	1145.20
WT. OF TARE	(grams)	191.95	192.04
WT. OF DRY SAMPLE	(grams)	962.25	953.16

SIEVE ANALYSIS QA ID: DCE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
3/8	9.500	Ø	Ø	Ø	
#4	4.750	.40	0.04	100	90 to 100
#8	2.360	57.50	5.10	94.9	
#16	1.180	258.50	26.90	63.1	
#30	0.600	525.80	54.60	45.4	
#50	0.300	848.50	88.20	11.8	7 to 40
#100	0.150	946.00	98.30	1.7	
#200	0.075	953.10	99.0	1.0	Ø to 10
PAN		953.16	99.0	1.0	

%FINER = 100 − Σ% RETAINED

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

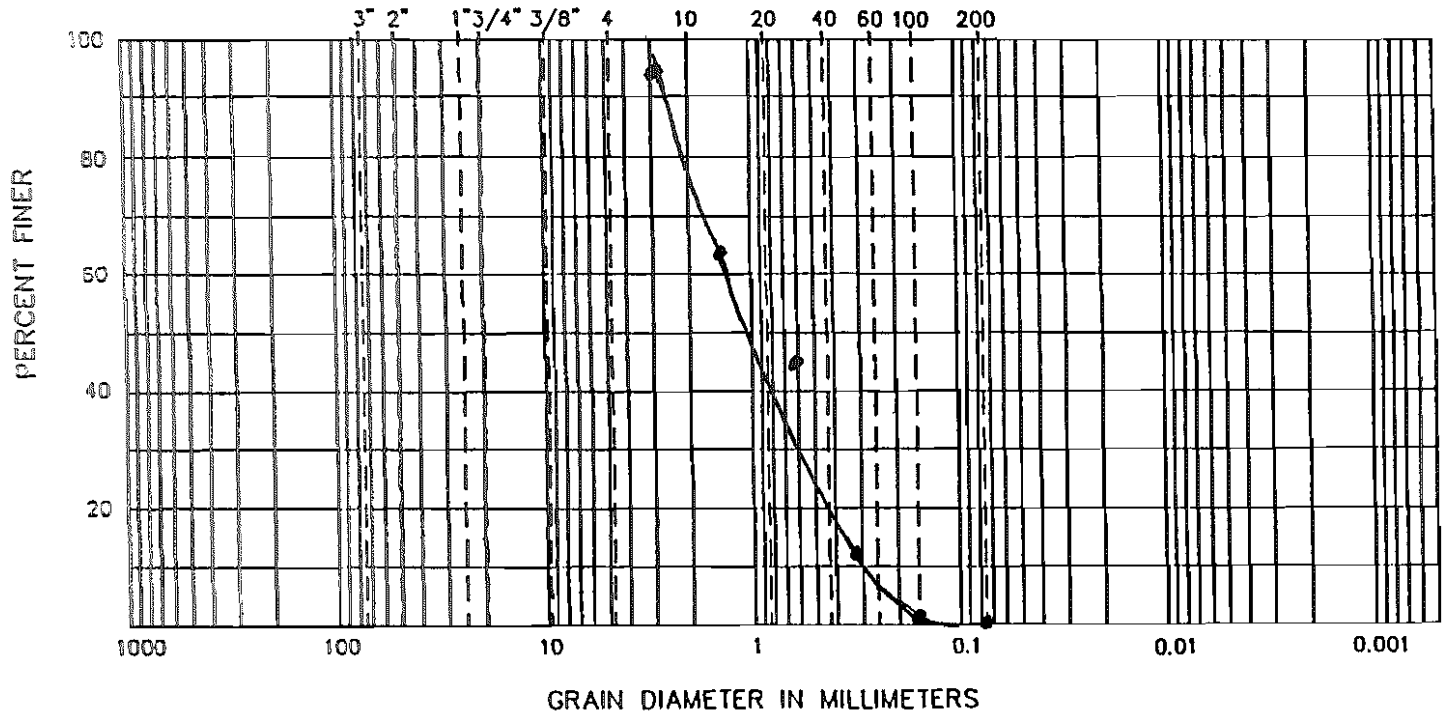
LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS - Phase II — DATE: 07 day June month 2000 year

MATERIAL TYPE: Pipe Embedment Fill C-136 — SAMPLE NO.: EP-1 QA ID: DCE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = 4.3$ $(C_c) \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = .92$

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	100
1/2-in.	100
3/8-in.	100
NO. 4	100
NO. 8	99.9
NO. 16	63.1
NO. 30	45.4
NO. 50	11.8
NO. 100	1.7
NO. 200	1.0

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): S.P.

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422) (C-136)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GO 1029 TASK NO.: 042

DESCRIPTION: Phase III DATE: 24 day Aug month 2000 year

MATERIAL TYPE: Sand Embankment Fill SAMPLE NO.: EP-11

SOIL SAMPLE SIZE

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		Wet Dirty BEFORE WASH	Dry Dirty	AFTER WASH
TARE NO.		N	N	N
WT. OF DRY SAMPLE PLUS TARE	(grams)	377.77	367.64	366.80
WT. OF TARE	(grams)	101.77	101.77	101.77
WT. OF DRY SAMPLE	(grams)	276.0	265.87	264.83

SIEVE ANALYSIS

QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
3/8 in	9.5	Ø	Ø	100	
#4	4.75	Ø	Ø	100 Dit	90-100
#8	2.36	17.14	6.45	93.6 ~~93.55~~	
#16	1.18	73.20	27.53	72.5 Dit ~~72.47~~	
#30	0.600	149.63	56.3 ~~23.70~~	43.7 ~~76.30~~	
#50	0.300	236.08	88.80	11.20	7-40
#100	0.150	263.95	99.28	.7 Dit ~~.72~~	
#200	0.075	264.82	99.61	.40 Dit ~~.39~~	Ø-10
Pan		264.84	99.61	.40 Dit ~~.39~~	

%FINER = 100 − Σ% RETAINED

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

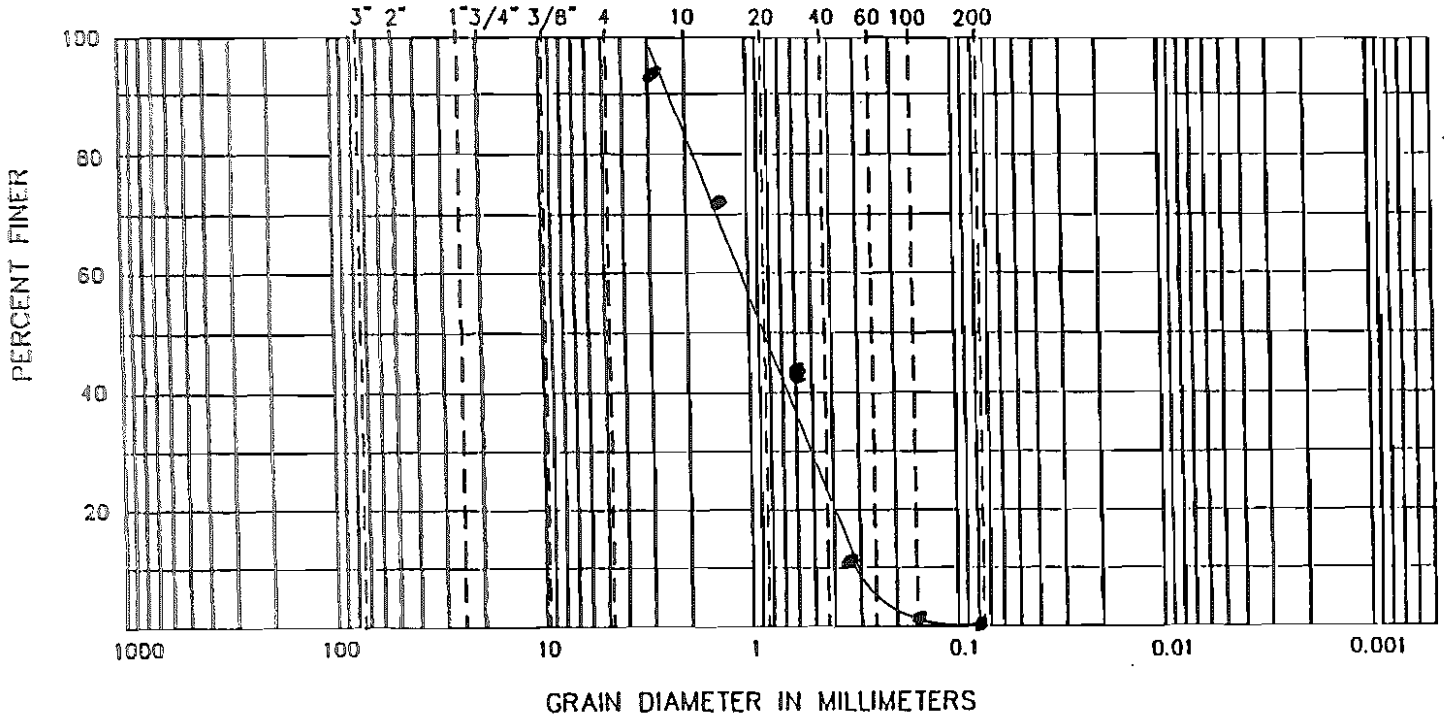
LOCATION: FERNALD, OHIO — PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 24 day Aug month 2000 year

MATERIAL TYPE: Sand, Embedment fill C-136 — SAMPLE NO.: EP311 QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{1}{.3} = 3.33$ $(C_c) = \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.5 = .25}{1 \times .3 = .3} = .83$

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDRARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-In.	100
2-In.	100
1 1/2-In.	100
1-In.	100
3/4-In.	100
1/2-In.	100
3/8-In.	100
NO. 4	100
NO. 8	93.6
NO. 16	82.5
NO. 30	43.7
NO. 50	11.2
NO. 100	.7
NO. 200	.4

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): SP

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422) (C-136)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GO 1029 TASK NO.: 04.2

DESCRIPTION: Phase III DATE: 25 day Aug month 2000 year

MATERIAL TYPE: Sand - Embankment fill SAMPLE NO.: EP-12

SOIL SAMPLE SIZE

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		BEFORE WASH wet Dirt	BEFORE WASH Dry Dirt	AFTER WASH
TARE NO.		K	K	K
WT. OF DRY SAMPLE PLUS TARE	(grams)	352.21	342.83	342.34
WT. OF TARE	(grams)	101.66	101.66	101.62
WT. OF DRY SAMPLE	(grams)	250.55	241.17	240.72

SIEVE ANALYSIS

QA ID: DCE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
3/8 in	9.5	Ø	Ø	100	
#4	4.75	Ø	Ø	100	90-100
#8	2.36	16.48	6.83	93.17	
#16	1.18	72.16	29.92	70.08	
#30	0.600	147.60	61.20	38.80	
#50	0.300	218.94	90.78	9.22	7-40
#100	0.150	239.03	99.11	0.89	
#200	0.075	240.72	99.81	0.19	0-10
Pan					

%FINER = 100 − Σ% RETAINED

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

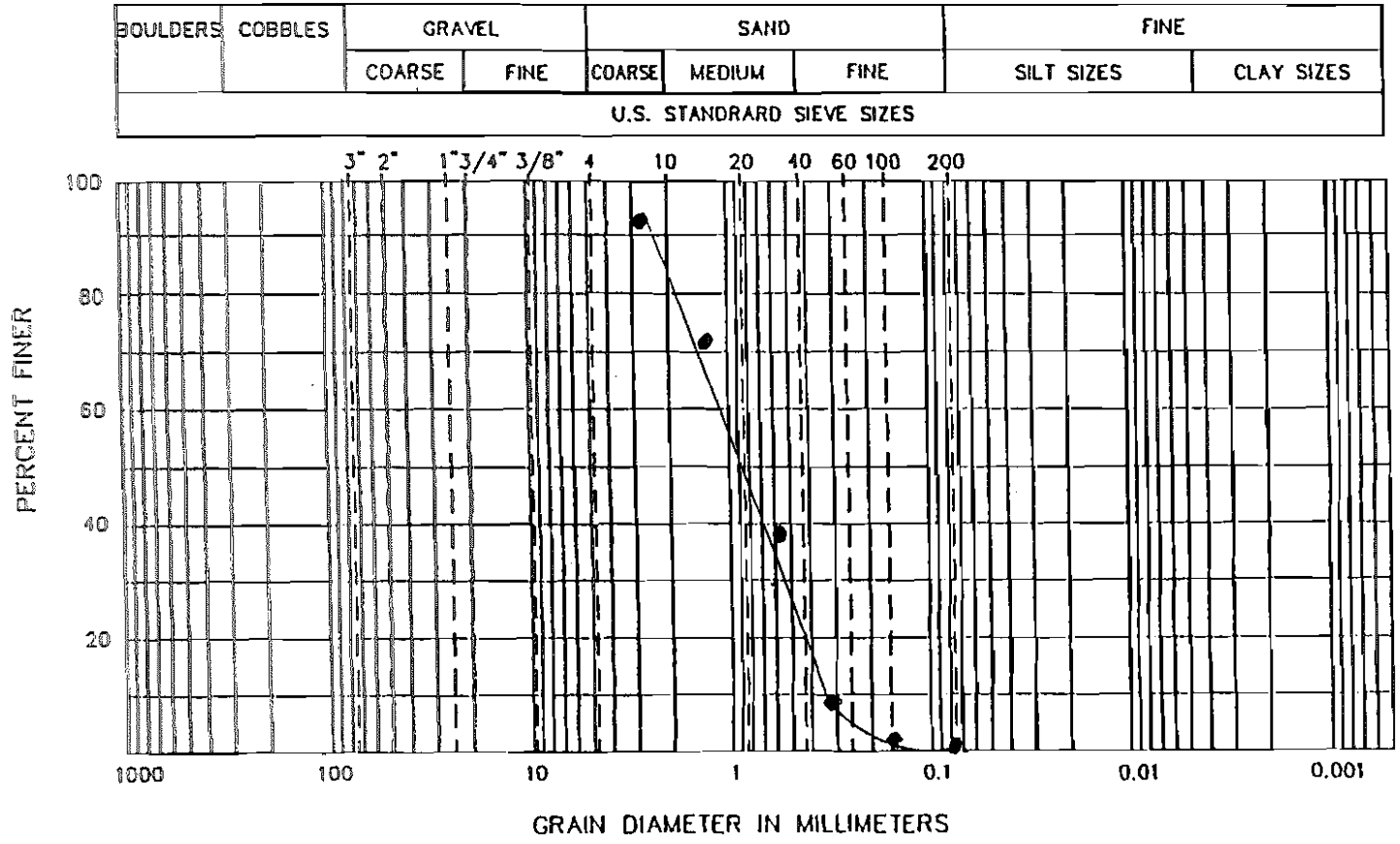
PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO. 6Q1029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 25 day Aug month 2000 year

MATERIAL TYPE: Sand, Embedment fill C-136 — SAMPLE NO.: EP-12 — QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{1.1}{.35} = 3.14$ $(C_c) \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.55}{.385} = 1.43$



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	100
1/2-in.	100
3/8-in.	100
NO. 4	100
NO. 8	93.19
NO. 16	70.08
NO. 30	38.80
NO. 50	9.22
NO. 100	0.89
NO. 200	0.19

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): S.P.

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GO 1029 TASK NO.: 042

DESCRIPTION: Phase III DATE: 28 day Sept month 2000 year

MATERIAL TYPE: Sand C-136 SAMPLE NO.: EP-15

SOIL SAMPLE SIZE 4398.37 Total Sample wt

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE)	(grams)	SAND	FINE GRAIN
1309.4 1101.1 1182.2 852.0		115	65

		BEFORE WASH	AFTER WASH
TARE NO.		L-1	L-1
WT. OF DRY SAMPLE PLUS TARE	(grams)	1292.80	1258.1
WT. OF TARE	(grams)	192.70	192.7
WT. OF DRY SAMPLE	(grams)	1100.10	1065.4

SIEVE ANALYSIS QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
3/4	19.0	25.59	2.3	97.7	
1/2	12.5	108.51	9.9	90.1	
3/8	9.5	160.61	14.6	85.4	
#4	4.75	308.50	28.0	72.0	90-100
#8	2.36	458.20	41.7	58.3	
#16	1.18	612.50	55.7	44.3	
#30	0.600	807.3	73.4	26.6	
#50	0.300	1007.4	91.6	8.4	7-40
#100	0.150	1058.5	96.2	3.8	
#200	0.075	1065.4	96.9	3.1	0-10
PAN					

%FINER = 100 - Σ% RETAINED

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

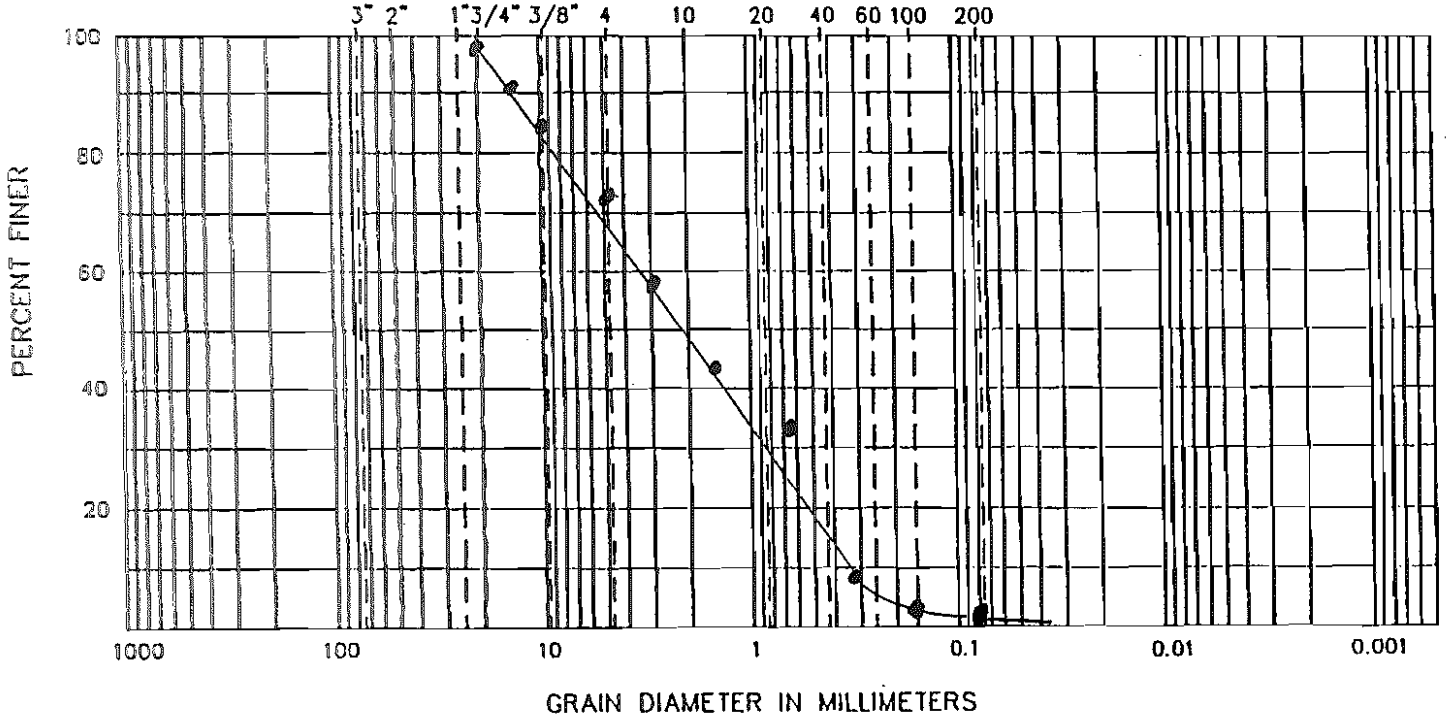
LOCATION: FERNALD, OHIO — PROJECT NO.: 601029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 28 day Sept month 2000 year

MATERIAL TYPE: Sand C-136 — SAMPLE NO.: EP-15 QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{3.3}{.35} = 9.4$ ..... $(C_c) = \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.9^2 = 0.81}{1.155} = .70$

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDRARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	97.7
1/2-in.	90.1
3/8-in.	85.4
NO. 4	72.0
NO. 8	58.3
NO. 16	44.3
NO. 30	26.6
NO. 50	8.4
NO. 100	3.8
NO. 200	3.1

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): SP

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: 6Q1029 TASK NO.: 042

DESCRIPTION: Phase III EPLTS DATE: 07 day Nov month 2000 year

MATERIAL TYPE: Pipe Embedment Fill (sand) SAMPLE NO.: EP-22

SOIL SAMPLE SIZE (C. 136)

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		BEFORE WASH		AFTER WASH	
TARE NO.		Big Pan		Big Pan	
WT. OF DRY SAMPLE PLUS TARE	(grams)	13.2 lb.	5896.80	12.99	5792.472
WT. OF TARE	(grams)	2.1 lb	952.56	2.1	952.56
WT. OF DRY SAMPLE	(grams)		4944.24		4839.912

SIEVE ANALYSIS QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
3 in	75.0	Ø	Ø	100	
2 1/2 in	63.0	Ø	Ø	100	
2 in	50.0	Ø	Ø	100	
1 1/2 in	37.5	Ø	Ø	100	
1 in	25.0	43.11	.87	99.1	
3/4 in	19.0	43.11	.87	99.1	
1/2 in	12.500	54.10	1.09	98.9	
3/8 in	9.500	61.69	1.25	98.8	
#4	4.750	69.10	1.40	98.6	90-100
#8	2.360	799.41	16.17	83.8	
#16	1.180	1962.28	39.69	60.3	
#30	0.600	3159.48	63.90	36.1	
#50	0.300	4471.41	90.44	9.6	7-40
#100	0.150	4816.88	97.42	2.6	
#200	0.075	4839.70	97.89	2.1	0-10
Pan		4839.87	97.89	2.1	0-10

%FINER = 100 − Σ% RETAINED

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO. GQ 1029 TASK NO.: 04.2

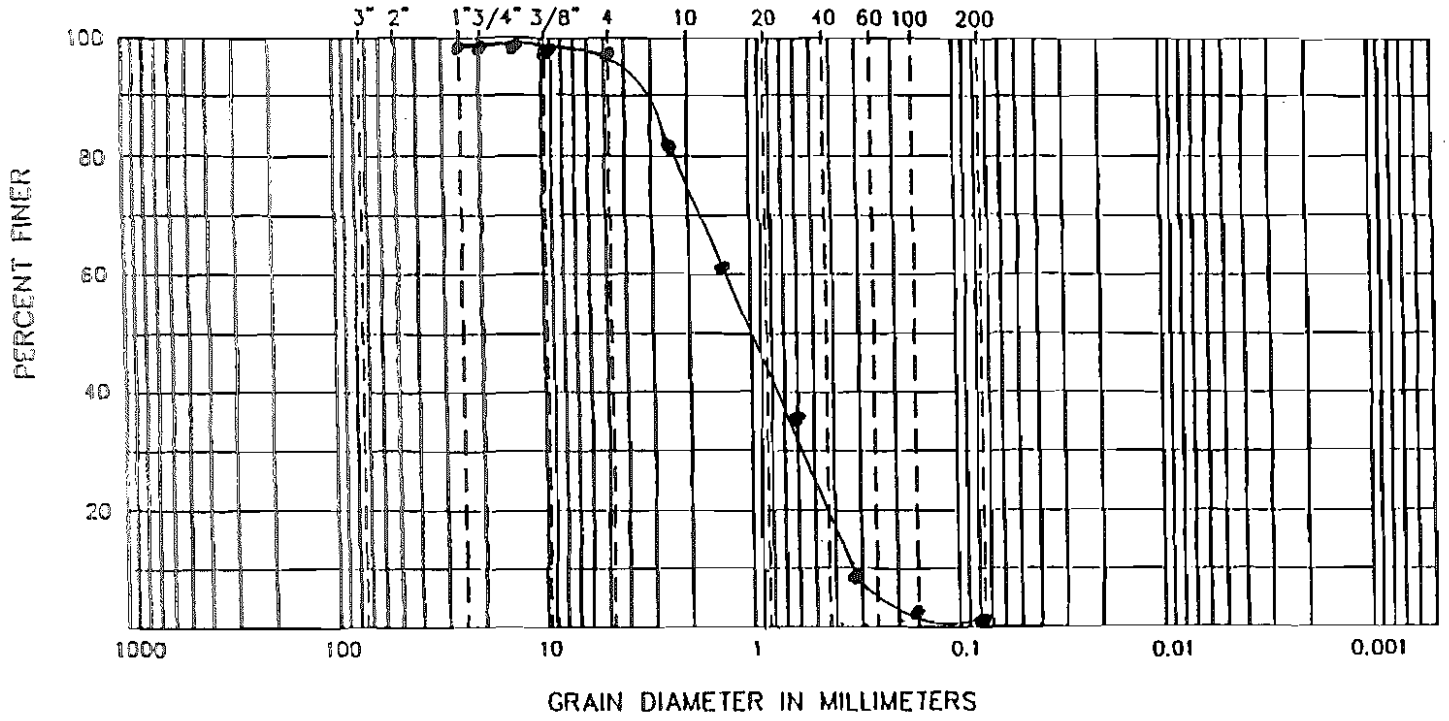
DESCRIPTION: Phase III EPLts — DATE: 07 day Nov month 2000 year

MATERIAL TYPE: Pipe Embankment Fill C-136 — SAMPLE NO.: EP-22 QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{1.4}{0.33} = 4.24$ $(C_c) \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.6^2}{0.462} = .78$

$1.4 \times 0.33 = 0.462$

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	99.1
3/4-in.	99.1
1/2-in.	98.9
3/8-in.	98.8
NO. 4	98.6
NO. 8	83.8
NO. 16	60.3
NO. 30	36.1
NO. 50	9.6
NO. 100	2.6
NO. 200	2.1

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): SP

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ1029 TASK NO.: 042

DESCRIPTION: Phase III DATE: 7 day Dec month 2000 year

MATERIAL TYPE: Sand SAMPLE NO.: EP-22 A

SOIL SAMPLE SIZE

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		BEFORE WASH	AFTER WASH
TARE NO.		Big Pan	Big Pan
WT. OF DRY SAMPLE PLUS TARE	(grams)	13.79 LB. 6255.14	6223.61
WT. OF TARE	(grams)	2.1 LB. 952.56	952.56
WT. OF DRY SAMPLE	(grams)	5302.58	5271.05

SIEVE ANALYSIS

QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
1/2	12.5	0			
3/8	9.5	9.91	0.2	99.8	
#4	4.75	18.94	0.4	@ ~~99.8~~ 99.6	100
#8	2.36	491.34	9.3	90.7	
#16	1.18	1688.24	31.8	68.2	
#30	0.600	3366.44	63.5	36.5	
#50	0.300	4915.34	92.7	7.3	7-40
#100	0.150	5237.54	98.8	1.2	
#200	0.075	5266.72	99.3	0.7	0-10
Pan		5270.67			

%FINER = 100 − Σ% RETAINED

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

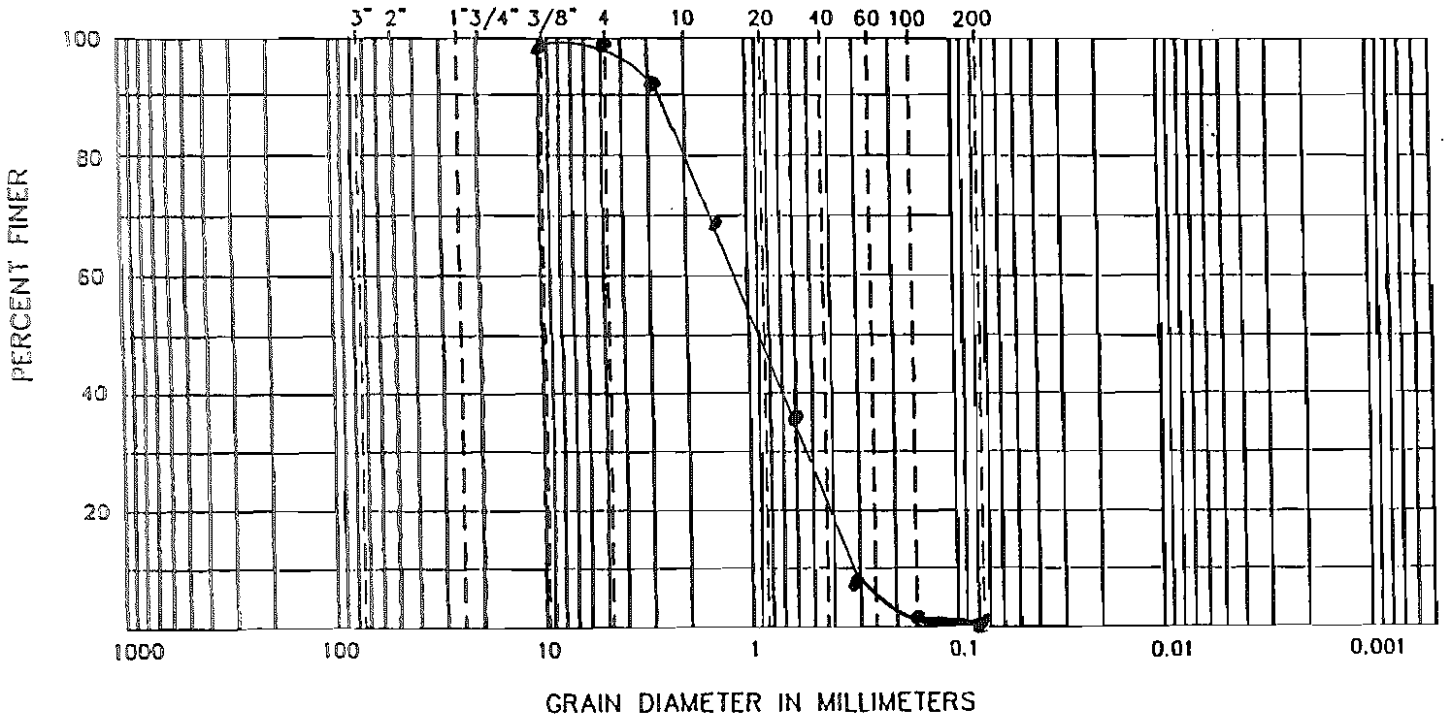
LOCATION: FERNALD, OHIO — PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 07 day Dec month 2000 year

MATERIAL TYPE: Sand C-136 — SAMPLE NO.: EP-22-A QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{1.2}{.32} = 3.75$ $(C_c)\left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.5^2}{1.2 \times .32} = \frac{.3025}{0.384} = .79$

BOULDERS	COBBLES	GRAVEL		SAND			FINE	
		COARSE	FINE	COARSE	MEDIUM	FINE	SILT SIZES	CLAY SIZES
U.S. STANDRARD SIEVE SIZES								



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	100
1/2-in.	100
3/8-in.	99.8
NO. 4	99.6
NO. 8	90.7
NO. 16	68.2
NO. 30	36.5
NO. 50	7.3
NO. 100	1.2
NO. 200	0.7

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487):

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

ARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM C 136) SAND

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)
LOCATION: FERNALD, OHIO
DESCRIPTION: PHASE III
MATERIAL TYPE: ~~78 Stone~~ Embedment Sand
PROJECT NO: GQ 1341 TASK NO.: 04.2
DATE: 12 day April month 2001 year
SAMPLE NO.: EP.36

SOIL SAMPLE SIZE	SAND	FINE GRAIN
APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO 10 SIEVE) (grams)	115	65

	BEFORE WASH	AFTER WASH
TARE NO.	V	K
WT. OF DRY SAMPLE PLUS TARE (grams)	941.40	915.30
WT. OF TARE (grams)	101.68	101.56
WT. OF DRY SAMPLE (grams)	839.72	813.74

SIEVE ANALYSIS QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
2"	50.0	Ø			100
1½"	37.50	Ø			|
1"	25.00	Ø			|
¾"	19.00	Ø			100
½"	12.50	Ø			~~85 To 100~~
⅜"	9.50	2.71	.32	99.68	~~40 To 75~~
#4	4.75	46.52	5.54	94.46	~~5 To 25~~ 90-
#8	2.36	164.98	19.65	80.35	~~0 To 10~~
#16	1.18	331.81	39.51	60.49	~~0 To 5~~
#30	0.60	550.32	65.54	34.46	~~0 To 5~~
#50	0.30	746.90	88.95	11.05	~~0 To 5~~ 7-4
#100	0.15	802.53	95.57	4.43	~~0 To 5~~
#200	0.75	813.32	96.86	3.14	~~0 To 2~~ 0-
PAN		813.71	96.90	3.10	

% FINER 100 - Σ % RETAINED

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GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS (ASTM C 136/D 422) (ASTM D 2487)

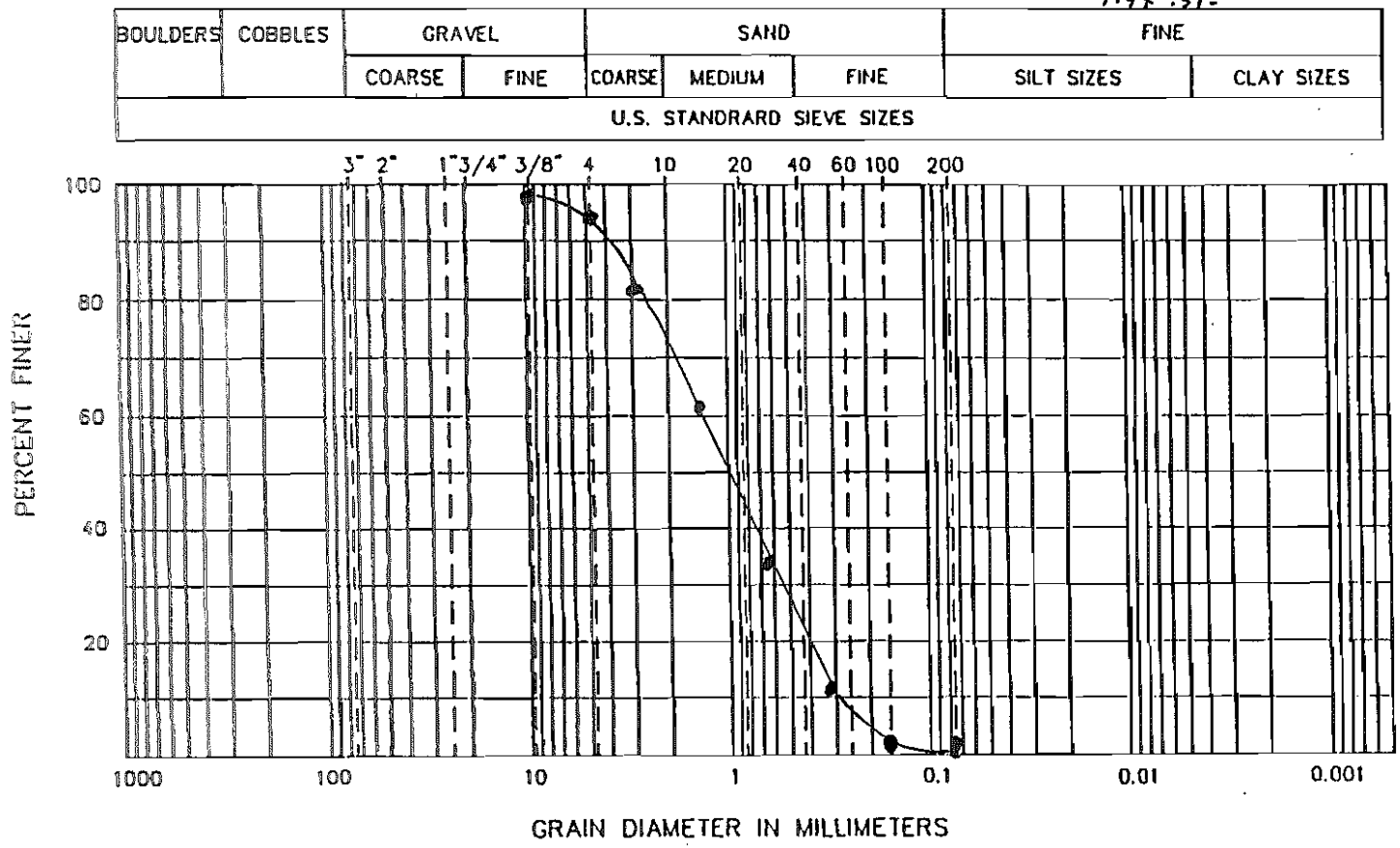
PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO.: 69 1341 TASK NO.: 04-2

DESCRIPTION: Phase III — DATE: 12 day April month 2001 year

MATERIAL TYPE: Embedment Fill C-136 — SAMPLE NO.: EP-36 QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{1.4}{.31} = 4.5$ $(C_c) \left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{.54^2}{1.4 \times .31 = 0.434} = \frac{0.2916}{0.434} = .67$



ATTERBERG LIMITS

(LL) N/A

(PL) N/A

(PI) N/A

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	100
3/4-in.	100
1/2-in.	100
3/8-in.	99.68
NO. 4	94.46
NO. 8	80.35
NO. 16	60.49
NO. 30	34.46
NO. 50	11.05
NO. 100	4.43
NO. 200	3.14

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487):

CURVED BY:

AGGREGATE BASE

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02230-002	REV: 0	DATE: 08-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wenty DATE: 6/8/00

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
8	641-02230-002	0						X			Certification 304		X		02230	X		

REVIEW DISTRIBUTION

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Jim Jenkins	52-5				
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B. Scott Wheeler	52-5				
Kwasi Bau Twereboah	64				

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

RECEIVED BY: [signature] DATE 6/13/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

ENTERED

WELCH
SAND & GRAVEL, INC.
10217 COLUMBIA STREET, HARRISON, OHIO 45030
(513) 353-3220

June 8, 2000

The Staver Group
Fernald, Ohio

Attn: Mr. Ron Woods

Dear Ron:

Please be advised that Welch Sand & Gravel's submittal given to your company on 05/18/00 for the Fernald Leachate Project was a gradation analysis for ODOT 304 aggregate. Welch will be supplying this 304 product from our Ross location to this leachate project.

If there are any questions on this ODOT gradation please call as soon possible.

Welch will also be supplying Type A-3 sand to this job from our Ross plant location. This sand has also been tested in accordance with ASTMD 2487 and ASTMC136 procedures. Please find these results enclosed.

Sincerely,

Gene Gillespie
Manager, Aggregate Sales

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02230-002
Reviewed By: DW
Date: 6/08/00

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
AGGREGATE TEST
R E P O R T

Sample Id: 00517203 01
Sample Date: 02/29/00 PID Nbr: 12962
Matl Name: 304 CR GRAVEL 304/04
P/S Name: WELCH S&G-HAMILTON
Rep Qty: 4720.000 MTON
Sampled From: STOCK

Proj/Item/Ref: 99 0738 304M20000 19
Cnty/Rt/Sect: BUT SR 12 06.549
Fed Aid Nbr: ----
Inspector Name: DAWES
Consign To:
Mfg Control Nbr: G#2095

Sample Weight: 14908.0 Wt P- 4.75mm: 4966.0 Dried Wt + 4.75mm: 2639.0
Washed Dry Wt: Split Wt P- 4.75mm: 523.0 Washed Wt + 4.75mm: 2627.0
Test Spec Year: 97 Washed Oven Dried Wt - 4.75mm: 447.1

Sieve	Wt	%Pass	Specs	In/Out	Sieve	Wt	%Pass	Specs	In/Out
100mm			-		2.36mm	180.5	22	-	
90mm			-		2mm			-	
75mm			-		1.18mm	87.7	16	-	
63mm			-		600um	71.6	12	9 - 33	✓
50mm	0.0	100	100 - 100	✓	425um	29.8	10	-	
37.5mm			-		300um	29.7	8	-	
25mm	1333.0	91	70 - 100	✓	212um			-	
19mm	1874.0	78	50 - 90	✓	150um			-	
12.5mm	2695.0	60	-		75um	47.8	5.2	0 - 13	✓
9.5mm	1383.0	51	-		PAN				
4.75mm	2632.0	33	30 - 60	✓					

Fineness Modulus:

75um: FA P- 75um:
Liquid Limit:
Plastic Index:
Fractured %:
Abrasion Loss %: A - 28 ✓
Soundness Loss %: 3 ✓
Dry Rod Wt
As Rec'd Wt
Coef Of Perm
Max Dry Wt
Siliceous Particles:
Opt Moist %:
Silicon Dioxide:
Freeze/Thaw Area:

Sample Id:
DELETERIOUS

Shale Matl %: 0.00
Chert %:
Limonitic Matl %:
Soft Pieces %:
Clay Lumps %:
Coal %:
Total %:

	Avg	Sample Id	Value	Sample Id	Value
Specific Gr:					
Absorption %:					

Test Remarks: APPROVED/FOR USE IN 304.
738-99
304

Number/Reference:
Requisition Number:

FDF PRO[illegible]T NO: 20111 | CONTRACT NO: PSC - 6[illegible] | SUBMITTAL NO: 02230-001 | REV: 0 | DATE: 18-May-00 | PROD #7284 Vol. 3 PAGE 1 OF 1

FROM: T[illegible] STAVER GROUP, Inc.

Ron Wood

SIGNATURE: Ron Wood

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

RECEIVED BY: Erika Jarrett DATE: 5/19/00

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	1641- 02230-001	0						X			304 Gradation		X		02230			X
	2.01 A																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525	RECEIVED			
Tim Cherry	525				
Jim Jenkins	525	MAY 23 2000			
Tom Escue	520				
Bob Kneip	525				
Scott Wheeler	525				
Geo Sutter (Tweneboah)	654				

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

Need source, mill certification and test results as required by the specification.

RECEIVED BY: [illegible] DATE 5/24/[illegible]

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

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)

CFC - CERTIFIED FOR CONSTRUCTION

INF - INFORMATION/RECORD

DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)

A - Conforms to Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

WELCH SAND & GRAVEL, INC.

AGGREGATE TEST DATA AND RESULTS

PROJECT NO. Fernald Leachate

COUNTY Hamilton Date 05/18/00

Contractor Staver Plant Location Ross #3

Coarse Agg. Size/Type 304 Source Stockpile Sample No.

Fine Agg. Size/Type Source Sample No.

COARSE AGGREGATE SIEVE ANALYSIS

*Sieve Sizes	Grams Retained	Percent Retained	Percent Passing	Specifications
2 1/2"				
2"	0	0	100	100
1 1/2"				
1"	444.5	7.28	92.72	70-100
3/4"	592.3	9.70	83.02	50-90
1/2"				
3/8"				
No. 4	2703.1	44.27	38.75	30-60
No. 8				
No. 30	1538.3	25.19	13.56	9-33
No. 200	531.3	8.70	4.86	0-13
PAN	297.0	4.86	xxxxx	xxxxx
TOTAL	6106.5	100.0	xxxxx	xxxxx

Material appears to be okay but we need to follow spec's submittal requirements.
KPT
5/24/00

FINE AGGREGATE SIEVE ANALYSIS

*Sieve Sizes	Grams Retained	Percent Retained	Percent Passing	Specifications
3/8"				
No. 4				
No. 8				
No. 16				
No. 30				
No. 50				
No. 100				
No. 200				
PAN			xxxxx	xxxxx
TOTAL			xxxxx	xxxxx

FINENESS MODULUS (F.M.) =

OTHER TESTS OR REMARKS:

*Note: Other sieve sizes may be written in if needed.

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER #7052

Submittal # 641-02230-001
Reviewed By: [illegible]
Date: 5/18/00

Sample Tested by: [illegible]

Certification No. 1276

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE ANALYSIS MECHANICAL SIEVE METHOD (ASTM D 422) (C-136)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GO 1029 TASK NO.: 042

DESCRIPTION: Phase III DATE: 05 day Oct month 2000 year

MATERIAL TYPE: 304 Stone SAMPLE NO.: EP-18

SOIL SAMPLE SIZE Total 20019.67

APPROXIMATE MINIMUM WT. OF SAMPLE (PASSING NO. 10 SIEVE) (grams)	SAND	FINE GRAIN
	115	65

		BEFORE WASH	AFTER WASH
TARE NO.		Big Pan	Big Pan
WT. OF DRY SAMPLE PLUS TARE	(grams)	14.372 LB : 6518.23	5887.976
WT. OF TARE	(grams)	2.10 LB : 952.56	952.56
WT. OF DRY SAMPLE	(grams)	12.27 LB : 5565.67	4935.416

stone
5565.67
3496.0
2600.0
3 7.9
31 .4
1478.7
20018.67

SIEVE ANALYSIS QA ID: DLE

SIEVE NO.	DIAMETER (mm)	WT. RETAINED (grams)	% RETAINED	% FINER	PROJECT SPECIFICATIONS
1	25.000	447.7	8.0	92.0	70 TO 100
3/4	19.000	1574.7	28.3	71.7	50 TO 90
1/2	12.500	2210.3	39.7	60.3	
3/8	9.500	3343.0	60.1	39.9	
#4	4.750	3845.6	69.1	30.9	30 TO 60
#8	2.360	3941.6	70.8	29.2	
#16	1.180	4285.0	77.0	23.0	
#30	0.600	4500.6	80.9	19.1	9 TO 33
#50	0.300	4670.0	83.9	16.1	
#100	0.150	4807.0	86.4	13.6	
#200	0.075	4913.5	88.3	11.7	0 TO 13
PAN		4935.2	88.7	11.3	

%FINER = 100 − Σ% RETAINED

©GEOSYNTEC CONSULTANTS FILE NO. 2-14-PMS CHECKED BY: [illegible] SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

PARTICLE SIZE DISTRIBUTION AND SOIL CLASSIFICATION TEST RESULTS

(ASTM C 136/D 422) (ASTM D 2487)

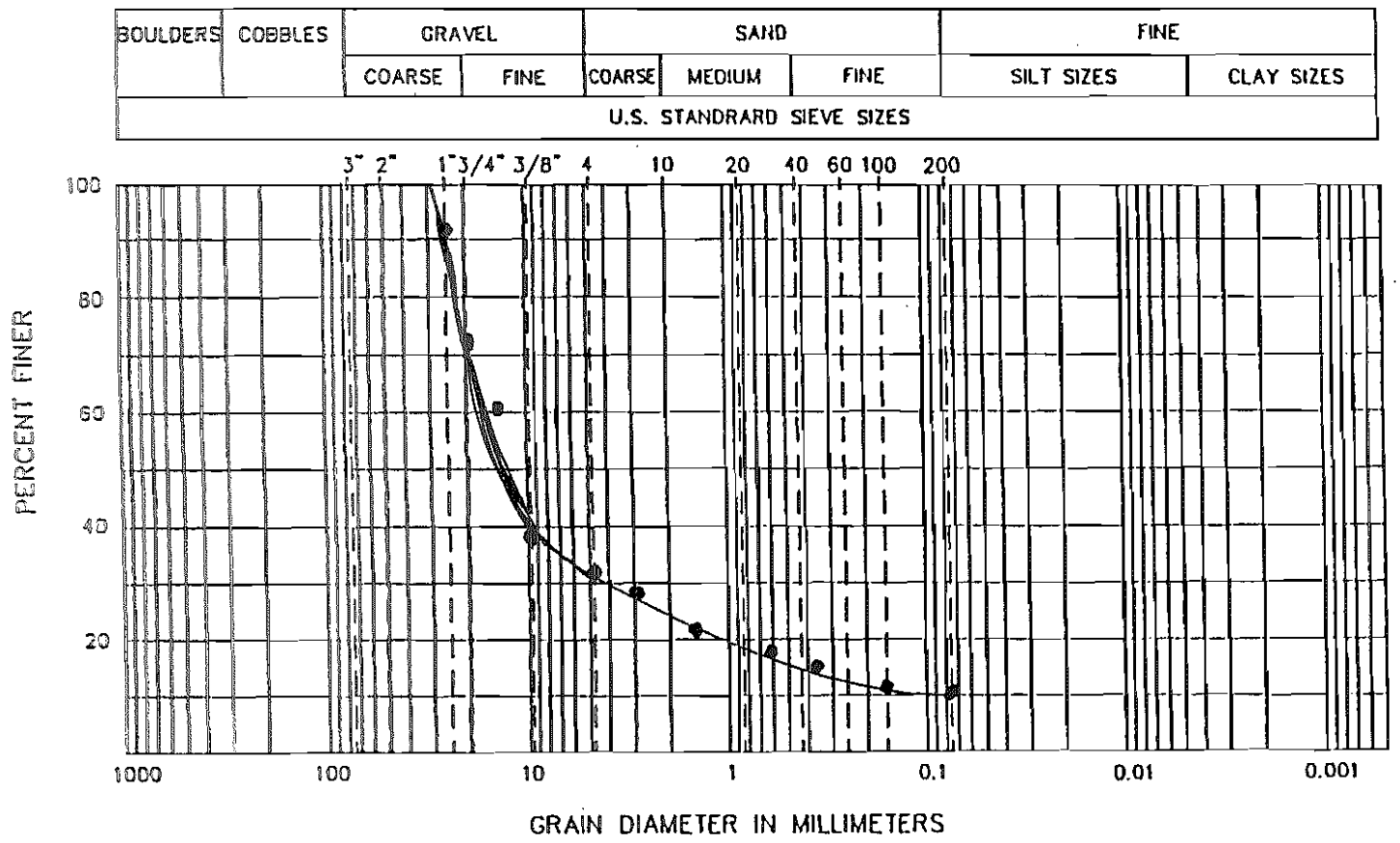
PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO — PROJECT NO. GG 1029 TASK NO.: 04.2

DESCRIPTION: Phase III EPLTS — DATE: 05 day Oct month 2000 year

MATERIAL TYPE: 304 Stone C-136 — SAMPLE NO.: EP-1B QA ID: DLE

CURVE COEFFICIENTS: $(C_u) = \left(\frac{D_{60}}{D_{10}}\right) = \frac{10.8}{0.1} = 108.0$ $(C_c)\left(\frac{D_{30}^2}{D_{60} \times D_{10}}\right) = \frac{4^2 = 16}{10.8 + 0.1 = 1.08} = 14.8$



ATTERBERG LIMITS

(LL) 22.3

(PL) 13.0

(PI) 9.3

SIEVE RESULTS

SIEVE SIZE	% FINER
3-in.	100
2-in.	100
1 1/2-in.	100
1-in.	92.0
3/4-in.	71.7
1/2-in.	60.3
3/8-in.	39.9
NO. 4	30.9
NO. 8	29.2
NO. 16	23.0
NO. 30	19.1
NO. 50	16.1
NO. 100	13.6
NO. 200	11.7

HYDROMETER RESULTS

PARTICLE DIA.	% FINER

SOIL CLASSIFICATION (ASTM D 2487): Poorly Graded Gravel w/ Silt

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

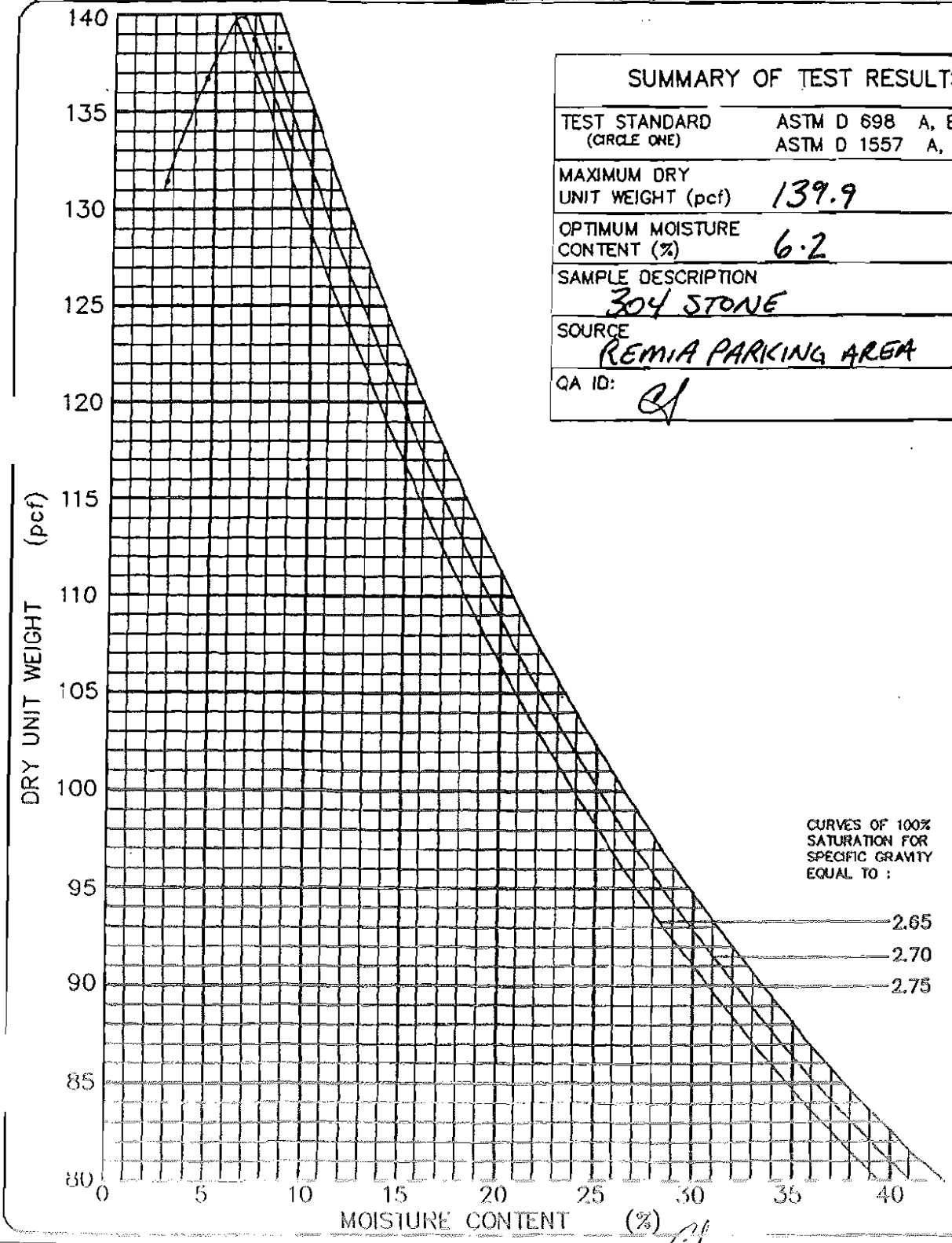
PROJECT NO: ~~CQ0400~~ CQ1029 TASK NO.: 04.2

DESCRIPTION: Phase II/EPLTS

DATE: 7 day Dec month 2000 year

MATERIAL TYPE: 304 STONE

SAMPLE NO.: EP-29



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, B, (C) ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	139.9
OPTIMUM MOISTURE CONTENT (%)	6.2
SAMPLE DESCRIPTION	304 STONE
SOURCE	REMIA PARKING AREA
QA ID:	

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

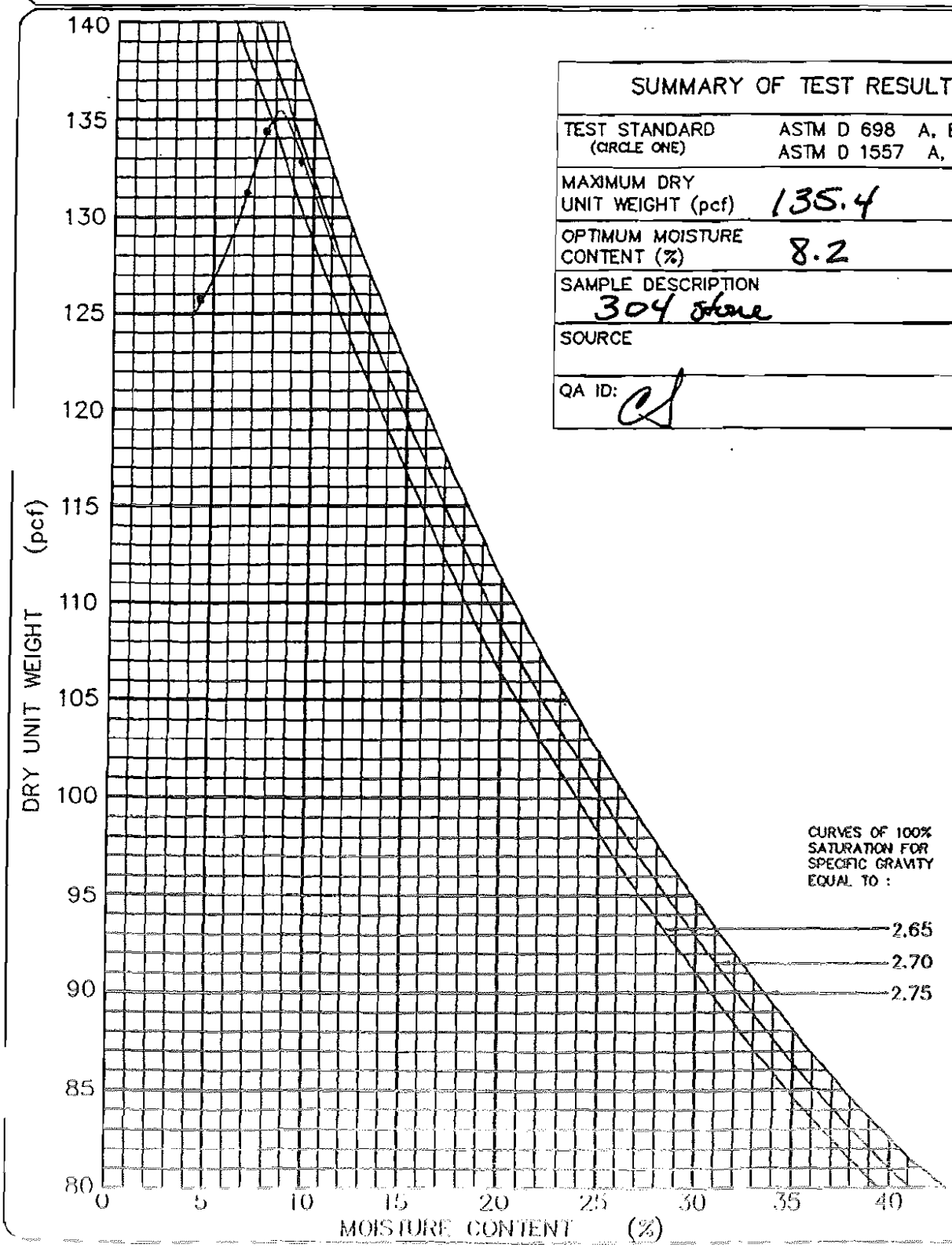
MOISTURE–DENSITY RELATIONSHIP

PROJECT: ON–SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ TASK NO.: 04

DESCRIPTION: EPLTS DATE: 8 day Dec month 2000 year

MATERIAL TYPE: 304 STONE SAMPLE NO.: EP-30



SUMMARY OF TEST RESULTS	
TEST STANDARD (CIRCLE ONE)	ASTM D 698 A, B, (C) ASTM D 1557 A, B, C
MAXIMUM DRY UNIT WEIGHT (pcf)	135.4
OPTIMUM MOISTURE CONTENT (%)	8.2
SAMPLE DESCRIPTION	304 stone
SOURCE	
QA ID:	

RIPRAP

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02271-002	REV: 1	DATE: 11-Aug-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Melissa Saffer DATE: 8-11-00

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
8	641-02271-002	1						X			Class C & D Rip Rap Data & Certs		X		02271	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52.5				
Tim Cherry	52.5				
Jim Jenkins	52.5				
Mike Godber	64				
Bob Knelp	52.5				
Scott Wheeler	52.5				
Bau Twenebogh	64				

RECEIVED AUG 15 2000 KB

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

RIPRAP TYPE C USED FOR PERMANENT STRUCTURES OKAY PER SPECS. RIPRAP TYPE D PER TONY SNIDER'S E-MAIL (ATTACHED) MAY NOT BE OKAY. PLEASE FORWARD TO DECIDE IF SUBMITTAL IS OK OR NOT.

RECEIVED BY: K Board DATE 8/17/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

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

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

ENTERED

NEW POINT STONE CO., INC.
992 S COUNTY ROAD 800 E
GREENSBURG, IN 47240
PHONE (812) 663-2021 FAX (812) 662-6088

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02271-002
Reviewed By: DKO
Date: 8/9/00

May 31, 2000

Staver Group
Fernald Jobsite
Phone 513-648-4118 Fax 513-648-4187
ATTN: Dave Opalka

RE: Fluor Daniel Fernald
Rip Rap Submittals

We submit the Following information with regard to above project:

1. SOURCE- The source of the Rip Rap is New Point Stone Co., Inc. 992 S County Road 800 E., Greensburg, IN 47240. This quarry is located in Decatur County in Southeastern Indiana just north of the Interstate 74 Exit no 143. The Rip Rap will be processed from ledges 1-5 as designated by the Indiana Department of Transportation. The New Point Quarry is designated as source #2536 by INDOT and is a Certified Aggregate Producer (Q952002)

2. RATING-Rip Rap materials from New Point Stone Co., Inc. have been tested and given an overall weighted score of 69. See "Off-Site borrow Materials Geothechnical Evaluation Report"(Parsons, 1996).

3. CERTIFICATION-Attached is certification that type C and type D Rip Rap meet gradation requirements of ITEM 601.07 of the Ohio DOT Specifications.

I hope that these submittals meet your approval.

Sincerely,

John R. Wanstrath

John R. (Randy) Wanstrath, Sec./Treas.
New Point Stone Co., Inc.

NEW POINT STONE CO., INC.

MATERIAL CERTIFICATION

Rip Rap Materials from New Point Stone Co., Inc., New Point Quarry have been tested and given and overall weighted score of 69. See "Off-Site Borrow Materials Geotechnical Evaluation Report"(Parsons, 1996). Table 6-1.

The Type C Rip Rap from New Point Stone Co., Inc. New Point Quarry meets the gradation requirements of ITEM 601-07 of the Ohio DOT Specifications.

May 31, 2000 _____

Ric Fullenkamp, INDOT Certified Aggregate Technician
New Point Stone Co., Inc.

NEW POINT STONE CO., INC.

MATERIAL CERTIFICATION

Rip Rap Materials from New Point Stone Co., Inc., New Point Quarry have been tested and given and overall weighted score of 69. See "Off-Site Borrow Materials Geotechnical Evaluation Report"(Parsons, 1996). Table 6-1.

The Type D Rip Rap from New Point Stone Co., Inc. New Point Quarry meets the gradation requirements of ITEM 601-07 of the Ohio DOT Specifications.

May 31, 2000 _____

Ric Fullenkamp, INDOT Certified Aggregate Technician
New Point Stone Co., Inc.

SOU.
FIELD OFFICE (3) Q6/11

SOURCE D

INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS
SUMMARY OF PRODUCTION QUALITY RESULTS

JUNE 2, 1999

SOURCE NEW POINT STONE COMPANY 2536 0952002 FIELD OFFICE
R.R.1 NEW POINT, IN. 47263

(PLEASE RETURN AFTER USE)

LAB NUMBER	DATE SAMPLED	SIZE NUMBER	REMARKS	BULK SP.G.	~~ABS~~ ~~RCT~~	BRI.	L.A. WEAR PCT	S.S. LOSS PCT	F.T. LOSS PCT	QUAL RTNG
99-7-0870-00518	01-19-99	8 STONE	LED 1 - 3	2.685	~~1.36~~		23.38		2.86*	A1
99-7-0870-00519	01-19-99	8 STONE	LED 1 - 5	2.643	~~1.97~~		28.70		11.18*	A1
99-7-0870-00520	01-19-99	53 STONE	LED 1 - 5	2.655	~~1.77~~		29.98		12.84*	D1
99-7-0870-00826	01-19-99	24 ST. SAND	LED 1 - 5	2.611	~~2.95~~				10.88*	B5

Why crossed out?
EBT
8-17-00

THIS IS A CATEGORY II SOURCE. SUBCATEGORY A. SOURCE INACTIVE DATE IS 04-07-99

FOR LEDGE QUALITY TEST RESULTS SEE SUMMARY LETTER DATED AUGUST 5, 1985.

SOURCE IS APPROVED TO SUPPLY AGGREGATES TO CONTRACTS SPECIFYING TYPE AP FROM LEDGES 1-3; EXCLUSIVELY. RE-TEST DATE IS 09-09-03.

* 25 CYCLES OF F.T. IN 3% NaCl SOLUTION.

#8 - 100% PASSING 1"
#53 - 100% PASSING 1½"

See attached E-mail from Terry Snider of Flower Terrell

CHIEF, DIVISION OF MATERIALS AND TESTS.

THIS REPORT IS NOT INTENDED TO BE USED FOR ADVERTISING.

MATERIAL TEST RESULTS

DATE: May 31, 2000
SOURCE: New Point Quarry Source #2536
LEDGES: 1-5

Test Performed-ASTM C127 Absorption

MATERIAL: ODOT Type D Rip Rap
INDOT Uniform Rip Rap

Absorption Tests are requirement for Type C Rip rap. KBT.

	A (DRY)	B (WET)
SUBSAMPLE 1 WEIGHT	7,322.5	7,341.1
SUBSAMPLE 2 WEIGHT	10,549.1	10,660.6
SUBSAMPLE 3 WEIGHT	4,341.5	4,357.2
SUBSAMPLE 4 WEIGHT	8,224.1	8,249.7
SUBSAMPLE 5 WEIGHT	7,971.5	7,991.0
SUBSAMPLE 6 WEIGHT	10,705.9	10,770.3
SUBSAMPLE 7 WEIGHT	6,485.1	6,504.6
TOTAL SAMPLE	55,599.7	55,874.5

ABSORPTION % = (B-A) / A X 100

$$\text{ABSORPTION } .494\ \% = \frac{55{,}874.5 - 55{,}599.7 \times 100}{55{,}599.7}$$

Ric Fullenkamp
INDOT Certified Aggregate Technician

NEW POINT STONE CO., INC. 992 S. COUNTY ROAD 800 E., GREENSBURG IN 47240

FAX

Date: 8-9-00

Number of pages including cover sheet: 2

To: STAVER GROUP

Attention: DAVE

Phone:

Fax phone: 513-648-4187

CC:

From: RANDY

Phone: 812-663-2021

Fax phone: 812-662-6088

REMARKS: ☐ Urgent ☒ For your review ☐ Reply ASAP ☐ Please comment

LAST TESTING DONE USING S.S. LOSS RESULTS - SWITCHED TO F-T 25 CYCLES NACl SOLUTION SINCE

RANDY

DMTE-5
SOURCE
FIELD OFFICE (3) Q3/3

INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF MATERIALS AND TESTS
SUMMARY OF PRODUCTION QUALITY RESULTS

APR 02 1993

MARCH 23, 1993

SOURCE NEW POINT STONE COMPANY 2536
R.R.1 NEW POINT, IN. 47263

LAB NUMBER	DATE SAMPLED	SIZE NUMBER	REMARKS	BULK SP.G.	BRI.	L.A. WEAR PCT	S.S. LOSS PCT	F.T. LOSS PCT	QUAL RTNG
92-7-1157-14987	12-09-92	8 STONE	LEDGES 1-5	2.673		27.44	8.78		A1
92-7-1157-14988	12-09-92	9 STONE	LEDGES 1-5	2.676		21.92	6.38		A2
92-7-1157-14989	12-09-92	11 STONE	LEDGES 1-5	2.677		23.22	2.61		A3
92-7-1157-15202	12-09-92	53 STONE	LEDGES 1-5	2.672		27.77	13.02		D1

THIS IS A CATEGORY II SOURCE. SOURCE INACTIVE DATE IS 03-09-94.

NEW POINT STONE

Rch

THIS REPORT IS NOT INTENDED
TO BE USED FOR ADVERTISING.

CHIEF, DIVISION OF MATERIALS AND TESTS.

002

GeoSyntec Consultants, Inc.

From: Snider, Anthony <Anthony.Snider@fernald.gov>
To: Kumthekar, Uday <Uday.Kumthekar@fernald.gov>; Wolinsky, Sam <Sam.Wolinsky@fernald.gov>; Vanarsdale, Chuck <Chuck.Vanarsdale@fernald.gov>; <KWASIB@GEOSYNTEC.COM>
Cc: Snider, Anthony <Anthony.Snider@fernald.gov>
Sent: Monday, August 14, 2000 2:18 PM
Subject: ODOT 601 RIPRAP TESTING

I talked to Kerry Goodyear with the Columbus office of ODOT (513-275-1343) on 8/7/00 regarding testing requirements for 601 stone (Riprap) supplied from quarries outside of the state of Ohio. Mr. Goodyear stated that aggregate material produced in other states must still go through the ODOT certification process for use on ODOT jobs.

All quarries that supply aggregate material for ODOT jobs must be tested in accordance with ODOT. Quarries must set aside a 26,000 ton pile for testing. The material must pass three consecutive tests performed by ODOT to be approved as a Class I (general use) supplier for ODOT jobs. ODOT repeats the testing quarterly to maintain certification.

Mr. Goodyear stated that the Indiana Department of Transportation creates alot of their own tests that are different from the test methods specified by ODOT. If testing is required for quarries not currently certified by the ODOT, Mr. Goodyear recommends Bowser-Morner in Dayton, Ohio [Jim Flecther 937-238-8805] as a good testing laboratory.

Tony Snider

RECEIVED
AUG 15 2000
KBT

COPY ATTACHED TO EPLTS Project 2011
Submittal No. 02271-002, Rev. 1 for
information only.

KBT
8-17-00

CONCRETE MATERIALS

SUPPLIER DOCUME SUBMITTAL

FDF PROJECT NO. 0111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-001	REV: 1	DATE: 18-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wiertz DATE: 5/18/00

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	641-03100-001	1						X			Concrete mix design		X		03100		X	
																	X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Jim Jenkins	52-5	MAY 19 2000			
Tom Escue	52-5				
Roy Cheup	52-5				
B. Scott Wheeler	52-5				
Kwasi Badu-Twenebeah	38				

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

5/22/00 See Comments

Need compressive strength test results 2, 7, and 28 days. Follow submittal requirements

RECEIVED BY: [signature] DATE 5/24/00

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

ORIGINAL

ENTERED

DESIGN DATA

MIAMI VALLEY READY MIX, INC.

HARRISON, OHIO

15-May-2000

Mix name: 4000 EXT A/E ID number: CSTAVER4000

Slump: 4 in Design W/C ratio: 0.380 Design strength: 4000 PSI CAF: 0.83

Type of Construction: Pavements and slabs.

Maximum coarse size: 3/4 in Minimum form width: NA

Minimum slab depth: 4in Minimum distance between rebars: NA

Concrete exposure is: SEVERE (Wet and freezing conditions and exposure to deicing chemicals.)

Type of concrete: (Air-entrained concrete) with 4 - 6 percent air content

Type of structure: Other than railings, curbs, sills, ornamental work and with more than 1 in. cover.

Concrete Environment: Structure wet and exposed to freezing and thawing.

CEMENT CONTENT DETAIL

(Type)	(Description)		
(Primary Cement)			
Cement Type 2	ESSROC CEM #2		
(Secondary cements)		% replacement	% added
Fly ash Class F	KOCH TR FLY ASH		12

DESIGN MIX COMPONENTS IN ONE CUBIC YARD

(Type)	(Name)	(Volume in ft³)	(Weight in lb)
Cement Type 2	ESSROC CEM #2	2.87	564
Fly ash Class F	KOCH TR FLY ASH	.51	80
Coarse Aggregate	ROSS GR 57	10.48	1791 ?
Fine Aggregate	ROSS SAND	7.6	1233 ?
Water		3.93	245
Air		1.62	
	Total volume:	27.00	Total wt: 3913 (145 #/c.y.

Absurd?

ADMIXTURE DOSES IN FLUID OUNCES

air entrainer	AIR MIX 200	3 fl oz
water reducer	EUCON MR	52 fl oz

Remarks:

Designed by: TWN

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03200-001
Reviewed By: DW
Date: 5/15/00

PROD #7284 Vol. 3

FDF P. CT NO: 20111	CONTRACT NO: FSC -	SUBMITTAL NO: 03100-008	REV: 1	DATE June 28,2000	E 1 OF 1

FROM: STAVER GROUP, Inc.

Ron Wood

SIGNATURE: Ron Wood

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

RECEIVED BY: Teresa Schulz DATE: 6-29-2000

			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
8	641-03100-008	1						X			Miami Valley Ready Mix Certification		X		03100	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Bob Kreip	525				
Scott Wheeler	525				
Kwasi Bam Twenebowah	38				

RECEIVED JUL 05 2000

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

WOULD HAVE HELPFUL TO ATTACH A COPY OF THE MIX DESIGN TO CERTIFICATION LETTER.

RECEIVED BY: [signature] DATE 7/6/00

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

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)

CFC - CERTIFIED FOR CONSTRUCTION

INF - INFORMATION/RECORD

DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)

A - Conforms to Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

MIAMI VALLEY READY MIX
Ready Mix Concrete
7466 New Haven Road • Harrison, Ohio 45030
(513) 738-1933 • Fax (513) 738-1935

June 6, 2000

Staver Group
1271 East 2nd Street
Franklin, Ohio

Re: Permanent Leachate Transmission System

Dave Opalka,

Per our conversation this letter is to confirm that the Staver mix design, submitted to Miami Valley Ready Mix and identified by Miami Valley as ID number CSTAVER4000.
Is the mix that will be delivered by Miami Valley Ready Mix for the Project identified as the Permanent Leachate Transmission System. A copy of the mix design is enclosed for your records.
If you have any further question or request please call.

Sincerely,

Thomas Norris
General Manager

Where is the copy?
KBT
7/6/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03100-008
Reviewed By: KBT
Date: 6/28/00

BATCHING DATA

MIAMI VALLEY READY MIX, INC.
HARRISON, OHIO

15-May-2000

Mix name: 4000 EXT A/E ID number: CSTAVER4000

Slump: 4 in Design W/C ratio: 0.380 Design strength: 4000 PSI

Type of Construction: Pavements and slabs.

Maximum coarse size: 3/4 in Minimum form width: NA

Minimum slab depth: 4 in Minimum distance between rebars: NA

Concrete exposure is: SEVERE (Wet and freezing conditions and exposure to deicing chemicals.)

Type of concrete: (Air-entrained concrete) with 4 - 6 percent air content

Type of structure: Other than railings, curbs, sills, ornamental work and with more than 1 in. cover.

Concrete Environment: Structure wet and exposed to freezing and thawing.

MIX COMPONENTS IN 1 CUBIC YARD

(Item)	(Description)	(Scale Weight)
Cement Type 2	ESSROC CEM #2	564 lb
Fly ash Class F	KOCH TR FLY ASH	80 lb
Coarse Aggregate	ROSS GR 57	1854 lb 1900
Fine Aggregate	ROSS SAND	1288 lb 1250
Adjusted Water Weight		128 lb
	Total batch weight	3915 lb

EXPLAIN THIS!

ADMIXTURE DOSES IN FLUID OUNCES

air entrainer	AIR MIX 200	3 fl oz
water reducer	EUCON MR	52 fl oz

CALCULATIONS ARE NOT DETAILED ENOUGH TO FIGURE OUT MIX. ⊗

LAB T

PROD #7284 Vol. 3

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 64	SUBMITTAL NO: 03100-008	REV: 0	DATE 20-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

Ron Wood

SIGNATURE: Ron Wood

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

RECEIVED BY: Rita Smith DATE: 6/20/00

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
8	641-03100-008	0						X			Miami Valley Ready Mix Material Certification		X		03100		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Jim Chung	525				
Sam Jenkins	525				
Mike Gadber	525				
Rob Koeip	525				
Scott Wheeler	525				
Kavasi Ban-Tuenebach	64				

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

Missing certification for the concrete mix.

RECEIVED

JUN 20 2000

COPY

RECEIVED BY: [signature] DATE 6/20/00

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

ORIGINAL

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

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

ISG RESOURCES, INC.

March 1, 2000

This is to certify that the Class "F" fly ash from Miami Fort in North Bend, Ohio, marketed by ISG Resources meets all the requirements of ASTM C-618, and the specifications of the state of Ohio. Source code for Miami Fort is 6640-01.

Alan G. Falls
Manager, Great Lakes Area

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03100-008
Reviewed By: PW
Date: 6/20/00

OK.
LAT
6/26/00

An INDUSTRIAL SERVICES GROUP Company
North Central Region, 4043 N. Euclid Ave., Bay City, MI 48706
Phone: (517) 671-1500 Fax: (517) 671-1504

Essroc
Italcementi Group

From: May 18 2000
To: May 24 2000

Mill Test Report
Speed Indiana
Type I / II Cement

Miami Valley Ready Mix

Attention: Attn: Tom Norris

Description	Test Result		ASTM C 150 Specifications	ASTM Method
SiO2	20.8		20.0 Minimum	C 114
Al2O3	4.6		6.0 Maximum	C 114
Fe2O3	3.4		6.0 Maximum	C 114
CaO	63.7			C 114
MgO	2.5		6.0 Maximum	C 114
SO3	2.5		3.0 Maximum*	C 114
C3S	59			C 150
C3A	6.3			C 150
Total Alkalis	0.50		0.6 Maximum	C 150
Autoclave Expansion (%	0.03		0.8 Maximum	C 151
Time of Set (Vicat)				C 191
Initial Set (Minutes)	209		45 Minimum	
Final Set (Minutes)			375 Maximum	
Compressive Strength	PSI	MPa		C 109
1 Day	1966	13.6		
7 Day			2800 PSI / 19.3 MPa Minimum	
28 Day				
Air Content (%)	8.7		12 Maximum	C 185
Fineness, Blaine (m2/kg	373			C 204
Loss on Ignition	0.9		3.0 Maximum	C 114
Insoluble Residue			0.75 Maximum	C 114

* When C3A is less than 8%

This is to certify that Portland Cement Type I / II meets the requirements of ASTM C 150 Standard Specification for Portland Cement.

Physical tests by: Paul Ehinger
Billy Mullins

Chemical tests by: Mike Landers
Dave Whalen

Kelly L. Farmer
Plant Chemist

OK
1087
6/26/00

BOWSER-MORNER, INC.

CORPORATE: 4518 Taylorsville Road • P. O. Box 51 • Dayton, Ohio 45401 • 937/236-8805

LABORATORY REPORT

Report To: Martin Marietta Aggregates
Attn: Mr. Jim Martin
16 State Route 126
Loveland, OH 45140

Date May 17, 2000
Report No. 007718
W.O. No. 118852
No. of Pages 9

Report On: Physical Testing of Coarse and Fine Aggregate; 2000 ASTM C33, ODOT 703 Analysis. Plant No. 457, Ross, Ohio

On January 17, 2000, the client submitted three natural aggregate samples for testing from the Ross, Ohio plant. Testing was performed as specified by P.O. No. 457-13024R and in accordance with ASTM C33 and ODOT 703 specifications. Other index properties, i.e. specific gravity, absorption, etc., were also determined.

The materials meet ASTM C33 and ODOT 703 specifications. Laboratory results are detailed on the attached data sheets. In the opinion of this laboratory, the materials are of satisfactory quality.

Should you have any questions, or if I may be of further service, please contact me at (937) 236-8805 extension 307.

Respectfully submitted,

BOWSER-MORNER, INC.

Robert A. Stadler, P.E.
Manager, Construction Materials
and Geotechnical Laboratories

RAS/jaf
007718
1-Client
1-File

6/26/00

All Reports Remain The Confidential Property Of BOWSER-MORNER, Inc. No Publication Or Distribution Of Reports May Be Made Without Our Express Written Consent, Except As Authorized By Contract. Results Contained In This Report Are Reflective Only Of The Items Calibrated or Tested. Unless Otherwise Agreed, Samples Or Specimens Will Be Discarded Or Returned At Bowser-Morner's Discretion.

Martin Marietta Aggregates
Plant No. 457, Ross, Ohio

TABLE I
Sieve Analysis and Decantation

Sample ID:	No. 57 Gravel		No. 8 Gravel		Natural Sand			
Sieve Size	Percent Passing	ASTM C33 Spec.	Percent Passing	ASTM C33 Spec.	Percent Passing	ASTM C33 Spec.	ODOT 703.02 Spec.	ODOT 703.05 Spec.
1 1/2"	100	100 ✓						
1"	100	95-100 ✓						
3/4"	73	---						
1/2"	31	25-60 ✓	100	100				
3/8"	10	---	98	85-100	100	100	100	100
#4	1	0-10 ✓	16	10-30	99	95-100 ✓	95-100	90-100
#8	1	0-5 ✓	1	0-10	95	80-100 ✓	70-100	65-100
#16			1	0-5	74	50-85 ✓	38-80	40-85
#30					46	25-60 ✓	18-60	20-60
#50					12	10-30 ✓	5-30	7-40
#100					1	2-10 ✓	1-10	0-20
#200					0.3	---	0-5	0-10
#200 Decant[1, 2], %:	0.1	1.0 Max.[3]	0.1	1.0 Max.[3]	0.1	3.0 Max.[4]	---[1]	---
Fineness Modulus:	---	---	---	---	2.73	2.3-3.1	---	---

OK
KB

[1] *Amount finer than the No. 200 sieve. ODOT 703.02 - The percentage of material finer than the No. 200 sieve in the aggregate portion of the concrete mix shall not exceed the following: Where the finer than No. 200 sieve material from the course aggregate consists of the dust of fracture essentially free from clay and shale: (1)-Superstructure 3.4 (% by weight) (2)-All Other Concrete 3.8 (% by weight). Where the finer than No. 200 sieve material from the coarse aggregate may consist of or include material other than dust of fracture (1)-Superstructure 2.0 (% by weight) (2)-All Other Concrete 2.2 (% by weight).*

[2] *ODOT 703.05 coarse aggregate specification 3.0% Max.*

[3] *This limit is 1.5% for coarse aggregate essentially free of clay or shale. See footnote D, ASTM C33, Table 3.*

[4] *This limit applies to fine aggregate used in concrete subject to abrasion. See footnote A, ASTM C33, Table 1.*

FROM : MIAMI VALLEY READY MIX FAX NO. : 5137381935 Jun. 15 2000 07:39AM P5

Martin Marietta Aggregates

Plant No. 457, Ross, Ohio

TABLE II

ASTM C33, ODOT 703 - Deleterious Substances Summary

	Gravel		Specification, % Max.					Specification, % Max.		
			ASTM	ODOT	703.02	ODOT		ASTM	ODOT	ODOT
	No. 57	No. 8	C33	Super-structure	All Other Concrete	703.05	Sand	C33	703.02	703.05
Los Angeles Abrasion, %:	30.5	22.9	50	40	40	40	n/a	---	---	---
Five Cycle Sodium Sulfate Soundness, %:	5.8	5.3	12	12	12	12	3.2	10	10	15
Clay Lumps & Friable Particles, %:	0.06	0.01	2.0	0.25	0.25	0.25	0.0	3.0	0.5	0.5
Lightweight Chert, (<2.40Gs), %:	0.7	1.6	3.0	---	---	---	n/a	---	---	---
Sum of Clay Lumps, Friable Particles and Lightweight Chert, (<2.40Gs), %:	0.76	1.61	3.0	---	---	---	n/a	---	---	---
Coal & Lignite, %:	0.0	0.0	0.5	0.25	1.0	0.25	0.0	0.5	---	---
Organic Impurities:	n/a	n/a	---	---	---	---	0	3	---	---
Rodded Unit Weight, pcf:	100.7	100.0	---	---	---	---	108.2	---	---	---
Bulk Dry Specific Gravity:	2.589	2.581	---	---	---	---	2.606	---	---	---
Bulk SSD Specific Gravity:	2.646	2.638	---	---	---	---	2.648	---	---	---
Apparent Specific Gravity:	2.744	2.739	---	---	---	---	2.719	---	---	---
Absorption, %:	2.2	2.2	---	---	---	---	1.6	---	---	---
Percent Fractured, %:	99.0	97.0	---	---	---	40 Min.	n/a	---	---	---
Water Soluble Sulfur, %:	n/a	n/a	---	---	---	---	<0.01	---	0.3	---
Water Soluble Chlorides, %:	<0.01	<0.01	---	---	---	---	<0.01	---	---	---
Soft Particles, %:	0.0	0.0	---	2.0	3.0	3.0	n/a	---	---	---
Flat & Elongated (5:1), %:	0.6	0.0	---	15	15	15	n/a	---	---	---
Shale and Shaley										
ODOT 703.02, %:	0.1	0.2	---	0.5	1.0	---	n/a	---	---	---
ODOT 703.05, %:	0.1	0.2	---	---	---	---	n/a	---	---	---
Chert Loss in Soundness, %:	0.0	0.0	---	0.5	1.0	---	n/a	---	---	---
Sum of Shale (703.05) and Chert Loss in Soundness, %:	0.1	0.2	---	---	---	2.5	n/a	---	---	---

Note: Under 703.02, Aggregate for Portland Cement Concrete, shaly is defined as particles containing > 50% shale. Under 703.05, Aggregate for Asphalt Concrete, shaly is defined as particles containing any shale or stringers of shale, but not shale stains.

No. 57 Gravel

A. Decant and Gradation (ASTM C117, C136)

Sieve Size		Percent Passing	ASTM C33 Specification, %
37.5mm	(1 1/2")	100	100
25.0mm	(1")	100	95-100
19.0mm	(3/4")	73	---
12.5mm	(1/2")	31	25-60
9.5mm	(3/8")	10	---
4.75mm	(#4)	1	0-10
2.36mm	(#8)	1	0-5
0.075mm	(No. 200) Decant, %	0.1	1.0 Max.

B. Los Angeles Abrasion (ASTM C131)

Grading	Percent Loss	ASTM C33 Specification, %	ODOT 703.02, .05 Specification, %
B	30.5	50.0 Max.	40.0 Max.

C. Clay Lumps and Friable Particles (ASTM C142)

Size Fraction		Percent Loss	ASTM C33 Specification, %	ODOT 703.02, .05 Specification, %
25.0mm to 19.0mm	(1" to 3/4")	0.01		
19.0mm to 12.5mm	(3/4" to 1/2")	0.02		
12.5mm to 9.5mm	(1/2" to 3/8")	0.02		
9.5mm to 4.75mm	(3/8" to #4)	0.01		
Total		0.06	2.0 Max.	0.25 Max.

D. Five Cycle Sodium Sulfate Soundness (ASTM C88)

Size Fraction		Percent Loss	Gradation Factor	Weighted Percent Loss
25.0mm to 19.0mm	(1" to 3/4")	6.93	0.27	1.87
19.0mm to 12.5mm	(3/4" to 1/2")	4.94	0.42	2.07
12.5mm to 9.5mm	(1/2" to 3/8")	4.94	0.21	1.04
9.5mm to 4.75mm	(3/8" to #4)	8.48	0.10	0.85
			Total	5.8

Specifications, %	
ASTM C33	12.0 Max.
ODOT 703.02	12.0 Max.
ODOT 703.05	12.0 Max.

E. Visual Deleterious Examination. No other categories were observed visually. *Percentages as percent of* size fraction, unweighted for gradation.

Size Fraction		Lt. Wt. Chert	Coal & Lignite	Soft Pieces	Flat & Elongated (5:1)	Other*	Shale & Shaley 703.02	Shale & Shaley 703.05
0mm to 19.0mm	(1" to 3/4")	0.4	0.0	0.0	0.9	0.0	0.0	0.0
0mm to 12.5mm	(3/4" to 1/2")	0.8	0.0	0.0	0.4	0.1	0.0	0.0
.5mm to 9.5mm	(1/2" to 3/8")	1.1	0.0	0.0	0.8	0.2	0.3	0.3
.5mm to 4.75mm	(3/8" to #4)	1.4	0.0	0.0	n/a	0.3	0.3	0.3

**Unsound Chert*

F. Deleterious Material Corrected for As-Received Gradation (ASTM C33, ODOT 703)

Size Fraction		Clay Lumps & Friable	Lt. Wt. Chert	Sum of Preceding	Coal & Lignite	Soft Pieces	Flat & Elongated (5:1)	Other*	Shale & Shaley 703.02	Shale & Shaley 703.05
0mm to 19.0mm	(1" to 3/4")	0.01	0.1	0.11	0.0	0.0	0.2	0.0	0.0	0.0
0mm to 12.5mm	(3/4" to 1/2")	0.02	0.3	0.32	0.0	0.0	0.2	0.0	0.0	0.0
5mm to 9.5mm	(1/2" to 3/8")	0.02	0.2	0.22	0.0	0.0	0.2	0.0	0.1	0.1
5mm to 4.75mm	(3/8" to #4)	0.01	0.1	0.11	0.0	0.0	n/a	0.0	0.0	0.0
Total		0.06	0.7	0.76	0.0	0.0	0.6	0.0	0.1	0.1
... % Allowed:										
TM C33		2.0	3.0	3.0	0.5	---	---	---	---	---
OT 703.02 (Superstructure)		0.25	---	---	0.25	2.0	15.0	0.5	0.5	---
OT 703.02 (All Other Concrete)		0.25	---	---	1.0	3.0	15.0	1.0	1.0	---
OT 703.05		0.25	---	---	1.0	3.0	15.0	---	---	2.5

**Unsound Chert*

G. Rodded Unit Weight (ASTM C29)

Unit Weight, pcf
100.7

H. Specific Gravity and Absorption (ASTM C127)

Bulk Dry	2.589
Bulk SSD	2.646
Apparent	2.744
Absorption, %	2.2

I. Fractured (ODOT S1021)

Percent Fractured (Crushed)	99.0
ODOT 703.05 Specification, %	40.0 Min.

2.) No. 8 Gravel

A. Decant and Gradation (ASTM C117, C136)

Sieve Size		Percent Passing	ASTM C33 Specification, %
12.5mm	(1/2")	100	100
9.5mm	(3/8")	98	85-100
4.75mm	(#4)	16	10-30
2.36mm	(#8)	1	0-10
1.18mm	(#16)	1	0-5
0.075mm	(No. 200) Decant, %	0.1	1.0 Max.

B. Los Angeles Abrasion (ASTM C131)

Grading	Percent Loss	ASTM C33 Specification, %	ODOT 703.02, .05 Specification, %
C	22.9	50.0 Max.	40.0 Max.

C. Clay Lumps and Friable Particles (ASTM C142)

Size Fraction		Percent Loss	ASTM C33 Specification, %	ODOT 703.02, .05 Specification, %
12.5mm to 9.5mm	(1/2" to 3/8")	0.00		
9.5mm to 4.75mm	(3/8" to #4)	0.01		
Total		0.01	2.0 Max.	0.25 Max.

D. Five Cycle Sodium Sulfate Soundness (ASTM C88)

Size Fraction		Percent Loss	Gradation Factor	Weighted Percent Loss
9.5mm to 4.75mm	(3/8" to #4)	5.72	0.84	4.80
4.75mm to 2.36mm	(#4 to #8)	3.30	0.16	0.53
			Total	5.3

Specifications, %	
ASTM C33	12.0 Max.
ODOT 703.02	12.0 Max.
ODOT 703.05	12.0 Max.

E. Visual Deleterious Examination. No other categories were observed visually. Percentages as percent of size fraction, unweighted for gradation.

Size Fraction		Lt. Wt. Chert	Coal & Lignite	Soft Pieces	Flat & Elongated (5:1)	Other*	Shale & Shaley 703.02	Shale & Shaley 703.05
.5mm to 9.5mm	(1/2" to 3/8")	2.5	0.0	0.0	0.0	0.4	0.0	0.0
.5mm to 4.75mm	(3/8" to #4)	1.9	0.0	0.0	n/a	0.0	0.3	0.3

*Unsound Chert

F. Deleterious Material Corrected for As-Received Gradation (ASTM C33, ODOT 703)

Size Fraction		Clay Lumps & Friable	Lt. Wt. Chert	Sum of Preceding	Coal & Lignite	Soft Pieces	Flat & Elongated (5:1)	Other*	Shale & Shaley 703.02	Shale & Shaley 703.05
.5mm to 9.5mm	(1/2" to 3/8")	0.00	0.1	0.10	0.0	0.0	0.0	0.0	0.0	0.0
.5mm to 4.75mm	(3/8" to #4)	0.01	1.5	1.51	0.0	0.0	n/a	0.0	0.2	0.2
Total		0.01	1.6	1.61	0.0	0.0	0.0	0.0	0.2	0.2
aximum % Allowed:										
STM C33		2.0	3.0	3.0	0.5	---	---	---	---	---
DOT 703.02 (Superstructure)		0.25	---	---	0.25	2.0	15.0	0.5	0.5	---
3.02 (All Other Concrete)		0.25	---	---	1.0	3.0	15.0	1.0	1.0	---
,03.05		0.25	---	---	1.0	3.0	15.0	---	---	2.5

*Unsound Chert

G. Rodded Unit Weight (ASTM C29)

Unit Weight, pcf
100.0

H. Specific Gravity and Absorption (ASTM C127)

Bulk Dry	2.581
Bulk SSD	2.638
Apparent	2.739
Absorption, %	2.2

I. Fractured (ODOT S1021)

Percent Fractured (Crushed)	97.7
ODOT 703.05 Specification, %	40.0 Min.

).) Natural Sand

A. Gradation and Decantation (ASTM C136, C117)

Size Fraction		Percent Passing	ASTM C33 Specification, %	ODOT 703.01, .02 Specification, %	ODOT 703.05 Specification, %
9.5mm	(3/8")	100	100	100	100
4.75mm	(#4)	99	95-100	95-100	90-100
2.36mm	(#8)	95	80-100	70-100	65-100
1.18mm	(#16)	74	50-85	38-80	40-85
0.600mm	(#30)	46	25-60	18-60	20-60
0.300mm	(#50)	12	10-30	5-30	7-40
0.150mm	(#100)	1	2-10	1-10	0-20
0.075mm	(#200)	0.3	---	0-5	0-10
0.075mm	(#200) Decant	0.1	3.0 Max.	*	---
Fineness Modulus		2.73	2.3 to 3.1	---	---

'.02: The percentage of material finer than the 75-µm (No. 200) sieve in the aggregate portion of the concrete mix shall exceed 2.0% for superstructure or 2.2% for all other concrete.

B. Five Cycle Sodium Sulfate Soundness (ASTM C88). Corrected for As-Received Gradation.

Size Fraction		Percent Loss	Gradation Factor	Weighted Percent Loss
4.75mm to 2.36mm	(#4 to #8)	5.00	0.05	0.25
2.36mm to 1.18mm	(#8 to #16)	4.80	0.21	1.01
1.18mm to 0.600mm	(#16 to #30)	2.30	0.28	0.64
0.600mm to 0.300mm	(#30 to #50)	3.80	0.34	1.29
			Total	3.2

Specifications, %	
ASTM C33	10.0 Max.
ODOT 703.02	10.0 Max.
ODOT 703.05	15.0 Max.

FDF PRO T NO: 20111	CONTRACT NO: FSC - 6	SUBMITTAL NO: 03100-009	REV: 1	08-Dec-00	PROD #7284 Vol. 3 PAGE 1 OF 1

FROM: T. STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Sarrett DATE: 12/11/00

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
8	641-03100-009	1						X			Trial Batch Concrete Cyl.		X		03100	X		
											Breaks: 28 day.*							
											*Sample taken and data collected							
											by Geo-Syntec.							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Rob Kneip	525				
Scott Wheeler	525				
Kwasi Bau Twereboah	38				

RECEIVED DEC 12 2000

NO COMMENTS: X

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

RECEIVED BY: [signature] DATE 12/12/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

RECEIVED DEC 8 2000 ROD #72 No. 3

ATC Engineering Services of Ohio L.P.
11121 Canal Road
Cincinnati, Ohio 45241
Office (513) 771-2112
Fax (513) 782-6908

REPORT OF CONCRETE COMPRESSION TESTS

TESTED FOR: Mr. Ronald Wood
Staver Group, Inc.
1231 East 2nd Street
Franklin, Ohio 45005

PROJECT: Leachate Transmission System
FFC 641
Fernald, Ohio

DATE: June 7, 2000
REPORT NO.: --
ATC FILE NO.: 72.17837.0005

FIELD DATA

LOCATION:	Test Cylinders		
DATE PLACED:	June 7, 2000	**PLANT:**	--
TIME:	--	**DELIVERY TICKET NO.:**	--
SLUMP (in): (ASTM C-143)	--	**TRUCK NUMBER:**	--
AIR CONTENT %: (ASTM C-231, ASTM C-173)	--	**MIX PROPORTIONS (SSD):**	--
AIR TEMP.(°F):	--	**CEMENT:**	--
CONCRETE TEMP.: (ASTM C-1064)	--	**WATER:**	--
DATE RECEIVED:	June 7, 2000	**FINE AGGREGATE:**	--
FIELD DATA SUBMITTED BY:	Client	**COARSE AGGREGATE:**	--
MIX DATA SUBMITTED BY:	--		

COMPRESSION TEST RESULTS (Nominal Cylinder Size 6" 12")

LAB NO.	SET NO.	TYPE CURING	CYL. WT.*	DATE TESTED	AGE, DAYS	MAXIMUM LOAD	COMPRESSIVE STRENGTH, PSI - ASTM C-39
17837-5	2A	Lab	28.4	06/09/00	2	64,100	2,270
17837-5	2B	Lab	28.6	06/14/00	7	103,340	3,660
17837-5	2C	Lab	28.6	07/05/00	28	140,820	4,980
17837-5	2D	Lab	28.2	07/05/00	28	142,160	5,030
SPECIFICATIONS					28		4,000

REMARKS: The test specimens represented here were fabricated by others. All listed information was supplied by others, except for the dates received and tested, and the compressive strengths. Tested at 8:30 a.m. on June 9, 2000.

CYLINDERS MADE BY: ATC X OTHERS

TEST RESULTS DO COMPLY WITH APPLICABLE SPECIFICATIONS

DIAMETER: 6.00 Inches CROSS SECTIONAL AREA: 28.27 Inches

FRACTURE:

CYLINDER WEIGHT ESTIMATED TO THE NEAREST 1/10 POUND, ACCURATE TO 1/4 POUND

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-CS100-029
Reviewed By: [illegible]
Date: 12/9/00

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-007	REV: 1	DATE 23-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wintz DATE: 6/26/00

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
8	641-03100-007	1						X			Hot Weather Concreteing Plan		X		03100	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Paul Cheep	525				
B. Scott Wheeler	525				
Kurt Ben Tweneboah	64				

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

Eucobar product info attached

RECEIVED BY: MW Gifi DATE 6/28/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

ENTERED

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03100-007
Reviewed By: DW
Date: 6/23/00

Hot Weather Concreting Plan

Reference ACI 305R-91

This plan identifies methods and practices necessary to place concrete during "Hot Weather" conditions. The environmental conditions constituting " Hot Weather" and the precautionary measures and practices contained in this plan are as recommended in ACI305R. This plan will ensure quality concrete is produced in greater than normal weather conditions. This plan will be followed as much as site conditions will allow.
For the purpose of defining hot weather, for concreting purposes, several factors must be taken into consideration:

1. High ambient and concrete temperature
2. Low relative humidity
3. Wind velocity
4. Solar radiation

The Staver Group will utilize several methods in order to mitigate the effects of the above conditions.

1. Concrete pours will be scheduled with forecast high temperatures as a consideration and every attempt will be made to place and finish concrete before the "heat of the day."
2. All necessary equipment for placing and finishing the concrete will be ready and operationally checked out before the concrete arrives. Pumping equipment will be utilized to place concrete in a timely manner to avoid excessive placement delay.
3. All pre-pour activities and inspections will be completed before the concrete arrives. Fogging of reinforcing steel, subgrade surfaces and forms will occur before concrete placement to reduce heat.
4. An adequate number of experienced workers will be utilized to place concrete in an expedient manner.
5. Concrete temperature will be checked upon arrival at the place of discharge and any concrete with a temperature over 90 degrees F will be rejected.
6. No concrete will be placed that has been batched for over 90 minutes,or if the revolution counter on the mixer is over 300.
7. When periods of excessively low relative humidity are experienced *fogging* in the area of the pour will be accomplished using a pressure washer and misting attachment.
8. Eucobar, an approved surface evaporation retarder will be used to minimize the effects of plastic shrinkage cracking and to assist finishing of flat-work. Application rate will vary depending on concrete texture and weather conditions.
9. Approved admixtures will be used by the batch plant to ensure that concrete of the specified slump is delivered and maintained during the placing operation.

ECDC CONTROL
COPY NO. 76896

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 6/28/00

10. After finishing operations are completed, one or more of the curing methods described in ACI305R Section 4.4 will be selected and implemented as site conditions dictate The two main cure methods utilized by STAVER will be the following:
    A. Moist-curing of walls using burlap soaked with water
    B. Liquid membrane curing of slabs per manufacture recommendations

PRODUCT DATABASE
HOME
now browsing:
The Euclid Chemical Company
CATEGORY INDEX | SECTION INDEX

12. MISCELLANEOUS: SURFACE TREATMENTS, CLEANERS & TOOLS - RETARDERS
viewing document: **TECH.DATA SHEET (English)** related documents: **(Francais) | ENGR.SPEC | MSDS**

EUCOBAR

EVAPORATION RETARDANT

EUCOBAR is designed to be used as an evaporation retardant on concrete flatwork of all types. When sprayed over fresh concrete, EUCOBAR forms a thin, continuous film which prevents rapid moisture loss from the concrete surface. It is easy to use requiring only the addition of water before spray application. EUCOBAR is especially effective when concreting operations must be performed in direct sun, wind, high temperatures, or low relative humidity.

Provided by M.W. Griffin

PRIMARY APPLICATIONS

- Floors
- Pavements
- Plain concrete toppings
- Dry shake floors including all SURFLEX and EUCO-PLATE formulations
- Specialty iron toppings including EUCO-TOP
- Parking decks and ramps

FEATURES / BENEFITS

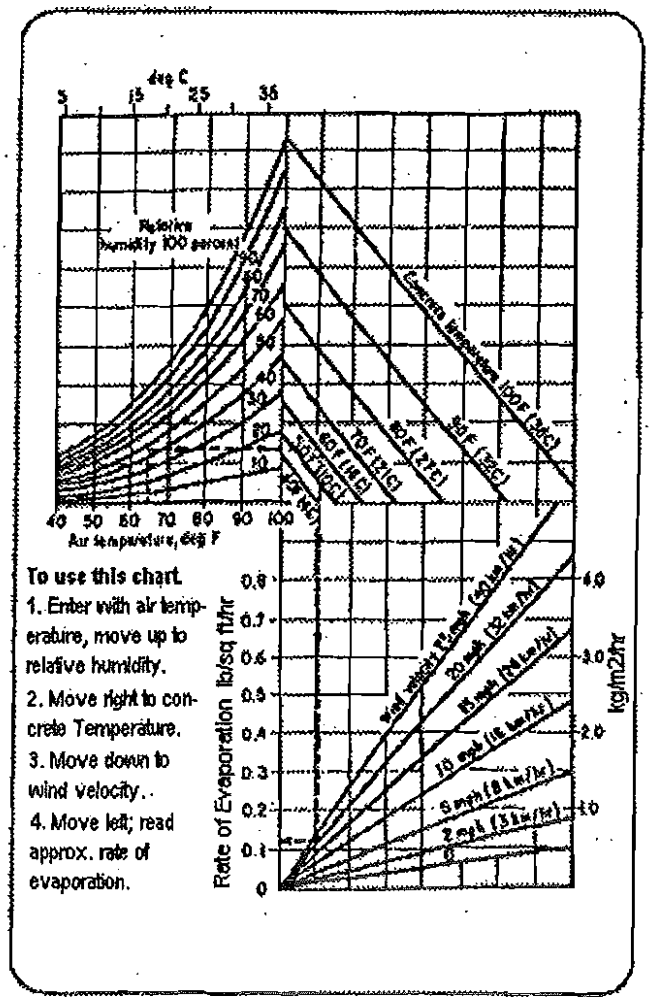
- Holds in surface moisture on concrete floors, slabs, and pavements
- Helps prevent plastic shrinkage cracking
- Easy and economical to use
- Helps eliminate crusting caused by loss of surface moisture
- Useful as a finishing aid during troweling operations
- Water based for total compatibility with fresh concrete
- Excellent for both interior and exterior flatwork
- Will not effect adhesion of curing compound or other floor treatments

PACKAGING

EUCOBAR is packaged in 55 gal (208 liter) drums, 5 gal (18.9 liter) pails and 6/1 gal (3.8 liter) units per case.

TECHNICAL INFORMATION

Plastic shrinkage cracking is a strong possibility when the rate of evaporation exceeds 0.2 lb/ft²/hr (1.0 kg/m²/hr). Evaporation rate is a function of relative humidity, concrete temperature, air temperature and wind velocity. The chart below, which is fig. 2.1.5 of ACI 305, Hot Weather Concreting, is useful in determining the evaporation rate under a given set of jobsite conditions. Use EUCOBAR when the above limit is exceeded.
EUCOBAR is a water based polymer concentrate that is readily dilutable in water. Shelf life is 2 years in original, unopened package.
Appearance-
EUCOBAR is a free flowing pink liquid designed to be mixed with water. The use of EUCOBAR will not affect the color of concrete.



This product meets V.O.C. contents in accordance to EPA 40 CFR Part 59 Table I Subpart D for Floor Coatings with a maximum V.O.C. content of 400 g/l.

V.O.C....39 g/l

COVERAGE

Dilution Rate: 9:1 (water:EUCOBAR)
EUCOBAR (after dilution) will cover approximately 200-400 ft²/gal (5-10 m²/liter). Coverage will vary depending on concrete texture and wind conditions. For estimating purposes, 1 gal (3.8 liter) of EUCOBAR concentrate will treat 2000-4000 ft² (186-372 m²) of concrete surface area, but is highly

dependent upon ambient conditions.

DIRECTIONS FOR USE

SURFACE PREPARATION EUCOBAR is applied directly to the surface of fresh concrete. No surface preparation is necessary.

MIXING Determine capacity of sprayer and divide by 10. Add this amount of EUCOBAR to the sprayer canister followed by 9 times that amount of water. For example, if 1 quart (0.95 liter) of EUCOBAR is added, dilute with 9 quarts (8.5 liter) of water. Mix or shake until thoroughly blended.
EUCOBAR is supplied as a concentrate and must be diluted with water at a 9:1 (water:EUCOBAR) ratio.

PLACEMENT Apply using a tank type, hand pump sprayer capable of spraying in a fine mist. Use a slotted tip for the best spray. Spray EUCOBAR over the fresh concrete surface as soon as possible after bullfloating. A pink, translucent sheen will appear as the surface is treated. On extreme drying conditions, additional applications may be given as needed. When used on floors with dry shake hardener applications, EUCOBAR may be used on the fresh concrete as well as between each shake application.

Curing & Sealing- Proper curing procedures are important to ensure the durability and quality of concrete. To prevent surface cracking, cure flatwork with a high solids curing compound, such as SUPER AQUA-CURE VOX or SUPER REZ-SEAL.
Curing compound must be ordered separately.

CLEAN-UP

Clean spray equipment with soap and water.

PRECAUTIONS / LIMITATIONS

- Use with proper dilution rate.
- Do not use as a curing compound.
- Apply only as a fine spray.
- Do not allow to freeze.

Form Eucobar-9.99

The Euclid Chemical Company
HOME | PRODUCTS | U.S. & CANADA | COMPANY INFO | CONTACT
19218 Redwood Road Cleveland OH 44110 TF: 800-321-7628 Fax: 216-531-9596

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SUPPLIER DOCU T SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-008 10	REV: 0	02-Oct-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Melissa Coffey DATE: 10-2-00

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
3	641-03100-008 10	0						X			Cold Weather Concreting Plan		X		03100	X		
	MC 10-2-00																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Sherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Kreip	52-5				
Brian Wheeler	52-5				
Grasystec	38				

RECEIVED OCT 04 2000

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

RECEIVED BY: [signature] DATE 10/9/00
(SIGN/DATE AND RETURN ACCEPTED TO ECDC, MS 52-7)

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
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ORIGINAL

THE STAVER GROUP INC.
COLD WEATHER CONCRETING PLAN
REFERENCE ACI 306R-88

The Staver Group will continue to provide the Enhanced Permanent Leachate Systems Project with Quality concrete during periods defined by ACI as cold weather. Cold Weather as defined by ACI 306R is "a period when for more than 3 consecutive days the following conditions exist: 1) the average daily temperature is less than 40 deg. F and 2) the air temperature is not greater than 50 deg. F for more than one-half of any 24 hour period.

Preparation before placement of concrete will ensure that snow and ice will be removed from any formwork, the subgrade is not frozen, and that the temperature of surfaces in contact with the concrete are above freezing. Subgrade must be insulated as required by ACI 306R-88.

Miami Valley Concrete recommends the use of a 1% Non-Chloride Accelerating Water Reducing Admixture for use when the ambient temperature falls below 50 deg. F. (See attached product data and the MSDS for Euclid Chemical's Accelguard ® 80 .) The recommended placement temperatures for concrete by section size is given in Table 1.1

Table 1.1 Minimum Placement Temperatures by Section Size

Section < 12 in.	Section 12 to 36 in.	Section 36 to 72 in.	Section > 72 in.
55 deg. F	50 deg. F	45 deg. F	40 deg. F

As soon as practical after the placement of concrete commercial blanket insulation will be placed on unformed sections of concrete. Table 2.1 shows the recommended length of protection period for concrete placed during cold weather.

Table 2.1 Length of Protection Period for Concrete Placed in Cold Weather

Service Category	Type I or II Cement
1-no load, not exposed	2 days
2-no load, exposed	3 days

Every precaution will be taken to ensure that new concrete placements will be protected against early age freezing. It is not anticipated that combustible heat sources will be used on the ELPTS Project. In the event that weather and schedule conditions necessitate the use of an external heat source, the proper permits will be obtained and required curing methods implemented.

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03100-008
Reviewed By: [illegible]
Date: 10/02/00

THE EUCLID CHEMICAL COMPANY
19218 REDWOOD ROAD
CLEVELAND, OH 44110

ACCELGUARD® 80

CONSTRUCTION PRODUCTS FOR VOC A SAFER ENVIRONMENT

NON-CHLORIDE, ACCELERATING WATER REDUCING ADMIXTURE

ACCELGUARD 80 is an accelerating, water-reducing admixture for concrete that does not contain calcium chloride or added chloride ions. It improves properties of plastic and hardened concrete, provides a significant improvement in early stiffening and setting characteristics, improved workability and decreased bleeding and segregation. This admixture is compatible with air-entraining admixtures, HRWR admixtures (super plasticizers), and conventional water reducing admixtures.

PRIMARY APPLICATIONS

- Cold weather concreting
- Structural and plain concrete
- Concrete block and mortar
- Precast and post tensioned concrete

FEATURES / BENEFITS

- Reduces initial set 1-4 hours depending on concrete temperatures
- Improves workability and provides denser concrete
- Minimizes bleeding and segregation
- Improves compressive strength development at early ages
- Decreases overtime allowing earlier finishing
- Increases protection for reinforcement in concrete

SPECIFICATIONS / COMPLIANCES

- Formulated to comply with ASTM C-494, Type C and E admixture.
- ACI 201, Guide for Durable Concrete and ACI 302 Guide for Concrete Floor and Slab Construction prohibit the use of chlorides in many types of concrete. ACCELGUARD 80 may be used in these types of concrete such as, floors over prestressed concrete or galvanized decking, floors containing two kinds of embedded metal, reinforced concrete in moist environments and/or exposed to chloride deicing salts.

TECHNICAL INFORMATION

Typical Engineering Data

Concrete Temperature	50°F* (10°C)	35°F* (2°C)
Air Temperature	40°F (4°C)	24°F (-4°C)
Cement	564 lb/yd³ (335 kg/m³)	564 lb/yd³ (335 kg/m³)
ACCELGUARD 80	16 oz/cwt (1000 ml/100 kg)	24 oz/cwt (1000 ml/100kg)
Slump	4.5" (114 mm)	2.75" (70 mm)
Air	3.2%	1.8%
Average 3 day Compressive Strength	2,825 psi (19.5 MPa)	1,478 psi (10.2 MPa)
Average 7 day Compressive Strength	4,138 psi (28.5 MPa)	3,257 psi (22.5 MPa)
Average 28 day Compressive Strength	5,371 psi (37.0 MPa)	5,229 psi (36.1 MPa)
Initial Set	5 hrs. 48 min. (1.5 hrs less than reference mix)	7 hrs. 46 min. (1.5 hrs less than reference mix)

*Average concrete temperature at or during the test.

ACCELGUARD 80 is used @ 16-32 oz/100 lb (1000 ml/100 kg) of cement for most work. As the quantity is increased, the acceleration of setting time and strengths are increased.

FROM : MIAMI VALLEY READY MIX FAX NO. : 5132381935 Sep. 27 2000 01:01PM P2

DIRECTIONS FOR USE

Add ACCELGUARD 80, with water and aggregate, to the ready mix concrete truck, but do not dispense onto dry cement. For temperatures 32°F-60°F (0°-16°C) add to concrete at the rate of 16 oz/100 lb of cement (1000 ml/100 kg), depending upon the desired rate of acceleration, early strength gain, stripping schedule, etc... For temperatures below 32°F (0°C), heat aggregate and use warm water so that concrete temperatures, when mixed, are above 60°F (16°C). When air temperatures are below 50°F (10°C) follow ACI 306, "Recommended Practice for Cold Weather Concreting". For temperatures above 60°F (16°C) ACCELGUARD 80 dosage may be reduced.

The Euclid Chemical Company recommends the contractor follow typical cold weather masonry practices. Please refer to "Recommended Practices for Cold Weather Masonry Construction" as published by International Masonry Industry All-Weather Council or "Cold Weather Concrete Masonry Construction" as published by the National Concrete Masonry Association (publication TEK 16B).

PACKAGING

ACCELGUARD 80 is packaged in bulk, 275 gal (1041 liter) totes, 55 gal (208 liter) drums and 5 gal (18.9 liter) pails.

CLEAN-UP

Clean tools and equipment with water before mortar hardens.

PRECAUTIONS / LIMITATIONS

- ACCELGUARD 80 will freeze at temperatures of approximately -15°F (-26°C). Freezing and thawing will not harm the material if thoroughly agitated.
- Do not use air for agitation.
- Do not dispense directly onto dry cement.
- Do not use ACCELGUARD 80 with Chemcomp Cement or other modified cements without consulting The Euclid Chemical Company.
- Keep mortar from freezing until a minimum of 1000 psi (7 MPa) is achieved.

Form Accelguard 80-6.96

WARRANTY: The Euclid Chemical Company ("Euclid") solely and expressly warrants that its products shall be free from defects in materials and workmanship for six (6) months from date of shipment. Unless authorized in writing by an officer of Euclid, no other representations or statements made by Euclid or its representatives, in writing or orally, shall enlarge this warranty. EUCLID MAKES NO WARRANTIES, EXPRESS OR IMPLIED OTHERWISE, AS TO THE MERCHANTABILITY OR FITNESS FOR ORDINARY OR PARTICULAR PURPOSES OF ITS PRODUCTS AND EXCLUDES THE SAME. If any Euclid product fails to conform with this warranty, Euclid will replace the product at no cost to Buyer. Replacement of any product shall be the sole and exclusive remedy available and Buyer shall have no claim for incidental or consequential damages. Any warranty claim must be made within one (1) year from the date of the claimed breach. Euclid does not authorize anyone on its behalf to make any written or oral statements which in any way enlarge, limit or modify the information or recommendations in its product literature or on its packaging labels. Any installation of Euclid products which fails to conform to such installation recommendations or instructions shall void the Euclid warranty. If any of the foregoing provisions are unenforceable, they are deemed to be severable and do not affect the validity or enforceability of the remaining provisions. Any alteration of any kind, Buyer shall be solely responsible for determining the suitability of Euclid products for its Buyer's intended purposes.

MATERIAL SAFETY DATA

The Euclid Chemical Company • Cleveland, Ohio 44110

FOR TRANSPORTATION & SAFETY EMERGENCIES CALL: 1-800-255-3924
INTERNATIONAL USERS CALL COLLECT: 1-813-979-4626

TRADE NAME: Accelguard 80

CHEMICAL NAME: Calcium Nitrate Solution

1. INGREDIENTS

MATERIAL	CAS #	%	ACGIH(TLV)	PEL
Calcium Nitrate	13477-34-4	95-100	NE	NE

2. PHYSICAL DATA

APPEARANCE: Colorless Liquid	ODOR: None	MELTPOINT: NA	SPECIFIC GRAVITY: 1.442 - 1.450
VAPOR DENSITY (AIR=1): NA	%VOLATILE BY WEIGHT: ~50%	BULK DENSITY: NA	BOILING POINT: NA
VAPOR PRESSURE: NA	%SOLUBILITY(H_2O): Complete	EVAPORATION RATE	PH: 8.5 ± 1

3. FIRE AND EXPLOSION HAZARD DATA

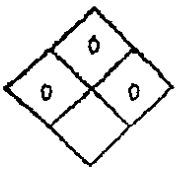
FLASH POINT & METHOD: None

FLAMMABLE LIMITS: LEL None UEL None

EXTINGUISHING MEDIA: None

SPECIAL FIRE FIGHTING PROCEDURES: None

NFPA FIRE HAZARDS IDENTIFICATION SYSTEM



UNUSUAL FIRE AND EXPLOSION HAZARDS: None

4. PHYSIOLOGICAL EFFECTS

LD50 ORAL (INGESTION): Rat=3900 mg/kg	LD50 DERMAL (SKIN CONTACT): NE	LC50 (INHALATION): NE
PRIMARY ROUTE OF EXPOSURE: Skin		THRESHOLD LIMIT VALUE (TLV): NE

EFFECTS OF OVEREXPOSURE

Inhalation: No information found to suggest toxicity, however excessive inhalation could cause nasal or respiratory irritation.

Eye: No information found to suggest any toxicity. May cause irritation on contact.

Skin: Prolonged contact may cause dermatitis.

Ingestion: May cause gastric irritation.

Acc 50

5. EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Move to fresh air. If illness or irritation occurs, call a Physician or Poison Control Center.
Eye: Flush with large amounts of water. If pain or irritation arises, call a Physician or Poison Control Center.
Skin: Wash area twice with soap and water. If pain or irritation persists, call a Physician or Poison Control Center.
Ingestion: Call a Physician or Poison Control Center immediately.

6. U.S. D.O.T. SHIPPING DESCRIPTION

Concrete or Masonry Plasticizer/Water Reducing Agent, Liquid, NOI, Class 55

7. SPECIAL PROTECTION INFORMATION

VENTILATION
Adequate fresh air.

RESPIRATORY
None

EYE PROTECTION
Yes

PROTECTIVE GLOVES
Yes (rubberized)

OTHER

All chemicals should be handled so as to prevent eye contact and excessive or repeated skin contact. Appropriate eye and skin protection should be employed. Inhalation of dusts and vapors should be avoided.

8. CHEMICAL REACTIVITY

CONDITIONS CAUSING INSTABILITY
None

INCOMPATIBILITY (MATERIALS TO AVOID)
Do not mix with other concrete admixtures.

HAZARDOUS DECOMPOSITION PRODUCTS
None

SPECIAL SENSITIVITY
None

9. STORAGE INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep from freezing. Do not contaminate with other chemicals, otherwise the resin will agglomerate and clog equipment.

10. SPILL, LEAK, AND DISPOSAL INFORMATION

STEPS TO BE TAKEN IN CASE MATERIAL IS SPILLED OR RELEASED
Small spills of up to 2 gallons, soak up with absorbent and dispose of in landfill. Wash area. Consult local sewer authority for effect on sewage treatment facility.

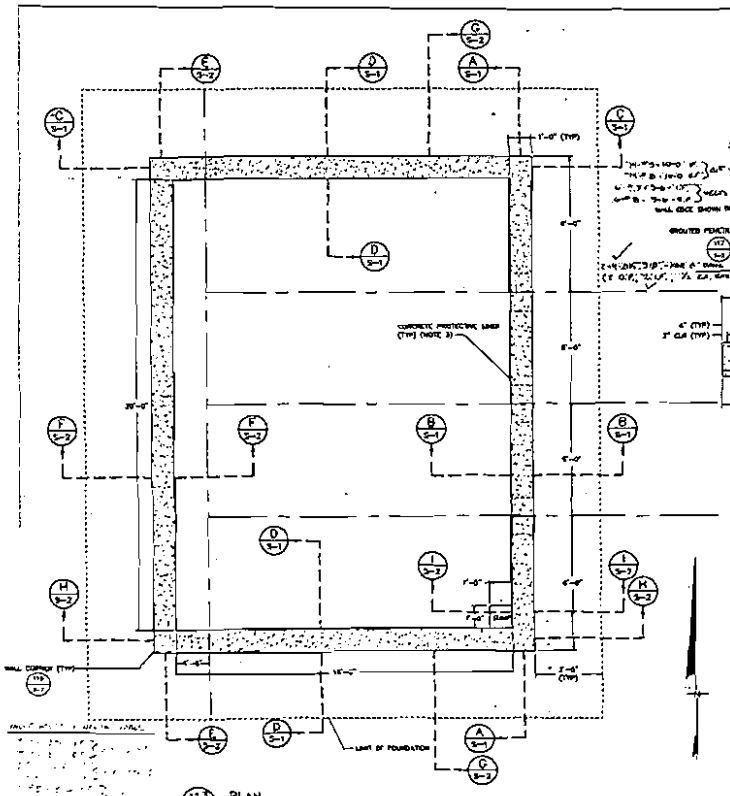
WASTE DISPOSAL METHOD
Dispose of in accordance with all federal, state, and local laws and regulations.

PREPARED BY	David M. Hudak	DATE	01/01/97
TELEPHONE NUMBER	216-531-9222	SUPERSEDES MSDS DATED	07/01/96

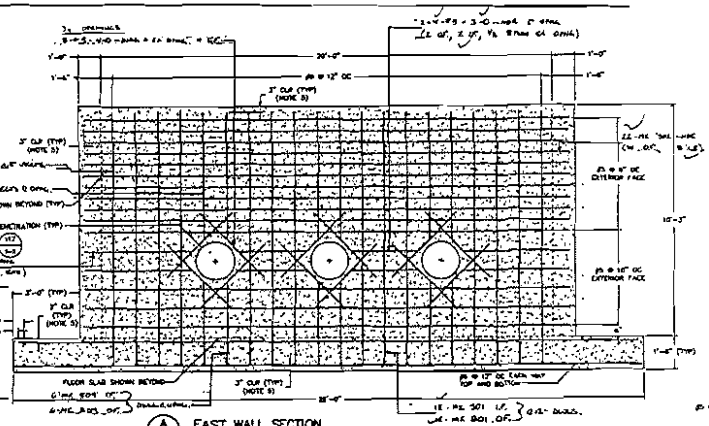
The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet.

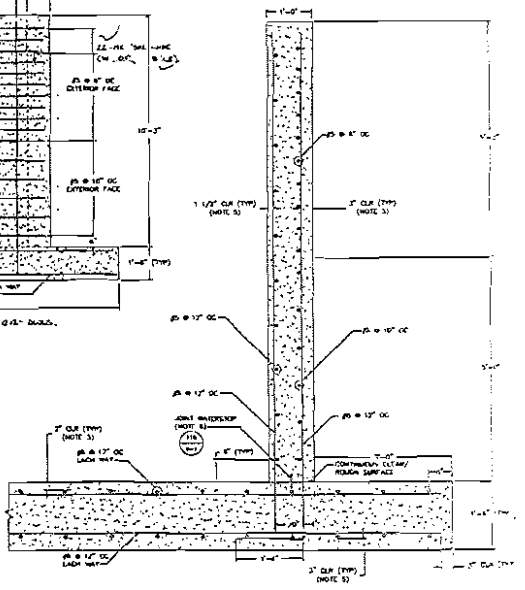
Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.



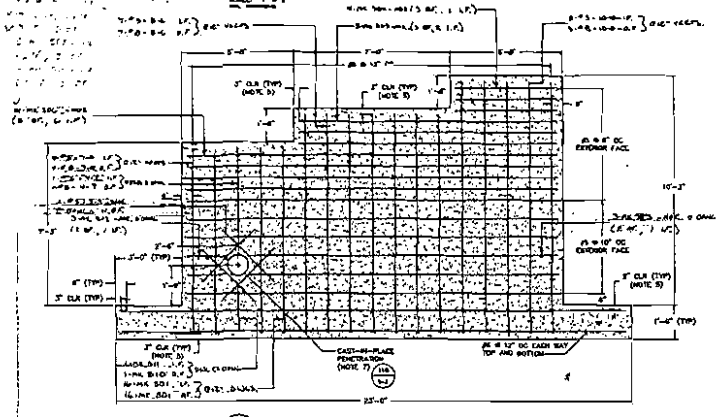
113 / S-3 PLAN
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE 1" = 5'



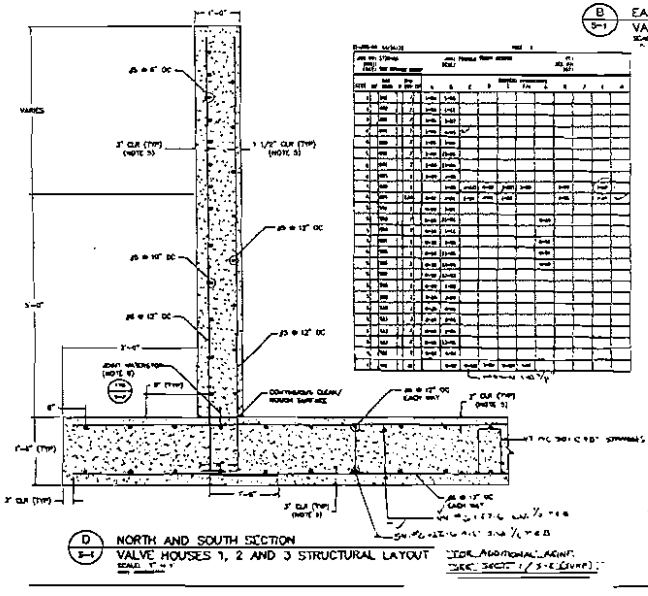
A / S-1 EAST WALL SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE 1" = 5'



B / S-1 EAST SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE 1" = 5'



C / S-1 NORTH WALL SECTION
VALVE HOUSES 2 AND 3 STRUCTURAL LAYOUT
SCALE 1" = 5'



D / S-1 NORTH AND SOUTH SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE 1" = 5'

NOTES:

1. VAPOR BARRIER SHALL BE INSTALLED UNDER FLOOR SLAB PRIOR TO CONSTRUCTION. VAPOR BARRIER SHALL BE 6 MIL THICK POLYETHYLENE SHEET.
2. CRACK SEAL SHALL BE APPLIED TO EXPOSED SURFACE OF CONCRETE PRIOR TO PLACEMENT OF TRENCH BACKFILL MATERIAL.
3. CONCRETE PROTECTIVE LINER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02410.
4. CONCRETE REINFORCING STEEL BARS AND FORMWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 03100.
5. STEEL REINFORCEMENT SHALL HAVE A MINIMUM CONCRETE COVER OF 2 INCHES, 3 INCHES OR 1.5 INCHES AS SHOWN.
6. WATERSTOPS SHALL BE CONTINUOUS AND SHALL HAVE A MINIMUM CONCRETE COVER OF 3 INCHES.
7. A WALL PENETRATION IS NOT REQUIRED IN NORTH WALL OF VALVE HOUSE 1.

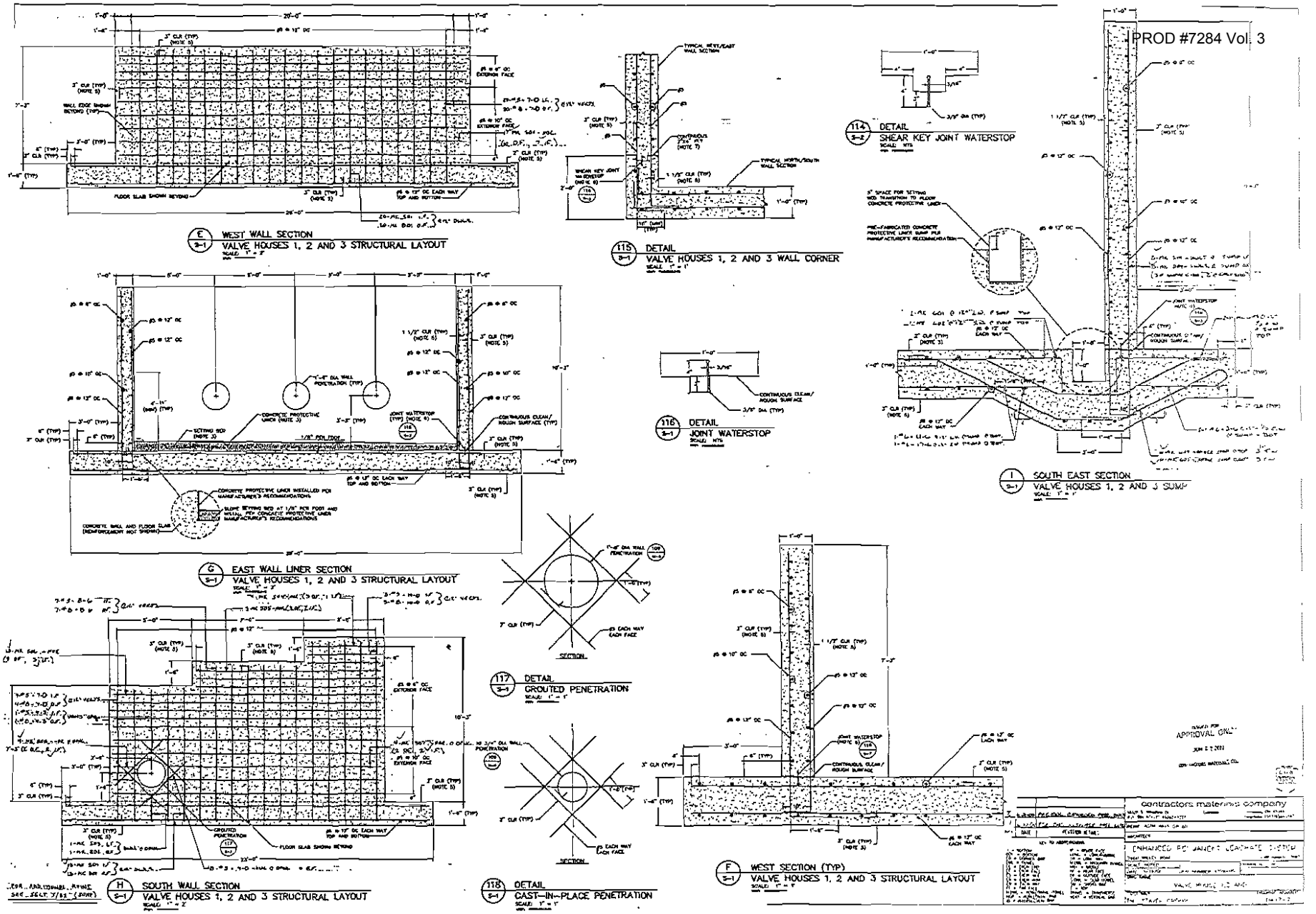
APPROVAL ONLY

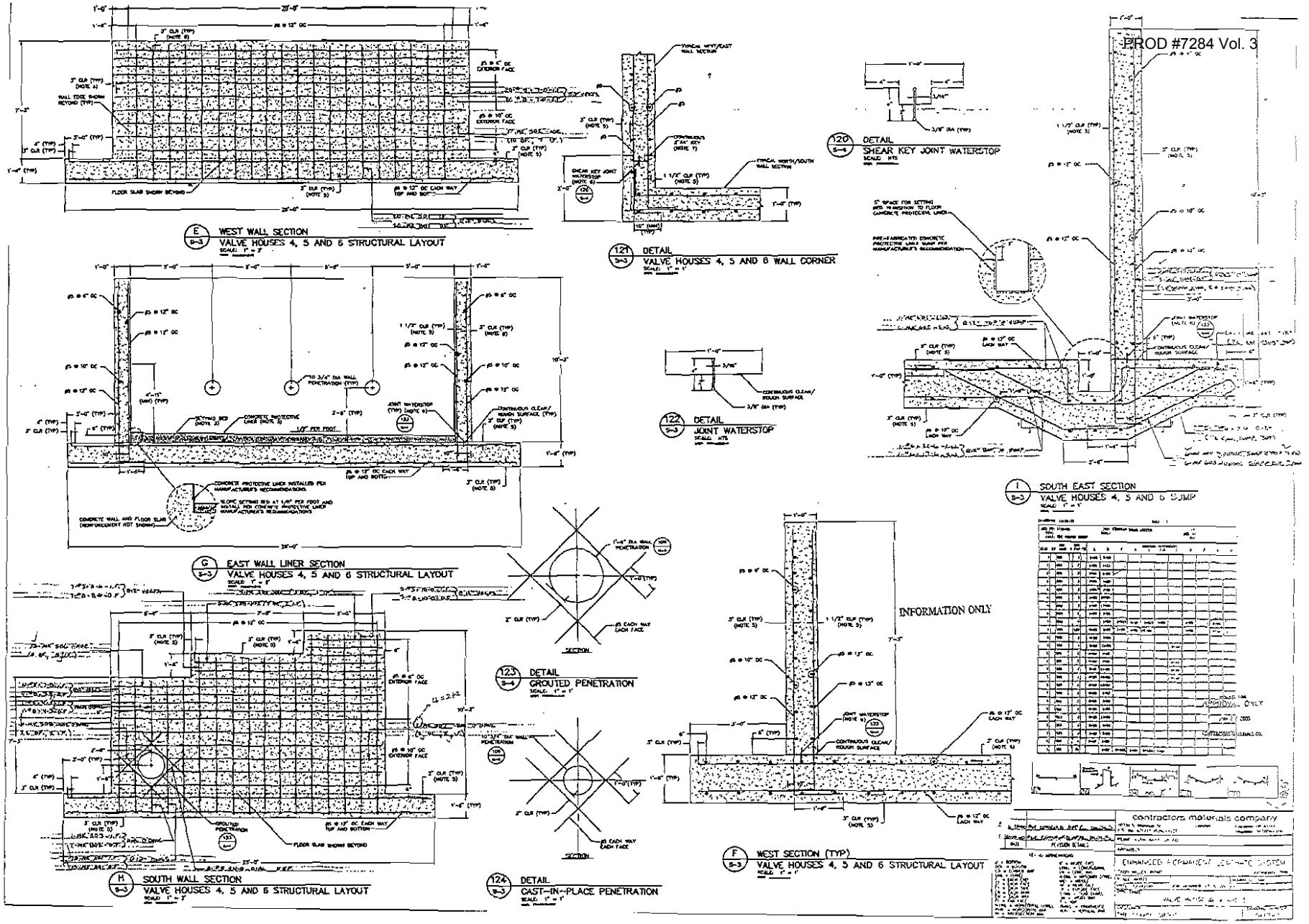
AUG 2 2 2000

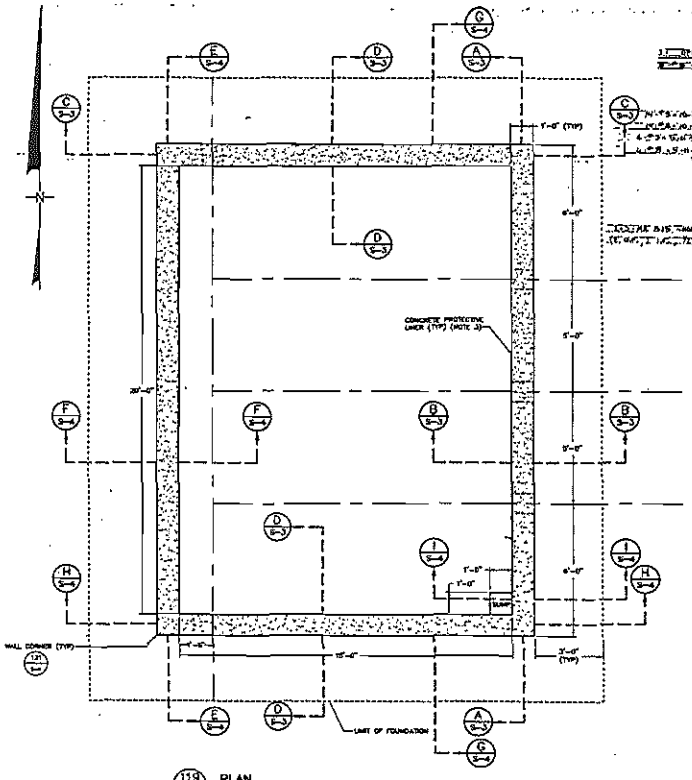
CONTRACTORS MATERIALS CO.

contractors materials company

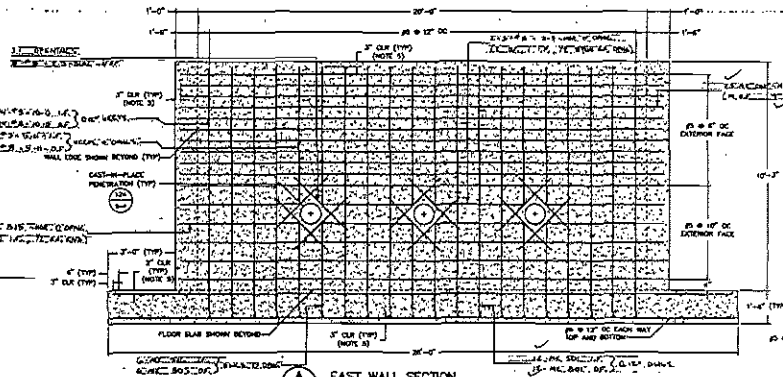
ENGINEERED MODULAR LEACH FIELD SYSTEM


E 3-1 WEST WALL SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE: 1" = 2'
115 3-1 DETAIL
VALVE HOUSES 1, 2 AND 3 WALL CORNER
SCALE: 1" = 1'
114 3-2 DETAIL
SHEAR KEY JOINT WATERSTOP
SCALE: NTS
116 3-1 DETAIL
JOINT WATERSTOP
SCALE: NTS
I 3-1 SOUTH EAST SECTION
VALVE HOUSES 1, 2 AND 3 SUMP
SCALE: 1" = 1'
G 3-1 EAST WALL LINER SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE: 1" = 2'
117 3-1 DETAIL
GROUTED PENETRATION
SCALE: 1" = 1'
118 3-1 DETAIL
CAST-IN-PLACE PENETRATION
SCALE: 1" = 1'
H 3-1 SOUTH WALL SECTION
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE: 1" = 2'
F 3-1 WEST SECTION (TYP)
VALVE HOUSES 1, 2 AND 3 STRUCTURAL LAYOUT
SCALE: 1" = 1'
APPROVAL ONLY
contractors materials company
ENHANCED PO LANDFILL LEACHATE SYSTEM
VALVE HOUSES 1, 2 AND

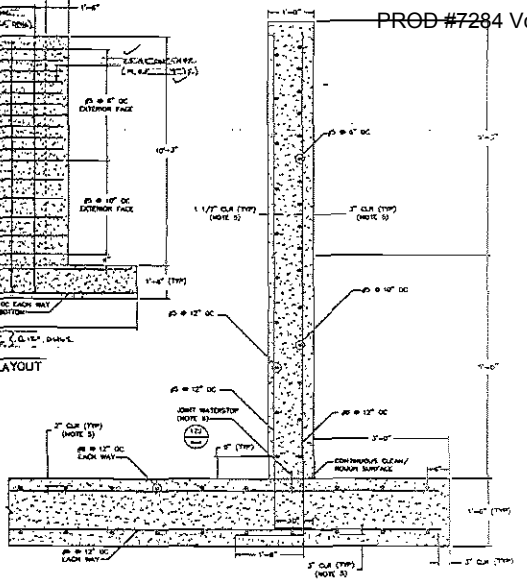

E 8-3 WEST WALL SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
121 3-3 DETAIL
VALVE HOUSES 4, 5 AND 6 WALL CORNER
120 3-4 DETAIL
SHEAR KEY JOINT WATERSTOP
122 3-3 DETAIL
JOINT WATERSTOP
I 8-3 SOUTH EAST SECTION
VALVE HOUSES 4, 5 AND 6 DUMP
G 8-3 EAST WALL LINER SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
123 3-4 DETAIL
GROUTED PENETRATION
INFORMATION ONLY
H 8-3 SOUTH WALL SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
124 3-3 DETAIL
CAST-IN-PLACE PENETRATION
F 8-3 WEST SECTION (TYP)
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
contractors materials company
ENHANCED REPAIR/REPLACEMENT CONCRETE SYSTEM



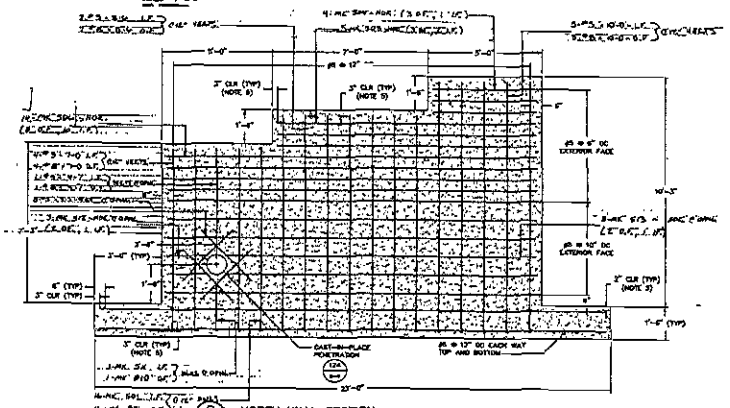
119 PLAN
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
SCALE: 1" = 2'



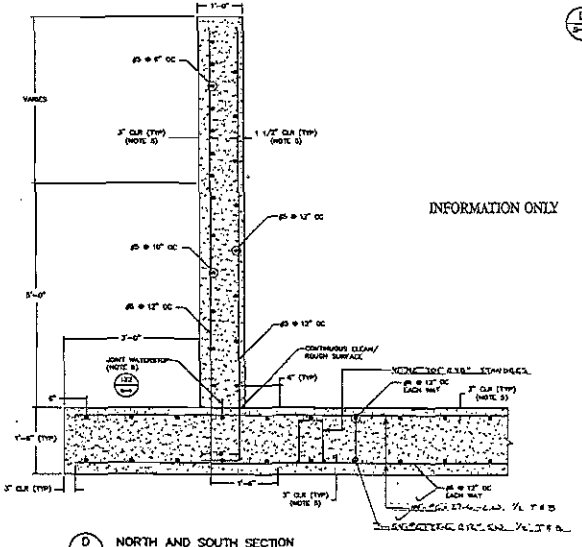
A EAST WALL SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
SCALE: 1" = 2'



B EAST SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
SCALE: 1" = 2'



C NORTH WALL SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
SCALE: 1" = 2'



D NORTH AND SOUTH SECTION
VALVE HOUSES 4, 5 AND 6 STRUCTURAL LAYOUT
SCALE: 1" = 2'

INFORMATION ONLY

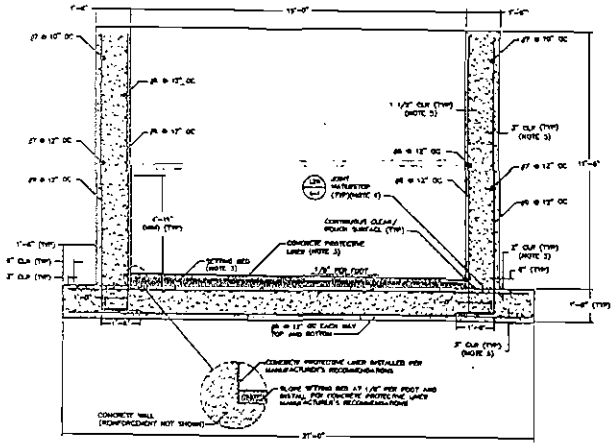
ISSUED FOR
APPROVAL ONLY
JUN 1 2 2004
CONTRACTORS MATERIALS CO.

contractors materials company

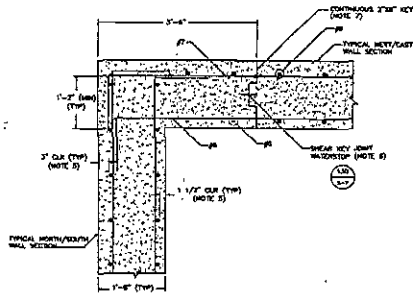
ENHANCED PERMANENT LEACHATE SYSTEM

VALVE HOUSE # 4 AND 5

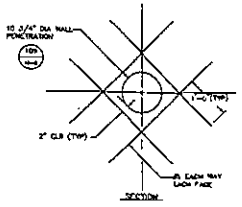
OWNER
THE STANTON GROUP



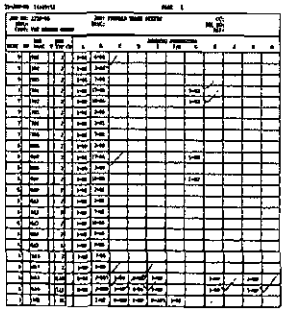
F 5-8 EAST WALL LINER SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
SCALE: 1" = 2'

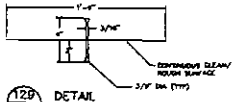


128 8-8 DETAIL
CONTROL VALVE HOUSE WALL CORNER
SCALE: 1" = 1'

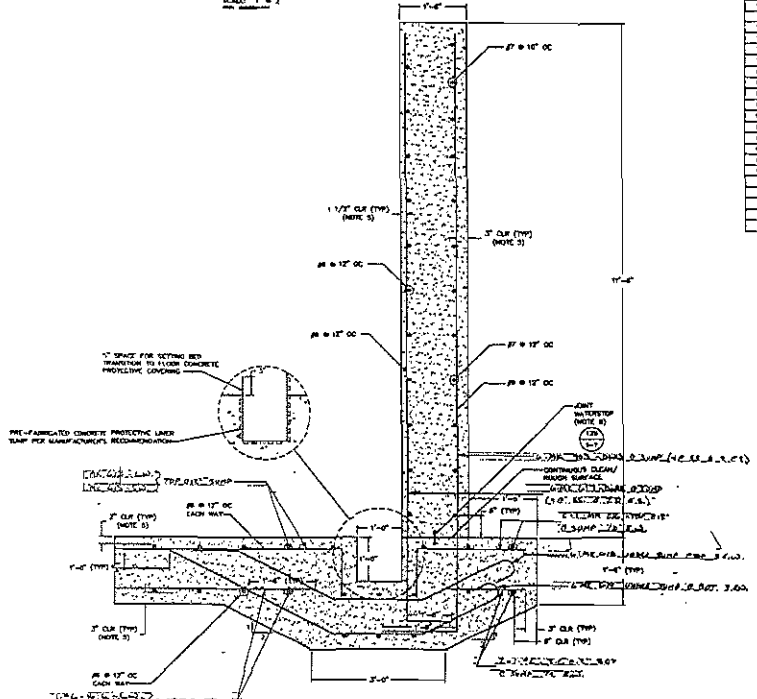


131 5-8 DETAIL
CAST-IN-PLACE PENETRATION
SCALE: 1" = 1'

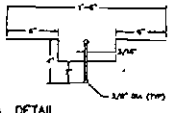




129 5-8 DETAIL
JOINT WATERSTOP
SCALE: NTS



G 5-8 SOUTH EAST SECTION
CONTROL VALVE HOUSE SUMP
SCALE: 1" = 1'



130 8-7 DETAIL
SHEAR KEY JOINT WATERSTOP
SCALE: NTS

NOTES:

1. VAPOR BARRIER SHALL BE INSTALLED UNDER FLOOR SLAB PRIOR TO CONSTRUCTION. VAPOR BARRIER SHALL BE 6-MIL THICK POLYETHYLENE SHEET.
2. EPOXY SEAL SHALL BE APPLIED TO EXPOSED SURFACE OF CONCRETE PRIOR TO PLACEMENT OF TRENCH BACKFILL MATERIAL.
3. SETTING BED AND CONCRETE PROTECTIVE LINER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 03100.
4. CONCRETE, REINFORCING STEEL BARS AND FORMWORK SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 03300.
5. STEEL REINFORCEMENT SHALL HAVE A MINIMUM CONCRETE COVER OF 3 INCHES, 2 INCHES OR 1.5 INCHES AS SHOWN.
6. WATERSTOPS SHALL BE CONTINUOUS AND SHALL HAVE A MINIMUM CONCRETE COVER OF 3 INCHES.
7. CONTINUOUS SHEAR KEY SHALL TERMINATE 6 INCHES FROM TOP OF WALL SECTION.

STATUS FOR
APPROVAL ONLY
JUN 5 2 2006
CONTRACTORS MATERIALS CO.

REV.	DATE	REVISION DETAILS
2	6-01-06	PER REVISED APPR. INDEX
1	6-30-06	PER REVISED APPR. INDEX

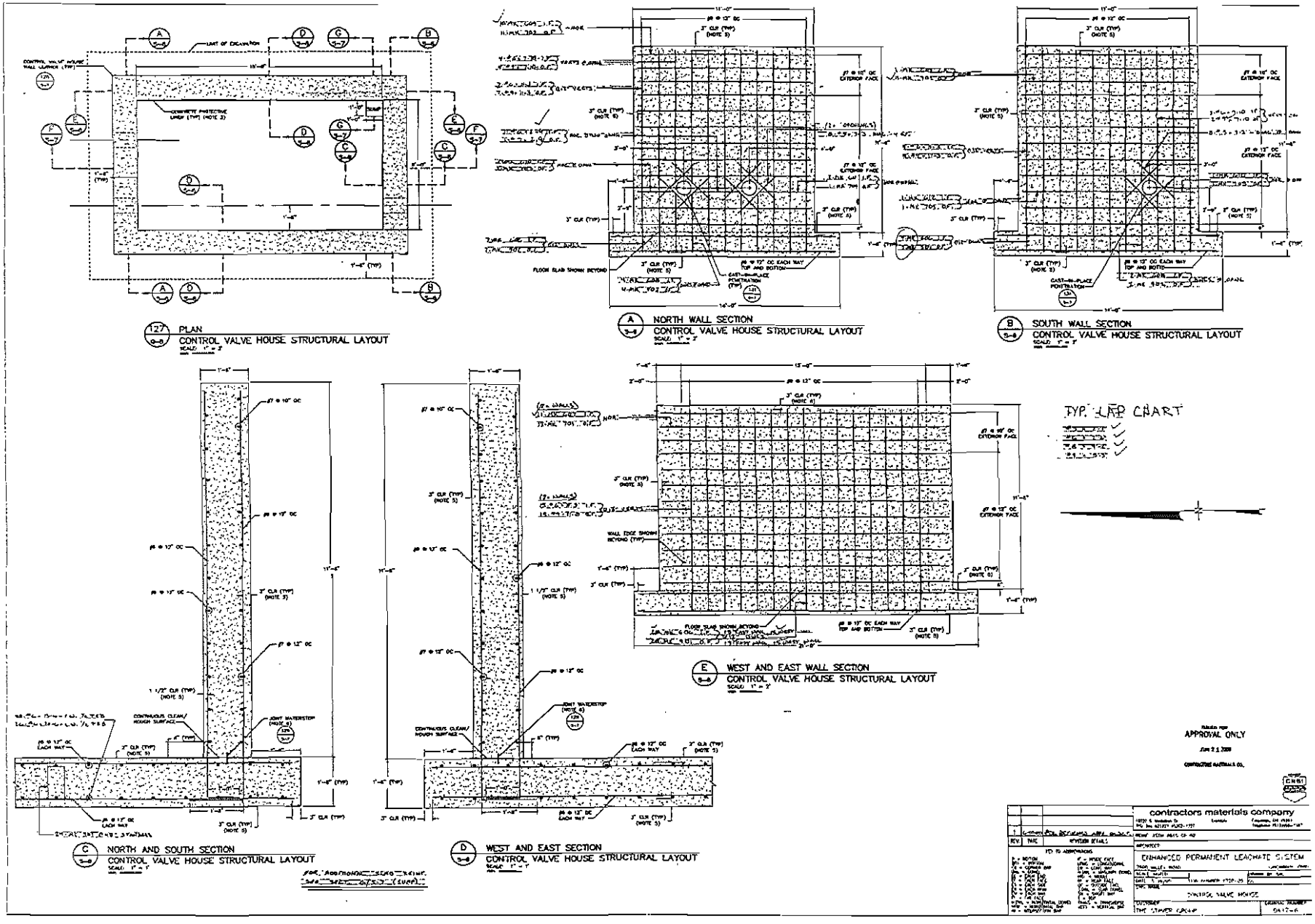
contractors materials company
3030 E. Kemper Rd. Cincinnati, OH 45241
PO Box 42027 45202-1027 Telephone (513)956-1147

ARCHITECT

ENHANCED PERMANENT LEACHATE SYSTEM
TRICO VALLEY LANDFILL CINCINNATI, OHIO

SCALE NOTED
DATE 5/19/06 JOB NUMBER 1-728-005 V.C.
DWG. NAME CONTROL VALVE HOUSE

CUSTOMER THE STANLEY GROUP
DRAWING NUMBER CVH 17-5


127 PLAN
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
A NORTH WALL SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
B SOUTH WALL SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
E WEST AND EAST WALL SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
C NORTH AND SOUTH SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
D WEST AND EAST SECTION
CONTROL VALVE HOUSE STRUCTURAL LAYOUT
TYP. LAP CHART
APPROVAL ONLY
contractors materials company
ENHANCED PERMANENT LEACHATE SYSTEM
CONTROL VALVE HOUSE

SUPPLIER DOCUMENT SUBMITTAL

PROD #7284 Vol. 3

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-004	REV: 0	DATE: June 7,2000	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Lisa Marrott DATE: 6/7/00

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
8	641-03100-004	0						X			PVC Waterstop		X		03100	X		

RECEIVED
JUN 08 2000

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin (Approver)	525				
Geo-Syntec (Kwasi)	64				
Tim Cherry	525				
Jim Jenkins	525				
Tom Escue	525				
Scott Wheeler	525				
Rob Knein	525				

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

RECEIVED BY: [signature] DATE 6/12/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

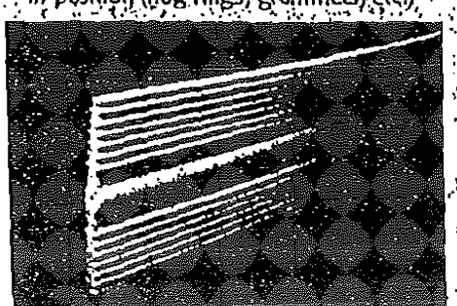
ORIGINAL

WATERSTOP BASIC USE

Embedded in concrete, across and/or along the joint, waterstops form a watertight diaphragm that prevents the passage of fluid through the joint.

SUGGESTED WATERSTOP DESIGN CHECKLIST

- Determine structure type
- Verify chemical containment requirements (if any)
- Verify hydrostatic head pressure requirements
- Determine joint type and joint movement requirements
- Verify joinery details of dissimilar or non-symmetrical waterstop profiles (consider using one profile throughout to simplify intersections)
- [illegible]y ribbed profile for best water [illegible]g performance
- Specify type and size (by product number, if possible)
- Specify factory fabrications of intersections and heat welded field butt joints
- Specify method for securing waterstop in position (hog rings, grommets, etc.)



PVC WATERSTOP

- The industry standard
- Broadest design selection
- Formulated and compounded by Greenstreak
- Manufactured by Greenstreak from [illegible]rime resins and all virgin [illegible]aterials
- Great inherent elasticity
- Resistant to many waterborne chemicals
- Heat weldable
- Will not discolor concrete or produce electrolytic action
- Suitable for [illegible]

Physical properties

All Greenstreak PVC waterstops are specially formulated and manufactured to meet or exceed the industry's standard specifications.

Greenstreak PVC Waterstop Physical Properties

PROPERTY	TEST ASTM	NOMINAL VALUE
Water absorption	D 570	0.15
Tear resistance	D 624	350/lb.in.
Ultimate Elongation	D 638	390%
Tensile strength	D 638	2250 psi min.
Low temperature brittleness	D 746	Passed @ -35°F / -37°C
Stiffness in flexure	D 747	1190 psi
Specific gravity	D 792	1.37
Ozone resistance	D1149	No failure
Volatile loss	D1203	0.30%
Hardness, Durometer A	D2240	[illegible]
Accelerated extraction	C 572	
• Tensile strength		[illegible]30 psi
• Elongation		390%
Effect of Alkali		
• Weight change		+0.05%
• hardness change		-1 point

Fluor Contract PSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 9052
Submittal # 641-03/00-(0)
Reviewed By: RW
Date: 6/06/00

Independent laboratory tests are available for the following applicable standards:

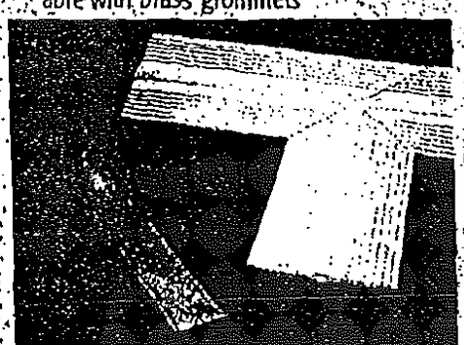
- Corps of Engineers CRD-C572-74
- Bureau of Reclamation C902
- CH2M Hill
- Department of Agriculture, Soil Conservation Service Manual Spec. 537
- Federal Standard 601
- Tennessee Valley Authority Spec. PF1026
- Montgomery Watson, Inc.
- Various State Highway and/or Public Works Department Standards

Installation aids for PVC waterstops

Greenstreak offers various features to economically assist and promote proper installation of PVC waterstops. Waterstops must be securely positioned in the forms to prevent deflection or misalignment during concrete placement. This is achieved by tethering the outer flanges of the waterstop to the adjacent reinforcing steel.

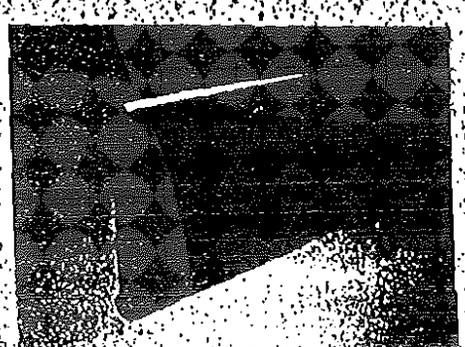
The following features are offered to assist this method of installation:

- Tie-Right - most PVC shapes are available with factory applied hog rings
- Punched Flanges - most ribbed shapes are available with punched flanges
- Grommets - selected shapes are available with brass grommets



PVC Waterstop fabrications

PVC waterstop splices, directional changes and intersections are critical components of a quality installation. Specifications requiring factory made fabrications are strongly recommended. Greenstreak can provide homogenous directional changes and intersections, leaving only the less difficult straight splices to be welded in the field.



SBR AND NEOPRENE RUBBER WATERSTOPS

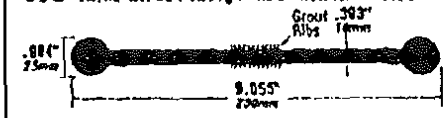
Greenstreak offers SBR and Neoprene waterstops for applications requiring the physical properties of rubber. These waterstops are manufactured to meet the Corps of [illegible]

CALL GREENSTREAK'S TECHNICAL SERVICE DEPARTMENT FOR ASSISTANCE WITH

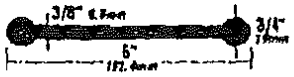
PVC SHAPES

Dumbbell

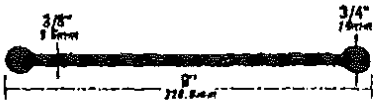
932 STD. WT. 2.67 lbs/ft 3.99 Kg/m HEAD PRESS. 150' 448 KPa



748 STD. WT. 1.51 lbs/ft 2.25 Kg/m HEAD PRESS. 125' 373 KPa

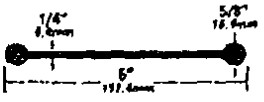


751 STD. WT. 2.18 lbs/ft 3.24 Kg/m HEAD PRESS. 150' 448 KPa

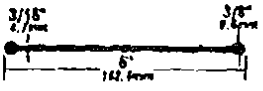


752 STD. WT. 2.55 lbs/ft 3.79 Kg/m HEAD PRESS. 150' 448 KPa

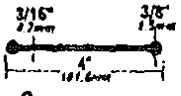
747 STD. WT. 1.20 lbs/ft 1.79 Kg/m HEAD PRESS. 100' 299 KPa



746 STD. WT. 0.71 lbs/ft 1.06 Kg/m HEAD PRESS. 75' 224 KPa



741 STD. WT. 0.47 lbs/ft 0.70 Kg/m HEAD PRESS. 65' 194 KPa

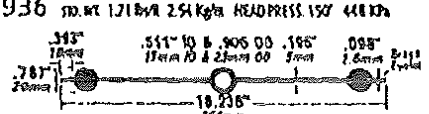


See RCF 2411-002R

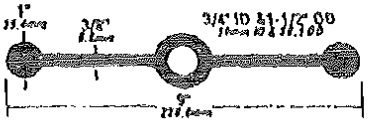
Dumbbell With Centerbulb

EBT

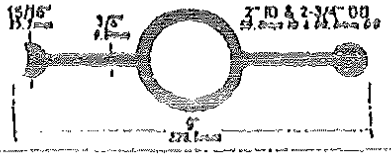
936 STD. WT. 1.71 lbs/ft 2.54 Kg/m HEAD PRESS. 150' 448 KPa



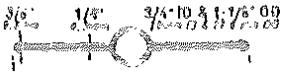
753 STD. WT. 3.10 lbs/ft 4.61 Kg/m HEAD PRESS. 150' 448 KPa



754 STD. WT. 3.70 lbs/ft 5.51 Kg/m HEAD PRESS. 150' 448 KPa

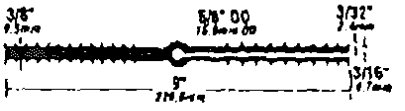


756 STD. WT. 1.20 lbs/ft 1.79 Kg/m HEAD PRESS. 100' 299 KPa

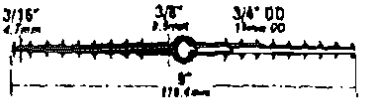


Split Flange

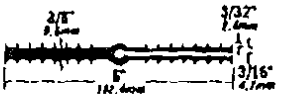
727 STD. WT. 2.25 lbs/ft 3.35 Kg/m HEAD PRESS. 150' 448 KPa



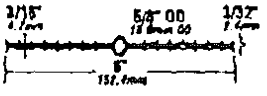
722 STD. WT. 1.90 lbs/ft 2.83 Kg/m HEAD PRESS. 150' 448 KPa



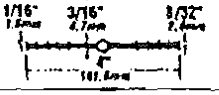
724 STD. WT. 1.51 lbs/ft 2.29 Kg/m HEAD PRESS. 125' 373 KPa



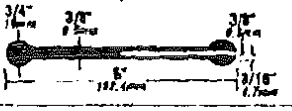
723 STD. WT. 0.76 lbs/ft 1.13 Kg/m HEAD PRESS. 100' 299 KPa



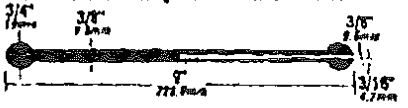
721 STD. WT. 0.50 lbs/ft 0.74 Kg/m HEAD PRESS. 65' 194 KPa



759 STD. WT. 1.49 lbs/ft 2.22 Kg/m HEAD PRESS. 125' 373 KPa



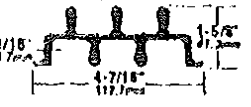
760 STD. WT. 2.20 lbs/ft 3.27 Kg/m HEAD PRESS. 150' 448 KPa



Labyrinth

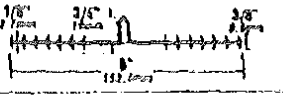
789 STD. WT. 0.84 lbs/ft 1.25 Kg/m HEAD PRESS. 10' 30 KPa

790 STD. WT. 1.24 lbs/ft 1.85 Kg/m HEAD PRESS. 50' 149 KPa

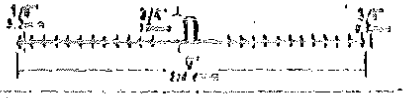


Year Web

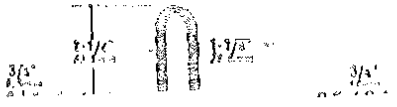
698 STD. WT. 0.78 lbs/ft 1.16 Kg/m HEAD PRESS. 65' 194 KPa



699 STD. WT. 1.00 lbs/ft 1.49 Kg/m HEAD PRESS. 100' 299 KPa

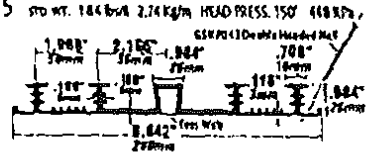


700 STD. WT. 3.24 lbs/ft 4.81 Kg/m HEAD PRESS. 150' 448 KPa

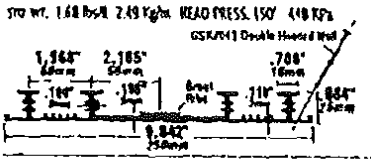


Base Seal

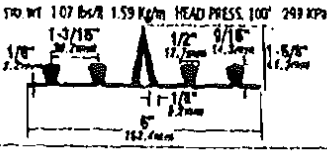
925 STD. WT. 1.84 lbs/ft 2.74 Kg/m HEAD PRESS. 150' 448 KPa



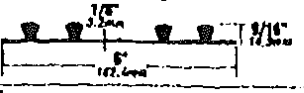
929 STD. WT. 1.68 lbs/ft 2.49 Kg/m HEAD PRESS. 150' 448 KPa



639 STD. WT. 1.07 lbs/ft 1.59 Kg/m HEAD PRESS. 100' 299 KPa

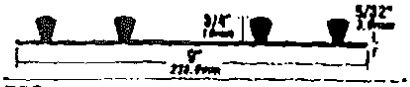


776 STD. WT. 0.83 lbs/ft 1.24 Kg/m HEAD PRESS. 100' 299 KPa



New York D

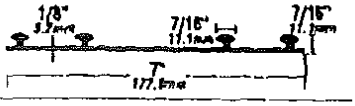
771 STD. WT. 1.53 lbs/ft 2.28 Kg/m HEAD PRESS. 100' 299 KPa



772 STD. WT. 1.85 lbs/ft 2.75 Kg/m HEAD PRESS. 100' 299 KPa

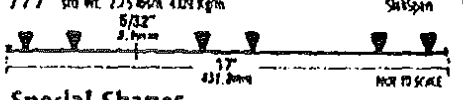
Texas Hwy. Type A

774 STD. WT. 0.79 lbs/ft 1.18 Kg/m HEAD PRESS. 75' 224 KPa



Texas Hwy. Type B

777 STD. WT. 2.75 lbs/ft 4.09 Kg/m



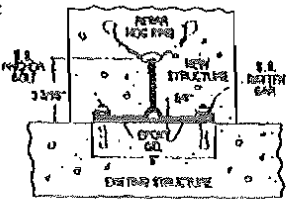
NOT TO SCALE

Special Shapes

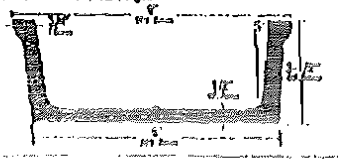
609 STD. WT. 9.60 Kg/m (14 Outside System)

Available as a system:

- 660996 Waterstop
- 660981 S.S. Batten Bar 2 / ft. of waterstop
- 660951 S.S. Anchor Bolt 4.2 pcs. / ft. of waterstop
- Epoxy Gel



775 STD. WT. 4.64 lbs/ft 6.91 Kg/m



792 STD. WT. 1.30 lbs/ft 1.94 Kg/m

SUPPLIER DO ENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-005	REV: 0	DATE: June 7,2000	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: RW . DW 6/7/00

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 6/7/00

			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
8	641-03100-005	0						X			Masterflow Grout		X		03100	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-S	RECEIVED			
Jim Cherry	52-S	JUN 08 2000			
Jim Jenkins	52-S				
Tom Escue	52-O				
Rob Kneip	52-S				
B. Scott Wheeler	52-S				
Kwasi Bau Twineboah	64				

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

RECEIVED BY: [signature] DATE 6/8/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Review and Resubmit (SEE COMMENTS)

ORIGINAL

ENTERED

Master Builders Technologies

Master Builders, Inc.
23700 Chagrin Boulevard
Cleveland, Ohio 44122-5554
Phone 216/831-5500
Telex 980-305

January 15, 1991

Certificate of Interchangeability and Performance
Masterflow 928 Grout and Masterflow 713 Grout
Master Builders Construction Products

TO WHOM IT MAY CONCERN;

State of Ohio)
County of Cuyahoga) ss

I, James C. Maras, Quality Assurance Manager for Master Builders, Inc., Cleveland, Ohio, duly depose and say:

That Masterflow 928:

- is a specially prepared, ready-to-use, nonmetallic, nonshrink grout;
- although having a different formulation, can be used in place of, or substituted for Masterflow 713 Grout;
- has extended workability and greater compressive strengths than Masterflow 713 Grout, i.e., working time: 45-60 minutes for Masterflow 928 Grout vs. 10-20 minutes for Masterflow 713 Grout; typical compressive strengths at 3, 7 and 28 days when mixed at a fluid consistency: 4,500; 6,000; and 7,000 psi for Masterflow 928 Grout vs. 2,800; 4,500; and 6,500 psi for Masterflow 713 Grout;
- has improved placing characteristics which allow placement at 40°F to 100°F, whereas the recommended placing temperature range for Masterflow 713 Grout is 45°F to 70°F;
- meets, as does Masterflow 713 Grout, the requirements of the Corps of Engineers' Specification for Nonshrink Grout, CRD-C 621-80, -81, -82, -82A, -82B, -83, -88 and -89.

James C. Maras
James C. Maras
Quality Assurance Manager

Subscribed and sworn to before me
this 15th day of January, 1991

Barbara K. Leslie
Barbara K. Leslie, Notary Public
State of Ohio
My Commission Expires August 13, 1994
(Recorded in Cuyahoga County)

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03100-005
Reviewed By: D. L
Date: 6/06/00

MASTERFLOW® 928 GROUT

High-precision, nonshrink, natural-aggregate grout

DESCRIPTION:

MASTERFLOW 928 grout is specially formulated for use at any consistency—from fluid to damp-pack—for grouting machines or plates requiring precision-bearing support. This ready-to-use product meets the volume change and exceeds the compressive strength requirement of CRD-C621, Corps of Engineers Specification for Nonshrink Grout and ASTM C-1107 at fluid consistency.

RECOMMENDED FOR:

- Acceptable as a machinery grout and concrete surface and crack repair in federally inspected meat and poultry plants.
- Precision grouting of equipment and machinery, baseplates, soleplates and columns.
- Grouting applications where shrinkage must be eliminated and where a high-strength grout, similar in appearance to concrete and mortar, is desired.
- Applications where high, one-day and later-age compressive strengths are required.
- Non-shrink grouting of precast wall panels, beams and columns, curtain walls, concrete systems, and other structural and nonstructural building members.
- Repairs to concrete, such as filling rock pockets and large cracks.
- Anchoring bolts, reinforcing bars and rods.
- Applications calling for a grout to be pumped.

FEATURES/BENEFITS:

- Hardens free of bleeding, settlement or shrinkage when mixed, placed and cured at almost any consistency—fluid (25 seconds or more), flowable, plastic or damp-pack.
- Passes ASTM C 1107 at 45° - 90° F at a fluid consistency over a 30 minute working time. (All materials including water are tested at required temperature range extremes.)
- Contains carefully graded, high-quality quartz aggregate for optimum strength and workability.

PACKAGING:

MASTERFLOW 928 grout is packaged in 55 lb (25 kg) moisture-resistant bags. Also available in 3300 lb (1500 kg) bulk bags.

ESTIMATING:

One 55 lb (25 kg) bag of MASTERFLOW 928 grout mixed with 10.5 lbs (4.8 kgs) [1.26 U.S. gallons (4.8 litres)] of water produces approximately 0.50 ft^3 (0.014 m^3) of grout.

NOTE: MASTERFLOW 928 grout should be mixed with a mechanical mixer for at least 5 minutes. The water requirement will vary due to mixing efficiency and other variables including the consistency. Begin with 9 lbs. (4 kg) {1.1 U.S. gallons/4.2 litres}of water per bag and adjust as needed to establish the recommended flow of 25-30 seconds through a flow cone per CRD-C 611/ASTM C 939, for a fluid grout. Lower values will be required for stiffer consistency.

TYPICAL PERFORMANCE DATA:

COMPRESSIVE STRENGTHS
ASTM-C-109 Modified

	Plastic[1]		Flowable[2]		Fluid[3]	
	psi	MPa	psi	MPa	psi	MPa
1-day	4500	31	4000	28	3500	24
3-day	6000	48	5000	41	4500	35
7-day	7500	52	6700	46	6500	44
28-day	9000	62	8000	55	7500	52

RATE OF HARDENING
[at 70°F (21°C)]

Set Time (hours)	Plastic	Flowable	Fluid
Initial Set Time	2.5	3.0	4.0
Final Set Time	4.0	5.0	6.0

[1] 100-125% flow on flow table, CRD C-621 (ASTM C 230, 5 drops in 3 seconds).
[2] 125-145% flow on flow table, CRD C-621 (ASTM C 230, 5 drops in 3 seconds).
[3] 25 to 30 second flow by Corps of Engineers Flow Cone Method, CRD-C 611.

NOTE: The data shown is based on controlled laboratory tests. Reasonable variations from the results shown above can be expected. Field and laboratory tests should be controlled on the basis of the desired placing consistency rather than strictly on the water content. However, it is recommended that the flow should not be less than 25 seconds.

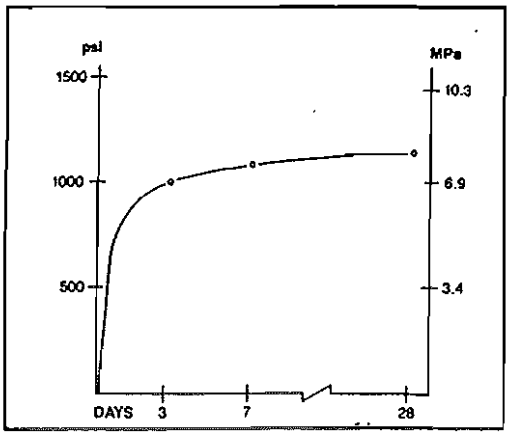
If the work requires that compressive strength test samples be made at the jobsite, do not use cylinder molds. Use 2" (50 mm) cube molds per ASTM C 109. Consult your local Master Builders representative for special procedures required when mixing and casting cubes of fluid, non-shrink grout for compressive strength tests, CRD-C 621/ASTM C 1107, as modified for premixed products.

PUNCHING SHEAR STRENGTHS**

	psi	MPa
3-day	2200	14.0
7-day	2260	14.9
28-day	2650	18.0

3"x3"x11" (76 mm x 76 mm x 279 mm) Beams

FLEXURAL STRENGTH**



ASTM C-78

	psi	MPa
3-day	1000	6.9
7-day	1050	7.1
28-day	1150	7.9

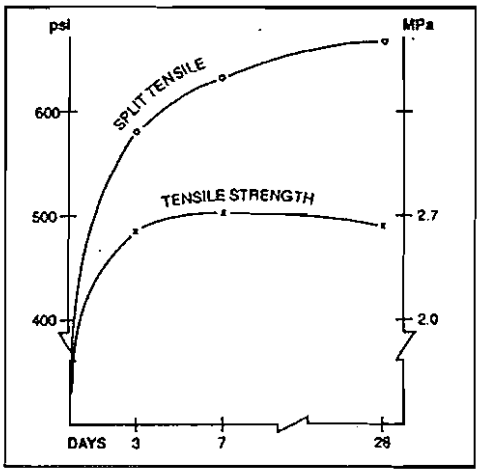
MODULUS OF ELASTICITY**
ASTM 469-87A MODIFIED

3 day	2.82×10^6 psi
7-day	3.02×10^6 psi
28-day	3.24×10^6 psi

COEFFICIENT OF THERMAL EXPANSION**
ASTM C-531

6.5×10^{-6} IN/IN/°F
(11.7×10^{-6} CM/CM/°C)

SPLIT TENSILE/TENSILE STRENGTHS**



Split Tensile - ASTM-C 496/Tensile Strength (Briquettes) ASTM-C 190

TYPICAL ULTIMATE TENSILE AND SHEAR LOADS OF ANCHOR BOLT TESTS
ASTM E-488-84 Strength of Anchors in Concrete & Masonry

	ULTIMATE TENSILE LOAD (LBS)	ULTIMATE SHEAR LOAD (LBS)
1 1/4" BOLTS - 9" EMBEDMENT IN 2 1/2" DIA. HOLE	56,000	27,500
7/8" BOLTS - 6" EMBEDMENT IN 1 3/4" DIA. HOLE	27,500	12,700
1/2" BOLTS - 4" EMBEDMENT IN 1 1/8" DIA. HOLE	7,950	2,100

(This table for threaded anchor bolts with washer and nut)

** Tests conducted at fluid consistency

RESISTANCE TO RAPID FREEZING-THAWING-ASTM-C-666-PROCEDURE A

PASSES - 300 Cycles

PRECAUTIONS:

The ambient and initial material temperature of the grout should be in the range of 45° - 90° for both mixing and placing. Ideally, the amount of water used should be that necessary to develop a 25-30 second flow for fluid applications (per CRD-611/ASTM C 939). For placement of grout outside of 45 and 90 degrees, contact a Master Builders sales representative.

When the grout will be in contact with a steel bar which is or will be stressed over 80,000 psi (552 MPa) use Masterflow® 816 cable grout.

Cure all exposed grout shoulders by wet curing for 24 hours and by applying a Master Builders curing compound, such as MB 429.

For additional information on Masterflow 928 grout or on other time-tested, high-quality grouting materials, contact your local Master Builders representative.

Masterflow 928 is a one component cement based grout which is formulated for industrial and professional use only, and must be kept out of the reach of children. These products contain chemicals which may be potentially HARMFUL to your health if not stored and used properly. Hazards can be significantly reduced by observing all precautions which are found on Material Safety Data Sheets, product labels, technical literature. Please read this literature carefully before using product.

WARRANTY:

Master Builders warranty its products are free from defects in manufacture for a period of one (1) year from date of purchase, if installed prior to expiration date and applied and used in accordance with Master Builders published specifications applicable to such products. MASTER BUILDERS EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. MASTER BUILDERS DISCLAIMS ALL LIABILITY FOR INCIDENTAL, CONSEQUENTIAL OR INDIRECT DAMAGES OF ANY NATURE WHATSOEVER. This warranty cannot be changed or modified by course of dealing, custom or trade or otherwise, unless agreed to in writing by Master Builders, Inc.

Master Builders, Inc.
23700 Chagrin Boulevard
Cleveland, Ohio 44122
216-831-5500
Fax: 216-831-6910

Master Builders Technologies, Ltd.
3637 Weston Road
Toronto, Ontario M9L 1W1
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Fax: 416-741-7925

Customer Service, Construction Products
800-227-3350

Master Builders Technologies
Grout Products
Data Sheet 9D34, MASTERFLOW® 928 GROUT

Related Bulletins
Installation Bulletin 9I51
Installation Bulletin 9I52

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Printed in U.S.A. 594

800-433-9517

MASTERFLOW® 713 GROUT

High-precision, nonshrink, natural-aggregate grout

DESCRIPTION:

Masterflow 713 grout contains specially graded, natural aggregates. It is formulated to be used at any consistency from extremely fluid to damp-pack, and is the ideal product for applications requiring precision support.

- Applications where shrinkage must be eliminated and where a grout similar in appearance to concrete and mortar is desired.
- Precision equipment, baseplate, soleplate and column grouting.
- Grouting precast wall panels, beams and columns, concrete systems, structural building members and curtain walls.
- Grouting anchor bolts and dowel rods.

FEATURES/BENEFITS:

- A ready-to-use grout that hardens free of bleeding, settlement or drying shrinkage when mixed, placed and cured at any consistency - fluid, flowable, plastic or damp-pack.
  Can be pumped into intricate areas or into areas inaccessible by conventional grouting methods.
- Provides shrinkage compensation through the expansion of hydrating mineral components.
- Develops high strengths at a fluid consistency.
- Meets all of the requirements of CRD-621, Corps of Engineers Specification for Nonshrink Grout and ASTM C1107.

PACKAGING:

Masterflow 713 grout is packaged in 55 lb (25 kg) moisture-resistant bags. Shelf life is 18 months.

ESTIMATING:

One 55 lb. (25 kg) bag of Masterflow 713 grout mixed with 11.0 lbs. (5.0 kg) [1.32 U.S. gallons (5.0 litres)] of water produces approximately 0.51 ft^3 (0.014 m^3) of grout. More or less water may be necessary to meet consistency requirements, thus increasing or decreasing the yield.

TYPICAL COMPRESSIVE STRENGTHS:

CONSISTENCY

	Plastic[1]		Flowable[2]		Fluid[3]	
	psi	MPa	psi	MPa	psi	MPa
3-day	4,900	34	3,800	26	2,800	19
7-day	6,600	46	5,500	38	4,500	31
28-day	7,800	54	7,200	50	6,500	45

NOTE: The data shown are based on controlled laboratory tests. Reasonable variations from the results given above can be expected. Field and laboratory tests should be controlled on the basis of the desired placing consistency rather than strictly on the water content.

If the work requires that strength tests be made at the jobsite or in the laboratory, do not use cylinder molds. Use 2" (50 mm) cube molds per ASTM C 109. Consult your local Master Builders representative for special procedures required when mixing and casting cubes of fluid, nonshrink grout for compressive strength tests, CRD-C 621, as modified for premixed products.

STRENGTH DEVELOPMENT:

The strength of the grout is often the determining factor in deciding when loads can be put on grouted structural members or machinery. The strength is dependent on the amount of mixing water, temperature of the object grouted, curing and age of the hardened grout.

Use of ice water to produce an ideal, as-mixed grout temperature of 50°F to 65°F (10°C to 18°C) will reduce the amount of water needed for a given consistency, and increase strengths and working time accordingly.

PRECAUTIONS:

The temperature of the mixed grout should be in the range of 45°F to 70°F (7°C to 21°C). **Do not use water in an amount or at a temperature that will produce a flow of less than 20 seconds (CRD-C 611) or cause the mixed grout to bleed or segregate.** If outside that range, special information on high or low temperature grouting techniques is available from your local Master Builders representative. For pours greater than 6" deep, consult your Master Builders representative for additional installation procedures. When the grout will be in contact with steel which is, or will be, stressed over 80,000 psi (552 MPa), use Masterflow® 816 cable grout.

NOTE: For even greater impact resistance - a desirable property in grout subjected to sever, dynamic operating forces and repetitive loading - use metallic-reinforced Embeco® 885 or 636 grout. Applications which would require such resistance include crane rail plates, heavy presses and steel and aluminum rolling mills.

[1] 100% flow on flow table, ASTM C 230, 5 drops in 3 seconds
[2] 135% flow on flow table, ASTM C 230, 5 drops in 3 seconds.
[3] 20 to 30 second flow by Corps of Engineers Flow Cone Method, CRD-C 611

Master Builders Technologies

SUPPLIER DOCUMENT SUBMITTAL

PROD #7284 Vol. 3

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-006	REV: 0	DATE: June 7,2000	PA 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

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

RECEIVED BY: Denise Wentz DATE: 6/8/00

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
8	641-03100-006	0						X			Conseal CS-55		X		03100	X		

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Jim Jenkins	52-5				
Tom Essue	52-0				
Rob Kneup	52-5				
B. Scott Wheeler	52-5				
Kwasi Baw Tweneboah	~~64~~ 38				

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

Section 03100, Part 1.04A does not require this submittal. However, Section 03100, Part 2.01C.4. specifies this product. Clarify Submittal!

RECEIVED BY: K Baldwin DATE 6/13/00

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

ORIGINAL

SEAL OF SECURITY

CONCRETE SEALANTS INC
8917 S. Palmer Road, Box 176
New Carlisle, Ohio 45344
Phone: (513) 845-8776
FAX: (513) 845-3587

BOND OF TRUST

Technical Product Bulletin

Damp-Proofing Concrete with

ConSeal™ CS-55

Water Based Concrete Coating

Product Description

ConSeal CS-55 is an extremely fast-drying, water and polymer-based concrete coating for use on all types of concrete structures.

Manufactured with non-toxic, environmentally friendly ingredients, CS-55 features an extremely low VOC content, may be applied with a brush, roller or sprayer and cleans up quickly with plain soap and water!

Product Features

Environmentally Friendly Water and Polymer-Based Formula

- Creates a hard, smooth polymer film that protects the structure from water intrusion and chemical attack.
- . Extremely low VOC (Volatile Organic Compound) content.

Extremely Fast Drying

- Dries in 5-10 minutes at 72°F and 15-20 minutes at 40°F. (Many asphalt based coatings require 48-72 hours.)
- Fast drying time helps minimize mess on job site.
- Allows coating and transporting structure almost immediately — or coating and drying on-site, if preferred.

Spray, Brush or Roll On for Three Times the Coverage of Asphalt-Based Products

- May be applied with choice of brush, paint roller or sprayer.
- One gallon of CS-55 covers 300-350 square feet of wet cast concrete. (Asphalt-based coatings typically cover only 75-125 square feet per gallon.)

May Be Applied Across A Broad Range of Temperatures

- 40°F to 120°F
- 4°C to 48°C

Cleans Up Quickly with Soap and Water

- Washes easily off skin.
- No dangerous solvents required.

Product Applications

Designed for exterior application as a damp-proof coating on...

- Manholes
- Septic Tanks
- Utility Vaults
- Concrete Pipe
- Concrete Pipe
- Burial Vaults
- Similar Structures

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-03100-006
Reviewed By: Rus
Date: 6/06/00

Toll-Free Technical Assistance

Call Concrete Sealants for...
...Fast answers to your questions about any ConSeal product
...Help choosing the right product and size for your application
...Assistance with estimating how much product you'll need
...The industry's best technical support program, featuring TOLL-FREE access to the answers you need to solve your concrete sealing problems

1-800-332-SEAL
(1-800-332-7325)

Technical Data

ConSeal™ CS-55 Water-Based Concrete Coating

Damp-Proofing with CS-55 Water-Based Concrete Coating

Scrape Adhesion Performance

The following are the results of a comparative study between ConSeal CS-55 and an asphalt foundation damp-proofing. The testing was conducted in accordance with **ASTM D-2197.** Testing involved the application of two coats of material to concrete blocks. Test specimens were given ample time to dry at an ambient temperature of 77°F (25°C). Asphalt coating dried within 48 hours. ConSeal CS-55 dried within 5 minutes.

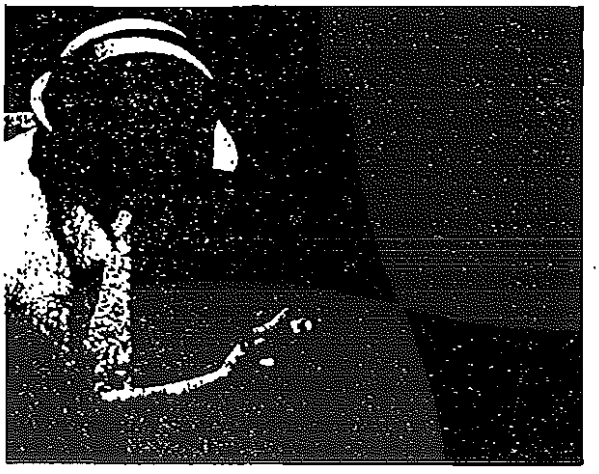
Film Millage	Asphalt Coating 0.071"	ConSeal CS-55 0.0038"
Force Applied	Result	Result
500 g	Passed Minimal Damage	Passed No Damage
1000 g	Failed 2/3rd Coating Scraped Off	Passed No Damage
1500 g	Failed Complete Film Removal	Passed Minimal Damage
2000 g	Failed Complete Film Removal	Passed Minimal Damage
2500 g	Failed Complete Film Removal	Passed Minimal Damage

Applying CS-55

If CS-55 is being used purely for decorative purposes, a single coat should be sufficient.

However, if CS-55 is being applied as a barrier to water and certain chemicals, we recommend that two coats be used.

We have found that CS-55 can be applied effectively with brush, paint roller or sprayer. If the spray method is used, we recommend a ***.011" to .013" spray tip*** opening for best results. An excellent air-powered sprayer for applying CS-55 may be obtained from Graco. For more information about this sprayer, you may contact Graco directly, TOLL-FREE at 1-800-328-0211.



HDPE PIPES AND FITTINGS

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-001	REV: 1	DATE: 27-Jul-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE: 7/26/00

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
8	641-02605-001	1						X			HDPE pipe and fittings data		X		02605		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525			RECEIVED	
Tim Cherry	525				
Jim Jenkins	525			AUG 02 2000	
Mike Godber	525				
Rob Kneip	64				
Scott Wheeler	525				
Kwasi Baw Tweneboah	64				

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

Need to resolve centralizer spacing and human machine pressures and temperatures!

RECEIVED BY: K. Boehnke DATE 8/2/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

Response to comments on 1.04 A-1

This is 5 ft. specs
~~using the maximum or~~
per ~~Manufacturer's reco~~
whichever is less.

A. The distance between centralizers will be 60".

B. Centralizers are hot air welded on the interior. The end, or exterior centrailizer will be extrusion welded

C. Please see drawing for monitoring ports, and fixed end seals

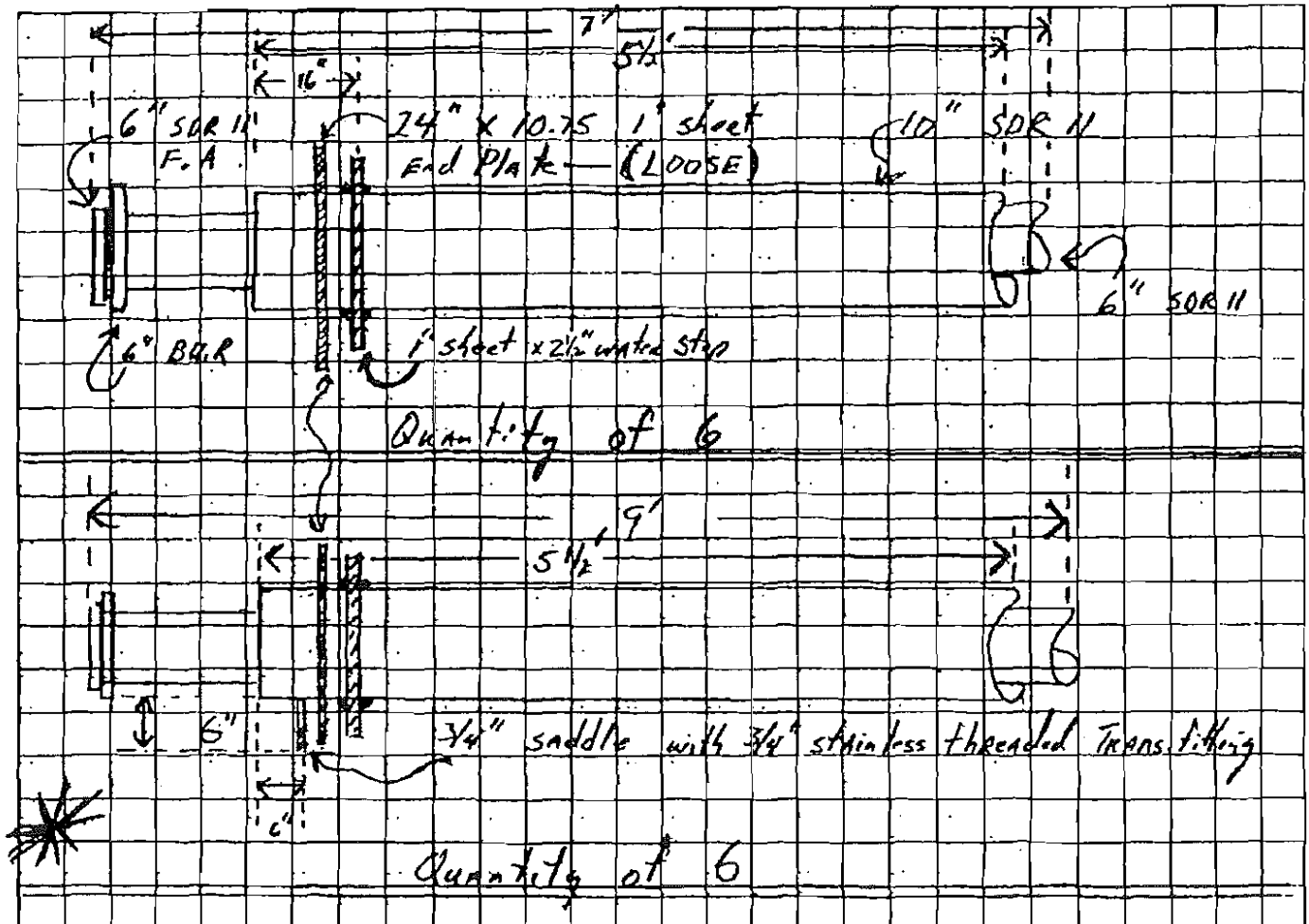
If DSCO plans ~~to~~ go with 5 ft
then we need a DCN!

KBT

IRRIGATION SUPPLY CO., INC. • (502) 583-6591

By Rick Hart Date 6-17-00 Date Due 7- -00

Hours _____ Job _____



* Same as top Drawing.
Except
1.) 6" is longer
2.) add 3/4" Tap.

Note

DRISCOPIPE

DRISCOPIPE® SYSTEMS INSTALLATION

Driscopipe products have been installed in many applications above and below ground. Polyethylene pipe has been used to cross land, lakes, deserts, bogs, and arctic tundra. Each installation requires thorough consideration of the environment in which the pipe is being installed.

Typical pipe installations can be categorized as one of seven types. The following pages discuss design details for each type of installation.

TYPE 1: Supported or Suspended Pipelines
TYPE 2: Overland Pipelines
TYPE 3: Marine Pipelines
TYPE 4: Water Surface Pipelines
TYPE 5: Marsh Pipelines
TYPE 6: Sliplined Pipelines
TYPE 7: Buried Pipelines

SUPPORTED OR SUSPENDED PIPELINES

Horizontally supported pipelines are affected by the weight of the pipe and its contents between supports. When the sag or deflection between supports is minimized, the stress in the pipe wall can be controlled. Supports should be spaced to limit the mid-span deflection to about ¼" using a simple, continuous beam analysis.

Supports should cradle the pipe for at least 4" or 1.5 times the pipe diameter, whichever is greater. A minimum of 120° of the pipe's circumference should be supported. The supports should be free of sharp edges.

Often, supported pipelines are installed outdoors. These installations are exposed to temperature changes due to weather. If possible, a supported or suspended pipeline should be installed as near its maximum operating temperature as practical (or in the hottest weather).

When a supported system is warmer than its installation temperature, the pipe will expand. As the pipe increases in length, lateral deflection or "snaking" will occur between restraints. The total amount of expansion that will occur depends on the pipe's length and the temperature increase above the system's installation temperature. While the total amount of expansion in a pipe cannot be changed, the designer can limit the deflection in a section of the pipe by selecting appropriate anchoring points.

The pipe must be restrained at all fittings and can be restrained at each support. Clamping the pipe at each support is recommended to limit deflections due to expansion. If the support is designed as an anchor point, it must be capable of restraining the pipe. If the pipeline is designed to move during expansion, the supports should provide a guide without restraint in the direction of movement.

PIPE SUPPORT SPACING Figures 9 through 13 give the required design support spacing for various DRs and pipe diameters. The distance between supports is based upon a continuous beam analysis and a mid-span deflection of 0.25" when the pipe is filled with water.

DRISCOPIPE

Figure 9: Pipe Support Spacing for DR32.5

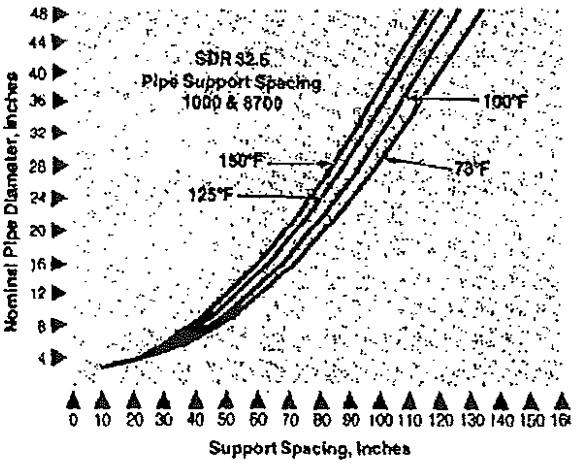


Figure 10: Pipe Support Spacing for DR26

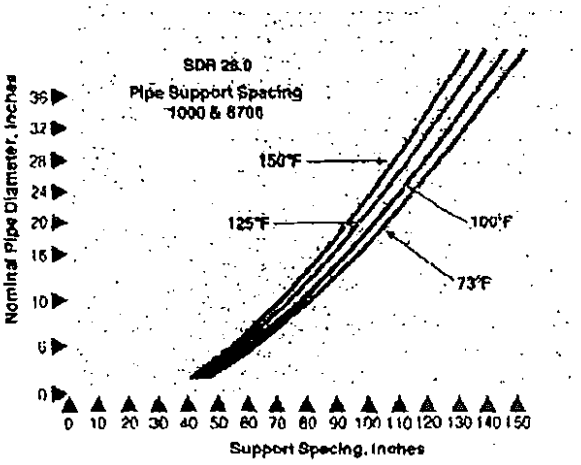


Figure 11: Pipe Support Spacing for DR17

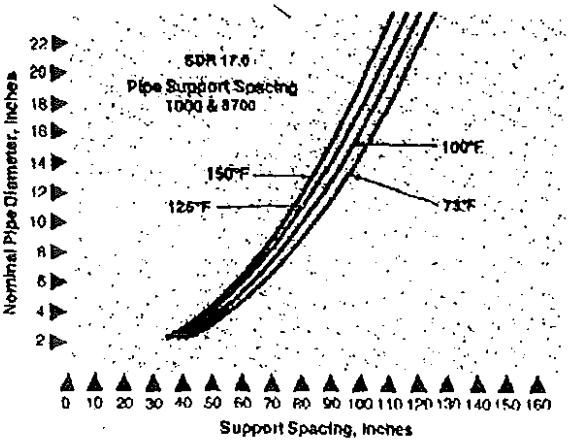


Figure 12: Pipe Support Spacing for DR11

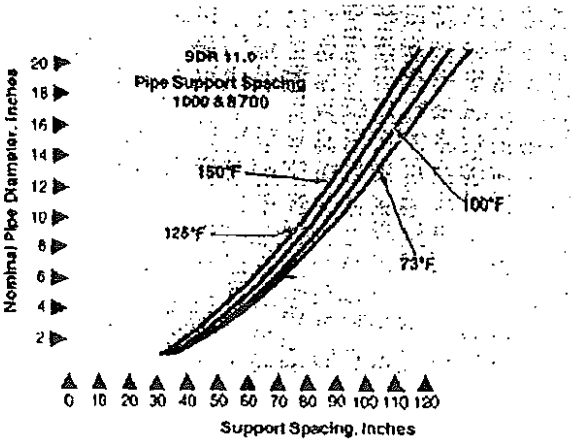
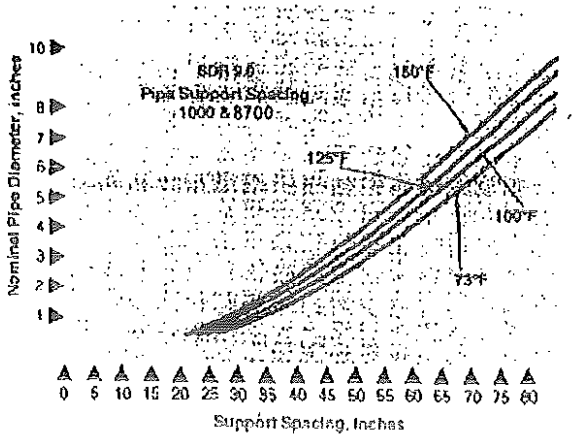


Figure 13: Pipe Support Spacing for DR9



Submittal 1.04-A-2

MATERIALS	SUPPLIER	DELIVERY
6"/10" SDR 11 Piping	Phillips Driscopipe 1000	July 2000
6" Flange SDR 11 Adapters/Fittings	Central Plastics	July
Back Up Rings	Improved Piping Products	July

*Fixed end seals are byKing Plastics, submitted under a separate cover.

SUBMITTAL 1.04 A-5

PHILLIPS DRISCOPIPE
A DIVISION OF PHILLIPS PETROLEUM COMPANY
http://www.driscopipe.com
2929 NORTH CENTRAL EXPRESSWAY, SUITE 300
P.O. BOX 83-3866
RICHARDSON, TEXAS 75083 • 972/783-2666

July 18, 2000

Environmental Stress Cracks

Mr. Rick Hart
ISCO Industires, Inc.

Dear Mr. Hart,

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Phillips Marlex TR-480 feedstock resin. The resin is manufactured by Chevron Phillips Chemical Company. The resin has a cell class of PE 345466C 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. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23° C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

If you have any further questions or need my assistance in any way please feel free to call the number below.

Sincerely,

Al Wilkes
Sr. Technical engineer
The Performance Pipe Company

Central Plastics

Fortiflex® HDPE

K44-15-123

Fortiflex® K44-15-123 is a black high density polyethylene copolymer designed specifically for extrusion of potable water, industrial, and mining pipe. It has NSF certification and is recognized by the Plastic Pipe Institute as having a PE 3408 rating. The natural version of this resin is available as Fortiflex® K44-15-122.

Property	ASTM Test Method	Typical Values English Units	Typical Values SI Units
Density (Natural)	D 4883	–	0.944 g/cc
Density (Black)		–	0.955 g/cc
Melt Index [1]	D 1238	–	13.0 g/10 min
Tensile Strength			
@ Yield (2 in/min)	D 638	3300 psi	22.8 MPa
@ Break (2 in/min)	D 638	4500 psi	31.0 MPa
Elongation			
@ Break (2 in/min)	D 638	>800%	>800%
Flexural Modulus [2]	D 790	120,000 psi	827 MPa
Notched Izod Impact Strength	D 256	6 ft-lb/in	0.32 kJ/m
Hardness (Shore D)	D 2240	68	68
Vicat Softening Point	D 1525	259°F	126°C
Brittleness Temperature	D 746	<-180°F	<-118°C
Hydrostatic Design Basis			
@ 23°C	D 2837	1600 psi	11.0 MPa
@ 60°C	D 2837	800 psi	5.5 MPa
Environmental Stress Crack Resistance [3]	D 1693	>2000 hrs	>2000 hrs
Environmental Stress Crack Resistance [4]	D 1693	>5000 hrs	>5000 hrs
Pipe Ring ESCR [5]	F 1248	>5000 hrs	>5000 hrs
Notch Tensile (PENT)	F 1473	>30 hrs	>30 hrs
Carbon Black Concentration	D 1603	2.6%	2.6%
Cell Classification	D 3350	345444C	345444C

(01/15/98)

1 190°C/21600 g
2 2% Secant Method 1
3 Condition B, 10%
4 Condition C
5 Two inch, SDR 19

Solvay Polymers, Inc., 3333 Richmond Avenue, Houston, Texas 77098-3099 1-800-231-6018
Fax: 713/522-3613 Mailing Address: P.O. Box 27619, Houston, Texas 77227-7228
Technical Service: 1-800-335-0499 Customer Order Service: 1-800-527-5419

Fortiflex® is a registered trademark of Solvay Polymers, Inc. To the best of our knowledge the information contained herein is accurate. However, neither Solvay Polymers, Inc. nor any of its affiliates assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of the suitability of any information or materials for the use contemplated, the manner of use, and whether there is any infringement of patents is the sole responsibility of the user. This more information form typical properties only and is not to be used for specification purposes.

Solvay Polymers

SOLVAY

Response to Comments on 1.04 A-6

The only values available are shown on the table that was submitted originally. We will provide certified values for pipe shipped to your site.

Submittal Comment on Section 1.04 A-7

Fusion pressure setting to be used when joining Phillips Driscopipe 1000 series 10" SDR 11 on a McElroy 412 high velocity machine is 407 psi. ?

Fusion pressure setting to be used when joining Phillips Driscopipe 1000 series 6" SDR 11 on a McElroy 412 high velocity machine is 172 psi. ?

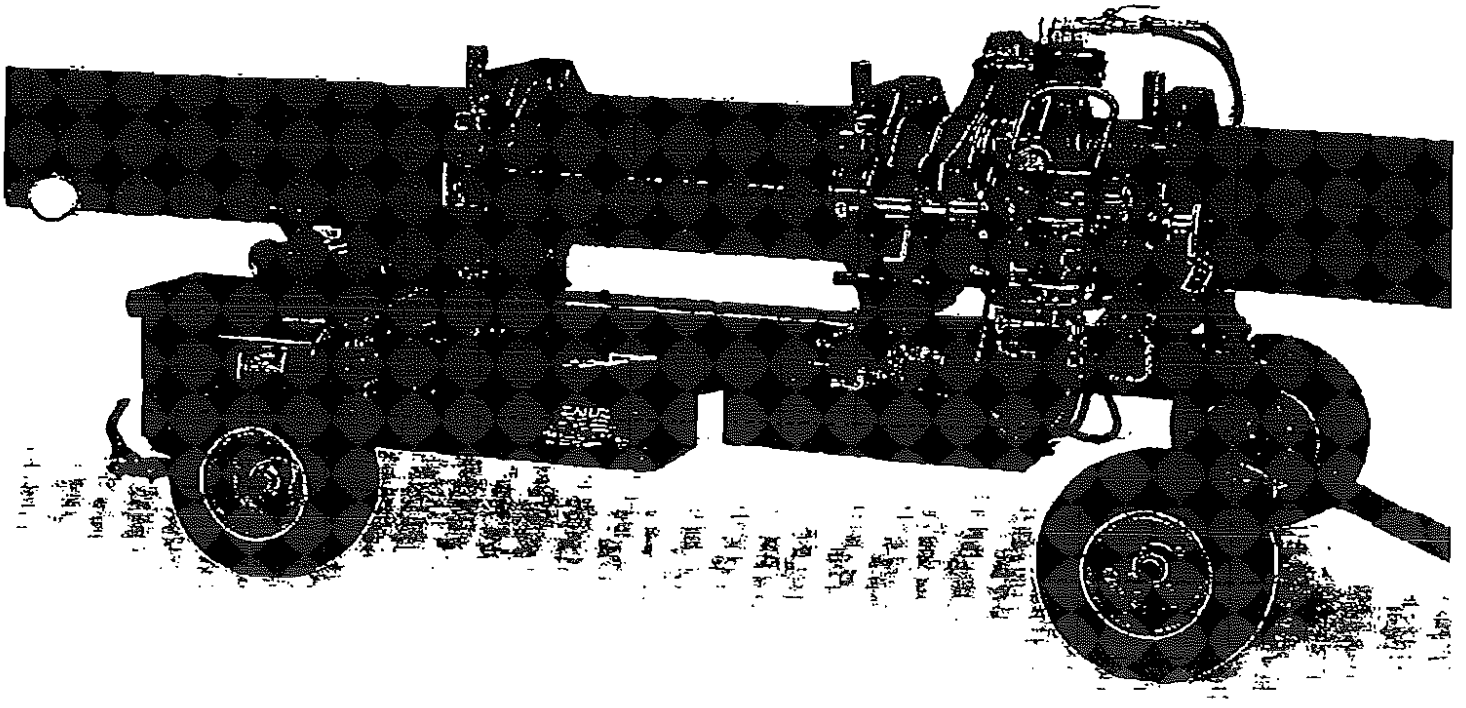
The recommended thermometer reading on a coated heater plate is 400 to 425.

this is not what we have on-site !!

McElroy Manufacturing, Inc.

McElroy Advances Self-Contained Hydraulic Fusion

No. 412: 4" IPS—12" DIPS; 110mm—315mm
No. 618: 6" IPS—16" DIPS & 18" IPS; 160mm—450mm



Specifications Subject To Change
Bulletin No. 1204965M
Printed in U.S.A.
Member AGA, AWWA, DCA, NUCA, PPI, WEF.
©1996 McElroy Manufacturing, Inc.

Welcome to the newest advancements in self-contained fusion machines, brought to you by the inventors and leaders of this world-proven technology: McElroy.

Introducing the improved McElroy No. 412 and No. 618 Hydraulic Fusion Machines. More power. Less maintenance. Quieter. More pipe size capability. Enhanced operator productivity, ease of training, use and safety.

Butt Fusion Versatility

- No. 412: 4" IPS—12" DIPS; 110mm—315mm
- No. 618: 6" IPS—16" DIPS & 18" IPS; 160mm—450mm
- Easily accommodates fusion of most fittings
- Fabrication of mitered ells

More Power

- 18 horsepower, V-twin gasoline engine
- California Air Resource Board-compliant
- Significantly less noise and vibration for operator comfort
- OPTIONAL diesel or electric power

Precise Facing

- Hydraulic-driven cutter block with maintenance-free sealed ball bearings; faces heaviest wall pipe with ease
- Facer stops ensure square surfaces for fusion
- Safety feature locks facer in open or closed position

Lightweight Heater

- Superior performance heater technology
- Easy reading, precise temperature control
- Rapid heating; 500° F in 15 minutes
- Durable anti-stick coating
- Half the weight of conventional heaters; easier operator use with less strain and fatigue

Centerline Guidance

- Patented McElroy system creates maximum joint quality and reliability with minimal maintenance

Semiautomatic Hydraulic Control System

- Simple-to-use system makes joining practically foolproof
- Engine-driven hydraulic pump and alternator
- Compact hydraulic manifold block
- Fully compatible with McElroy DataLogger™
- Control valves for carriage movement and pressure reducing valve selection
- Pressure reducing valves to preset facing, heating and fusion pressures

Ease of In-Ditch Use

- Compact, easily removable three jaw carriage assembly for remote operation
- OPTIONAL hydraulic extension hoses with quick disconnects for close quarter operation

Additional Features

- Only one operator required
- Total insert compatibility—accepts all tooling from all previous McElroy No. 412 and No. 618 machines
- Heavy duty steel fabricated front axle built for the most punishing of field assignments
- Hydraulic pipe lift assists pipe handling
- Manifold block protection with built-in lift point to assist in removing top works for in-ditch use
- Low maintenance, heavy duty parking brake
- Battery located for ultimate protection
- Minimized hydraulic connections for low maintenance
- Pressure gauge with dual pressure face for PSI and BAR readings
- Voltmeter and digital hour meter as standard equipment

The advanced No. 412 and No. 618 Fusion Machines—the newest reason why McElroy Manufacturing is *The Leader By Design.*

McElroy Manufacturing, Inc.
The leader by design.

P.O. Box 580550, Tulsa, Oklahoma 74158-0550
918-836-8611
Marketing & Sales Fax 918-831-9256
General Fax 918-831-9285

SPECIFICATIONS

Model Number	Pipe Size Range		Dimensions			Weight lbs./kg.			
	Minimum Inches/cm	Maximum Inches/cm	Length Inches/cm	Width Inches/cm	Height Inches/cm	Facer	Heater	Top Works	Machine
412	4" IPS/110mm	12" DIPS/ 315mm	93 3/8"/ 237.2cm	69"/ 174.46cm	49 1/4"/ 125.10cm	20#/35.82kg	20#/9.07kg	260#/117.94kg	1225#/ 555.66kg
618	6" IPS/160mm	16" DIPS 18" IPS/ 450mm	93 3/8"/ 237.2cm	69"/ 174.46cm	50"/ 127.0cm	115#/52.16kg	29#/13.15kg	370#/167.83kg	1335#/ 605.56kg

McELROY NO. 412 FUSION MACHINE

Features & Benefits

1. The No. 412 Fusion Unit is fully self-contained and capable of generating sufficient pressures to fuse the full range of pipe densities and SDR's from 4" IPS through 12" DIPS; 110mm - 315mm, and 6" through 12" fittings. Mitered inserts are available for fabricating ells, as well as metric insert sizes.

2. The unit is driven by a 18 HP V-twin gasoline engine design, elect-start w/choke. The engine is coupled to an "oil gear" pressure compensated piston pump, which in turn, provides hydraulic power for carriage movement, pipe lift cylinder and facer operation. A 4,000 watt, 220 Volt, single phase, 60 Hertz alternator is also coupled to the engine to power the heater plate. Over current protection is provided at the alternator through the use of circuit breakers. It has been relocated to the operator's side to allow direct electrical plug-in.

3. California Air Resources Board-compliant. Less noise at the operator controls, and less vibration for the operator comfort. Quieter through reduction of dB's by approximately 5dB.

4. Our centerline guidance system ensures equal pressure application around inner face of pipe ends for optimum joint integrity.

5. Added 9" to the distance between the Stationary Jaws to make it easier to fabricate fittings and to have a common chassis between the 412 and 618 machines.

6. Improved lifting device (Sling Type). Top works are removable for in-ditch fusion.

7. Return to center pipe lift control valve.

8. Hydraulic pipe lift facilitates pipe removal.

9. Heavy Duty Manifold Block guard w/ Built-in lift point.

10. There are multiple deep serrations in all jaws and inserts. This, combined with thrust bearings in the clamp knobs, minimizes force required to clamp the pipe, as well as prolonging the life of these parts. Clamp pads reduce wear as well.

11. Semi-automatic hydraulic controls simplify operator training. Facing, heating and fusion pressures can be pre-set and locked so repeatability is assured.

12. Stronger Steel Fabricated front axle, pivoting front axle helps to level the unit in rough terrain.

13. Hydraulic reservoir with sight glass is incorporated in the frame, eliminating the need for cooling coils.

14. Hour meter helps to track operation time so maintenance can be scheduled.

15. Improved hand brake has been moved to operator's side.

16. Auxiliary quick disconnect hydraulic outlets allow operation of other hydraulic tools.

17. Bolt on Steel Gas Tank.

18. Improved battery location for ultimate protection. It has more cold crank power for better efficiency.

19. High flotation tires allow for easy mobility in rough terrain.

1.04 B & C

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
11711 Hopewell Rd
Hagerstown MD 21740

July 25, 2000

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

CUSTOMER: Isco Industries
PO Box 4545
Louisville KY 40204

ATTENTION: Quality Assurance

CUSTOMER ORDER NO: 8342 Direct
PHILLIPS ORDER NO: 5053643
SHIPPING DATE: 07/19/00
QUANTITY 3,400 ft
EXTRUSION DATE(S): 10/00 03/00 05/00

PRODUCT: 10" dr 11 1000

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density, high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TRC as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

Shen Eckles-Perucci
Services Supervisor Assistant

PHILLIPS DRISCOPIPE INC

PAGE 1

PLANT I-HS Product Description 10P 10 00" SDR 11 00 0040" J1

PRINT OUT DATE 07/25/2000

PRODUCTION ORDER NUMBER 100067226

Start Date 10/03/1999

End Date 10/3/99

Minimum Wall (IN)	0.959	Minimum Toe-In (%)	0.930
Maximum Wall (IN)	1.052	Maximum Toe-In (%)	0.976
Minimum OD (IN)	10.750	Minimum Hoop Stress (PSI)	3329
Maximum OD (IN)	10.755	Maximum Hoop Stress (PSI)	3329
Minimum ID (IN)	8.699	Minimum Ring Tensile (PSI)	
Maximum ID (IN)	8.716	Maximum Ring Tensile (PSI)	
Minimum Eccentricity (%)	3.942	Minimum Carbon Black (%)	2.300
Maximum Eccentricity (%)	5.038	Maximum Carbon Black (%)	2.300
Minimum Out of Round (IN)		Minimum Melt Index	
Maximum Out of Round (IN)		Maximum Melt Index	
Minimum Ovality (%)		Resin	TR460Z
Maximum Ovality (%)		Lot	8291293
Number of Samples	2		

JUL-25-00 03:02P P.10

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 792 • PHONE 713 475-3866
PASADENA, TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

September 03, 1999

KSL# 25014-99

FAX. 301-582-6670

Phillips Driscopipe
11711 Hopewell Road
Hagerstown, MD 21741

Quality Control

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

Type:	HHM TR-480Z
Lot Number:	8291293
P.O. Number:	REL 95
Date Shipped:	09/02/99
Package:	PSPX 1561
Quantity:	187950 LBS.
Melt Index, ASTM D1238:	.11 G/10 MIN ✓
Density, ASTM D1505:	.944 G/CC ✓
ESCR, F/20:	>192 HOURS ** ✓

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

PHILLIPS DRISCOPIPE, INC

PAGE 1

PLANT HG Product Description 10P 0.00 SDR 11.00 0040 JT

PRINT OUT DATE: 07/25/2000

PRODUCTION ORDER NUMBER 100090889

Start Date 03/25/2000

End Date 3/26/00

Minimum Wall (IN)	0.978	Minimum Toe-In (%)	0.735
Maximum Wall (IN)	1.035	Maximum Toe-In (%)	0.866
Minimum OD (IN)	10.743	Minimum Hoop Stress (PSI)	3287
Maximum OD (IN)	10.765	Maximum Hoop Stress (PSI)	3369
Minimum ID (IN)	8.695	Minimum Ring Tensile (PSI)	
Maximum ID (IN)	8.772	Maximum Ring Tensile (PSI)	
Minimum Eccentricity (%)	2.126	Minimum Carbon Black (%)	2.540
Maximum Eccentricity (%)	2.634	Maximum Carbon Black (%)	2.670
Minimum Out of Round (IN)		Minimum Melt Index	0.100
Maximum Out of Round (IN)		Maximum Melt Index	0.100
Minimum Ovality (%)		Resin	TR480
Maximum Ovality (%)		Lot	7100062
Number of Samples	5		

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 700 • PHONE: 713 475-5000
PASADENA, TEXAS 77501-0700

PHILLIPS PLASTICS RESINS
"Making Chemistry Company"

January 21, 2000

KSL# 1785-00

FAX: 301-582-6670

Phillips Driscopipe
11711 Hopewell Road
Hagerstown, MD 21742

Quality Control

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

Type:	HHM TR-4802
Lot Number:	7100062
P.O. Number:	REL 12
Date Shipped:	01/21/00
Package:	PSPX 1582
Quantity:	187400 LBS.
Melt Index, ASTM D1238:	.11 G/10 MIN ✓
Density, ASTM D1505:	.945 G/CC ✓
ESCR, F/20:	>192 HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

TOTAL P.01

PHILLIPS DRISCOPIPE INC

PAGE 1

PLANT HC Product Description 10P 10.00" DR 11.00 0040" JT

PRINT OUT DATE 07/25/2000

PRODUCTION ORDER NUMBER 100095028

Start Date 05/29/2000

End Date 5/31/00

Minimum Wall (IN):	1.003	Minimum Toe-In (%):	0.867
Maximum Wall (IN):	1.059	Maximum Toe-In (%):	1.785
Minimum OD (IN):	10.724	Minimum Hoop Stress (PSI):	3307
Maximum OD (IN):	10.757	Maximum Hoop Stress (PSI):	3391
Minimum ID (IN):	8.633	Minimum Ring Tensile (PSI):	2946.115
Maximum ID (IN):	8.716	Maximum Ring Tensile (PSI):	2946.115
Minimum Eccentricity (%):	2.088	Minimum Carbon Black (%):	2.470
Maximum Eccentricity (%):	3.636	Maximum Carbon Black (%):	2.540
Minimum Out of Round (IN):	0.080	Minimum Melt Index:	0.110
Maximum Out of Round (IN):	0.192	Maximum Melt Index:	0.140
Minimum Ovality (%):	0.746	Resin:	TR-4802
Maximum Ovality (%):	1.786	Lot:	7100588
Number of Samples:	6		

JUL-26-00 03:01P P.06

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 181 • PHONE (713) 476-3000
PASADENA TEXAS 77501-0181

PHILLIPS PLASTICS BRANCH
Houston Chemical Complex

May 11, 2000

KSL# 12265-00

FAX. 301-582-6670

Phillips Driscopipe
11711 Hopewell Road
Hagerstown, MD 21741

Quality Control

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

Type:	HDPE TR-480Z
Lot Number:	7100588
P.O. Number:	REL 54
Date Shipped:	05/11/00
Package:	PSPX 9016
Quantity:	182500 LBS.
Melt Index, ASTM D1238:	.13 G/10 MIN
Density, ASTM D1505:	.944 G/CC
ESCR, F/20:	>192HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Connie Buckner, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
11711 Hopewell Rd
Hagerstown MD 21740

July 25, 2000

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

CUSTOMER: Isco Industries
PO Box 4545
Louisville KY 40204

ATTENTION Quality Assurance

CUSTOMER ORDER NO: 8342 Direct
PHILLIPS ORDER NO: 5053643
SHIPPING DATE: 07/19/00
QUANTITY: 2,400 ft
EXTRUSION DATE(S): 05/00

PRODUCT: 6" dr 11 1000

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company, LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 2408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

Sheri Eckles-Petricci
Services Supervisor Assistant

PHILLIPS DRISCOPIPE, INC

PLANT HG Product Description 10P 06 00" DR 11.00 0040' JT

PRINT OUT DATE 07/19/2000

PRODUCTION ORDER NUMBER 100092774

Start Date 5/16/00

End Date 5/17/00

Minimum Wall (IN):	0.618	Minimum Toe-In (%):	0.362
Maximum Wall (IN):	0.658	Maximum Toe-In (%):	0.483
Minimum OD (IN):	6.617	Minimum Hoop Stress (PSI):	3338
Maximum OD (IN):	6.624	Maximum Hoop Stress (PSI):	3360
Minimum ID (IN):	5.340	Minimum Ring Tensile (PSI):	
Maximum ID (IN):	5.371	Maximum Ring Tensile (PSI):	
Minimum Eccentricity (%):	1.716	Minimum Carbon Black (%):	2.450
Maximum Eccentricity (%):	5.319	Maximum Carbon Black (%):	2.830
Minimum Out of Round (IN):		Minimum Melt Index:	0.110
Maximum Out of Round (IN):		Maximum Melt Index:	0.110
Minimum Ovality (%):		Resin	TR-480
Maximum Ovality (%)		Lot	8200608
Number of Samples	4		

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 762 • PHONE (713) [illegible]
PASADENA, TEXAS 77501-[illegible]

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

May 01, 2000

KSL# 11285-00

FAX: 301-582-6670

Phillips Driscopipe
11711 Hopewell Road
Hagerstown, MD 21741

Quality Control

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

Type:	HHM TR-480Z
Lot Number:	8200608
P.O. Number:	REL 46
Date Shipped:	05/01/00
Package:	PSPX 6809
Quantity:	198900 LBS.
Melt Index, ASTM D1238:	.11 G/10 MIN
Density, ASTM D1505	.944 G/CC
ESCR, F/20:	>192HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Connie Buckner, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

SUPPLIER DOCUMENT SUBMITTAL

DWS 8/3/00

FDF PROJ NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-002	REV: 32	DATE: 02-Aug-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

Ron Wood

SIGNATURE: Ron Wood

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

RECEIVED BY: Denise Wentz DATE: 8/3/00

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
8	641-02605-002	32 DWS 8/3/00						X			HDPE Pipe Testing & Training		X		02605	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Bob Kneup	52-5				
B. Scott Wheeler	52-5				
Kwasi Bawtwenebnah	64				

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

① Previous submittal had wider heater plate temperature range - Consider slightly wider range per Driscopipe.
② Minor note added to hydrostatic test procedure.

RECEIVED BY: [signature] DATE 8/9/00

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

ENTERED

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

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

ORIGINAL

INFORMATION ONLY

RIECK
Mechanical Electrical Services, Inc.
Platers, Constructors & Maintainers

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-002
Reviewed By: RW
Date: 8/2/00

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: RW Date: 8/9/00

Training & Certifying Joiners in Butt-Fusion of HDPE Pipe, Tubing & Fittings

An ISCO Industries instructor will conduct onsite training of welders assigned to perform Butt-Fusion of HDPE pipe and fittings. Welders of HDPE Pipe on the ELPTS Project will be trained to perform Butt- Fusion welding on the McElroy No. 412 Fusion Machine. The 412 Fusion Machine is capable of Butt-Fusing Pipe in the 4" IPS to 12" IPS range. Each joiner will be instructed according to the following criteria.

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 for each fusion apparatus used that day. Each joiner shall make at least one trial joint per day. Trial joining shall be conducted under the same conditions as the actual joining. Prepare trial joints that are at least 2 feet long.

1. Verify that there are no obstructions inside of the pipe.

2. Clean the pipe with a clean oil free rag prior to facing. Cleaning should extend approximately one inch beyond the face of the pipe. Observe that the joint is free of moisture , dust, dirt and debris of any kind.

3. Face the pipe properly. The wheel pressure for facing shall be approximately 75 to 80 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.

4. Remove all shavings 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. Properly align the pipe prior to joining. Adjust the jaws if necessary to achieve proper alignment. NOTE: If there is realignment the pipe shall be refaced.

6. The heater plate should be between 400° and 425° F. NOTE: The heater plate shall be cleaned with a clean oil free cloth.

7. Insert the heater plate into the machine and bring the pipe ends into firm contact with the plate. The pipe should be under 0 pressure when being heated.

8. Heat pipe long enough to achieve a 1/8 to ¼ inch high melt bead prior to removing the plate.

9. The pressure settings for the McElroy 412 Standard machine are as follows: 10" SDR 11 pipe will be fused at approximately 218 PSI. 6 " SDR 11 pipe will be fused at 101 PSI.

10. Allow the weld to cool to the touch before removing clamps.

11. Perform bent strap test according to approved test plan.

RIECK
Mechanical Electrical Services, Inc.
Planners, Constructors & Maintainers

TEST PROCEDURE FOR HYDROSTATIC UNDERGROUND HDPE PIPING

1. System is to be flanged off at all but one opening to allow for filling of system with water. Once system is filled with water, fill flange valve will be closed. The flange on the upstream (high point) side will have a vent to release trapped air.

2. A hydrostatic pump will be connected to inlet side (low side) of fill flange and power applied to create hydrostatic pressure on a calibrated gauge of proper resolution within the boundary of the system test.

3. Installed HDPE solid wall, carrier, and containment pipe will be pressure tested with a minimum 6 inches of initial backfill placed over the containment pipe. Joints, fittings, and flanged connections of containment pipe will remain uncovered so that they can be visually inspected for any leaks.

4. Test will be performed in the presence of the CQC Consultant. Containment pipe testing shall not proceed until the carrier pipe has been successfully tested.

5. HDPE solid wall carrier pipe will be tested at 60-psi internal pressure. Containment pipe shall be at atmospheric pressure when testing carrier pipe. → Verified with gauge or opening to atmos. MB 8/9/00

6. HDPE containment pipe will be tested at 15-psi internal pressure. Carrier pipe shall be at atmospheric pressure when testing containment pipe. Verified as above MB 8/9/00

7. Initial expansion phase: Piping shall stand at the specified internal pressure until stabilization has been reached. Sufficient make-up water will be added to the pipe four times at one-hour intervals to return to the test pressure. Stabilization will be achieved if there is no further change in pressure over a one-hour period. The initial expansion phase shall not exceed 4 hours.

8. Actual test phase: Testing will start after the fourth addition of make-up water in the initial expansion phase. Testing will be performed for 1 hour. Make-up water will be added to return the pipe pressure to the test pressure. A passing test will require less make-up water than the attached table shows (adjusted for actual test pressure & ambient temperature). A failing test will require identification of any leaks and if leaks exist, repair and retest.

9. Alternative test: Initial expansion phase test will be performed at 70 psi internal pressure for carrier pipe and 25-psi internal pressure for containment pipe. Test pressure will be maintained over a 4-hour period as specified. Test pressure will be dropped by 10-psi in accordance with recommendations of AWWA (1999). If the pressure remains steady (i.e., within 5 percent of the target value) for an hour, with no visible leaks; passing results are achieved.

10. Once the testing is finalized, Fluor, and Contractor representatives will sign a pipe test report form.

11. Upon completion of the test, the piping will be drained appropriately per STAVER instructions.

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	3.2
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	8.8	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]

RIECK
Mechanical Electrical Services, Inc.
Planners, Constructors & Maintainers

TEST PROCEDURE FOR PNEUMATIC ABOVE GROUND HDPE PIPING

1. A safety relief valve set at approximately 20 psi will be installed in the test system to limit overpressure of the test specimen. Sand bags will also be installed around the flange ends to control movement.

2. System is to be flanged off at all but one opening to allow for fill of system with air. Once system is filled with air, fill flange valve will be closed.

3. Air compressor will be connected to inlet side of fill flange and power applied to create pressure on a calibrated gauge within the boundaries of the system.

4. Pressure will be gradually increased to one-half of the full pneumatic test pressure. We will pause for 15 minutes to allow the pipe strains to become somewhat equalized and to detect any possible major leaks by means of soap bubbles or monitoring of test gauge.

5 Pressure will be gradually increased to the full pneumatic test pressure of 10 psi. Close valve. Pressure will be held for 15 minutes.

6. This will be above ground, low-pressure air test (no greater than 10 psi) which includes soaping of joints, for all HDPE piping prior to placement in the trench. If the gage pressure does not drop below full pneumatic test pressure and no leaks are found, the test is considered passing.

7. Once the above testing is finalized, Flour Fernald and Contractor representatives will sign a pipe test report form.

46 Wadsworth Rd

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-003	REV: 0	DATE: 28-Jul-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 7/28/00

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
8	641-02605-003	0						X			HDPE Flatstock Product Data & Quality Information		X		02605		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Kneip	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Tweneboah	64				

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

attached

RECEIVED BY: MW Griffin DATE 8/9/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02608-003
Reviewed By: DO
Date: 7/28/00

July 25, 2000

Mr. Dave R. Opalka
The Staver Group, Inc.
1271 East 2nd Street
Frankln, Ohio 45005

Dear Mr. Opalka

This letter will serve as confirmation that the attached certification documents are for the 1" HDPE sheet used for fabrication of Waterstops, Interior HDPE Plates, Exterior HDPE Plates, Pipe Stands, Tank Plates, and End Seals supplied to you for the Enhanced Permanent Leachate Transmission System.

Sincerely Yours,

Richard J, Hart
Regional Sales Manager

INFORMATION ONLY

[ ] A - Conforms to the Subcontract Requirements
[x] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 8/9/00

Include density and melt index D1238/E on certification. MW

ISCO INDUSTRIES, Inc.
926 Baxter Avenue
Box 4545
Louisville, KY 40204
P 502.583.6591
F 502.584.0713
http://www.isco-pipe.com

POLYETHYLENE PIPE AND FITTINGS
HDPE FABRICATION
CULVERT PIPES
GOLF COURSE IRRIGATION SUPPLIES

KING PLASTIC CORPORATION

PLASTIC SHEETS SLAB AND MASSIVE SHAPES

May 24, 2000

ISCO Industries, Inc.
3435 Stanwood Blvd, N.E.
Huntsville, AL 35811

RE: P.O. #7822
INV. #13398

We certify that the material produced for your P.O.#7822 was produced from 100% Virgin raw materials.

10 Shts 1" x 60" x 120" Black Pipegrade HDPE

If you have any questions, please contact our Sales Department.

Sincerely,

Robert Skuce
Quality Manager

1020 OGDEN ROAD
P.O. BOX 1435
VENICE, FL 34284
USA 1 (941) 491-8882
FAX (941) 497-3574

KING PLASTIC CORPORATION
PLASTIC SHEETS SLABS AND MASSIVE SHAPES

June 24, 2000

Mr. Rich Hart
ISCO Industries Inc.
3435 Stanwood Blvd., NE
Huntsville, Al 35811

Re: P.O. # 7822
Inv. #13338

Dear Rich,

Please be advised that the 10 sheets of 1" x 60" x 120" Black Pipe grade HDPE that you purchased on the above mentioned purchase order were made from material as Certified by our supplier under their batch # 0000399754.

I have enclosed a copy of their Certificate of Analysis for this batch number.

Any questions please call.

Sincerely,

Robert Skuce
Quality Manager

1220 OGDEN ROAD
P.O. BOX 1475
VENICE, FL 34284
USA 1(941)493-5502
FAX (941)497-3274

Union Carbide Corporation

Interpak
8790 Wallacoville Road
HOUSTON TX 77029-0000
USA

Certificate of Analysis

KING PLASTICS CORPORATION
1220 OGDEN RD
VENICE-SARASOTA, FL 34292-3530
USA

DGDB-2480 BK 3408 UNIPOL(TM) POLYOLEFINS

Vehicle ID:

Customer P.O. No.: 19031
Sales Order No.: 50290448
Delivery Qty: 31
Delivery Unit: Box, Octagonal, 1500 #

UCC Material ID: 17001695
Customer Number: 30006865
UCC Batch No.: 0000399754
Delivery Doc. No.: 80331914
Shipping Date: 09 May 2000
Date of Manu.: 2/25/2000

Test Characteristic	Unit	Tolerance Limits	Results
Flow Index 190C 21.6kg	dg/min	-	9.6
Carbon Black	wt%	-	2.28
Tensile Stress Yield 2/m SC,LT	PSI	-	3339
Tensile Str 2"/min Slowcool,LT	PSI	-	4991
Elongation Break 2"/m slwcl,LT	%	-	866
ESCR 600hr 100%Ig 100C,LT	%	-	0

This product meets all applicable Union Carbide Corporation Specifications. Please direct any content questions to your Customer Service Representative. Persons receiving this COA in error are requested to direct any changes to fax number 732-271-7887.

Document Date: 10 May 2000
Time: 16:43:52

Material: 17001695

TYPICAL PHYSICAL PROPERTIES

Property	Test Method	Typical Value
Mechanical Properties		
Tensile Strength @ break, psi (MPa)	D 638	4500 (31.0)
Tensile Strength @ yield, psi (MPa)	D 638	3,200 (22.1)
Ultimate Elongation, %	D 638	850
Flexural Modulus, psi (MPa)	D 790	120,000 (828)
Thermal Properties		
Brittleness Temperature, °C	D 746	< -100
Melt Index, g/10 minutes	D 1238/E	0.10
High Load Melt Index, g/10 minutes	D 1238/F	12
DSC Induction Temperature, °C	D 3350	> 250
DSC Induction Time, at 210°C (100% Oxygen), minutes	(b)	
Melting Point, °C[a]	(b)	127
Crystallization Point, °C[a]	(b)	113
Vicat Softening Temperature, °C	D 1525	121
Miscellaneous Properties		
Density, g/cm³ (base resin)	D 1505	0.944
Density, g/cm³ (compound)	D 1505	0.954
Environmental Stress Crack Resistance F*, Hours	D 1693/C	> 2000
Compressed Ring ESCR, F_0, hours	F 1248	> 1500
Durometer Hardness, Shore "D"	D 2240	58
Linear Thermal Coefficient of Expansion In/in/°C (-30°C to + 30°C)	D 696	1.4×10^{-4}
Izod Impact, ft • lbs/in notch at 23°C	D 256	4.0

(a) Heating and cooling at 10°C/min.
(b) Union Carbide test methods.

UNION CARBIDE

PIPE MATERIALS

HIGH DENSITY POLYETHYLENE COMPOUND DGDB-2480 Black 3408

DESCRIPTION

DGDB-2480 Black 3408 is a high density polyethylene pipe compound meeting the requirement of ASTM 1248, Type III, Grade P34, Class C, Category 5 product. Therefore, it falls into the C3 Pipe Test Category as required in various ASTM standards for polyethylene waterpipe. Its outstanding properties are a high level of environmental stress cracking resistance and high strength.

APPLICATIONS

DGDB-2480 Black 3408 has been specifically designed as a high performance, high-density pipe compound where high hoop stress, outstanding stress crack resistance and low temperature toughness are required. This includes pipe applications such as large diameter industrial piping, mining, sewage or other water systems as well as municipal water service lines and natural gas distribution.

The Hydrostatic Design Stress Subcommittee of the Plastics Pipe Institute has recommended to the industry hydrostatic design stresses for DGDB-2480 Black 3408 of 800 psi (5.5 MPa) for water at 73°F (23°C) and 400 psi (2.75 MPa) for water at 140°F (60°C). DGDB-2480 Black 3408 is classified under ASTM D-3350 as Grade PE-345434 C. It has also been approved by the NSF International as suitable for use in potable water piping systems. DGDB-2480 Natural, when properly extruded with the appropriate level of carbon black masterbatch DFNF-0092 Black (6.5%), will meet the same performance standards as DGDB-2480 Black 3408.

UNION CARBIDE CORPORATION
POLYOLEFINS DIVISION
39 Old Ridgebury Road
Danbury, CT 06817-0001

ASTM NSF NSF INTERNATIONAL

PPI PPFA

IMPORTANT: This information is offered solely for your consideration, investigation, and verification and is not to be construed as a warranty or representation for which we assume legal responsibility. In using these materials, you must establish for yourself the most suitable formulations, production methods, and control tests to ensure the uniformity and quality of your product. Specific recommendations for processing conditions can be determined only when the application and processing equipment are known. Please contact your Union Carbide representative for such particulars.

Nothing contained herein is to be understood as permission or recommendation to practice a patented invention without a license, and you should determine whether relevant patents exist.

© 1986, 1993 Union Carbide.

SUPPLIER DOC' 'ENT SUBMITTAL

FDF PROJE	O: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-004	REV: 0	DATE: 02-Aug-00	PA 1 OF 1

FROM: The STAVER GROUP, Inc.

Ron Wood

SIGNATURE: R Wood

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

RECEIVED BY: Denise Wentz DATE: 8/3/00

			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
8	641-02605-004	0						X			HDPE Pipe Training Certification		X		02605	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Jim Jenkins	52-5				
Mike Gadber	104				
Bob Kreep	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Tweneboah	104				

NO COMMENTS

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

RECEIVED BY: [signature] DATE 8/9/00

(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 Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

ENTERED

ORIGINAL

ISCO

August 2, 2000

Stanly Garber
Reick Machanical
5245 Wadsworth Rd
Dayton Oh, 45414

Dear Mr. Garber

This letter is to confirm that on July 31, 2000 at your location at the Fernald plant a Butt Fusion training session was held. Dave Seubert, Dick Seuber, Dan Haft, and Phill Thomas were trained in the Butt Fusion process. The Phillips Driscopipe Butt Fusion procedure was used on a McElroy 412 fusion machine. We used Phillips Driscopipe 1000 series 6" and 10" SDR 11 pipe.

If any additional clarification is needed on the training session please let me know.

Sincerely Yours,

Richard J. Hart
ISCO Industries, Inc.
Regional Sales Manager

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Diffa Date: 8/9/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-003
Reviewed By: tw
Date: 8/02/00

ISCO INDUSTRIES, Inc.
926 Baxter Avenue
Box 4545
Louisville, KY 40204

P 502.583.6591
F 502.584.9719
HTTP //www.isco-pipe.com

POLYETHYLENE PIPE AND FITTING
HDPE FABRICATION
CULVERT LINERS
GOLF COURSE IRRIGATION SUPPLIES

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO. 20111 | CONTRACT NO. FSC - 641 | SUBMITTAL NO: 02605-005 | REV: 0 | DATE: 09-Aug-00 | PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wenz DATE: 8/10/00

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
8	641-02605-005A	0						X			Additional Piping Certification		X		02605	X		
											(10" HDPE VH Stub-outs)							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Rob Kneip	525				
B. Scott Wheeler	525				
Kurosi Bar Tuneberch	64				

RECEIVED AUG 11 2000

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

RECEIVED BY [signature] DATE 8/11/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL ENTERED

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

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

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
Performance Pipe
Starnes Plant
2950 Nazareth Road
Wellford, S.C. 29385

July 26, 2000

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

CUSTOMER: LSCO Industries
PO Box 4545
Louisville KY 40204

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02005-005
Reviewed By: DRO
Date: 8/9/00

ATTENTION: N/A

CUSTOMER ORDER NO: N/A
PHILLIPS ORDER NO: N/A
SHIPPING DATE: N/A
QUANTITY: N/A
EXTRUSION DATE(S): 4/00

PRODUCT: 10" DR 11

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company, LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density, high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

(Services Supervisor)
Services Supervisor

PIPING STUB OUTS

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 799 • PHONE: 713 475-3666
PASADENA TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Marlex Chemical Complex

March 13, 2000

KSL# 6620-00

FAX: 864-439-7918

Phillips Driscopipe
Startex Plant
2950 Nazareth Road
Wellford, SC 29385

Quality Control

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

Type:	HHM TR-480Z-01
Lot Number:	7100339
P.O. Number:	REL 48
Date Shipped:	03/13/00
Package:	PSPX 9065
Quantity:	18405C LBS.
Melt Index, ASTM D1238:	.06 G/10 MIN
Density, ASTM D1505:	.944 G/CC
ESCR, F/20:	>192HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

Date Sampled 4-28-00
A .07 .942
B .07 .942
Tap Date 4-29-00
PO # 4501165323
G/R # 5000829154
Date Posted 4-29-00
4901221502 - 4901221503

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 1	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-006	REV: 1	24-Oct-00	PAGE 1 of 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Ginny Dragoo DATE: 10-24-2000

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
3	641-02605-006	1						X			Cold Weather Butt-Fusion		X		02605	X		
											HDPE Pipe							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Tim Jenkins	52-5				
Mike Gadber	64				
Rob Krein	52-5				
R. Scott Wheeler	52-5				
Geo Synte. Consultants	38				

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

RECEIVED BY: MW Gill DATE 10/30/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

Fluor Contract FSC-641
USDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02608-006
Reviewed By: DW
Date: 10/24/00

Cold Weather Fusion Procedures
Butt-Fused HDPE Pipe

ECDC CONTROLLED
COPY NO. 76896

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MWB Date: 10/30/00

COLD WEATHER DEFINED: For the purpose of the fusion of HDPE pipe, cold weather will be defined as "ambient temperatures equal to or less than 40 degrees Fahrenheit." In order to provide a consistent temperature for use in all activities the recorded temperature at the Communications Center, x4444, will be used.

PIPE PREPARATION: Because of reduced impact resistance, extra caution shall be taken when handling pipe in sub-freezing conditions. Pipe will be inspected for damage prior to placement in the fusion machine. All frost, ice, and snow will be removed from the O.D. and I.D. pipe surfaces to be fused. Any ice and snow adhering to the clamps on the fusion machine will be removed. No moisture on pipe mwb

WIND AND PRECIPITATION: A wind-break will be utilized to mitigate the effects of wind gusts which would have a cooling effect on the pipe and equipment during the fusion processes. The heating tool will be kept in an insulated container to prevent heat loss. According to the ~~ELPTS~~ EPLTS Job Specifications no welding will occur in periods of precipitation. mwb

HEATING: The temperature of the heating plate will be checked before each weld is made to ensure that the tool temperature remains within the specified limits. Welders will anticipate extending the heat soak cycle in order to achieve the desired bead "melt" pattern.

> **The time required to form the initial melt bead will automatically extend the total melt time cycle. After the melt forms, the standard butt-fusion heat cycle will be followed. A 3/16" to 1/4" melt bead is indicative of an adequate heat soak cycle.**

FUSION: Pressure will not be increased (0 psi) mwb during the heating cycle. When the proper melt bead has been formed, the pipe and heater plate will be separated in a rapid, snap-like motion. The melted surfaces will then be joined immediately in one smooth motion so as to minimize cooling of the melted pipe ends.

TRIAL WELDS: Trial welds will be made at the beginning of each production day. Production welds will continue to be made while allowing the trial piece to cool to ambient temperature. After reaching ambient temperature, a strap will be cut from the trial piece and tested per the approved bent strap test procedure. If the bent strap test fails, any production welds made during the cooling period will be removed.

SUPPLIER DOCUMENT SUBMITTAL

FDF PRC NO: 20111	CONTRACT NO: FSC - 6	SUBMITTAL NO: 02605-007	REV: 0	05-Dec-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrell DATE: 12/5/00

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
8	641-02605-007	0						X			McElroy Mini-Mc		X		02605	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	104				
Rob Kneip	525				
Scott Wheeler	52-5				
Kwasi Baw Tuenebah	38				

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

RECEIVED BY: MW Griffin DATE 12-11-00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

McELROY MINI-Mc

BUTT FUSION PROCEDURE

1. Plug in heater(110VAC only, 250 watts) and place in heater box.

2. Select and install the appropriate inserts (if required) using 4 each 6-32 x 3/8" long FHSC screws. Clean each pipe end with a clean, dry cloth. Load the tubing in the machine allowing the pipe ends to extend approximately 1/2" through each jaw.

3. Choose the proper facer (separate facer is required for each tubing size). Place the facer on the tubing ends and adjust for faceoff. Lightly snug clamp knobs. Do not overtighten. Overtightening can flare the pipe ends causing misalignment. Rotate the facer in the direction of the arrows until it bottoms out against the inside of t jaws. It is critical for proper face-off and alignment, that facing continues until bottoming out.

4. Remove the facer and bring the tubing ends together. Check for alignment and high-low. If a high-low misalignment exists, adjust by tightening the appropriate clamp. After obtaining proper alignment, tighten both knobs just enough so the tubing will not slip when applying fusion force.

5. Check the heater temperature. Wipe the surface with a clean non-synthetic cloth. Place the heater in position with the slotted area resting on the flat machined surface of the unit.
Bring the tubing ends against the heater face using the pipe manufacturer's time, temperature, and pressure recommendations for the heating cycle.

6. HEATER PLATE SHOULD BE CHECKED PERIODICALLY WITH A TEMPILSTIK OR PYROMETER FOR CORRECT SURFACE TEMPERATURE.

7. After the heating cycle is complete quickly eject the tubing ends from the heater faces. Remove the heater being careful not to pull any melted plastic with it. Bring the tubing ends quickly together. Apply force according to the pipe manufacturer's recommendations and maintain force until cooling cycle is completed. Remove the unit from the tubing.

INFORMATION ONLY

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 12-11-00

Submittal # 641-02605-007
Reviewed By: RW
Date: 12/5/00

McElroy Manufacturing, Inc.
The leader by design.
P.O. Box 580550 • Tulsa, OK 74158-0550
(918) 836-8611 • Telex: 492472

Orig. Nov. 22, 1977
Revised January 11, 1980

SAFETY BULLETIN:

Fusion and Hot Tapping in Explosive Environment

HEATER PLATES AND ELECTRIC MOTOR DRIVEN FACERS ARE NOT EXPLOSION PROOF!!!

We offer the following suggestions for fusion under hazardous conditions:

Heater plates should be brought up to temperature in a safe environment, then unplugged before entering the ditch or other possibly explosive atmosphere for fusion.

Electric motor-driven facers are equipped with a hex head drive mounted on the motor shaft, which provides for manual operation using a ratchet wrench. Facers produced prior to December 1977 can be so equipped by installing a 1/2-20 NF hex head cap screw and jam nut using loctite into the motor shaft (through the bearing cap opposite the motor).

REMOVE BOTH BRUSHES FROM MOTOR PRIOR TO CRANKING!

It is absolutely mandatory that anyone involved with hot tapping be thoroughly familiar with the written procedures. We further suggest that an actual hot tap be performed on a test main charged with shop air at 60-80 PSI.

Early production tapping tools were equipped with cutters (throat depth 1-3/16") designed for maximum pipe size of 6" SDR-9.33. Later production cutters (throat depth 1-9/16") must be used if hot tapping 8" SDR-11 or heavier. Be sure to measure cutter depth before hot tapping 8" SDR-11 or heavier.

We hope this information will assist you in the safe operation of McElroy fusion equipment. Please call on us any time we can be of service.

Very truly yours,

Dave Dutton

Dave Dutton
Marketing Manager

DD/sah

3/7/85
J-4

MC ELROY MINI-MC

MAINTENANCE INSTRUCTIONS

UNIT

This tool is specifically designed to butt fuse tubing on a true centerline with a minimum number of moving parts. The tool is virtually maintenance free, but care should be taken to keep the machine clean. On a daily basis clean the tool using a soap and water wash. Lubricate the barrel (movable jaw) and the pivot pin with WD-40 or similar material.

Keep the eyebolt threads free of dirt and grit. Lubricate threads with lightweight oil.

Keep the jaw and insert serrations clean using a stiff bristle brush.

Make sure the torque spring is working properly.

FACER

Care should be taken to keep the facer dry and free of dirt.

The facer blades cannot be resharpened and should be replaced when dull.

Keep the knurls on the outside of the facer clean using a stiff bristle brush.

Do not allow shavings to become tightly packed in the facer.

HEATER

The heater contains one element (250 watts), a thermoswitch (110VAC), and a thermometer. The temperature is set at assembly. The indicated temperature may be approximately 10° higher than the actual surface temperature. **HEATER PLATE SHOULD BE CHECKED PERIODICALLY WITH A TEMPILSTIK OR PYROMETER FOR CORRECT SURFACE TEMPERATURE.**

The surface of the heater is coated with an antistick coating. Periodic cleaning of the plate surface is recommended. This prevents plastic residue from accumulating, which could cause a bad fusion joint. When the heater is hot, wipe the surface with a clean, dry, non-synthetic cloth after every fusion joint.

The heater plate should be kept in its box when not in actual use. Care should be taken to keep dirt and moisture out of the heater box.

B-3b
Lg-USA
2/19/85
679

SUPPLIER DO ENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-008	REV: 0	11-Jan-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R. Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 1/11/01

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
8	641-02605-008	0						X			3-20' Sections of 6" HDPE		X		02605		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
[redacted]	[redacted]				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Badber	64				
Rob Kneup	52-5				
B. Scott Wheeler	52-5				
Kwasi Ban Tweneboah	38				

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

Also need Quality control report for the resin lot as provided in previous material submittals - MWG

RECEIVED BY: [signature] DATE 1/30/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
STARTEX Plant

January 5, 2001

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

INFORMATION ONLY

CUSTOMER: ISCO INDUSTRIES
PO BOX 4545
LOUISVILLE KY 40204
ATTENTION: HANK

CUSTOMER ORDER NO: NA
PHILLIPS ORDER NO: NA
SHIPPING DATE: NA
QUANTITY: NA
EXTRUSION DATE(S): 05/16/00

PRODUCT: 6" IPS DR11

[ ] A - Conforms to the Subcontract Requirements
[X] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [signature] Date: 1/30/01
Need QC report for this resin lot [signature]

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company, LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density, high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

[signature]
Carolyn Rogers
Services Supervisor

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-008
Reviewed By: [signature]
Date: 01/10/01

PHILLIPS DRISCOPIPE, INC.

PAGE 1

PRINT OUT DATE: 01/05/2001

LANT ST Product Description: 10P 06.00" DR 11.00 0040' JT

ODUCTION ORDER NUMBER 100098608

Start Date 05/15/2000

End Date 5/29/2000

Minimum Wall (IN):	0.602	Minimum Toe-In (%):	0.439
Maximum Wall (IN):	0.719	Maximum Toe-In (%):	0.918
Minimum OD (IN):	6.603	Minimum Hoop Stress (PSI):	3124
Maximum OD (IN):	6.648	Maximum Hoop Stress (PSI):	3405
Minimum ID (IN):	5.257	Minimum Ring Tensile (PSI):	
Maximum ID (IN):	5.421	Maximum Ring Tensile (PSI):	
Minimum Eccentricity (%):	1.385	Minimum Carbon Black (%):	2.803
Maximum Eccentricity (%):	11.416	Maximum Carbon Black (%):	3.517
Minimum Out of Round (IN):	0.040	Minimum Melt Index:	0.050
Maximum Out of Round (IN):	0.148	Maximum Melt Index:	0.070
Minimum Ovality (%):	0.604	Resin	TR480Z-C1
Maximum Ovality (%):	2.232	Lot	71-0-0152
Number of Samples:	93		

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-008	REV: 1	DATE: 07-Feb-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denisi Wenk DATE: 2/07/01

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
3	641-02605-008	1						X			Resin QC report for additional 6"		X		02605	X		
											HDPE pipe sections							
											(3-20' Sections 16" HDPE) mwG 2/14/01							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	164				
Rob Kneip	525				
Scott Wheeler	525				
Susi Bai Turenebach	38				

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

RECEIVED BY: mw DATE 2/05/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

TOTAL P.02

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 792 • PHONE: 713 475-3666
PASADENA, TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

March 30, 2000

KSL# 8274-00

FAX: 864-439-7918

Phillips Driscopipe
Startex Plant
2950 Nazareth Road
Wellford, SC 29385

Quality Control

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

Type:	HHM TR-480Z-01
Lot Number:	7100162
P.O. Number:	REL 59
Date Shipped:	03/30/00
Package:	PSPX 7120
Quantity:	183700 LBS.
Melt Index, ASTM D1238:	.06 G/10 MIN
Density, ASTM D1505:	.942 G/CC
ESCR, F/20:	>192HOURS **

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-008
Reviewed By: DLO
Date: 2/7/01

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

Date Sampled 5-22-00
ADate Sa 01 .942
BA .07 .943
Tag Date 5-27-00
PO # 4501725318
G/R # 5000404455
Date Posted 5-26-00
4961458779 - 4961458780

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MWA Date: 2/15/01

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-013	REV: 0	DATE: 28-Mar-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Spalka
SIGNATURE: David R. Spalka

TO: FEDERAL ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE: 3/28/01

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
8	641-02605-013	0						X			Fluid-Lok simultaneous butt fusion welding procedure		X		02605	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Goelber	64				
Rob Kreip	525				
Scott Wheeler	525				
Kwasi Badu Tweneboah	38				

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

RECEIVED BY: MW Gipp DATE 4/17/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

✓ A - Conforms to S/C Reqmts
_ B - MINOR COMMENT - Incorporate / Resubmit
_ C - Revise & Resubmit
Sign MW/SJC Date 4/17/01

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-013
Reviewed By: DRO
Date: 3/28/01

ISCO INDUSTRIES

INFORMATION ONLY

To: Whom it may concern 3 / 23 / 01

RE: The use of special Split Heater
Job: Reick Mechanical – Fernald Environmental Site

The attached is the recommended fusion procedure for the tie – in fusions using the following piping and equipment.
Piping: 6" DR 11 x 10" DR 11 HDPE Fluid-Lok Dual Contained Piping
Equipment: McElroy # 412 Fusion Unit – 11.78 Cylinders (Green)

Guidelines:
Heater Temperature range: 400 degrees F - 475 degrees F (The heater has been pre – set at 450 degrees F and should not need adjusting in field)
Fusion Pressure: 215 – 225 psi.

Notes for operator using special heater:

- Please take the time to review attached Fluid-Lok Simultaneous Butt Fusion Welding Procedure to insure a successful job out come.
- The heater has two handles mounted to it, one straight and one bent at an angle. The proper position for the heater in the unit is with the one bent handle placed in unit away from the operator. This is needed for travel clearance of the moving parts on unit as fusion is made.

Please feel free to contact the following personnel with any questions you may have in regards to this procedure.
Phone # 1.800.345.4726
Steve McGriff @ ext. 410 (or)
Mike Montgomery @ ext. 412

FLUID-LOK®
HDPE
DUAL CONTAINMENT PIPING SYSTEMS

FLUID-LOK®
Simultaneous Butt FusionWelding Procedure

I. INTRODUCTION

The Fluid-Lok® System is a dual containment piping system. HDPE is a thermoplastic that is joined through thermoplastic heat butt fusion welding. A weld results when HDPE is "squeezed" together with enough heat and pressure. Of course, the weld zone must be clean and dry and the material must be properly aligned. The standard for butt fusion welding is ASTM D2657.

"High points" of the Fluid-Lok® Simultaneous Butt Fusion Welding procedure.

- Fluid-Lok® Systems install very much like single wall piping. This provides a system that contractors can install without a steep learning curve. Fluid-Lok® pipe and fittings are designed for simultaneous butt fusion welding where both pipes are joined at the same time.

- The Fluid-Lok® Simultaneous Butt Fusion Welding procedure follows the visual practice for single wall butt fusion welding as identified in ASTM D-2657 Guidelines for Polyolefin Thermoplastic Butt Fusion Heat Welding.

- Fluid-Lok® Simultaneous Butt Fusion Welding is highly reliable. As defined in ASTM D2657, this procedure produces a double wall joint that is as easy to visually verify as a good weld in single wall HDPE pipe.

- Fluid-Lok® Systems eliminates the expensive, time consuming closures and end terminations that other piping profiles require.

II. LEAK DETECTION AND LOCATION CABLE INSTALLATION

Fluid-Lok® Systems can be supplied with Trace-Tek™ Leak Detection and Location Systems as part of the dual containment system. Fluid-Lok® Simultaneous Butt Fusion Welding can easily accomodate the installation of these systems as an integral part of the joining process; the sensor is installed concurrently with the pipe welding adding very little time to the installation.

If Trace-Tek™ leak detection is required a special heater must be used to heat the pipe ends. This heater accomodates a steel leader wire that is used to join the "pull rope". The pull rope is used to install the actual leak detection sensing cable. See the document Fluid-Lok® Simultaneous Butt Fusion Welding Procedure with Leak Detection Pull Rope.

III. WELDING PROCEDURE

1. End centralizers are welded to the carrier and containment pipes to prevent any movement of the carrier pipe. In this manner fusion pressure can be applied evenly to both pipe ends. Centralizers are the pipe support and guidance system for the carrier pipe. Centralizers provide for the inner pipe alignment.
2. The carrier extends past the end of the containment on all pipe and fabricated fittings. This is

key to the Fluid-Lok® Simultaneous Fusion Welding Procedure. The extended carrier pipe provides for 4 quality control (Q.C.) checks during the fusion procedure following ASTM D-2657 guidelines. With the pipe (and/or fitting) clamped in the fusion equipment, fusion pressure is then applied only to the carrier pipe ends insuring that the carrier pipe will not move relative to the containment. This insures that fusion pressure can be evenly applied to both dual contained pipe ends, once the pipe has been faced. This is our first Q.C. check. Alignment for the carrier pipe ends should be visually checked at this time as the second Q.C check.

3. The next step is called "facing the pipe". The facer is a rotary planer that "shaves" the pipe ends. The facer gives clean, parrellel pipe ends. Proper facing is critical in any butt-fusion procedure. Before facing, wipe the piple ends with a dry , clean cotton cloth. Once facing is complete all four pipe ends will be smooth, clean and parallel. Remove the pipe shavings and using another clean, dry cloth wipe the pipe ends again.

4. After facing the pipe ends, check alignment of the containment pipe by bringing the pipe ends together. Containment pipe ends should be flush, parallel and smooth. This is our third Q.C. check.

5. The pipe ends are then seperated and the heater is placed in the fusion unit. The pipe ends are then brought in direct contact with the heater plate. Pressure is not applied at this time. This is the heat soak cycle. The pipe material absorbs heat before fusion pressure is applied. A bead of material will form as the pipe heats up from expansion of the pipe end. The weld bead formation is observed and indicates when the pipe is hot enough. A weld bead of approximately 1/8" on pipe up to 8" OD and 3/16" on pipe with a 10" OD and larger is the neccessary size and indicates sufficient heat soak.

6. When the weld bead is formed evenly around the pipe and is of the right size, the heater is removed.

7. The fourth Q.C. check is done when the heater is removed. All 4 pipe ends are inspected. The weld bead will have formed on the ID as well as the observed bead on the OD of the containment pipe and on both the OD and ID of the carrier. The pipe end itself should be flat or slightly convex with the bead flaring away. A concave bead is not acceptable.

8. The pipe ends are brought together at this time with fusion pressure. The weld bead roll-back is observed as pressure is applied. When the bead has properly rolled-back and touched the pipe wall, lock the machine so pressure is constant on the joint while it cools.

9. At this point the fusion weld is nearly complete. The pipe weld has only to cool down. The pipe can be removed from the fusion equipment when your thumb nail can no longer leave an indentation in the weld beads.

TO RECAP: Simultaneous butt-fusion is a reliable process based on accepted butt-fusion procedures (ASTM D-2657) with the addition of 4 extra quality assurance steps. The alignment of the carrier pipe is verified. The alignment of the containment is verified. By observing the pipe ends after heat soak and checking the weld bead formation on the carrier as well as the containment, we verify that the pipe is hot enough. The ability of the carrier pipe to accept fusion pressure was verified by checking for any relative movement between the carrier and containment. After facing, the carrier and containment pipe ends are both parallel insuring that pressure is applied evenly to both pipe ends. All the parameters for a sound butt-fusion weld have been met. As pressure is applied squeezing the pipe ends together, the roll-back of the weld bead is observed. A properly "rolled-back" weld bead indicates a sound, leak free Fluid-Lok® simultaneous butt-fusion weld.

3435 Stanwood Blvd.
Huntsville, AL 35811
Phone: 800-345-4726
Fax: 256-852-6005

ISCO INDUSTRIES

Fax

To: DAVID OPALKA
From: MIKE MONTGOMERY (Ph. Ex.- 412)
Comp.: THE STAVER GROUP
Date: 3/23/01
Fax: 513.648.4187
Pages: 4
Phone:
Re: D/C PIPE PROCEDURE
Comments

DAVID,

HERE IS SOME INFO THAT I HOPE IS HELPFUL & NEEDED. WE ARE WORKING TO GET TRUCK OUT OF HERE THIS AFTERNOON WITH PREFABBED PIPE SPOOLS SO YOU HAVE ON MONDAY. THE SPECIAL SPLIT HEATER WILL ALSO BE ON THAT TRUCK FOR RICK TO USE IN MAKING TIE-INS.

MIKE

March 21, 2001

ISCO INDUSTRIES

The Staver Group[
1271 East 2nd Street
Franklin, Oh. 45005
Fax: 513-648-4677

Dear Mr. Opalka

ISCO Industries, LLC will provide the regular Centralizers. We will also provide 9 extra, to be used to centralize the ends that are cut in the field. The centralizers will need to be hot air tacked into place, to centralizing the 6" before fusion.

The recommended fusion pressure for fusing dual containment pipe simultaneously, is to use the fusion pressure for the containment pipe. In this case, the fusion pressure for 10" SDR 11 pipe.

Sincerely Yours

Richard J. Hart
Regional Sales Manager

As submitted
(Not marked by Fluor Fernald
4/17/01

REVISED

March 21, 2001

ISCO INDUSTRIES

The Staver Group[
1271 East 2nd Street
Franklin, Oh. 45005
Fax: 513-648-4677

Dear Mr. Opalka

ISCO Industries, LLC will provide the regular Centralizers as summated. We will also provide 9 extra to be used to centralize the ends that are cut. The centralizers will need to be hot air tacked into place, only for the purpose of centralizing the 6".

ISCO Industries, LLC experience with dual containment simultaneous fusion is to use the containment fusion pressure. In this case the fusion pressure for 10" SDR 11.

Sincerely Yours

Richard J. Hart
Regional Sales Manager

Date: March 21, 2001

Fax #: 513-648-4187

To: Dave

From: Rick Hart ISCO Industries, LLC

Phone: 859-283-5884 Fax: 859-283-5879

Page, 1 of 2

Comments:

Attached is letter on centralizers & fusion presures.

RH

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02605-014	REV: 0	DATE: 28-Mar-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Sarrel DATE: 3/28/01

			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
8	641-02605-014	0						X			Cell Tie-in HDPE piping certifications		X		02605	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin ✓	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Kreip ✓	525				
Scott Wheeler	525				
Kwasi Badu-Tweneboah	38				

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

RECEIVED BY: [illegible] DATE 4/17/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02605-014
Reviewed By: DLO
Date: 3/28/01

March 26, 2001

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
Startex Plant
2950 Nazareth Rd.
Wellford S.C. 29385
(864) 439-3066

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

CUSTOMER: ISCO INDUSTRIES
:P.O. BOX 4545
LOUISVILLE KY. 40204

ATTENTION:RICK

INFORMATION ONLY

CUSTOMER ORDER NO: NA
HILLIPS ORDER NO:NA
SHIPPING DATE:
QUANTITY:
EXTRUSION DATE(S): 5/2000

PRODUCT:6" DR 11

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company, LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density, high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

Margaret Kelley
(Carolyn Rogers)
Services Supervisor

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 4/17/01

This data is for pre-fabbed centralized dual-containment piping - MWB 4/17/01

Mar 26 01 04:52p Rick Hart 606-283-5879 P.3

PHILLIPS DRISCOPIPE, INC.

PLANT ST Product Description: 10P 06.00" DR 11.00 0040' JT

PRINT OUT DATE: 03/26/2001

PRODUCTION ORDER NUMBER 100098608 Start Date 05/15/2000 End Date 5/29/2000

Minimum Wall (IN):	0.602	Minimum Toe-In (%):	0.439
Maximum Wall (IN):	0.719	Maximum Toe-In (%):	0.918
Minimum OD (IN):	6.603	Minimum Hoop Stress (PSI):	3124
Maximum OD (IN):	6.648	Maximum Hoop Stress (PSI):	3405
Minimum ID (IN):	5.257	Minimum Ring Tensile (PSI):	
Maximum ID (IN):	5.421	Maximum Ring Tensile (PSI):	
Minimum Eccentricity (%):	1.385	Minimum Carbon Black (%):	2.803
Maximum Eccentricity (%):	11.416	Maximum Carbon Black (%):	3.517
Minimum Out of Round (IN):	0.040	Minimum Melt Index:	0.050
Maximum Out of Round (IN):	0.148	Maximum Melt Index:	0.070
Minimum Ovality (%):	0.604	Resin	TR480Z-01
Maximum Ovality (%):	2.232	Lot	71-0-0162
Number of Samples:	93		

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 792 • PHONE 713 475-3660
PASADENA, TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

March 30, 2000

KSL# 8274-00

FAX: 864-439-7918

Phillips Driscopipe
Startex Plant
2950 Nazareth Road
Wellford, SC 29385

Quality Control

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

Type:	HHM TR-480Z-01
Lot Number:	7100162
P.O. Number:	REL 59
Date Shipped:	03/30/00
Package:	PSPX 7120
Quantity:	183700 LBS.
Melt Index, ASTM D1238:	.06 G/10 MIN
Density, ASTM D1505:	.942 G/CC
ESCR, F/20:	>192HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

Date Sampled 5-22-00
Actual Sp. Gr. .942
Ba .07 .942
Tap Date 5-27-00
PO # 45D1225217
G/R # 5000404455
Date Posted 5-26-00
4901493339 - 4961493330

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
Startex Plant
2950 Nazareth Rd.
Wellford S.C. 29385
(864) 439-3066

March 26, 2001

DRISCOPIPE 1000 PRODUCT QUALITY CERTIFICATION

CUSTOMER: ISCO INDUSTRIES
:P.O. BOX 4545
LOUISVILLE KY. 40204

ATTENTION:RICK

CUSTOMER ORDER NO: NA
HILLIPS ORDER NO:NA
SHIPPING DATE:
QUANTITY:
EXTRUSION DATE(S): 4/2000

PRODUCT:6 " DR 11

This letter is being written at your request concerning Driscopipe 1000 series pipe. Driscopipe 1000 series pipe is manufactured from Marlex TR-480 feedstock resin manufactured by Chevron Phillips Chemical Company, LP. The resin has a cell class of PE 345464C according to ASTM D3350. This is a high density, high molecular weight polyethylene resin that meets the criteria for a Type III, Class C, Category 5, Grade PE34 piping material in accordance with ASTM D3350. Driscopipe 1000 pipe, has a Plastic Pipe Institute recommended hydrostatic basis of 1600 psi at 23°C and 800 psi at 60°C based on TR/3 as derived from ASTM D2837 test methodology.

The polyethylene material designation code is PE 3408 CDC.

The dimensional characteristics and pressure capabilities of Driscopipe 1000 are established in accordance with the guidelines set forth in ASTM F714 for sizes 3" IPS and larger, and D3035 for sizes smaller than 3" IPS. These standards are referenced in the print line, and repeated every two feet along the entire length of pipe.

Sincerely,

Margaret Kelley
(Carolyn Rogers)
Services Supervisor

TOTAL P.07

PHILLIPS CHEMICAL COMPANY
A DIVISION OF PHILLIPS PETROLEUM COMPANY
BOX 792 • PHONE: 713 475-3666
PASADENA, TEXAS 77501-0792

PHILLIPS PLASTICS RESINS
Houston Chemical Complex

March 06, 2000

KSL# 5929-00

FAX: 864-439-7918

Phillips Driscopipe
Startex Plant
2950 Nazareth Road
Wellford, SC 29385

Quality Control

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

Type:	HHM TR-480Z-01
Lot Number:	7100327
P.O. Number:	REL 43
Date Shipped:	03/06/00
Package:	PSPX 7089
Quantity:	184300 LBS.
Melt Index, ASTM D1238:	.08 G/10 MIN
Density, ASTM D1505:	.944 G/CC
ESCR, F/20:	>192 HOURS **

Karen S. Lively
Quality Assurance Manager

For COA questions call Linda Murray, 713-475-3625

* Reg. U.S. Pat. Off.
** Nominal Value (not tested on each lot)

cc: QA-File-RC

Date Sampled 4-14-2000
A .06 .942
B .07 .942
Tap Date
PO # 4501653884
G/R # 5000289968
Date Posted 4-14-00 vou
4901062462-4901062461

TOTAL P.01

PHILLIPS DRISCOPIPE, INC.

PAGE 1

PLANT: ST Product Description: 10P 06.00" DR 11.00 0040' JT

PRINT OUT DATE: 03/26/2001

PRODUCTION ORDER NUMBER 100092724 Start Date 04/08/2000 End Date 4/17/2000

Minimum Wall (IN):	0.613	Minimum Toe-In (%):	0.302
Maximum Wall (IN):	0.683	Maximum Toe-In (%):	0.634
Minimum OD (IN):	6.614	Minimum Hoop Stress (PSI):	3148
Maximum OD (IN):	6.642	Maximum Hoop Stress (PSI):	3300
Minimum ID (IN):	5.287	Minimum Ring Tensile (PSI):	
Maximum ID (IN):	5.370	Maximum Ring Tensile (PSI):	
Minimum Eccentricity (%):	2.016	Minimum Carbon Black (%):	2.596
Maximum Eccentricity (%):	7.303	Maximum Carbon Black (%):	3.116
Minimum Out of Round (IN):	0.047	Minimum Melt Index:	0.050
Maximum Out of Round (IN):	0.079	Maximum Melt Index:	0.050
Minimum Ovality (%):	0.708	Resin	TR-480Z-01
Maximum Ovality (%):	1.194	Lot	71-0-0327
Number of Samples:	66		

To: Ann Showalter March 27, 2001
Fr: John Kay

No Pgs: 8

Re: Traceability of raw material to finished product.

Here's how we determine the material used to produce any particular production run of pipe.

Pipe Lot Number: N056A001020101
N = Nova HD2007 Material
056 = The run number assigned for the production run.
A = Produced at Abbeville, SC plant
001 = Produced on 1st shift.
020101= month/date/year produced.

For run numbers N056A001020101 & N636A002080900 I have sent.

1. Production Control Records which verifies the lot numbers and shows the extrusion line on which the pipe was made. Machine 402.

2. The Daily Line Sheet which lists the material lot numbers, resin & concentrate, used on machine 402 on that day. From this I can obtain the information needed to retrieve the material Certificate of Analysis.

   Note: On the Daily Line Sheet for 02/01/01 there are two lots of Nova HD2007 listed for machine 402. This means the lot was changed. I have sent you the C of A's for both lots.

PERFORMANCE PIPE
A DIVISION OF CHEVRON PHILLIPS CHEMICAL COMPANY LP
217 OLD CALHOUN FALLS ROAD
P.O. BOX 608
ABBEVILLE, SOUTH CAROLINA 29620-0608 • 864/446-2136 • FAX 864/446-2139

QUALITY CERTIFICATION

CUSTOMER: ISCO IND. LLC

PRODUCT: 10"IPS DR11 PE3408 EHMW

LOT NUMBERS: N056A001020101
N636A002080900

This is to certify that the product(s) described above has been produced in accordance with the applicable requirements of the specification(s) indicated below:

☑ ASTM D3350- *Polyethylene Plastics Pipe and Fitting Material* (meets or exceeds cell classification of 345444C or E)

☑ ASTM F714 - *Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter*

☐ AWWA C906 - *Polyethylene (PE) Pressure Pipe and Fittings, 4" through 63" for Water Distribution*

☑ OTHER- *The products referenced above meet or surpass the following dimensional requirements of ASTM F714*

Outside Diameter - 10.75" +/- .048"
Wall Thickness - .977" - 1.094"

Nova Chemicals HD2007 Resin Certificates Attached

John Kay
QC Supervisor

402
MACHINE NO.

PERFORMANCE PIPE
PRODUCTION CONTROL RECORD

Reference: N-056
Lot Number

Produced For _____ Customer

PIPE DESCRIPTION: Stock # 1000687 ☐ Inventory Sheet ___ of ___ Date 02/01/01

Size	CTS / IPS	SDR	Length	Material Type	Std. Weight
10"	IPS	11	40	2007	13.0896

	Coil/ Length Number	Wall Min.	Wall Max.	Outside Diameter Min.	Outside Diameter Max.	Outside Diameter Avg.	Disposition Oper. #	Disposition Q.C.	Length Shift	Length Time	Length Hot	Length Cold
1	#1	1.033	1.080			10.760	154	✓	001	0900	406	3:16
2		#2	#3									401
3	#4	1.031	1.070			10.760				10:00		
4		#5	#6									
5	#7	1.023	1.070			10.755				11:00		
6		#8	#9									
7	#10	1.020	1.062			10.765		✓		12:00		
8		#11	#12									
9	#13	1.031	1.072			10.760				1:00		
10		#14	#15									
11	#16	1.025	1.067			10.755				2:00	406	401
12		#17	#18									
13	#19	1.012	1.057			10.750				3:00		
14												
15												
16												
17												
18												
19												
20	SCRAP.											
21	120 FT.											
22												
23												
24												
25												
26												
27												
28												

PIECE NUMBER _____ TOE-IN 10.785 10.650 %

PIECE NUMBER _____ TOE-IN _____ %

PIECE NUMBER _____ TOE-IN _____ %

QUALITY CONTROL
Signature [signature]
Date of Disposition 2-2-01

CP-140 - REV. 8/18/99

DAILY LINE SHEET

DATE 02-01-01

Machine Number	Resin		Concentrate		Rework Percent	Blender #	Dryer #	Silo #
	Matl Type	Lot Number	Matl Type	Lot Number				
102	480Z	8201671	2801	1207059	Ø	3	3	N/A
202	2001	31580	2139	1177137	2Ø	2	2	3
302			N/A					
402	2001	31345	2139	1177137	2Ø	4	4	4
	2001	31655	2139	1177137	2Ø	4	4	4
502	2001	31580	2139	1177137	2Ø	4	4	4

NOVA Chemicals

Post Office Box 3042
Sarnia Ontario, Canada N7T 8C9
Offices and Plant: 510 Moore Line Road
Moorstown, Ontario, Canada N0N 1M0
Telephone: (519) 862-2961

CERTIFICATE OF ANALYSIS

December 15, 2000

PERFORMANCE PIPE DIVISION,
6 HIGHWAY 32
ABBEVILLE,SC
US 29620

NOVA CHEMICALS CORPORATION certifies that the polyethylene product described herein, meets the requirements of Nova's product specification(s) for such product.

Customer P.O. Number:	119009
Nova Product Designation:	HD2007H: HOPPER CAR
Nova Batch Number:	MP0001345
Container Number:	NCIN6813
Product Weight(LB):	195241
Nova Order Number	143493
Delivery Note Number/Item No.	40033875S-10
Shipment Date	15-Dec-00
Manufacturing Date	05-Dec-00

THE FOLLOWING TEST RESULTS WERE OBTAINED:

CHARACTERISTIC NAME	UNITS	RESULTS
Density	G/CM3	0.9449
ESCR, Cond C, F20	HOUR	> 600
Bulk Density	LB/FT3	34.9
Flow Rate 190/5.0	G/10 MIN	0.32
Flow Rate 190/21.6	G/10 MIN	7.6
Oxidation Induction Time@210C	MIN	41.3
Thermal Stability	DEGC	261.0
Elongation	%	900
Tensile Strength @ Yield	MPA	21.1

This is to confirm that Novapol HD-2007-H is a Type III, Class A, Grade P34, Category 5 resin, as classed by ASTM D4976. In addition, Novapol HD-2007-H when used with the proper colour concentrate meets or exceeds the requirement of cell classification 345464C in accordance with ASTM D3350.

Joe Gravel

Joe Gravel
Lab Systems Coordinator

CONTACT(S):
PATRICK MCALLISTER
1-972-705-6525

LAB QUALITY CONTROL
1-864-446-2139

PO# 4502055496

Dot# 500000367

Copyright of this certificate may not be reproduced except with prior written approval of Nova Chemicals Ltd. and the client

NOVA Chemicals

Post Office Box 3042
Sarnia, Ontario, Canada N7T 8C9
Offices and Plant: 510 Moore Line Road
Mooretown, Ontario, Canada N0N 1M0
Telephone: (519) 862-2061

CERTIFICATE OF ANALYSIS

January 10, 2001

PERFORMANCE PIPE DIVISION,
E HIGHWAY 32
ANDERSVILLE,SC
US 29620

NOVA CHEMICALS CORPORATION certifies that the polyethylene product described herein, meets the requirements of Nova's product specification(s) for such product..

Customer P.O. Number:	RBL-04
Nova Product Designation:	HD2007H: HOPPER CAR
Nova Batch Number:	A0000031655
Container Number:	NCIX6614
Product Weight(LB):	194029
Nova Order Number	156829
Delivery Note Number/Item No.	400345171/10
Shipment Date	09-Jan-01
Manufacturing Date	08-Jan-01

THE FOLLOWING TEST RESULTS WERE OBTAINED:

CHARACTERISTIC NAME	UNITS	RESULTS
Density	G/CM3	0.9450
ESCR, Cond C, F20	HOUR	>600
Bulk Density	LB/FT3	34.8
Flow Rate 190/5.0	G/10 MIN	0.40
Flow Rate 190/21.6	G/10 MIN	8.9
Oxidation Induction Time@210C	MIN	42.4
Thermal Stability	DEGC	266.3
Elongation	%	850
Tensile Strength @ Yield	MPA	21.5

This is to confirm that Novapol HD-2007-H is a Type III, Class A, Grade P34, Category 5 resin, as classed by ASTM D4976. In addition, Novapol HD-2007-H when used with the proper colour concentrate meets or exceeds the requirement of cell classification 345440C in accordance with ASTM D3350.

Joseph Gravel

PO# 4502055492
Doc# 5000009069

Joe Gravel
Lab Systems Coordinator

CONTACT(S):
PATRICK MCALLISTER 1-972-705-6525
LAB QUALITY CONTROL 1-864-446-2139

Copyright of this certificate may not be reproduced except with prior written approval of Nova Chemicals Ltd. and the client.

402
MACHINE NO.

PLEXCO - _____
PRODUCTION CONTROL RECORD

Reference: N-636
Lot Number

Produced For _____
Customer

PIPE DESCRIPTION: Stock # 987554 ☐ Inventory Sheet ___ of ___ Date 08/09/00

Size	CTS / IPS	SDR	Length	Material Type	Std. Weight
10"	IPS	11	40'	2007	13.0896

	Coil/ Length Number	Wall Min.	Wall Max.	Outside Diameter Min.	Outside Diameter Max.	Outside Diameter Avg.	Disposition Qual. #	Disposition Q.C.	Length Start	Length Time	Length Hot	Length Cold
1		#42	#43									
2	#44	1.010	1.053			10.750	76	✓	000	420	952	901
3		#45	#46									
4	#47	.995	1.015			10.750						
5		#48	#49									
6	#50	1.001	1.039			10.750		✓				
7		#51	#52									
8	#53	.999	1.012			10.750						
9		#54	#55									
10	#56	.996	1.015			10.750	76		000	200	907	901
11		#57	#58									
12	#59	.995	1.019			10.750						
13		#60	#61									
14	#62	1.001	1.012			10.750						
15		#63	64	#65								
16	Lo #66	.998	1.039			10.750						
17												
18												
19				#66 left pipe								
20												
21												
22												
23												
24												
25											10.770	10.675
26												
27												
28												

PIECE NUMBER #44 TOS-IN .94 %

PIECE NUMBER _____ TOS-IN _____ %

PIECE NUMBER _____ TOS-IN _____ %

QUALITY CONTROL
Signature DW
Date of Disposition 8-10-00

QP-140-REV. 10/99

DAILY LINE SHEET DATE 8/9/00

Machine Number	Resin		Concentrate		Rework Percent	Blender #	Dryer #	Silo #
	Melt Type	Lot Number	Melt Type	Lot Number				
102	2007	30137	190109	1901	30	2	2	3
202	2007	30254	190109	1901	0	3	3	4
302	N/S							
402	2007	30254	190109	1901	25	4	4	4
502	2007	30254	190109	1901	25	4	4	4

NOVA Chemicals

Post Office Box 3012
Sarnia, Ontario, Canada N7T 8C9
Office and Plant: 500 Moore Line Road
Mooretown, Florida, Canada N0N 1M0
Telephone: (519) 862-2961

CERTIFICATE OF ANALYSIS

July 21, 2000

PERFORMANCE PIPE DIVISION.
E HIGHWAY 32
ABBEVILLE, SC
US 29620

NOVA CHEMICALS CORPORATION certifies that the polyethylene product described herein meets the requirements of Nova's product specification(s) for such product.

Customer P.O. Number	117372
Nova Product Designation	HD2007E HOPPER CAR
Nova Batch Number	MHV00036254
Customer Number	NOVN6294
Product Weight(LBS)	197402
Nova Order Number	136819
Delivery Note Number-Item No.	4000293806-10
Shipment Date	20-Jul-00
Manufacturing Date	20-Jul-00

THE FOLLOWING TEST RESULTS WERE OBTAINED

CHARACTERISTIC NAME	UNITS	RESULTS
Density	G/CM3	0.9455
Bulk Density	LB/FT3	35.2
Flow Rate 190/5.0	G/10 MIN	0.34
Flow Rate 190/21.6	G/10 MIN	8.0
Melt Flow Ratio 21.6/5.0	RATIO	23.5
Colour Code	.	A-
Colour	.	116

Joseph Gravel

Joe Gravel
Lab Systems Coordinator

CONTACTS:
GARRY VESELY
1-630-359-3762

LAB QUALITY CONTROL
1-884-446-2139

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CONCRETE PROTECTIVE LINER

SUPPLIER DOCUMENT SUBMITTAL

PROD #7284 Vol. 3

FDF PROJECT: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-001	REV: 4	DATE: 24-Jul-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

David R. Opalka

SIGNATURE: David R. Opalka

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

RECEIVED BY: Erka Jarrett DATE: 7/24/00

			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
8	641-03110-001	4						X			Concrete Protective Liner -		X		03110		X	
	parts 1.04A.8, 1.04 E.4.c										Installation & QA Manuals							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS

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

attached

RECEIVED BY: [illegible] DATE 7/25/00

(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 Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

Griffin, Michael

From: Godber, Mike
Sent: Monday, July 24, 2000 3:36 PM
To: Kneip, Rob; Griffin, Michael
Cc: Godber, Mike
Subject: RE: Bekaplast field installation and QC manual Review Comments....

I would like to add to Robs comments on the ISCO installation manual.

The manual did not mention that overlap joints will be used for horzontal seams. I am assuming there will be no horizontal seams as part of this liner system. I would like to make note there is a seam where the wall ties into the sump in VH-1 that has a width greater than 9/16" which is required by ISCO's manual to have a lap joint.

No further comments
Mike Godber
-----Original Message-----
From: Kneip, Rob
Sent: Monday, July 24, 2000 4:01 PM
To: Griffin, Michael; Godber, Mike; Hughes, Jack; Jenkins, James; Cherry, Tim; Wheeler, B Scott; Kneip, Rob
Subject: Bekaplast field installation and QC manual Review Comments....

Submit as 03110-001, Rev 4
mwb 7/25/00

Mike,

Attached are two minor comments on the Bekaplast submittal....as far as I am concerned....we can approve this with comments and let STAVER get started again....

I spoke to Dave Opalka...and he implied that they intended to address these comments in a submittal that is forthcoming on the setting bed material.

Thanks...Rob

Comments on Bekaplast Installation
And Quality Control Manuals
By Rob Kneip
7/24/2000

1. These documents make reference to a maximum allowable setting bed thickness of 6 inches. However, documents previously transmitted by STAVER and ISCO implied that a setting bed thickness of 7.5 inches is acceptable. These documents should be modified to address this discrepancy since our specific installation will require a setting bed of up to 7.5 inches thick.

2. The issue of wire mesh reinforcement and anchoring of the setting bed to the base slab is not addressed by this submittal. The specific details of the setting bed and the reinforcement and anchoring need to be addressed either in this submittal or another one to follow. The EPLTS Calculation Package clearly indicates that hydraulic uplift is anticipated at the valve houses....therefore, the Bekaplast setting bed is required to have reinforcing that is anchored to the base slab.

New Submittal
for setting Bed & anchoring System
MWG 7/25/00

ISCO Industries, Inc.

Bekaplast Installation Manual

INFORMATION ONLY

[ ] A - Conforms to the Subcontract Requirements
[X] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 7/25/00

Resubmit only:

1. Horizontal lap joint seams (See attached comment)
2. Clarify 7.5" setting bed thickness and reference other submittal.

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-001
Reviewed By: DLO
Date: 7/24/00

ISCO INDUSTRIES, LLC

BEKAPLAST FIELD INSTALLATION

QUALITY CONTROL MANUAL

The purpose of this document is to identify, define, and outline approved quality control (QC) procedures for the fabrication, installation and inspection of the Bekaplast Protective Lining System. Any individual involved with the QC of a Bekaplast field installation must be familiar with the fabrication and installation of the Bekaplast System and must have a complete understanding of the requirements contained in this document and the ISCO Industries, LLC(ISCO) Field Installation Manual.

This document is intended to be used in conjunction with the ISCO Field Installation Manual during field operations. The QC Manual will identify the responsibilities of the QC Inspector, the contractors, and the customer. Responsibilities of the contractor and customer are called out specifically. Where no personal reference is given, the responsibility belongs to the QC Inspector. Indexing of the QC Manual matches the ISCO Field Installation Manual so that the QC functions for each step of the installation can be easily located in the QC Manual.

The QC Inspector must have attended the Welder Training Seminar given by Atlas Minerals and Chemicals, Inc. (ATLAS) within the previous 24 months or must have attended the seminar at some time in the past and have received refresher training in the previous 24 months or provided passing pull samples meeting the requirements of ASTM C-1147 in the past 24 months using HDPE Bekaplast.

The individual(s) responsible for QC shall maintain a log book to record pertinent data as described in the text of this document. The log book shall include all recordings and verifications required as part of this manual except for those items recorded on approved forms from ISCO. The log book will become the property of ISCO Industries at the conclusion of the job.

For the purposes of this manual the following definitions apply:

Observe: Watch that work being done conforms with practices described in the Installation Manual. When actual work deviates from the instructions in the Manual, the Inspector shall notify the Contractors supervisor and find out why procedures are not being followed. Steps should be made to correct the deficiencies. Any deficiencies in following proper procedures should be noted in the log book.

Verify: This requires a physical check to assure that proper procedure is being followed along with a written record of the verification in the log book or on forms agreed upon in advance.

Specific jobsite conditions may require some deviation from the installation manual. Alterations to the manual must have written authorization from ISCO.

The remainder of this document is indexed to correspond with applicable section of the ISCO Field Installation Manual. For each section of the Installation Manual this document lists the specific duties and responsibilities associated with Quality Control.

1 GENERAL INFORMATION

1.1 No applicable QC procedures.

1.2 No applicable QC procedures

1.3 All welders must have documentation on the job site indicating that they hold current certification as having met the requirements of ASTM C-147 for the type of material and welding to be performed.

2 SCOPE

2.1 A current copy of the ISCO Installation and Quality Manuals must be on site during field installations.

3 CHANGE AUTHORIZATION

3.1 Procedural changes pertinent to the specific field job must be made in writing and be kept on file at the jobsite.

4 TOOLING REQUIRENTS

4.1 General Construction Tools - No applicable QC procedures.

4.2 Welding Tools -

A - Hot Gas Hand Welding Guns -

-Gun must be identified with a permanent, legible, identification number.

-Documentation must accompany gun to indicate it was inspected by a certified welder and found to be in good working order before shipping to the jobsite.

B- Hot Gas Tips -

- Tips must be inspected before, use. Any tip found to be in unsatisfactory condition should be labeled as such and repaired on site or returned to Owner.

C - Hot Gas Extrusion Guns

- Guns must be identified with legible, identification number.
- Documentation must accompany each gun to indicate it was inspected by a certified welder and found to be in satisfactory condition before shipping to the jobsite.

D- Shoes for Extrusion Welding -

- Each shoe must be inspected before use. Any shoe found to be in unsatisfactory condition should be repaired if possible or returned to owner.

E -Air Supply -

- Portable air supply units must be identified with a permanent, legible, identification number.
- Documentation must accompany each unit to indicate it was inspected by a certified welder and found to be in satisfactory condition before shipping to the jobsite.
- Compressors are acceptable for use as long as the air meets the

requirements of ASTM- D-4285 and volume requirements are met.

F - Thermocouples

- Thermocouples must be identified with a permanent, legible, identification number.
- Documentation must accompany each thermocouple to indicate that it was inspected and found to be in good working order before shipping to the jobsite.

4.3 Accessory Equipment and Supplies - No applicable QC procedures.

5 THERMOPLASTIC LINER REQUIREMENTS

The QC Inspector shall verify that all thermoplastic liner materials received at the jobsite are as specified and shall record all pertinent details in the daily log book.

5.1 Bekaplast Sheet and Prefabricated Structures

- ISCO Industries, LLC will provide documents showing chain of custody from Atlas Minerals & Chemicals to the jobsite.

5.2 Bekaplast Welding Rod -

-Bekaplast welding rod received at field jobs must arrive packaged in coils, bundles, or on spools with stickers indicating the type and diameter of rod.

5.3 - No applicable QC procedures required.

5.4 - No applicable QC procedures required.

5.5 Bekaplast Disc Seals -

-Bekaplast disc seals received at field jobs must arrive in sealed boxes with an inspection sticker on the outside of the box indicating the type of material, the dimensions, and quantity of pieces in the box. Inspection sticker must be signed indicating it was inspected and approved by ISCO.

5.5 - No applicable QC procedures required.

6 MATERIAL STORAGE AND HANDLING

6.1 Verify that materials are stored in accordance with instructions in the Installation Manual.

6.2 As per 6.1.

6.3 As per 6.1.

6.4 QC inspector must verify at the outset of the job that proper handling equipment is available for use and must observe that proper handling procedures are used throughout the job

available for use and must observe that proper handling procedures are used throughout the job Contractor must instruct laborers on the proper methods of handling all materials.

6.5 Contractor or customer must, provide a segregated area for storage of product received and approved by the QC Inspector Storage area must provide for storage of materials in accordance with section 6.1 of the Installation Manual. Crews may only obtain materials' from this area. QC Inspector is responsible for expediting the return of non-conforming goods.

7 FOUNDATIONS

7.1 Contractor must assure that excavation has been properly filled and compacted. Contractor shall verify that slab finish is in accordance with the Installation Manual.

7.2 Elevations must be verified by the contractor to assure that they are in the ranges as cited in the Installation Manual.

7.3 Elevations and reinforcement must be verified by the contractor to assure that they are in accordance with the Installation Manual.

8 CONCRETE DESIGN

8.1 Concrete mix design shall be as agreed to in the specifications. When ready mix is used, tickets on each batch shall be kept on file by the contractor.

8.2 No applicable QC procedures.

8.3 No applicable' QC procedures.

9 CONCRETE FORMS

9.1 Contractor must verify that field applied form release agents are not used in the area where the liner is applied.

9.2 No applicable QC procedures.

10 WALL INSTALLATION - NEW CONSTRUCTION~

10.1 QC inspector shall observe proper alignment of the system.

10.2 Verify ambient temperatures are between 32 and 100F.

10.3 Mounting Bekaplast Sheet on Wall Forms -

10.3.1 No applicable QC procedures

10.3.2 Observe that sheet placement in H-Zip Strip is in accordance with Installation Manual.

10.3.3 Observe that conductive tape placed on the joint seam. Record seam thickness in log book.

10.3.4 Observe that all seams are installed with conductive backing.

10.3.5 Observe proper use and placement of tie wire between sheet.

10.3.6 Verify that sheet is as flat as possible against the forms and that any nailing is done in accordance with instructions in the Installation Manual.

10.3.7 Observe that no nails are used except as outlined in the Installation Manual or as approved by ISCO.

10.3.8 Contractor observe form ties have been properly installed.

10.4 Outlets

10.4.1 ISOC verify that plastic pipe materials to be used are compatible with the Bekaplast.

10.4.2 Contractor QA verify hole location, size and methods of cutting the Bekaplast liner.

10.4.3 No applicable QC procedures.

10.5 Placing Concrete

10.5.1 The Contractor must make a detailed pre-pour inspection as cited in Installation Manual. All formwork and liner securement must be indicated as acceptable to the inspector before concrete placement commences..

10.5.2 Contractor is responsible for assuring that the rate of pour is suitable for the form design.

10.6 Contractor record details on concrete cure in daily log book.

10.7 Form Removal

10.7.1 Contractor observe that all nails that can be removed are removed before forms are taken apart.

10.7.2 Contractor observe that care is taken in removal of forms not to damage Bekaplast.

10.8 No applicable QC procedures.

10.9 No applicable QC procedures.

11 Floor Installation

11.1 Ambient temperatures for installation of floors must be between 32 and 100-F (0 and 35^{0}C).

11.2 Contractor must shelter and/or protect installation to prevent liquid migration under the floor until installation is fully welded.

11.3 Verify that all wall seams have been welded in accordance with section 15.12 of the Installation Manual.

11.4 Floor Sheet Installation

11.4.1 Wall Screed Strip Installation

11.4.1.1 No applicable QC procedures

11.4.1.2 Observe that wall joints are removed or that wall screed is notched as needed.

11.4.1.3 Verify that wall screed strips are properly beveled before installation.

11.4.1.4 Observe proper placing of wall screed strips.

11.4.1.5 Observe that wall screed strips are welded according to instructions in the Installation Manual. No mechanical fastening is permitted.

11.4.2 No applicable QC procedures.

11.4.2.1 No applicable QC procedures.

11.4.2.2 No applicable QC procedures.

11.4.2.2.1 Verify that construction of wire mesh reinforcement is of the design required in specifications and that placement of screeds is consistent with the specification.

11.4.2.3 Observe consistency of screed mortar mix and approved design

11.4.2.4 Observe use of bonding agent.

11.4.2.5 No applicable QC procedures.

11.4.2.6 Verify elevations and placement of screed strips and assure that they are suitable for proper placement of sheet. Any strips out of line or level shall be removed and redone. Assure that shape of screed bed will not interfere with sheet placement. Any interfering bed will need to be removed and/or replaced.

11.4.3 Floor Sheet Installation

11.4.3.1 Observe that sheets with overlap strip have conductive tape installed before being placed.

11.4.3.2 Observe that sheet will fit properly on screeds to yield seam widths as indicated in the Installation Manual. Trimming of sheet shall not result in

interfere with observation of proper seam alignment and seam width when sections a put together.

12.3.2 Observe that formwork is properly secured.

12.3.3 Observe that concrete pour is performed so that the underside of the structures are completely filled.

12.3.4 Contractor record time between placement of concrete and removal of form.

13. WELDING REQUIREMENTS

13.1 Welding Guns- See sections 5A - 5D for required inspections and testing of guns, tips, and shoes.

13.2 Electrical Requirements - Contractor must verify that adequate sources of power are available.

13.3 Air Supply - Contractor is responsible for performance of all duties listed under this section.

13.3.1 No applicable QC procedures.

13.3.2 The air quality at each welding station must be checked at the start of each shift or before welding is initiated per ASTM D-4285 to assure that air supply is clean and oil free.

13.3.3 Check blowers daily to verify that dust filters are in place and working properly.

13.3.4 No applicable QC procedures.

13.3.5 Air volume at each welding station must be checked at the start of each shift, before welding is initiated for the day, after any interruptions in the air supply or as requested by the on-site QC inspector to verify that air volumes are in accordance with requirements as described in the Installation Manual. Air volume must be checked using a flow meter placed just before the welding gun. In addition each gun must be checked to insure that the preheat pattern emanating from the gun is suitable for the type of welding being performed.

13.3.6 Observe that air is run through hoses for at least 15 minutes before connecting to guns at the start of each day and as needed after interruptions in the air supply.

13.4 Contractor is responsible for recording data on the temperature, humidity, and dew point at the start of each shift or as requested by the QC Inspector. Results must be recorded and turned in to the QC Inspector daily.

13.4.1 Verify that air temperatures are within the parameters cited in the Installation Manual.

13.4.2 Verify that conditions are within the parameters cited in the Installation Manual.

15.12 Welding of Walls

15.12.1 Observe and record methods used to weld walls.

15.12.2 No applicable QC procedures

15.12.3 Observe that sump seams are being prepared and welded in accordance with the Installation Manual.

15.12.4 No applicable QC procedure's.

15.12.5 Observe that preparation and welding is in accordance with the Installation Manual.

15.13 Welding of Floors

15.13.1 No applicable QC procedures.

15.13.2 Observe that short dimensions are welded in accordance with the Installation Manual.

15.13.3 Observe that wall sheet is scraped when seams abut walls in accordance with the Installation Manual.

15.13.4 Observe that intersections are being prepared in accordance with the Installation Manual.

15.13.5 Observe that wall sheet is, scraped in accordance with the Installation Manual;

15.13.6 Observe and record method used to weld long dimensions.

15.14 Welding of Floor/Wall Corners

15.14.1 No applicable QC procedures.

15.14.2 Observe that all welds intersecting corner are prepared in , accordance with the Installation Manual.

15.14.3 Observe that welding proceeds continuously around the corners.

15.15 Welding of Disc Seals (Wall Tie Closures)

15.15.1 Observe that welders are using disc seals with conductive backing.

15.15.2 Observe proper tacking of disc seals.

15.15.3 Observe that disc seals are installed in accordance with the Installation Manual.

15.15.4 Observe that installation proceeds in accordance with the Installation Manual.

15.16 Welding of Inlet/Outlet Pipes

15.16.1 Verify method of welding pipe.

15.16.2 Verify that conductive tape backs the joint or that conductive wire is tacked into the interface.

15.16.3 Observe that rod welding proceeds in the same manner as for disc seals.

16. FINISHED LINER TESTING

16.1 Spark Testing

16.1.1 Record model of spark tester used.

16.1.2 No applicable QC procedures.

16.1.3 Observe that preparation is in accordance with the Installation Manual.

16.1.4 Observe that spark testing is being carried out in an acceptable manner.

16.2 Testing for Voids in Lining -

16.2.1 Observe that testing is performed and any voids are marked.

17. REPAIRS OF WELDED JOINTS

17.1 No applicable QC procedures.

17.2 No applicable QC procedures.

17.3 Verify that rod welded joints, disc seals, and pipe are repaired in accordance with the Installation Manual.

17.4 Verify that extrusion welds are repaired in accordance with the Installation Manual.

17.5 Verify that nail holes are repaired in accordance with the Installation Manual.

17.6 Observe that repairs are spark tested.

18. REPAIR OF VOID UNDER OR BEHIND LINER

18.1 Record type of grouting material used, mix ratios and method used to mix grout.

18.2 Observe that procedure used for grouting is in accordance with installation manual. Other procedures are acceptable as long as no damage to the Bekaplast occurs and the voids are effectively filled.

ISCO Industries, Inc.

Bekaplast Installation Manual

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-001
Reviewed By: DKO
Date: 12/24/00

This manual is based on the accepted practices of installing Bekaplast sheet as learned in the Bekaplast training class given by Atlas Minerals and Chemicals. The purpose of the manual is to provide a recommended procedure of installing the Bekaplast Thermoplastic Liner System. Although it is an in-depth description of how to install Bekaplast there may be field situations that require variations from the standard installation procedure in order to provide a quality installation. The Installer, QC Manager, and ISCO Industries, Inc. Shop Fabrication Manager, should review and approve variations from this manual for these situations.

ISCO Industries, Inc. will not be liable for any work not performed by ISCO Industries, Inc. installers and will not be responsible for services provided by others.

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REFERENCE TABLES 1 –3
ATLAS REFERENCE DRAWINGS

1 GENERAL INFORMATION

1.1 The purpose of this document is to describe proper procedures for installation of Bekaplast Lining Systems. Included are descriptions for tooling, equipment, materials, accessories, site requirements, environmental restrictions, sheet placement, welding, procedures, and inspection.

1.2 Of vital importance to the successful installation' of a leak-free liner is the expertise of the technicians installing and welding. the Bekaplast Lining System. These technicians must be experienced in the installation of thermoplastic liners under field conditions.

1.3 All individuals involved directly in welding of this product must be certified as having met the requirements of ASTM C-1147, "Standard Practice for Determining the Short Term Tensile Weld Strength of Chemical-Resistant Thermoplastics" for the type of material and welding to be performed.

2 SCOPE

2.1 These instructions are intended to serve as a standard practice for the proper installation of Bekaplast Lining Systems during field operations. Specific procedures are described for placing of floors, walls, appurtenances, and sumps as well as proper welding methods for installation of a leak-free system.

3 CHANGE AUTHORIZATION

3.1 The procedures described herein must be followed in the field installation of Bekaplast Lining Systems and may not be altered without written authorization from ISCO Industries, LLC.

4 TOOLING

Recommended tooling and equipment would include but not be limited to the following:

4.1 - General Construction Tools

-Circular saw	-Level	-Chalk line
-Saber saw	-Ruler/Measuring tape	-Nail punch
-Hand saws	-Square	-Pliers
-Sander	-Rasps	-Pencil Grinder
-Router	-Scrapers	- Screwdrivers
-Side grinder	-Chisels-	-Clamps
-Straight edge	-Electric drill and bits	-Knife

4.2 - Welding Tools

-Hot air hand welding guns.
-Hot air extrusion welding guns; Those manufactured by Koch, Munsch, or Wegener are recommended.
-Tips and shoes as needed for extrusion and hand guns.
A suitable, steady, source of clean, dry, air, capable of delivering appropriate volumes to

carry out the specific type of welding to be performed. (i.e. – Air Compressor or Blower)
-Air flow meters to check the air flow to guns.
-A suitable supply of non-wavering electrical energy suitable for the type of welding being performed.
-Rifle cleaners for use in cleaning welding tips.
-Wooden pushing tool
-Thermocouples for measurement of preheat and material temperatures

4.3 - Accessory Equipment and Supplies

-Tie Wire - Approximately 16 gauge
-3/4" waterproof particle or wafer board
-Finishing nails - long enough to penetrate 1/4" beyond the combined thickness of the Bekaplast and the concrete forms
-Portland Cement
-Concrete Sand
-Concrete Forms
-Concrete pump
-Ballast for seating floor sheet – Sandbags weighing 20-25 lbs each are recommended.
-Conductive tape
-Conductive wire (25-28 gauge)
-Spark testers
-Grease pens
-I.D. stamp
-Auxiliary lighting where required
-Enclosures and/or coverings as needed to meet temperature, humidity, and other environmental requirements for installation and welding.
-Temperature and humidity measuring devices
-Scaffolding, ladders, scissorlifts, cherrypickers
-Safety glasses hard hat, safety shoes and any other safety equipment to satisfy working conditions, site requirements, or customers' safety programs.

5 THERMOPLASTIC LINER REQUIREMENTS

5.1 Bekaplast Sheet and prefabricated structures
5.2 Bekaplast welding rod of same base resin as the Bekaplast sheet
5.3 Approved wall screed strips compatible with the Bekaplast sheet
5.4 Bekaplast floor screed strips of the same base resin as the Bekaplast sheet
5.5 Bekaplast disc seals of the same base resin as the Bekaplast sheet
5.6 Bekaplast H-Zip Strip

6 MATERIAL STORAGE AND HANDLING

6.1 Bekaplast sheet, Screed Strips, Prefabricated Structures, and H-Zip Strip must be stored at temperatures above freezing, under waterproof coverings in a manner to prevent contamination from foreign substances.

6.2 Prefabricated structures and Bekaplast sheet shall be stored in a manner to prevent deformation.

6.3 Welding rod must be stored to prevent contamination from foreign substances and condensation.

6.4 Bekaplast sheet and fabrications will require proper handling equipment to prevent deformation or damage while transporting or installing.

6.5 Bekaplast sheet or fabrications received at jobsite are to be moved to a segregated storage area after approval of the QC Inspector. Contractor must verify that crew is using only approved materials.

7 FOUNDATIONS

7.1 The Bekaplast Lining System is designed to be used with typical standard construction practices. On properly graded, filled, and compacted excavation a reinforced concrete base slab is placed and finished to a broom finish.

7.2 In areas where a potential for hydraulic pressure is anticipated, the elevation of the base slab should be a minimum 3.5" (90mm), maximum 6" (152mm) below the finished Bekaplast floor to accommodate mechanical anchors, and wire mesh reinforcement. The type and placement of reinforcement shall be in accordance with standard concrete practice.

8 CONCRETE DESIGN

8.1 The concrete mix design is established by the engineer and should be consistent with the intended purpose of the structure.

8.2 Once established the mix design cannot be changed without prior written consent of the party responsible for the mix design

8.3 The Bekaplast Lining System should not be regarded as a structural member when establishing the concrete mix design, steel reinforcement, and concrete form requirements.

9 CONCRETE FORMS

9.1 Field applied form release agents are not required since the Bekaplast acts as a release. The use of field applied release agents are incompatible with the welding of the Bekaplast.

9.2 Form design for concrete structures to be lined with Bekaplast should maximize the use of outside bracing to be sufficiently rigid to eliminate or minimize the use of form ties that penetrate the concrete forms and the Bekaplast lining. Form rigidity is important to prevent bulging or movement that could cause the Bekaplast sheet to move, creating seam misalignment. Form design should be done in accordance with applicable sections of ACI-347 or accepted industry practice.

10 WALL INSTALLATION - NEW CONSTRUCTION

10.1 The placing of Bekaplast sheet on the forms is critical to achieving leak-free joints. Sheets must be placed so that all seams are properly aligned and in the same plane, with sheet edges that will be between 1/8" and 9/16" apart after the concrete has cured and the forms have been removed. If this gap exceeds 9/16", a cap strip will be used to seal the joint. Cap usage is not the first option and will be used in an as needed and limited basis. The caps will be welded per section 15.

10.2 The ambient temperatures during sheet installation must be between 32 and 100^{0}F(0 and 35^{0}C)

10.2.1 Sheet installed at low temperatures will expand as temperatures increase resulting in tight seams that may require additional work to achieve desired seam gaps before welding. Conversely, sheet installed at high temperatures will shrink as temperatures decrease and may result in seam widths that are too far apart. These factors should be kept in mind when placing sheet on forms.

10.3 Mounting Bekaplast Sheet on Wall Forms

10.3.1 Vertical seams between wall sheet are connected using conductive *H-Zip Strip as* shown in drawing #1. When prefabricated corners are supplied, these sections are connected to the adjacent sheet by use of H-Zip Strip.

~~10.3.2 *H-Zip Strip* is attached to the vertical edges of the sheet in such a manner that the sheets~~ are securely in the slot to meet dimensional requirements in section 10.1.

10.3.3 Where sheets meet at the prefabricated sump to form a seam, conductive tape will be secured behind the seam. During welding operations, this joint will be extrusion welded and tested as outlined in this manual, Section 15.12 and 16, respectively.

10.3.4 All seams must be installed with conductive material backing the welded joint to allow for spark testing.

10.3.5 Use tie wire around anchors on the vertical edges of adjacent sheet to hold sheet together. To do this wrap a tie wire around an anchor at the edge of the sheet then pull tightly across the H-Zip Strip seam on a diagonal and wrap around an anchor at the edge of the adjoining sheet. Wrap free ends of wire together and twist to tighten, bringing sheet tight into the H-Zip Strip slot. Repeat procedure at 4 anchor intervals, or closer as job conditions dictate as shown in drawing #4.

10.3.5.1 Double sided adhesive tape or a construction adhesive such as "Liquid Nails" or silicone caulk may be used to help secure the Bekaplast sheet tightly against the forms.

10.3.6 If necessary to help keep the sheet tight to the form the sheet may be nailed to the concrete form through the center of the H-Zip Strip (drawing #4) and only as necessary in corner joints. This is only to be done after the adjacent sheet has been pulled tight into the H-Zip Strip with tie wire as previously described. Use finishing nails, driven through the center of the H-Zip strip at intervals of approximately 10 - 12" (25 - 30cm) to secure the sheet to the form. It is important to keep the sheet flat enough against the form to prevent disconnections from adjacent sheet. Nails, when used, must be long enough to extend through the form at least 1/4"(6mm) so they can be pulled through the Bekaplast after the concrete has hardened and before the forms are removed. To keep sheet tight to the wall, the use of 1 ½" plastic tipped rebar chairs can be used between liner and inside rebar mat as necessary.

10.3.7 No nails are to be used in the main field of the sheet except where necessary as determined by ISCO. Use of nails is not standard practice, and will be used in a limited fashion. Nail penetrations in the main field will be repaired as outlined in section 17.5 and/or 15.15. Nail penetrations in corner sheets will be covered by a full extrusion weld to reseal the joint.

10.3.8 After the interior-wall forms with Bekaplast sheet have been erected, place the reinforcing steel and the exterior wall forms. If form ties are required drill holes through the forms and Bekaplast sheet to accommodate

10.3.8.1 Form tie holes are not to exceed 1" (25mm) in diameter. After the forms are stripped the tie rods are cut at the face of the Bekaplast or removed and the holes in the sheet are sealed by welding a Bekaplast disc seal over the hole. If tie rods are removed, the holes must be grouted prior to welding a disc seal over the hole. (Use a waterproof grout if waterproof concrete has been specified for the walls.)

10.3.8.2 Sheet adjacent to the form tie hole can be nailed to help secure the sheet to the form. Finishing nails of the type described in 10.3.6 are recommended. Nails should be placed no more than 1/4" (6, mm) ,from the hole. Two nails are usually sufficient.

10.4 Outlets

10.4.1 Pipe sleeves and drains that pass through the wall may be fitted to the Bekaplast sheets as they are hung on the forms or the space between the forms may be blocked out to permit installation after the concrete is poured and cured. Plastic pipe materials must be compatible with the Bekaplast. Similar methods are used for installation of dissimilar pipe, such as steel and clay, however, the methods used for joining the pipe to the sheet are different.

10.4.2 When placing plastic pipe at the time the sheet is hung the forms, proceed as follows:

10.4.2.1 Locate the hole for the pipe on the back of the Bekaplast sheet and scribe the hole size to fit the outside diameter of the pipe.

10.4.2.2 Use a drill and/or jigsaw to cut a hole through the form and Bekaplast sheet with a minimum ¼" and maximum ½"clearance to allow for expansion/contraction. Protect these hole location during concrete placement to ensure a smooth and stable joint.

10.4.2.3 Install plastic collar assembly around pipe as shown on the project drawings.

10.4.3 If placing of pipe sleeves or drains is to be done after the pour then proceed as follows for plastic pipe;

10.4.3.1 Do not cut any holes in the sheet when mounting the Bekaplast.

10.4.3.2 Block a space of sufficient size using sonatube type materials and then proceed with reinforcement, exterior forms, and pouring of the concrete.

10.4.3.3 After the concrete has hardened and the forms have been striped, cut a hole in the Bekaplast sheet from the inside so that the fit of the pipe will be as tight as possible. Remove the formwork, and insert the pipe through the wall.

10.4.3.4 Grout the annular space between the pipe and the concrete with a suitable grouting material. Do not disturb the pipe during the grouting and curing

process. Seal the pipe/sheet interface beforehand, if needed, to prevent grout from leaking out. Do not disturb the pipe during the grouting and curing process.

10.4.3.5 A plastic collar of the same base material as the lining is placed to fit snug around the pipe. The outer circumference of the collar should extend radially at least 4" beyond the pipe/sheet interface. The outer circumference of the collar is three rod welded to the sheet. The collar is attached to the pipe in the manner described in 15.16.

10.5 Placing Concrete

10.5.1 Before placing concrete, the contractor will perform a detailed, pre-pour inspection to insure that the lining system and formwork are properly in place and secured according to this manual requirements.

10.5.2 Place concrete so as not to exceed the rate of pour for which the forms were designed per ACI Standard 347-88.

10.6 Curing Concrete

10.6.1 Cure the concrete in accordance with standard industry practice.

10.6.2 Do not under any circumstances steam cure Bekaplast lined concrete pipe, components, or structures.

10.7 Form Removal-

10.7.1 All nails should be pulled through the forms before form removal.

10.7.2 Remove the forms when the concrete has cured sufficiently, being careful not to damage the Bekaplast.

10.8 It is important to shelter the tops of liner material after form removal until they are welded or sealed to prevent any moisture migration behind the liner.

10.9 After the wall forms are removed all wall seams are welded as described in sections 14 and 15.

11. FLOOR INSTALLATION

11.1 Temperature restrictions for installation of the floor are the same as for walls with the added provision that it is very important that the entire floor be protected from construction activities.

11.2 Migration of liquids from outside sources (i.e. -groundwater, rainwater) behind the wall lining and under the Bekaplast floor after it has been laid MUST be prevented.

11.3 The wall seams should be welded before the floors are placed. Working in this sequence eliminates the potential for damage to the floor sheet that could occur when moving equipment, such as ladders, lifts, and scaffolding, across the floor to weld the upper reaches of the walls seams. At a minimum the wall seams must be welded from below the final floor elevation to a height of 20" above the floor elevation.

11.4 The procedure for installation of floor sheet is as follows:

11.4.1 Wall Screed Strip Installation

11.4.1.1 Establish the finished floor elevation and snap a chalk line along the wall 3/16"5mm) below the elevation.

11.4.1.2 Carefully remove the previously welded vertical wall joint at the elevation where the wall screed strip is to be installed by using a side grinder with sanding disc or other suitable device. It is important to only remove the minimum amount of weld to fit the 1/2"x 1/2"(13x13mm) wall screed strip against the wall. After grinding or sanding the weld, scrape to smooth weld and adjacent sheet.

11.4.1.2.1 Alternatively, the wall screed strip can be notched to bridge the welded joint.

11.4.1.3 If the wall screed strip is not supplied pre-beveled, bevel the top corner of the screed that fits against the wall.

11.4.1.4 Tack weld the wall screed strip to the wall as shown in drawing #6

11.4.1.5 Scrape the wall screed strip, seam, and 3mm welding rod, and hand weld the wall screed strip to the wall, topside, with a single rod weld. This weld must be made in such a manner that the rod will not interfere with the fit of the floor sheet (drawing #6). If clearance from the base slab allows, weld the bottom of strip with a single rod weld also applying conductive tape to top side of all welded wall screed.

11.4.2 Floor Screed Strip Installation - Lay out the locations of the screed strip as indicated on the drawings. Proper location of screeds will facilitate the subsequent placement of sheet. Screed strip should be installed as follows:

11.4.2.1 The proper placement of the first screed strip is critical and should be done as follows:

i)String a line parallel to one of the long walls at the elevation of the wall screed strip.

ii) Find the location where the distance from the string to the wall is the greatest.

iii)Using the above location snap a line the width of a sheet away from the wall. This provides the centerline of the first floor screed strip.

iv) From this point measure along both of the short walls in intervals of the sheet width plus 1/8" to determine the centerline of each subsequent screed strip.

v)It is also recommended that a center line be scribed into the screed strip before placement.

11.4.2.2 Once the above has been determined, construct forms for placement of screed strips by using 2" x 4" lumber arranged as shown in drawing #7a.

11.4.2.2.1 Installation of Wire Mesh - As cited in section 7.2, some installations require the use of wire mesh reinforcement. When job specifications require that the reinforcement must run continuously through the floor, floor screeds should be designed with the mesh running through the screed supports as shown in drawing 7b.

11.4.2.3 Prepare the screed mortar mix using Portland cement and concrete sand in a ratio of 1:3 by volume with just enough water to be able to form a ball in the hands from which water can be squeezed while still retaining the shape of the ball.

11.4.2.4 Apply a bonding agent to the concrete where the screeds will be placed. Pack the mortar mix inside the 2" - 4" forms and then lay the screed strip into the compacted mortar. Tap the screed strip lightly to seat the screed into the form.

11.4.2.5 Make certain that the level of the screed strip is one floor sheet thickness below the elevation of the finished floor along the entire length of the strip.

11.4.2.6 Strip the 2" X 4" forms when the mortar has attained an initial set. Trim the sides of the mortar bed to ensure they will not interfere with the placement of the Bekaplast floor panels. Allow the mortar bed to harden before proceeding with the laying of the sheet.

11.4.3 Floor Sheet Installation-

11.4.3.1 Apply conductive tape one of the short dimensions as shown in drawing #8.

11.4.3.2 Sheets should be laid out and arranged in advance, trimmed as needed to seat tightly against wall on perimeter sheet and properly on the screeds to yield seam widths as shown in drawing #9. Trimming of sheet should not result in removal of any knobs from the sheet.

11.4.3.3 Layout must be staggered so that a maximum of three sheets meet in any one place.

11.4.3.4 Before placement of sheet insure that tape is on the anchor side of the unlapped sheet, 1/16" to 1/8" (1.6-3.2mm) from the edge for use in spark testing of the finished lining.

11.4.3.5 The setting bed mortar is prepared using a mixture of three (3) volumes of concrete sand to one (1) volume of Portland cement with an amount of water so that the mortar can be molded into a ball by hand and a slight side to side motion of the hand will cause the ball to slump.

11.4.3.6 For larger projects, complex installations or in very warm weather, it is advisable to have a retarder added to the mix. Do not retard more than 6 hours.

11.4.3.7 It is advisable to pre-moisten concrete slab before placing the setting mortar to enhance the-bond to the base slab.

11.4.3.8 In instances where the base slab is more than three (3) months old a concrete bonding agent is recommended.

11.4.3.9 The setting bed mortar is placed and brought level with the top of the screed strips. Screed, compact, and finish as is normally done for screed installations. Fill any low spots immediately with fresh mix. Finish with a wood or magnesium float.

~~11.4.3.10 Carefully remove all setting bed mortar and foreign substances from~~ the surfaces of screed strips with a damp sponge to assure that the sheet will lay properly.

11.4.3.11 Only place the setting bed mortar in an area that will be immediately covered with Bekaplast sheet.

11.4.3.12 Carefully place the pre-measured sheet onto the leveled and compacted setting bed. Gently press the sheet edges to firmly seat onto the screed strips. Then cover the Bekaplast sheet with 3/4" exterior grade particleboard or waferboard, sized, to leave approximately 1/8" of the perimeter edge of the Bekaplast sheet exposed. This will allow laying of adjacent Bekaplast sheet without interference.

11.4.3.13 Place approximately 1/2 the ballast evenly over the surface particleboard or waferboard

A 59" x 118" (1.5m x 3m) HDPE sheet, with a total area of 48sq.ft. (4.5 sq. meter) will require approximately 900 lbs (408kg) of ballast or 36 twenty-five lb.(11 kg) bags.

11.4.3.14 With 1/2 the required ballast placed evenly on the board, gently tamp the board between the ballast using the butt end of a two x four. Tamping must not distort the sheet in any way. Tamp with just enough force and repetition to insure that the setting bed mortar encapsulates the anchors and the sheet edge seats firmly on the screeds.

11.4.3.15 As tamping is completed apply remaining ballast. Leave ballast in place for a minimum of three days. Avoid any traffic on sheet until set.

11.4.3.16 Clean screed strips of residual setting bed mortar.

12. INSTALLATION OF PREFORMED BEKAPLAST SUMP

12.1 Factory fabricated Bekaplast sumps can be supplied for field placement based on shipping and installation limitations.

12.2 The ambient temperature during the installation of trench and sump must be below 100^{0}F (35^{0}C) and above 32^{0}F (0^{0}C).

12.3 Procedures for installation of these pre-fabricated structures for new and existing construction is outlined as follows:

12.3.1 Form out Bekaplast sump sections as per standard concrete requirements. Typical formwork designs for sump sections with plywood and 2" X 4" bracing are similar to drawing #13.

12.3.1.2 Attachment of the formwork to the liner is to be made so that no penetrations are made through the liner. This is done by clamping the prefabbed sump to the sump formwork.

12.3.2 In order to keep sump sections at specified elevation and to prevent floating, use 2" x 4" set across the excavation and attached to the formwork

12.3.3 Using the approved, specified concrete mix, observe the Contractor placing concrete on opposite side of the structure. Use vibrators in the concrete mix to help assure that the underside of sump is properly filled.

12.3.4 Allow sufficient cure time before removing the forms. Care must be taken in form removal so that the liner is not damaged.

13 WELDING REQUIREMENTS

13.1 Welding Guns - Welding guns of the type listed under Section 5 in Tooling Requirements have been used successfully and are recommended for the welding of Bekaplast. Guns must be maintained and proven to be functioning properly through regular weld testing. Weld tips and shoes must be checked frequently for defects due to wear and repaired or replaced as described in the ISCO Quality Control Manual.

13.2 Electrical Requirements - Welding guns require an uninterrupted supply of electrical energy to assure uniform heating of the thermoplastic materials. The most important consideration is that the wattage (product of voltage x amperage) remains constant. On many construction jobs a frequent problem occurs when other users of electricity "cut in" and affect the wattage delivered to the welding guns. Proper precautions and planning must be used in order to prevent this from occurring.

13.3 Air Supply

13.3.1 Suitable means must be provided for the delivery of adequate volumes of clean, dry, oil-free, air at steady pressure (must not pulsate), to the welding

13.3.2 Air quality is checked daily using ASTM D-4285.

13.3.3 Dust filters are needed on blowers and other similar air moving equipment.

13.3.4 Recommended air volumes for the differing methods and materials of welding are shown in Tables 1 and 2.

13.3.5 Air volume should be checked by use of a flow meter placed just before the welding

gun.

13.3.6 Hoses must be blown out each morning to eliminate any water that may have accumulated overnight due to condensation.

13.4 Environmental Conditions -Certain restrictions apply during the welding of Bekaplast Supervisors on site are responsible for measuring and recording all pertinent data such as temperature, humidity, and dew point

13.4.1 Ambient air temperatures in the local environment where welding is taking place must be maintained between 55^0F and 95^0F.

13.4.2 Minimum and maximum surface temperatures for the different types of Bekaplast materials are shown in table 3.

13.4.3 All sheet surfaces in areas subject to welding must be protected from dirt, dust, and other contaminants.

13.4.4 All seams must be dry when welding.

14. SURFACE PREPARATION FOR WELDING

14.1 It is very important that surfaces to be welded are free of dust, dirt, and other contaminants. It is recommended that the entire lining be wiped down with damp rags or a sponge to remove excess concrete and other contaminates. Cleaning should not be performed using a hose or any other method that will expose the unwelded floor to excessive amounts of water. Any water infiltration of the seams is not acceptable. Floors should be cleared of extraneous debris and dirt by sweeping followed by vacuuming. Sweeping compounds, dust preventative materials, or similar types of cleaning aids shall not be used in the cleaning of Bekaplast.

14.2 When scraping seams welders must be sure to scrape all surfaces that will receive welds.

14.3 Wall Seam Preparation- (see drawings #17a - #17d)

14.3.1 On vertical wall seams remove the inside face of the H-Zip strip and scrape the center nub beyond the depth of the wall sheet. (drawings #17b and #17c)

14.3.2 Remove all residual concrete from the surface of the H-Zip Strip and/or overlap strips.

14.3.3 Using appropriate scrapers, prepare the seam bevel, gap, and adjacent sheet surfaces at least 3mm on each side of seam, to the dimensions and configuration shown in drawing #17d. It is very important for all seams to be prepared to uniform dimensions.

14.3.4 The sump seam will be scraped and beveled the same as a vertical seams.

14.4 Wall tie-rod closure (Disc seal) preparation-

14.4.1 The surface of the sheet around tie rod holes should be cleaned of any dirt and/or laitance and scraped thoroughly. Tie rod should be cut off so as not to extend beyond the surface of the Bekaplast sheet. When tie rod is removed, holes must be grouted before disc

seals are welded on.

14.5 Floor Seam Preparation

Remove all concrete from sheet and screeds. Using appropriate scrapers prepare the seam bevel, gap, and adjacent sheet to the dimensions shown in drawing #18. Make sure that screed strip is clean and free of all contaminants. It is very important for all seams to be prepared to uniform dimensions.

14.6 Preparation of floor/wall corners

14.6.1 Remove all concrete from screeds and sheet adjacent to the seam.

14.6.2 Using appropriate scrapers prepare the floor/wall seam as shown in drawing #19. Clean wall screed of all contaminants and scrape exposed surface of wall screed. It is very important that all seams be prepared to uniform dimensions.

15 WELDING METHODS

15.1 Extrusion welding is preferred. Hand welds are limited to use on disc seals, corner connectors, small bore pipe less than 6" in diameter, holding down misaligned sheet, and in areas where extrusion welds cannot be applied reliably because of space limitations.

15.2 All rod used for hand welding must be scraped immediately before use.

15.3 All bevels, lap strips, screed strips, and sheet immediately adjacent to seams must be scraped or rescraped no more than 30 minutes prior to welding.

15.4 Maximum hose length between blower and welding gun is (33ft.). Extrusion guns generally require a dedicated blower due to the air volume requirements, however, other means, such as compressors, can be used as long as volume and cleanliness criteria are met. For hand guns, several guns can generally be joined to a manifold off one blower as long as volume and cleanliness criteria are met for each gun.

15.5 All equipment must be checked for conformance to temperature and air supply standards at the beginning of each day or shift. Preheat patterns must also be checked to verify that the heated air is being properly directed. Weld tests are to be made in accordance with the project QC requirements.

15.5.1 Recommended temperature ranges for hand and extrusion welding are shown in tables 1 and 2 for the various types of Bekaplast.

15.5.2 Specified welding temperatures can vary and are dependent on factors such as air and surface temperatures, the air flow used, size of the weld size of the rod, type of welding gun, and individual welder techniques. Gun temperature and air flow parameters must be adjusted to insure good fusion.

15.6 Welding must be planned to minimize stopping and starting points.

15.7 Extrusion welding shoes should be selected to extrude a weld that will overlap adjacent sheets at least 3mm (1/8"). See drawing #20.

15.8 Anytime an extrusion gun is idle for more than one hour, it should be operated to extrude 12 to 18"

(30 - 46cm) of material on a piece of wood immediately before welding of sheet is begun. This will preheat the weld shoe and remove any overheated material from the extruder.

15.9 When initiating a weld, the sheet and beveled area must be heated 10 - 15 seconds with a fanning motion of the preheat air in order to adequately preheat the sheet.

15.10 After extrusion welds have cooled, excess weld must be scraped off by use of semicircular chisels (buck gouges) and scrapers modified to prevent damage to the sheet and weld. The same person that welds should scrape the joint. This will allow the welder to critically evaluate the weld quality and adjust welding parameters accordingly. Before and after sketches are shown in drawing #21.

15.10.1 When extrusion welds are stopped in midseam, they must be prepared for subsequent welding by tapering over a distance of approximately 2". If the new weld is to continue in the same direction proceed with standard extrusion welding practice. If the new weld meets the tapered weld from the opposite direction, the extrusion is stopped midway over the tapered weld while continuing to move the gun at the normal rate of speed to cover the remainder of the taper. This results in a smooth transition.

15.11 Sheet adjacent to welds must be stamped to identify the welder performing the work.

15.12 Welding of walls

15.12.1 As stated in section 11.3 it is highly recommended that all wall welding be performed prior to the placement of the Bekaplast floor. When this is not possible weld the lower portions of each vertical seam, starting below the final floor elevation to a height of 20" (50cm) above the final floor elevation.

15.12.2 Wall seams are welded using a suitably sized extruder that can be operated comfortably over a relatively long period of time

15.12.3 The Sump wall seams are welded before the verticals. A suitably sized extruder shoe shall be used to weld sump seam. If joint is larger than shoe limits, cap strips can be used to cover seam. Test joint according to section 16.

15.12.4 The remainder of the vertical seams are then welded from the top down to meet the previously welded portion, if necessary. Use of lifts, high reaches, and/or counterbalances are recommended in order to make a continuous weld.

15.12.5 Prefabricated vertical corners must be cleaned, scraped, and extrusion welded using a minimum 20mm (90°) corner shoe.

15.13 Welding of Floors

15.13.1 Floor seams are usually welded using a large extruder and 4mm weld rod.

15.13.2 Short dimensions are welded first. The sheet surface must be scraped at "tee" intersections 1- 2" (2.5-5cm) beyond the vertical seam into the adjacent sheet. Welding is initiated opposite the intersection (on the adjacent sheet) and runs through the entire horizontal seam, proceeding past the second "tee" and out 1" onto the adjacent sheet. After cooling, excess weld is removed as described in section 15.10.

15.13.3 When doing short dimensions that abut the walls wall sheet should be scraped 1 - 2" up from the floor seam and welds must be run from the wall and out into the floor.

15.13.4 Before welding the long dimensions, prepare intersections as follows: After the horizontal weld has cooled, prior to welding the verticals, the weld on the adjacent sheet is ground off level. The vertical seam, at the intersection, is "V"ed out just enough to allow for the passage of the shoe when doing the vertical weld.

15.13.5 Before welding the long seams, the wall sheet immediately above and in line with the seam should be scraped.

15.13.6 The long welds are done by starting at the floor/wall corner. The area is preheated until adequately softened, as shown by probing, (Approx. 10 -15 seconds). Weld is extruded and pushed into the corner with the a pushing tool and run out into the floor. Two options exist for finishing the long seams.

15.13.6.1 (Preferred Method) Start the weld as described above and stop a maximum 12" from the opposite wall. Immediately start weld from the opposite direction as described in section 15.13.6 and weld to meet initial weld while it is still warm. Use the wooden pushing tool to help fuse the two welds.

15.13.6.2 Alternatively the weld can be run out into the floor and stopped at any point. Allow to cool. Prepare for joining and weld as described in 15.10.1.

15.14 Welding of Floor/Wall Corners

15.14.1 Floor/Wall corners are usually welded using a large extruder, equipped with an appropriately sized corner shoe and 4mm weld rod.

15.14.2 All wall and floor welds that intersect the floor/wall corner should be ground and angled into the corner just enough to allow for the passage of the shoe when doing the corner weld.

15.14.3 Perimeter welding should be planned to proceed continuously. Welding must proceed continuously around the corners. In order to do this the handles of the extruder may need to be removed while operating in order to allow the gun to turn the corner. The gun may be stopped momentarily but the shoe must not be lifted from the sheet.

NOTE: Removal of handles in some extruders may result in air leakage. In these cases the handle hole must be plugged to prevent air leakage.

15.15 Welding of Disc Seals (Wall Tie Closures)

15.15.1 All disc seals are supplied with conductive material taped to the back side of the disc.

15.15.2 Using a tacker tip and hand gun tack the disc securely in place.

15.15.3 Weld disc to sheet with a 3mm weld rod. Spark test after the 3mm root rod has cooled. Replace root rod if any leaks are found.

15.15.4 Cover with two 4mm rod welds, scraping previous rod, disc seal edge, and sheet as required.

15.16 Welding of Inlet/Outlet Pipes

15.16.1 Inlet/Outlet piping compatible with the sheet is hand or extrusion welded depending on the pipe size and accessibility. Generally, pipe larger than 6" (152mm) can be extrusion welded. A flatstock collar of the same material can also be installed around the pipe penetration per the project drawings.

15.16.2 Place the Bekaplast collar, of the same base resin as the lining around the pipe. The outside radii of the collar must receive conductive tape before being placed.

15.16.3 Weld the outer edge of the flatstock collar to the wall using a 3 rod hand weld.

16 FINISHED LINER TESTING

16.1 Spark Testing

16.1.1 Spark testing is usually the method of choice for testing the finished Bekaplast linings for defects.

16.1.2 Welds can be tested when cool to touch.

16.1.3 The area adjacent to the weld should be rapped smartly with a rubber or plastic mallet prior to spark testing. This will help identify any marginal welds.

16.1.4 Generally 100 volts per mil (0.001") of liner thickness is recommended for spark testing in dry air. Since most testing is not performed in dry air it is recommended to set the voltage so that the spark will jump approximately 3/4" to 1".

16.2 Testing for Voids in Lining

16.2.1 After welding has been completed test for voids under the sheet by lightly tapping with a broom handle, 2x4, or some other similar device that will not damage the sheet. Voids will be identified by a hollow sound on tapping. Mark hollow areas with chalk to be repaired as described in section 18.

17 REPAIRS OF WELDED JOINTS

17.1 This section pertains to repairs required on welded joints. The type and degree of defects in the welded joint can vary widely and it is difficult to generalize on repair procedures. What follows are descriptions of how to proceed in a general way to make some of the more common types of repairs.

17.2 The Atlas Minerals and Chemicals Engineering Department will help in ascertaining the cause of defects, if needed, and will provide design assistance for repair.

17.3 Repair of Rod Welds

17.3.1 Repair of Rod Welded Joints

17.3.1.1 Locate the exact point of the defect and remove all weld 1" to 1.5" (2.5 - 3.8cm) on either side of defect by suitable means. From these points taper the weld out an additional 2"- 3"

17.3.1.2 Apply a 3mm rod as a root weld beginning approximately at the mid-point of one taper and finishing at the mid-point of the second taper. Allow to cool and spark test before applying two 4mm rods to complete the repair, scraping between each pass.

17.3.1.3In some cases the defect may initially appear as a pinhole but when scraped will reveal a larger void. All unsound weld must be removed and adjacent weld tapered as described above.

~~17.3.2 Repair of Disc Seals and Small Bore Pipe Nozzles-~~

17.3.2.1 If a defect is a pinhole type, re-weld.

17.3.2.2 If defect is shown to be larger than a pinhole then the disc or pipe must be completely reworked by removal of disc or weld on pipe, followed by rewelding.

17.4 Repair of Extrusion Welds

17.4.1 Defects in Flat Joint (Single Plane)

17.4.1.1 Locate exact point of defect and proceed as in 17.3.1.1.

17.4.1.2 Using an extrusion gun equipped with a suitably sized shoe preheat a minimum 1" from tapered area and weld from this point through the repair, at least 1" beyond the end of the second taper in a manner as described in section 15.10.1.This practice ensures good weld fusion through the repair.

17.4.1.3 Allow weld- to cool and dress as described in 15.10.

17.4.2 Defects in Two Plane Corners

17.4.2.1 Proceed as described in 17.4.1 but use a suitably sized corner shoe to reweld.

17.4.3 Leaks in or Near Three Plane Corners

17.4.3.1 Defect in Horizontal Plane

17.4.3.1.1 Remove all weld within 6" (152mm)of corner in both directions. Taper each for an additional 3"

17.4.3.1.2 Reweld as described in 15.14.3.

17.4.3.2 Defect in Vertical Plane

17.4.3.2.1 Remove all weld within 6" of corner in the vertical weld plus one of the adjacent horizontal welds. Taper each for an additional 3".

17.4.3.2.2 Reweld as described in 15.14.3.

17.4.3.3 In both cases allow weld to cool and dress as described in 15.10.

17.5 Repair of Nail Holes

17.5.1 When possible nails should be pulled out. If this is not possible, drive nail through the sheet with a nail punch.

17.5.2 Scrape the area around the nail hole and at least 2 to 2.5" (51 to 63 mm) in opposite directions from the nail hole in preparation for extrusion welding.

17.5.3 Extrusion weld over the nail hole by starting 2 to 2.5" away and welding directly over the hole, continuing for another 2 to 2.5" beyond the nail hole.

17.6 All repaired welds must be retested by methods described in section 16.1.

18 REPAIR OF VOIDS UNDER OR BEHIND LINER

18.1 This section pertains to repairs of voids found under or behind the lining. This procedure calls for injection of a resinous or cementitious grout material through the liner to fill voids behind the liner.

18.2 A generalized procedure for void filling is described as follows;

18.2.1 Drill 31/64" (12.3mm) or 1/2" (12.7mm) holes as needed through the Bekaplast sheet into the voided areas

18.2.2 Screw the Insertion Fitting into two adjacent holes, allowing the fitting to cut its own thread into the plastic sheet.

18.2.3 Mix the grout material per the manufacturers directions. Adjust fluidity to accommodate the type of void to be filled

18.2.4 Place the mixed grout into an empty one quart caulking cartridge. Cut off the tip of the cartridge, retaining a portion that will fit snugly into the nipple on hose. Pierce the seal in the cartridge and place in caulking gun. Attach hose assembly to cartridge and to Insertion Fitting.

18.2.5 Pump the caulking gun slowly until reaches the next Insertion Fitting.

18.2.6 Remove the Pumping Unit and the Insertion Fitting from the first hole. Attach the Pumping Unit to the second Insertion Fitting. Clean the first Insertion Fitting and screw it into the third hole. Temporarily close the first hole using a 1/4" (6mm) pipe plug. Continue in this pattern until the void is completely filled and all drilled holes are plugged.

18.2.7 Allow grout to cure and remove 1/4" pipe plugs.

18.2.8 Weld disc seals over holes as described in 14.4 and 15.15.

TABLE I - PARAMETERS FOR HAND WELDING

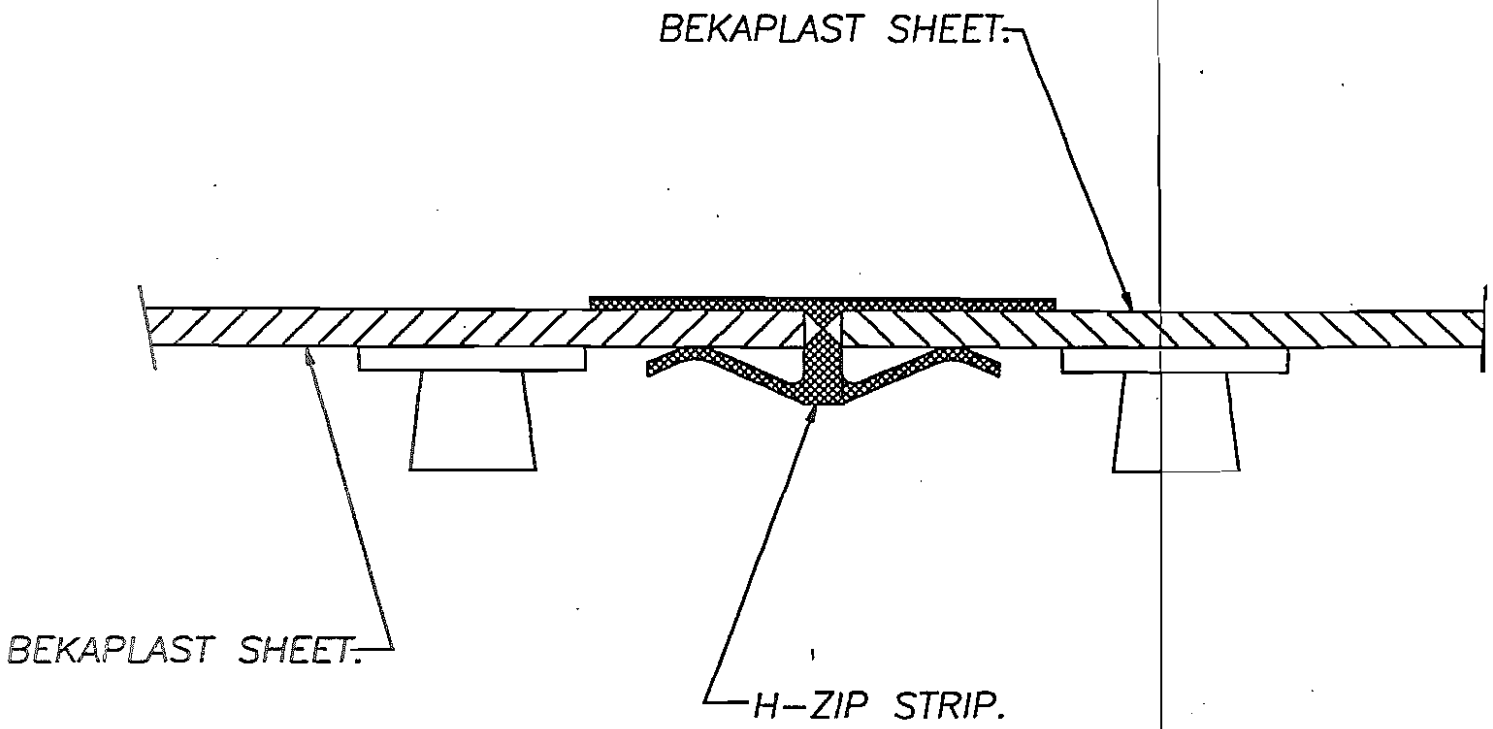
SPEED WELDING	HDPE	PPC	PVC	PVDF
TEMPERATURE (°C)	320 - 340	280 - 300	350 - 380	350 - 400
TEMPERATURE (°F)	608 - 644	536 - 572	662 - 716	662 -752
AIR FLOW (LITERS/MIN)	80 - 100	80 - 100	80 - 100	80 - 100
AIR FLOW (CFM)	2.8 - 3.5	2.8 - 3.5	2.8 - 3.5	2.8 - 3.5

TABLE 2 - PARAMETERS FOR EXTRUSION WELDING

EXTRUSION WELDING	HDPE	PPC
PREHEAT TEMPERATURE (°C)	250 - 300	250 - 300
PREHEAT TEMPERATURE (°F)	482 - 572	482 - 572
MATERIAL TEMPERATURE(°C)	200 - 230	200 - 230
MATERIAL TEMPERATURE(°F)	392 - 446	392 - 446
AIR FLOW (liters/min)	300 - 400	300 - 400
AIR FLOW (CFM)	10.6 - 14.1	10.6 - 14.1

TABLE 3 - SURFACE TEMPERATURES

SURFACE TEMPERATURES	HDPE	PPC	PVC
MINIMUM (°C)	13	13	13
MINIMUM (°F)	55	55	55
MAXIMUM (°C)	35	50	40
MAXIMUM (°F)	95	122	104



SHOWN WITHOUT FORMWORK.

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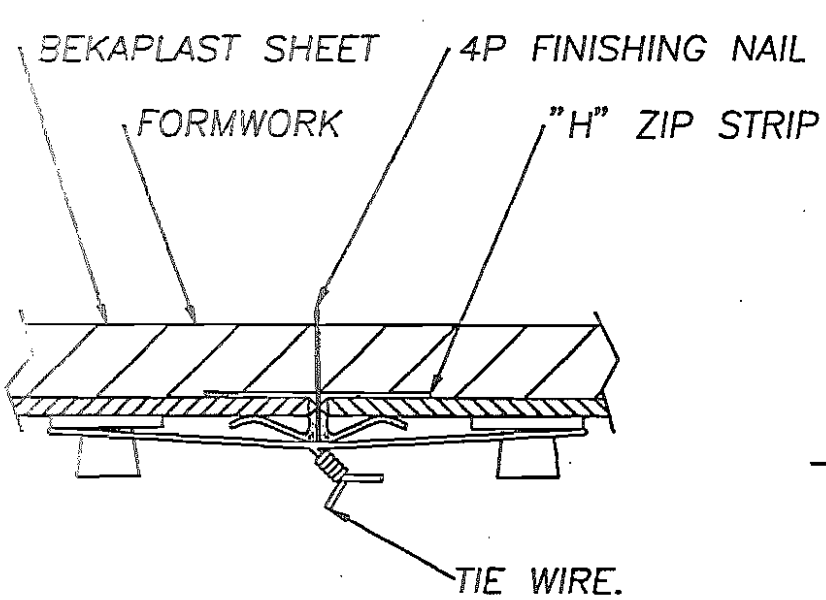
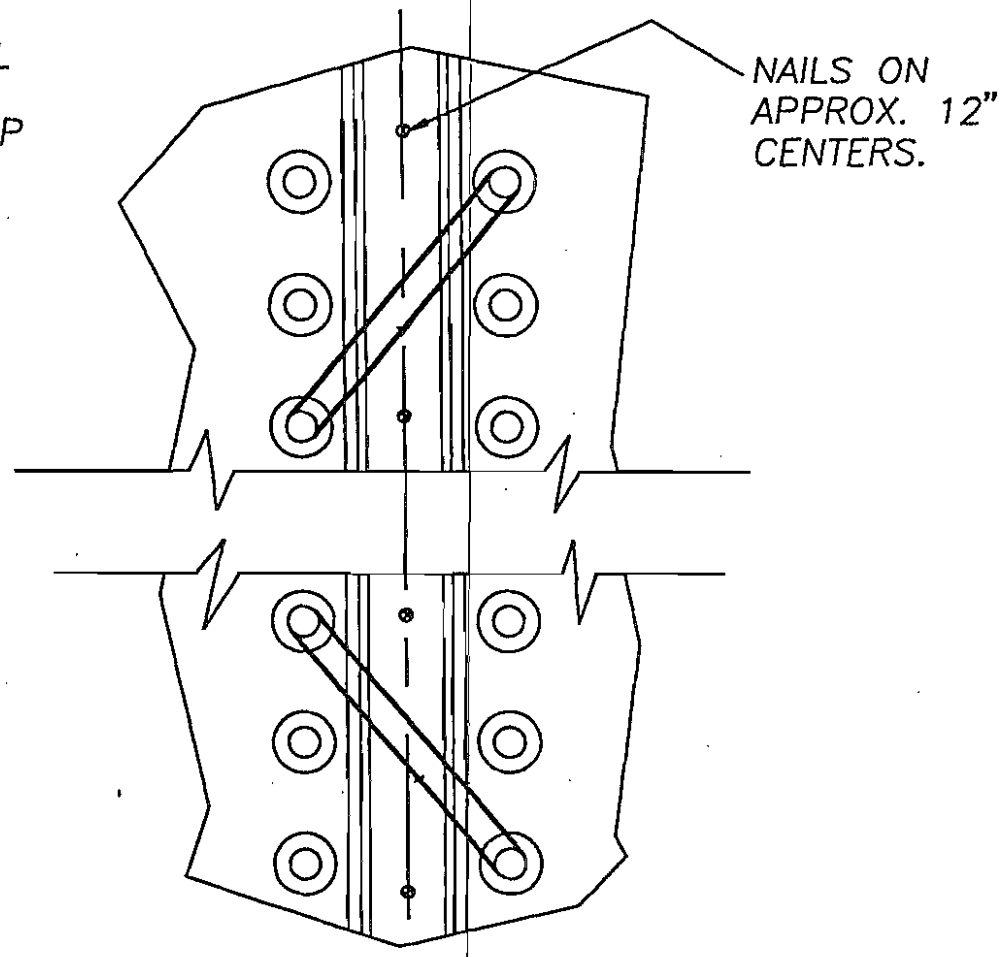
BEKAPLAST INSTALLATION MANUAL.

H-ZIP STRIP.

SCALE:	NONE.	DRAWING NO. DWG. 1
DATE:	10-25-95	



TOP VIEW–"H" ZIP STRIP WITH SHEET.



REAR VIEW–"H"–ZIP STRIP AND TIE WIRE WITH STRIP.

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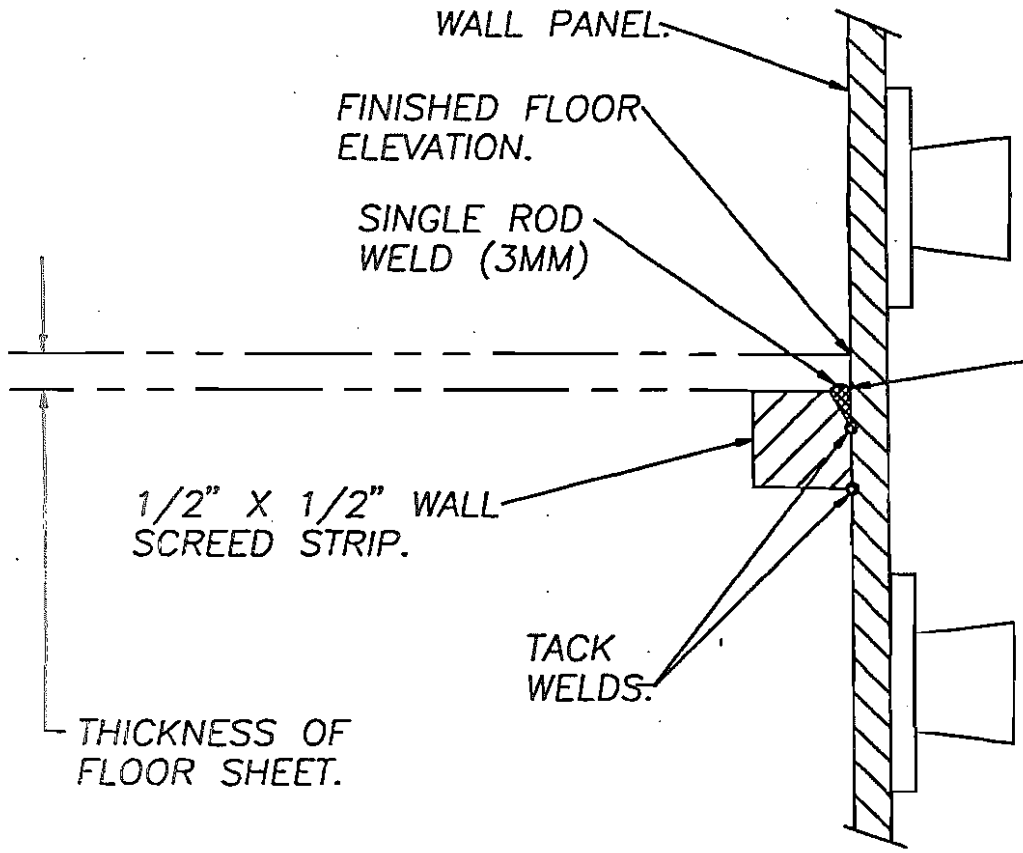
HORIZONTAL WALL JOINTS ATTACHMENT TO FORMS.

SCALE: NONE.	DRAWING NO. DWG. 4
DATE: 11–20–95	



NOTE:
SCRAPE WELD LEVEL TO TOP OF SCREED.

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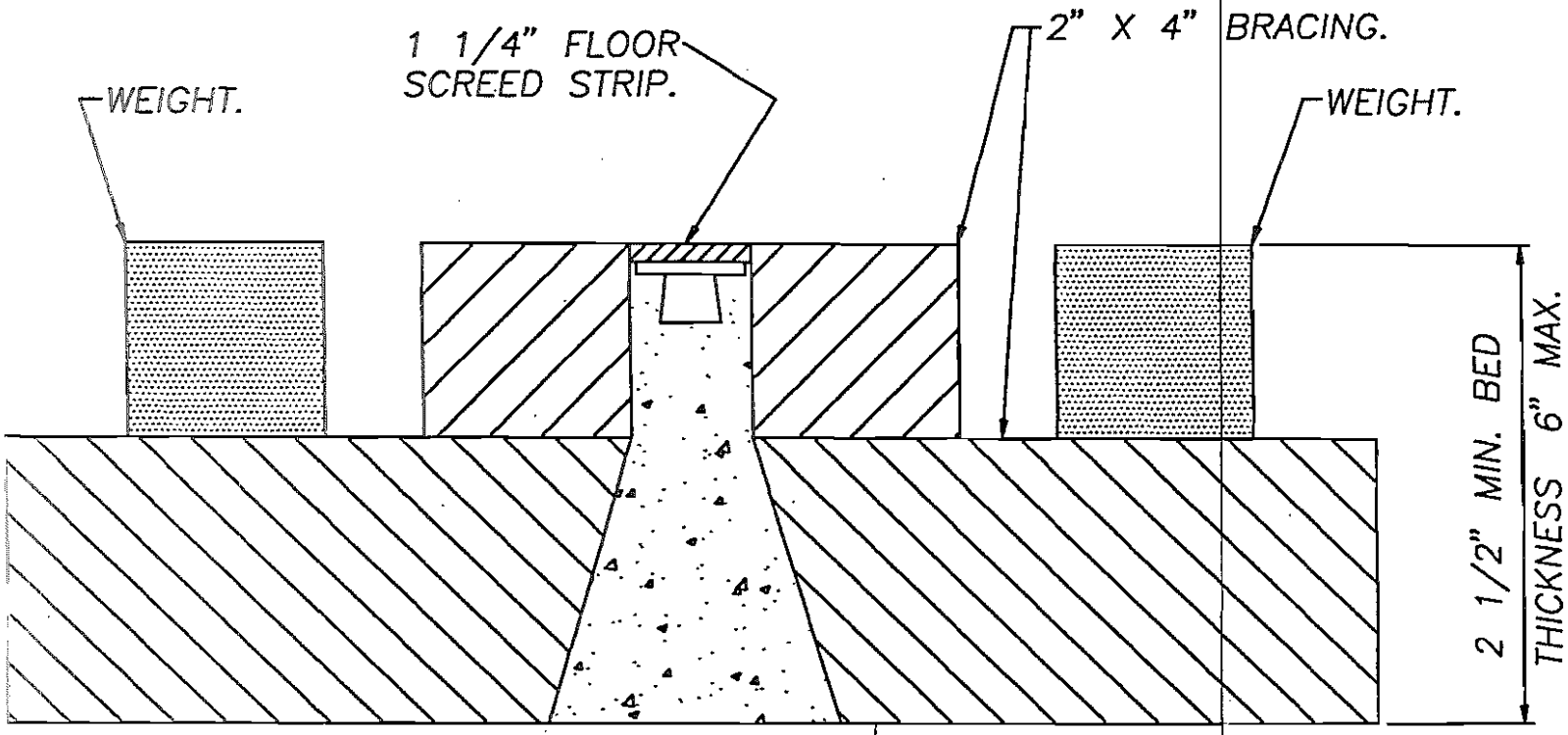
BEKAPLAST INSTALLATION MANUAL.

WALL SCREED DETAIL.

SCALE: FULL SIZE.	DRAWING NO. DWG. 6
DATE: 10-24-95	



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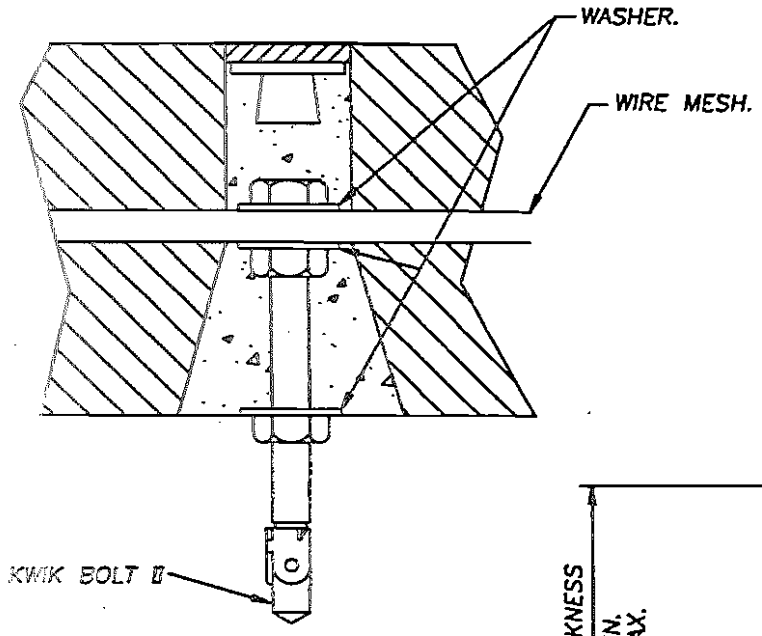
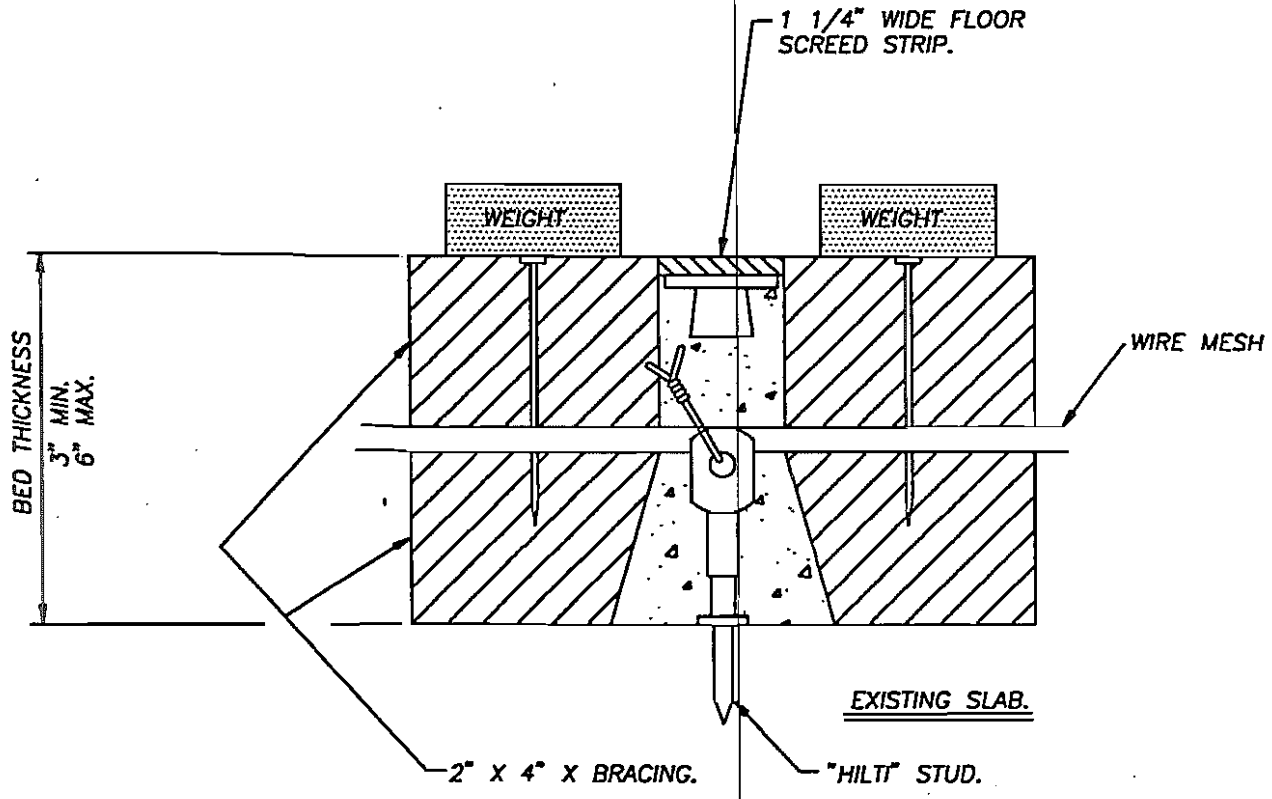
FLOOR SCREED MORTAR
BED & FORM DETAIL

SCALE: NONE	DRAWING NO.
DATE: 10-31-95	DWG. 7A



ALTERNATING ANCHOR



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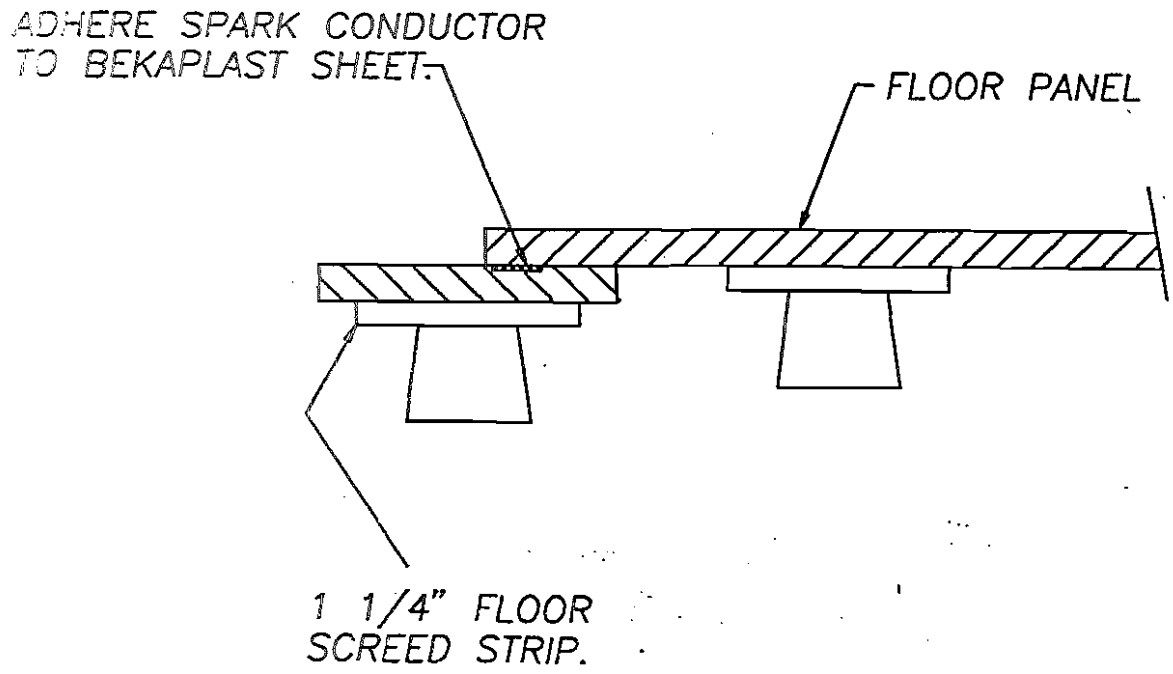
SCREED AND FORM DETAIL WITH ANCHORS AND REINFORCEMENT.

SCALE:	NONE	DRAWING NO. DWG. 7B
DATE:	2-23-96	



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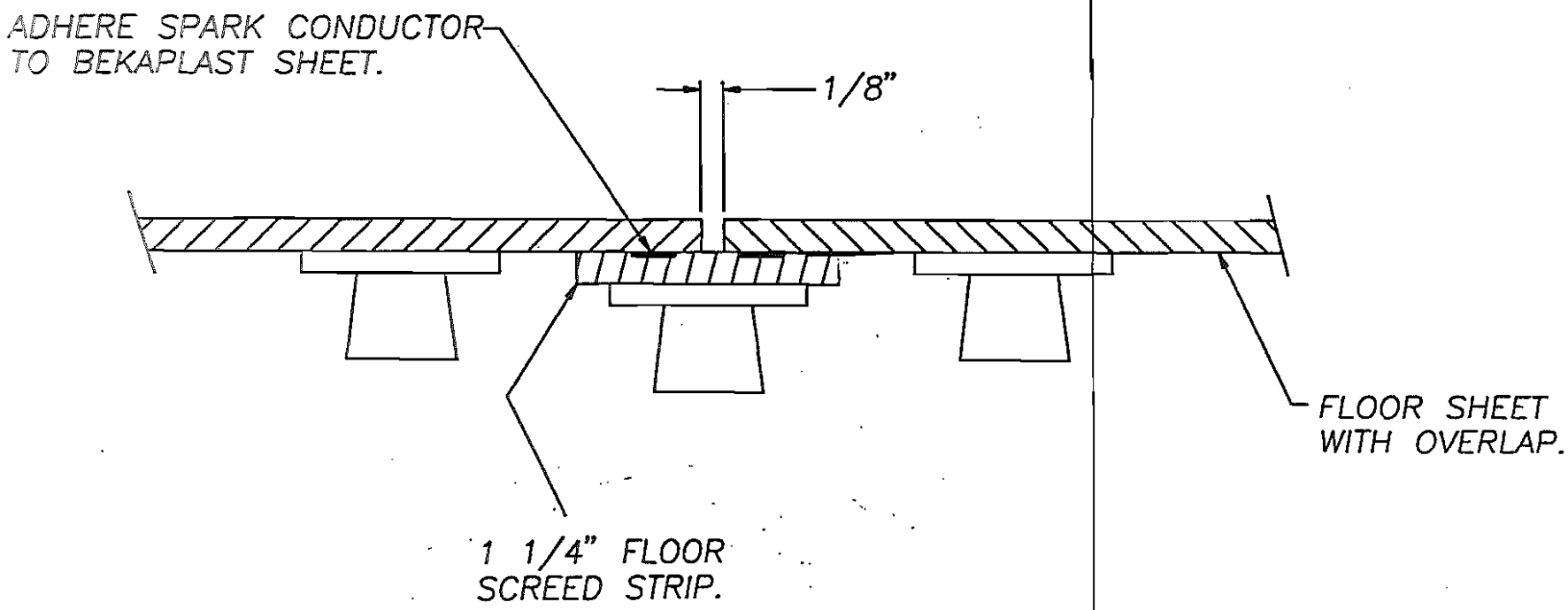
BEKPLAST INSTALLATION MANUAL.
FLOOR OVERLAP DETAIL.

SCALE:	FULL SIZE	DRAWING NO.
DATE:	10-30-95	DWG. 8



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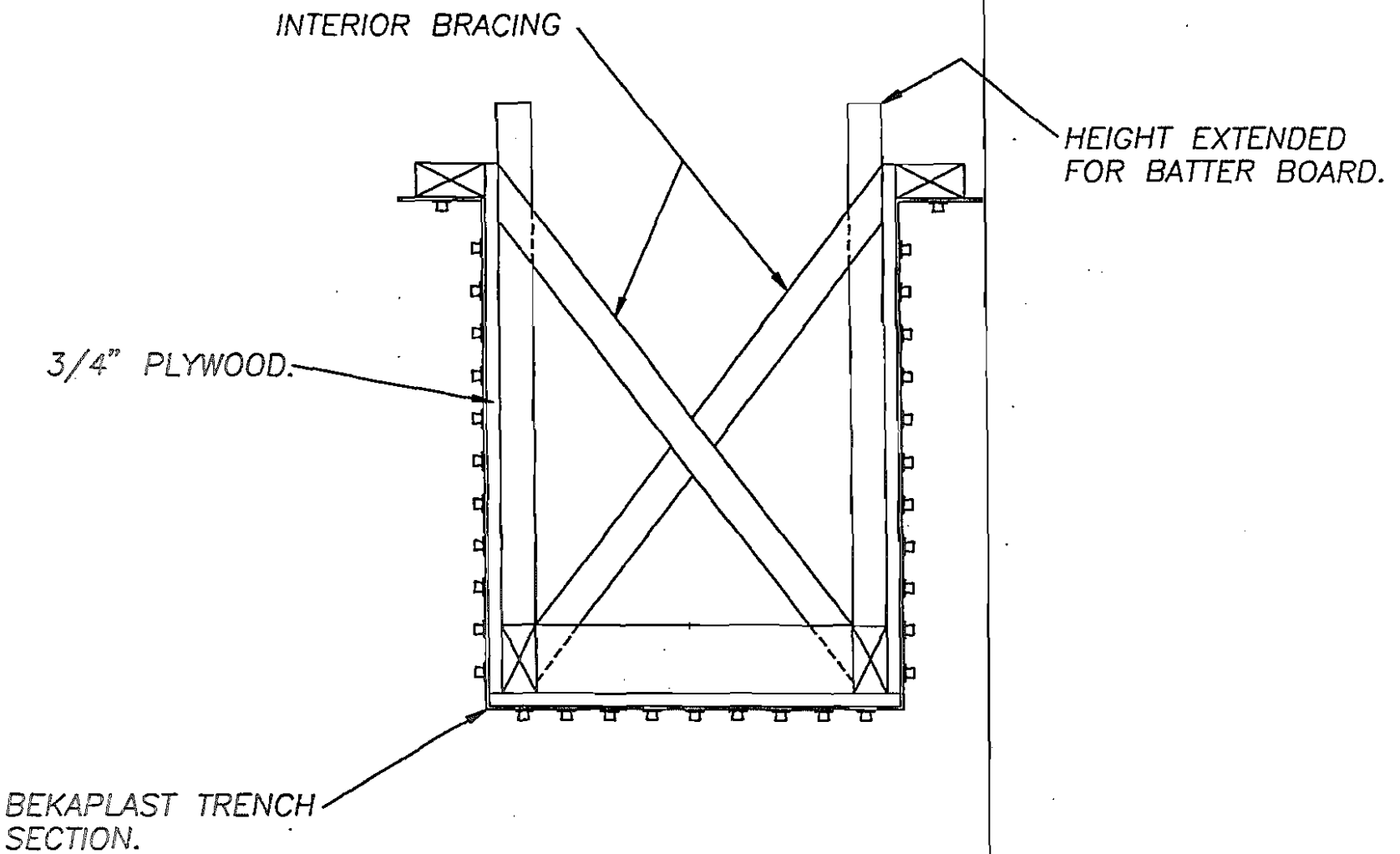
BEKAPLAST INSTALLATION MANUAL.
FLOOR OVERLAP JOINT.

SCALE:	FULL SIZE	DRAWING NO.
DATE:	10-30-95	DWG. 9



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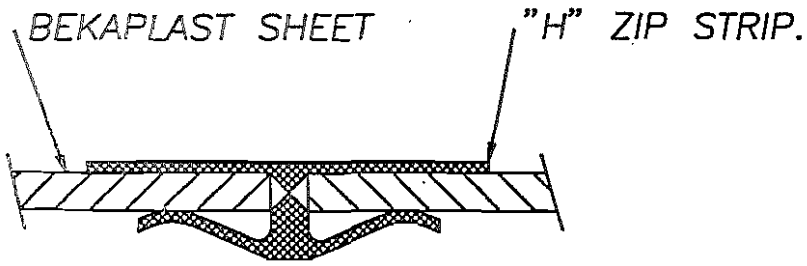
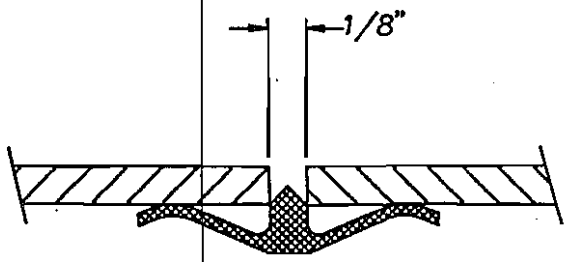
BEKAPLAST INSTALLATION MANUAL.
TYPICAL FRAMING DETAIL

SCALE: NONE.	DRAWING NO.
DATE: 1-25-96	DWG. 13

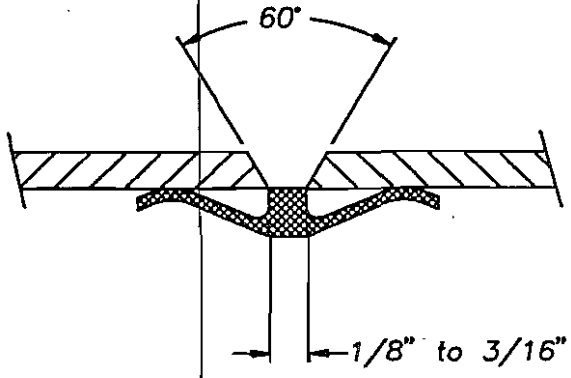


DWG. 17a VERTICAL WALL SEAM WITH ZIP STRIP.



DWG. 17b VERTICAL WALL SEAM AFTER ZIP STRIP REMOVED.

DWG.17c VERTICAL WALL SEAM AFTER NUB REMOVAL.



DWG. 17d VERTICAL WALL SEAM AFTER BEVEL.

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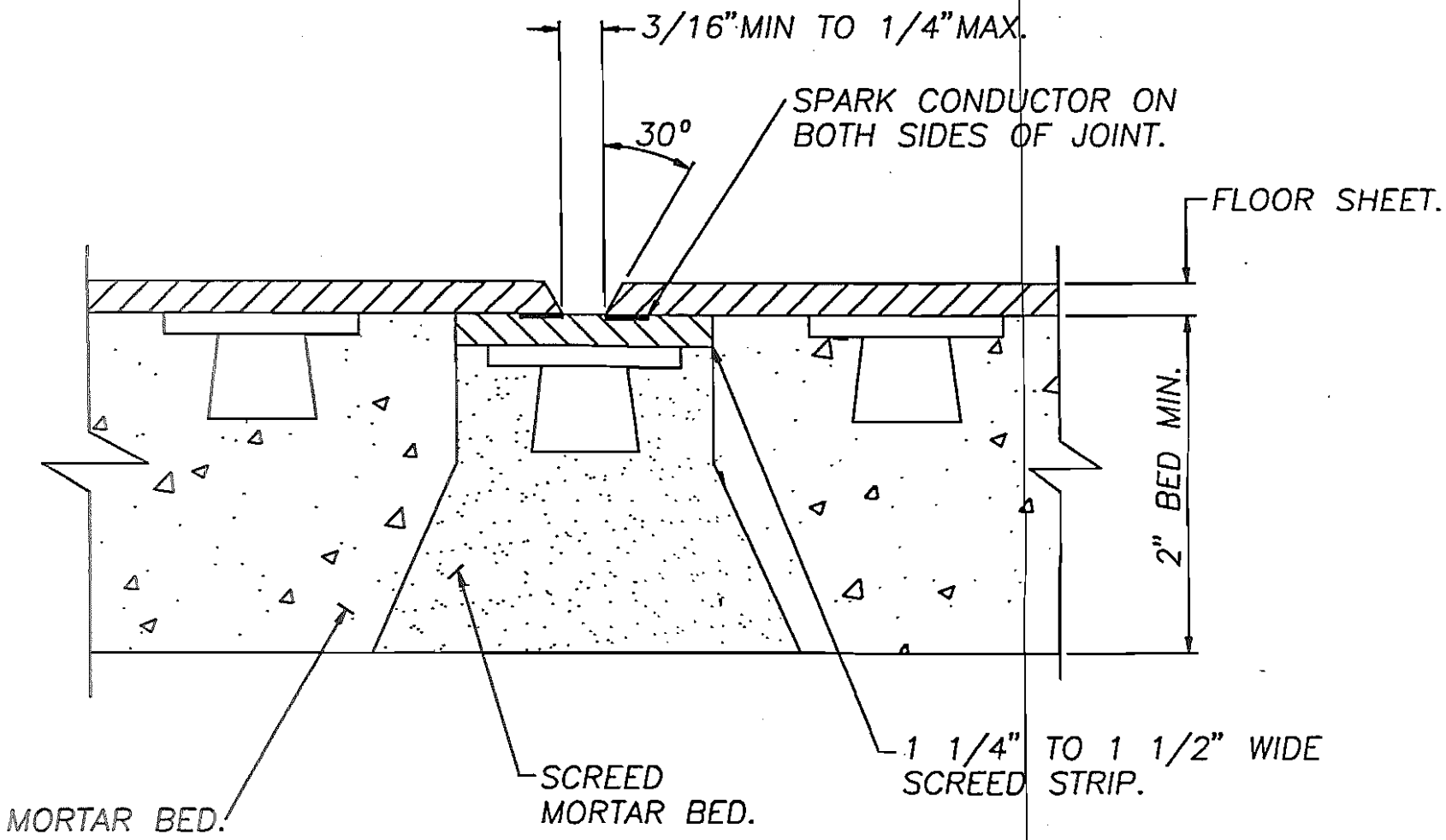
BEKAPLAST INSTALLATION MANUAL.

WALL JOINT DETAIL WITH H-ZIP STRIP.

SCALE:	NONE	DRAWING NO.
DATE:	10-26-95	DWG. 17



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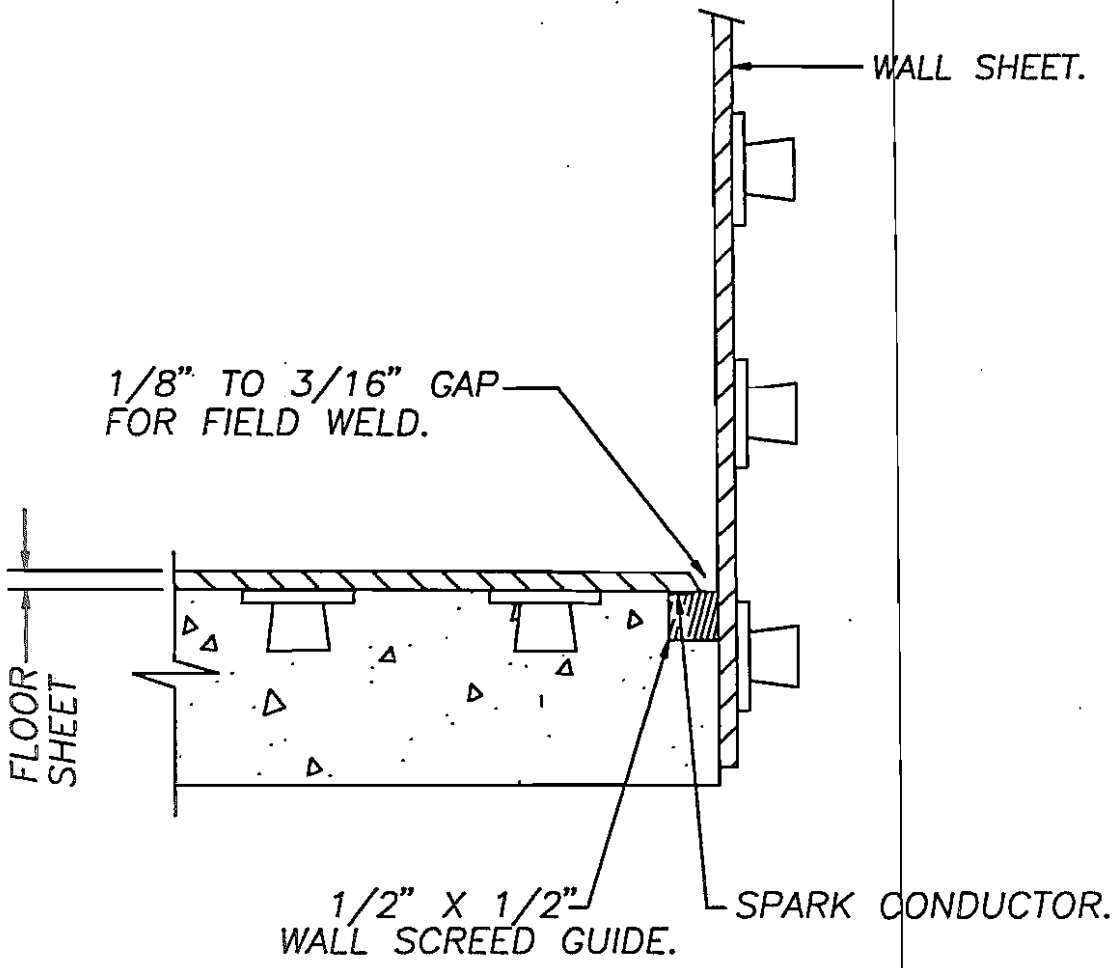
BEKAPLAST INSTALLATION MANUAL.

FLOOR SCREED GUIDE FOR EXTRUSION WELD.

SCALE:	FULL SIZE	DRAWING NO.	DWG. 18
DATE:	10-24-95		



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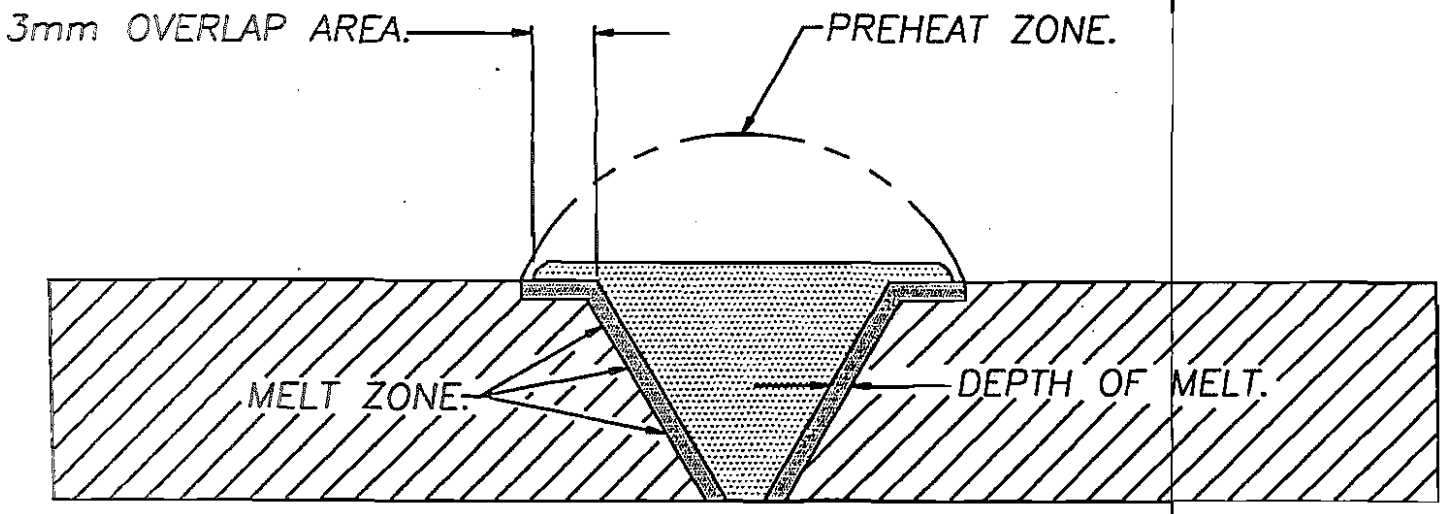
BEKAPLAST INSTALLATION MANUAL.

FLOOR TO WALL DETAIL.

SCALE:	6" = 1'-0"	DRAWING NO.
DATE:	10-25-95	DWG. 19



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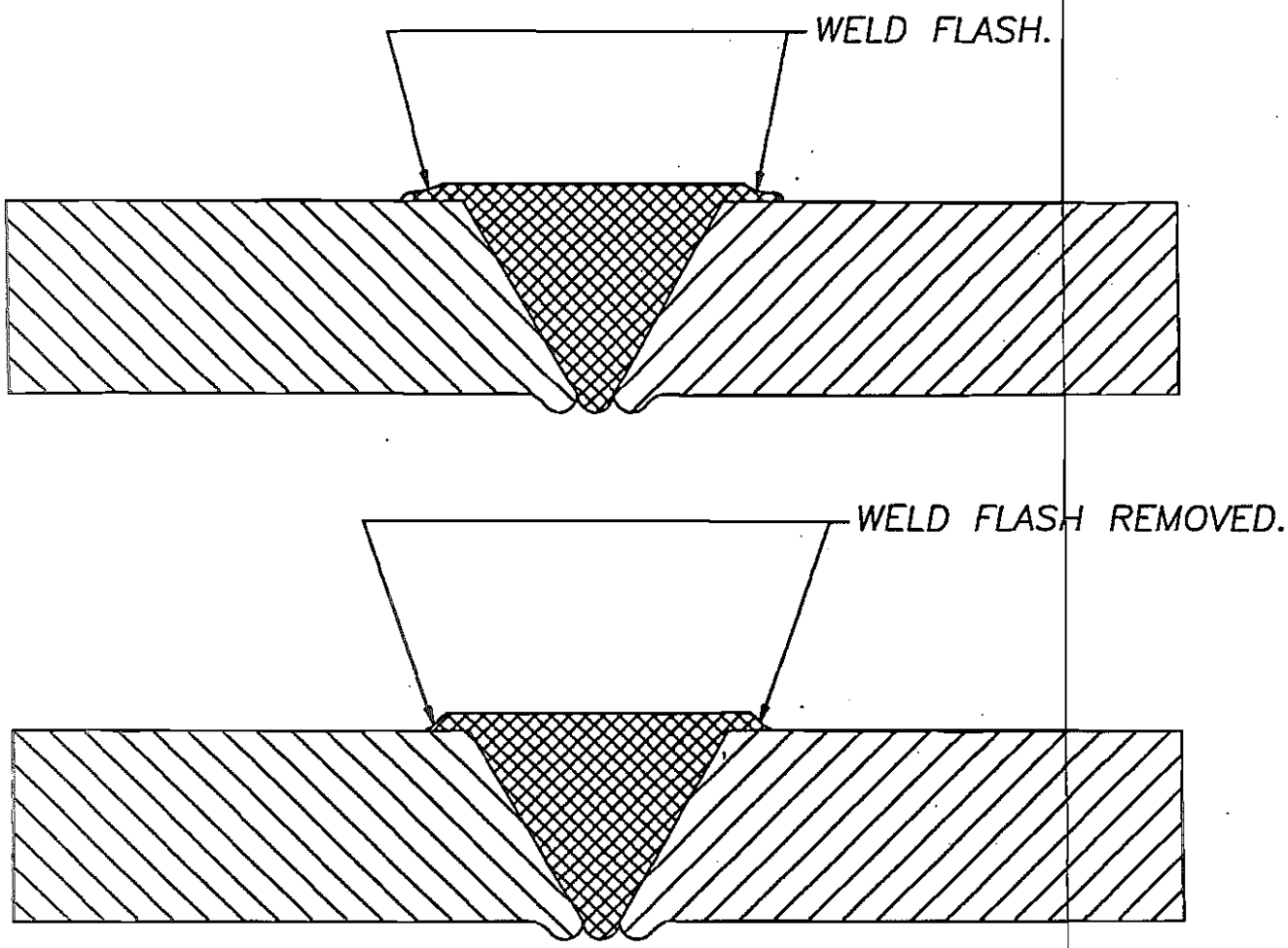
BEKAPLAST INSTALLATION MANUAL.

TYPICAL EXTRUSION WELD.

SCALE:	NONE.	DRAWING NO.
DATE:	10-25-95.	DWG. 20



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BEKAPLAST INSTALLATION MANUAL.

DRESSING OF EXTRUSION WELD.

SCALE:	NONE	DRAWING NO.
DATE:	10-25-95	DWG. 21

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-001	REV: 2	DATE: 20-Jul-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Melissa Coffey DATE: 7-20-00

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
8	641-03110-001	2						X			Concrete Protective Liner		X		03110	X		
	1.04,A-6 1.04, D-1, D-2-a,b,c,																	
	1.04, E-1, 1.04 E-5, c-f																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Jim Jenkins	52-5				
mike Godber	64				
Bob Kneip	52-5				
scott wheeler	52-5				
Glosynter	38				

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

Minor comment - attached

RECEIVED BY: MW Griffin DATE 7/25/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

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

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

1.04

A-6

INFORMATION ONLY

→ [X] A - Conforms to the Subcontract Requirements
~~[ ] B - Minor Comment - Incorporate and Resubmit~~
[ ] C - Revise and Resubmit
Sig: MW/SJ Date: 7/25/00

* Fluor will request GeoSyntec to measure thickness of Bekaplast sheets
MW/SJ 7/25/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-001
Reviewed By: [illegible]
Date: 7/20/00

To: John Flugstad
fax 513-648-4187

SIMONA

Certifiable Values
1.04.A.6

STEULER INDUSTRIEWERKE GMBH

POSTFACH 1448

56195 HOEHR-GRENZHAUSEN

Date : 14.07.2000

INSPECTION CERTIFICATE 3.1 B ACCORDING TO EN 10204

Certificate No.	: 0024884	Kd.-Nr:	21049
Order	: 43675/05	of 31.08.1999	
Your Order	: BEST.-NR.104-5531 TEL.H.DAHLEM		
Delivery note	: 40826/9915513	of 07.10.1999	
Our invoice No.	: 301310	of 08.10.1999	
Article-No.	: 300.003.03		
Product	: PE-HWU-B SHEET EXTRUDED		BLACK
Dimension mm	: 3000 X 1500 X 5,0		
Quantity	: 999 Pc		
Moulding batch	: ISO 1872-1 PE,ECHL,45 T 006		
Raw material	: HOSTALEN GM 5010 T3		
Charge no.	: 704462	639921	

Test results of the specific control

Moulding batch

Density DIN 53479 C	Act.val : 0,955 Set val.: 0,956 +/- 0,002	g/cm3 g/cm3
Melt flow index DIN 53735 190/5	Act.val : 0,42 Set val.: 0,45 +/- 0,05	g/10 min g/10 min

SIMONA

Certificate No : 0024884 Page : 2

Semi-finished product

Condition of delivery / Condition of surface: acc. to standards
Thickness mm : acc. to standards +/- 0,23

Melt flow index DIN 53735 190/5	Act.val : 0,41 Set val.: MFI Rohst.+max.0,2		g/10 min g/10 min
Tensile stress at yield DIN 53455 test specimen 3 V=50mm/min	Act.val : 25,14 Set val.: >/= 20	N/mm2 N/mm2	
Elongation at yield DIN 53455 test specimen 3 V=50mm/min	Act.val : 9,54 Set val.: >/= 8	% %	
Elongation at break DIN 53455 test specimen 3 V=50mm/min	Act.val : 518,29	%	
E-modulus DIN 53457 test specimen 3	Act.val : 1093,79 Set val.: >/= 800	N/mm2 N/mm2	
Behaviour after thermal treatment al. DIN 8075	Act.val : - 0,33 Set val.: </= 3 %	% %	
Behaviour after thermal treatment cr. DIN 8075	Act.val : 0,11 Set val.: according to standards	% %	

Delivery corresponds to the building and test principles for the water protection part 3 (1/85) and the requirements of DVS 2205 part 1 and DIN 8075: PE 80.
The above-mentioned semi-finished product is subject to an outside control.
The above indications do not release the fabricator to carry out own tests.
G.Congrds
Werkssachverständiger

SUBMITTAL

1.04

D-1

D-2-a
b
c

July 19, 2000

Mr. David R. Opalka
The STAVER Group, Inc.
1271 East 2nd Street
Franklin, Ohio 45005

Dear Mr. Opalka:

This letter will serve as conformation that the attached certification documents are for the Bekaplast materials we are providing for the Enhanced Permanent Leachate Transmission System Project. All prefabricated pieces are constructed from these Bekaplast materials, and all required support items are compatible with the Bekaplast sheets.

Sincerely Yours,

Richard J. Hart
Regional Sales Manager

ISCO INDUSTRIES, Inc.
926 Baxter Avenue
Box 4545
Louisville, KY 40204

Atlas Minerals & Chemicals, Inc.

1227 Valley Road, PO Box 38 • Mertztown, Pennsylvania 19539-0038
610-682-7171 • Toll Free 800-523-8269 • Fax 610-682-9200
Email sales@atlasmin.com • Web site www.atlasmin.com

July 19, 2000

RE: Bekaplast Sheet Certification
Your P.O.#008092-00

Fax No.: (606) 283-5884

Mr. Rick Hart
ISCO Industries, LLC
926 Baxter Avenue
Louisville, KY 40204

Dear Mr. Hart:

By way of this letter, we are confirming that the certification documents in your possession correspond to the Bekaplast materials we have shipped to you under your purchase order 008092-00.

Sincerely,

Atlas Minerals & Chemicals Inc.

Gary A. Adamski
Fabrication Manager

GAA:mm

cc: John Flugstad
Jack Estes
Steve Abernathy
Frank Hanson

FAX Transmittal

SURFACE PROTECTIVE SYSTEMS DIVISION

STEULER
Industriewerke GmbH

- ☐ Refractory Systems
- ■ Surface Protective Systems
- ☐ Equipment Engineering
- ☐ Plastics Engineering
- ☐ Tiles/Design Ceramics

To: Atlas Minerals & Chemicals, Inc.
1227 Valley Road
Mertztown
PA 19539 U.S.A.

Att.: Renee Hanson

Fax: 001/610-882 9200

Pages: 3 (incl. cover sheet)

Contact: Karin Neuneier
Phone: +49 2624 13-249
Fax: +49 2624 13-330
e-Mail: k.neuneier@steuler.de
P.O.BOX 14 46
D 56195 Höhr-Grenzhausen
Date: 11.07.2000

Your P.O. No. 101192 dt. June 08,2000
Our Ref. No. 99190 L

Our Ref.: KN/lb

Dear Renee,

Following our yesterday's telcon, please find here enclosed copy of

- Inspection Certificate 3.1B acc.to EN 10204
  Certificate No. 9938266 dt. 14.10.99

for the HD-PE sheet material supplied per your above referenced Purchase Order.

Best regards

STEULER - INDUSTRIEWERKE
G.m.b.H.
i.V. K. Neuneier

Enc.

To: John Flugstad
English version is forthcoming.

PROD #7284 Vol. 3

To: John Hugstad
Fax 513-648-4187

SIMONA

1.04.D.182

STRÜLER INDUSTRIEWERKE GMBH

POSTFACH 1448

56195 HOEHR-GRENZHAUSEN

DATE : 14.07.2000

INSPECTION CERTIFICATE 3.1 B ACCORDING TO EN 10204

Certificate No.	: 0024884	Kd.-Nr: 21049
Order	: 43675/05	of 31.08.1999
Your Order	: BEST.-NR.104-5531 TEL.H.DAHLEM	
Delivery note	: 40826/9915513	of 07.10.1999
Our invoice No.	: 301310	of 08.10.1999
Article-No.	: 300.003.03	
Product	: PE-HWU-B SHEET EXTRUDED	BLACK
Dimension mm	: 3000 X 1500 X 5,0	
Quantity	: 999 Pc	
Moulding batch	: ISO 1872-1 PE,ECHL,45 T 006	
Raw material	: HOSTALEN GM 5010 T3	
Charge no.	: 704462	639921

Test results of the specific control

Moulding batch

Density DIN 53479 C	Act.val : 0,955 Set val.: 0,956 +/- 0,002	g/cm3 g/cm3
Melt flow index DIN 53735 190/5	Act.val : 0,42 Set val.: 0,48 +/- 0,05	g/10 min g/10 min

SIMONA

Certificate No : 0024884 Page : 2

Semi-finished product

Condition of delivery / Condition of surface: acc. to standards
Thickness mm : acc. to standards +/- 0,23

Melt flow index
DIN 53735 Act.val : 0,41 g/10 min
190/5 Set val.: MFI Rohst.+max.0,2 g/10 min

Tensile stress at yield
DIN 53455 Act.val : 25,14 N/mm2
test specimen 3 V=50mm/min Set val.: >/= 20 N/mm2

Elongation at yield
DIN 53455 Act.val : 9,84 %
test specimen 3 V=50mm/min Set val.: >/= 8 %

Elongation at break
DIN 53455 Act.val : 518,29 %
test specimen 3 V=50mm/min

E-modulus
DIN 53457 Act.val : 1091,79 N/mm2
test specimen 3 Set val.: >/= 900 N/mm2

Behaviour after thermal treatment al.
DIN 8075 Act.val : - 0,33 %
Set val.: </= 3 % %

Behaviour after thermal treatment cr.
DIN 8075 Act.val : 0,11 %
Set val.: according to standards %

Delivery corresponds to the building and test principles for the water protection part 3 (1/85) and the requirements of DVS 2205 part 1 and DIN 8075, PE 80.
The above-mentioned semi-finished product is subject to an outside control.
The above indications do not release the fabricator to carry out own tests.
G.Conradt
Werkssachverständiger

.szeugnis / Certificate / Certificat
.0204-3.1B

RÖCHLING
Haren · Technische Kunststoffe

Atlas Minerals & Chemicals ,Inc.
1227 Valley Road
Mertztown, PA 19539
USA

16.02.2000

Rod

Bestell-Nr./Order No/Numéro de commande:	100580
Auftrags-Nr./P.O. No/Accuse de réception:	377447.1 from 24.01.00
Format/Size/Format:	Weld rods Ø 4 mm
Handelsname/Trade name/Désignation commerciale:	Polystone G- black B GM 5010 T3
Chargen Nr./Charge No./Numéro de charge:	409081T04
Menge/Quantity/ Quantité:	55 reels of approx.2,5kg

Technische Werte / Technical Values / Charactéristiques techniques
Prüfergebnisse aus Prüfungen an der Charge/Results from random tests/Résultats des contrôles statistiques

Formmasse/Moulding batch/Matière Moulable

Formmassentyp/Moulding batch type/Type de matière	DIN 16776	PE-EACH	45-T006
Dichte/Specific gravity/Masse volumique	ISO 1183	0,955	g/cm³
Schmelzindex MFI 190/5/Melt flow index 190/5/Indice de fusion 190/5	ISO 1133	0,42	g/10min

Formstoff/Moulding product/Demi-Produit moulé

Dichte/Specific gravity/Masse volumique	ISO 1183	0,956	g/cm³
Schmelzindex MFI 190/5/Melt flow index 190/5/Indice de fusion 190/5	ISO 1133	0,47	g/10min
Streckspannung/Tensile strength/Résistance a la traction	DIN 53455	.....	N/mm²
Streckdehnung/Yield point/Allongement a l'etirement	ISO 527-1	.....	%
Elastizitätsmodul/Modul of elasticity	ISO 527-1	.....	N/mm²
Maßänderung (120°C)längs/Change in dimension/Changement de dimension	DIN 16925	0,58	%
Maßänderung (120°C)quer/Change in dimension/Changement de dimension	DIN 16925	.....	%

Die Angaben befreien den Verarbeiter nicht von eigenen Prüfungen und Versuchen.
The informations do not discharge the consumer from own examinations and tests.
Les informations ne dispensent pas le consommateur de propres test et essais.

Hinweis/Remark/Indication:

Röchling Haren KG

Werkstoffprüfer/Works inspector, Expert d'usine

Qualitätssicherung
Röchling
Quality Assurance

Qualitätsmanager/Quality manager/Dirigeant de qualité

W008-R001-D
Ausg. 03.09.99

SUBMITTAL

1.04

E-1

7/7/00 M.J.M.

1.04.E.1

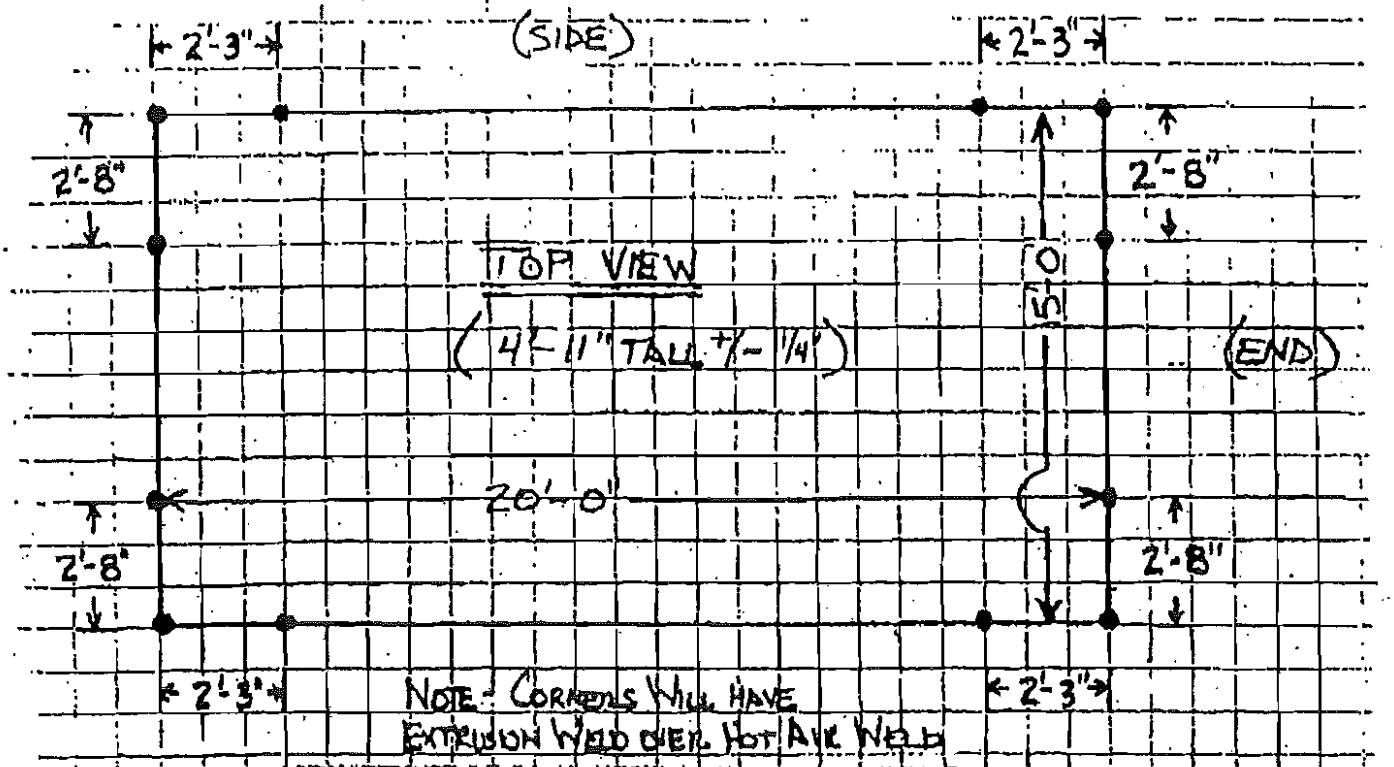
Job: FLOUR FERNALD INC.

CONTRACTOR: THE STAVER GROUP INC.

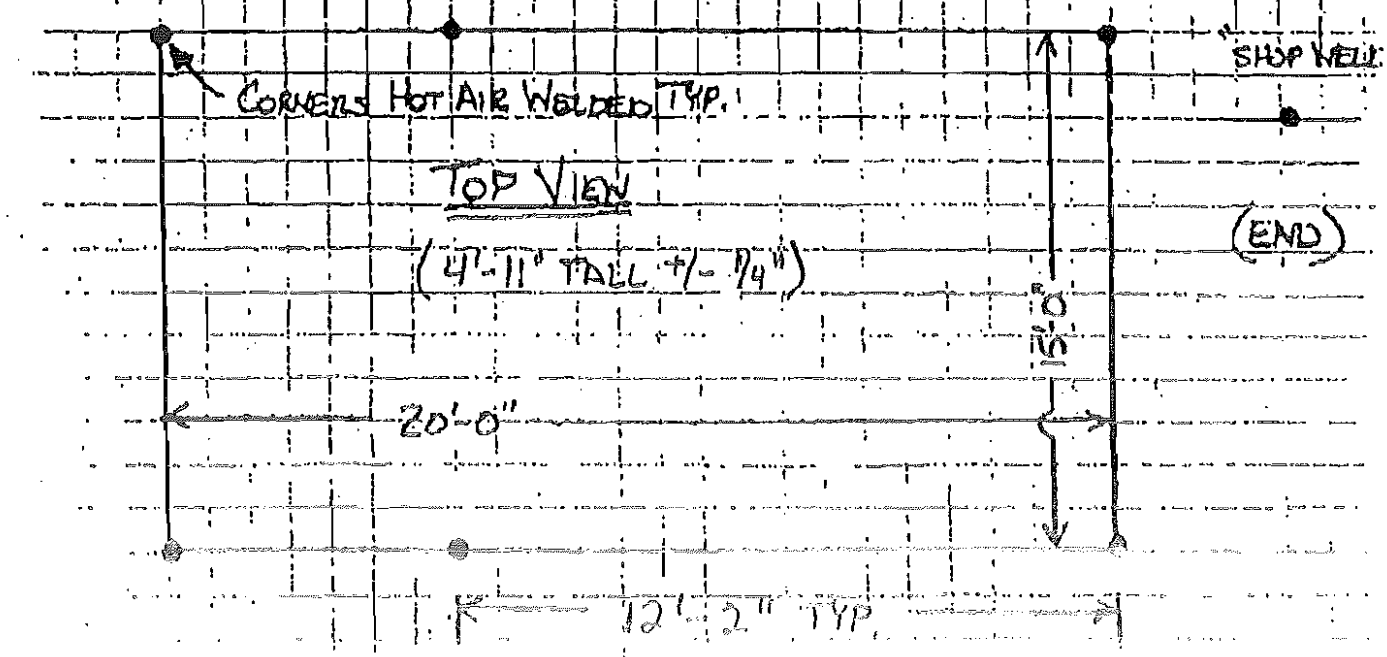
N.T.S.

"FIELD WELD"

VALVE HOUSES #1-#6
WALL PANEL WELD LAYOUT (FIELD)



VALVE HOUSES #1-#6 WALL PANEL WELD LAYOUT (ISCO SHOP)
(SIDE)



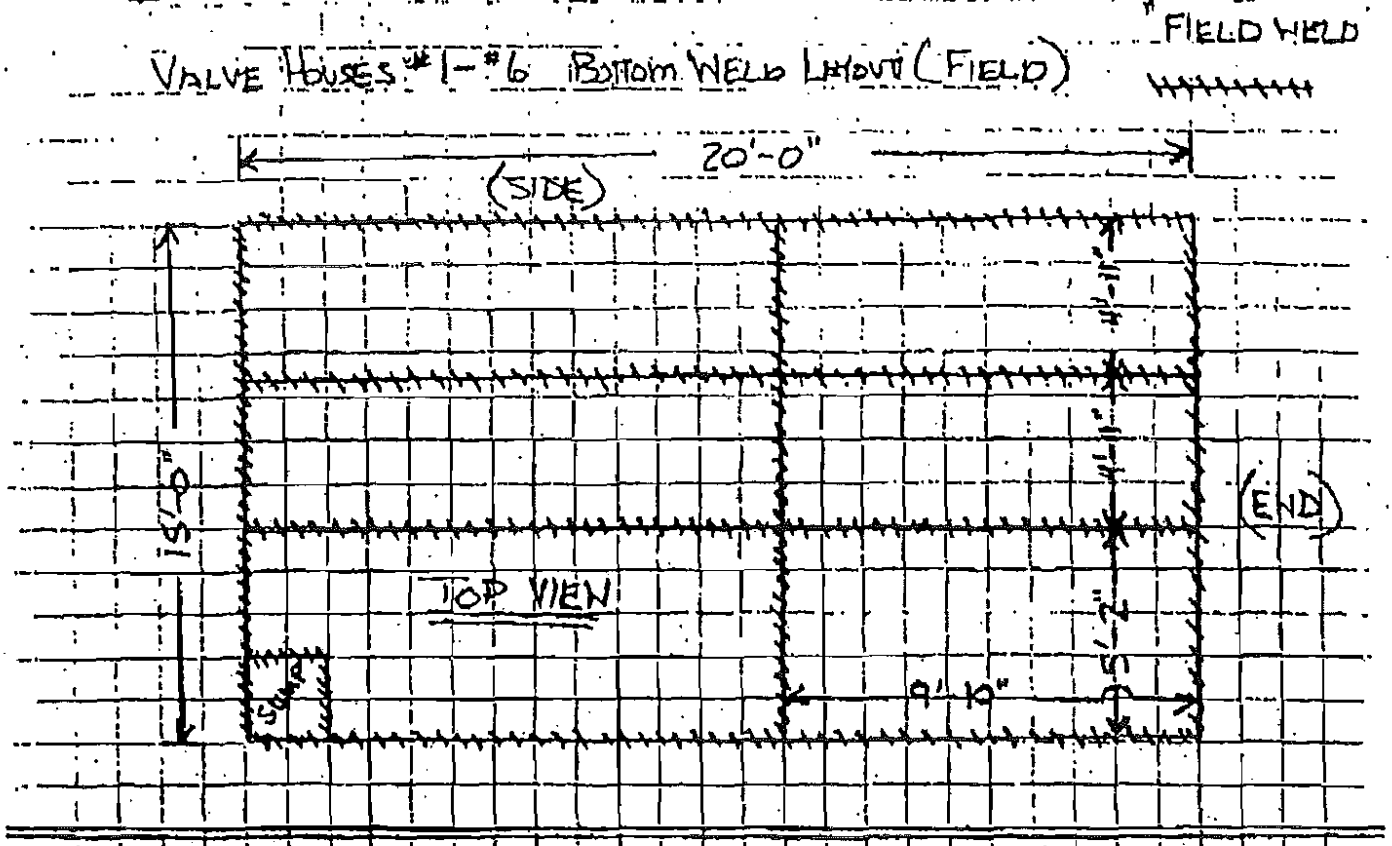
7/7/00 M.J.M.

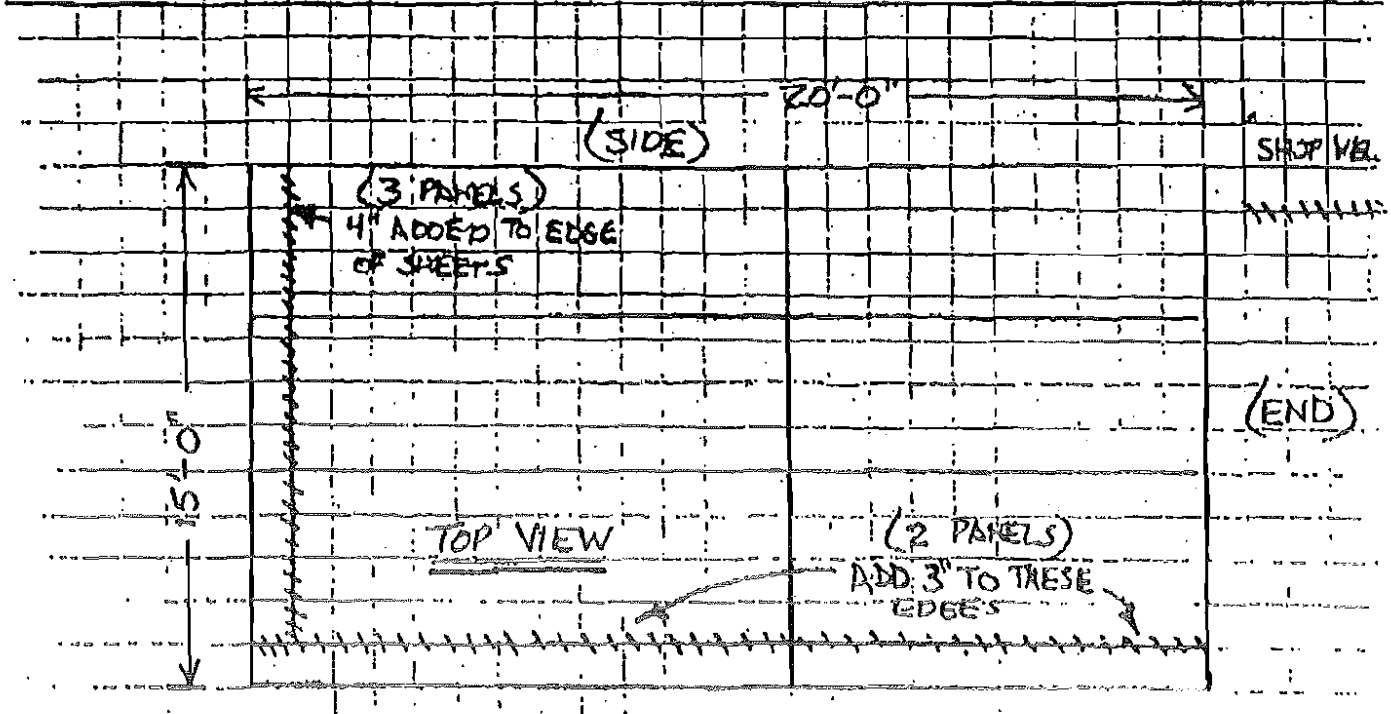
Job: FLOUR FERNALD INC.

CONTRACTOR: THE STAVEK GROUP INC

N.T.S.

VALVE HOUSES #1-#6 BOTTOM WELD LAYOUT (FIELD)





VALVE HOUSES #1-#6 BOTTOM WELD LAYOUT (ISCO SHOP)

7/7/00 MJM.

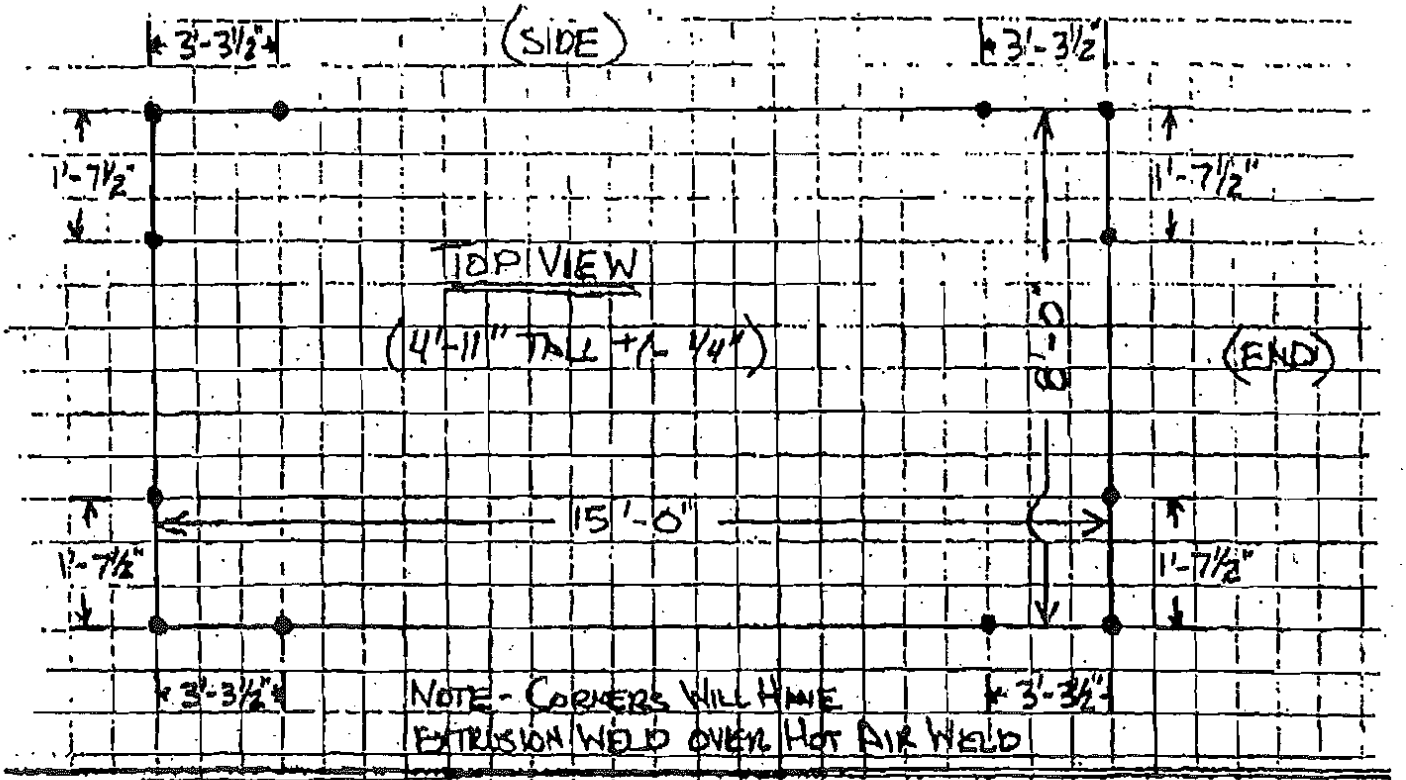
Job: FLOUR FERNALD INC

CONTRACTOR: THE STAYER GROUP INC.

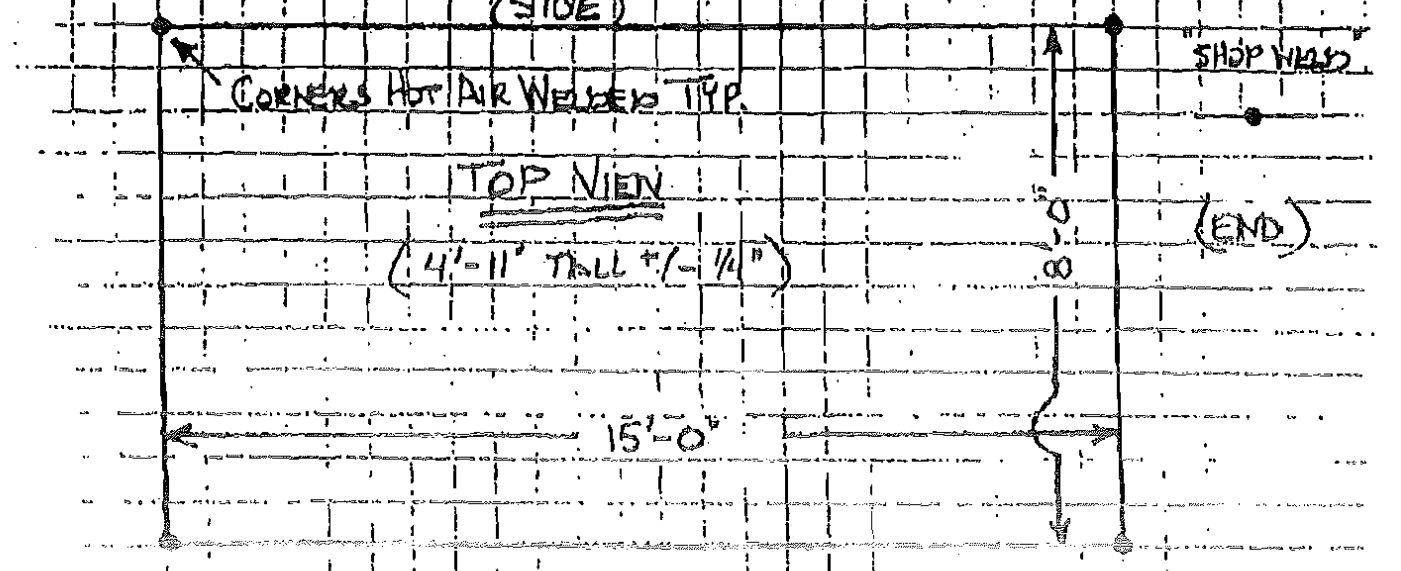
N.T.S.

"FIELD WELD"

CONTROL VALVE HOUSE
WALL PANEL WELD LAYOUT (FIELD)



CONTROL VALVE HOUSE
WALL PANEL WELD LAYOUT (ISCO SHOP)



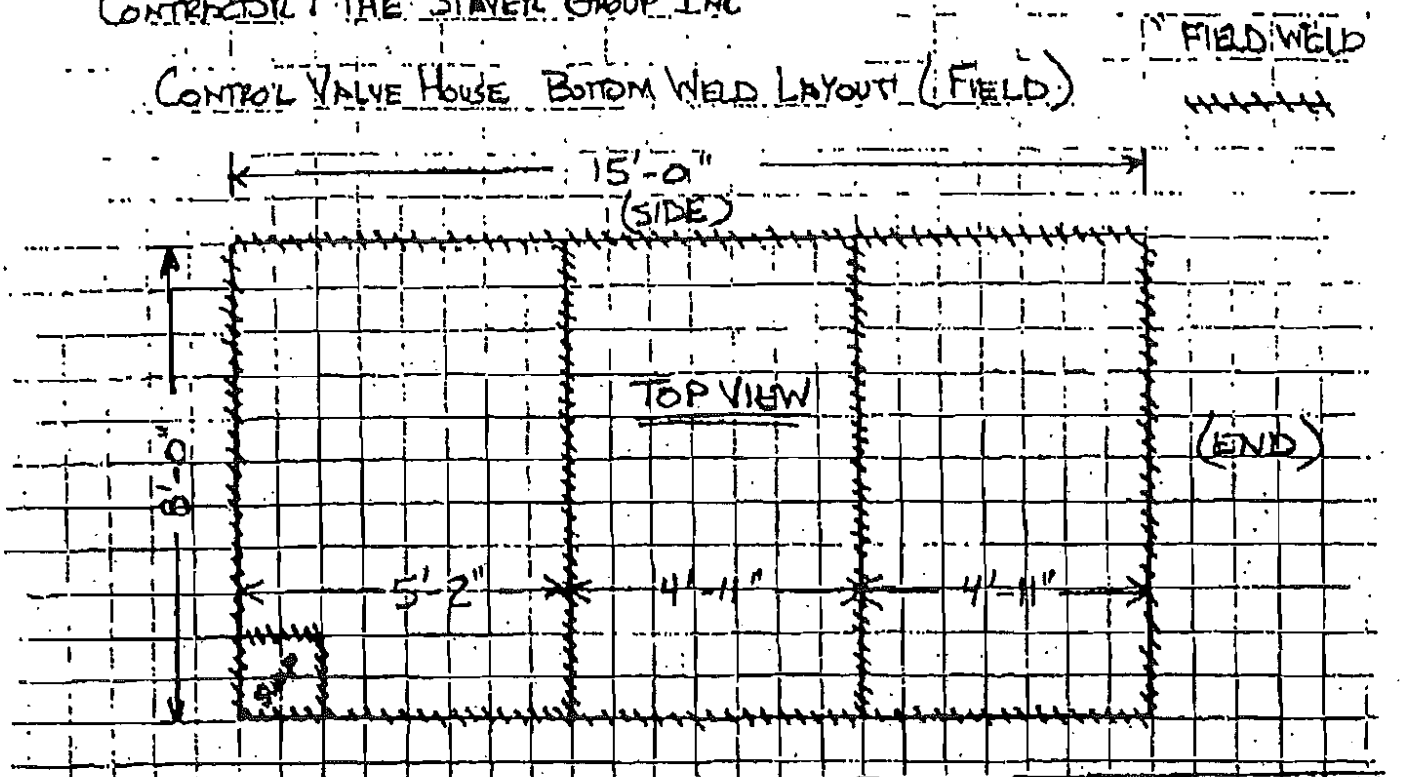
7/7/00 M.J.M.

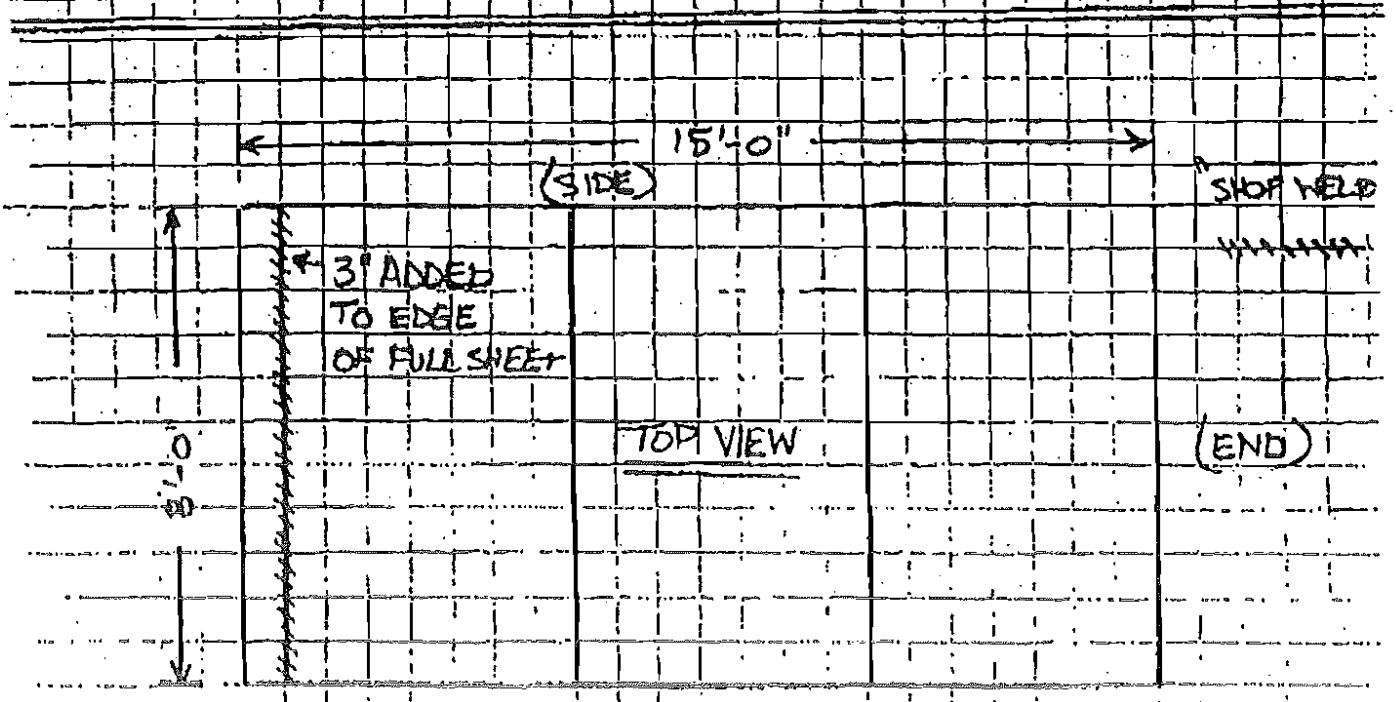
Job: FLOUR FERNALD INC.

CONTRACTOR: THE STAYER GROUP INC

N.T.S.

CONTROL VALVE HOUSE BOTTOM WELD LAYOUT (FIELD)





CONTROL VALVE HOUSE BOTTOM WELD LAYOUT (ISCO SHOP)

SUBMITTAL

1.04

E-5 C-f

E-5. g & h submitted on 7/8/00
approved on. 7/13/00

ISCO

~~Atlas Bekaplast Job References~~
ISCO INSTALLATIONS

- Customer – Phenolcheme Inc., Location – Theodore, Al., Brown & Root Engineering & Construction, April – June of 1999, Prefabbed Sumps
- Customer – Olin Chemicals, Location – McIntosh, Al., BE&K Contractor, BE&K Engineering, July-August of 1997, Prefabbed Sumps, Field Fabbed Sumps, Trenches
- Customer – International Paper, Location- Mansfield, La., I.P. Engineering, Garney Construction Co., May-August of 1995, Field Fabbed Lift Station
- Customer - Texas Instruments, Location- Sherman, Tx., Plyler Construction Co., January of 1996, Prefabbed Sump & Trenches
- Customer – International Paper, Location – Natchez, Ms., I.P. Engineering, Boh Brothers Construction Co., August of 1996, Prefabbed Trenches

Supervisor: JACK OLSEN
THICKNESS: 5MM HDPE.
SEAMING: EXTRUSION WELDING
EQUIP: EXTRUSION WELDER GUN

ISCO INDUSTRIES, LLC
CORPORATE HEADQUARTERS
926 Barret Avenue
Box 4545
Louisville, KY 40204
800-545-4726
502-583-6591
fax 502-584-9713

3435 Hermitage Blvd. NE
Huntsville, AL 35811
fax 256-852-6005
www.isco-pipe.com

POLYETHYLENE PIPE AND FITTINGS
DUAL CONTAINMENT PIPE
HOPE FABRICATION
CULVERT LINERS

Atlas Minerals & Chemicals, Inc.

♦♦♦

John Flugstad

P.O. Box 54091 ♦ Cincinnati, OH 45254-0091
Phone (513) 231-1232 ♦ Fax (513) 231-1570

FACSIMILE TRANSMITTAL

June 14, 2000

To: Rick Hart
ISCO, Inc.

Fax # 606-283-5879
Phone: 606-283-5884

Subject: Bekaplast References

I've added some information to the references previously sent to Rob Kneip. You can also submit the following to Staver Group:

Allegheny Ludlum Steel
New Castle, IN
5mm PP Sump
400 sf
765-529-9570

FMC
Soda Springs, ID
5mm HDPE
1400 sf
863-665-1511 (Jacobs)

Bayer, Inc.
Elkhart, IN
5mm PP sumps,trenches
300 sf
219-262-7195

Bayer
New Martinsville, WV
5mm HDPE
700 sf
304-455-4400

Mead-Johnson
Evansville, IN
3mm HDPE Membrane
2000 sf
812-429-5000

TYCO, Inc.
Franklin, IY
5mm PP sump,trench
400 sf
270-598-0485

Let me know if you need more info.

John Flugstad

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-002	REV: 0	DATE 20-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE:

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
8	641-03110-002	0						X			Certification of Ancillary Material		X		03110	X		
											Compatibility with HDPE Liner				03100 mwh			

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tom Cherry ✓	525				
Jim Jenkins ✓	525				
Mike Godber	525				
Rob Kreip	525				
Scott Wheeler	525				
Kwasi Bau Turenchock	641				

RECEIVED JUN 29 2000 KPT

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

See attached Comments ~~Also submit under 03100~~ mwh

RECEIVED BY: MW Griffin DATE 6/27/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

ORIGINAL

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

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

Atlas Minerals & Chemicals, Inc.
♦♦♦
John Flugstad
P.O. Box 54091 ♦ Cincinnati, OH 45254-0091

INFORMATION ONLY

FACSIMILE TRANSMITTAL

June 9, 2000

Mr. David Opalka
Staver Group
1271 East 2nd Street
Franklin, OH 45005

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Griffin Date: 6/27/00

Fax # 513-648-4187

Reference: Fernald-OSDF Leachate Transmission System Project

Dear Mr. Opalka:

We have received your fax regarding curing compound, form release agent, and form design. We have the following comments:

a) Curing Compound. The Sealtight 1100 will be acceptable. We have not found that these compounds effect the Bekaplast/concrete mechanical bond.

NOTE!!

b) Form Release Agent. We do not recommend using any release agents with Bekaplast since they can be detrimental to the welding process. Your forms should release easily from the Bekaplast sheet without the need of an agent. If using an agent above the end point of the Bekaplast sheet, care should be taken to avoid drippage down onto the face of the sheet.

c) Form Design. Atlas will not assume responsibility for the mechanical integrity of wall form design. We do believe that your design will adequately support the Bekaplast sheet. This should also be reviewed by the Bekaplast installer, ISCO.

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-002
Reviewed By: RWJ
Date: 6/20/00

Very truly yours,

John Flugstad,
Regional Sales Manager

Cc ISCO-Louisville
PDI-J. Estes
Atlas-G. Adamski

Atlas Minerals & Chemicals, Inc.
♦♦♦
John Flugstad
P.O. Box 54091 ♦ Cincinnati, OH 45254-0091

FACSIMILE TRANSMITTAL

May 19, 2000

Mr. David Opalka
Staver Group
1271 East 2nd Street
Franklin, OH 45005

Reference: Fernald-OSDF Leachate Transmission System Project

Dear Mr. Opalka:

We have reviewed the design and batching data on the proposed concrete mix for this project. We find this data to be acceptable for use with the Bekaplast material as specified.

We look forward to working with you and ISCO on this project. Please call with any questions.

Very truly yours,

John Flugstad,
Regional Sales Manager

Cc ISCO-R. Hart
PDI-J. Estes
Atlas-G. Adamski

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-~~003~~ 002 mwb
Reviewed By: [illegible]
Date: 6/26/00

A- Conforms to s/c reqmts
mwb 6/27/00

1.04

G

Our installer has reviewed the attached concrete formwork design. After review it apperes to be compatible with the installation of the concrete protective liner.

Richard J. Hart

Regional Sales Manager

A - Conforms to s/c
6/27/00

ISCO INDUSTRIES, Inc.
926 Baxter Avenue
Box 4545
Louisville, KY 40204

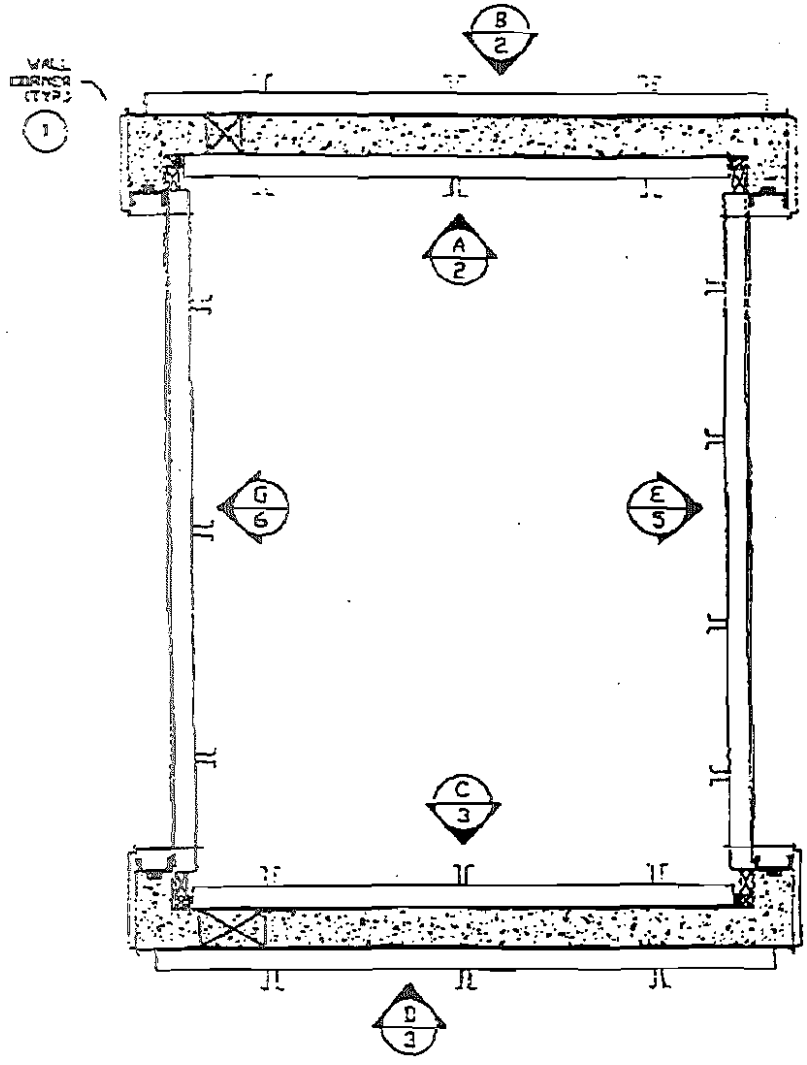
P 502.583.6591
F 502.564.9713
HTTP //www.isco-pipe.com

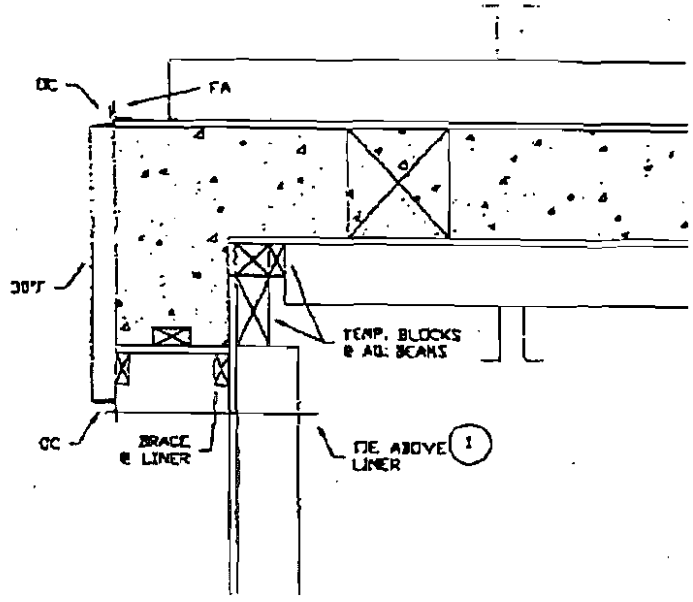
POLYETHYLENE PIPE AND FITTING

HDPE FABRICATION

CULVERT LINERS

GOLF COURSE IRRIGATION SUPPLIES

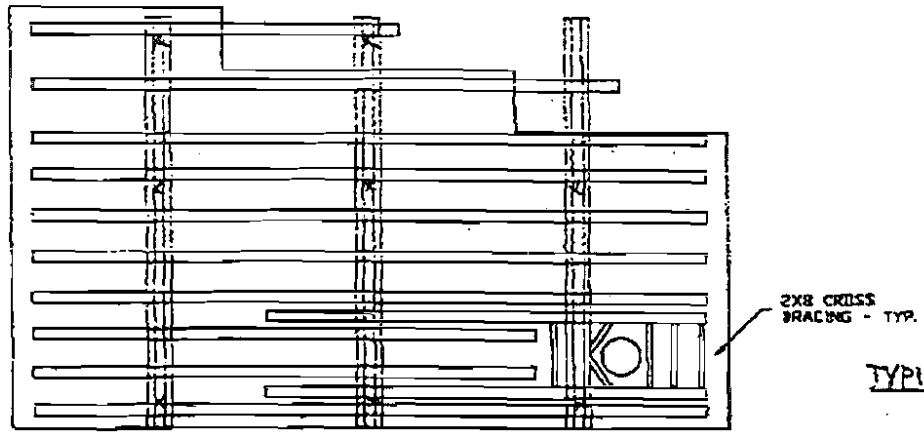




A - Conforms to s/c Regmts multiple 6/27/00
Note: Additional details provided in Submittal 20111-641-03110-001

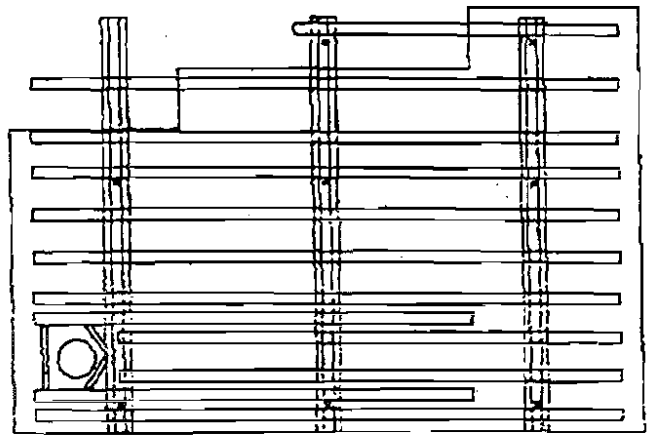
GAMCO
CONCRETE FORMS & ACCESSORIES

FOR STAVER			
JOB VALVE HOUSES, POUR #1			
LOCATION FERNALD, OH			
DRAWN MRM	DATE 5/2200	REV NO	SHEET NO 1 OF 6



B/1 SOUTH ELEVATION

TYPICAL NOTE:
BOTTOM FORM TIES
BELOW GROUT LINE
(TOP OF FLOOR)



A/1 NORTH ELEVATION

GAMCO
CONCRETE FORMS & ACCESSORIES

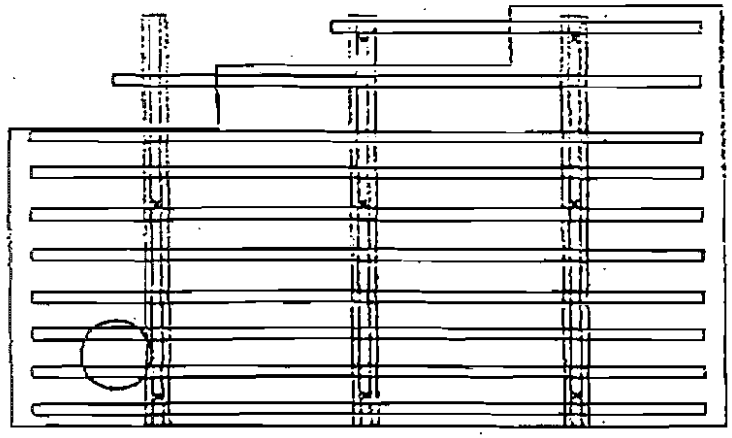
FOR
STAYER

JOB
VALVE HOUSES

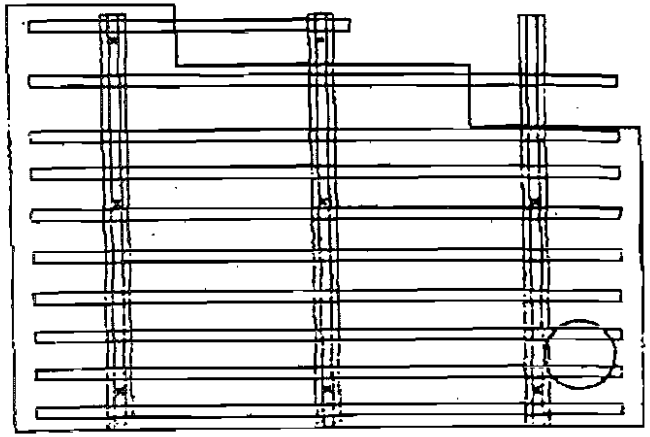
LOCATION
FERNALD, OH

DRAWN	DATE	REF NO	SHEET NO
MRM	6/7/00		2 OF 5

JUN 7-00 WED 3:45 PM P. 3



D/1 NORTH ELEVATION



C/1 SOUTH ELEVATION

GAMCO

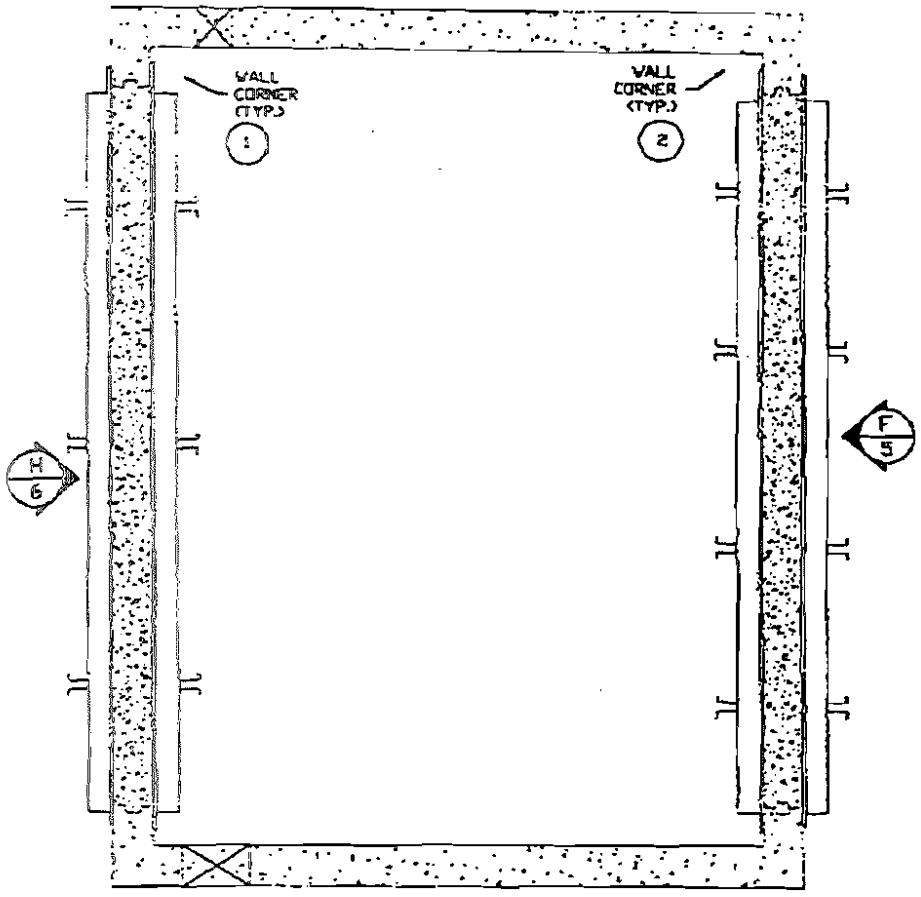
CONCRETE FORMS & ACCESSORIES

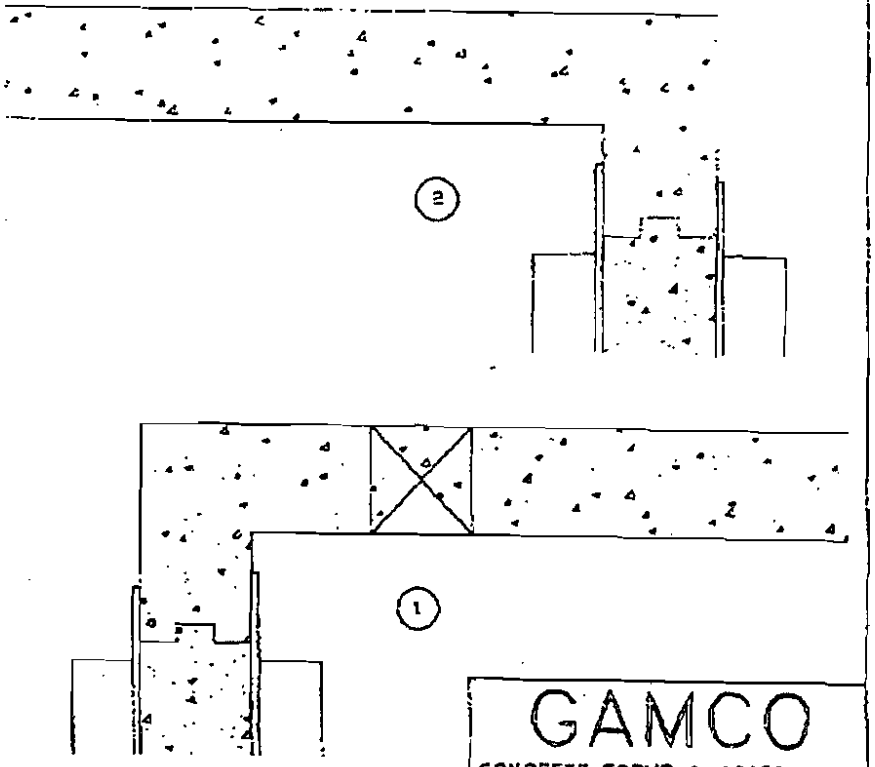
FOR
STAVER

JOB
VALVE HOUSES

LOCATION
FERNALD, OH

DRAWN	DATE	REV NO	SHEET NO
MRM	6/1/00		3 OF 6





GAMCO

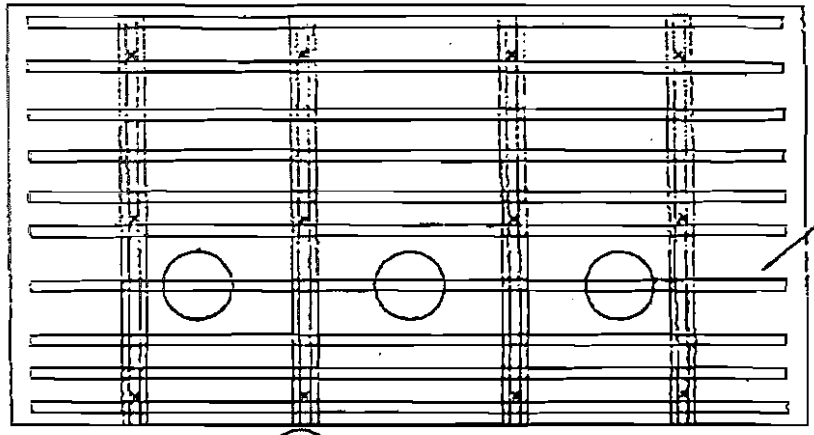
CONCRETE FORMS & ACCESSORIES

FOR
STAVER

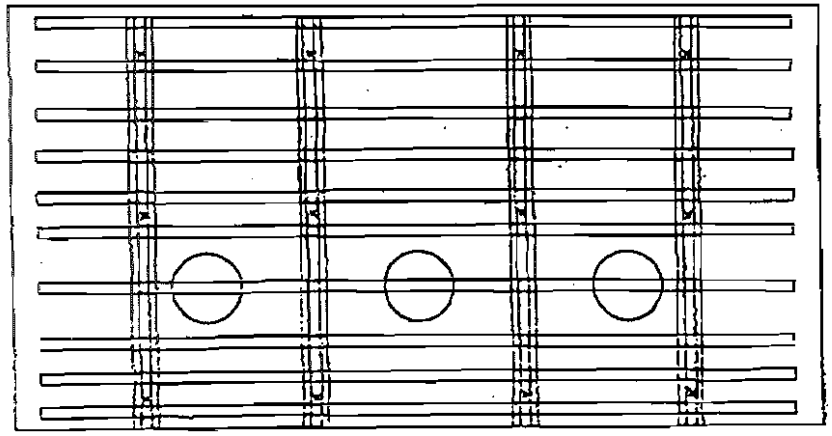
JOB
VALVE HOUSES, POUR #2

LOCATION
FERNALD, OH

DRAWN	DATE	REV NO	SHEET NO
MRM	5/2000		4 OF 5



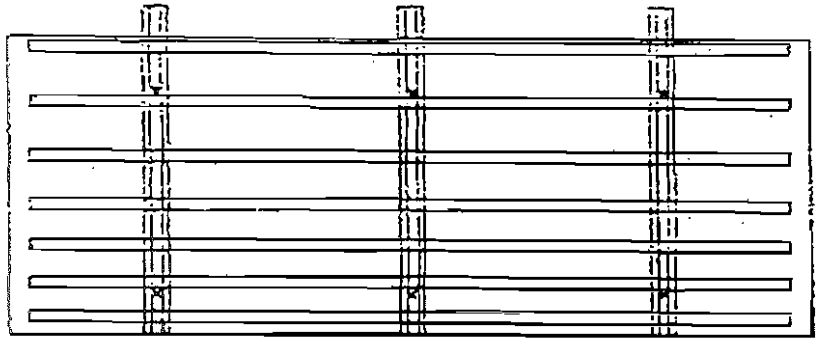
F/4 WEST ELEVATION



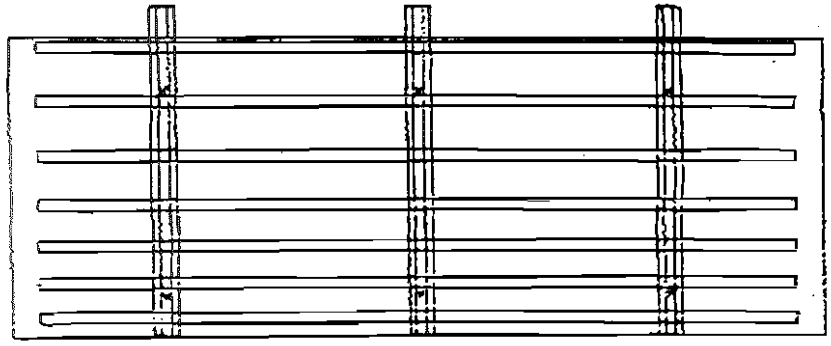
E/1 EAST ELEVATION

GAMCO
CONCRETE FORMS & ACCESSORIES

FOR STAVER			
JOB VALVE HOUSES			
LOCATION FERNALD, OH			
DRAWN MRM	DATE 6/6/2000	REV NO	SHEET NO 5 OF 6



H/4 EAST ELEVATION



G/1 WEST ELEVATION

GAMCO

CONCRETE FORMS & ACCESSORIES

FOR
STAYER

JOB
VALVE HOUSES

LOCATION
FERNALD, OH

DRAWN	DATE	REF NO	SHEET NO
MRM	6/6/2000		6 OF 6

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-003	REV: 1	DATE: 30-Jun-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE: 6/30/00

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
8	641-03110-003	1						X			QC Inspector - Sumps		X		03110	X		
	parts 1.04.E.5																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Jim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Rob Knerp	525				
R. Scott Wheeler	525				
Kwasi Bau Tweneboah	64				

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

RECEIVED BY: MW Griffin DATE 7/6/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

Atlas Minerals & Chemicals, Inc.
♦♦♦
John Flugstad
P.O. Box 54091 ♦ Cincinnati, OH 45254-0091

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641: 03110-003
Reviewed By: DRO
Date: 6/30/00

FACSIMILE TRANSMITTAL

June 30, 2000

Mr. David Opalka
Staver Group
1271 East 2nd Street
Franklin, OH 45005

Fax # 513-648-4187

Reference: Fernald-OSDF Leachate Transmission System Project

Re: Background and Personnel Information
Jack Estes

Dear Mr. Opalka:

Atlas Minerals and Chemicals, Inc., confirms that Mr. Estes is qualified to QC the field installation of the Bekaplast prefabricated (preformed) sumps in the Permanent Leachate Transmission System project. Mr. Estes is familiar with the fabrication and installation of Bekaplast systems and understands the requirements of the Bekaplast Field Installation Manual and Quality Control Manual.

Mr. Estes' responsibilities will include the applicable sections contained in Part 16 of the above referenced Bekaplast manuals. The statement contained in the introduction of the Quality Control Manual requiring that the "QC Inspector must have attended the Welder Training Seminar given by Atlas..." refers to QC inspection of field welding procedures and does not apply to the QC procedures that Mr. Estes will be performing.

INFORMATION ONLY

Very truly yours,

John Flugstad

John Flugstad,
Regional Sales Manager

Cc ISCO, Louisville
Jack Estes

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 7/6/00

Atlas Minerals & Chemicals, Inc.

♦♦♦

John Flugstad

P.O. Box 54091 ♦ Cincinnati, OH 45254-0091

Jack Estes
Manufacture Representative

Relative Experience and Background
Atlas Minerals & Chemicals, Inc.

Mr. Estes personal accomplishments and knowledge include the following:

- Mr. Estes has over 10 years experience in the Thermoplastic Industry and has been associated with Atlas Minerals for over 3 years
- Mr. Estes has considerable knowledge in Thermoplastics Linings, Chemical-Bacteria Resistant Floors, and Corrosion Resistant Tanks.
- Mr. Estes is knowledgeable in mist and dust eliminators, tower packing and aerosol separation.
- Mr. Estes is familiar with all pertinent US and Canadian product standards

John R Flugstad

FDF PROJECT NO: 20111 | CONTRACT NO: FSC - 6 | SUBMITTAL NO: 03110-004 | REV: 0 | DATE: 08-Jul-00 | PROD #7284 Vol. 3

FROM: TRAVER GROUP, Inc.

Ron Wood

SIGNATURE: R Wood

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

RECEIVED BY: Denise Wentz DATE: 7/10/00

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
8	641-03110-004A	0					X				Jack Olsen ISCO QC		X		03110	X		
8	641-03110-004B	0					X				Steve Holpp Technician		X		03110	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5			COPY	
Willie Frazier	52-5			RECEIVED	
Tim Cherry	52-5	KWASI - GeoSyntec		JUL 13 2000	
Jim Jenkins	52-5			EBT	
Keith Lanning	52-5				
R. Scott Wheeler	52-5				

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

no comments

Tim Cherry 7/12/00

RECEIVED BY: [signature] DATE 7/13/00

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

ORIGINAL

ENTERED

SERVICE TIME AND TRAINING

Jack Olsen
ISCO Industries, LLC
QA/QC Inspector & Installer Superintendent
As of 2 / 00

- Years involved in the Thermoplastics Industry – 10
- Atlas Bekaplast Trained
- Forklift Trained
- OSHA 40 Hour Trained
- OSHA Confined Space Trained
- Phillips Driscopipe Butt Fusion and Sidewall Fusion Trained
- CDL Licensed
- Central Electrofusion Trained
- Raychem Leak Detection Trained
- McElroy Manufacturing Large Diameter and Small Diameter Fusion Machine Trained
- McElroy DataLogger Trained
- McElroy TracStar Trained

The above is current and actual information pertaining to Jack Olsen's work experience.

ISCO Industries, LLC
Mike Montgomery
Huntsville Plant Manager

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-08110-004A
Reviewed By: [illegible]
Date: 7/10/00

ISCO INDUSTRIES, LLC
CORPORATE HEADQUARTERS
926 Baxter Avenue
Box 6585
Louisville, KY 40204
800-345-4726
502-583-6591
fax 502-584-9713

3433 Stringfellow Blvd. NE
Huntsville, AL 35811
fax 256-852-6005

www.isco-pipe.com

POLYETHYLENE PIPE AND FITTINGS
DUAL CONTAINMENT PIPE
HDPE FABRICATION
CULVERT LINERS

SERVICE TIME AND TRAINING
Steve Holpp
ISCO Industries, LLC
Field / Shop Service Technician
As of 2 / 00

- Years involved in the Thermoplastics Industry – 9
- Atlas Bekaplast Trained
- Forklift Trained
- OSHA 40 Hour Trained
- OSHA Confined Space Trained
- Phillips Driscopipe Butt Fusion and Sidewall Fusion Trained
- CDL Licensed
- Central Electrofusion Trained
- Central Ultrafusion Trained
- Raychem Leak Detection Trained
- McElroy Manufacturing Large Diameter and Small Diameter Fusion Machine Trained
- George Fischer Trained (Socket Fusion)
- McElroy DataLogger Trained
- McElroy TracStar Trained

The above is current and actual information pertaining to Steve Holpp's work experience.

ISCO Industries, LLC

Mike Montgomery
Huntsville Plant Manager

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-0043
Reviewed By: BW
Date: 7/10/00

ISCO INDUSTRIES, LLC
CORPORATE HEADQUARTERS
926 Baxter Avenue
Box 4545
Louisville, KY 40204
800-345-4726
502-583-6591
fax 502-584-9713

3435 Stanwood Blvd. NE
Huntsville, AL 35811
fax 256-852-6005
www.isco-pipe.com

POLYETHYLENE PIPE AND FITTINGS
DUAL CONTAINMENT PIPE
HDPE FABRICATION
CULVERT LINERS

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-006	REV: 0	DATE: 12-Sep-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Penny Dragos DATE: 9/12/2000

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
8	641-03110-006	0						X			Liner Floor & Setting Bed		X		03110	X		
											Demolition Plan							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Bob Kneip	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Yuenobah (Gen Synted)	64				

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

attached

RECEIVED BY: [signature] DATE 9/13/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

STAVER

The Staver Group, Inc.
1271 East 2nd St.
Franklin, Ohio 45005

ECDC CONTROLLED COPY NO. 76896

DEMOLITION PLAN

Valve House 1 – Liner & Setting Bed Removal

May change due to results of demolition and/or plans for new setting bed MWB 9/13/00

INTRODUCTION

The placement of the liner floor occurred in two phases: 1) Screed strip installation and 2) Grout and Bekaplast floor liner placement. Removal of the setting bed at Valve House 1 will not be a complete removal. The integrity of the screed strips will be preserved. As described in our revised anchoring plan, the screed strip anchors do not contribute to the overall strength required to resist the designed 5 psi uplift. Therefore, only the grout floor will be removed and the screed grout strips will be left in place. The work methods are described below.

REMOVAL METHODS *

The first operation will be to pull the liner sheets from the grout bed using a small Hilti Hammer Drill(TE-25) with a chisel bit. Then, a Hilti Hammer Drill (TE-55 size) with various point and/or chisel bits will be used to remove the liner sheet from the grout bed. Where the liner sheet cannot be initially separated from the grout, a grinder with cutting wheels or an electric Quick Saw will be used to sawcut a portion of the liner away from the screed strip, then that liner sheet will be pulled from the grout. After the grout bed is partially exposed, the remaining sheet will be removed using the Hilti drill. Once the grout bed is fully exposed, the Hilti Hammers and/or a 60 # electric jack hammer will be used to break up the grout "squares." The grout debris will then be removed and all areas will be cleaned from debris.

PROTECTION METHODS

The adjacent structures (HDPE liner) will be protected using 5/8" plywood in the direct area where work is being performed. This plywood will protect the existing liner from concrete debris and errant equipment damage. The existing concrete valve house slab will be protected from damage by equipment usage selection and by using depth gages on all demo equipment. By using low impact hammers, potential damage to the valve house concrete slab will be eliminated since these drills do not have the impact strength of full size air jack hammers.

SAFEY METHODS

The chief safety concerns with the demolition activities are concrete dust, debris, and excessive noise. The approved, in-place, safe work plans outline the required safety protections. Briefly, the excessive dust will be controlled ~~contained~~ using water during all cutting and sawing operations. Workers will be protected from concrete debris by using face shields during hammering operations. To control the excessive noise, all workers in the immediate area will use double hearing protection, ear plugs and ear muffs.

* Evaluate how well grout formed around liner anchor knobs. MWB

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MWB Date: 9-13-00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-03110-006
Reviewed By: DRO
Date: 9/12/00

Tel (513) 743-7995

Fax (513) 743-5873

SUPPLIER DO 'ENT SUBMITTAL

PROD #7284 Vol. 3

FDF PROJE D: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-005	REV: 0	DATE: 16-Aug-00	PAG 1 OF 1

FROM: The STAVER GROUP, Inc.

David R. Opalka

SIGNATURE: David R Opalka

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

RECEIVED BY: Melissa Coffey DATE: 8-16-00

			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
8	641-03110-005A	0						X			Field Tensiometer Calibration		X		03110	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Kneip	52-5				
Scott Wheeler	52-5				
Kwasi Bau Tweneboah	64				

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

RECEIVED BY: [illegible] DATE 8/22/00

(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

ENTERED

SUBMITTAL ACTION CODE: (BY FDF)

A - Conforms to Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

PROD #7284 Vol. 3

Com-Ten INDUSTRIES

CERTIFICATE OF CALIBRATION

TRACEABLE TO THE UNITED STATES NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

THIS DEVICE IS CERTIFIED TO BE WITHIN +/- 1.0% OF FULL SCALE READING AT EACH TEST POINT AT THE TIME OF SHIPMENT

CERTIFICATE NUMBER: 5979 **CALIBRATION DATE:** 6/15/2000

PART AND CUSTOMER INFORMATION

MODEL #: CFG1000 SERIAL #: 2960630

CUSTOMER: ISCO INDUSTRIES INC CUSTOMER #: ISC35811

CALIBRATION DATA

APPLIED VALUE (LB)	AS FOUND (LB)	EXPECTED VALUE (LB)	RUN 1 (LB)	RUN 2 (LB)	RUN 3 (LB)	AVERAGE (LB)	FULL SCALE ERROR
0.000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000%
100.000	100.0000	100.0000	100.0000	100.0000	100.0000	100.0000	0.000%
200.000	200.0000	200.0000	200.0000	200.0000	200.0000	200.0000	0.000%
300.000	300.0000	300.0000	300.0000	300.0000	300.0000	300.0000	0.000%
400.000	400.0000	400.0000	400.0000	400.0000	400.0000	400.0000	0.000%
500.000	495.0000	500.0000	498.0000	500.0000	500.0000	499.3333	-0.067%
600.000	595.0000	600.0000	595.0000	595.0000	600.0000	596.6667	-0.333%
700.000	695.0000	700.0000	695.0000	695.0000	699.0000	696.3333	-0.367%
800.000	790.0000	800.0000	795.0000	795.0000	795.0000	795.0000	-0.500%
900.000	891.0000	900.0000	895.0000	897.0000	895.0000	895.6667	-0.433%
1000.000	000.0000	1000.0000	995.0000	1000.0000	1000.0000	998.3333	-0.167%

CALIBRATION EQUIPMENT USED

SERIAL #1: 2970335

CAL EQUIP: PSB1000

CAL DATE: 11/4/1999

COMTEN Industries load cell PSB1000, sn 2970335 and CQTM-5, sn 23731 calibrated according to ASTM specification E-74 & MIL-STD-45662a. Uncertainty is 0.26 LBF. Calibration done at Marehouse Instrument Company traceable to NIST on report no:2970335K0499

SERIAL #2:

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

Sig: MWA Date: 8/22/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-005A
Reviewed By: DRO
Date: 8/15/00

THIS EQUIPMENT IS CERTIFIED TRACEABLE TO THE UNITED STATES NATIONAL INSTITURE OF STANDARDS AND TECHNOLOGY.

CONDITIONS

TEMPERATURE 75°F

RELATIVE HUMIDITY: 55 %

AS FOUND NOTES:

INFORMATION ONLY

VALIDATION

CALIBRATION PERFORMED BY: JR

COMTEN CERTIFIED INDUSTRIES

Calibration not valid without CERTIFIED stamp and initials

6405 - 49th Street North, Pinellas Park, FL 33781-5724 • 727-520-1200 • FAX 727-520-0299

RECEIVED

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110-007	REV: 2	DATE: 13-Sep-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 9/22/00

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
8	641-03110-007	2						X			Setting Bed Installation Plan		X		03110	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
~~Mike Cotton~~	~~52-5~~				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Krupp	52-5				
R. Scott Wheeler	52-5				
Cursi Bau Tweneboah	138				

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

See DWG 78.1

RECEIVED BY: MW Gill DATE 9-27-00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ENTERED

ORIGINAL

STAVER

The Staver Group, Inc.
1271 East 2nd St.
Franklin, Ohio 45005

INSTALLATION PLAN

Valve House and Control Valve House
Setting Bed Anchor Installations

ECDC CONTROLLED
COPY NO. 76896

INTRODUCTION

This installation plan covers the basic techniques and methods that will be used to install the anchoring system for the HDPE Liner grout setting beds.

ANCHOR AND MESH INSTALLATION

After the valve house slab is cleaned of debris, the screed strips will be laid out. ¼" Tapcon screw anchors will be installed in the screed strips to prevent lateral movement and to provide additional reinforcement. In the grid areas internally threaded, heavy duty, steel expansion drop-in anchors (see attached product data sheet for Red Head RM-58 anchors) will be installed per drawings 7B and per manufactures instructions (see attached). These anchors will receive 5/8"/11 All Thread rod cut to length required to allow the W6xW6 – 42# mesh to be positioned at or above the setting bed depth and below the Bekaplast sheet anchor cleats. Anchor installation will strictly adhere to manufactures installation instructions and QC inspections shall ensure the following: 1) Proper hole cleaning, 2) Proper anchor setting, 3) Proper hole diameter, and embedment, and 4) tightening All Thread per instructions. The W6 x W6 mesh will then be attached to the wedge bolts similar to drawing 7C (attached). The wire mesh will be secured between two washers and two nuts as shown.

Additionally, the preformed screed strips will have 2 foot long #9 lap wires installed at the mid-height of the screed strips on approximately 6" centers The lap wires will be roughly centered on the screed strips and will be wire tied in two places on each side of the screed strip. The wire mesh /anchor bolt assemblies will be installed all at one time. Plywood sheeting will be used on top of individuals to facilitate worker movement and access.

After each mesh sheet is anchored, the grout will be placed into each grid panel. The grout will be floated level, and the sheet will be installed and properly tamped per the installation manual. The slump of the grout will be closely monitored to ensure bonding to the liner anchors per the installation manual.

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: M W Griffin Date: 9-27-00

See DWG 7B.1

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052
Submittal # 641-03110-007 (Rev. 2
Reviewed By: DRO
Date: 9/25/00

September 20, 2000

Staver
Dave Opalka
1271 East 2nd Street
Franklin OH, 45005
Fax 513-648-4187

Dear Dave

ISCO Industries, Inc. approves the revised method of slab reinforcement. Using sections of mesh placed in grid sections with drop-in anchors and All Thread is an acceptable practice. Particular attention is required to the mesh height to ensure no interference with the Bekaplast anchors.

Sincerely Yours

Richard J. Hart
Regional Sales Manager

ISCO INDUSTRIES, Inc.
926 Baxter Avenue
Box 4545
Louisville, KY 40204
P 502.583.6591
F 502.584.9717

POLYETHYLENE PIPE MANUFACTURERS

HDPE FABRICATORS

CONTRACTORS

D. OPALKA

No. 5505 Engineer's Computation Pad
ALVIN

SETTING BED ANCHORS

TOTAL VALVE HOUSE LINER AREA = 299 SF

299 SF X 144 in^2/SF = 43,056 in^2

SIX grid panels per drawing ⇒ WORST CASE 5'-2" X 9'-10"

5.17' X 9.83' = 50.82 ☐' X 144 in^2/☐' = 7318 in^2

DESIGNED UPLIFT = 7318 in^2 X 5 psi = 36,590 lbs per large panel (WORST CASE)

ANCHORS: REDHEAD RM-57 OR 58 MULTISET DROP-INS W/ A-36 All thread rod.

FIND LIMITING

① A-36 All thread → tensile strength = 58,000 psi (See data sht)

5/8" ϕ = 0.307 in^2 ⇒ OVERALL strength = 58,000 psi (.307 in^2) = 17,806 lbs

② REDHEAD DROP INS

pullout per data sheet = 15,218# w/ 4:1 SF

15,218/4 = 3804# allowable w/ SF

REDHEADS ARE LIMITING

No. OF ANCHORS @ WORST PANEL = REQUIRED / ANCHOR lbs = 36,590# / 3804#/ANCH. = 9.6 ANCHORS REQD

DWG. 7C USE 10 ANCHORS per PANEL

10 > 9.6 ok ✓

* CHECK TOTAL OVERALL GROUT SLAB RESISTANCE

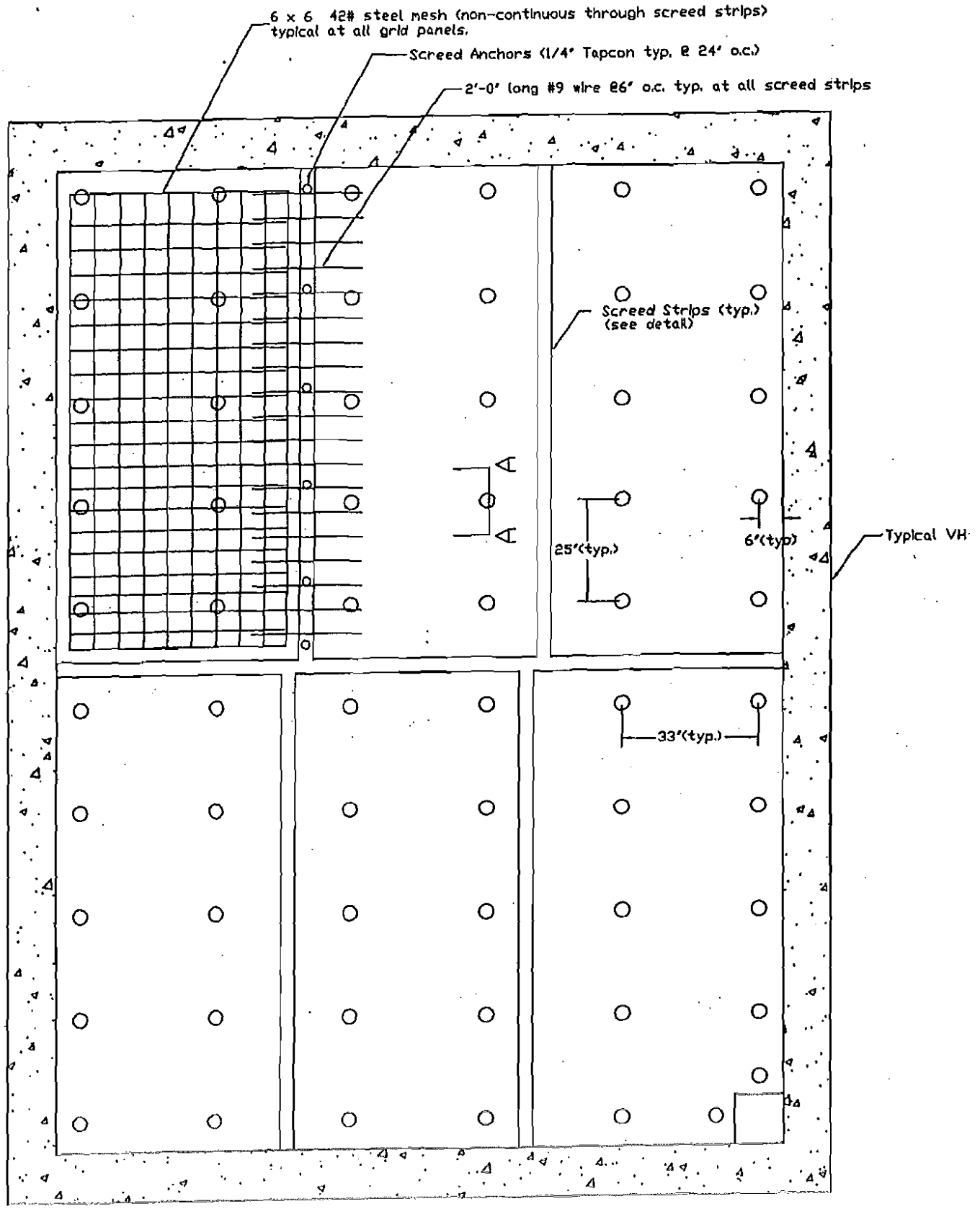
(TOTAL SLAB) 43,056 in^2 X 5 psi = 215,280 lbs required

10 per 6 PANELS = 60 ANCHORS TOTAL

60 ANCH. X 3804#/ANCH = 228,240 lbs

228,240 lbs > 215,280 ok ✓

* All ANCHORS ARE CONNECTED to MESH & through Screed Strips
See Attached details



NOTES:

sh and anchor config. is the same for each liner grid.

-All dimensions are +/- 3" since mesh locations and field conditions may vary.

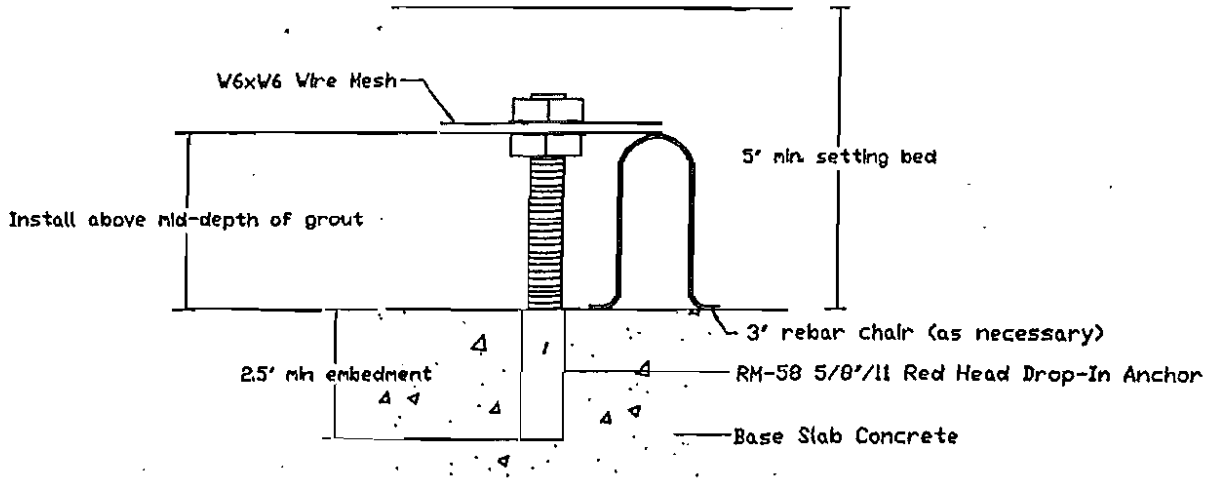
-Screed strips are formed per DWG. 7C

-CVH floor panels designed & anchored similar to VH panels

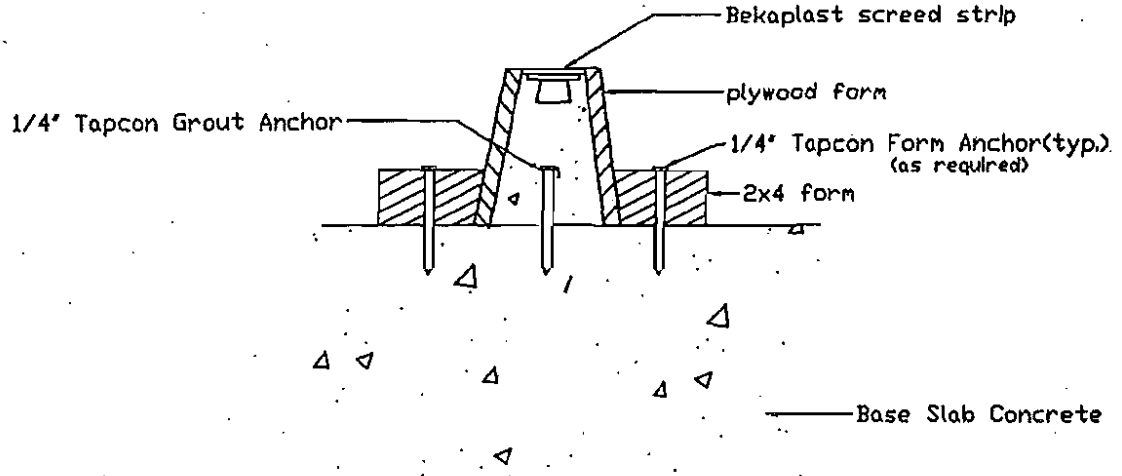
The STAVER Group, Inc.
1271 East 2nd Street
Franklin, Ohio 45005

VH 1 - 6 Grout Bed Anchor Layout

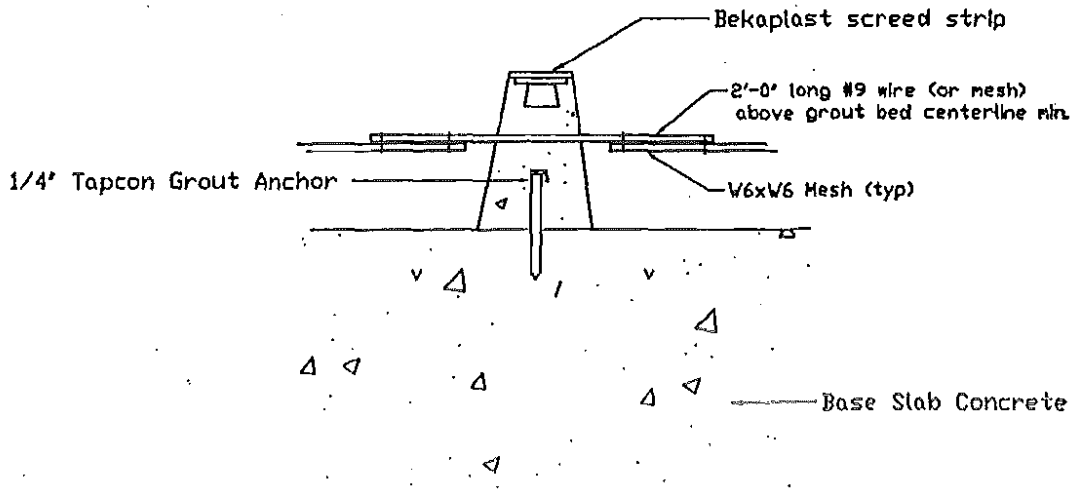
Revision 03 | DWG. 7B



Section A-A
(NTS)



Screed Forms

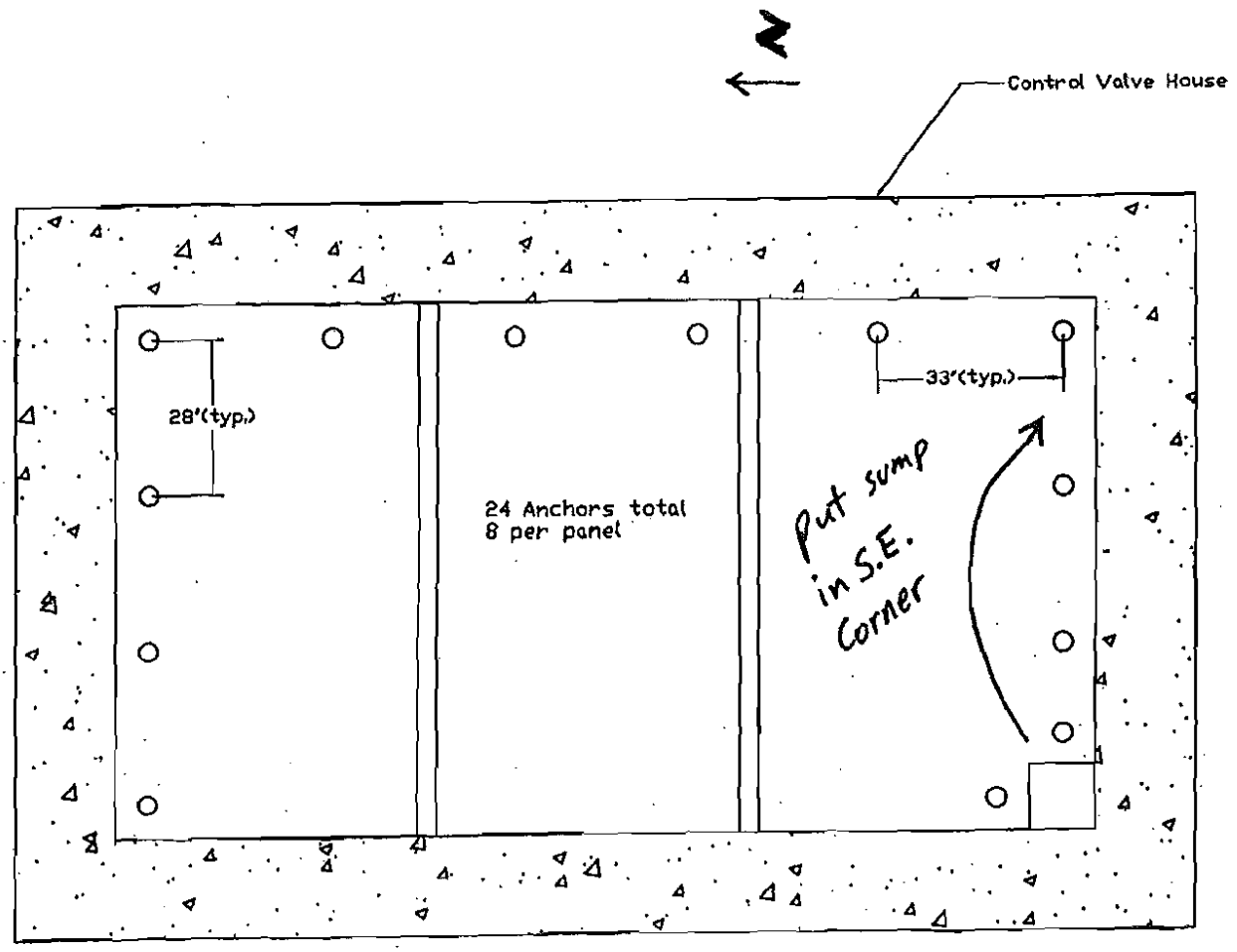


Screed Strips

The STAVER Group, Inc.
1271 East 2nd Street
Franklin, Ohio 45005

Grout Bed Details

Revision 1 | DWG. 7C



NOTES:

- Mesh and anchor config. is the same for each liner grid.
- All dimensions are +/- 3' since mesh locations and field conditions may vary.
- Screed strips are formed and detailed per DWG. 7C
- All grout beds are detailed the same as the Valve Houses

The STAVER Group, Inc.
1271 East 2nd Street
Franklin, Ohio 45005

CVH Grout Bed Anchor Layout

Revision 0 | DWG. 7B.1

ITW Ramset/Red Head

RED HEAD
CONCRETE ANCHORING SYSTEMS

MADE IN U.S.A.

MULTI-SET II DROP-IN

INTERNALLY THREADED, HEAVY-DUTY, STEEL EXPANSION DROP-IN ANCHOR

- Flange-topped, non-bottom bearing anchor.
- Fast, easy installation.
- Multi-Set II anchor can be installed flush or recessed in a hole of any depth.
- Four-way slot assures dependable, uniform anchor expansion.
- Pre-assembled plug cannot fall out in shipment, or during installation.
- Anchor body installs quickly and reduces concrete unit stress.
- Layout and hole-spotting necessary for accurate installation.

MODELS/VARIATIONS

Carbon Steel—Multi-Set II Anchors are available in sizes ¼" through ¾". Zinc plated in accordance with Fed. Spec. ASTM B633-85, SC1, Type III.

Stainless Steel—for protection in humid or corrosive environments, available in sizes ¼" through ⅝".

SELECTION CHART

Carbon Steel Cat. No.	303 Stainless Steel Cat. No.	Bolt Size/ Threads Per Inch	Drill Bit Size	A Thread Depth	B Min. Hole Depth	Ultimate[1] Pullout* Lbs.	Ultimate[1] Shear* Lbs.	Setting Tool Cat. No.[2]
RM-14	SRM-14	1/4"/20	3/8"	3/8"	1"	3,204	1,986	RT-114
♦•RM-38	♦•SRM-38	3/8"/16	1/2"	1/2"	1-5/8"	6,350	3,968	RT-138
♦•RM-12	♦•SRM-12	1/2"/13	5/8"	3/4"	2"	8,544	6,502	RT-112
♦•RM-58	♦•SRM-58	5/8"/11	7/8"	1"	2-1/2"	15,218	10,380	RT-158
♦•RM-34		3/4"/10	1"	1-1/4"	3-3/16"	17,255	13,962	RT-134

[1]Performance data also available for lightweight aggregate concrete from 4000 to 6000 PSI.
[2]Use only Ramset/Red Head setting tools to insure proper installation.
*Ultimate load capacity in 4310 PSI 3/4 inch crushed limestone aggregate concrete. Capacities are for carbon steel versions. Based on independent Testing Laboratory tests. Copies of reports are available on request.

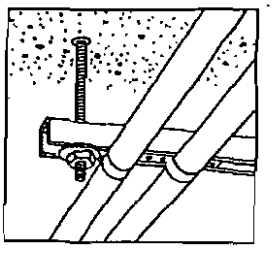
For load capacities in structural lightweight aggregate concrete refer to ICBO Report No. 1372 or contact Technical Service Dept.

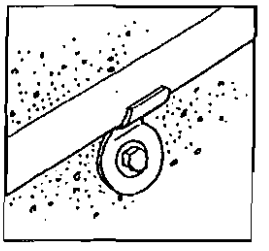
Safe working loads for single installations under static loading should not exceed 25% of the ultimate load capacity. For information on other conditions, contact your nearest factory representative.

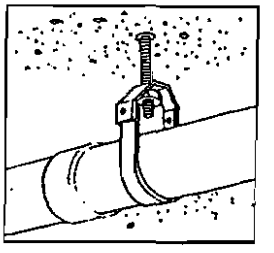
♦Indicates FM Approval. • Indicates UL Listing.

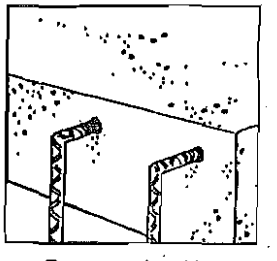
For additional Approvals/Listings see Selector Guide (page 2).

APPLICATIONS









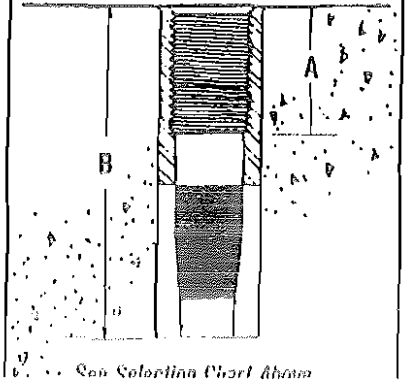
• Pipe hanging • Machinery mounts and valves • Transformers and meters • Blowers and pumps • Transportation, highway and bridge construction

APPROVALS/LISTINGS

Meets or exceeds U.S. Government G.S.A. Specification FF-S-325 Group VIII, Type 1.

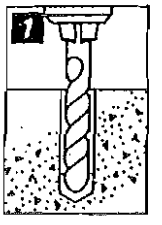
- UL Underwriters Laboratories.
- FM Factory Mutual.
- ICBO Evaluation Service, Inc. Report #1372.
- City of Los Angeles Report #RR2748.
- SBCCI Compliance Report #9368.
- California State Fire Marshal.
- Metro Dade County Florida.

INTERNALLY THREADED, HEAVY DUTY, STEEL EXPANSION DROP-IN ANCHOR



See Selection Chart Above

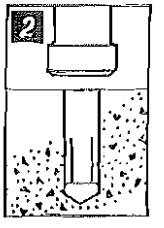
INSTALLATION STEPS



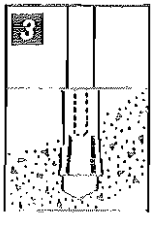
To set anchor flush with surface.

1.
Drill hole the same diameter as anchor being used to any depth exceeding minimum embedment. Clean hole.

2.
Drive anchor flush with surface of concrete.



3.
Expand anchor with setting tool provided. Anchor is properly expanded when shoulder of setting tool is flush with top of anchor.



To set anchor below surface.

1a.
Drill hole deeper than anchor length. Thread bolt into anchor. Hammer anchor into hole until bolt head is at desired depth. Remove bolt and set anchor with setting tool.

See Installation Guidelines on Back Page.

Mechanical Specifications for Externally Threaded Fasteners with Grade Markings, ASTM A36 Material Specification, SAE J429 Bolt and Nut Compatibility

Mechanical Specifications for Externally Threaded Fasteners with Grade Markings

Specification	Material	Size Range (inches)	Min. Proof Strength (psi)	Min. Tensile Strength (psi)	Core Hardness Rockwell Min.	Core Hardness Rockwell Max.	Min. Yield Strength (psi)	Grade Identification Marking
SAE J429-Grade 1	Low or medium carbon steel	1/4–1-1/2	33,000	60,000	B70	B100	36,000	
SAE J429-Grade 2		1/4–3/4 7/8–1-1/2	55,000 33,000	74,000 60,000	B80 B70	B100 B100	57,000 36,000	
ASTM A307-Grade A	Low or medium carbon steel	1/4–4		60,000	B69 *See Note 1*	B100		A307A
ASTM A307-Grade B	Low or medium carbon steel	1/4–4		60,000(min) 100,000(max)	B69 *See Note 1*	B95		A307B
SAE J429-Grade 5 ASTM A449-Type1	Medium carbon steel: quenched & tempered	1/4–1 1-1/8–1-1/2	85,000 74,000	120,000 105,000	C25 C19	C34 C30	92,000 81,000	
ASTM A449-Type 1 *See Note 2*		1-3/4–3	55,000	90,000			58,000	
ASTM A325-Type 1	Medium carbon steel: quenched & tempered	1/2–1 1-1/8–1-1/2	85,000 74,000	120,000 105,000	C25 C19 *See Note 3*	C34 C30	92,000 81,000	A325 *See Note 5*
ASTM A354 Grade BC	Medium carbon alloy steel: quenched & tempered	1/4–2-1/2 2-1/2–4	105,000 95,000	125,000 115,000 *See Note 2*	C26 C22	C36 C33	109,000 99,000	BC
ASTM A354 Grade BD	Medium carbon alloy steel: quenched & tempered	1/4–2-1/2 2-1/2–4	120,000 105,000	150,000 140,000	C33 C31 *See Note 2*	C39 C39	130,000 115,000	BD *See Note 4*
SAE J429-Grade 8	Medium carbon alloy steel: quenched & tempered	1/4–1-1/2	120,000	150,000	C33	C39	130,000	
SAE J429-Grade 8.2	Low carbon boron steel: quenched & tempered	1/4–1	120,000	150,000	C33	C39	130,000	
ASTM A490-Type 1	Medium carbon alloy steel: quenched & tempered	1/2–1-1/2	120,000	150,000(min) 170,000(max)	C33 *See Note 3*	C38	130,000	A 490
ASTM A574 Socket Head Cap Screw	Low alloy steel: quenched & tempered	#0–1/2 over 1/2–2	140,000 135,000	180,000 170,000	C39 C37	C45 C45		

Note 1: No minimum hardness is required on bolts and studs 3 times the diameter and longer.

Note 2: Bolts less than 3 times the diameter in length and studs less than 4 times the diameter in length shall have hardness values not less than minimum and not more than maximum.

Note 3: Bolts 3 times the diameter in length and over are not required to meet minimum hardness requirements.

Note 4: ASTM A354-Grade BD with diameters 1/4" through 2-1/2" shall be marked with the grade symbol "BD" and, in addition may be marked with six radial lines.

Note 5: Radial line markings 120 degrees apart are optional.

ASTM A36 Material Specification

Specification	Material	Tensile Strength (psi)	Minimum Yield Strength (psi)
ASTM A36	Carbon Structural Steel	58,000 (min.) – 80,000 (max.)	36,000

Most designers and end users focus on the strength and other characteristics of the bolt or stud. Once having selected the bolt, they must choose the appropriate nut. There are two simple rules when it comes to selecting the nut;

Rule #1; choose a nut specification compatible with the bolt specification. The bolt specification will usually dictate which nut specification is applicable (ASTM A193 bolts require ASTM A194 nuts).

Rule #2; choose a nut whose minimum proof strength is greater than or equal to the minimum ultimate tensile strength of the bolt. This ensures us that the bolt will break in tension prior to the female and/or male threads stripping.

A broken bolt is an obvious failure. It's loose. However, when the threads strip prior to the bolt breaking, we may not notice the failure until after the fastener is put into service.

SAE J429 Bolt and Nut Compatibility

Bolt Grade	Recommended Nut Grade (1)	Suitable Substitution (2)
SAE J-429 Grade 2	Low Carbon Regular or Heavy Hex Nut	SAE J995 Grade 5 or Grade 8 Hex Nut
SAE J-429 Grade 5	SAE J995 Grade 5 Hex Nut	SAE J995 Grade 8 Hex Nut
SAE J-429 Grade 8	SAE J995 Grade 8 Hex Nut	

(1) "Recommended" denotes a commercially available nut having the most suitable mechanical properties that will make it possible to obtain the desired bolt load.
(2) "Suitable" denotes SAE J995 nuts having mechanical properties that will also make it possible to obtain the desired bolt load.

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 1	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03110 - 008	REV: 1	DATE: 19-Oct-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opelka
SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: [signature] DATE: 10-23-2000

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
8	641-03110-008	0						X			Revised Cap Strip Installation Plan		X		03110	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin (Approver)	52-5				
Jim Cherry	52-5				
Jim Jiakino	52-5				
Mike Godber	64				
Rob Kreig	52-5				
Scott Wheeler	52-5				
Geotechnic (Kwari-Bau-Ivenbark)	38				

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

ORIGINAL

Oct 23 7 45 AM '00

RECEIVED BY: [signature] DATE 10/30/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)	SUBMITTAL ACTION CODE: (BY FDF)
CFC - CERTIFIED FOR CONSTRUCTION	A - Conforms to Subcontract Requirements
INF - INFORMATION/RECORD	B - Minor Comments - Incorporate and Resubmit
DRFT - DRAFT/PRELIMINARY	C - Revise and Resubmit (SEE COMMENTS)

ISCO

Cap Strip installation.

After the concrete has cured and the forms have been removed, if a gap between the sheets exceeds 9/16" a cap strip should be used.

1.1 The cap strip should be from the same batch or run of Bekaplast being used for the walls.

1.2 The width of the cap strip should be wide enough to bridge the gap between the two sheets and have an over lay of a minimum of 1" on each sheet that it will be attached to.

1.3 An extrusion bead wide enough to fill the gap with slight over flow should be applied before attaching the cap strip. The over flow should be ground flat to make a flat surface for the cap strip. An extrusion welding should follow the procedures as outlined in section 15.

1.4 Conductive tape should be attached to each edge of the cap strip prior to its installation to the wall OR FLOOR. — MWJ

1.5 Use a tacker tip and hand gun to tack cap strip into place.

1.6 Weld cap strip to sheet using a 3mm root rod or extrusion welding. Spark test after the 3mm root rod has cooled. Replace root rod if any leaks are found.

1.7 If a 3mm root rod is used to weld cap strip , cover with two 4mm rod welds. If the cap strip is extrusion welded in step 1.6, installation is complete.

ECDC CONTROLLED
COPY NO. 76896

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-03110-008
Reviewed By: DJO
Date: 10/19/00

Sig: [signature] Date: 10/30/00
[ ] A - Conform to the accompanying comments
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit

ISCO INDUSTRIES, Inc.
924 Rankin Avenue
Box 4549
Louisville, KY 40204
P 502.583.6591

POLYETHYLENE PIPE AND FITTING
HDPE FABRICATION
CULVERT LINERS

GEOTEXTILE

SUPPLIER DOCU... SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02714-001	REV: 1	02-Jan-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R. Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wenta DATE: 1/03/01

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
3	641-02714-001	1						X			Geotextile		X		02714	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Knepp	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Tweneboah	38				

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JAN - 4 2001

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

ORIGINAL

TNS
ADVANCED TECHNOLOGIES

9855 Greenville Highway
Building F
Spartanburg, SC 29301
800-867-5181
fax: 864-949-6222

June 8, 2000
REF: TNS R070

The Staver Group
Project: Fernald
Location: Hamilton, OH

Dear Sir/Madam:

This is to certify that TNS R070 is a 100% polypropylene, nonwoven, needle-punched fabric. TNS R070 is resistant to degradation due to ultraviolet exposure and resists commonly encountered soil chemicals, insects, mildew, and is non-biodegradable. Polypropylene is stable within a pH range of 2 to 13. TNS R070 conforms to the physical properties listed in the following table:

FABRIC PROPERTY	TEST METHOD	UNITS	M.A.R.V
Weight (typical)	ASTM D 5261	oz/sy	7.0 (238 g/sm)
Grab Tensile	ASTM D 4632	lbs	180 (.80 kN)
Grab Elongation	ASTM D 4632	%	50
Trap Tear	ASTM D 4533	lbs	75 (.34 kN)
Puncture	ASTM D 4833	lbs	105 (.46 kN)
Mullen Burst	ASTM D 3786	psi	350 (2412 kPa)
A.O.S.	ASTM D 4751	U.S. Sieve	80 (.180 mm)
Permittivity	ASTM D 4491	1/sec	1.5
Water Flow	ASTM D 4491	gpm/sq.ft.	100 (4072 l/min/sm)
U.V. Resistance after 500 hours	ASTM D 4355	% retained	70

Sincerely,

J. Melissa Keller
TNS Advanced Technologies

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02714-001
Reviewed By: Dus
Date: 01/02/01

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02714-002	REV: 1	02-Jan-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 01/03/01

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
8	641-02714-002	1						X			Geotextile Certification		X		02714	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godbey	64				
Bob Kneip	52-5				
B. Scott Wheeler	52-5				
Kwasi Baa Tweneboah	38				

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

RECEIVED BY: MW Gr DATE 1-17-01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

DATE: 12/0(TNS : _s, INC. PAGE: 1

NONWOVEN QUALITY DATA INQD(

FOR ROLL# 200058638 THROUGH 200058638

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC RESI	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
200058638	R070	180	300	7.0	96	185	195	66	72	76	94	112	398	169	.660	2.64	80

Dec. 7. 2000 2:25PM

Roll # 10035048 - Submittal # 641-02714-002 Rev 0.
WAS Returned to Supplier.
Ron Wood

INFORMATION ONLY

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 1/5/01

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02714-002
Reviewed By: Ron
Date: 01/02/01

No. 3110 P. 3

TNS M , INC.
NONWOVE ALITY DATA
FOR ROLL# 200058573 THROUGH 200058573

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
200058573	R070	180	300	7.1	99	189	200	64	75	86	104	131	454	169	.660	2.64	80

DATE: 12/05/00

TNS MILLS, INC.
NONWOVEN QUALITY DATA
FOR ROLL# 200058653 THROUGH 200058653

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
200058653	R070	180	300	7.0	96	185	195	66	72	76	94	112	398	169	.660	2.64	80

Dec 7. 2000 2:25PM
No.3110 P. 6

DATE: 12/05/ TNS M. S, INC. PAGE:

NONWOVEN QUALITY DATA INQ

FOR ROLL# 200058640 THROUGH 200058640

ROLL #	STYL	WDT	LNG	FABR WGHT	THCK	GRAB MD	GRAB XMD	ELNG MD	ELNG XMD	TRAP MD	TRAP XMD	PUNC REST	BRST STRG	FLOW RATE	PERM -ABL	PERM -ITY	AOS
200058640	R070	180	300	7.0	96	185	195	66	72	76	94	112	398	169	.660	2.64	80

TOTAL P.06

CULVERTS

SUPPLIER DOCUMENT SUBMITTAL 02721-001

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-~~001~~	REV: 0	DATE 22-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 5/22/00

			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	641-02721-001	0						X			Type IV RCP		X		02721-001	X		
	~~2041-02721-001~~														2.02 A			
	MC 5-22-00																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry ✓	52-5				
Jim Jenkins ✓	52-5				
Jim Escue ✓	52-0				
Zab Kneup ✓	52-5				
B. Scott Wheeler ✓	52-5				
Kwasi Bau Twenebah ✓	164				

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

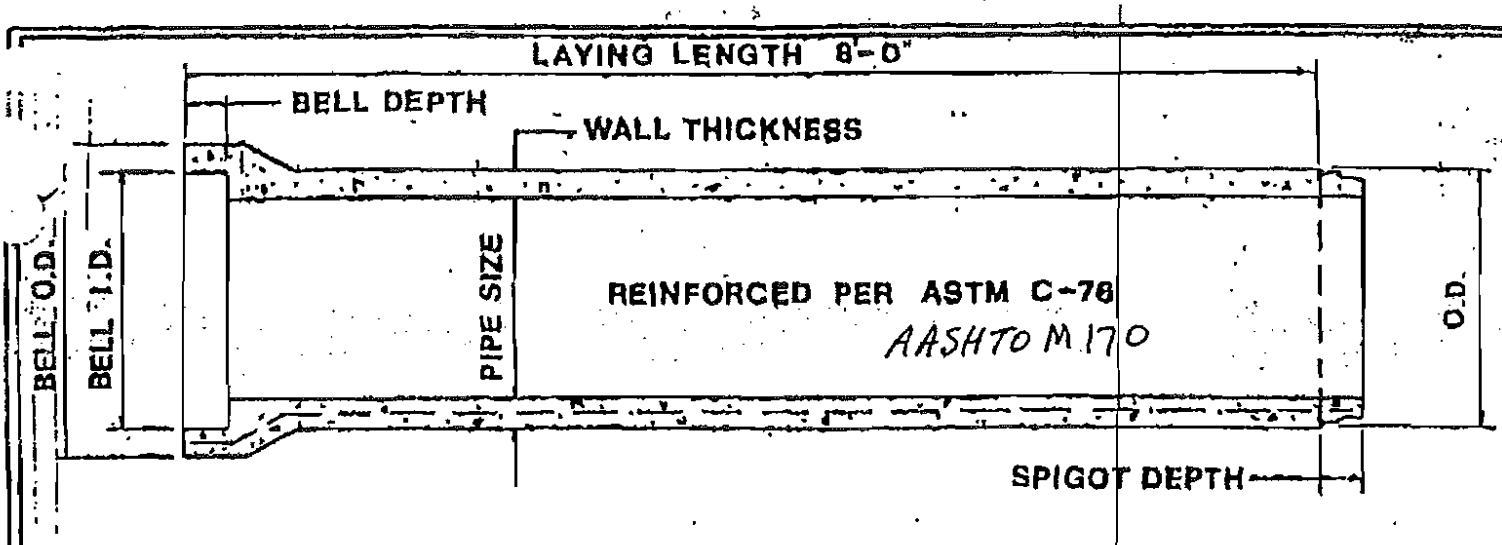
Submit additional data per 02721-1.04A (Storage, handling, installation methods should have been submitted with this submittal)
+ CMP culverts
+ ASTM/AASHTO cross-reference

RECEIVED BY: MW Griffin DATE 5/25/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit SEE COMMENTS

ORIGINAL



Type III

PIPE SIZE	B-WALL	O.D.	BELL O.D.	BELL I.D.	B&S DEPTH
12	2 .17	16	20-1/4	15-1/4	3-1/2
15	2-1/4 .19	19-1/2	24-1/8	18-3/4	3-1/2
18	2-1/2 .21	23	28-1/8	22	3-1/2
21	2-3/4 .23	26-1/2	31-3/4	25-1/2	3-3/4
24	3 .25	30	35-1/2	29	3-3/4
27	3-1/4 .27	33-1/2	39-3/8	32-1/4	3-7/8
30	3-1/2 .29	37	43-1/4	36	3-7/8
36	4 .33	44	51-1/4	42-1/2	3-7/8
42	4-1/2 .38	51	57	49	4
48	5 .42	58	63-1/2	55	4

DURA-CRETE, INC.
REINFORCED CONCRETE PIPE.

1504 N. GETTYSBURG AVENUE. DAYTON, OHIO 45427

PHONE: 513-268-6708

Fluor Contract FSC-641
SDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

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

Submittal # 641-02721-001
Reviewed By:
Date: 5/22/00

Sig: [signature] Date: 5/25/00

INFORMATION ONLY

SUPPLIER DOCUMENT SUBMITTAL 02721-001

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-001	REV: 0	DATE 22-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 5/22/00

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
1	(04) --02721-001	0						X			Type IV RCP		X		02721-001	X		
	~~2011-02721-001~~														2.02 A			
	MC 5-22-00																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5	RECEIVED			
Jim Cherry	52-5				
Jim Jenkins	52-5	MAY 23 2000			
Jim Fscue	52-C				
Zeb Knepp	52-5				
B. Scott Wheeler	52-5				
Kwasi Boa-Tweneboah	~~52~~ 38				

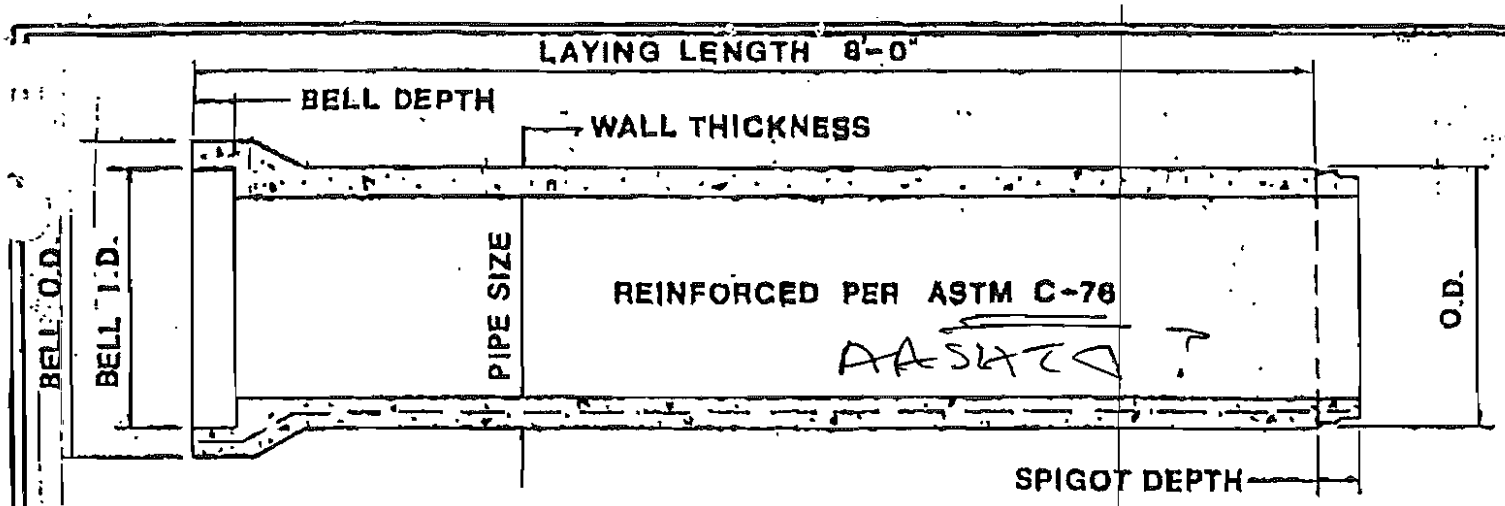
NO COMMENTS: COMMENTS: (PLEASE USE SPACE BELOW FOR COMMENTS OR INDICATE IF ATTACHMENTS)

RECEIVED BY: [signature] DATE 5/25/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL



TYPE IV

PIPE SIZE	B-WALL	O.D.	BELL O.D.	BELL I.D.	B&S DEPTH
12	2 .17	16	20-1/4	15-1/4	3-1/2
15	2-1/4 .19	19-1/2	24-1/8	18-3/4	3-1/2
18	2-1/2 .21	23	28-1/8	22	3-1/2
21	2-3/4 .23	26-1/2	31-3/4	25-1/2	3-3/4
24	3 .25	30	35-1/2	29	3-3/4
27	3-1/4 .27	33-1/2	39-3/8	32-1/4	3-7/8
30	3-1/2 .29	37	43-1/4	36	3-7/8
36	4 .33	44	51-1/4	42-1/2	3-7/8
42	4-1/2 .38	51	57	49	4
48	5 .42	58	63-1/2	55	4

DURA-CRETE, INC.
REINFORCED CONCRETE PIPE.

1504 N. GETTYSBURG AVENUE. DAYTON, OHIO 45427.
PHONE: 513-268-6706

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641 C0121-003
Reviewed By: D.J.
Date: 5/30/00

SUPPLIER DOC T SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-002	REV: 0	DATE: 23-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 5/23/00

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	641-02721-002A	0						X			RCP gasket product data		X		02721	X		
	P1.04A																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry ✓	52-5				
Jim Jenkins ✓	52-5				
Tom Escue ✓	52-0				
Joe Knepp ✓	52-5				
J. Scott Wheeler ✓	52-5				
Kwasi Ban Tweneboah ✓	64				

RECEIVED
MAY 30 2000

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

attached

RECEIVED BY: [signature] DATE 5/25/00
(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 Subcontract Requirements
B - Minor Comments, Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

ENTERED

FORSHEDA

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641- 02721-002A
Reviewed By: DRO
Date: 5/23/00

Forsheda 145

"Non-Lubricated Pipe Seal"

The Win-Win Solution in Pipe Sealing Systems
Easier for you to produce. Easier for your customers to lay!

Conversion is simple and inexpensive. Uses your existing pallets. All you need are one or two new tongue formers — plus a few set rings . . . and you're in business!

Application and Usage

Concrete Pipe — Reinforced low-head pressure ASTM C-361 and sewer and culvert pipe using rubber gasket ASTM C-443.

Pipe and Material Design

Spigot and bell concrete pipe. A suitable joint design is shown below. (Fig. 1) A drawing with suggested joint designs may be obtained from Forsheda.

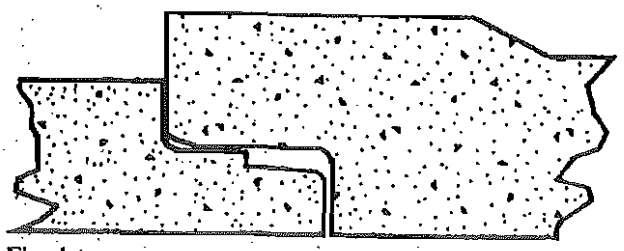


Fig. 1

Function

The seal cross-section is designed as a Non-Lubricated Profile Seal. (Fig. 2)

The seal consists of an engineered delta shaped compression section which is self centering and easy to install.

Because of the substantial width of its compression section, the Forsheda 145 seal is capable of withstanding high lateral forces, e.g., heavy traffic or deep trenches.

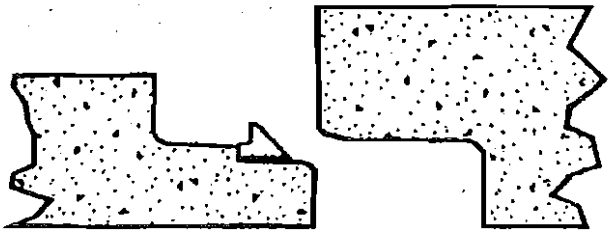


Fig. 2

The seal is mounted on the spigot end of the pipe — note the shoulder which provides axial support. The wedge shape of the seal makes it easy to center the pipes as the joint is assembled. Proper lubrication of sliding surfaces is required.

INFORMATION ONLY

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 5/25/00

* Submit additional data per 02721-1.04A MWB

* MUST BE ~~FOR~~ TYPE A ~~CULVERT~~ MWB GASKET

Gasket Placement

1. Place the gasket on the spigot end. Make sure that the seal is set firmly against the shoulder all the way around. (Fig. 3)

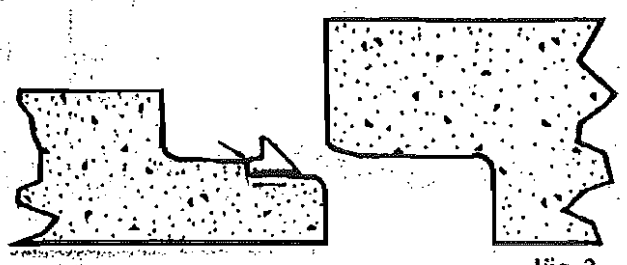


Fig. 3

2. Check to make sure the bell is clean.

3. Lubricate the Gasket & Bell with an approved pipe joint lubricant.

4. Center the spigot in the bell and push the pipe section home. (Fig. 4)

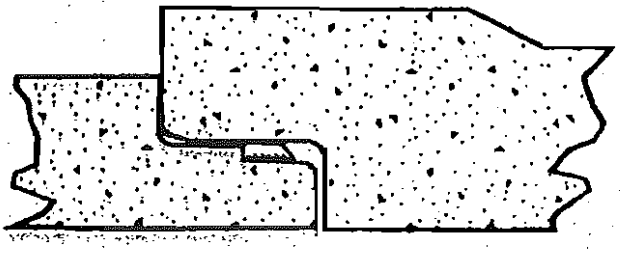


Fig. 4

Advantages

1. The joint can withstand high lateral forces because of the wide contact surface of the seal.
2. Centering of the pipe sections is made easier by the wedge shape of the seal.
3. The cross-sectional width assures that the ring is firmly located on the spigot end.
4. Simpler handling all around saves pipe-laying time.

Rubber Quality

Meets or exceeds ASTM C-361 and C-443, AASHTO M 198, Florida Dot Specifications and other applicable specifications.

Tensile Strength: 2500 PSI AVG.

Elongation: 500% avg.

Shore Durometer Hardness Nominal: 45° ± 5°

Compression Set % of Original: 16% avg.

Accelerated Aging
- Decrease in Tensile Strength: 8%
- Decrease in Elongation: 15%

Liquid Immersion Max % Weight Increase
Water Absorption: 3%

Ozone Resistance: No Cracks

Marking

The marking is embossed on the outermost part of the gasket.

Example:
F Forsheda F-145
ASTM C-361 Made in USA 89-1.

F-145	
ASTM C-361	Conforms to this USA standard
89-1	Year and Quarter of Manufacture

Forsheda — We've changed more than our logo

Now:

ISO 9002 Certified
New Commitment to Pipe Producer
Faster Service
Higher Quality
Competitive Pricing
Continual Improvement

FORSHEDA

Forsheda Pipe Seals, 2200 South McDuffie Street, Anderson, South Carolina 29624, (800) 537-3138, FAX (864) 226-9834
"We've Changed More Than Our Logo."

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-003	REV: 0	DATE: June 6,2000	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

Ron Wood

SIGNATURE: R Wood

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

RECEIVED BY: Teresa Schwab DATE: 6-6-2000

			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	641-02721-003	0						X			Certification for RCP		X		02721	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Tom Escue	52-0				
Rob Kheip	52-5				
Scott Wheeler	52-5				
Kwasi Bau Twineboab	38				

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

RECEIVED BY: M W Griffin DATE 6/8/00

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

ORIGINAL

SUBMITTAL TYPE: (BY SUPPLIER)

CFC - CERTIFIED FOR CONSTRUCTION

INF - INFORMATION/RECORD

DRFT - DRAFT/PRELIMINARY

SUBMITTAL ACTION CODE: (BY FDF)

A - Conforms to Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

DURA-CRETE, INC.

1504 N. Gettysburg Avenue
Dayton, OH 45427-3814
(800) 866-6706
(937) 268-6706
(937) 268-8321 FAX

Date: 5-30-00

Re: Pipe Certification

The reinforced concrete pipe manufactured by Dura-Crete, Inc. is made according to ASTM C-76-84 and all applicable Ohio Department of Transportation specifications.

Randy H. Yoakum
Vice President

RHY/ct

INFORMATION ONLY

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 6/8/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02721-003
Reviewed By: [illegible]
Date: 6/06/00

FORSHEDA

Forsheda Pipe Seals
Anderson, South Carolina

**********Certification**********

DATE: 6-02-00
CUSTOMER: Duracrete – Dayton, Ohio
PRODUCTS: F-145 [C-361]

FROM: Thomas A Bailey
SIGNED: Thomas A. Bailey
Quality Assurance Manager FPS

This is to certify that the F-145 [C-361], as furnished by Forsheda Pipe Seals, Anderson, SC, will meet or exceed the rubber requirements as specified in standard C-361, AASHTO M198, CSA B137.3 and other applicable specifications common to Federal, State and Local requirements.

Original Properties & ASTM standard / test	Standard	45 Duro (F-145) - actual
Tensile Strength, Min. P.S.I. [D412]	2300	2756
Elongation, Min. % [D412]	425	818
Hardness, Shore A [D2240]	40-50	49
Compression Set (Max %) [D395]	20	12.57
Accelerated Aging (Air Oven Test) [D573]		
Decrease In Tensile Strength, Max. % of Original	15	0.13
Decrease In Elongation, Max. % of Original	20	-7.02
Hardness, Shore A Durometer Max. Increase, Points	8	3
After Water Immersion, [D471] Change in Volume, Max. %	5	1.34
Elastomer Effect on Pipe [F477 / D395]	pass / fail	pass

**********Certification**********

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-004	REV: 0	DATE: June 6,2000	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wendy DATE: 6/6/00

			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	641-02721-004	0						X			Installation instructions for RCP		X		02721		X	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Tom Escue	52-0				
Rob Knerp	52-5				
B. Scott Wheeler	52-5				
Kwasi Bau Tweneboah	64				

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

Submit pipe joint lubricant & MSDS

RECEIVED BY: Mike Griffin DATE: 6/8/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

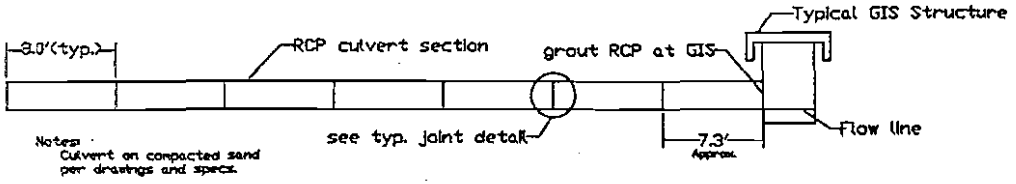
ORIGINAL

ERRATA

Storage Requirements:
Alternate bell and spigot ends
Elevate off ground to keep clean
Block ends to prevent rolling

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02721-004
Reviewed By: DMO
Date: 6/6/00



Typical Culvert Layout
N.T.S

1. Place the gasket on the spigot end. Make sure that the seal is set firmly against the shoulder all the way around. (Fig. 3)

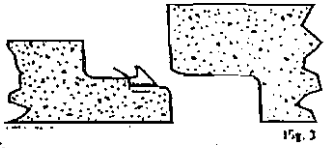


Fig. 3

2. Check to make sure the bell is clean.
3. Lubricate the Gasket & Bell with an approved pipe joint lubricant.
4. Center the spigot in the bell and push the pipe section home. (Fig. 4)

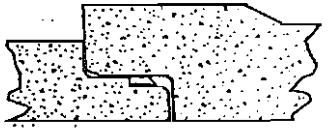


Fig. 4

Culvert Joint Detail &
Installation Instructions

[ ] A - Conforms to the Subcontract Requirements
[X] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Griffin Date: 6/8/00

Submit pipe joint lubricant and MSDS

STAVER

The Staver Group, Inc.
1271 East 2nd St.
Franklin, Ohio 45005

INFORMATION ONLY

SUPPLIER DOC .ENT SUBMITTAL

FDF PROJECT NO: 2011	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02721-005	REV: 0	DATE: 14-Jul-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R. Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Jarrett DATE: 7/17/00

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
8	641-02721-005	0						X			Misc. Drainage Products		X		02721	X		X

mb 7/26/00

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Gorber	64				
Rob Krupp	525				
Scott Wheeler	525				
Kwasi Osu Tuzenbah	64				

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

(1) ~~Submit correct size info – both products~~ mb 7/26/00
(2) ~~Submit coupling info~~ mb 7/26/00
(3) Submit mated certifications for all matls including couplings mb 7/26/00

RECEIVED BY: MW Gill DATE 7/25/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

SUBMITTAL TYPE: (BY SUPPLIER)	SUBMITTAL ACTION CODE: (BY FDF)
CFC - CERTIFIED FOR CONSTRUCTION	A - Conforms to Subcontract Requirements
INF - INFORMATION/RECORD	B - Minor Comments - Incorporate and Resubmit
DRFT - DRAFT/PRELIMINARY	C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

JUL 10 2000 15:26 FR DEINEH FDRY 614 876 8216 TO 15136484167 P.02/02

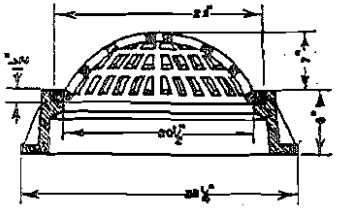
R-2510-A
Catch Basin Frame, Beehive Grate

Heavy Duty

Designed to fit in bell of 24" sewer pipe.

For other beehive catch basin castings, see pages 99 and 100.

Furnished standard with as-cast bearing surfaces.



Uses R-1761 frame.

[x] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [signature] Date: 7/26/00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02721-005
Reviewed By: [signature]
Date: 7/10/00

NEENAH FOUNDRY COMPANY

INFORMATION ONLY

2

Introduction.

This catalog presents the wide range of pipe designs, materials, coatings and linings available from CONTECH CONSTRUCTION PRODUCTS INC.

It should serve as a valuable reference for engineers, contractors and owners.

For additional information, call your local CONTECH Sales Engineer, or write to CONTECH CONSTRUCTION PRODUCTS INC., P.O. Box 800, Middletown, Ohio 45042.

A pioneering tradition

It has been more than 80 years since CONTECH began producing corrugated steel pipe. During that time, CONTECH earned a reputation as the world's leader in pipe design and innovation. Many steel pipe configurations, coatings and linings that are now industry standards were conceived and developed by CONTECH CONSTRUCTION PRODUCTS INC.

No other type of drainage structure offers the range of structural strength available with corrugated steel. Corrugated steel pipe can perform where rigid pipe fails.

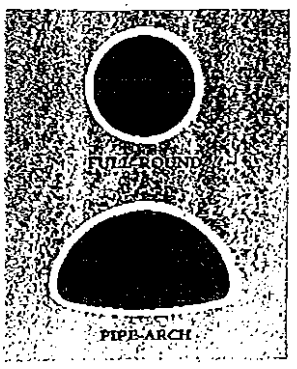
Corrugated steel pipe transfers live and dead loads to the surrounding soil envelope, creating composite steel/soil interaction. Loads are distributed uniformly around the entire circumference of round pipe — the unit pressure at the top and bottom being as little as one-third that on a rigid pipe under identical loading conditions. This composite action provides an economical, structurally sound approach to pipe design.

That's why engineers and contractors from coast to coast have relied on CONTECH Corrugated Steel Pipe for culverts, small bridges, conduits, storm and sanitary sewers.

Two basic shapes

Full-round pipe is suitable for most applications. However, CONTECH also produces a pipe-arch for use with limited headroom conditions. The low, wide pipe-arch design distributes the area horizontally to provide adequate capacity without lowering grade.

The first corrugated metal pipe was riveted together by hand at this open air plant at Crawfordsville, Indiana, in 1896. James Watson, co-inventor with Crawfordsville City Engineer Stanley Simpson, is the third man from the left. CONTECH CONSTRUCTION PRODUCTS INC. has evolved as a descendent of Watson's sheet metal shop.



Reference Specifications

Material	Galvanized Steel ALUMINIZED STEEL Type 2 FIBER-BONDED Steel Polymer-Coated Steel	ASTM A 929 and AASHTO M218 ASTM A 929 and AASHTO M274 ASTM A 885 ASTM A 742 and AASHTO M246
Pipe	Steel (Galvanized and ALUMINIZED STEEL Type 2) Steel (Polymeric)	ASTM A 760 and AASHTO M36 ASTM A 762 and AASHTO M245
Coating/Lining	Asphalt and Concrete	ASTM A 849 and AASHTO M190
Design	Steel	ASTM A 796 and AASHTO Standard Specification for Highway Bridges, Section 12
Installation	Steel	ASTM A 798 and AASHTO Standard Specification for Highway Bridges, Section 26

Corrugations and wall thicknesses

Both CONTECH Pipe and Pipe-Arch are produced in six wall thicknesses from 0.052 to 0.168-inch and are available with either helical or annular corrugations. CONTECH HEL-COR Pipe (helical corrugations) is furnished with continuous butt-welded or locked seams, and with rerolled annular ends. CONTECH riveted pipe is furnished with annular corrugations only.

Corrugations include 1½" x ¼" and 2⅔" x ½" for economical and efficient metal use in small diameters; 3" x 1" and 5" x 1" offer high sectional properties in large-diameter pipe.

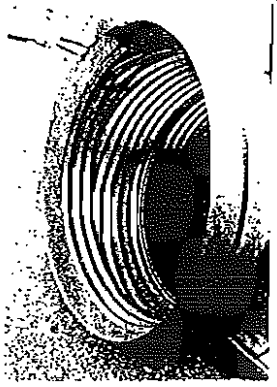
The wide variety of corrugations and thicknesses permits selection of materials for a balanced design to meet specific jobsite conditions. Each project can be designed individually for the most cost-efficient combination of corrugations, thicknesses, sizes, materials, and installations maximizing your investment on a job-by-job basis. For guidance, call your local CONTECH Sales Engineer.

Diameters and lengths

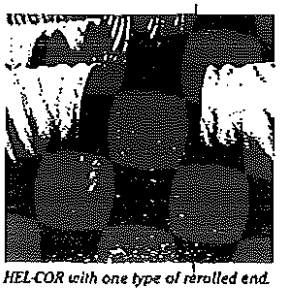
CONTECH Corrugated Steel Pipe is available in diameters ranging from 12 inches to 96 inches in the 2⅔" x ½" corrugation. Smaller diameters (6, 8 and 10-inch) are available in 1½" x ¼" corrugation, but only in lock-seam construction.

The 3" x 1" corrugation is available in diameters of 36 inches to 144 inches; the 5" x 1" corrugation is available in diameters from 48 inches to 144 inches.

Pipe-arch sizes range from 17" x 13" through 83" x 57" for 2⅔" x ½" corrugations, and up to 142" x 91" for both 3" x 1" and 5" x 1" corrugations. Normally pipe and pipe-arch are supplied in 20-foot lengths. Other lengths are available on request.

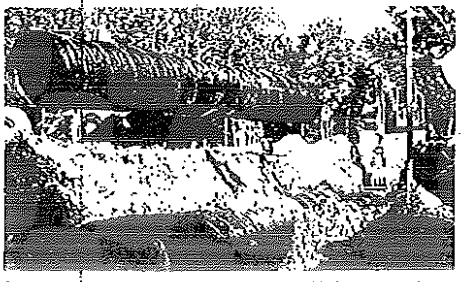


Gasketed bell-and-spigot couplings allow quick and easy jointing and meet most site and project requirements.



HEL-COR with one type of rerolled end.

HUGGER Band combined with rerolled ends for superior pull apart strength.



Polymer-coated corrugated steel pipe gives added protection in adverse conditions.

SUPPLIER DO ENT SUBMITTAL

FDF PROJ. NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 03100-002	REV: 0	DATE: 16-May-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: D. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 5/17/00

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	641-03100-002	0						X			GIS Structure shop drawings		X		03100		X	
	P1.04.A.5																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Jim Cherry ✓	52-5				
Jim Jenkins	52-5				
Tom Esue ✓	52-0				
Rob Kneip	52-5				
B. Scott Wheeler	52-5				
Kwasi Ban Tuneboah ✓	64				

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

attached

RECEIVED BY: [signature] DATE 5/18/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ENTERED

ORIGINAL

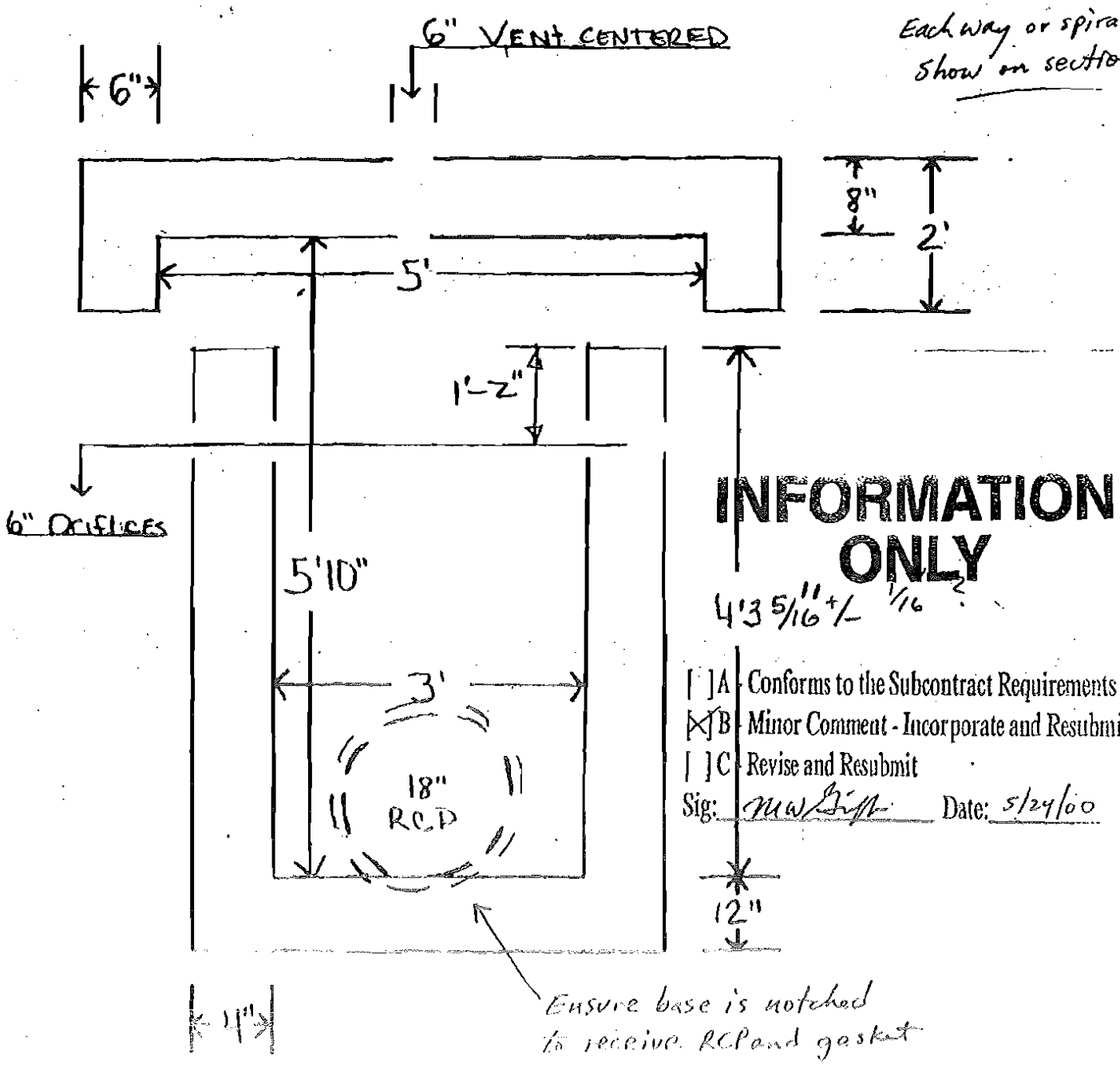
Submittal 03100-6
P 1.04 A.5

AEROCRETE PRECAST CORPORATION

5660 LIMBABURG ROAD, BURLINGTON, KENTUCKY 41005
Phone (606) 371-8800 Fax (606) 371-8333

Anti-Vortex Structure
Not to Scale

NOTES:
4000 psi Concrete
#4 rebar @ 12" o.c.
Each way or spiral?
Show on section

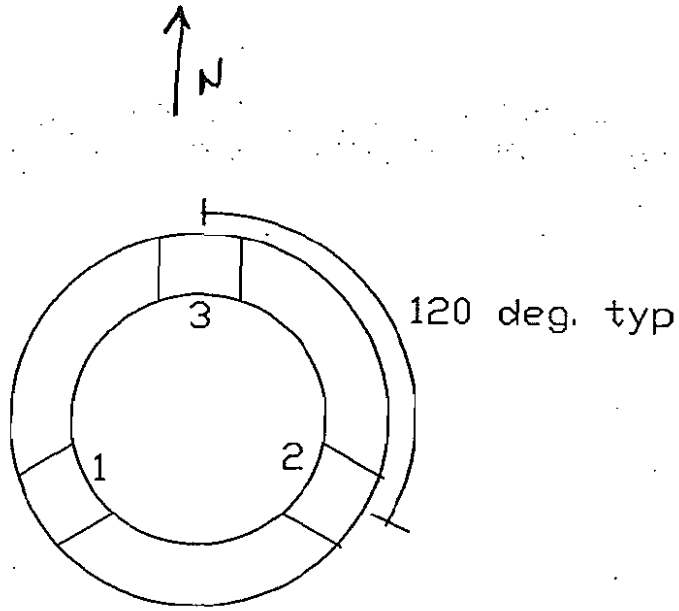


INFORMATION ONLY

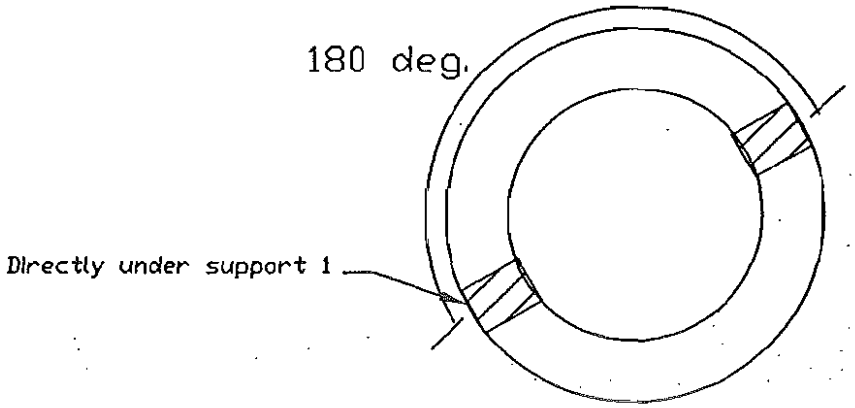
[ ] A - Conforms to the Subcontract Requirements
[X] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Gifft Date: 5/24/00

Support Notes:
1'-6 11/16" +/- tall
1'-0" wide (outside)
0'-4" thick

supports will be an extension of the inlet structure walls at specified locations.



Support locations
NTS



Orifice locations
NTS

MONITORING WELL COVERS

SUPPLIER DC MENT SUBMITTAL

FDF PRO. NO: 20111	CONTRACT NO: FSC - 64	SUBMITTAL NO: 02270-004	REV: 0	24-Apr-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

Ron Wood

SIGNATURE: R Wood

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

RECEIVED BY: Denise Wentz DATE: 4/24/01

			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
8	641-02270-004	0						X			**Monitoring Well Covers**		X		02270	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	64				
Rob Kneep	52-5				
B. Scott Wheeler	52-5				
GeoSyntec Consultants	38				

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

RECEIVED BY: [signature] DATE 4/25/01

(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)

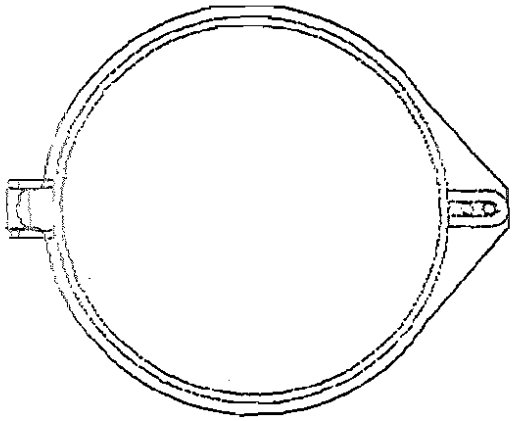
A - Conforms to Subcontract Requirements

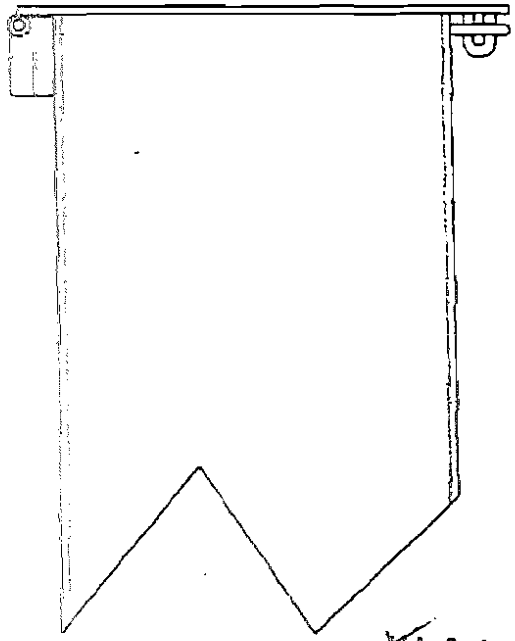
B - Minor Comments, Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

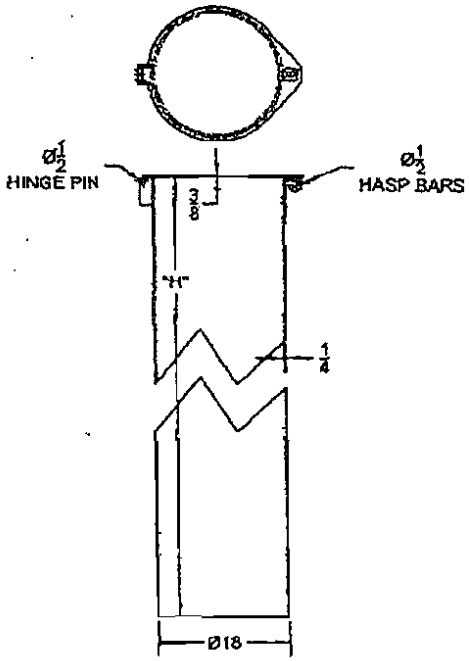
04/23/2001 17:11 5136/118/05 GLOBAL DRLG SUPLRS PAGE 01

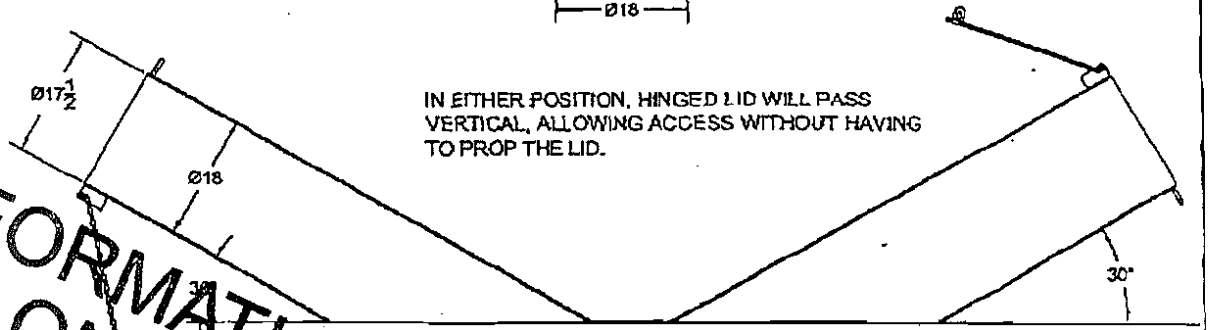




Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02270-004
Reviewed By: DRO
Date: 4/23/01





IN EITHER POSITION, HINGED LID WILL PASS VERTICAL, ALLOWING ACCESS WITHOUT HAVING TO PROP THE LID.

INFORMATION ONLY

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 4/25/01

GLOBAL DRILLING SUPPLIERS, INC.

18" ROUND X 1/4" WALL" PROCOVER

SIZE	FSCM NO.	DWG NO.	REV
		GDS PC RD 18	
SCALE	DATE: 04-23-2001	SHEET	

VEGETATION

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJ. NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 02930-001	REV: 0	DATE: 02-May-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Garrett DATE: 5/3/01

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
8	641-02930-001	0						X			Vegetation seed mixture information		X		02930	X		
8	641-02930-002	0						X			Conweb fibers product data		X		02930	X		
8	641-02930-003	0						X			Hydrostik Tackifier product data		X		02930	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cheney	52-5				
Jim Jenkins	52-5				
Mike Godber	14				
Bob Kneip	52-5				
Scott Wheeler	52-5				
Kwasi Badu-Tweneboah	38				

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

Need to submit other info required by Spec Sect 02930
- Application rates
- Seeding plan
- Fertilizer
- manufacturers data / application methods

ORIGINAL

RECEIVED BY: Michael W. Griffin DATE 5/9/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

CWS
Cincinnati Wholesale Supply

To: The Staver Group
Attn: Dave Opalka
From: Terry Kennedy
Re: Custom Seed Mix

Mr. Opalka,

This notice shall serve as certification that the seed being supplied by Cincinnati Wholesale Supply meets or exceeds the specifications as outlined Section 02930, Part 2, section 2.01, paragraph A. Below is a list of the seeds contained in the mix along with the actual purity and germination percentages listed:

Purity	Germ.	Origin
54.75% Regreen	85%	WA
22.18% Canada Wild Rye	85%	MT
21.90% Annual Ryegrass	92%	OR

.27% crop
.89% inert
.01% weed

Noxious Weeds: None Found
Test Date: 04/01

INFORMATION ONLY

If any further information is needed, please contact me directly at 513.226.8768.

Thank you,

Terry Kennedy

Terry Kennedy
General Manager
Cincinnati Wholesale Supply

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MWB Date: 5/9/01

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641- 02930-001
Reviewed By: DMO
Date: 5/2/01

Profile

CONWED FIBERS®

Gentlemen:

As requested this letter certifies that ENVIROBLEND® Hydraulic Mulch meets the following specifications:

ENVIROBLEND® Hydraulic Mulch fiber is composed of recycled wood, green chips, newsprint and contains no germination or growth-inhibiting factors. It is colored green to allow visual monitoring in its application. It has the property to be evenly dispersed and suspended when agitated in water. When it is sprayed uniformly on the surface of the soil, the fibers form an absorbent cover, allowing percolation of water to the underlying soil.

The material is organic and it non-toxic to plant and animal life in normal circumstances. The material will not normally stain concrete or painted surfaces but may cause temporary discoloration of highly porous material.

The ENVIROBLEND® Hydraulic Mulch fiber is packaged in polyethylene bags weighing 60 pounds, and containing 53-lbs. net dry weight. The bag measures approximately 9.5" x 18" x 39".

Fiber length	2.0 cm (max)
Fiber diameter	.04 mm (max)
Percent moisture content	12.5% ± 3.0%
Percent organic matter (O D Basis)..	99.2% ± 0.6%
Percent ash content	0.8% ± 0.2%
PH	4.0% to 7.0%
Water holding capacity	900% minimum

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-02930-002
Reviewed By: DRO
Date: 5/2/01

This data is based on laboratory analysis and is reliable to the best of our knowledge. Due to variations in conditions and methods, tests cannot be guaranteed exactly if performed under other conditions.

Conwed Fibers® certifies that ENVIROBLEND® Hydraulic Mulch fiber has been tested and does meet the above specifications.

INFORMATION ONLY

Sincerely,

Stephen R. Zwilling
VP Sale
PROFILE Products

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 5/9/01

MATERIAL SAFETY DATA SHEET

CONWED FIBERS® ENVIROBLEND®

PROFILE PRODUCTS LLC
750 LAKE COOK ROAD - SUITE 440
BUFFALO GROVE, IL 60089

847-215-1144
800-366-1180
FAX 847-215-0577

HAZARDOUS COMPOUNDS	CAS NO	NIOSH	ACGIH	IDLH MG/CU METER
POPLAR, PINE & OAK WOOD DUST			5 MG / CUBIC METER	

HAZARDOUS RATINGS

HEALTH 2 FLAMMABILITY 1 REACTIVITY 0 DUST EXPLOSION 1

PHYSICAL / CHEMICAL CHARACTERISTICS

BOILING POINT	N/A	VAPOR PRESSURE	N/A
SPECIFIC GRAVITY	0.6444	VAPOR DENSITY	N/A
MELTING POINT	N/A	EVAPORATIVE RATE BuAc=1	N/A
SOLUBILITY IN WATER		"SLIGHT TO INSOLUBLE"	
APPEARANCE AND ODOR		"DARK GREEN WITH WOOD ODOR"	

FIRE AND EXPLOSION HAZARD DATA N/A "NOT APPLICABLE"

FLASH POINT N/A FLAMMABLE LIMITS N/A LEL UEL

EXTINGUISHING MEDIA "WATER"

FIRE FIGHTING PROCEDURES "NORMAL – AVOID FUMES (IF ANY)"

UNUSUAL FIRE AND EXPLOSION HAZARDS "DUST MAY FORM AN EXPLOSIVE MIXTURE IN AIR"

REACTIVITY DATA

STABILITY UNSTABLE CONDITIONS TO AVOID
STABLE YES "AVOID OXIDIZERS / REDUCERS"

INCOMPATIBLE MATERIALS "AVOID STRONG OXIDIZERS / REDUCERS"

MATERIAL SAFETY DATA SHEET

CONWED FIBERS® ENVIROBLEND®

PAGE 2

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS **NONE**

HAZARDOUS POLYMERIZATION	MAY OCCUR? "WILL NOT OCCUR"	CONDITIONS TO AVOID "WILL NOT OCCUR"	NONE

HEALTH HAZARDS DATA

ROUTE OF ENTRY:	INHALATION? X	SKIN? X	INGESTION? X

HEALTH HAZARD: AVOID INHALATION OF ANY DUST, AVOID SKIN CONTACT, PROTECT EYES, AVOID INGESTION AND PROLONGED EXPOSURE.

OBSERVE FOR DEVELOPMENT OF ALLERGENIC REACTIONS AND CALL A PHYSICIAN

CARCINOGENICITY:	**NPT?**	**IARC MONOGRAPHS?**	**OSHA REGULATED?**
	"NO"	"NO"	"NO"

SYMPTOMS OF EXPOSURE IRRITATES SKIN, EYE IRRITATION; BURNING, TEARING, SWELLING.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

ALLERGIES, DERMATITIS

EMERGENCY FIRST AID PROCEDURES: USE WATER TO CLEANSE AREA, EYES FLUSH WITH WATER, CONTACT PHYSICIAN IF ALLERGIC REACTIONS OCCUR WITHIN 0-2 HOURS.

PRECAUTIONS FOR SAFE HANDLING AND USE

GOGGLES FOR EYES, GLOVES FOR HANDS, WEAR CLOTHING TO PREVENT SKIN CONTACT

STEPS TO BE TAKEN IN CASE OF SPILL

SPRINKLE SPILLAGE COMPOUND TO MINIMIZE DUST AND SWEEP UP SPILLED DEBRIS, ABSORB AND SWEEP UP / COLLECT; AVOID INHALATION AND / OR INGESTION OF ANY DUST.

WASTE DISPOSAL METHOD NO SPECIAL DISPOSAL METHOD STANDARD LANDFILL

DISPOSAL ACCORDING TO LOCAL, STATE AND FEDERAL ENVIRONMENTAL REQUIREMENTS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE

"NO SPECIAL REQUIREMENTS EXCEPT FOR CONTAINER DAMAGE". 1-1-01

RANTEC CORPORATION

P.O. BOX 729,
HWY 14 WEST, RANCHESTER, WY 82839
PH 307-655-9565 FAX 307-655-9528
email rantec@ranteccorp.com

April 24, 2000

CERTIFICATE OF COMPLIANCE
FINN A500 HYDROSTIK TACKIFIER

Rantec Corporation certifies that Hydrostik has been tested and meets all the requirements for Guar based tacking agents. This statement is based on laboratory and field trials using the recommended application rates for actual conditions.

Hydrostik is a specially treated dispersible Guar based tackifier with rapid hydration and excellent adhesive properties when used in conjunction with virgin wood fiber, recycled paper or native agricultural fiber sources such as straw or corn fiber.

Hydrostik produces rapid viscosity that acts as a slurry lubricant and also is designed for use as a temporary soil stabilizer.

Hydrostik is biodegradable and non-toxic when used as directed.

Hydrostik contains no germination nor growth inhibiting products and is non-toxic to fish and other wildlife when used as directed.

J.E. Davis
Gen. Mgr.
Rantec Corporation.

INFORMATION ONLY

finn0116

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-02930-003
Reviewed By: DKO
Date: 5/2/01

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW/DN Date: 5/9/01

MATERIAL SAFETY DATA SHEET

SECTION I

Product Name:	Finn A500 HydroStik
Chemical Name:	Galactomannan
Family Name:	Carbohydrate
Manufacturer:	Finn Corporation 9281 LeSaint Dr. Fairfield, OH 45014
Emergency Number:	(513) 874-2818
Date Prepared:	February 21, 1996

SECTION II **HAZARDOUS INGREDIENT INFORMATION**

Hazardous Ingredients:	None

SECTION III **PHYSICAL CHARACTERISTICS**

Boiling Point:	N/A
Vapor Pressure:	N/A
Evaporation Rate:	N/A
Solubility in Water:	Complete
Appearance and Odor:	Cream colored powder, bean-like odor
Specific Gravity:	(Water = 1.0) 1.6
Vapor Density:	N/A
Melting Point:	Decomposes

SECTION IV **FIRE AND EXPLOSION HAZARD DATA**

Flash Point:	N/A
Flammable Limits:	Lel 0.04 oz/cf (Similar to flour or grain dusts)
Extinguishing Media:	CO_2; dry chemical, foam, water fog.
Special Fire Fighting Procedures:	Wear self-contained breathing apparatus to avoid smoke
Unusual Fire and Explosion Hazards:	Powder has the potential to form explosive mixture with air. Avoid creating dust. Keep away from heat, open flame, and sparks. Use spark-proof motors, ventilate to control dust, and use preventive measures as with all dusty materials.

SECTION V	REACTIVITY DATA
Stability:	Stable
Conditions to Avoid:	Ignition sources, water contact
Incompatibility:	Strong oxidizers
Hazardous Decomposition Products:	None
Hazardous Polymerization:	Will not occur

SECTION VI	HEALTH HAZARD DATA
OSHA Permissible Exposure Limit:	None established
Signs and Symptoms of Overexposure:	**Acute:** None established **Chronic:** None established
Medical Conditions Generally Aggravated by Exposure:	None established. However, like any dusty material, HydroStik may produce respiratory irritation and/or allergic response in some individuals.
Carcinogenicity:	Not established as a carcinogen
Primary Route(s) of Exposure:	Eyes, Inhalation, Skin
Emergency/First Aid Procedures:	**Eyes:** May be irritating. Remove excess material from around eyes. Irrigate eyes with water. Consult physician if irritation persists. **Inhalation:** May produce respiratory irritation and/or allergic response in some individuals. Move to fresh air. Consult physician if irritation or allergic reaction occurs. **Skin:** May cause dryness. Wash skin with soap and water. Apply a suitable skin lotion.

SECTION VII	***PRECAUTIONS FOR SAFE HANDLING AND USE***
Handling and Storage Precautions:	Store in a cool, dry place. HydroStik is stable when dry. Keep container closed to avoid moisture pick-up. Retest after extended storage to assure proper quality prior to use.
Steps to be Taken in event of Spill:	Note: HydroStik is slippery when wet. Sweep up any dry material: reuse if possible, or dispose. Mop area with hot water to remove final traces. Test area: repeat if needed.
Waste Disposal Methods:	HydroStik is not classified as a hazardous waste. Dispose of in an approved landfill in accordance with local regulations. Do not dump in sewers or drains, as this may cause blockage.
SECTION VIII	**CONTROL MEASURES**
Respiratory Protection:	Dust masks or respirators
Ventilation:	Remove or recover airborne dust. Use spark-proof equipment.
Protective Gloves:	Rubber, plastic, leather
Eye Protection:	Chemical goggles or safety glasses
Work / Hygienic Practices:	Avoid allowing material to become airborne and dusty.

PAINTING

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJ ID: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 09900-001	REV: 0	06-Dec-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Sarrott DATE: 12/6/00

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
8	641-09900-001	0						X			Carboline Epoxy		X		09900	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Jim Cherry	525				
Jim Jenkins	525				
Mike Godber	164				
Rob Kreip	525				
Scott Wheeler	525				
Kwasi Bau Tweneboah	38				

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

~~Comments~~ — (1) Which is primer
(2) ~~Need written statement from Carboline that states the primer is OK for the other paint~~

MW 12/14/00 — No Comment

RECEIVED BY: MW DATE 12-14-00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

product data carboline® Carbomastic® 242

Selection & Specification Data

Generic Type: Urethane Modified Epoxy

Description: Aluminum-pigmented, low temperature curing mastic designed for cold weather applications down to 0°F. This unique coating provides excellent corrosion resistance over existing finishes and rusted or SSPC-SP2 or SP3-cleaned steel.

Features:
- Single coat application characteristics
- Suitable as a topcoat for most tightly adhered existing coatings
- Dry to handle in 24 hours at 20°F.
- Extended pot life at low temperatures
- VOC compliant to current AIM regulations

Color: Aluminum (C901)

Finish: Flat

Primers: Self-priming. May be applied over most tightly adhering coatings as well as inorganic zinc primers. A mist coat may be required to minimize bubbling over inorganic zinc primers.

Topcoats: Acrylics, Alkyds, Epoxies, Polyurethanes

Dry Film Thickness:
3.0 mils (75 microns) over inorganic zinc primers
5.0 mils (125 microns) over unprimed steel and existing coatings.
10.0 mils (250 microns) applied in two coats for immersion service.
Do not exceed 8.0 mils (200 microns) in a single coat.

Solids Content: By Volume: 62% ± 2%

Theoretical Coverage Rate: 994 mil ft² (24.5 m²/l at 25 microns)
Allow for loss in mixing and application

VOC Values:
As supplied: 2.73 lbs/gal (327 g/l)
Thinned:
6 oz/gal w/ #76: 2.92 lbs/gal (350 g/l)
13 oz/gal w/ #76: 3.09 lbs/gal (370 g/l)
25 oz/gal w/ #76: 3.39 lbs/gal (406 g/l)
These are nominal values.

Dry Temp. Resistance:
Continuous: 180°F (82°C)
Non-Continuous: 200°F (121°C)
Discoloration is observed above 180°F (82°C).

Limitations:
- Not recommended for hot weather applications above 80°F (27°C).
- Do not use over rusted steel in severe environments.

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Substrates & Surface Preparation

General: Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel:
Immersion: SSPC-SP5 with a 2.0-3.0 mil (50-75 micron) surface profile.
Non-Immersion: SSPC-SP6 with a 2.0-3.0 mil (50-75 micron) surface profile for maximum protection. SSPC-SP2, SP3, or SP7 are also acceptable methods.

Galvanized Steel (Aged): SSPC-SP1

Galvanized Steel (New): SSPC-SP7

Previously Painted Surfaces: Lightly sand or abrade to roughen and degloss the surface. Existing paint must attain a minimum 3B rating in accordance with ASTM D3359 "X-Scribe" adhesion test.

Performance Data

Test Method	System	Results	Report #
ASTM D 4541 Adhesion (Elcometer)	A) Blasted steel B) Rusted steel	A) 710 psi. B) 658 psi.	03220
ASTM D 4541 Adhesion (Pneumatic)	A) Blasted steel B) Rusted steel	A) 1511 psi. B) 1213 psi.	03220
ASTM D 522 Elongation	Conical Mandrel 1 ct. cured at: A) 73°F B) 40°F	Distance from end of mandrel to end of first crack: A) ½ inch avg. Actual elongation: 40% avg. B) ¼ inch avg. Actual elongation: 74% avg.	02829
ASTM D 3363 Pencil Hardness	1 ct. applied at 6 mils DFT	Harder than 8H pencil	02776
ASTM D 4060 Abrasion	1000 cycles, 1000 gm. Load, CS-17 wheel 2 cts.	169 mg loss	03216
ASTM B 117 Salt Spray	2 cts over blasted steel	No blistering or rusting. No loss of adhesion. Rust in scribe Less than 3/16 inch undercutting at scribe	03222

Test reports and

Submittal # 641-09900-
Reviewed By:
Date: 12/6/00

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

Date 12/14/00

CDC INFORMATION ONLY

November 1999

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without notice. It is the responsibility of the user to verify current data before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to meet our specifications at the time of shipment. Performance is based on many factors beyond our control and is the sole responsibility of the user. No representation or warranty, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR USE, is made. NO OTHER REPRESENTATION OR WARRANTY OF ANY KIND IS MADE BY CARBOLINE. Carboline, Carbomastic and Carboline Company are registered trademarks of Carboline Company.

Carbomastic® 242

Application Equipment

Application (General): This is a high solids coating and may require slight adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray: Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .086" I.D. fluid tip, and appropriate air cap.

Airless Spray:

Pump Ratio:	30:1 (min.)
GPM Output:	3.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.017-.021"
Output PSI:	1900-2100
Filter Size:	60 mesh

Teflon packings are recommended and available from the pump manufacturer.

Brush & Roller (General): Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling.

Brush: Use a medium bristle brush.

Roller: Use a short-nap mohair roller cover with phenolic core.

Mixing & Thinning

Mixing: Power mix separately, then add Part B to Part A and power mix. DO NOT MIX PARTIAL KITS.

Ratio: 4:1 Ratio (A to B).

Thinning: May be thinned up to 25 oz/gal (20%) with #76 for spray, brush or roller applications. For warmer temperatures, may be thinned up to 26 oz/gal (20%) with #72. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life: 6 Hours at 35°F (2°C); 3 Hours at 75°F (24°C). This material is moisture sensitive. Moisture contamination will shorten pot life and cause gelation. Pot life ends when coating becomes too viscous to use.

Cleanup & Safety

Cleanup: Use #2 Thinner or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety: Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation: When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.

Caution: This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code, in areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Normal	45°-60°F (7°-16°C)	20°-75°F (-7°-24°C)	20°-75°F (-7°-24°C)	70%
Minimum	35°F (2°C)	0°F (-18°C)	0°F (-18°C)	0%
Maximum	75°F (24°C)	80°F (27°C)	80°F (27°C)	80%

Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions. Note: In warm conditions, it is important to control film thickness, especially in overhead areas as excessive thickness may cause blistering.

Curing Schedule

Surface Temp. & 50% Relative Humidity	Dry to Handle	Dry to Recoat / Topcoat	Final Cure for Immersion Service
0°F (-18°C)	36 Hours	36 Hours	N/A
20°F (-7°C)	24 Hours	24 Hours	N/A
50°F (10°C)	12 Hours	12 Hours	N/A
75°F (24°C)	4 Hours	4 Hours	5 Days

These times are based on a 5.0 mil (125 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Maximum recoat/topcoat times are 30 days for epoxies and 90 days for polyurethanes at 75°F (24°C). Excessive humidity or condensation on the surface during curing can interfere with the cure. Any haze or blush must be removed by water washing before recoating. If the maximum recoat time is exceeded, the surface must be abraded by sweep blasting prior to the application of additional coats. Note: This product contains conductive pigments and cannot be holiday tested.

Packaging, Handling & Storage

	1.25 Gallon Kit	5 Gallon Kit
Shipping Weight (Approximate)	13 lbs (6 kg)	53 lbs (24 kg)

Flash Point (Setaflash): Part A: 60°F (16°C); Part B: >212°F (100°C)

Storage (General): Store indoors.

Storage Temperature & Humidity: 35° - 110°F (2°-43°C); 0-90% Relative Humidity

Shelf Life: 24 months at 75°F (24°C)

carboline

350 Hanley Industrial Court St. Louis, MO 63144-1599
(314) 644-1000 (314) 644-1617 (fax) www.carboline.com

November 1999

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product data carboline®

Carboguard® 561 & 561 LT

Selection & Specification Data

Generic Type Epoxy Polyamide

Description User-friendly potable water coating with a proven track record and excellent application characteristics. Self-priming coating available in conventional (561) and low-temperature (561 LT) versions. Offers excellent application properties with extended recoat times.

Features
- Conventional and low-temperature versions
- Ready to apply after mixing; no sweat-in time required
- User-friendly; extended recoat times
- VOC compliant to current AIM regulations
- Meets or exceeds all requirements of:
  - AWWA/NSF Std. 61 for potable water tanks of 1000 gallons or larger
  - AWWA D102 Inside System 1 and 2
  - AWWA C210-92 for use on interior and exterior of steel water pipe

Color White (S600) & (0800); Off White (1898); Gray 0794); Tan (K203) Blue (0100) & (4169)

Finish Satin

Primers Self-priming

Topcoats Acrylics, Alkyds, Epoxies, Polyurethanes

Dry Film Thickness 4.0-6.0 mils (100-150 microns) per coat. Do not exceed 10 mils in a single coat or 17 mils for total system

Solids Content By Volume: 58% ± 2%

Theoretical Coverage Rate 930 mil ft² (23.0 m²/l at 25 microns). Allow for loss in mixing and application

VOC Values
As supplied: 3.00 lbs/gal (360 g/l)
Thinned:
10 oz/gal w/ #10: 3.20 lbs/gal (387 g/l)
15 oz/gal w/ #10: 3.40 lbs/gal (413 g/l)
16 oz/gal w/ #33: 3.50 lbs/gal (420 g/l)
These are nominal values and may vary slightly with color.

Dry Temp. Resistance
Continuous: 200°F (93°C)
Non-Continuous: 250°F (121°C)
Discoloration and loss of gloss is observed above 200°F (93°).

Wet Temp. Resistance Immersion temperature resistance depends upon exposure. Consult Carboline Technical Service for specific information. It is recommended that metal tanks operating above 140°F (60°C) be insulated.

Limitations
- Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. Discoloration is more pronounced with 561 LT.

Substrates & Surface Preparation

General Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Immersion: SSPC-SP10
Non-Immersion: SSPC-SP6
Surface Profile: 1.5-3.0 mils (38-76 micron)

Concrete
Immersion:
Concrete must be cured 28 days at 75°F (24°C) and 50% relative humidity or equivalent. Prepare surfaces in accordance with ASTM D4258 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require surfacing.

Performance Data

561

Test Method	System	Results	Report #
ASTM D4541 Adhesion	Blasted Steel 2 ct. 561	1600 psi (Pneumatic)	09453
ASTM D522 Flexibility	Blasted Steel 1 ct. 561	90° bend produced no cracking, ¼" Cylindrical Mandrel Bend	09453

561 LT

ASTM D4541 Adhesion	Blasted Steel 2 ct. 561 LT (cured at 35°F)	1900 psi (pneumatic)	09453
ASTM D522 Flexibility	Blasted Steel 1 ct. 561LT (cured at 35°F)	90° bend produced no cracking, ¼" Cylindrical Mandrel Bend	09453

Test reports and additional data available upon written request.

November 1999

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Carboguard® 561 & 561 LT

Application Equipment

Spray Application (General) — The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray — Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

Airless Spray

Pump Ratio:	30:1 (min.); 45:1 (min) for LT
GPM Output:	2.5 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.017"-.021"
Output PSI:	2100-2300; 3000 psi for LT
Filter Size:	60 mesh

Teflon packings are recommended and available from the pump manufacturer.

Brush & Roller (General) — Not recommended for tank lining applications except when striping welds. Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie in within 10 minutes at 75°F (24°C).

Brush — Use a medium bristle brush.

Roller — Use a short-nap synthetic roller cover with phenolic core.

Mixing & Thinning

Mixing — Power mix separately, then combine and power mix. DO NOT MIX PARTIAL KITS.

Ratio — 561 and 561 LT 1:1 Ratio (A to B)

Thinning — Normally not required but may thin as follows:
Spray: Up to 15 oz/gal (12%) w/ #10
#33 Thinner up to 16 oz/gal (12%) may be used for brush & roll applications for non-NSF applications. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life

561	4 Hours at 75°F (24°C)
561 LT	3 Hours at 75°F (24°C)

Pot life ends when coating loses body and begins to sag. Pot life times will be less at higher temperatures.

Cleanup & Safety

Cleanup — Use #2 Thinner or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety — Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation — When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Caution — This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes.

Application Conditions

561

Condition	Material	Surface	Ambient	Humidity
Normal	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	60°-90°F (16°-32°C)	0-80%
Minimum	50°F (10°C)	50°F (10°C)	50°F (10°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	80%

561 LT

Normal	60-85°F (16-29°C)	60-85°F (16-29°C)	60-90°F (16-32°C)	0-80%
Minimum	40°F (5°C)	35°F (2°C)	35°F (2°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	80%

This product simply requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions.

Curing Schedule

561

Surface Temp. & 50% Relative Humidity	Dry to Recoat & Topcoat w/ Other Finishes	Final Cure for Immersion Service	Maximum Recoat Time
50°F (10°C)	24 Hours	N/A	120 Days
60°F (16°C)	10 Hours	10 Days	90 Days
75°F (24°C)	7 Hours	7 Days	90 Days
90°F (32°C)	4 Hours	5 Days	45 Days

561 LT

35°F (21C)	24 Hours	21 Days	120 Days
50°F (10°C)	18 Hours	12 Days	120 Days
75°F (24°C)	8 Hours	5 Days	90 Days

These times are based on a 4.0-5.0 mil (100-150 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing can interfere with the cure, can cause discoloration and may result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements.

Packaging, Handling & Storage

	2 Gallon Kit	10 Gallon Kit
Shipping Weight (Approximate)	32 lbs (15 kg)	150 lbs (68 kg)

Flash Point (Setaflash) — 80°F (27°C) for Parts A & B, 561 & 561 LT

Storage (General) — Store indoors.

Storage Temperature & Humidity — 40° - 110°F (4° - 43°C); 0-100% Relative Humidity

Shelf Life — 24 months at 75°F (24°C)

carboline

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314-644-1000 314-644-1617 (Fax) www.carboline.com

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PROD #7284 Vol. 3

FDF PROJECT: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 09900-001	REV: 0	06-Dec-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: [signature]

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Sarrett DATE: 12/6/00

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
8	641-09900-001	0						X			Carboline Epoxy		X		09900			

REVIEW DISTRIBUTION

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Jim Jenkins	525				
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(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

product data **carboline** **Carbomastic® 242**

Selection & Specification Data

Generic Type Urethane Modified Epoxy

Description Aluminum-pigmented, low temperature curing mastic designed for cold weather applications down to 0°F. This unique coating provides excellent corrosion resistance over existing finishes and rusted or SSPC-SP2 or SP3-cleaned steel.

Features
- Single coat application characteristics
- Suitable as a topcoat for most tightly adhered existing coatings
- Dry to handle in 24 hours at 20°F.
- Extended pot life at low temperatures
- VOC compliant to current AIM regulations

Color Aluminum (C901)

Finish Flat

Primers Self-priming. May be applied over most tightly adhering coatings as well as inorganic zinc primers. A mist coat may be required to minimize bubbling over inorganic zinc primers.

Topcoats Acrylics, Alkyds, Epoxies, Polyurethanes

Dry Film Thickness 3.0 mils (75 microns) over inorganic zinc primers
5.0 mils (125 microns) over unprimed steel and existing coatings.
10.0 mils (250 microns) applied in two coats for immersion service.
Do not exceed 8.0 mils (200 microns) in a single coat.

Solids Content By Volume: 62% ± 2%

Theoretical Coverage Rate 994 mil ft² (24.5 m²/l at 25 microns)
Allow for loss in mixing and application

VOC Values
As supplied: 2.73 lbs/gal (327 g/l)
Thinned:
6 oz/gal w/ #76: 2.92 lbs/gal (350 g/l)
13 oz/gal w/ #76: 3.09 lbs/gal (370 g/l)
25 oz/gal w/ #76: 3.39 lbs/gal (406 g/l)
These are nominal values.

Dry Temp. Resistance
Continuous: 180°F (82°C)
Non-Continuous: 200°F (121°C)
Discoloration is observed above 180°F (82°C).

Limitations
- Not recommended for hot weather applications above 80°F (27°C).
- Do not use over rusted steel in severe environments.

Fluor Contract FSC-641
OSDP Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-09900-001
Reviewed By: DAJ
Date: 12/6/00

November 1999

Substrates & Surface Preparation

General Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Immersion: SSPC-SP5 with a 2.0-3.0 mil (50-75 micron) surface profile.
Non-Immersion: SSPC-SP5 with a 2.0-3.0 mil (50-75 micron) surface profile for maximum protection. SSPC-SP2, SP3, or SP7 are also acceptable methods.

Galvanized Steel (Aged) SSPC-SP1

Galvanized Steel (New) SSPC-SP7

Previously Painted Surfaces Lightly sand or abrade to roughen and deglaze the surface. Existing paint must attain a minimum 3B rating in accordance with ASTM D3359 "X-Scribe" adhesion test.

Performance Data

Test Method	System	Results	Report #
ASTM D 4541 Adhesion (Elcometer)	A) Blasted steel B) Rusted steel	A) 710 psi. B) 658 psi.	03220
ASTM D 4541 Adhesion (Pneumatic)	A) Blasted steel B) Rusted steel	A) 1311 psi. B) 1213 psi.	03220
ASTM D 522 Elongation	Conical Mandrel 1 ct. cured at: A) 73°F B) 40°F	Distance from end of mandrel to end of first crack: A) ½ inch avg. Actual elongation: 40% avg. B) ¼ inch avg. Actual elongation: 74% avg.	02829
ASTM D 3363 Pencil Hardness	1 ct. applied at 6 mils DFT	Harder than 6H pencil	02776
ASTM D 4060 Abrasion	1000 cycles, 1000 gm. Load, CS-17 wheel 2 cts.	169 mg loss	03216
ASTM B 117 Salt Spray	2 cts over blasted steel	No blistering or rusting; No loss of adhesion; Rust in scribe Less than 3/16 inch undercutting at scribe	03222

Test reports and additional data available upon written request.

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Carbomastic® 242

Application Equipment

Spray Application (General): This is a high solids coating and may require slight adjustments in spray techniques. Wet film thickness is easily and quickly achieved. The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray: Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .086" I.D. fluid tip and appropriate air cap.

Airless Spray:

Pump Ratio:	30:1 (min.)
GPM Output:	3.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.017-.021"
Output PSI:	1900-2100
Filter Size:	60 mesh

Teflon packings are recommended and available from the pump manufacturer.

Brush & Roller (General): Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling.

Brush: Use a medium bristle brush.

Roller: Use a short nap mohair roller cover with phenolic core.

Mixing & Thinning

Mixing: Power mix separately, then add Part B to Part A and power mix. DO NOT MIX PARTIAL KITS.

Ratio: 4:1 Ratio (A to B).

Thinning: May be thinned up to 25 oz/gal (20%) with #76 for spray, brush or roller applications. For warmer temperatures, may be thinned up to 25 oz/gal (20%) with #72. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life: 6 Hours at 35°F (2°C); 3 Hours at 75°F (24°C). This material is moisture sensitive. Moisture contamination will shorten pot life and cause gelation. Pot life ends when coating becomes too viscous to use.

Cleanup & Safety

Cleanup: Use #2 Thinner or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety: Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workplace safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation: When used as a tank lining or in enclosed areas, through air circulation must be used during and after application, until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. In addition to ensuring proper ventilation, appropriate respirators must be used by all application personnel.

Caution: This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use nonferrous tools and wear conductive and non sparking shoes.

Application Conditions

Condition	Material	Surface	Ambient	Humidity
Normal	45°-80°F (7°-18°C)	20°-75°F (-7°-24°C)	20°-75°F (-7°-24°C)	70%
Minimum	35°F (2°C)	0°F (-18°C)	0°F (-18°C)	0%
Maximum	75°F (24°C)	80°F (27°C)	80°F (27°C)	80%

Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions. Note: In warm conditions, it is important to control film thickness, especially in overlap areas as excessive thickness may cause blistering.

Curing Schedule

Surface Temp. & 50% Relative Humidity	Dry to Handle	Dry to Recoat / Topcoat	Final Cure for Immersion Service
0°F (-18°C)	36 Hours	36 Hours	N/A
20°F (-7°C)	24 Hours	24 Hours	N/A
50°F (10°C)	12 Hours	12 Hours	N/A
75°F (24°C)	4 Hours	4 Hours	5 Days

These times are based on a 5.0 mil (125 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Maximum recoat/topcoat times are 30 days for epoxies and 90 days for polyurethanes at 75°F (24°C). Excessive humidity or condensation on the surface during curing can interfere with the cure. Any haze or blush must be removed by water washing before recoating. If the maximum recoat time is exceeded, the surface must be abraded by sweep blasting prior to the application of additional coats. Note: This product contains conductive pigments and cannot be holiday tested.

Packaging, Handling & Storage

	1.25 Gallon Kit	5 Gallon Kit
Shipping Weight (Approximate)	13 lbs (6 kg)	53 lbs (24 kg)

Flash Point (SetaFlash): Part A: 60°F (16°C); Part B: >212°F (100°C)

Storage (General): Store indoors.

Storage Temperature & Humidity: 35° - 110°F (2°-43°C); 0-90% Relative Humidity

Shelf Life: 24 months at 75°F (24°C)

carboline

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314-644-1000 314-644-1617 (fax) www.carboline.com

November 1999

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product data

carboline

Carboguard® 561 & 561 LT

Selection & Specification Data

Generic Type Epoxy Polyamide

Description User-friendly potable water coating with a proven track record and excellent application characteristics. Self-priming coating available in conventional (561) and low-temperature (561 LT) versions. Offers excellent application properties with extended recoat times.

Features
- Conventional and low-temperature versions
- Ready to apply after mixing; no sweat-in time required
- User-friendly; extended recoat times
- VOC compliant to current AIM regulations
- Meets or exceeds all requirements of:
  - ANSI/NSF Std. 61 for potable water tanks of 1000 gallons or larger
  - AWWA D102 Inside System 1 and 2
  - AWWA C216-92 for use on interior and exterior of steel water pipe

Color White (3600) & (0800); Off White (1898); Gray 0794); Tan (K203) Blue (0100) & (4169)

Finish Satin

Primers Self-priming

Topcoats Acrylics, Alkyds, Epoxies, Polyurethanes

Dry Film Thickness 4.0-6.0 mils (100-150 microns) per coat
Do not exceed 10 mils in a single coat or 17 mils for total system

Solids Content By Volume: 58% ± 2%

Theoretical Coverage Rate 930 mil ft² (23.0 m²/l at 25 microns)
Allow for loss in mixing and application

VOC Values
As supplied: 3.00 lbs/gal (360 g/l)
Thinned:
10 oz/gal w/ #10: 3.20 lbs/gal (387 g/l)
15 oz/gal w/ #10: 3.40 lbs/gal (413 g/l)
16 oz/gal w/ #33: 3.50 lbs/gal (420 g/l)
These are nominal values and may vary slightly with color.

Dry Temp. Resistance
Continuous: 200°F (93°C)
Non-Continuous: 250°F (121°C)
Discoloration and loss of gloss is observed above 200°F (93°).

Wet Temp. Resistance Immersion temperature resistance depends upon exposure. Consult Carboline Technical Service for specific information. It is recommended that metal tanks operating above 140°F (60°C) be insulated.

Limitations
- Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. Discoloration is more pronounced with 561 LT.

Substrates & Surface Preparation

General Surfaces must be clean and dry. Employ adequate methods to remove dirt, dust, oil and all other contaminants that could interfere with adhesion of the coating.

Steel
Immersion: SSPC-SP10
Non-Immersion: SSPC-SP6
Surface Profile: 1.5-3.0 mils (38-75 micron)

Concrete
Immersion:
Concrete must be cured 28 days at 75°F (24°C) and 50% relative humidity or equivalent. Prepare surfaces in accordance with ASTM D4258 Surface Cleaning of Concrete and ASTM D4259 Abrading Concrete. Voids in concrete may require surfacing.

Performance Data

561

Test Method	Systems	Results	Report #
ASTM D4541 Adhesion	Blasted Steel 2 ct. 561	1600 psi (Pneumatic)	09453
ASTM D522 Flexibility	Blasted Steel 1 ct. 561	90° bend produced no cracking, ¼" Cylindrical Mandrel Bend	09453

561 LT

ASTM D4541 Adhesion	Blasted Steel 2 ct. 561 LT (cured at 35°F)	1800 psi (pneumatic)	09453
ASTM D522 Flexibility	Blasted Steel 1 ct. 561LT (cured at 35°F)	90° bend produced no cracking, ¼" Cylindrical Mandrel Bend	09453

Test reports and additional data available upon written request.

November 1999

To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to [illegible] STATUTORY, BY OPERATION OF LAW OR OTHERWISE, [illegible] MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE [illegible] Carboline Company.

Carboguard® 561 & 561 LT

Application Equipment

Spray Application (General) — The following spray equipment has been found suitable and is available from manufacturers such as Binks, DeVilbiss and Graco.

Conventional Spray — Pressure pot equipped with dual regulators, 3/8" I.D. minimum material hose, .070" I.D. fluid tip and appropriate air cap.

Airless Spray

Pump Ratio:	30:1 (min.); 45:1 (min) for LT
GPM Output:	2.0 (min.)
Material Hose:	3/8" I.D. (min.)
Tip Size:	.017"-.021"
Output PSI:	2100-2300; 3000 psi for LT
Filter Size:	60 mesh

Teflon packings are recommended and available from the pump manufacturer.

Brush & Roller (General) — Not recommended for tank lining applications except when striping welds. Multiple coats may be required to obtain desired appearance, recommended dry film thickness and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie in within 10 minutes at 75°F (24°C).

Brush — Use a medium bristle brush.

Roller — Use a short-nap synthetic roller cover with phenolic core.

Mixing & Thinning

Mixing — Power mix separately, then combine and power mix. DO NOT MIX PARTIAL KITS.

Ratio — 561 and 561 LT 1:1 Ratio (A to B)

Thinning — Normally not required but may thin as follows:
Spray: Up to 16 oz/gal (12%) w/ #10
#33 Thinner up to 16 oz/gal (12%) may be used for brush & roll applications for non-NSF applications. Use of thinners other than those supplied by Carboline may adversely affect product performance and void product warranty, whether expressed or implied.

Pot Life
561 4 Hours at 75°F (24°C)
561 LT 3 Hours at 75°F (24°C)
Pot life ends when coating loses body and begins to sag. Pot life times will be less at higher temperatures.

Cleanup & Safety

Cleanup — Use #2 Thinner or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations.

Safety — Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal industrial safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas.

Ventilation — When used as a tank lining or in enclosed areas, sufficient air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved supplied air respirator.

Caution — This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be sealed and grounded in accordance with the National Electric Code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear protective and non-sparking shoes.

Application Conditions

561

Condition	Material	Surface	Ambient	Humidity
Normal	60°-85°F (16°-29°C)	60°-85°F (16°-29°C)	60°-90°F (16°-32°C)	0-80%
Minimum	50°F (10°C)	50°F (10°C)	50°F (10°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	80%

561 LT

Normal	60-85°F (16-29°C)	60-85°F (16-29°C)	60-90°F (16-32°C)	0-80%
Minimum	40°F (5°C)	35°F (2°C)	35°F (2°C)	0%
Maximum	90°F (32°C)	125°F (52°C)	110°F (43°C)	80%

This product always requires the substrate temperature to be above the dew point. Condensation due to substrate temperatures below the dew point can cause flash rusting on prepared steel and interfere with proper adhesion to the substrate. Special application techniques may be required above or below normal application conditions.

Curing Schedule

561

Surface Temp. & 50% Relative Humidity	Dry to Recoat & Topcoat w/ Other Finishes	Final Cure for Immersion Service	Maximum Recoat Time
50°F (10°C)	24 Hours	N/A	120 Days
60°F (16°C)	10 Hours	10 Days	90 Days
75°F (24°C)	7 Hours	7 Days	90 Days
90°F (32°C)	4 Hours	5 Days	45 Days

561 LT

35°F (2°C)	24 Hours	21 Days	120 Days
60°F (16°C)	18 Hours	12 Days	120 Days
75°F (24°C)	8 Hours	5 Days	90 Days

These times are based on 4.0-5.0 mil (100-150 micron) dry film thickness. Higher film thickness, insufficient ventilation or cooler temperatures will require longer cure times and could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing can interfere with the cure, can cause discoloration and may result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements.

Packaging, Handling & Storage

	2 Gallon Kit	10 Gallon Kit
Shipping Weight (Approximate)	32 lbs (15 kg)	150 lbs (68 kg)

Flash Point (Setaflash) — 80°F (27°C) for Parts A & B, 561 & 561 LT

Storage (General) — Store indoors.

Storage Temperature & Humidity — 40° - 110°F (4° - 43°C)
0-100% Relative Humidity

Shelf Life — 24 months at 75°F (24°C)

carboline

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 09900-002	REV: 0	09-Feb-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: Ron Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Erika Garrett DATE: 2/12/01

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
8	641-09900-002	0						X			Dura-Pox Primer & Finish		X		09900	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cheek	525				
Jim Jenkins	525				
Mike Godber	164				
Bob Kneip	525				
Scott Wheeler	525				
Kwasi Badu Twereboah	38				

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

RECEIVED BY: MW Griffin DATE 2/15/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

INFORMATION ONLY

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: mwsm Date: 2/15/01

4.15

THE SHERWIN-WILLIAMS COMPANY

Industrial and Marine Coatings

EnviroSpec™

DURA-POX®

WATER BASED EPOXY PRIMER

PART A	B70-710	SERIES
PART B	B70V710	HARDENER

INDUSTRIAL & MARINE COATINGS

PRODUCT INFORMATION

Revised 1/2001

PRODUCT DESCRIPTION

DURA-POX WATER BASED EPOXY PRIMER is a two component, VOC complying, high performance, water based, phenalkamine, corrosion resistant primer. Developed for use in conjunction with Dura-Pox Epoxy Finish and other industrial coatings to provide excellent corrosion resistance.

- Corrosion resistant
- Early moisture resistance
- Low temperature cure (40°F)
- Low VOC
- Fast dry
- Low odor
- nonflammable
- Suitable for use in USDA inspected facilities

RECOMMENDED USES

For use over prepared steel surfaces in industrial exposures such as:

- Manufacturing plants
- Structural steel
- Pulp and paper mills
- Storage tank exteriors
- Pharmaceutical facilities
- Industrial machinery
- Waste water treatment facilities

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-09900-0012
Reviewed By: BW
Date: 2/9/01

2/12/01 EJ

PRODUCT CHARACTERISTICS

Finish:	Flat
Color:	Off White, Gray, Red Oxide
Volume Solids:	48% ± 2%, mixed
Weight Solids:	60% ± 2%, mixed
VOC (EPA Method 24):	186 g/L; 1.54 lb/gal, mixed
Mix Ratio:	4:1

Recommended Spreading Rate per coat:

Wet mils:	4.0 - 8.5
Dry mils:	2.0 - 4.0
Coverage:	193 - 384 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.0 mils wet @ 50% RH:

	@ 40°F	@ 77°F	@ 100°F
To touch:	1 hour	45 minutes	15 minutes
To handle:	5 hours	4-1/2 hours	45 minutes
To recoat:			
minimum:	6 hours	6 hours	1-1/2 hours
maximum:	30 days	30 days	30 days
To cure:	7 days	7 days	7 days
Pot Life:	6 hours	4 hours	1-1/2 hours
Sweat-in-time:	30 minutes	none	none

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity and film thickness dependent.

Shelf Life:	12 months, unopened, at 77°F
Flash Point:	>200°F, SETA Flash, mixed
Reducer/Clean Up:	Water

PERFORMANCE CHARACTERISTICS

System Tested: (unless otherwise indicated)
Substrate: Steel
Surface Preparation: SSPC-SP10
1 ct: Dura-Pox Primer @ 4.0 mils dft
1 ct: Dura-Pox Finish @ 4.0 mils dft

Abrasion Resistance:
Method: ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load
Result: 120 mg loss

Adhesion:
Method: ASTM D4541
Result: 550 psi

Corrosion Weathering:
Method: ASTM D5894, 20 cycles, 6720 hours
Result: Passes

Dry Heat Resistance:
Method: ASTM D2485
Result: 250°F

Flexibility: primer only
Method: ASTM D522, 180° bend, 1/4" mandrel
Result: Passes

Impact Resistance, Direct: primer only
Method: ASTM D2794
Result: 40 in. lb.

Impact Resistance, Indirect: primer only
Method: ASTM D2794
Result: 20 in. lb.

Moisture Condensation Resistance:
Method: ASTM D4585, 100°F, 2000 hours
Result: Passes

Pencil Hardness:
Method: ASTM D3363
Result: HB

Salt Fog Resistance:
Method: ASTM B117, 2000 hours
Result: Passes

Slip Coefficient:
Method: ASTM C1028-96, .60 minimum Static Coefficient of Friction
Result: Class A, 0.47

Thermal Shock:
Method: ASTM D2246, 20 cycles
Result: Passes

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THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

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DURA-POX®

WATER BASED EPOXY PRIMER

PART A	B70-710	SERIES
PART B	B70V710	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1 ct. Dura-Pox WB Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Steel:
1 ct. Dura-Pox WB Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Centurion Water Based Polyurethane @ 2.0 - 3.0 mils dft/ct

Steel:
1 ct. Zinc-Clad VI @ 2.0 - 3.0 mils dft
1 ct. Dura-Pox WB Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Hi-Solids Polyurethane @ 3.0 - 4.0 mils dft/ct

Galvanized Steel:
1 ct. Dura-Pox WB Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Aluminum:
1 ct. Dura-Pox WB Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure good adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Do not use hydrocarbon solvents for cleaning.

Minimum recommended surface preparation:

Iron & Steel:	SSPC-SP2
Galvanized:	SSPC-SP1
Aluminum:	SSPC-SP1

COLOR AVAILABILITY/TINTING

Do not tint.

Color: Off White, Gray, Red Oxide

APPLICATION CONDITIONS

Temperature:	40°F minimum, 100°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.
Application of coating above or below recommended temperature range may adversely affect coating performance.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	4 gallons in a 5 gallon can and 1 gallon
Part B:	1 gallon and 1 quart
Weight per gallon:	11.5 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

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DURA-POX®

WATER BASED EPOXY PRIMER

PART A	B70-710	SERIES
PART B	B70V710	HARDENER

APPLICATION BULLETIN

Revised 1/2001

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Iron & Steel
Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1 (recommended preparation is Steam Cleaning). For better performance, use Commercial Blast Cleaning per SSPC-SP6, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel within 8 hours or before flash rusting occurs.

Aluminum
Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1.

Galvanized Steel
Allow to weather a minimum of six months prior to coating. Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1 (recommended preparation is Steam Cleaning). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 (recommended preparation is Steam Cleaning) and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Previously Painted Surfaces
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, or if this product attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

APPLICATION CONDITIONS

Temperature:	40°F minimum, 100°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Reducer/Clean Up ..... Water

Airless Spray
- Pressure ..... 2000 psi
- Hose ..... 1/4" ID
- Tip ..... .015" - .017"
- Filter ..... 60 mesh
- Reduction ..... as needed up to 10% by volume

Conventional Spray
- Gun ..... DeVilbiss MBC-510
- Fluid Tip ..... E
- Air Nozzle 704
- Atomization Pressure .... 40-60 psi
- Fluid Pressure ..... 10-20 psi
- Reduction ..... as needed up to 10% by volume

Brush
- Brush ..... Nylon/Polyester
- Reduction ..... not recommended

Roller
- Cover ..... 3/8" woven with phenolic core
- Reduction ..... not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

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Industrial and Marine Coatings

EnviroSpec™

4.15A

DURA-POX®

WATER BASED EPOXY PRIMER

PART A	B70-710	SERIES
PART B	B70V710	HARDENER

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly using power agitation. Make certain no pigment remains on the bottom of the can. Then combine four parts by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated prior to application. Re-stir before using.

If reducer is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint to the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	4.0 - 8.5
Dry mils:	2.0 - 4.0
Coverage:	193 - 384 sq ft/gal approximate

NOTE Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 4.0 mils wet @ 50% RH:

	@ 40°F	@ 77°F	@ 100°F
To touch:	1 hour	45 minutes	15 minutes
To handle:	5 hours	4-1/2 hours	45 minutes
To recoat:			
minimum:	6 hours	6 hours	1-1/2 hours
maximum:	30 days	30 days	30 days
To cure:	7 days	7 days	7 days
Pot Life:	6 hours	4 hours	1-1/2 hours
Sweat-in-time:	30 minutes	none	none

If maximum recoat time is exceeded, abrade surface before recoating.
Drying time is temperature, humidity and film thickness dependent.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with water.

Application of coating above or below recommended temperature range may adversely affect coating performance.

Do not use hydrocarbon solvents for cleaning.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with soap and warm water. Clean hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with Mineral Spirits, R1K4, to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using any solvent.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

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DURA-POX®

WATER BASED EPOXY FINISH

PART A	B70-500	SERIES
PART B	B70V510	HARDENER

PRODUCT INFORMATION

Revised 1/2001

PRODUCT DESCRIPTION

DURA-POX WATER BASED EPOXY FINISH is a two component, VOC complying, high performance, water based, epoxy/cycloaliphatic amine finish coating. Developed for use in industrial environments. Dura-Pox is a high gloss, abrasion resistant, low yellowing epoxy finish with excellent weathering properties.

- Early moisture resistance
- Resists yellowing
- Chemical resistant
- Impact and abrasion resistant
- Low VOC
- Fast dry
- Low odor
- Nonflammable
- Suitable for use in USDA inspected facilities

RECOMMENDED USES

For use over prepared steel and concrete surfaces in industrial exposures such as:

- Marine applications
- Manufacturing plants
- Structural steel
- Pulp and paper mills
- Storage tank exteriors
- Pharmaceutical facilities
- Nuclear power facilities
- Waste water treatment facilities
- Food processing facilities
- Bridges

PRODUCT CHARACTERISTICS

Finish: High Gloss

Color: Ultra White and a wide range of colors available

Volume Solids: 44% ± 2%, mixed
Ultra White

Weight Solids: 54% ± 2%, mixed
Ultra White

VOC (EPA Method 24): 198 g/L; 1.65 lb/gal, mixed

Mix Ratio: 4:1

Recommended Spreading Rate per coat:

Wet mils:	4.5 - 9.0
Dry mils:	2.0 - 4.0
Coverage:	176 - 352 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 5.0 mils wet @ 50% RH:

	@ 50°F	@ 77°F	@ 100°F
To touch:	1-1/2 hours	45 minutes	25 minutes
To handle:	5-1/2 hours	4-1/2 hours	2 hours
To recoat:			
minimum:	8 hours	6 hours	3 hours
maximum:	30 days	30 days	30 days
To cure:	7 days	7 days	7 days
Pot Life:	4-1/2 hours	3-1/2 hours	1-1/2 hours
Sweat-In-time:	30 minutes	30 minutes	10 minutes

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity and film thickness dependent.

Shelf Life: 12 months, unopened, at 77°F

Flash Point: >200°F, SETA Flash, mixed

Reducer/Clean Up: Water

PERFORMANCE CHARACTERISTICS

System Tested: *(unless otherwise indicated)*
Substrate: Steel
Surface Preparation: SSPC-SP10
1 ct: Dura-Pox WB Epoxy Primer @ 4.0 mils dft
1 ct: Dura-Pox WB Epoxy Finish @ 4.0 mils dft

Abrasion Resistance: topcoat only
Method: ASTM D4060, CS17 wheel, 1000 cycles, 1 kg load
Result: 120 mg loss

Adhesion:
Method: ASTM D4541
Result: 550 psi

Corrosion Weathering:
Method: ASTM D5894, 20 cycles, 6720 hours
Result: Passes

Dry Heat Resistance:
Method: ASTM D2485
Result: 250°F

Flexibility:
Method: ASTM D522, 180° bend, 1/4" mandrel
Result: Passes

Impact Resistance, Direct: topcoat only
Method: ASTM D2794
Result: 160 in. lb.

Impact Resistance, Indirect: topcoat only
Method: ASTM D2794
Result: 100 in. lb.

Irradiation-Effects on Coatings used in Nuclear Power Plants
Method: ANSI 5.12 / ASTM D4082-89
Result: Passes

Moisture Condensation Resistance:
Method: ASTM D4585, 100°F, 2000 hours
Result: Passes

Pencil Hardness:
Method: ASTM D3363
Result: HB

Salt Fog Resistance:
Method: ASTM B117, 2000 hours
Result: Passes

Thermal Shock:
Method: ASTM D2246, 20 cycles
Result: Passes

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THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

4.16

DURA-POX®

WATER BASED EPOXY FINISH

PART A	B70-500	SERIES
PART B	B70V510	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel:
1 ct. Dura-Pox Water Based Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Steel:
1 ct. ProCryl Universal WB Primer @ 3.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Steel:
1 ct. Recoatable Epoxy Primer @ 4.0 - 6.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Steel:
1 ct. Zinc-Clad VI @ 2.0 - 3.0 mils dft
1 ct. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft
1-2cts. Centurion Water Based Polyurethane @ 2.0 - 3.0 mils dft/ct

Concrete/Masonry:
1-2 cts. Epo-Plex Water Based Epoxy Block Filler @ 10.0 - 20.0 mils dft/ct, as required to fill voids and provide a continuous surface.

Other suitable surfacers are:
Heavy Duty Block Filler
Cement-Plex 875
Kem Cati-Coat HS Epoxy Filler/Sealer

Topcoat
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Concrete, smooth:
2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

Galvanized Steel:
1 ct. Dura-Pox Water Based Epoxy Primer @ 2.0 - 4.0 mils dft
1-2 cts. Dura-Pox Water Based Epoxy Finish @ 2.0 - 4.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure good adhesion.

Refer to product Application Bulletin for detailed surface preparation information.

Do not use hydrocarbon solvents for cleaning.

Minimum recommended surface preparation:

* Iron & Steel:	SSPC-SP2
Galvanizing:	SSPC-SP1
Concrete & Masonry:	SSPC-SP13/NACE 6
Wood, interior:	Clean, smooth, dust free

* Primer recommended

COLOR AVAILABILITY/TINTING

Tint with EnviroToner Colorants at 100% strength. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.
Do not use Blend-A-Color Toner.

Color: Ultra White and a wide range of colors available

APPLICATION CONDITIONS

Temperature:	50°F minimum, 100°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	5 gallons mixed
Part A:	4 gallons in a 5 gallon can and 1 gallon
Part B:	1 gallon and 1 quart
Weight per gallon:	10.5 ± 0.2 lb, mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

THE SHERWIN-WILLIAMS COMPANY

INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

4.16A

DURA-POX®

WATER BASED EPOXY FINISH

PART A	B70-500	SERIES
PART B	B70V510	HARDENER

APPLICATION BULLETIN

Revised 1/2001

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Iron & Steel
Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1 (recommended preparation is Steam Cleaning). For better performance, use Commercial Blast Cleaning per SSPC-SP6, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Prime any bare steel within 8 hours or before flash rusting occurs.

Masonry and Block
For surface preparation, refer to SSPC-SP13/NACE 6. Surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 28 days @ 75°F. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Dura-Pox 258 WB Cementitious Epoxy Filler/Sealer. Weathered masonry and soft or porous cement board must be brush blasted or power tool cleaned to remove loosely adhering contamination and to get to a hard, firm surface. Laitance must be removed by etching with a 10% muriatic acid solution and thoroughly neutralized with water.

Galvanized Steel
Allow to weather a minimum of six months prior to coating. Remove all oil, grease, dirt, oxide and other foreign material by Solvent Cleaning per SSPC-SP1 (recommended preparation is Steam Cleaning). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 (recommended preparation is Steam Cleaning) and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Previously Painted Surfaces
If in sound condition, clean the surface of all foreign material. Smooth, hard or glossy coatings and surfaces should be dulled by abrading the surface. Apply a test area, allowing paint to dry one week before testing adhesion. If adhesion is poor, or if this product attacks the previous finish, removal of the previous coating may be necessary. If paint is peeling or badly weathered, clean surface to sound substrate and treat as a new surface as above.

APPLICATION CONDITIONS

Temperature:	50°F minimum, 100°F maximum (air, surface, and material) At least 5°F above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Reducer/Clean Up ..... Water

Airless Spray
- Pressure ..... 2000 psi
- Hose ..... 1/4" ID
- Tip ..... .015" - .017"
- Filter ..... 60 mesh
- Reduction ..... as needed up to 10% by volume

Conventional Spray
- Gun ..... DeVilbiss MBC-510
- Fluid Tip ..... E
- Air Nozzle 704
- Atomization Pressure .... 40-60 psi
- Fluid Pressure ..... 10-20 psi
- Reduction ..... as needed up to 10% by volume

Brush
- Brush ..... Nylon/Polyester
- Reduction ..... not recommended

Roller
- Cover ..... 3/8" woven with phenolic core
- Reduction ..... not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

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THE SHERWIN-WILLIAMS COMPANY
INDUSTRIAL & MARINE COATINGS

Industrial and Marine Coatings

EnviroSpec™

4.16A

DURA-POX®

WATER BASED EPOXY FINISH

PART A	B70-500	SERIES
PART B	B70V510	HARDENER

APPLICATION BULLETIN

APPLICATION PROCEDURES

Surface preparation must be completed as indicated.

Mix contents of each component thoroughly using power agitation. Make certain no pigment remains on the bottom of the can. Then combine four parts by volume of Part A with one part by volume of Part B. Thoroughly agitate the mixture with power agitation. Allow the material to sweat-in as indicated prior to application. Re-stir before using.

If reducer is used, add only after both components have been thoroughly mixed, after sweat-in.

Apply paint to the recommended film thickness and spreading rate as indicated below:

Recommended Spreading Rate per coat:

Wet mils:	4.5 - 9.0
Dry mils:	2.0 - 4.0
Coverage:	176 - 352 sq ft/gal approximate

NOTE: Brush or roll application may require multiple coats to achieve maximum film thickness and uniformity of appearance.

Drying Schedule @ 5.0 mils wet @ 50% RH:

	@ 50°F	@ 77°F	@ 100°F
To touch:	1-1/2 hours	45 minutes	25 minutes
To handle:	5-1/2 hours	4-1/2 hours	2 hours
To recoat:			
minimum:	8 hours	6 hours	3 hours
maximum:	30 days	30 days	30 days
To cure:	7 days	7 days	7 days
Pot Life:	4-1/2 hours	3-1/2 hours	1-1/2 hours
Sweat-in-time:	30 minutes	30 minutes	10 minutes

If maximum recoat time is exceeded, abrade surface before recoating.
Drying time is temperature, humidity and film thickness dependent.

Application of coating above maximum or below minimum recommended spreading rate may adversely affect coating performance.

PERFORMANCE TIPS

Stripe coat all crevices, welds, and sharp angles to prevent early failure in these areas.

When using spray application, use a 50% overlap with each pass of the gun to avoid holidays, bare areas, and pinholes. If necessary, cross spray at a right angle

Spreading rates are calculated on volume solids and do not include an application loss factor due to surface profile, roughness or porosity of the surface, skill and technique of the applicator, method of application, various surface irregularities, material lost during mixing, spillage, overthinning, climatic conditions, and excessive film build.

Excessive reduction of material can affect film build, appearance, and adhesion.

Do not mix previously catalyzed material with new.

Do not apply the material beyond recommended pot life.

In order to avoid blockage of spray equipment, clean equipment before use or before periods of extended downtime with water.

Do not use hydrocarbon solvents for cleaning.

Refer to Product Information sheet for additional performance characteristics and properties.

CLEAN UP INSTRUCTIONS

Clean spills and spatters immediately with soap and warm water. Clean hands and tools immediately after use with soap and warm water. After cleaning, flush spray equipment with Mineral Spirits, R1K4, to prevent rusting of the equipment. Follow manufacturer's safety recommendations when using any solvent.

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

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99

— Section 1 —
Product Identification

Material Safety Data Sheet

The Sherwin-Williams Co.
101 Prospect Ave. N.W.
Cleveland, OH 44115

Emergency telephone number (216) 566-2917
Information telephone number (216) 566-2902
Date of preparation March 17, 1999

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DURA-POX® Water Based Epoxy Primer

B70-710

— Section 2 —

CAS No.	Hazardous Ingredients (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	B70A710 Gray	B70N710 Red Oxide	B70W710 Off White	B70V710 Hardener	
1569-01-3	1-Propoxy-2-propanol	Not Established			1.7				9	Percent By Weight
2807-30-9 §	2-Propoxyethanol	Not Established			1.3	4	4	4		
Proprietary	Epoxy Polymer.	Not Established				26	26	26		
Unknown	Polyamine.	Not Established							26	
13463-67-7	Titanium Dioxide.	10	10[5]	Mg/M3 [Resp.	as Dust Fraction]	11	3	11		
§	Zinc Compound [% Zinc]					8 [4.0]	8 [4.0]	8 [4.0]		
	Weight per Gallon (lbs.)					12.21	12.10	12.20	8.21	
	Solids by Weight (%)					68.7	67.8	68.7	26.3	
	Solids by Volume (%)					53.6	52.6	53.6	26.0	
	Percent Water					26.2	27.1	26.2	64.6	
	VOC (Volatile Organic Compounds) Total - lbs./gal.					0.61	0.61	0.61	0.74	
	VOC Less Water & Federally Exempt Solvents - lbs./gal.					0.99	1.02	0.99	2.06	
	Photochemically Reactive					No	No	No	No	
	Flash Point (°F)					None	None	None	None	
	HMIS (NFPA) Rating (health - flammability - reactivity)					2* - 0 - 0	2* - 0 - 0	2* - 0 - 0	2 - 0 - 0	

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

→→→ MSDS Text Page Follows →→→

DURA-POX® Water Based Epoxy Primer B70-710

Section 3 — Physical Data

PRODUCT WEIGHT	See TABLE	*EVAPORATION RATE*	Slower than Ether
SPECIFIC GRAVITY	0.99-1.47	*VAPOR DENSITY*	Heavier than Air
BOILING RANGE	212-308 °F	*MELTING POINT*	N.A.
VOLATILE VOLUME	46-74 %	*SOLUBILITY IN WATER*	N.A.
pH	7.5-10.5		

Section 4 — Fire And Explosion Hazard Data

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* N.A. *UEL* N.A.

Not Applicable

EXTINGUISHING MEDIA

Carbon Dioxide, Dry Chemical, Alcohol Foam

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.

SPECIAL FIRE FIGHTING PROCEDURES

Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 5 — Health Hazard Data

ROUTES OF EXPOSURE

Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.

ACUTE Health Hazards

EFFECTS OF OVEREXPOSURE

Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

Redness and itching or burning sensation may indicate eye or excessive skin exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None generally recognized.

EMERGENCY AND FIRST AID PROCEDURES

If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN: Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.

CHRONIC Health Hazards

No ingredient in these products is an IARC, NTP or OSHA listed carcinogen.

Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Section 6 — Reactivity Data

STABILITY – Stable

CONDITIONS TO AVOID

None known.

INCOMPATIBILITY

None known.

HAZARDOUS DECOMPOSITION PRODUCTS

By fire: Carbon Dioxide, Carbon Monoxide, Phosphoric Acid Fumes, Oxides of Phosphorus

HAZARDOUS POLYMERIZATION – Will Not Occur

Section 7 — Spill Or Leak Procedures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Remove all sources of ignition. Ventilate and remove with inert absorbent.

WASTE DISPOSAL METHOD

Waste from these products is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate all products in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section 8 — Protection Information

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.

These products may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), 3 mg./m3 (respirable fraction), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section 2.

EYE PROTECTION

Wear safety spectacles with unperforated sideshields.

Section 9 — Precautions

DOL STORAGE CATEGORY – Not Applicable

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

These products must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Section 10 — Other Regulatory Information

CALIFORNIA PROPOSITION 65

WARNING: B70A710, B70N710 and B70W710 contain chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

TSCA CERTIFICATION

All chemicals in these products are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to these products as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to these products may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

— Section 1 —
Product Identification

Material Safety Data Sheet

The Sherwin-Williams Co.
101 Prospect Ave. N.W.
Cleveland, OH 44115

Emergency telephone number (216) 566-2917
Information telephone number (216) 566-2902
Date of preparation March 17, 1999

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DURA-POX® Water Based Epoxy Finish

B70-500

CAS No.	— Section 2 — Hazardous Ingredients (percent by weight)	ACGIH TLV <STEL>	OSHA PEL <STEL>	Units	Vapor Pressure (mm Hg)	B70T504 Clear Base	B70W500 Ultra White	B70W501 Tinting Base	B70V510 Hardener	
64742-88-7	Mineral Spirits 140-Flash.	100	100	PPM	0.5	1				%
2807-30-9 §	2-Propoxyethanol	Not Established			1.3	8	6	6		BY
Proprietary	Epoxy Polymer.	Not Established				47	32	36		WEIGHT
Unknown	Polyamine.	Not Established							27	
1477-55-0	1,3-Benzenedimethanamine	Not Established							5	
13463-67-7	Titanium Dioxide.	10	10[5]	Mg/M3	as Dust [Resp. Fraction]	0 - 8	30	20		
1333-86-4	Carbon Black.	3.5	3.5	Mg/M3		0 - 3	0 - 3	0 - 3		
	Weight per Gallon (lbs.)					8.96	11.44	10.43	8.62	
	Solids by Weight (%)					49.7	63.8	57.7	33.5	
	Solids by Volume (%)					44.4	49.1	45.8	30.9	
	Percent Water					36.7	27.7	32.1	66.5	
	VOC (Volatile Organic Compounds) Total - lbs./gal.					1.21	0.97	1.05	0.00	
	VOC Less Water & Federally Exempt Solvents - lbs./gal.					2.01	1.57	1.77	0.00	
	Photochemically Reactive					No	No	No	No	
	Flash Point (°F)					None	None	None	None	
	HMIS (NFPA) Rating (health - flammability - reactivity)					2* - 0 - 0	2* - 0 - 0	2* - 0 - 0	3 - 0 - 0	

§ Ingredient subject to the reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313, 40 CFR 372.65 C

→→→ MSDS Text Page Follows →→→

DURA-POX® Water Based Epoxy Finish B70-500

Section 3 — Physical Data

PRODUCT WEIGHT	See TABLE	*EVAPORATION RATE*	Slower than Ether
SPECIFIC GRAVITY	1.04-1.38	*VAPOR DENSITY*	Heavier than Air
BOILING RANGE	212-477 °F	*MELTING POINT*	N.A.
VOLATILE VOLUME	50-69 %	*SOLUBILITY IN WATER*	N.A.
pH	7.5-9.0		

Section 4 — Fire And Explosion Hazard Data

FLAMMABILITY CLASSIFICATION *FLASH POINT* See TABLE *LEL* N.A. *UEL* N.A.
Not Applicable
EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section 5 — Health Hazard Data

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None generally recognized.
EMERGENCY AND FIRST AID PROCEDURES
If INHALED: If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN: Wash affected area thoroughly with soap and water.
Remove contaminated clothing and launder before re-use.
If in EYES: Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED: Get medical attention.
CHRONIC Health Hazards
Carbon Black is classified by IARC as possibly carcinogenic to humans (group 2B) based on experimental animal data, however, there is insufficient evidence in humans for its carcinogenicity.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung cancer, however, such exposure levels are not attainable in the workplace.

Section 6 — Reactivity Data

STABILITY — Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION — Will Not Occur

Section 7 — Spill Or Leak Procedures

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.
WASTE DISPOSAL METHOD
Waste from these products is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.
Incinerate all products in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section 8 — Protection Information

PRECAUTIONS TO BE TAKEN IN USE
Use only with adequate ventilation. Avoid breathing vapor and spray mist. Avoid contact with skin and eyes. Wash hands after using.
These products may contain materials classified as nuisance particulates (listed "as Dust" in Section 2) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section 2, the applicable limits for nuisance dusts are ACGIH TLV 10 mg./m3 (total dust), 3 mg./m3 (respirable fraction), OSHA PEL 15 mg./m3 (total dust), 5 mg./m3 (respirable fraction).
VENTILATION
Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section 2 is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.
RESPIRATORY PROTECTION
If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section 2.
When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.
PROTECTIVE GLOVES
Wear gloves which are recommended by glove supplier for protection against materials in Section 2.
EYE PROTECTION
Wear safety spectacles with unperforated sideshields.

Section 9 — Precautions

DOL STORAGE CATEGORY — Not Applicable
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.
OTHER PRECAUTIONS
These products must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Section 10 — Other Regulatory Information

CALIFORNIA PROPOSITION 65
WARNING: B70T504 contains a chemical known to the State of California to cause cancer.

TSCA CERTIFICATION
All chemicals in these products are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to these products as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to these products may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJ. NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 09900-002	REV: 1	21-Feb-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R. Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wenty DATE: 2/21/01

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
8	641-09900-002	1						X			Epo-Plex Epoxy Paint		X		09900	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
~~Mike Stiffler~~	~~52-5~~				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	104				
Rob Knep	52-5				
B. Scott Wheeler	52-5				
Geosyntec Consultants	38				

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

RECEIVED BY: [illegible] DATE 2/27/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit See COMMENTS

ORIGINAL

SHERWIN Williams

Industrial and Marine Coatings

EnviroSpec™

4.17

EPO-PLEX® MULTI-MIL
WATER BASED EPOXY FINISH

PART A B71-100 SERIES
PART B B71V100 HARDENER

PRODUCT INFORMATION

1/99

PRODUCT DESCRIPTION

EPO-PLEX MULTI-MIL WATER BASED EPOXY FINISH is a high performance, interior/exterior, VOC compliant, low odor, high film build, two-component, water based acrylic epoxy. It dries to a tough, tile-like finish that exhibits excellent durability and performance properties:

- Low odor
- Moisture resistant
- Abrasion resistant
- Chemical resistant
- Impact resistant
- Suitable for use in USDA inspected facilities
- Yellowing resistant

RECOMMENDED USES

For use properly primed steel and masonry surfaces, concrete, plaster, wallboard, and wood. Use over previously painted surfaces in sound condition.

- High maintenance areas
- For upgrading conventional coating systems
- Stadiums
- Schools
- Interior and exterior use

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-09900-002
Reviewed By: CR
Date: 2/21/00

PRODUCT CHARACTERISTICS

Finish:	High Luster
Color:	Ultra White and a wide range of colors possible
Volume Solids:	42% ± 2%, mixed
Weight Solids:	52% ± 2%, mixed
VOC (EPA Method 24): Pure White	240 g/L 2.0 lb/gal, mixed
Mix Ratio:	4:1

Recommended	**Rate per coat:**
Wet mils	[illegible] - 15.0
Dry mils	[illegible] - 6.0
Coverage	[illegible] - 170 sq ft/gal approximate

NOTE: [illegible] may require multiple coats to achieve maximum [illegible] and uniformity of appearance.

Drying Schedule @ 10.0 mils wet @ 50% RH:

	@ 50°F	@ 77°F	@ 120°F
To touch:	2 hours	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat:			
minimum:	4 hours	2 hours	1 hour
maximum:	30 days	30 days	30 days
To cure:	30 days	14 days	7 days

If maximum recoat time is exceeded, abrade surface before recoating. Drying time is temperature, humidity, and film thickness dependent.

Pot Life:	8 hours @ 77°F, 50% RH
Sweat-In Time:	15 minutes @ 77°F, 50% RH
Shelf Life:	12 months, unopened, at 77°F
Flash Point:	230°F, SETA, mixed
Reducer/Clean Up:	Water

PERFORMANCE CHARACTERISTICS

System Tested: (unless otherwise indicated)
Substrate: Steel
Surface Preparation: SSPC-SP10
1 ct. Dura-Pox WBE Primer @ 4.0 mils dft
1 ct. Epo-Plex Multi-Mil Epoxy @ 5.0 mils dft

Abrasion Resistance, topcoat only:
Method: ASTM D4060, CS10 wheel, 1000 cycles 1 kg load
Result: 141 mg loss

Adhesion, topcoat only:
Method: ASTM D4541
Result: 751 psi

Dry Heat Resistance, topcoat only:
Method: ASTM D2485
Result: 180°F, intermittent 200°F

Flexibility, topcoat only:
Method: ASTM D522, 180° bend 1/8" mandrel
Result: Passes

Impact Resistance, Direct: topcoat only:
Method: ASTM D2485
Result: 42 in. lb.

Impact Resistance, Indirect: topcoat only:
Method: ASTM D2485
Result: 24 in. lb.

Pencil Hardness:
Method: ASTM D3363
Result: HB

Thermal Shock:
Method: ASTM D2246, 12 cycles
Result: Passes

Wind Driven Rain:
Method: Federal Spec. TT-C-555B
Result: Passes

[X] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: [illegible] Date: 2/23/01

INFORMATION ONLY

Resists fumes, splash, and spillage of mild acids, alkalies, salts, aliphatic and aromatic hydrocarbon solvents, and lubricating oils (ASTM D3912).

continued on back

SHERWIN Williams

Industrial and Marine Coatings

EnviroSpec™

4.17A

EPO-PLEX® MULTI-MIL

WATER BASED EPOXY FINISH

PART A	B71-100	SERIES
PART B	B71V100	HARDENER

APPLICATION BULLETIN

1/99

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Steel

Minimum surface preparation is Hand Tool Clean per SSPC-SP2. Remove all oil and grease from surface by Solvent Cleaning per SSPC-SP1 (recommended preparation is Steam Clean). For better performance, use Commercial Blast Cleaning per SSPC-SP6, blast clean all surfaces using a sharp, angular abrasive for optimum surface profile (2 mils). Remove all weld spatter and round all sharp edges by grinding. Prime any bare steel within 8 hours or before flash rusting occurs.

Galvanized Steel

Allow to weather a minimum of six months prior to coating. Solvent Clean per SSPC-SP1 (recommended preparation is Steam Clean). When weathering is not possible, or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 (recommended preparation is Steam Clean) and apply a test patch. Allow paint to dry at least one week before testing adhesion. If adhesion is poor, brush blasting per SSPC-SP7 is necessary to remove these treatments. Rusty galvanizing requires a minimum of Hand Tool Cleaning per SSPC-SP2, prime the area the same day as cleaned.

Concrete - New

For surface preparation, refer to SSPC-SP13/NACE 6. Surface must be clean, dry, sound, and offer sufficient profile to achieve adequate adhe[illegible] Minimum substrate cure is 28 days at 75°F. [illegible] [illegible]m release agents, curing compounds, s[illegible] [illegible]laitance, and other foreign matter by s[illegible] [illegible]ing, mechanical scarification, or suitab[illegible] [illegible]h as muriatic acid etch, refer to ASTM [illegible] [illegible]y to achieve a final pH between 6.0 an[illegible] [illegible]oroughly prior to coating.

Concrete

Surface preparation is done in much the same manner as new concrete; however, if the concrete is contaminated with oils, grease, chemicals, etc., they must be removed by cleaning with a strong detergent. Refer to ASTM D4258. Form release agents, hardeners, etc. must be removed by sandblasting, shotblasting, mechanical scarification, or suitable chemical means. If surface deterioration presents an unacceptably rough surface, Kem Cati-Coat HS Epoxy Filler/Sealer is recommended to patch and resurface damaged concrete.

Always follow the industry standards listed below:

ASTM D4258 Standard Practice for Cleaning Concrete.
ASTM D4259 Standard Practice for Abrading Concrete.
ASTM D4260 Standard Practice for Etching Concrete.
ASTM D4263 Plastic Sheet Method for Checking Moisture in Concrete.
SSPC-SP13/NACE 6 Surface Preparation of Concrete

APPLICATION CONDITIONS

Temperature:	50°F minimum, 120°F maximum (air, surface, and material) At least 5° above dew point
Relative humidity:	85% maximum

APPLICATION EQUIPMENT

The following is a guide. Changes in pressures and tip sizes may be needed for proper spray characteristics. Always purge spray equipment before use with listed reducer. Any reduction must be compatible with the existing environmental and application conditions.

Reducer/Clean Up ..... Water

Airless Spray
- Pressure ..... 2400 psi
- Hose ..... 3/8" ID
- Tip ..... .019" - .023"
- Filter ..... 60 mesh
- Reduction ..... as needed up to 6% by volume

Brush
- Brush ..... Nylon/Polyester
- Reduction ..... not recommended

Roller
- Cover ..... 3/8" woven with phenolic core
- Reduction ..... not recommended

If specific application equipment is listed above, equivalent equipment may be substituted.

continued on back

SHERWIN Williams

Industrial and Marine Coatings

EnviroSpec™

4.17

EPO-PLEX® MULTI-MIL
WATER BASED EPOXY FINISH

PART A	B71-100	SERIES
PART B	B71V100	HARDENER

PRODUCT INFORMATION

RECOMMENDED SYSTEMS

Steel
1 ct: Dura-Pox WBE Primer @ 2.0 - 4.0 mils dft
1-2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Steel
1 ct: Dura-Pox WBE Primer @ 2.0 - 4.0 mils dft
1 ct: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft
1-2 cts: Centurion Water Based Urethane @ 2.0 - 3.0 mils dft/ct

Steel
1 ct: DTM Acrylic Primer/Finish @ 2.5 - 5.0 mils dft
1-2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Steel
1 ct: Pro-Cryl Universal Primer @ 2.0 - 4.0 mils dft
1-2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Steel
1 ct: Water Based Catalyzed Epoxy Primer @ 3.0 - 5.0 mils dft
1-2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Galvanized
2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Masonry:
1 coat of appropriate masonry filler/sealer as required, such as:
Heavy Duty Block Filler @ 10.0 - 18.0 mils dft
or Cement-Plex 875 @ 13.0 - 25.0 mils dft
or Epo-Plex Cementitious WB Epoxy Block Filler @ 10.0 - 20.0 mils dft
or Kem Cati-Coat HS Epoxy Filler/Sealer @ 10.0 - 20.0 mils dft
topcoated with:
1-2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

Masonry, smooth:
2 cts: Epo-Plex Multi-Mil Epoxy @ 4.0 - 6.0 mils dft/ct

The systems listed above are representative of the product's use. Other systems may be appropriate.

SURFACE PREPARATION

Surface must be clean, dry, and in sound condition. Remove all oil, dust, grease, dirt, loose rust, and other foreign material to ensure adequate adhesion.

Do not use hydrocarbon solvents for cleaning.

Refer to product Application Bulletin for detailed surface preparation information.

Minimum recommended surface preparation:

Iron & Steel:	SSPC-SP2
Galvanizing:	SSPC-SP1
Concrete & Masonry:	SSPC-SP13/NACE 6

COLOR AVAILABILITY / TINTING

Tint with Blend-A-Color Toner or EnviroToner at 100% tint strength, using the respective tinting formula pages. Five minutes minimum mixing on a mechanical shaker is required for complete mixing of color.

Color: Ultra White and a wide range of colors possible.

APPLICATION CONDITIONS

Temperature:	50°F minimum, 120° [illegible] ximum (air, surface, and ma[illegible] At least 5° above dew point
Relative humidity:	85% maximum

Refer to product Application Bulletin for detailed application information.

ORDERING INFORMATION

Packaging:	1 and 5 gallon mixes
Part A:	1 gallon and 4 gallon short filled cans
Part B:	Quart and 1 gallon containers
Weight per gallon:	10.2 ± 0.2 lb mixed

SAFETY PRECAUTIONS

Refer to the MSDS sheet before use.

Published technical data and instructions are subject to change without notice. Contact your Sherwin-Williams representative for additional technical data and instructions.

FROM : SHERWIN WILLIAMS DOMNT 11970 PHONE NO. : 513 424 5788 Feb. 21 2001 10:33AM P4

THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

21-FEB-01

J A Painting
Attn: Jim Donaldson
7780 State Road
Cincinnati, OH 45255

Enclosed are Material Safety Data Sheets for the following products:

B71V100 B71W100

Please note that our Material Safety Data Sheet conforms to the OSHA Hazard Communication Standard, 29 CFR 1910.1200(g)(2).

Thank you for letting us be of service to you.

Sincerely,

Regulatory Information Services
(216)566-2902

MATERIAL SAFETY DATA SHEET

B71W100
00

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
21-FEB-01

INFORMATION TELEPHONE NO.
(216) 566-2902

Section I -- PRODUCT IDENTIFICATION

PRODUCT NUMBER

B71W100

HMIS CODES

Health	3
Flammability	0
Reactivity	0

PRODUCT NAME
EPO-PLEX* Multi-Mil Water Based Epoxy (Part A), Ultra White

PRODUCT CLASS
Base component for 2-package Water-reducible Epoxy

Section II -- HAZARDOUS INGREDIENTS

INGREDIENT CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Xylene. 1330-20-7	1	100	100	PPM	5.90
	STEL	150	150	PPM	
Diacetone Alcohol. 123-42-2	4	50	50	PPM	1.20
2-Ethoxyethanol 2807-30-9	4	Not Established			1.30
Triethylamine. 121-44-8	2	1	25	ppm (Skin)	54.00
	STEL	3	100	ppm (Skin)	
Amorphous Precipitated Silica 112926-00-8	1	10	6	mg/m3 as D	0.00
Titanium Dioxide. 13463-67-7	19	10	10(5)	mg/m3 as Dust ***	
		*** Total Dust (Respirable Fraction)			

pH - 7.6

Section III -- PHYSICAL DATA

PRODUCT WEIGHT	10.56 lb/gal	1265 g/l
SPECIFIC GRAVITY	1.27	
BOILING POINT	185 - 342 F	85 - 172 C
MELTING POINT	Not Available	
VOLATILE VOLUME	59 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

2.12 lb/gal	254 g/l	Less Federally Exempt Solvents
1.21 lb/gal	145 g/l	Emitted VOC

Continued on page 2

Section IV -- FIRE AND EXPLOSION HAZARD DATA

LASH POINT	LEL	UEL
Applicable	N.A.	N.A.

LA. .BILITY CLASSIFICATION
Not Applicable

KTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam

NUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when
posed to extreme heat.

ECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus
ould be used. Water spray may be ineffective. If water is used, fog
zzles are preferable. Water may be used to cool closed containers to
event pressure build-up and possible autoignition or explosion when
posed to extreme heat.

Section V -- HEALTH HAZARD DATA

UTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on
nditions of use. To minimize exposure, follow recommendations for proper
e, ventilation, and personal protective equipment.

UTE Health Hazards

FECTS OF OVEREXPOSURE
Irritation of eyes, skin and upper respiratory system. In a confined
ea vapors in high concentration may cause headache, nausea or dizziness.

GNS AND SYMPTOMS OF OVEREXPOSURE
Redness and itching or burning sensation may indicate eye or excessive
in exposure.

DI CONDITIONS AGGRAVATED BY EXPOSURE
N generally recognized.

ERGENCY AND FIRST AID PROCEDURES

If INHALED:	If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
If in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Do not induce vomiting. Get medical attention immediately.

RONIC Health Hazards
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.
Prolonged overexposure to solvent ingredients in Section II may cause
erse effects to the liver, urinary and reproductive systems.
Rats exposed to titanium dioxide dust at 250 mg./m3 developed lung
cer, however, such exposure levels are not attainable in the workplace.

Section VI -- REACTIVITY DATA

BILITY -- Stable

DITIONS TO AVOID
None known.

OMPATIBILITY
None known.

Continued on page 3

Section X -- OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
1330-20-7	Xylene.	1	
121-44-8	Triethylamine.	2	
	Glycol Ethers	4	

CALIFORNIA PROPOSITION 65

WARNING: This product contains a chemical known to the State of California to cause cancer.

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

MATERIAL SAFETY DATA SHEET

B71V100
01 00

MANUFACTURER'S NAME
THE SHERWIN-WILLIAMS COMPANY
101 Prospect Avenue N.W.
Cleveland, OH 44115

EMERGENCY TELEPHONE NO.
(216) 566-2917

DATE OF PREPARATION
21-FEB-01

INFORMATION TELEPHONE NO.
(216) 566-2902

Section I -- PRODUCT IDENTIFICATION

PRODUCT NUMBER

B71V100

HMIS CODES

Health	2*
Flammability	0
Reactivity	0

PRODUCT NAME
EPO-PLEX* Multi-Mil Water Based Epoxy (Part B), Hardener

PRODUCT CLASS
Coreactant for 2-package Water-reducible Epoxy Coating

Section II -- HAZARDOUS INGREDIENTS

INGREDIENT CAS No.	% by WT	ACGIH TLV	OSHA PEL	UNITS	V.P.
Diacetone Alcohol. 123-42-2	7	50	50	PPM	1.20
2-Propoxyethanol 2807-30-9	2	Not Established			1.30
Epoxy Polymer. Unknown	30	Not Established			0.00

- 7.5

Section III -- PHYSICAL DATA

PRODUCT WEIGHT	8.69 lb/gal	1041 g/l
SPECIFIC GRAVITY	1.05	
BOILING POINT	212 - 369 F	100 - 187 C
MELTING POINT	Not Available	
VOLATILE VOLUME	69 %	
EVAPORATION RATE	Slower than ether	
VAPOR DENSITY	Heavier than air	
SOLUBILITY IN WATER	N.A.	

VOLATILE ORGANIC COMPOUNDS (VOC Theoretical)

3.00 lb/gal	360 g/l	Less Federally Exempt Solvents
1.48 lb/gal	177 g/l	Emitted VOC

Section IV -- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	LEL	UEL
Not Applicable	N.A.	N.A.

FLAMMABILITY CLASSIFICATION
Not Applicable

Continued on page 2

EXTINGUISHING MEDIA
Carbon Dioxide, Dry Chemical, Alcohol Foam
UNUSUAL FIRE AND EXPLOSION HAZARDS
Closed containers may explode (due to the build-up of pressure) when exposed to extreme heat.
SPECIAL FIRE FIGHTING PROCEDURES
Full protective equipment including self-contained breathing apparatus should be used. Water spray may be ineffective. If water is used, fog nozzles are preferable. Water may be used to cool closed containers to prevent pressure build-up and possible autoignition or explosion when exposed to extreme heat.

Section V -- HEALTH HAZARD DATA

ROUTES OF EXPOSURE
Exposure may be by INHALATION and/or SKIN or EYE contact, depending on conditions of use. To minimize exposure, follow recommendations for proper use, ventilation, and personal protective equipment.
ACUTE Health Hazards
EFFECTS OF OVEREXPOSURE
Irritation of eyes, skin and upper respiratory system. In a confined area vapors in high concentration may cause headache, nausea or dizziness.
SIGNS AND SYMPTOMS OF OVEREXPOSURE
Redness and itching or burning sensation may indicate eye or excessive skin exposure.
MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
May cause allergic skin reaction in susceptible persons.
EMERGENCY AND FIRST AID PROCEDURES

If INHALED:	If affected, remove from exposure. Restore breathing. Keep warm and quiet.
If on SKIN:	Wash affected area thoroughly with soap and water. Remove contaminated clothing and launder before re-use.
f in EYES:	Flush eyes with large amounts of water for 15 minutes. Get medical attention.
If SWALLOWED:	Do not induce vomiting. Get medical attention immediately.

CHRONIC Health Hazards
No ingredient in this product is an IARC, NTP or OSHA listed carcinogen.

Section VI -- REACTIVITY DATA

STABILITY -- Stable
CONDITIONS TO AVOID
None known.
INCOMPATIBILITY
None known.
HAZARDOUS DECOMPOSITION PRODUCTS
By fire: Carbon Dioxide, Carbon Monoxide
HAZARDOUS POLYMERIZATION
Will not occur

Section VII -- SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Remove all sources of ignition. Ventilate and remove with inert absorbent.

Continued on page 3

WASTE DISPOSAL METHOD

Waste from this product is not hazardous as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261.

Incinerate in approved facility. Do not incinerate closed container. Dispose of in accordance with Federal, State, and Local regulations regarding pollution.

Section VIII -- PROTECTION INFORMATION

PRECAUTIONS TO BE TAKEN IN USE

Use only with adequate ventilation. Avoid breathing vapor and spray mist. Do not get in eyes or on skin. Wash hands after using.

This coating may contain materials classified as nuisance particulates (listed "as Dust" in Section II) which may be present at hazardous levels only during sanding or abrading of the dried film. If no specific dusts are listed in Section II, the applicable limits for nuisance dusts are ACGIH TLV 10 mg/m3 (total dust), 3 mg/m3 (respirable fraction), OSHA PEL 15 mg/m3 (total dust), 5 mg/m3 (respirable fraction).

VENTILATION

Local exhaust preferable. General exhaust acceptable if the exposure to materials in Section II is maintained below applicable exposure limits. Refer to OSHA Standards 1910.94, 1910.107, 1910.108.

RESPIRATORY PROTECTION

If personal exposure cannot be controlled below applicable limits by ventilation, wear a properly fitted organic vapor/particulate respirator approved by NIOSH/MSHA for protection against materials in Section II.

When sanding or abrading the dried film, wear a dust/mist respirator approved by NIOSH/MSHA for dust which may be generated from this product, underlying paint, or the abrasive.

PROTECTIVE GLOVES

Wear gloves which are recommended by glove supplier for protection against materials in Section II.

PROTECTION

Wear safety spectacles with unperforated sideshields.

OTHER PROTECTIVE EQUIPMENT

Use of barrier cream on exposed skin is recommended.

Section IX -- PRECAUTIONS

DOL STORAGE CATEGORY

Not Applicable

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Keep container closed when not in use. Transfer only to approved containers with complete and appropriate labeling. Do not take internally. Keep out of the reach of children.

OTHER PRECAUTIONS

This product must be mixed with other components before use. Before opening the packages, READ AND FOLLOW WARNING LABELS ON ALL COMPONENTS.

Section X -- OTHER REGULATORY INFORMATION

SARA 313 (40 CFR 372.65C) SUPPLIER NOTIFICATION

CAS No.	CHEMICAL/COMPOUND	% by WT	% Element
	Glycol Ethers	3	

Continued on page 4

TSCA CERTIFICATION

All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.

The above information pertains to this product as currently formulated, and is based on the information available at this time. Addition of reducers or other additives to this product may substantially alter the composition and hazards of the product. Since conditions of use are outside our control, we make no warranties, express or implied, and assume no liability in connection with any use of this information.

METAL WALL LOUVERS

SUPPLIER DOC NT SUBMITTAL

FDF PROJEC. O: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 10211-001A	REV: 0	DATE: 23-Aug-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Julema Lewis DATE: 08-23-2000

			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
8	641-10211-001A	0						X			Metal Wall Louvers/Dampers		X		10211	X		
	parts 1.04.A,B																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mark Hoffman (Approver)	525				
Jim Cherry	525				
Jim Justice	525				
Mike Gloeber	64				
Rob Krieg	525				
Scott Wheeler	525				
Kwasi Bru Quarshah (Holyoke)	64				

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

attached

ORIGINAL

RECEIVED BY: MW Griffin DATE 8/30/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

PROJECT: ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM

CONTRACTOR: RIECK MECHANICAL

EQUIPMENT SUBMITTAL ON: ARROW LOUVERS

****

SHEET	CONTENTS
1	MODEL 377 COMBINATION LOUVER/DAMPER
2	MODEL 377 PERFORMANCE DATA

SUBMITTED BY:

Andy Tepe

CONTROLLED AIR INCORPORATED
3491 MUSTAFA DRIVE
CINCINNATI, OHIO 45241

07/10/00

A3631

Submission of product for review, acceptance, and comment prior to release of purchase order by
RIECK MECHANICAL-ELECTRICAL SERVICES
Stanley Barbe Date 7-17-00

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-10211-001A
Reviewed By: DRO
Date: 8/22/00

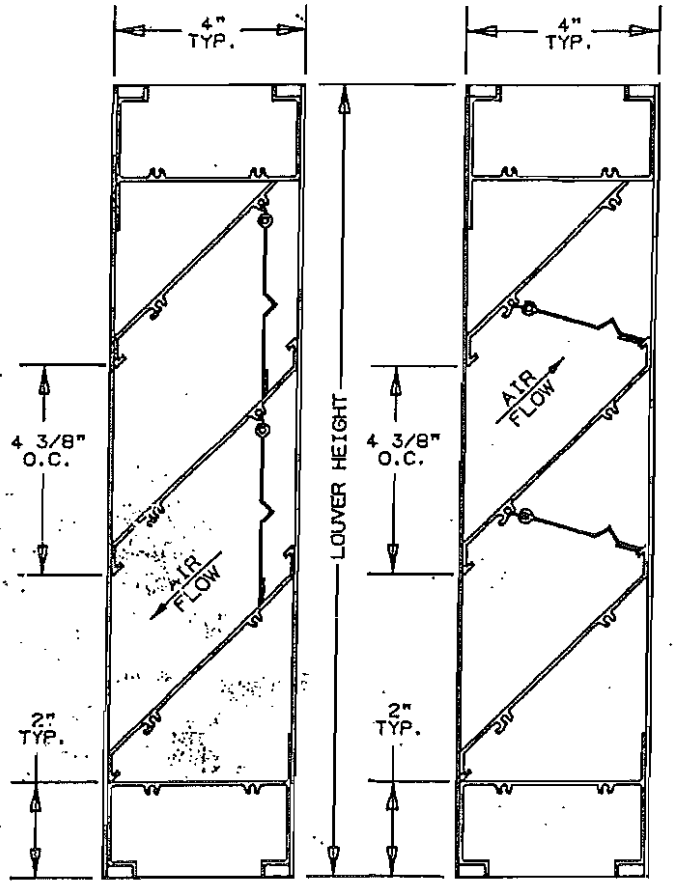
[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 8/30/00

INFORMATION ONLY

ARROW
EXTRUDED ALUMINUM LOUVERS
4" DEEP - AUTOMATIC DUAL COMBINATION

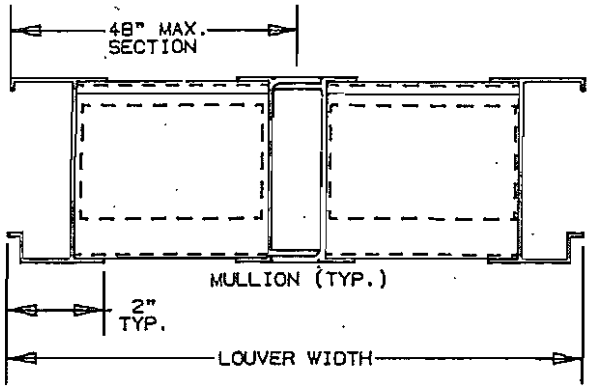
TYPE 377

45° STANDARD BLADE-COMBINATION-INTAKE OR EXHAUST



EXHAUST INTAKE

NOT TO SCALE



SPECIFICATIONS

MATERIAL: EXTRUDED ALUMINUM, 6063-T52 ALLOY, .081" THK. FRAME AND STATIONARY BLADE, .050" THK. OPERABLE BLADE.
FACE OF LOUVER: FULL JAMB SECTION, WITH BLADES HEAD AND SILL CONTAINED IN JAMB.
SCREENS: (WHEN INDICATED)
BIRD SCREEN - 1/2" FLATTENED ALUMINUM, .051" THK.
- 1/2" SQ. MESH INTERMEDIATE DOUBLE CRIMPED ALUMINUM WIRE, .063" DIA.
INSECT SCREEN - 18/16 MESH, .011" DIA. ALUMINUM WIRE
MAXIMUM PANEL SIZE: 48"x96" MAXIMUM.
MINIMUM PANEL SIZE 12"x13"

FINISH: Aged Copper

INTER-CONNECTING LINKAGE AND COUNTERWEIGHTS NOT AVAILABLE

SPECIFY TYPE WHEN ORDERING

SEE REVERSE SIDE FOR PERFORMANCE DATA

KYNAR COATING....ADVISE COLOR

Bird screen on outside of each louver

LOUVERS WILL BE FABRICATED 1/2" SMALLER THAN OPENING SIZE UNLESS OTHERWISE SPECIFIED.

ITEM	QTY.	WIDTH (OPENING SIZE)	HEIGHT (OPENING SIZE)	WIDTH (LOUVER SIZE)	HEIGHT (LOUVER SIZE)	MULL	TYPE (SCREENS)	LOC (SCREENS)	INTAKE (LOUVER TYPE)	EXHAUST (LOUVER TYPE)
EXHAUST		24	24	23½	23½		mesh		ADVISE QUANTITY	
INTAKE		24	24	23½	23½		mesh		ADVISE QUANTITY	

UNION MADE

ARROW UNITED INDUSTRIES
A DIVISION OF MESTEK, INC.
314 RIVERSIDE DRIVE
WYALUSING, PA 18853
TEL: (717) 746-1888 FAX (717) 746-9286

AGENT:

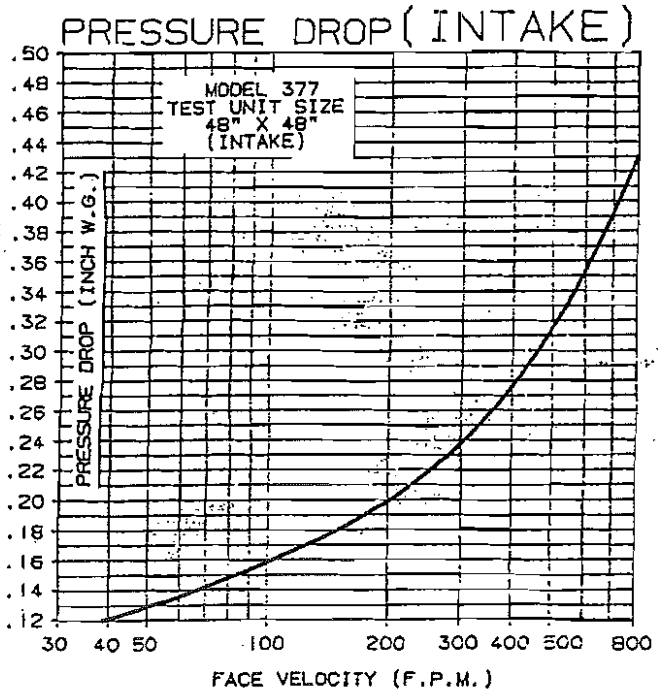
ARCH./ENG.:
CONTR.:
PROJECT:
EDR: ECN: JOB:
DATE: DWN.: DWG:

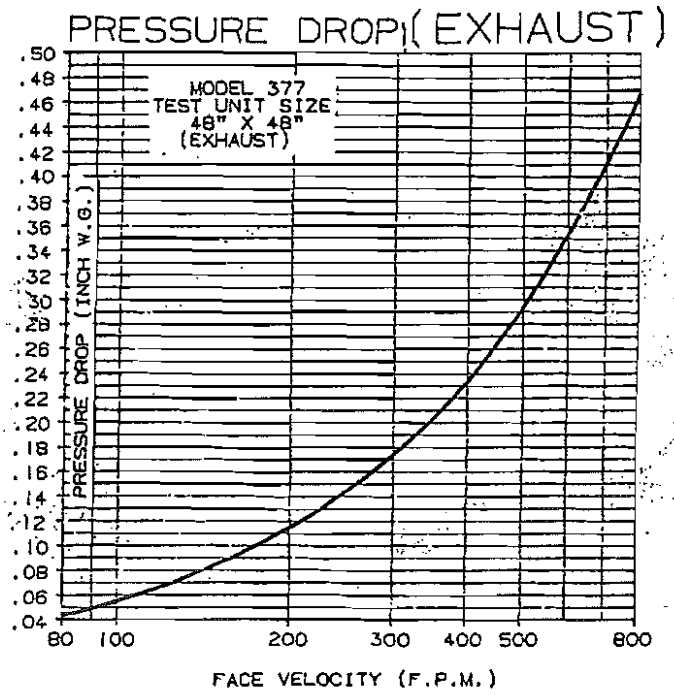
847-1991-1

LOUVER MODEL 377 COMBINATION LOUVER PERFORMANCE DATA

WITHOUT DUCTWORK

LOUVER INSTALLED PER AMCA 500 FIG. 5.4 (FACE MOUNTED TO A PLENUM) PRESSURE IS CORRECTED TO .075 LB./CU. FT. AIR DENSITY.





TYPICAL PERFORMANCE FOR MODEL 377 COMBINATION LOUVER, WITHOUT THE USE OF BLADE LINKAGE, COUNTERWEIGHTS, AND SCREENS.

THE VALUES FOR FACE VELOCITY (FPM) NOTED ABOVE ARE BASED ON ONLY THE ACTIVE LOUVER FACE AREA.

THE ACTIVE LOUVER FACE AREA IS DETERMINED BY SUBTRACTING 9" FROM THE OVERALL LOUVER HEIGHT AND 4" FROM THE OVERALL LOUVER WIDTH. MAXIMUM SINGLE PANEL SIZE IS 48" X 96".

ARROW UNITED INDUSTRIES COLOR SELECTOR FOR AIR DRY, BAKED ENAMEL AND KYNAR PAINTED FINISHES

FINISHES

Air-Dry Enamel — Our product is chemically cleaned, prime coated and a finished top coat(s) applied. Excellent adhesion to aluminum and steel products.

Baked Enamel — An economical architectural coating, applied over a chemically cleaned surface, offers excellent corrosion resistance, color control, color fast, and impact resistant.

Kynar — Kynar 500® resin is a fluoropolymer used by coating formulators as a vehicle in formulating a superior coating that is extremely resistant to chalking and ultra-violet deterioration, and is exceptionally color fast. This coating exceeds all the test requirements of AAMA specification 605.2 for high performance organic coatings on architectural aluminum extrusions and panels. A warranty is *not* offered by the licensed applicator or coating manufacturer when coating steel.

Kynar – XL — Same as Kynar 500® with an added Clear Coat.

Bone White | Colonial White | Ivory

Fashion Gray | Colonial Gray | Charcoal Gray

Autumn Mist | Beige | Seawolf | Sandstone

Desert Tan | Rosewood | Brick Red | Black

Aged Copper | Sage Brown | Gothic Brown | Dark Brown

Statuary Bronze | Light Bronze | Medium Bronze | Dark Bronze

THESE ARE OUR STANDARD COLORS

Interstate Green

River Rouge Red | Banner Red

Colonial Blue | Hartford Green

THESE ARE OUR NON STANDARD – CUSTOM COLORS

THESE COLOR SAMPLES ARE AS CLOSE AS POSSIBLE TO ACTUAL COLORS OFFERED, WITHIN THE LIMITATIONS OF COLOR CHIP REPRODUCTION

ARROW UNITED INDUSTRIES
A Division of Mestek, Inc.
314 Riverside Drive, Wyalusing, PA 18853 | Fax: (570)746-9286 Tel: (570)746-1888

PRE-ENGINEERED BUILDINGS

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 13120-001	REV: 0	DATE: 22-Aug-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R. Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Glenna Kraus DATE: 08-23-2000

			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
8	641-13120-001A	0						X			VH Pre-Eng. Building product data		X		13120	X		
8	641-13120-001B	0						X			CVH Pre-Eng. Building product data		X		13120	X		
	parts 1.06.A.1-5																	

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin (Approver)	525				
Jim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Rob Kreis	525				
Scott Wheeler	525				
Louise Bar-Sunenbosh (Info only)	64				

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

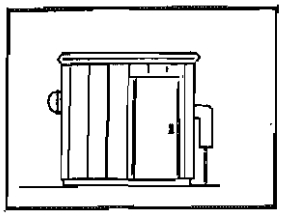
attached

ORIGINAL

RECEIVED BY: Mike Griffin DATE 8/30/00
(SIGN/DATE AND RETURN A COPY TO ECDC, MS 52-7)

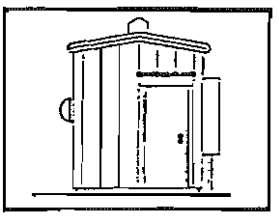
SUBMITTAL TYPE: (BY SUPPLIER)
CFC - CERTIFIED FOR CONSTRUCTION
INF - INFORMATION/RECORD
DRFT - DRAFT/PRELIMINARY

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



PARKLINE, INC.
P.O. Box 65
Winfield, WV 25213

SMALL INDUSTRIAL BUILDING



Parkline Order Number : 364 (VH 1-6)
Customer : PARKLINE KENTUCKIANA
17'- 0'' Wide x 22'- 0'' Long x 9'- 0'' High - Type S2
Colors : ?? Walls, ?? Trim, .GL Roof
Live Load : 20 PSF. Wind Load : 80 MPH
Customer Ref :

We are enclosing the following Parkline Drawings for your approval on the above subject order. Please return one set marked "Approved"or with any required corrections. This order will not be released for fabrication until approved drawings have been returned.

000364-1	FLOOR PLAN
000364-2	ROOF PLAN
000364-4	WALL ELEVATIONS
CLR-CHT	COLOR CHART
A- RWP	ROOF AND WALL PANEL DESIGN
A- FDN	BUILDING FOUNDATION
A- BS	SINGLE SLOPE BUILDINGS
A- DS	DOOR HARDWARE SCHEDULE
A- DL	HOLLOW METAL DOOR LEAF
A- DH	HOLLOW METAL DOOR HARDWARE
A- DF	HOLLOW METAL DOOR DETAILS
A- WO	WALL OPENING KIT
A- RIN	ROLL-IN WALL INSULATION
A- RIS	BLANKET ROOF INSULATION (TYPE 'S')

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-13120-001A
Reviewed By: DRO
Date: 8/22/00

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 8/30/00

1. See dwg 000364-4
2. WALLS - LAUREL GREEN
3. TRIM - ARCTIC WHITE
4. Doors - LAUREL GREEN
MWB

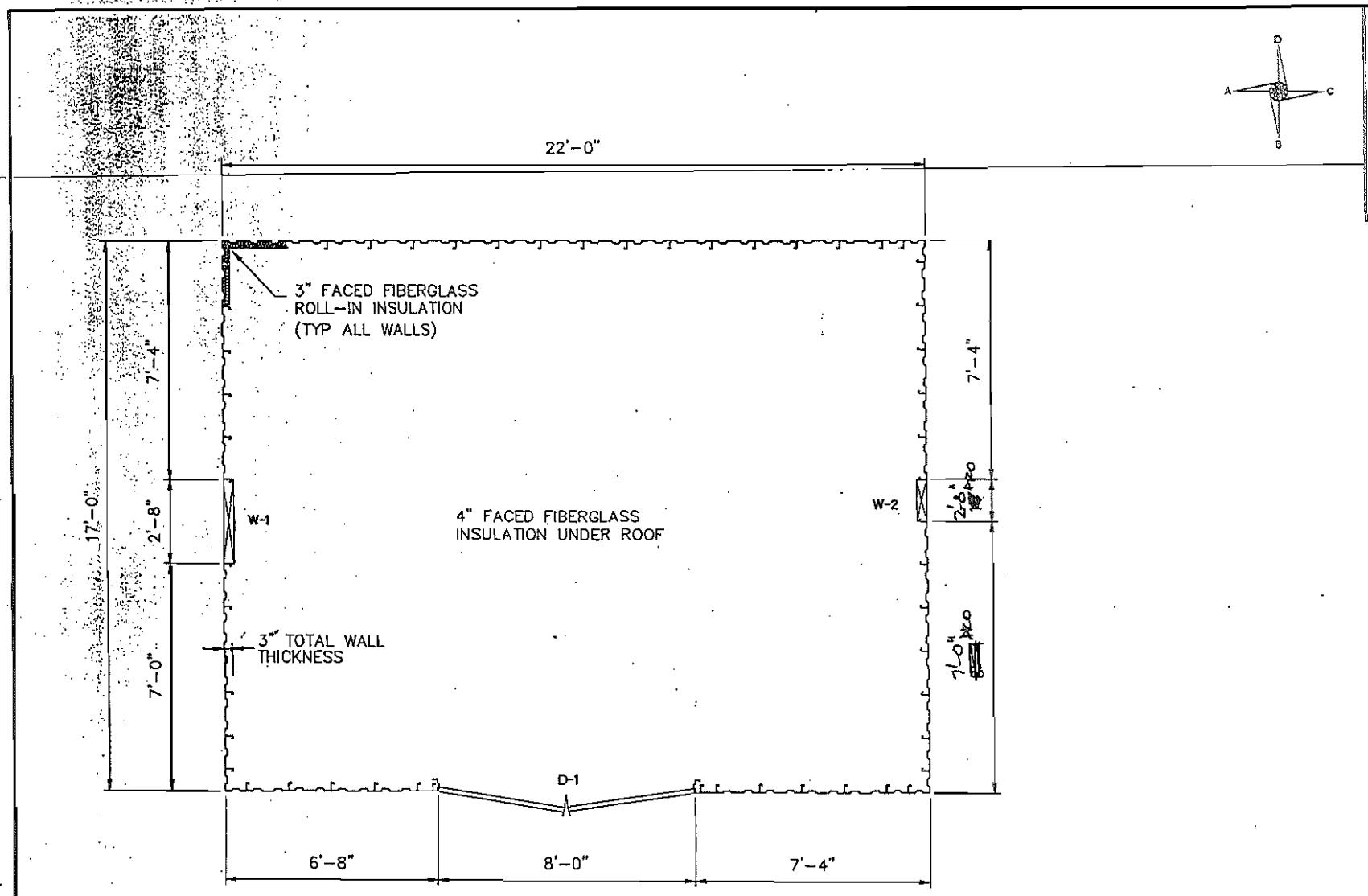
Thomas W. Harding
7-31-00

APPROVAL DRAWING PACKAGE

INFORMATION ONLY

PLEASE REVIEW AND VERIFY ALL DIMENSIONS ON FLOOR PLAN, ELEVATIONS, AND ROOF PLAN AND RETURN THOSE DRAWINGS WITH ANY CORRECTIONS MARKED IN RED

DUE TO PRODUCTS BEING CONSTANTLY IMPROVED, DATA IS SUBJECT TO CHANGE WITHOUT NOTICE.



RE: VALVE HOUSE

REVISIONS	BY

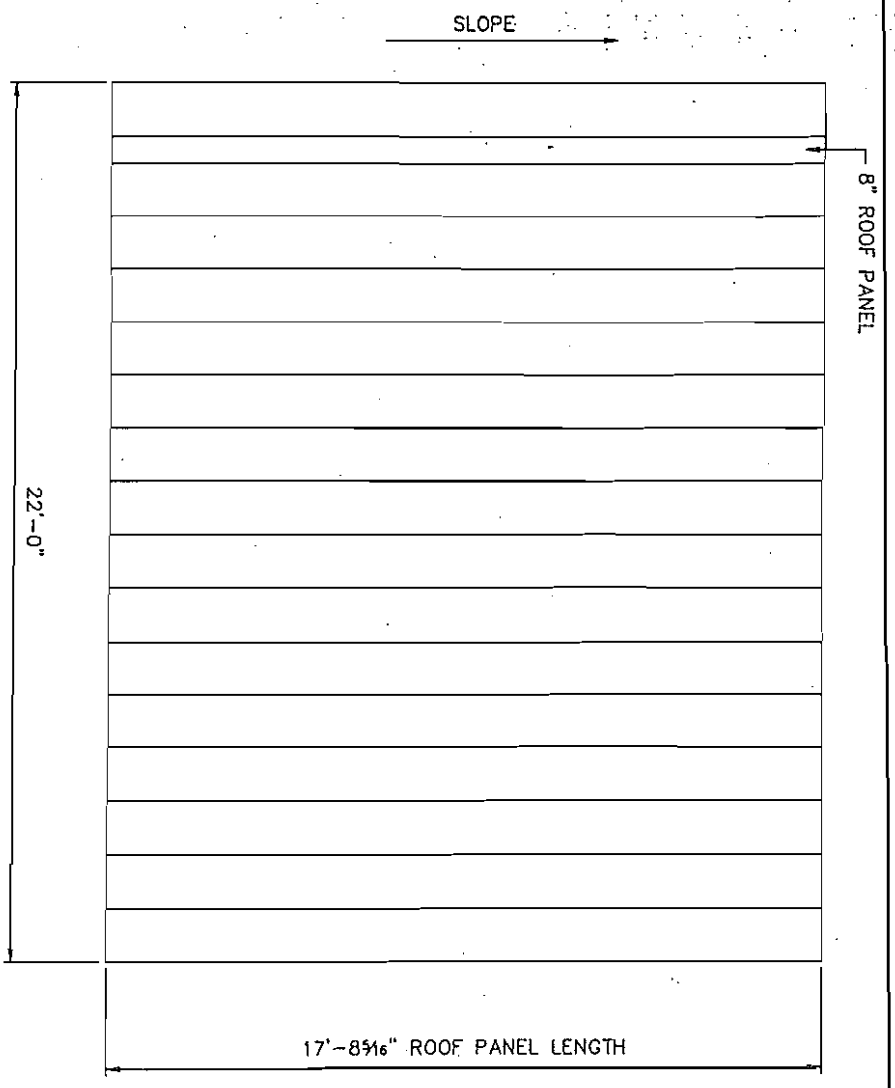
PARKLINE INC.
P.O. Box 15 [illegible], WV 25213
Phone (304) [illegible] 911

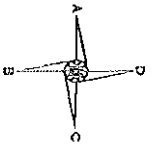
JOB DESCRIPTION: PARKLINE KENTUCKIANA
LOUISVILLE, KY

SHEET TITLE: FLOOR PLAN

DATE	7-19-99
DRAWN BY	[illegible]
SCALE	N.T.S.
ORDER NO.	
REVISION	0
DWG. NO.	000364-1

18 GA. 4" RIB ROOF PANELS
FACTORY FINISH: GALVALUME



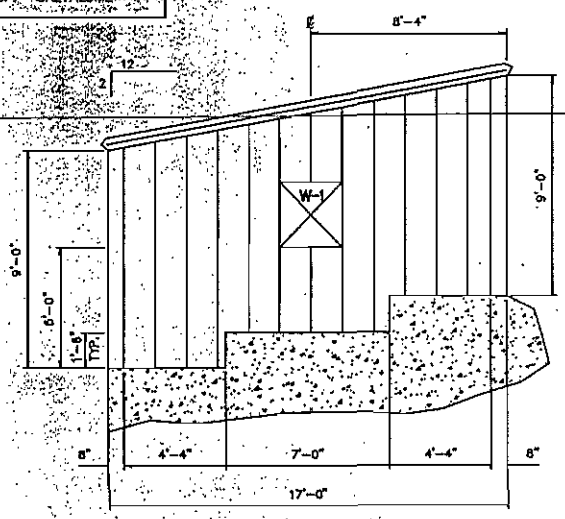


RE: VALVE HOUSE

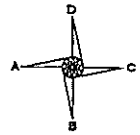
JOB DESCRIPTION	PARKLINE KENTUCKIANA LOUISVILLE, KY	PARKLINE, INC. P.O. Box 69 Fort Gay, WV 25213 Phone: (304) 396-2113	REVISIONS
DATE 7-19-00	SHEET TITLE ROOF PLAN		
DRAWN BY			
SCALE N.T.S.			
ORDER NO.			
REVISION 0			
DWG. NO. 000364-2			

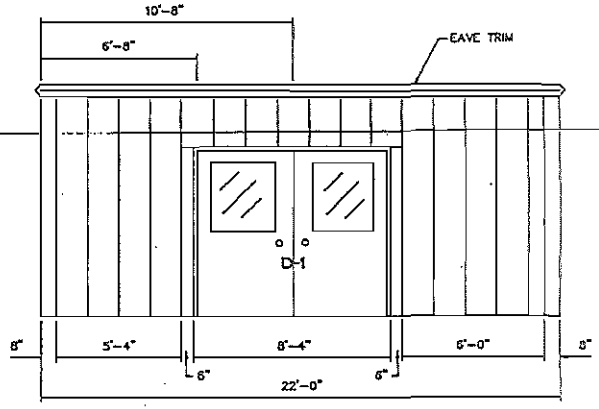
PROD #7284 Vol. 3

BUILDING FINISH
WALLS: TO BE SELECTED
TRIM: TO BE SELECTED
ROOF: GALVALUME



ELEVATION A (SOUTH)

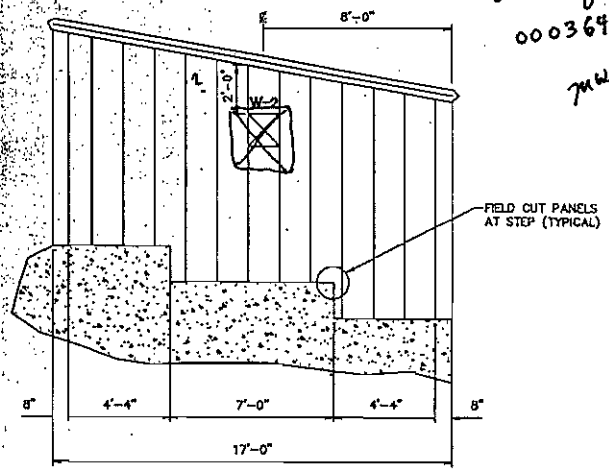




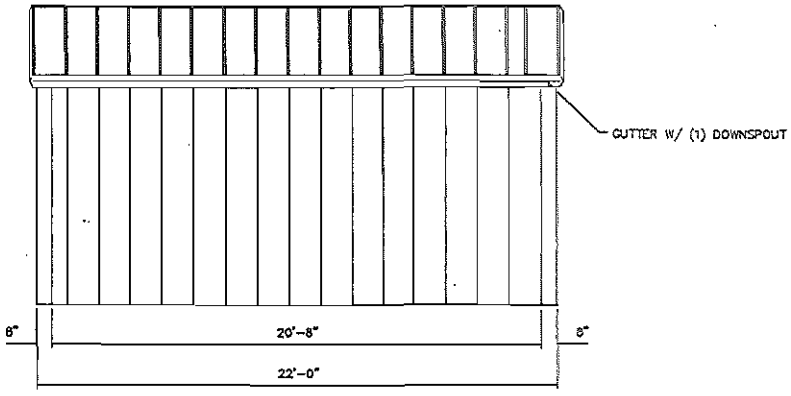
ELEVATION B (EAST)

D-1 – 8'-0"x 7' WALK DOOR
W-1 – 2'-8" WALL OPENING KIT (FOR LOUVER BY OTHERS) FIELD CUT
W-2 – 1'-4" WALL OPENING KIT (FOR EXHAUST DUCT BY OTHERS) FIELD CUT

+/- - see dwg 000364-1 mwb



ELEVATION C (NORTH)



ELEVATION D (WEST)

RE: VALVE HOUSE

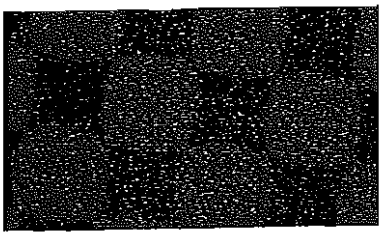
REVISIONS	BY
	???

PARKLINE, INC.
P O Box 65 Wayne, WV 25213
Phone: (304) 525-2113

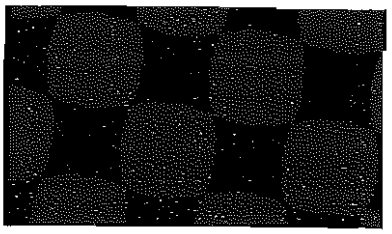
JOB DESCRIPTION: PARKLINE KENTUCKIANA LOUISVILLE, KY

SHEET TITLE: ELEVATIONS

DATE	7-19-06
DRAWN BY	RLS
SCALE	N.T.S
ORDER NO.	
REVISION	0
DWG. NO.	000364-4

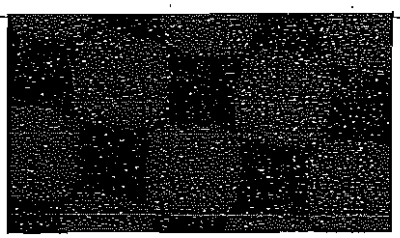


Shell Gray–Walls

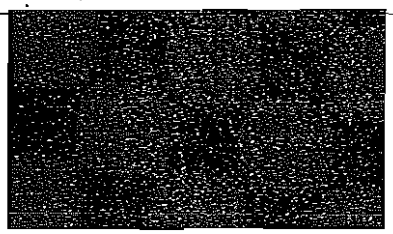


Twilight Blue–Walls

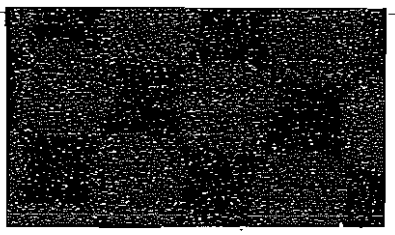
Arctic White–Walls, Trim
Arctic White–Roof *



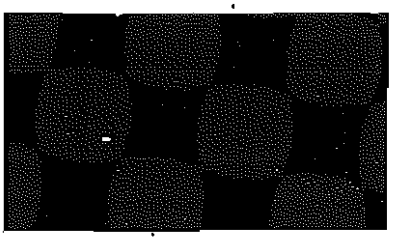
Laurel Green–Walls



Harvest Gold–Walls



Desert Tan–Walls



Roman Bronze–Walls, Trim, Fascia

COLOR FINISHES

Prefinished panels are designed to be attractive, as well as functional and durable. A variety of attractive standard colors are chosen to enhance the beauty of the building, as well as harmonize with the environment.

The standard coating system by Akzo Nobel Coatings, Inc. is applied in two parts: a specially formulated primer coat designed to provide maximum adhesion to the galvanized substrate, and a finish coat of siliconized polyester to give the maximum in appearance and durability.

Copies of warranties against loss of adhesion, cracking, peeling, flaking and excessive color change are available on request.

PARKLINE, INC.™
P.O. Box 65
Winfield, WV 25213
800-786-4855
304-586-2113
304-586-3842 FAX
http://www.parkline.com
E-Mail: parkline@parkline.com

* Parkline's standard roof is provided with a zinc and aluminum alloy coating and Arctic White is available at an additional cost.

NOTE: Factory produced color-coated metal panels will not exactly match the above standard color representations. Embossing will change the perception of color.

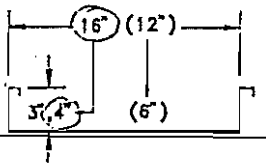
Due to products being constantly improved, data is subject to change without notice. Printed in U.S.A.

ROOF AND WALL PANEL DESIGN

ROOF PANEL DESIGN

Roof panels shall be supplied in a single continuous length from eave to ridge line, Gable (AL), or eave line, Shed (S), and shall be designed to tightly interlock so that no fastners are required at intermediate points along the panel side laps.

Roof panels shall be a maximum of 16" wide with a flat surface between the interlocking side ribs. The interlocking ribs shall be a minimum 3" high, and shall be turned upwards. All roof panels shall be factory punched for connection at the eave of the building.



ROOF PANEL FINISH (STANDARD)

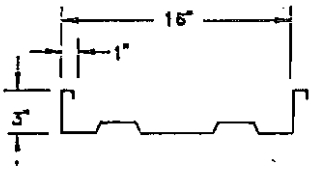
Roof panels shall be nominal 24 gauge steel coated on both sides with a coating of corrosion resistant aluminum zinc alloy applied by a continuous hot dipping process. Coating weight shall be a minimum of 0.32 oz. of aluminum-zinc alloy per square foot of coated sheet (both sides) - equivalent to approximately 0.80 mil thickness on each side. Minimum yield strength of panel material shall be 50,000 PSI.

(Optional) PAINTED ROOF PANEL FINISH (Available at additional charge)

Roof panels shall be nominal 24 gauge galvanized steel conforming to ASTM A 525 specifications with the galvanized coating conforming to G90 (1-1/4 oz.) standards. Minimum yield strength of panel materials shall be 50,000 PSI. All exterior surfaces of the galvanized steel roof panels, shall receive two factory, roller applied, paint coats having a combined coating thickness of 0.8 to 1.2 mils of dry film thickness. The finished coat for roof panels shall be a white polyester formulation.

WALL PANEL DESIGN

Exterior wall panels of the building shall be a single continuous length from the base channel to the roof line of the building at the sidewalls and endwalls of the building except where interrupted by wall openings. Wall panels shall be maximum 16" wide with a 3" deep inward turned interlocking side rib. Wall panels shall contain two 3/4" deep by 3-1/8" wide fluted recesses, each starting 2-7/16" from each panel edge.



Wall panels shall be fastened internally to the base channel and eave cap of the building with 3/8" diameter electrogalvanized machine bolts placed within the panel interlock. The fastening system shall be designed so that no wall fasteners are exposed on the exterior surface of the walls.

Wall panels shall be nominal 24 gauge galvanized steel conforming to ASTM A 525 Specifications with the galvanized coating conforming G90 (1-1/4 oz.) standards. Minimum yield strength of panel material shall be 40,000 PSI. Panel material shall be embossed with a random pattern pebble embossure of approximately 0.007-0.008 depth.

The bases of the wall panels shall be closed off with polystyrene closures conforming to the panel profile.

WALL PANEL FINISH

All exterior surfaces of the galvanized steel wall panels and exterior trim shall receive two factory, roller applied, paint coats having a combined coating thickness of 0.8 to 1.2 mils of dry film thickness. The finished coat for wall panels shall be a siliconized polyester formulaiton of one of the following Parkline colors: Twilight Blue, Desert Tan Laurel Green, Arctic White, Harvest Gold, Roman Bronze or Shell Gray.

Exterior color coating shall meet the following performance standards after 10 years continuous exposure in normal* vertical atmospheric conditions.

A. Panels shall show no evidence of blistering, peeling, or chipping.

B. Panels shall not show surface chalking in excess of the No. 8 rating D 659-80 as established by American Socirty for Testing and Materials (ASTM).

C. Panels, after cleaning, shall not show color change in excess of five (5) NBS units when measured in accordance with the ASTM D 2244-85 standards.

The above performance standards shall not apply where panels have been damaged by fire, radiation or other physical damage.

* "Normal" atmospheric conditions exclude exposure to corrosives such as chemical fumes or salt spray.

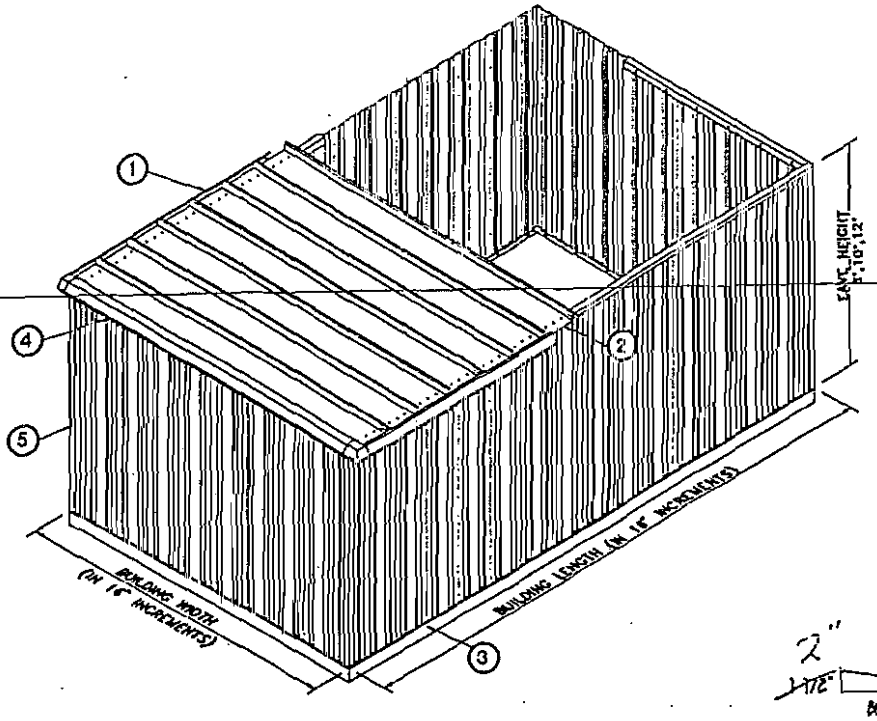
PARKLINE, INC.

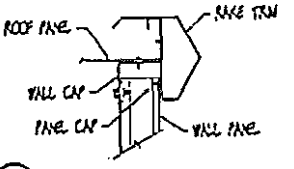
A - RWP

11-99

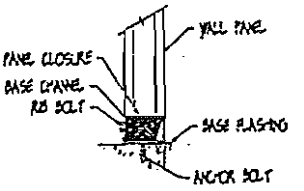
SINGLE SLOPE BUILDING

APPROVAL SHEET

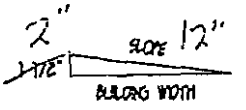


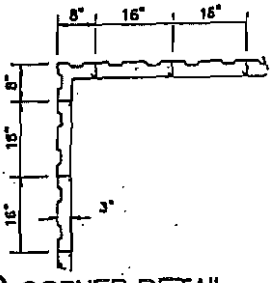


4 END WALL FASCIA

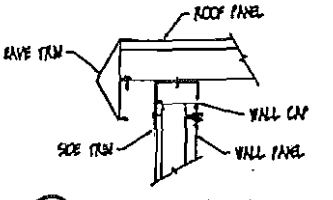


3 DETAIL AT BASE OF WALL

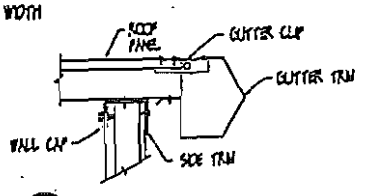




5 CORNER DETAIL



1 HIGH SIDE EAVE



2 LOW SIDE EAVE

TYPE S (TRIMLINE)

Roof Design

A. Each building roof shall have ~~1 1/2"~~ 2 on 12 pitch in building width. Roof panels shall be interlocking and attached to the wall cap through factory punched holes with #14 corrosion resistant fasteners.

B. The roof system shall include a gutter and downspout system at low sidewall and matching rake trim at the building endwalls. All gutters and trim shall be nominal 26 gauge galvanized steel prepainted Arctic White or Roman Bronze.

Structural Framing

Transmission of horizontal wind loads across the building shall be made through the panel roof system and no separate roof or wall diagonal bracing shall be required.

Where required for proper transmission of lateral wind loads, structural frame wind bents shall be installed.
Wind bents shall consist of a bolted column and rafter assembly of steel conforming to ASTM A 36 specifications.

PARKLINE, INC.

A-BS

11-99

WALK DOOR HARDWARE SCHEDULE

'ER # 364

Key	Qty.	Size	Type	Swing	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
D-1	1	8' 0" X 7' 0"	H	DSO		X	X		X			X			X		X	X		X		X

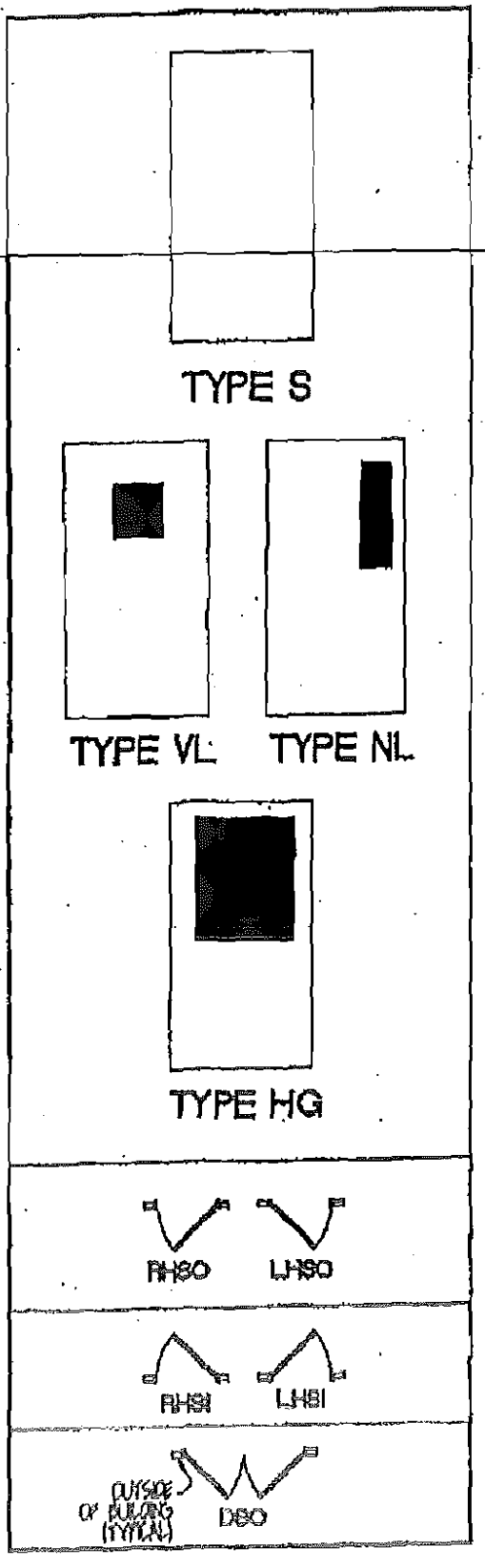
	OPTIONS	ANSI # / DESCRIPTION
A	Mortise Lock	ANSI A156.13, Series 1000, Grade 1, F13, 626
B	Weatherstripping	1/4" x 1/2" Silicone
C	Threshold -Inswing -Outswing	ANSI J32300 (In) ANSI J36300 (Out)
D	Hinges (STD. WT. Plain Bearing)	ANSI A5133
E	Hinges (STD. WT. BB NRP)	ANSI A5112
F	Hinges (HVY. WT. BB NRP)	ANSI A5111
G	Rim Panic Cross Bar	ANSI A156.3, F05, Grade 1, 627
H	Rim Panic Push Pad	ANSI A156.3, F08, Grade 1, 689/626
I	Cylindrical (KIKL)	ANSI A156.2, Series 4000, Grade 2, F81, 626
J	Passage Set	ANSI A156.2, Series 4000, Grade 2, F75, 626
K	Closer with Hold Open Arm	ANSI A156.4, C02081, 689
L	Louver	22" x 20" Adjustable (155 Square Inches of free area)
M	Head & Foot Bolts (Double Door Only)	ANSI 156.16 L04151
N	Insulated Leaf	
O	Finish Paint	
P	18 Ga. Leaf	
Q	Transom	
R	Glazing H[X] N[ ] V[ ]	[X] 1/4" Polished (Clr) Wire [ ]1/4"Acrylic [ ]1/4" Polycarbonate
		NOTE: (6) BUILDING ORDER. ALL DOORS KEYED ALIKE.

PARKLINE, INC.

A-DS

APPROVAL SHEET

HOLLOW METAL DOOR



PRODUCT DESCRIPTION

DOOR LEAVES - Shall be of types indicated below.

- ☐ 10" X 10" Vision Lite (Type VL)
- ☐ Solid Panel (Type S)
- ☒ Narrow lite, top with 5" x 30", 1/4" acrylic glazing (standard), solid bottom. (Type NL)
- ☐ Half glass, top open for glazing, solid bottom. (Type HG) Nominal Glass Sizes:

  2470 - 12" x 30"
  3070 - 20" x 30"
  3870 - 28" x 30"

Preglazing options for half glass and narrow lites:

- ☐ 1/4" Acrylic
- ☐ 1/4" Polycarbonate
- ☒ 1/4" Clear Wire

STANDARD DOOR HARDWARE:

A: Mortise lockset per ANSI A156.13. Series 1000, Grade 1, F13, 626 Satin Chrome Finish. (levers both sides)

B: 1/4" x 1/2" silicone rubber weatherstripping.

C: 3 11/16" wide x 5/8" high extruded aluminum threshold. (out swing)

D: (3) 4-1/2" steel hinges per ANSI # A5133 630 Satin Stainless Steel Finish with non-rising pins.

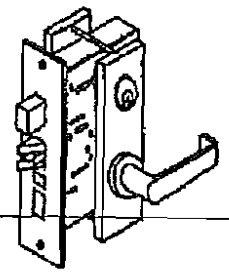
NOTE:
Refer to Walk Door Hardware Schedule, Floor Plan, and Elevation Drawing for exact size and location of accessories.

PARKLINE, INC.

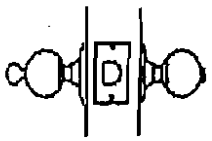
A-DL
02-00

APPROVAL SHEET

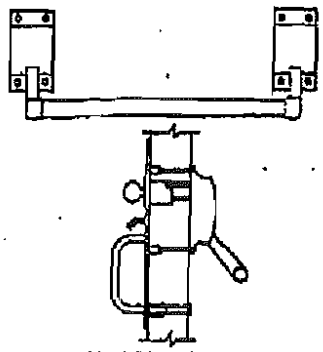
HOLLOW METAL DOOR
(Optional Hardware)



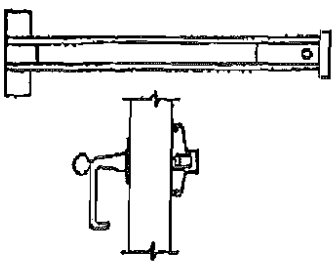
MORTISE LOCKSET



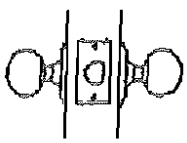
CYLINDRICAL KEY IN KNOB LOCKSET



CROSS BAR



PUSH PAD



PASSAGE SET

PRODUCT DESCRIPTION

OPTIONAL DOOR HARDWARE:

E. (3) 4-1/2" steel hinges per ANSI# A5112 std. wt., ball bearing, 630 Satin Stainless Steel Finish with non-rising pins.

F. (3) 4-1/2" steel hinges per ANSI# A5111 heavy wt., ball bearing, 630 Satin Stainless Steel Finish with non-rising pins.

G. Rim type "Cross Bar" panic device per ANSI A156.3, Type 1, Grade 1, F05, 627 Satin Aluminum Finish.

H. Rim type "Push Pad" panic device built to ANSI A156.3, Type 1, Grade 1, F08, 626 Satin Chrome Finish (exterior), 689 Aluminum Lacquer Finish (interior).

I. Cylindrical key in knob lockset per ANSI A156.2, Series 4000, Grade 2, F81, 630 Satin Stainless Steel Finish.

J. Passage set per ANSI A156.2, Series 4000, Grade 2, F75, 626 Satin Chrome Finish.

K. Door closer is certified to conform to ANSI 156.4 Grade 1 and meets exterior barrier free codes in 689 Aluminum Lacquer Finish.

L. 23" wide x 20" high adjustable blade louver with mesh insect screen.

N. Insulated foamed-in-place, rigid, closed cell polyurethane core chemically bonded to 20 gauge galvanized steel face sheets. Insulated leaves have STC rating 22 and U value .07.

O. Factory painted to match wall color.

P. 18 gauge galvanized steel leaves.

Q. Permanent or removable transoms.

NOTE:

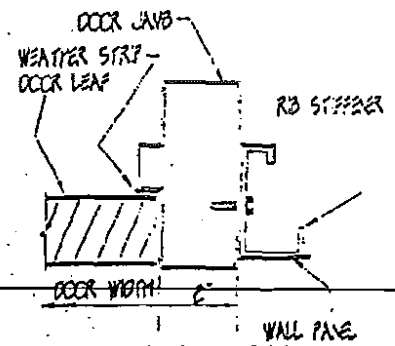
Refer to Walk Door Hardware Schedule, Floor Plan, and Elevation Drawing for exact size and location of accessories.

PARKLINE, INC.

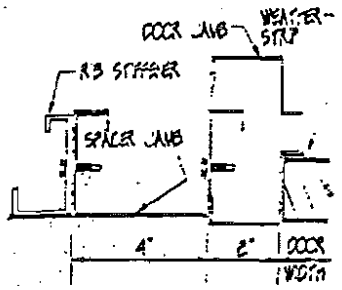
A-DH

11-99

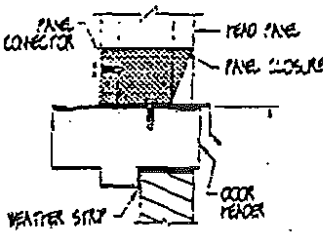
HOLLOW METAL DOOR

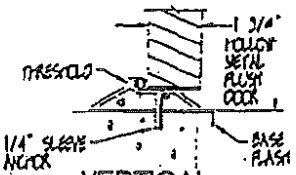


JAMB SECTION
2470 AND 3070



JAMB SECTION
W/ 4" SPACER JAMB
BOTH SIDES 3070
LEFT SIDE 6070





VERTICAL SECTION

PRODUCT DESCRIPTION

DOOR LEAF

Door leaves shall be 1 3/4" thick flush construction of a nominal 20 gauge galvanized steel, reinforced by lamination to a small cell honeycomb core. Leaves shall be manufactured in accordance with ANSI/SDI-100, Grade 1, Model 1 (STD rating 30 and U value .41).

DOOR FRAME

Door frames shall be 4 3/4" deep, double rebated type, of nominal 16 gauge galvanized steel. Frames shall have hinge reinforcement of a nominal 7 gauge and lock reinforcement of a nominal 16 gauge.

DOOR FINISH

All leaves and frames shall be factory painted with one coat of baked on primer.

DOOR ASSEMBLY

All doors shall be provided "assembled" in their frames with all hardware, except door levers or knobs, installed on door leaf. 6'0" x 7'0" double swing doors require some field assembly.

NOTE :

Refer to Floor Plan and Elevation Drawing for exact size and location of accessories.

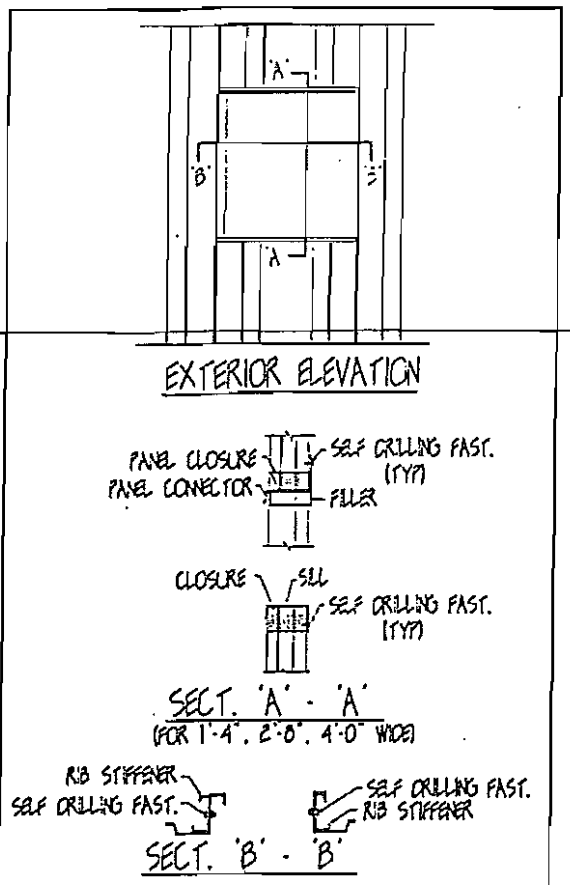
PARKLINE, INC.

A - DF

APPROVAL SHEET

SPECIAL OPENING

PRODUCT DESCRIPTION



Wall Opening Kit

WALL OPENING KIT

All necessary framing and connectors to structurally replace the panels removed by wall opening. All trim and flashings required to make a unit placed in the opening weathertight, shall be provided by the supplier of the unit being installed.

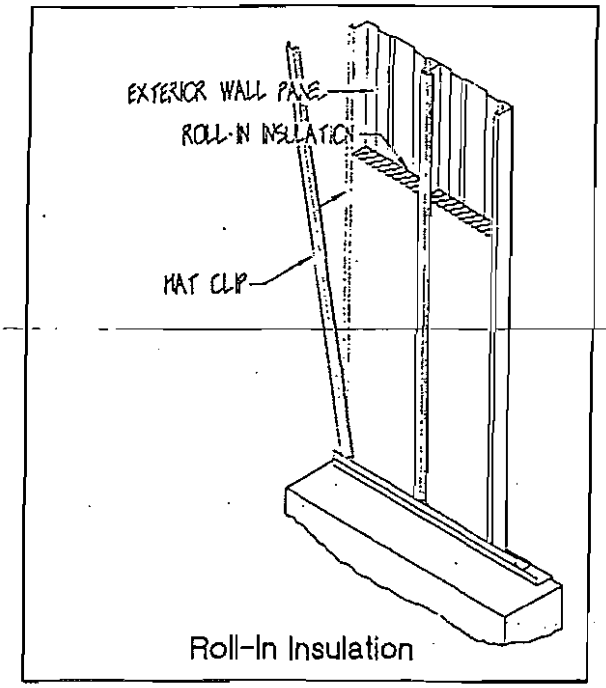
NOTE :

Refer to Floor Plan and Elevation Drawing for exact size and location of accessories.

PARKLINE, INC.

A - W□

11-99



Roll-In Insulation

WALL INSULATION

PRODUCT DESCRIPTION

ROLL-IN INSULATION

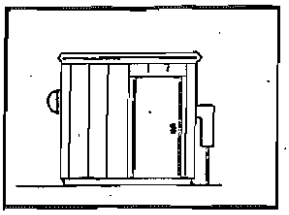
The interior of the building shall be insulated with 3" thick fiberglass faced on its exposed side with a white metalized polypropylene scrimkraft facing. The insulation shall be retained between the interlocking panel ribs with a white PVC hat clip attached with #8 screw over the panel ribs.

SYSTEM VALUES		U	R
3' THICK	C	.19	5.4

PARKLINE, INC.

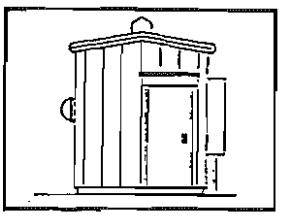
A - RIN

11-99



PARKLINE, INC.
P.O. Box 65
Winfield, WV 25213

SMALL INDUSTRIAL BUILDING



Parkline Order Number : 365 (CVH)
Customer : PARKLINE KENTUCKIANA
11'- 0'' Wide x 18'- 0'' Long x 9'- 0'' High - Type S2
Colors : ?? Walls, ?? Trim, GL Roof
Live Load : 20 PSF. Wind Load : 80 MPH
Customer Ref :

Floor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-13120-00|B
Reviewed By: DRO
Date: 8/22/00

365-1	FLOOR PLAN
365-2	ROOF PLAN
365-4	WALL ELEVATIONS
CLR-CHT	COLOR CHART
A- RWP	ROOF AND WALL PANEL DESIGN
A- FDN	BUILDING FOUNDATION
A- BS	SINGLE SLOPE BUILDINGS
A- RIN	ROLL-IN WALL INSULATION
A- DS	DOOR HARDWARE SCHEDULE
A- DL	HOLLOW METAL DOOR LEAF
A- DH	HOLLOW METAL DOOR HARDWARE
A- DF	HOLLOW METAL DOOR DETAILS
A- WO	WALL OPENING KIT
A- RIS	BLANKET ROOF INSULATION (TYPE 'S')
A- RIN	ROLL IN WALL INSULATION

[X] A - Conforms to the Subcontract Requirements
~~[X] B - Minor Comment - Incorporate and Resubmit~~ M.B.
[ ] C - Revise and Resubmit
Sig: MW Date: 8/30/00

1. Dwgs 000365-001 & 4
Rev 0 - N/A
Rev 1 - OK
2. Walls - Laurel Green
3. Trim - Arctic White
4. Door - Laurel Green
MWB

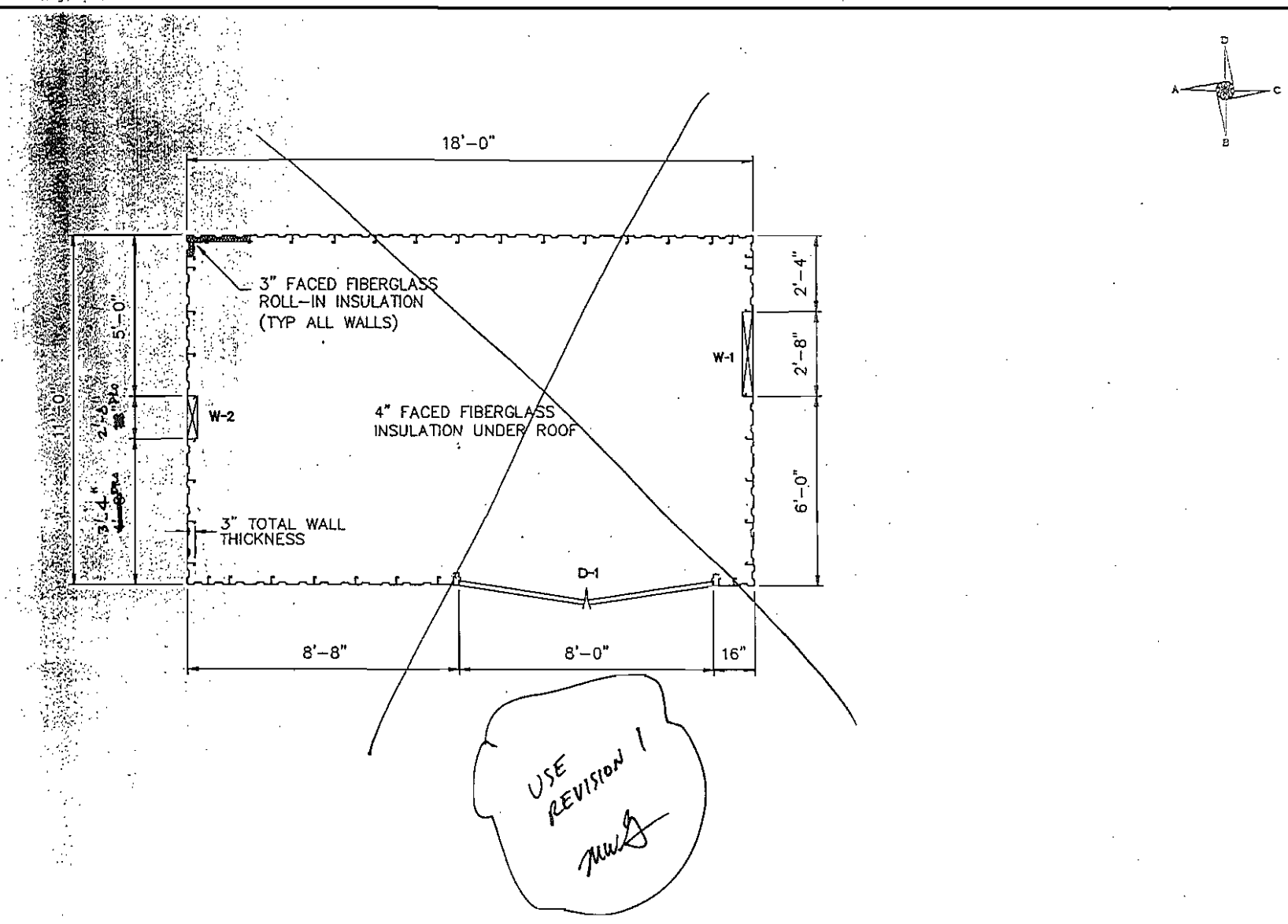
Thomas W. Harding
7-31-00

INFORMATION ONLY

APPROVAL DRAWING PACKAGE

PLEASE REVIEW AND VERIFY ALL DIMENSIONS ON FLOOR PLAN, ELEVATIONS, AND ROOF PLAN AND RETURN THOSE DRAWINGS WITH ANY CORRECTIONS MARKED IN RED

DUE TO PRODUCTS BEING CONSTANTLY IMPROVED, DATA IS SUBJECT TO CHANGE WITHOUT NOTICE.



RE: CONTROL VALVE HOUSE

REVISIONS	BY

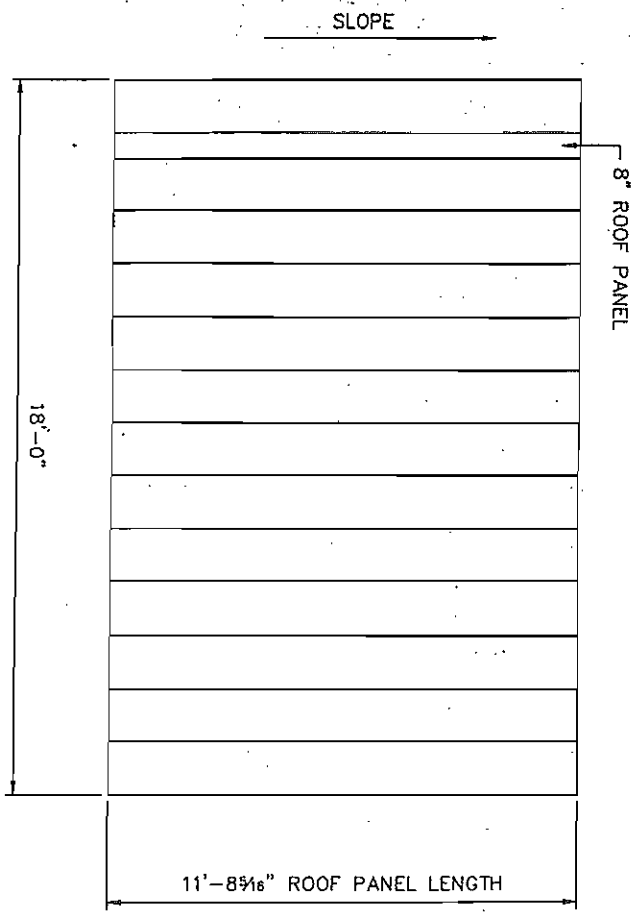
PARKLINE, INC.
P.O. Box 65 Louisville, KY 40213
Phone (502) 585-2113

JOB DESCRIPTION
PARKLINE KENTUCKIANA
LOUISVILLE, KY

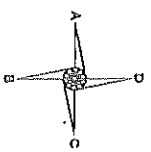
SHEET TITLE
FLOOR PLAN

DATE	7-21-00
DRAWN BY	PLR
SCALE	N.T.S.
ORDER NO.	
REVISION	0
DWG. NO.	000365-1

24 GA. 7½" RIB ROOF PANELS
FACTORY FINISH GALVALUME



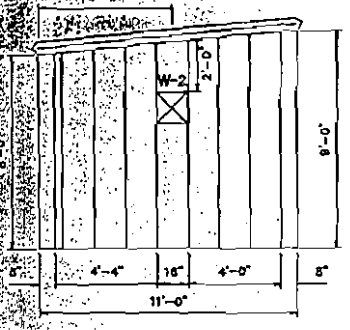
RE: CONTROL VALVE HOUSE



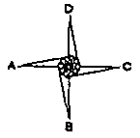
DWG. NO.	000365-2
REVISION	0
DRWR NO.	
SCALE	N.T.S.
DRAWN BY	RLS
DATE	7-21-09
JOB DESCRIPTION	PARKLINE KENTUCKIANA LOUISVILLE, KY
SHEET TITLE	ROOF PLAN

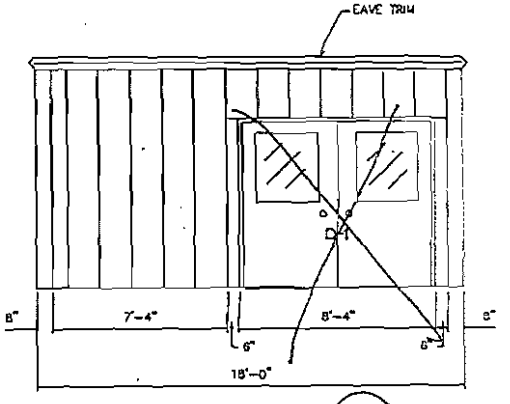
PARKLINE, INC.
P.O. Box 65 [illegible], WV 25213
Phone: (304) [illegible]

REVISIONS



ELEVATION A (SOUTH)





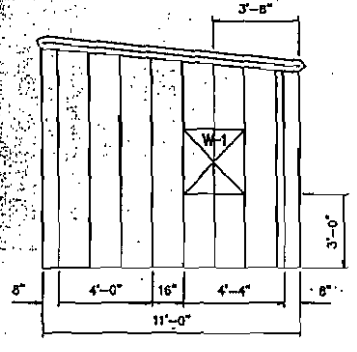
ELEVATION B (EAST)

USE REV 1 mwg 8/20/00

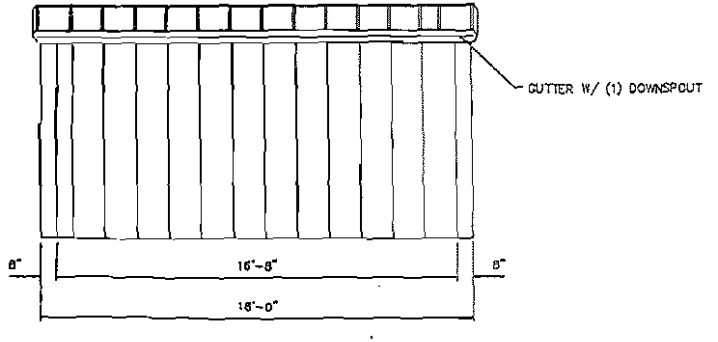
D-1 – 8'-0"x 7' WALK DOOR
W-1 – 2'-8" WALL OPENING KIT (FOR LOUVER BY OTHERS) FIELD CUT
W-2 – 1'-4" WALL OPENING KIT (FOR EXHAUST DUCT BY OTHERS) FIELD CUT

BUILDING FINISH

WALLS: TO BE SELECTED
TRIM: TO BE SELECTED
ROOF: GALVALUME



ELEVATION C (NORTH)



ELEVATION D (WEST)

RE: CONTROL VALVE HOUSE

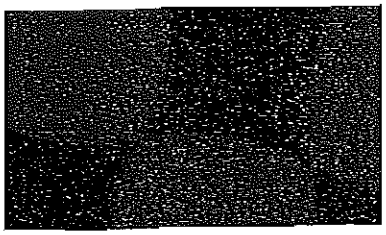
REVISIONS

PARKLINE INC.
P.O. BOX 65 [illegible], WV 25011
PHONE: (304) 415-2011

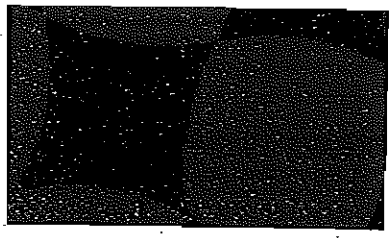
JOB DESCRIPTION: PARKLINE KENTUCKIANA LOUISVILLE, KY

SHEET TITLE: ELEVATIONS

DATE	7-21-00
DRAWN BY	BLH
SCALE	N.T.S.
ORDER NO.	
REVISION	0
DWG. NO.	000365-4

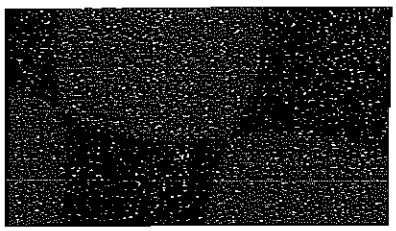


Shell Gray–Walls

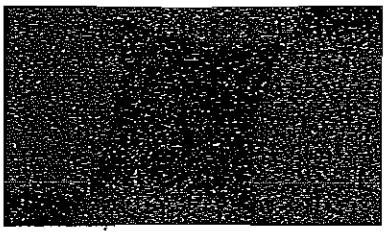


Twilight Blue–Walls

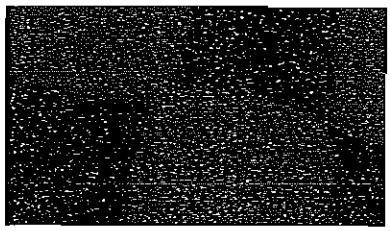
Arctic White–Walls, Trim
Arctic White–Roof *



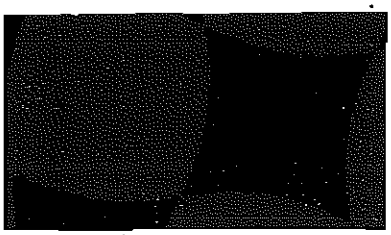
Laurel Green–Walls



Harvest Gold–Walls



Desert Tan–Walls



Roman Bronze–Walls, Trim, Fascia

COLOR FINISHES

Prefinished panels are designed to be attractive, as well as functional and durable. A variety of attractive standard colors are chosen to enhance the beauty of the building, as well as harmonize with the environment.

The standard coating system by Akzo Nobel Coatings, Inc. is applied in two parts: a specially formulated primer coat designed to provide maximum adhesion to the galvanized substrate, and a finish coat of siliconized polyester to give the maximum in appearance and durability.

Copies of warranties against loss of adhesion, cracking, peeling, flaking and excessive color change are available on request.

PARKLINE, INC.™

P.O. Box 65
Winfield, WV 25213
800-786-4855
304-586-2113
304-586-3842 FAX
http://www.parkline.com
E-Mail: parkline@parkline.com

* Parkline's standard roof is provided with a zinc and aluminum alloy coating and Arctic White is available at an additional cost.

NOTE: Factory produced color coated metal panels will not exactly match the above standard color representations. Embossing will change the perception of color.

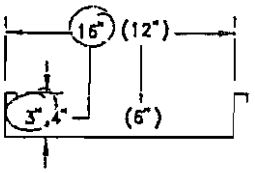
Due to products being constantly improved, data is subject to change without notice. Printed in U.S.A. CC 7-98 (20M)

ROOF AND WALL PANEL DESIGN

ROOF PANEL DESIGN

Roof panels shall be supplied in a single continuous length from eave to ridge line, Gable (AL), or eave line, Shed (S), and shall be designed to tightly interlock so that no fastners are required at intermediate points along the panel side laps.

Roof panels shall be a maximum of 16" wide with a flat surface between the interlocking side ribs. The interlocking ribs shall be a minimum 3" high, and shall be turned upwards. All roof panels shall be factory punched for connection at the eave of the building.



ROOF PANEL FINISH (STANDARD)

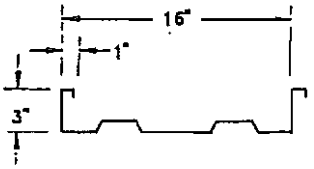
Roof panels shall be nominal 24 gauge steel coated on both sides with a coating of corrosion resistant aluminum zinc alloy applied by a continuous hot dipping process. Coating weight shall be a minimum of 0.32 oz. of aluminum–zinc alloy per square foot of coated sheet (both sides) – equivalent to approximately 0.80 mil thickness on each side. Minimum yield strength of panel material shall be 50,000 PSI.

(Optional) PAINTED ROOF PANEL FINISH (Available at additional charge)

Roof panels shall be nominal 24 gauge galvanized steel conforming to ASTM A 525 specifications with the galvanized coating conforming to G90 (1–1/4 oz.) standards. Minimum yield strength of panel materials shall be 50,000 PSI. All exterior surfaces of the galvanized steel roof panels, shall receive two factory, roller applied, paint coats having a combined coating thickness of 0.8 to 1.2 mils of dry film thickness. The finished coat for roof panels shall be a white polyester formulation.

WALL PANEL DESIGN

Exterior wall panels of the building shall be a single continuous length from the base channel to the roof line of the building at the sidewalls and endwalls of the building except where interrupted by wall openings. Wall panels shall be maximum 16" wide with a 3" deep inward turned interlocking side rib. Wall panels shall contain two 3/4" deep by 3–1/8" wide fluted recesses, each starting 2–7/16" from each panel edge.



Wall panels shall be fastened internally to the base channel and eave cap of the building with 3/8" diameter electrogalvanized machine bolts placed within the panel interlock. The fastening system shall be designed so that no wall fasteners are exposed on the exterior surface of the walls.

Wall panels shall be nominal 24 gauge galvanized steel conforming to ASTM A 525 Specifications with the galvanized coating conforming G90 (1–1/4 oz.) standards. Minimum yield strength of panel material shall be 40,000 PSI. Panel material shall be embossed with a random pattern pebble embossure of approximately 0.007–0.008 depth.

The bases of the wall panels shall be closed off with polystyrene closures conforming to the panel profile.

WALL PANEL FINISH

All exterior surfaces of the galvanized steel wall panels and exterior trim shall receive two factory, roller applied, paint coats having a combined coating thickness of 0.8 to 1.2 mils of dry film thickness. The finished coat for wall panels shall be a siliconized polyester formulaiton of one of the following Parkline colors: Twilight Blue, Desert Tan Laurel Green, Arctic White, Harvest Gold, Roman Bronze or Shell Gray.

Exterior color coating shall meet the following performance standards after 10 years continuous exposure in normal* vertical atmospheric conditions.

A. Panels shall show no evidence of blistering, peeling, or chipping.

B. Panels shall not show surface chalking in excess of the No. 8 rating D 659–80 as established by American Socirty for Testing and Materials (ASTM).

C. Panels, after cleaning, shall not show color change in excess of five (5) NBS units when measured in accordance with the ASTM D 2244–85 standards.

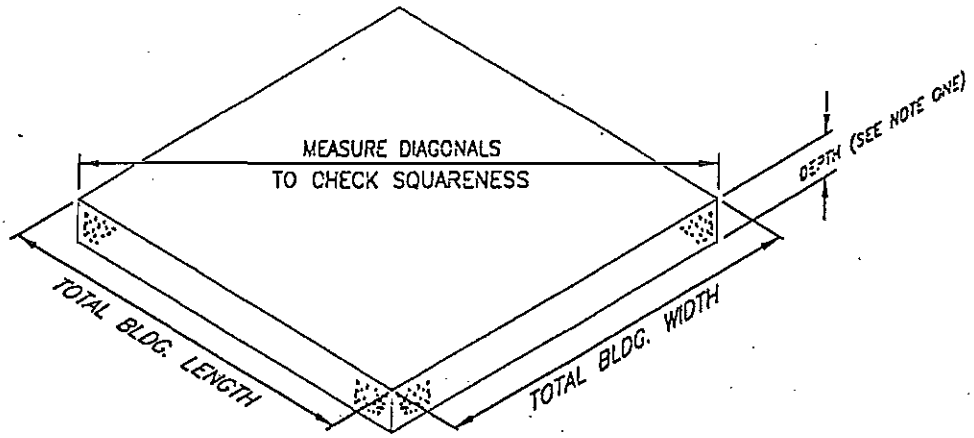
The above performance standards shall not apply where panels have been damaged by fire, radiation or other physical damage.

* "Normal" atmospheric conditions exclude exposure to corrosives such as chemical fumes or salt spray.

PARKLINE, INC.

A - RWP

BUILDING FOUNDATION



ALLOWABLE FOUNDATION TOLERANCES:

WIDTH AND LENGTH	± 1/8" in 12' ± 1/4" OVERALL
OUT OF SQUARE DIAGONALLY	± 1/2"
OUT OF LEVEL	± 1/8" in 20' ± 1/4" OVERALL

NOTE 1. ACTUAL FOUNDATION DESIGN MUST BE DONE BY AN ENGINEER FAMILIAR WITH LOCAL BUILDING CODES, SOIL CONDITIONS, ETC. IN THE AREA WHERE THE BUILDING IS TO BE CONSTRUCTED. THE TABULATION BELOW SHOWS THE NOMINAL LOADS INDUCED INTO THE PERIMETER FOUNDATION WALL.

NOTE 2. ANCHORS ARE DRILL IN PLACE WEDGE TYPE PROVIDED BY PARKLINE, INC.

FOUNDATION LOAD REQUIREMENTS

	VERTICAL LOAD #/LIN.FT.				HORIZONTAL LOAD
	STANDARD DESIGN LOAD COMBONATIONS (LL/WL)				
BLDG. WIDTH	20/70	20/100	30/90	40/90	
5'-4" THRU 8'-0"	100	100	140	180	
10'-8" AND 12'-0"	150	150	210	270	
16'-0" THRU 24'-0"	300	300	420	420	150# PER LINEAL FOOT
26'-0" THRU 32'-0"	415	415	575	575	

THE VALUES SHOWN INCLUDE DEAD LOAD, LIVE LOAD AND WIND LOAD. ANY OTHER LOADS SUPPORTED BY THE BUILDING MUST BE ADDED AND THE FONDATION DESIGNED ACCORDINGLY.

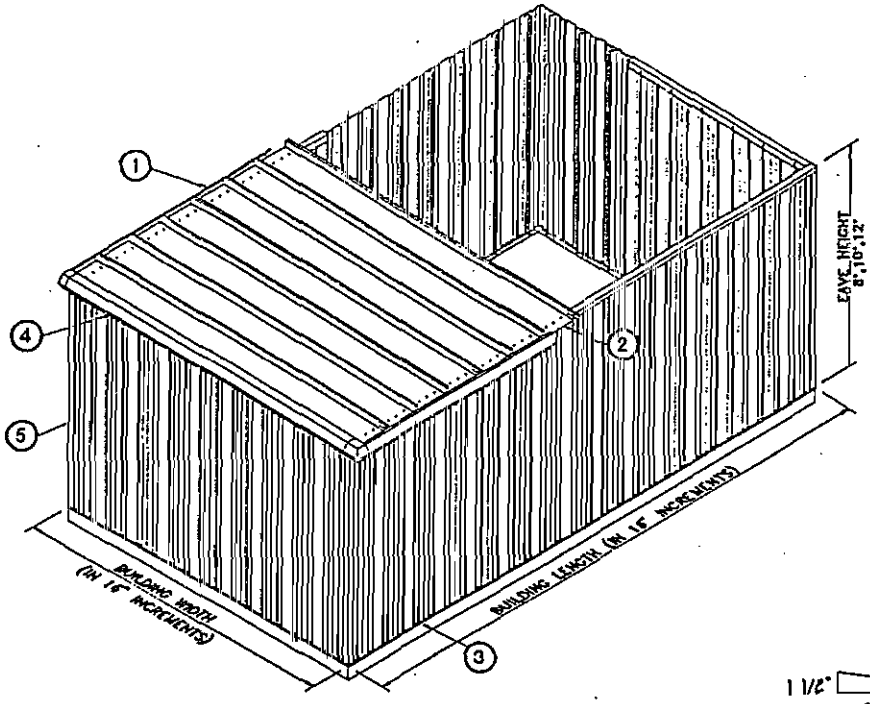
PARKLINE, INC.

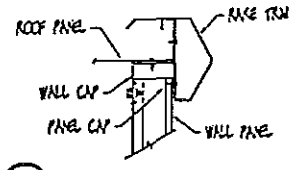
A - FDN

11-99

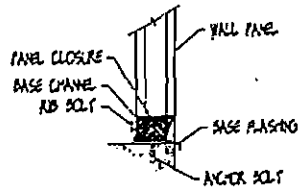
SINGLE SLOPE BUILDING

APPROVAL SHEET

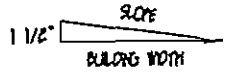


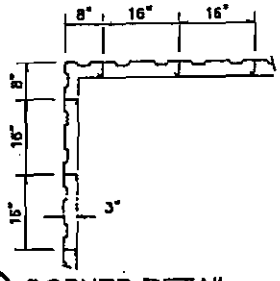


4 END WALL FASCIA

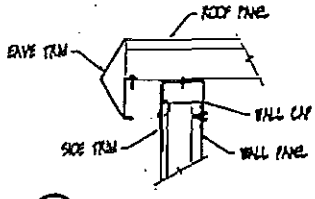


3 DETAIL AT BASE OF WALL

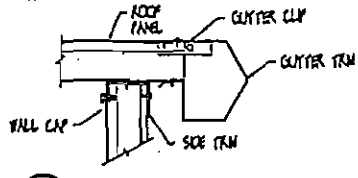




5 CORNER DETAIL



1 HIGH SIDE EAVE



2 LOW SIDE EAVE

TYPE S (TRIMLINE)

Roof Design

A. Each building roof shall have 1 1/2" pitch in building width. Roof panels shall be interlocking and attached to the wall cap through factory punched holes with #14 corrosion resistant fasteners.

B. The roof system shall include a gutter and downspout system at low sidewall and matching rake trim at the building endwalls. All gutters and trim shall be nominal 26 gauge galvanized steel prepainted Arctic White or Roman Bronze.

Structural Framing

Transmission of horizontal wind loads across the building shall be made through the panel roof system and no separate roof or wall diagonal bracing shall be required.

Where required for proper transmission of lateral wind loads, structural frame wind bents shall be installed.
Wind bents shall consist of a bolted column and rafter assembly of steel conforming to ASTM A 36 specifications.

PARKLINE, INC.

A-BS

11-99

WALK DOOR HARDWARE SCHEDULE

)ER # 365

Key	Qty.	Size	Type	Swing	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
D-1	1	4' 0" X 7' 0"	H	LHSO		X	X		X			X			X							X

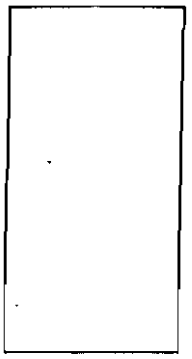
	OPTIONS	ANSI # / DESCRIPTION
A	Mortise Lock	ANSI A156.13, Series 1000, Grade 1, F13, 626
B	Weatherstripping	1/4" x 1/2" Silicone
C	Threshold -Inswing -Outswing	ANSI J32300 (In) ANSI J36300 (Out)
D	Hinges (STD. WT. Plain Bearing)	ANSI A5133
E	Hinges (STD. WT. BB NRP)	ANSI A5112
	'Iinges (HVY. WT. BB NRP)	ANSI A5111
G	Rim Panic Cross Bar	ANSI A156.3, F05, Grade 1, 627
H	Rim Panic Push Pad	ANSI A156.3, F08, Grade 1, 689/626
I	Cylindrical (KIKL)	ANSI A156.2, Series 4000, Grade 2, F81, 626
J	Passage Set	ANSI A156.2, Series 4000, Grade 2, F75, 626
K	Closer with Hold Open Arm	ANSI A156.4, C02081, 689
L	Louver	22" x 20" Adjustable (155 Square Inches of free area)
M	Head & Foot Bolts (Double Door Only)	ANSI 156.16 L04151
N	Insulated Leaf	
O	Finish Paint	
P	18 Ga. Leaf	
Q	Transom	
R	Glazing H[X]N[ ] V[ ]	[X] 1/4" Polished (Clr) Wire [ ]1/4"Acrylic [ ]1/4" Polycarbonate

PARKLINE, INC.

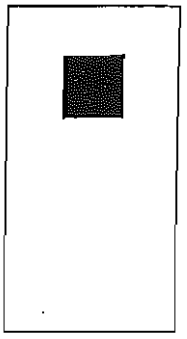
A-DS

APPROVAL SHEET

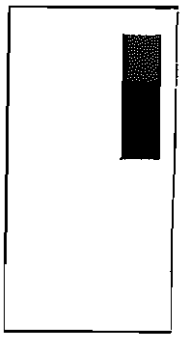
HOLLOW METAL DOOR



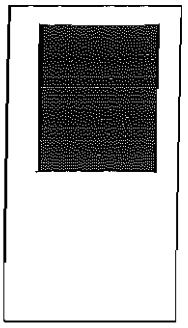
TYPE S



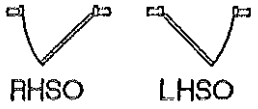
TYPE VL



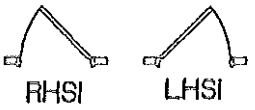
TYPE NL



TYPE HG



RHSO LHSO



RHSI LHSI

OUTSIDE OF BUILDING (TYPICAL)

DSO

PRODUCT DESCRIPTION

DOOR LEAVES – Shall be of types indicated below.

- ☐ 10" X 10" Vision Lite (Type VL)
- ☐ Solid Panel (Type S)
- ☐ Narrow lite, top with 5" x 30", 1/4" acrylic glazing (standard), solid bottom. (Type NL)
- ☒ Half glass, top open for glazing, solid bottom. (Type HG) Nominal Glass Sizes:

  2470 – 12" x 30"
  3070 – 20" x 30"
  3870 – 28" x 30"

Preglazing options for half glass and narrow lites:

- ☐ 1/4" Acrylic
- ☐ 1/4" Polycarbonate
- ☒ 1/4" Clear Wire

STANDARD DOOR HARDWARE:

A: Mortise lockset per ANSI A156.13, Series 1000, Grade 1, F13, 626 Satin Chrome Finish. (levers both sides)

B: 1/4" x 1/2" silicone rubber weatherstripping.

C: 3 11/16" wide x 5/8" high extruded aluminum threshold. (out swing)

D: (3) 4-1/2" steel hinges per ANSI # A5133 630 Satin Stainless Steel Finish with non-rising pins.

NOTE:

Refer to Walk Door Hardware Schedule, Floor Plan, and Elevation Drawing for exact size and location of accessories.

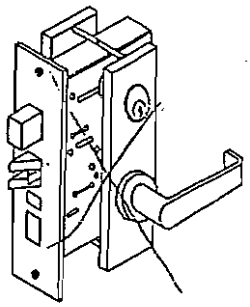
PARKLINE, INC.

A-DL

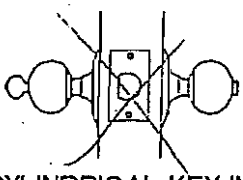
02-03

APPROVAL SHEET

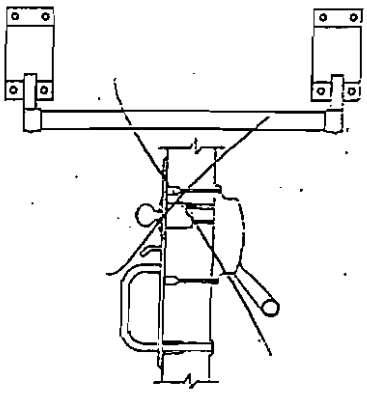
HOLLOW METAL DOOR
(Optional Hardware)



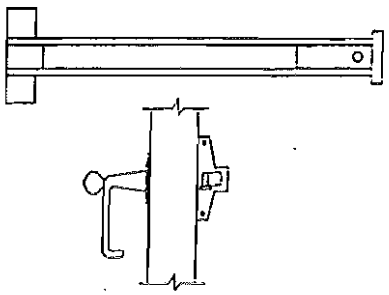
MORTISE LOCKSET



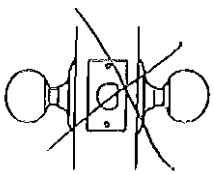
CYLINDRICAL KEY IN KNOB LOCKSET



CROSS BAR



PUSH PAD



PASSAGE SET

PRODUCT DESCRIPTION

OPTIONAL DOOR HARDWARE:

E. (3) 4-1/2" steel hinges per ANSI# A5112 std. wt., ball bearing, 630 Satin Stainless Steel Finish with non-rising pins.

F. (3) 4-1/2" steel hinges per ANSI# A5111 heavy wt., ball bearing, 630 Satin Stainless Steel Finish with non-rising pins.

G. Rim type "Cross Bar" panic device per ANSI A156.3, Type 1, Grade 1, F05, 627 Satin Aluminum Finish.

H. Rim type "Push Pad" panic device built to ANSI A156.3, Type 1, Grade 1, F08, 626 Satin Chrome Finish (exterior), 689 Aluminum Lacquer Finish (interior).

I. Cylindrical key in knob lockset per ANSI A156.2, Series 4000, Grade 2, F81, 630 Satin Stainless Steel Finish.

J. Passage set per ANSI A156.2, Series 4000, Grade 2, F75, 626 Satin Chrome Finish.

K. Door closer is certified to conform to ANSI 156.4 Grade 1 and meets exterior barrier-free codes in 689 Aluminum Lacquer Finish.

L. 23" wide x 20" high adjustable blade louver with mesh insect screen.

N. Insulated foamed-in-place, rigid, closed cell polyurethane core chemically bonded to 20 gauge galvanized steel face sheets. Insulated leaves have STC rating 22 and U value .07.

O. Factory painted to match wall color.

P. 18 gauge galvanized steel leaves.

Q. Permanent or removable transoms.

NOTE:

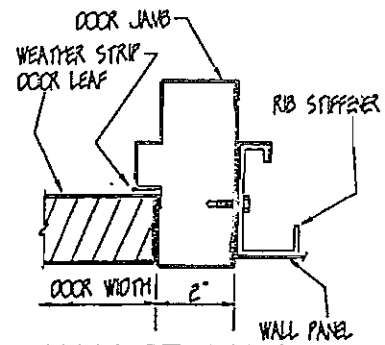
Refer to Walk Door Hardware Schedule, Floor Plan, and Elevation Drawing for exact size and location of accessories.

PARKLINE, INC.

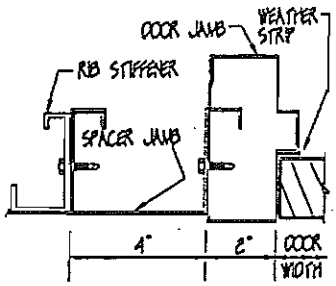
A-DH

11 93

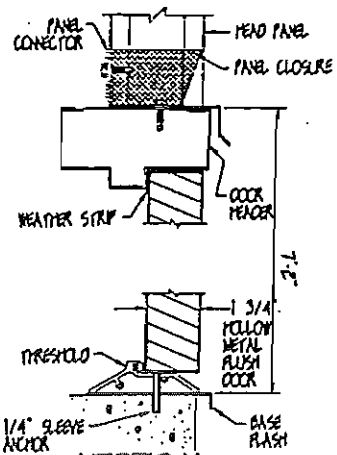
HOLLOW METAL DOOR



JAMB SECTION
2470 AND 3070



JAMB SECTION
W/ 4" SPACER JAMB
BOTH SIDES 3070
LEFT SIDE 6070



VERTICAL SECTION

NOTE :

Refer to Floor Plan and Elevation Drawing for exact size and location of accessories.

PRODUCT DESCRIPTION

DOOR LEAF

Door leaves shall be 1 3/4" thick flush construction of a nominal 20 gauge galvanized steel, reinforced by lamination to a small cell honeycomb core. Leaves shall be manufactured in accordance with ANSI/SDI-100, Grade I, Model 1 (STC rating 30 and U value .41).

DOOR FRAME

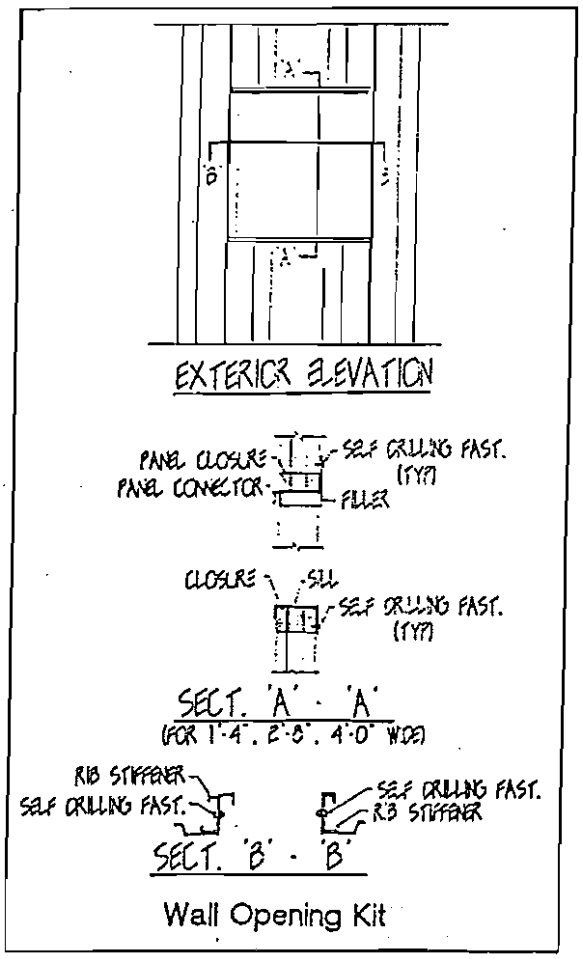
Door frames shall be 4 3/4" deep, double rabbeted type, of nominal 16 gauge galvanized steel. Frames shall have hinge reinforcement of a nominal 7 gauge and lock reinforcement of a nominal 16 gauge.

DOOR FINISH

All leaves and frames shall be factory painted with one coat of baked on primer.

DOOR ASSEMBLY

All doors shall be provided "assembled" in their frames with all hardware, except door levers or knobs, installed on door leaf. 6'0" x 7'0" double swing doors require some field assembly.



Wall Opening Kit

SPECIAL OPENING

PRODUCT DESCRIPTION

WALL OPENING KIT

All necessary framing and connectors to structurally replace the panels removed by wall opening. All trim and flashings required to make a unit placed in the opening weathertight, shall be provided by the supplier of the unit being installed.

NOTE :

Refer to Floor Plan and Elevation Drawing for exact size and location of accessories.

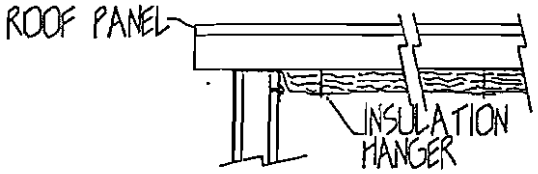
PARKLINE, INC.

A - W0

11 99

APPROVAL

SHEET



'S' TYPE BLDG.

BLANKET ROOF INSULATION

ROOF INSULATION

PRODUCT DESCRIPTION

BLANKET ROOF INSULATION

Roof insulation shall consist of 48" wide, .6# density fiberglass faced on its exposed side with a white metalized polyproplene scrimkraft facing. The faced insulation material shall have a UL Flame Spread Rating of 25 when tested in accordance with UL 723 ASTM E 84 procedures.

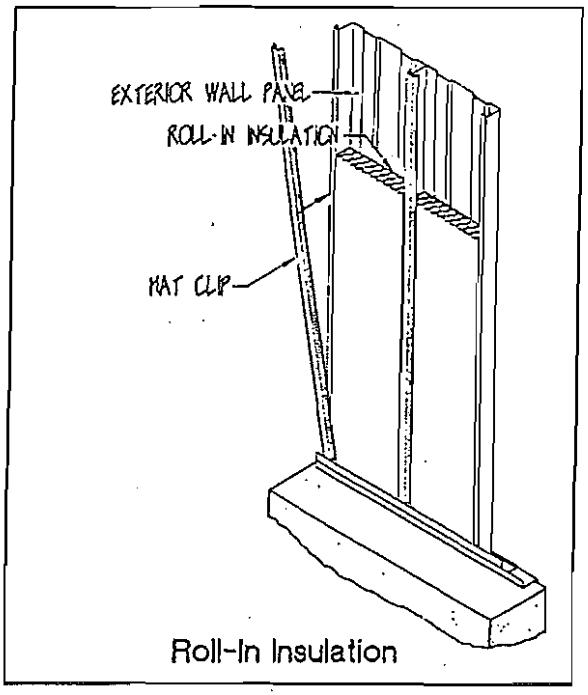
Insulation shall be supported at the roof line by means of mechanical clips spaced on maximum 4' centers and shall be sealed by means of 2" side tab on the facing.

	SYSTEM VALUES		U	R
	3' THICK	C	.10	10.4
X	4' THICK	C	.08	13.2
	6' THICK	C	.05	19.3

PARKLINE, INC.

A - RTS

11-99



Roll-In Insulation

WALL INSULATION

PRODUCT DESCRIPTION

ROLL-IN INSULATION

The interior of the building shall be insulated with 3" thick fiberglass faced on its exposed side with a white metalized polypropylene scrimkraft facing. The insulation shall be retained between the interlocking panel ribs with a white PVC hat clip attached with #8 screw over the panel ribs.

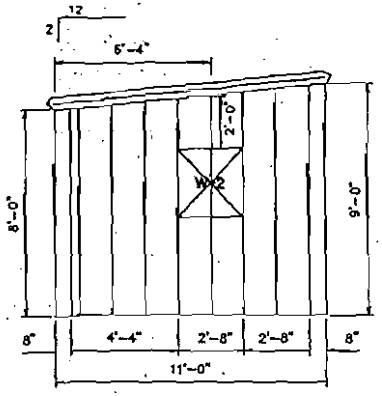
SYSTEM VALUES		U	R
3" THICK	C	.19	5.4

PARKLINE, INC.

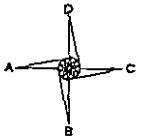
A – RIN

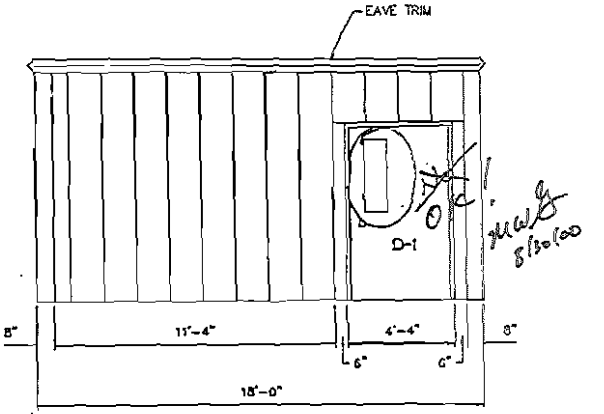
11-99

PROD #7284 Vol. 3



ELEVATION A (SOUTH)



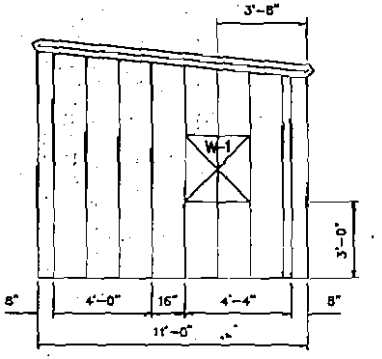


ELEVATION B (EAST)

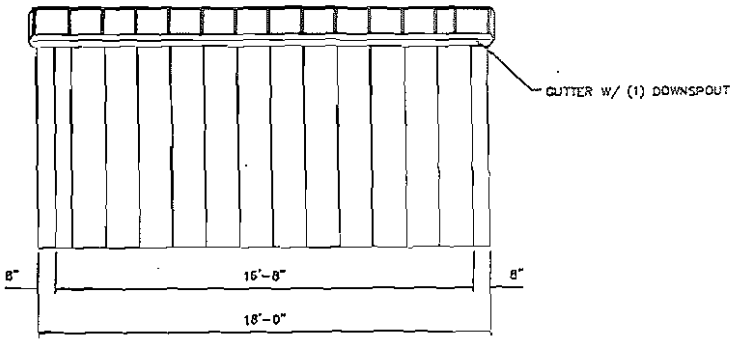
D-1 = 4'-0" x 7' WALK DOOR
W-1 = 2'-8" WALL OPENING KIT (FOR LOUVER BY OTHERS) FIELD CUT
W-2 = 2'-8" WALL OPENING KIT (FOR EXHAUST DUCT BY OTHERS) FIELD CUT

BUILDING FINISH

WALLS: TO BE SELECTED
TRIM: TO BE SELECTED
ROOF: GALVALUME



ELEVATION C (NORTH)



ELEVATION D (WEST)

RE: CONTROL VALVE HOUSE

REVISIONS	BY
8-16-00	[illegible]

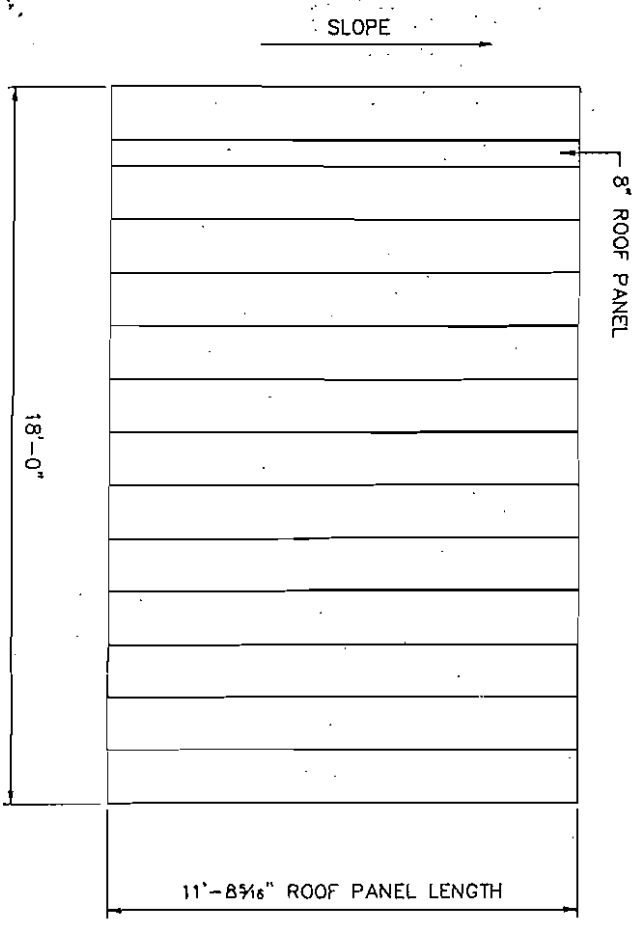
P O Box 65 [illegible], WV 25213
Phone: (304) 553-2113

PARKLINE KENTUCKIANA
LOUISVILLE, KY

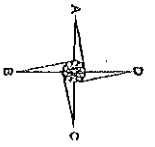
ELEVATIONS

DATE	7-21-00
DRAWN BY	[illegible]
SCALE	N.T.S.
ORDER NO.	
REVISION	1
DWG. NO.	000365-A

24 GA. 3" RIB ROOF PANELS
FACTORY FINISH: GALVALUME



RE: CONTROL VALVE HOUSE



DWG. NO.	C00065-2
REVISION	0
ORDER NO.	
SCALE	N.T.S.
DRAWN BY	DLR
DATE	7-21-08

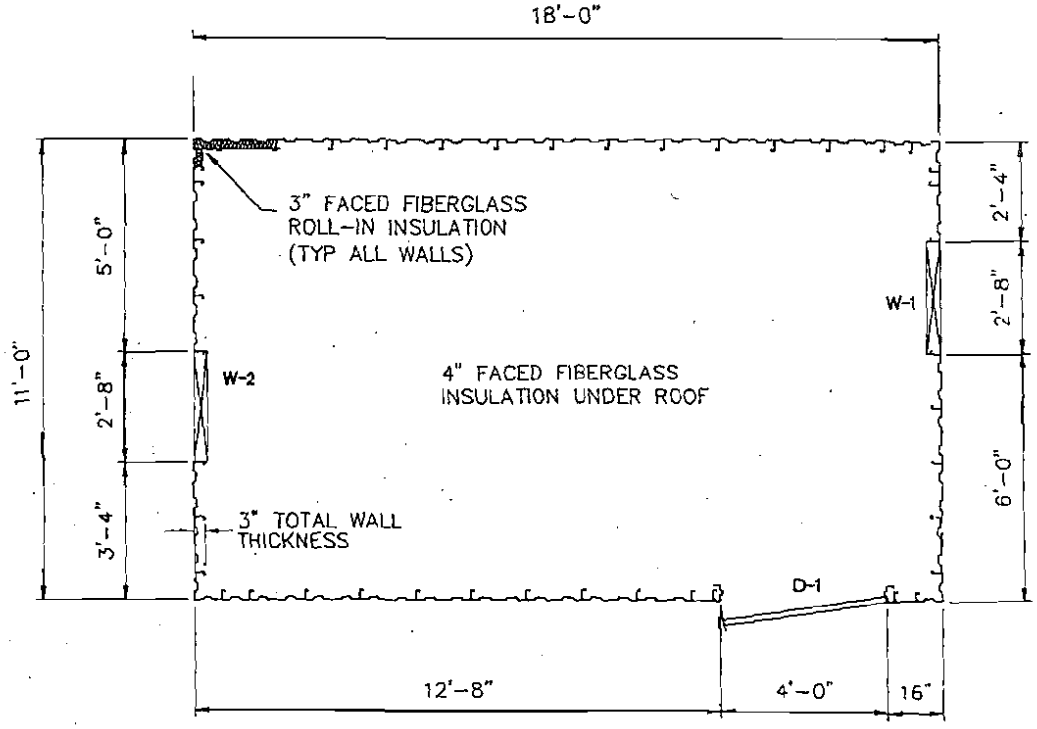
JOB DESCRIPTION
PARKLINE KENTUCKIANA
LOUISVILLE, KY

SHEET TITLE
ROOF PLAN

PARKLINE INC.
P.O. Box 85 [illegible], WV 25213
phone: (304) 555-2113

REVISIONS

PROD #7284 Vol. 3



RE: CONTROL VALVE HOUSE

REVISIONS

9-16-00	

PARKLINE, INC.
P O Box 65 W. Hill, WV 25213
phone: (304) 656-2113

PARKLINE KENTUCKIANA
LOUISVILLE, KY
FLOOR PLAN

DATE
DRAWN BY
SCALE
ORDER NO.
REVISION
DWG. NO.
000365-1

LAPEYRE STAIRS

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 13130-002	REV: 0	DATE: 07-Aug-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE:

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 8/7/00

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
8	641-13130-002	0						X			Lapeyre Stair shop drawings,		X		13130	X		
	parts 1.04A1 - 5.										specifications, & install instr.							

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	52-5				
Tim Cherry	52-5				
Jim Jenkins	52-5				
Mike Godber	104				
Rob Kneip	52-5				
B. Scott Wheeler	52-5				
Kwasi Boutwineboah	104				

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

See note on dimensions

RECEIVED BY: [signature] DATE 8/9/00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

ATTACHED

USE 116" (ALLOWANCE FOR 1/4" EPDM SEAL & 1/2" SHIM

VH 1-6

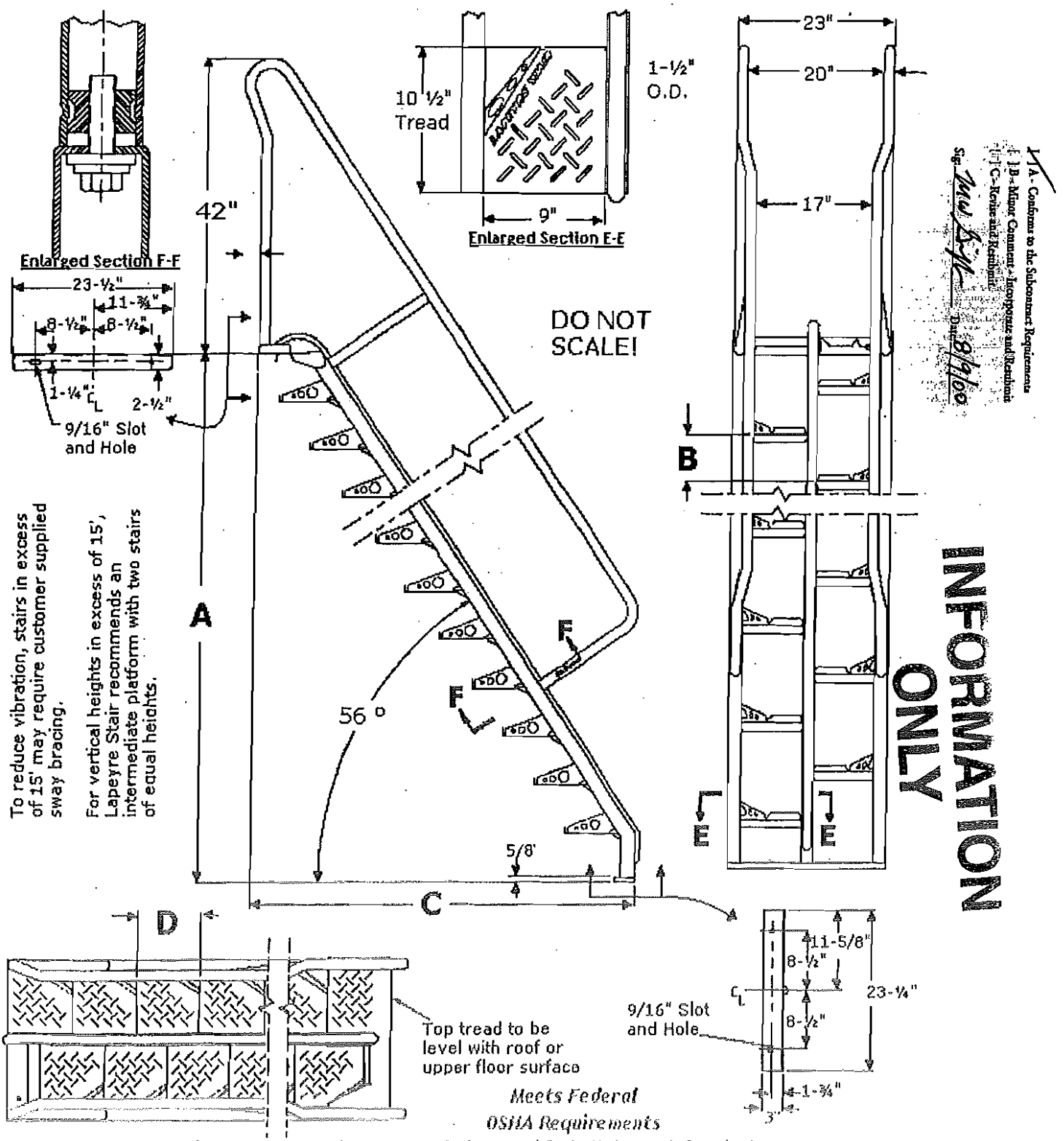
A	Height	116.750 inches
B	Riser Height	7.297 inches
C	Horizontal Run	83.325 inches
D	Projected Tread	9.843 inches
	Number of Risers	16

Change

Lapeyre Stair, Inc.

Lapeyre Stair manufactures products under one or more U.S. and Foreign patents.

AUG 09 2000



1/A - Conforms to the Subcontract Requirements
2/B - Minor Comment - Incorporate and Resubmit
3/C - Revise and Resubmit
Sig. MW Date 8/9/00

Description: 116.75 Inch 56 Degree Carbon Steel Stair, Yellow with Standard Parapet

1/4" EPDM SEAL
1/4" SHIM

CVH

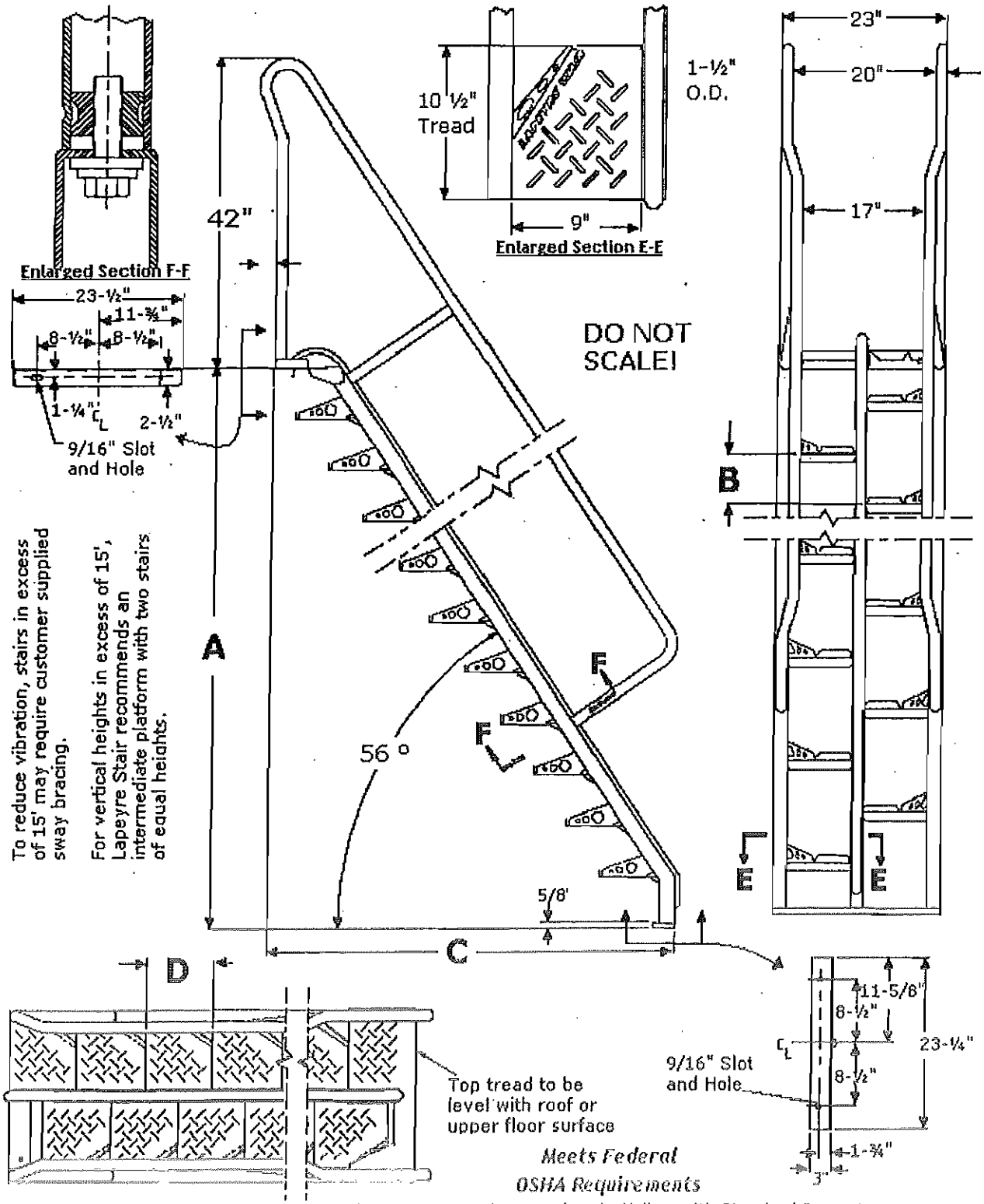
A	**Height**	132.600 inches
B	**Riser Height**	7.367 inches
C	**Horizontal Run**	93.969 inches
D	**Projected Tread**	9.937 inches
	Number of Risers	18

change

Lapeyre Stair, Inc.

Lapeyre Stair manufactures products under one or more U.S. and Foreign patents.

AUG 09 2000



To reduce vibration, stairs in excess of 15' may require customer supplied sway bracing.

For vertical heights in excess of 15', Lapeyre Stair recommends an intermediate platform with two stairs of equal heights.

Meets Federal OSHA Requirements

Description: 132.6 Inch 56 Degree Carbon Steel Stair, Yellow with Standard Parapet

Specifications

Technical / Engineering Data
Estimated Weights

Dimensional Formulas for all models
Horizontal Projections

SECTION 05512
ALTERNATING TREAD METAL STAIRS

This section is based on products manufactured by Lapeyre Stair, Inc.
5117 Toler Street, Harahan, LA 70123
Telephone: 1-800-535-7631 or 1-504-733-6009
FAX: 1-504 733-4393

The Lapeyre® Stair is a custom built, space-saving industrial stair that meets OSHA requirements for non-public access. The Lapeyre Stair's alternating tread design provides greater tread depth than vertical or ship's ladders while taking up no more room than a ship's ladder. University safety studies conclude that The Lapeyre Stair is overwhelmingly safer than ship's ladders.

Specifications include stairs made of aluminum, powder coated carbon steel, galvanized steel, and stainless steel.

SECTION 05512 - ALTERNATING TREAD METAL STAIRS

PART 1 GENERAL

1.1 SECTION INCLUDES

*NOTE ** Delete items below not required for project.*

A. Prefabricated steel stairs with integral handrails.

B. Prefabricated steel platforms with integral handrails.

C. Prefabricated stainless steel stairs with integral handrails.

D. Prefabricated stainless steel platforms with integral handrails.

E. Prefabricated aluminum stairs with integral handrails.

F. Prefabricated aluminum platforms with integral handrails.

1.2 RELATED SECTIONS

*NOTE ** Delete any sections below not relevant to this project; add others* as required.

A. Section 05500 - Metal Fabrications: Miscellaneous bracing and anchorage.

B. Section 05510 - Metal Stairs: Conventional prefabricated metal stairs.

C. Section 09900 - Paints and Coatings.

1.3 REFERENCES

A. ASTM A 123 - Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

B. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

C. ASTM A 513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

D. ASTM A 563 - Standard Specification for Carbon and Alloy Steel Nuts.

E. ASTM A 569/A 569M - Standard Specification for Steel, Carbon (0.15 Maximum, Percent), Hot-Rolled Sheet and Strip Commercial Quality.

F. ASTM A 780 - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

1.4 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Provide manufacturer's installation instructions.

C. Shop Drawings: Submit dimensioned prints showing critical dimensions, jointing and connections, and fasteners provided by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Provide pre-engineered alternating tread metal stairs fabricated by Lapeyre Stair, Inc., 5117 Toler Street, Harahan, LA 70123. Telephone 1-800-535-7631 or 1-504-733-6009. FAX 1-504-733-4393.

B. Substitutions will not be acceptable.

2.2 MANUFACTURED UNITS

A. Alternating Tread Stairs: Alternating treads with center stringer.

*NOTE ** Delete all but one of the following material descriptions. If more than one stair of different materials is required, edit these descriptions to indicate which stairs are made of which material.*

1. Material: Carbon Steel, powder coated finish
2. Material: Galvanized steel.
3. Material: Aluminum, natural finish.
4. Material: Stainless steel, natural finish.

*NOTE ** Delete the following factory paint finish if not required.*

5. Finish: Manufacturer's standard safety yellow powder coating.
6. Stair treads: Capable of withstanding a concentrated 1,000 pound load without deformation.
7. Risers spaced equally to within 3/16 inch for adjacent risers and to within 3/8 inch for any two non-adjacent risers.
8. Handrail: Capable of withstanding a load of 200 pounds applied in any direction at any point on the rail.
9. Handrails contoured for body guidance and underarm support.

*NOTE ** Select at least one of the three angle requirements below and delete the others.*

10. Steel stair angle: 56 degrees from horizontal.
11. Steel stair angle: 68 degrees from horizontal.
12. Aluminum stair angle: 68 degrees from horizontal.

*NOTE ** Delete one of the following vertical drop descriptions. If not shown on the drawings enter a specific distance in the blank.*

13. Vertical Drop: Distance between upper finished floor surface where top landing will be attached and lower finished floor surface as indicated on Drawings.
14. Vertical Drop: Distance between upper finished floor surface where top landing will be attached and lower finished floor surface of _____.

*NOTE ** Edit the materials below to conform to project requirements. Coordinate with material description(s) included above.*

B. Structural Steel Components: 1010/15, per ASTM A 569/A 569M, size and gage to meet performance requirements and project dimensions.

1. Treads: 13 gage HRPO.
2. Stair Landings and Foot Stampings: 11 gage.
3. Stringers: 2 inch by 1-3/4 inch by 11 gage.

*NOTE ** Select stringers above for 56 degree stairs under 10 vertical feet and 68 degree stairs under 12 vertical feet. Select stringers below for greater vertical drops up to 20 feet maximum*

4. Stringers: 3 inch by 1-3/4 inch by 11 gage.
5. Platforms: CS, 3/16 inch diamond safety plate.

C. Steel Handrails: 1010/15 CS per ASTM A 569/A 569M, cold drawn, fully annealed tube per ASTM A 513, 1-1/2 inches OD by 0.083 inch.

D. Stainless Steel Structural Components: Type 304 SS, size and gage to meet performance requirements.

1. Treads: 13 gage.
2. Landings and Foot Stampings: 11 gage.
3. Stringers: 2 inch by 1-3/4 inch by 11 gage.

*NOTE ** Select stringers above for 56 degree stairs under 10 vertical feet and 68 degree stairs under 12 vertical feet. Select stringers below for greater vertical drops up to 20 feet maximum.*

4. Stringers: 3 inch by 1-3/4 inch by 11 gage.
5. Platforms: 3/16 inch diamond safety plate.

E. Stainless Steel Handrails: Type 304 SS cold drawn, fully annealed tube per ASTM A 513, 1-1/2 inches OD by 0.065 inch.

F. Aluminum Landings, Treads, and Foot Castings: Aluminum Alloy F356F.

G. Aluminum Stringer: Aluminum Alloy 6063-T52, box shape, 1-3/4 inch by 4 inch by 1/8 inch.

H. Aluminum Handrails: Aluminum Alloy 6063-T4 Tube, 1-1/2 inches OD by 1/8 inch.

I. Aluminum Platforms: Aluminum Alloy 5086 (H112 or equivalent), 1/4 inch diamond safety plate.

J. Aluminum Platform Handrail Clamps: Cast aluminum (F356F).

K. Miscellaneous Materials:
1. Rubber spine: Hollow neoprene.
2. Rubber foot divider: Santoprene (Type 101-73).
3. Bolts: ASTM A 307.
4. Nuts: ASTM A 563.

2.3 FABRICATION

A. Fabricate components to comply with performance and design requirements specified and in accordance with approved shop drawings. Fabricate to minimize field assembly.

B. Steel Stairs: Fabricate by gas metal arc welding, with stamped steel treads spot-welded to stringers.

1. Provide custom-fabricated steel handrails for field bolting to prefabricated stair unit.
2. Provide handrail design to accommodate field conditions indicated on Drawings.

C. Stainless Steel Stairs: Fabricate by gas tungsten arc welding or gas metal arc welding, with stamped steel treads spot-welded to stringers.

1. Provide custom-fabricated stainless steel handrails for field bolting to prefabricated stair unit.
2. Provide handrail design to accommodate field conditions indicated on Drawings.

D. Aluminum Stairs: Provide all welded construction, using gas metal arc welding or gas tungsten arc welding. Fabricate using cast aluminum treads and cast aluminum mounting plates; shop weld handrails to stair assembly.

E. Platforms: Provide cut, formed, and punched platforms with mounting brackets and kickplates, configured and sized as indicated on Drawings.

1. Steel construction: Fabricate using gas metal arc welding.
2. Stainless steel construction: Fabricate using gas tungsten arc welding or gas metal arc welding.
3. Aluminum construction: Fabricate using gas tungsten arc welding or gas metal arc welding.
4. Handrails: Provide bolt-on handrails of same material as platform construction.

F. Galvanizing: Hot-dip galvanize steel components in accordance with ASTM A 123.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that dimensions are correct and substrate is in proper condition for installation of metal stair components. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

*NOTE ** Delete the following paragraph if all stairs are aluminum.*

A. Install handrails to stair unit, using bolts furnished with stair unit by manufacturer.

B. Prepare mounting holes, using drawings supplied by stair manufacturer.

3.3 INSTALLATION

A. Position stair units with top tread at same elevation as finished floor or roof surface.

B. Verify that stairs are properly aligned with building construction, at correct angle, and free from distortion. Secure in position using not fewer than two bolts or studs at top and two at bottom.

C. Install crossover or landing platform with stair, securing with two bolts and handrail clamps. Bolt handrails in place. Support platforms with customer supplied bracing.

D. Do not field cut or alter members.

3.4 ADJUST AND CLEAN

A. Touch up damage to galvanized surfaces using galvanizing repair paint in accordance with ASTM A 780.

*NOTE ** Delete paragraphs above and below if project requires only aluminum or stainless steel stairs.*

B. Touch up abraded areas on shop paint immediately after erection, using matching paint.

C. Clean work area of debris associated with installation of alternating tread metal stairs.

END OF SECTION 05512-1

Steel Stair Installation Instructions

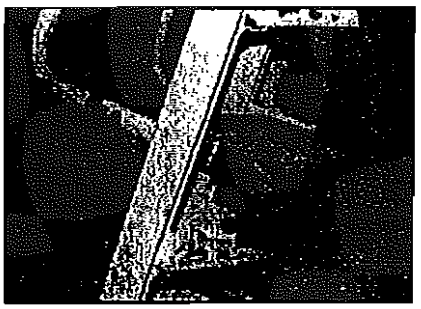
Platform Installation Instructions | **Technical / Engineering Data Steel Stairs** | **Aluminum Stair Installation Instructions**

With proper installation, your Lapeyre stair will give you many years of maintenance-free service.

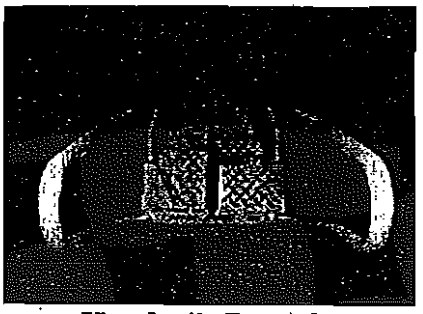
Attaching Handrail

1) Remove the Lapeyre stair from the shipping container and lay on a solid, flat surface.

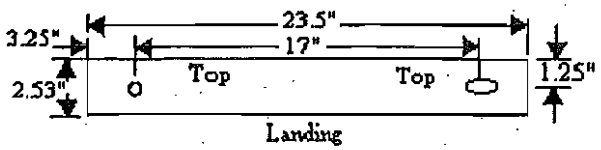
2) MAKE SURE THE HANDRAILS NARROW TOWARD THE CENTER OF THE STAIR. Using the supplied 1/2"-13x1-1/2" bolts, lock washers and rectangular flat washers, attach handrails to the stair. The bolts should be tightened to 35 ft-lbs.

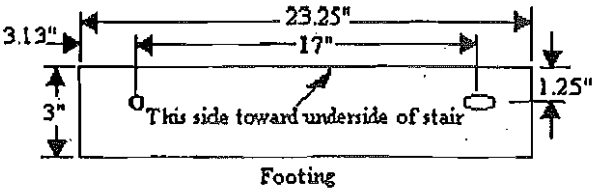


Bolting Handrails to Stair



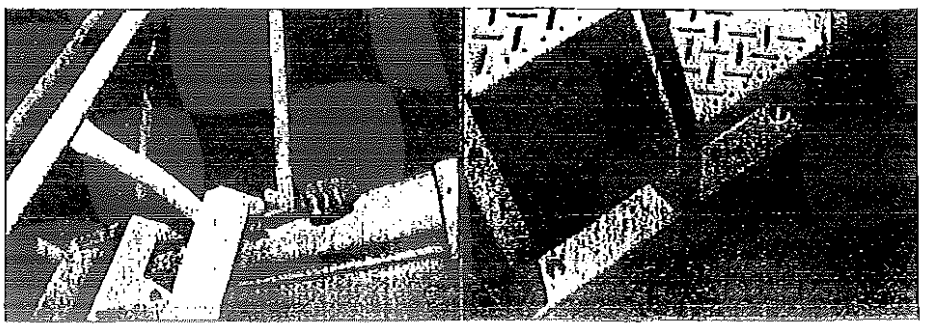
Handrails Bend In





Installation

1) Install the stair with the top tread at the same elevation as the upper finished floor or roof surface.



Landing Footing

2) Prepare the mounting holes for the stair, using the bolt pattern shown, at right, as a guide.

3) Put in position and securely bolt both the landing (top) and footing (bottom) of the stair. Bolts are not provided. Use bolts or studs (minimum 1/2" diameter).

4) If the stair is 15' or taller, you should install bracing to prevent vibration.

Grey prime only - rubber bumper applied on-site to central stringer. Just peel and press.

SUPPLIER DOCUMENT SUBMITTAL

PROD #7284 Vol. 3

FDF PROJ. NO: 20111	CONTRACT NO: FSC - 64	SUBMITTAL NO: 13130-003	REV: 0	DATE: 06-Dec-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.

David R. Opalka

SIGNATURE: David R. Opalka

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

RECEIVED BY: Erika Jarrett DATE: 12/6/00

			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
8	641-13130-003	0						X			Lapeyre stair supports		X		13130	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	64				
Rob Kreip	525				
Scott Wheeler	525				
Kwasi Baw Tweneboah	38				

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

RECEIVED BY: MW DATE 12-14-00

(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)

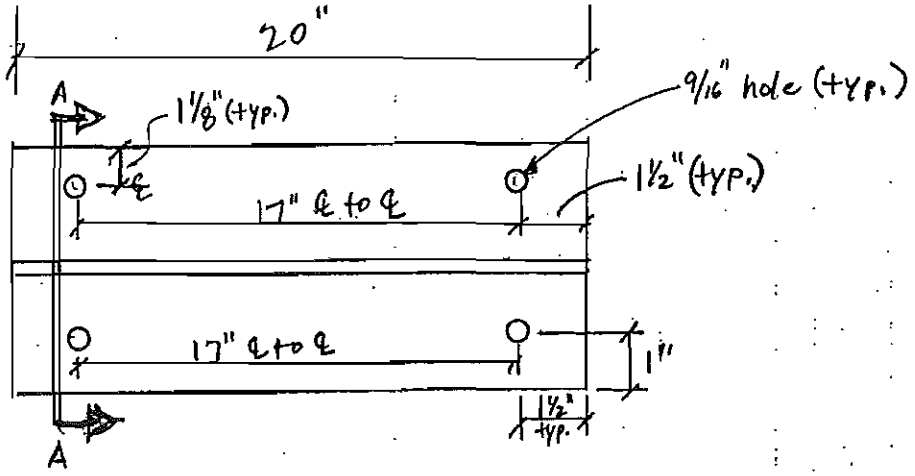
A - Conforms to Subcontract Requirements

B - Minor Comments - Incorporate and Resubmit

C - Revise and Resubmit (SEE COMMENTS)

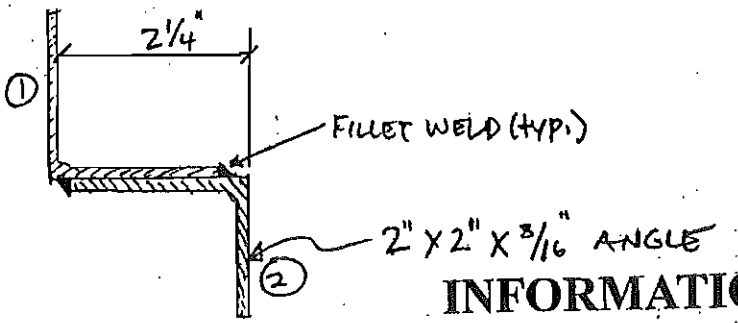
ORIGINAL

LAPEYRE STAIR SUPPORTS



Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-13130-003
Reviewed By: DRO
Date: 12/6/00



INFORMATION ONLY

NOTES:

1 COAT PRIMER

2 COATS Safety yellow

[✓] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MW Date: 12-14-00

ANGLE SUPPORTS WILL BE INSTALLED AT EACH STAIR LOCATION

ANGLE ONE WILL BE BOLTED TO LAPEYRE STAIR AND ANGLE TWO WILL BE BOLTED TO WEB OF C-SECTION OF GRATING SYSTEM.

ALVIN Engineer's Computation Pad

FIBERGRATE

SUPPLIER DOC NT SUBMITTAL

FDF PROJE O: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 13130-001	REV: 1	DATE: 07-Sep-00	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
David R. Opalka
SIGNATURE: David R Opalka

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wertz DATE: 9/7/00

			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
8	641-13130-001	1						X			Fibergrate Product Data		X		13130	X		
8	20111-DWG-001	1						X			FibergrateShop Drawing		X		13130	X		
8	20111-DWG-002	1						X			FibergrateShop Drawing		X		13130	X		
8	20111-DWG-003	1						X			FibergrateShop Drawing		X		13130	X		
8	20111-DWG-004	1						X			FibergrateShop Drawing		X		13130	X		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
[illegible]	52-5				
Tim Cherry	52-5				
Tim Jenkins	52-5				
Mike Godber	64				
Rob Kneip	52-5				
B. Scott Wheeler	52-5				
Kurt Bob Tweneboah	64				

RECEIVED SEP 14 2000

NO COMMENTS:

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

RECEIVED BY: MW Giff DATE 9-13-00
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

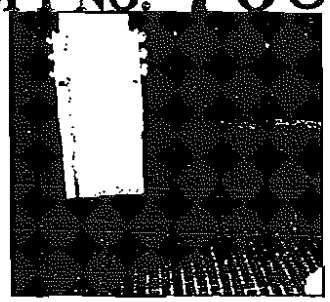
Fibergrate® Molded Grating

ECDC CONTROLLED COPY NO. 76896

CORVEX® (Fibergrate only) An economy polyester grating, Corvex outperforms a number of competitive fiberglass and metal products and meets the requirements for corrosion resistance found in light industrial and water/wastewater applications. **Color:** yellow, dark gray or dark green. **Flame Spread:** ASTM rating of 25 or less.

XFR (Fibergrate only) This highly corrosion resistant vinyl ester resin is recommended for use where the fire potential is high. **Color:** dark gray. **Flame Spread:** ASTM rating of 10 or less, a level exceeded by no other resin system.

Super Vi-Corr® (Fibergrate only) A superior grade vinyl ester resin system designed for extreme temperatures (180 to 400 degrees F) and extremely ive environments such as solvents and acidic oxidizers, including aqueous chlorine and chlorine dioxide solutions forming sodium hypochlorite. This custom resin system is used mainly as packing hold-downs (bed limiters) and as packing supports in environmental or process scrubber and stripping applications. **Color:** natural - tan to beige. **Flame Spread:** non-fire retardant, unless specified.



ELS (Fibergrate only) The added benefit of greater worker visibility and lower toxicity in emergencies, make ELS products ideal for tunnel, offshore, ship and other confined area applications. **Color:** light gray. **Flame Spread:** ASTM rating of 15, a smoke density index of 70 and Fuel Contribution of 0.

[ ] A - Conforms to the Subcontract Requirements
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig. _____ Date: _____

mwb jr 9-13-00

As the acknowledged leader in resin systems development, Fibergrate is committed to furthering the advancement of resin chemistry. To support that commitment, Fibergrate is engaged in on-going programs for the development and application of specially designed resin systems and improvements to current resin systems.

Floor Contract FSC-641
OSDI Enhanced Permanent Leachate Transmission System Project
STAVER # 7052

Submittal # 641-3130-001
Reviewed By: NPO
Date: 9/1/00

Fiberglass Grating Selection Guide

Fibergrate also offers Safe-T-Span® brand pultruded grating and RIGIDEX™ Moltruded™ grating. The following table is included as a guide to help in choosing the best grating for a particular application.

	MOLDED GRATING		PULTRUDED GRATING	MOLTRUDED GRATING	
	1" Rectangular Mesh	1", 1-1/2" & 2" Square Mesh		RIGIDEX I	RIGIDEX II
Corrosion Resistance	HR	HR	R	HR	HR
Strength/Stiffness (longest span)	R	R	HR	R	HR
Impact Resistance	R	HR	A	A	R
Open Area (for drainage, aeration, light penetration)	HR	HR	A	HR	A
Single-Direction Span	R	A	HR	HR	HR
Bi-Direction Span	NR	HR	NR	NR	NR
Layout and Installation	A	HR	A	R	R
Lightweight in Comparison to Metals	HR	HR	HR	HR	R
Custom Panel Sizes Available	A	R	HR	NR	NR

HR = Highly Recommended R = Recommended A = Acceptable NR = Not Recommended

These are general comparisons. A Fibergrate representative should be consulted for an exact match of grating and application.

Fibergrate® Molded Grating

Fibergrate® Molded Grating Selection

To satisfy the structural requirements of a wide range of applications, Fibergrate manufactures a number of different panel sizes, in square and rectangular mesh (See pages 35-36 for grating details). These various panel sizes provide utilization options that may actually lower the total installation cost.

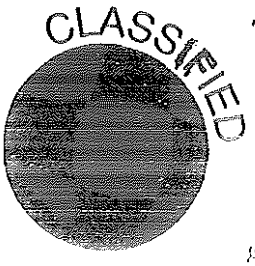
Note: AirMesh is an FRP screening product only.

Brand	Depth	Mesh	Panel Sizes	Lbs/Sq. Ft.	Open Area
Chemgrate®	5/8"	1" x 4" rectangular	12' x 4'	2.1 lbs.	58%
Fibergrate AirMesh®	1/2"	1-1/2" x 1-1/2" square (non-load carrying product)	4' x 8'	0.8 lbs.	87%
Fibergrate Multigrid®	1/2"	2" x 2" square (non-load carrying product)	4' x 12'	1.0 lbs.	82%
Fibergrate	3/4"	1" x 4" rectangular	10' x 3', 8' x 4'	2.5 lbs.	69%
Fibergrate	3/4"	1-1/2" x 1-1/2" square	3' x 10', 4' x 8', 4' x 12'	2.0 lbs.	70%
Chemgrate	1"	1" x 4" rectangular standard	12' x 4', 12' x 3'-1/4"	2.7 lbs.	65%
Fibergrate	1"	1" x 4" rectangular	10' x 3', 8' x 4'	2.5 lbs.	69%
Chemgrate	1"	1" x 4" rectangular heavy duty	12' x 4'	3.4 lbs.	52%
Fibergrate	1"*	1-1/2" x 1-1/2" square	3' x 10', 4' x 8', 4' x 12'	2.5 lbs.	70%
Chemgrate	1"	2" x 2" square	4' x 12'	1.7 lbs.	76%
Fibergrate	1-1/4"	1-1/2" x 1-1/2" square	3' x 10', 4' x 8', 4' x 12', 5' x 10'	3.2 lbs.	70%
Fibergrate	1-1/2"*	1-1/2" x 1-1/2" square	3' x 10', 4' x 8', 4' x 12', 5' x 10'	3.2 lbs.	70%
Fibergrate Micro-Mesh®	1-1/2"	Top 3/4" square Bottom 1-1/2" square	2' x 2'	5.0 lbs.	44%
Chemgrate	1-1/2"	1-1/2" x 1-1/2" square	4' x 12'	3.5 lbs.	69%
Chemgrate	1-1/2"	1-1/2" x 6" rectangular	12' x 4'	3.4 lbs.	67%
Chemgrate	2"	2" x 2" square	4' x 12'	4.1 lbs.	72%
Fibergrate	2"	2" x 2" square	4' x 12'	4.0 lbs.	72%

**Available in UL Classified Vi-Corr and IFR resin formulations*

Underwriter's Laboratory Classified

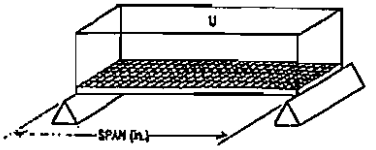
In keeping with its quality leadership role, Fibergrate offers the only FRP molded grating classified by Underwriter's Laboratory for meeting established standards for chemical exposure, flame spread, load-bearing characteristics and slip resistance. Two superior resins, Fibergrate Vi-Corr and IFR, in two mesh sizes with meniscus top, are available with a UL classification.



This certification by an independent third party provides the user a strong sense of security knowing that Fibergrate molded grating meets established performance specifications. *No other manufacturer of FRP grating can make that claim!*

Load Tables - Fibergrate Resins

U Uniform load - lbs/ft²
ΔU Uniform load deflection (in.)

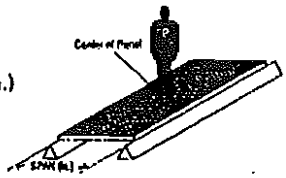


MOLDED GRATING UNIFORM LOAD TABLES - DEFLECTIONS IN INCHES												MAX RECOMMENDED RESIN SYSTEM			ULTIMATE CAPACITY
CLEAR SPAN (IN)	STYLE DEPTH (IN)	STYLE MESH (IN x IN)	LOAD = LBS/FT² 50	65	100	150	200	300	500	1000	2000	CORVEX ELS	FGI	Vi-Corr Super Vi-Corr XER	
12"	1	1x4	<.01	<.01	<.01	<.01	<.01	0.01	0.02	0.05	0.09	2367	2367	4628	10155
	1	1-1/2x1-1/2	<.01	<.01	<.01	<.01	0.01	0.02	0.04	0.08	0.16	1580	1580	3085	6770
	1-1/2	1-1/2x1-1/2	<.01	<.01	<.01	<.01	<.01	0.01	0.02	0.04	0.07	2067	2833	7700	10420
	2	2x2	<.01	<.01	<.01	<.01	<.01	<.01	0.01	0.02	0.04	2500	6267	6267	9624
	3/4	1x4	<.01	<.01	0.01	0.01	0.02	0.02	0.04	0.08	0.15	1356	2033	2033	8133
	3/4	1-1/2x1-1/2	<.01	<.01	0.01	0.02	0.02	0.04	0.06	0.12	--	1000	1500	1500	6000
	1-1/4	1-1/2x1-1/2	<.01	<.01	<.01	<.01	<.01	0.01	0.02	0.04	--	1110	1665	1665	6660
18"	1	1x4	0.01	0.01	0.02	0.03	0.04	0.07	0.11	0.22	0.44	1052	1052	2057	4756
	1	1-1/2x1-1/2	0.02	0.02	0.04	0.06	0.08	0.11	0.20	0.38	--	702	702	1371	3170
	1-1/2	1-1/2x1-1/2	<.01	<.01	0.01	0.02	0.03	0.04	0.07	0.14	0.28	919	1259	3422	6947
	2	2x2	<.01	<.01	0.01	0.01	0.02	0.03	0.04	0.09	0.17	1111	2785	2785	6416
	3/4	1x4	0.02	0.02	0.04	0.06	0.08	0.11	0.19	--	--	603	904	904	3615
	3/4	1-1/2x1-1/2	0.03	0.04	0.06	0.09	0.12	0.18	0.30	--	--	445	667	667	2667
	1-1/4	1-1/2x1-1/2	0.01	0.01	0.02	0.03	0.04	0.06	0.09	0.19	--	740	1110	1110	4440
24"	1	1x4	0.04	0.05	0.07	0.11	0.15	0.22	0.37	0.73	--	592	592	1157	2675
	1	1-1/2x1-1/2	0.06	0.08	0.12	0.19	0.25	0.37	0.64	--	--	395	395	771	1783
	1-1/2	1-1/2x1-1/2	0.02	0.03	0.04	0.06	0.06	0.12	0.21	0.42	--	517	708	1925	4000
	2	2x2	0.01	0.01	0.02	0.03	0.04	0.06	0.10	0.20	--	625	1567	1567	4812
	3/4	1x4	0.06	0.08	0.12	0.18	0.24	0.36	0.59	--	--	339	508	508	2033
	3/4	1-1/2x1-1/2	0.09	0.12	0.18	0.28	0.37	0.55	--	--	--	250	375	375	1500
	1-1/4	1-1/2x1-1/2	0.03	0.04	0.06	0.09	0.11	0.17	0.29	--	--	445	667	667	2667
30"	1	1x4	0.08	0.11	0.17	0.26	0.34	0.51	0.85	--	--	379	379	740	1712
	1	1-1/2x1-1/2	0.14	0.18	0.27	0.41	0.55	0.82	--	--	--	253	253	494	1141
	1-1/2	1-1/2x1-1/2	0.05	0.06	0.09	0.14	0.18	0.27	0.46	0.91		331	453	1232	2560
	2	2x2	0.02	0.03	0.05	0.07	0.09	0.14	0.23	0.45	--	400	1003	1003	3344
	3/4	1x4	0.13	0.17	0.26	0.40	0.53	0.79	--	--	--	217	325	325	1301
	3/4	1-1/2x1-1/2	0.17	0.23	0.35	0.53	0.70	--	--	--	--	160	240	240	960
	1-1/4	1-1/2x1-1/2	0.08	0.10	0.15	0.23	0.30	0.465	--	--	--	285	427	427	1707
36"	1	1x4	0.16	0.21	0.32	0.49	0.65	0.97	1.61	--	--	263	263	514	1189
	1	1-1/2x1-1/2	0.31	0.40	0.62	0.93	1.24	1.85	--	--	--	176	176	343	793
	1-1/2	1-1/2x1-1/2	0.10	0.13	0.20	0.30	0.40	0.59	0.99		--	230	315	856	1778
	2	2x2	0.04	0.06	0.09	0.13	0.18	0.26	0.44	--	--	278	696	696	2322
	3/4	1x4	0.25	0.33	0.50	0.76	1.01	--	--	--	--	151	226	226	904
	3/4	1-1/2x1-1/2	0.39	0.51	0.78	1.17	--	--	--	--	--	111	167	167	667
	1-1/4	1-1/2x1-1/2	0.14	0.18	0.28	0.42	0.56	--	--	--	--	198	296	296	1185
42"	1	1x4	0.33	0.43	0.66	0.99	1.32	1.98	--	--	--	193	193	378	873
	1	1-1/2x1-1/2	0.49	0.64	0.98	1.48	1.97	--	--	--	--	129	129	252	582
	1-1/2	1-1/2x1-1/2	0.17	0.22	0.34	0.52	0.69	1.03	1.72	--	--	169	231	629	1306
	2	2x2	0.08	0.10	0.16	0.24	0.32	0.47	0.79	--	--	204	512	512	1706
	1-1/4	1-1/2x1-1/2	0.26	0.34	0.52	0.78	1.04	--	--	--	--	145	218	218	871
46"	1	1x4	0.48	0.62	0.95	1.42	1.90	2.85	--	--	--	161	161	315	728
	1	1-1/2x1-1/2	0.77	1.00	1.54	2.31	3.08	--	--	--	--	108	108	210	485
	1-1/4	1-1/2x1-1/2	0.37	0.49	0.75	1.13	--	--	--	--	--	121	182	182	726
48"	1-1/2	1-1/2x1-1/2	0.28	0.37	0.56	0.85	1.13	1.70	--	--	--	129	177	481	1000
	2	2x2	0.14	0.18	0.28	0.42	0.56	0.84	--	--	--	156	392	392	1306
54"	1-1/2	1-1/2x1-1/2	0.42	0.55	0.84	1.27	1.68	2.53	--	--	--	102	140	380	790
	2	2x2	0.21	0.27	0.42	0.63	0.84	1.26	--	--	--	123	309	309	1032
60"	2	2x2	0.37	0.47	0.73	1.10	1.46	--	--	--	--	100	251	251	836

NOTES:
1. Shaded [illegible] indicate non standard panels.
2. MAX RECOMMENDED LOAD for alternate [illegible] CORVEX and ELS [illegible] of ULTIMATE CAPACITY
2. MAX RECOMMENDED LOAD for alternate [illegible] FGI and Vi-Corr/XER [illegible] of ULTIMATE CAPACITY

Load Tables - Fibergrate Resins

P Concentrated point load - lbs
ΔP Concentrated point load deflection (in.)

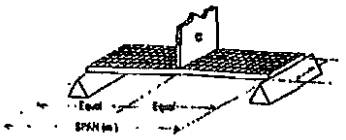


MOLDED GRATING CONCENTRATED POINT LOAD TABLES - Deflections in Inches

CLEAR SPAN (IN)	STYLE		LOAD = LBS						
	DEPTH (IN)	MESH (IN x IN)	50	100	200	300	500	1000	2000
18"	1	1 x 4	<.01	0.01	0.02	0.03	0.06	0.11	0.22
	1	1-1/2 x 1-1/2	<.01	0.01	0.03	0.04	0.07	0.14	0.27
	1-1/2	1-1/2 x 1-1/2	<.01	<.01	0.01	0.02	0.03	0.06	0.13
	2	2 x 2	<.01	<.01	0.01	0.02	0.03	0.05	0.10
24"	1	1 x 4	0.01	0.02	0.05	0.07	0.12	0.24	0.49
	1	1-1/2 x 1-1/2	0.01	0.03	0.05	0.08	0.13	0.26	0.53
	1-1/2	1-1/2 x 1-1/2	<.01	0.01	0.02	0.03	0.06	0.12	0.23
	2	2 x 2	<.01	<.01	0.01	0.02	0.04	0.07	0.14
30"	1	1 x 4	0.02	0.05	0.09	0.14	0.23	0.45	--
	1	1-1/2 x 1-1/2	0.03	0.05	0.10	0.15	0.26	0.52	--
	1-1/2	1-1/2 x 1-1/2	0.01	0.02	0.04	0.06	0.10	0.20	--
	2	2 x 2	<.01	0.01	0.02	0.03	0.06	0.12	0.23
36"	1	1 x 4	0.04	0.07	0.14	0.21	0.35	0.71	--
	1	1-1/2 x 1-1/2	0.03	0.07	0.14	0.20	0.34	0.68	--
	1-1/2	1-1/2 x 1-1/2	0.02	0.03	0.06	0.09	0.15	0.30	--
	2	2 x 2	<.01	0.01	0.03	0.04	0.07	0.15	0.29
42"	1	1 x 4	0.05	0.11	0.21	0.32	0.53	--	--
	1	1-1/2 x 1-1/2	0.06	0.12	0.23	0.35	0.59	--	--
	1-1/2	1-1/2 x 1-1/2	0.02	0.04	0.09	0.13	0.22	0.44	--
	2	2 x 2	0.01	0.02	0.05	0.08	0.12	0.25	0.50
46"	1	1 x 4	0.07	0.13	0.26	0.39	--	--	--
	1	1-1/2 x 1-1/2	0.07	0.14	0.28	0.42	--	--	--
48"	1-1/2	1-1/2 x 1-1/2	0.03	0.06	0.12	0.18	0.29	0.58	--
	2	2 x 2	0.01	0.03	0.06	0.09	0.15	0.30	0.60
54"	1-1/2	1-1/2 x 1-1/2	0.04	0.07	0.15	0.22	0.37	--	--
58"	1-1/2	1-1/2 x 1-1/2	0.04	0.08	0.17	0.25	0.42	--	--

Notes:
1. Gratings not shown and/or spans not listed have not been tested.
2. Ultimate loads have not been determined.

C Concentrated line load - lbs./ft of width
ΔC Concentrated line load deflection (in.)



MOLDED GRATING CONCENTRATED LINE LOAD TABLES - DEFLECTIONS IN INCHES										MAX RECOMMENDED			ULTIMATE CAPACITY
CLEAR	STYLE		LOAD = LBS/FT. of Width							RESIN SYSTEM			
SPAN (IN)	DEPTH (IN)	MESH (IN x IN)	50	100	200	300	500	1000	2000	CORVEX ELS	FGI	Vi-Corr Super Vi-Corr XFR	
12"	1	1x4	<.01	0.01	0.02	0.02	0.04	0.08	--	1183	1183	2314	5350
	1	1-1/2x1-1/2	<.01	0.01	0.03	0.04	0.06	0.13	--	790	790	1543	3567
	1-1/2	1-1/2x1-1/2	<.01	<.01	0.01	0.02	0.03	0.05	0.11	1033	1417	3850	8000
	2	2x2	<.01	<.01	<.01	0.01	0.02	0.03	0.06	1250	3133	3133	9624
	3/4	1x4	<.01	0.01	0.02	0.04	0.06	0.12	--	678	1017	1017	4067
	3/4	1-1/2x1-1/2	0.01	0.02	0.04	0.06	0.10	--	--	500	750	750	3000
	1-1/4	1-1/2x1-1/2	<.01	<.01	0.01	0.02	0.03	0.06	--	1110	1665	1665	6660
18"	1	1x4	0.01	0.02	0.05	0.07	0.12	0.23	--	789	789	1543	3567
	1	1-1/2x1-1/2	0.02	0.04	0.08	0.12	0.20	0.41	--	527	527	1028	2378
	1-1/2	1-1/2x1-1/2	0.01	0.02	0.03	0.05	0.08	0.15	0.30	889	944	2567	5333
	2	2x2	<.01	0.01	0.02	0.03	0.05	0.09	0.18	833	2089	2089	6967
	3/4	1x4	0.02	0.04	0.08	0.12	0.20	--	--	452	678	678	2711
	3/4	1-1/2x1-1/2	0.03	0.06	0.13	0.19	0.32	--	--	333	500	500	2000
	1-1/4	1-1/2x1-1/2	0.01	0.02	0.04	0.06	0.10	--	--	540	810	810	3240
24"	1	1x4	0.03	0.06	0.12	0.18	0.30	0.59	--	592	592	1157	2675
	1	1-1/2x1-1/2	0.05	0.10	0.20	0.30	0.49	--	--	395	395	771	1783
	1-1/2	1-1/2x1-1/2	0.02	0.03	0.07	0.10	0.17	0.33	--	517	708	1925	4000
	2	2x2	0.01	0.02	0.03	0.05	0.08	0.16	--	625	1567	1567	5225
	3/4	1x4	0.05	0.09	0.19	0.28	0.47	--	--	339	508	508	2033
	3/4	1-1/2x1-1/2	0.07	0.15	0.30	0.44	--	--	--	250	375	375	1500
	1-1/4	1-1/2x1-1/2	0.02	0.05	0.09	0.14	0.23	--	--	460	690	690	2760
30"	1	1x4	0.05	0.11	0.22	0.32	0.54	--	--	473	473	926	2140
	1	1-1/2x1-1/2	0.09	0.18	0.35	0.53	0.88		--	316	316	617	1427
	1-1/2	1-1/2x1-1/2	0.03	0.06	0.12	0.18	0.29	0.59		413	567	1540	3200
	2	2x2	0.01	0.03	0.06	0.09	0.14	0.29		500	1253	1253	4180
	3/4	1x4	0.08	0.17	0.34	0.51	--	--	--	271	407	407	1627
	3/4	1-1/2x1-1/2	0.11	0.22	0.45	0.67	--	--	--	200	300	300	1200
	1-1/4	1-1/2x1-1/2	0.05	0.10	0.19	0.29	0.49	--	--	356	533	533	2133
36"	1	1x4	0.09	0.17	0.34	0.52	0.86		--	394	394	771	1783
	1	1-1/2x1-1/2	0.16	0.33	0.66	0.99	1.65	--	--	263	263	514	1189
	1-1/2	1-1/2x1-1/2	0.05	0.11	0.21	0.32	0.53	1.06	--	344	472	1283	2667
	2	2x2	0.02	0.05	0.09	0.14	0.23	0.47	--	417	1044	1044	3483
	3/4	1x4	0.13	0.27	0.54	0.81	--	--	--	226	339	339	1356
	3/4	1-1/2x1-1/2	0.21	0.42	0.84	--	--	--	--	167	250	250	1000
	1-1/4	1-1/2x1-1/2	0.07	0.15	0.30	0.45	--	--	--	296	445	445	1778
42"	1	1x4	0.15	0.30	0.60	0.90	1.51	--	--	338	338	661	1529
	1	1-1/2x1-1/2	0.23	0.45	0.90	1.35	--	--	--	226	226	441	1019
	1-1/2	1-1/2x1-1/2	0.08	0.16	0.32	0.47	0.79	1.58	--	295	405	1100	2286
	2	2x2	0.04	0.07	0.14	0.22	0.36	--	--	357	895	895	2986
	1-1/4	1-1/2x1-1/2	0.12	0.24	0.48	0.71	--	--	--	254	381	381	1524
46"	1	1x4	0.20	0.40	0.79	1.19	1.98	--	--	309	309	604	1396
	1	1-1/2x1-1/2	0.32	0.64	1.29	1.93	--	--	--	206	206	402	903
	1-1/4	1-1/2x1-1/2	0.16	0.31	0.62	0.94	--	--	--	232	348	348	1391
48"	1-1/2	1-1/2x1-1/2	0.11	0.23	0.45	0.68	1.13	--	--	258	354	963	2000
	2	2x2	0.06	0.11	0.22	0.33	0.56	--	--	313	783	783	2613
54"	1-1/2	1-1/2x1-1/2	0.15	0.30	0.60	0.90	1.50	--	--	230	315	856	1778
	2	2x2	0.07	0.15	0.30	0.45	0.75	--	--	278	696	696	2322
60"	2	2x2	0.12	0.23	0.47	0.70	1.17			250	627	627	2090

NOTES:
1. Shaded cells indicate non-standard panels.
2. MAX REC'OMMENDED LOAD for CORVEX ELS represents 66.7% of ULTIMATE CAPACITY
3. MAX REC'OMMENDED LOAD for FGI and Vi-Corr Super Vi-Corr XFR represents 33.3% of ULTIMATE CAPACITY

SUPPLIER DOCUMENT SUBMITTAL

FDF PROJECT NO: 20111	CONTRACT NO: FSC - 641	SUBMITTAL NO: 15060-001	REV: 2	22-Jan-01	PAGE 1 OF 1

FROM: The STAVER GROUP, Inc.
Ron Wood
SIGNATURE: R Wood

TO: FDF ENGINEERING/CONSTRUCTION DOCUMENT CONTROL (ECDC), MS 52-7
RECEIVED BY: Denise Wentz DATE: 1/23/01

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
8	641-15060-001	2						X			Carbon Steel Pipe Testing Procedure		X		15060	✓		

REVIEW DISTRIBUTION

NAME	MS	NAME	MS	NAME	MS
Mike Griffin	525				
Tim Cherry	525				
Jim Jenkins	525				
Mike Godber	1H				
Don Kneip	525				
B. Scott Wheeler	525				
Geo Syntec Consultants	38				

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

Notes added to Submittal

RECEIVED BY: [signature] DATE 1/25/01
(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 Subcontract Requirements
B - Minor Comments - Incorporate and Resubmit
C - Revise and Resubmit (SEE COMMENTS)

ORIGINAL

RIECK
Mechanical Electrical Services, Inc.
Planners, Constructors & Maintainers

Fluor Contract FSC-641
OSDF Enhanced Permanent Leachate
Transmission System Project
STAVER # 7052

Submittal # 641-15060-001
Reviewed By: DW
Date: 01/22/01

The valves in the system shall be open during testing. Plugs, pancakes, and blind flanges shall be used to isolate the carbon steel piping system from the HDPE piping for testing.

For Valve Houses 1 through 6, the piping will be have to be filled from two points due to the presence of check valves (see attached diagram). For the Control Valve House the system will be filled at the low point drain (see attached diagram). Air will be released from the highpoints as necessary. The test gauge that will be used to monitor the test shall be calibrated within 6 months of the test date.

A hydrostatic pump will be used with isolation block valve closed and pump off/disconnect to apply a pressure of 60psi to the carbon steel piping. This pressure will be held for a period of three hours and the system shall be visually inspected for leaks. At the end of the three hours the gauge will be checked to verify that there was no pressure drop. Any drop in pressure will indicate a failing test. Representatives from Staver/Rieck, FF QA/QC, and the CQC consultant will perform the verification activities for this testing.

MWB 1/25/01

If the test fails or defective work is found during the testing it shall be repaired or replaced as necessary and the test shall be repeated.

Once finalized, a pipe test report will be prepared which will include, at a minimum the following information:

- Date
- Time of test start and completion
- Pressure gauge ID and Calibration date
- Description of the system being tested
- Signoff from persons that witness the testing

Upon completion of the test, the water will be drained out of the system and the plugs, pancakes, and blind flanges that were installed to isolate the system shall be removed.

INFORMATION ONLY

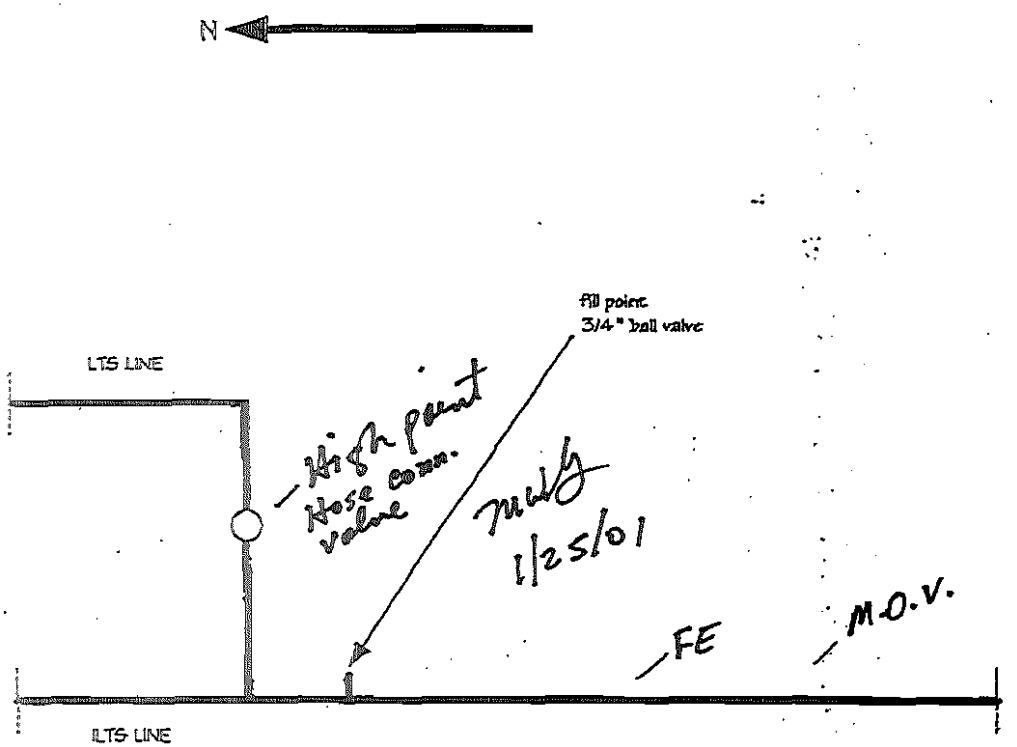
[✓] A - Conforms to the Subcontract Requirements w/added note 5
[ ] B - Minor Comment - Incorporate and Resubmit
[ ] C - Revise and Resubmit
Sig: MWB Date: 1/25/01

RIECK
Mechanical Electrical Services, Inc.
Planners, Constructors & Maintainers

GENERALIZED DIAGRAM ILLUSTRATING TEST SETUP
FOR HYDROSTATIC TESTING OF CARBON STEEL PIPE
FOR THE EPLTS CONTROL VALVE HOUSE

Notes:
- The valves and flow meter are not shown in this diagram.
- Any additional outlets will be capped or otherwise isolated to allow the testing of the system with the valves in the open position.
- N.T.S.

= the test boundaries for the testing in the control valve house.

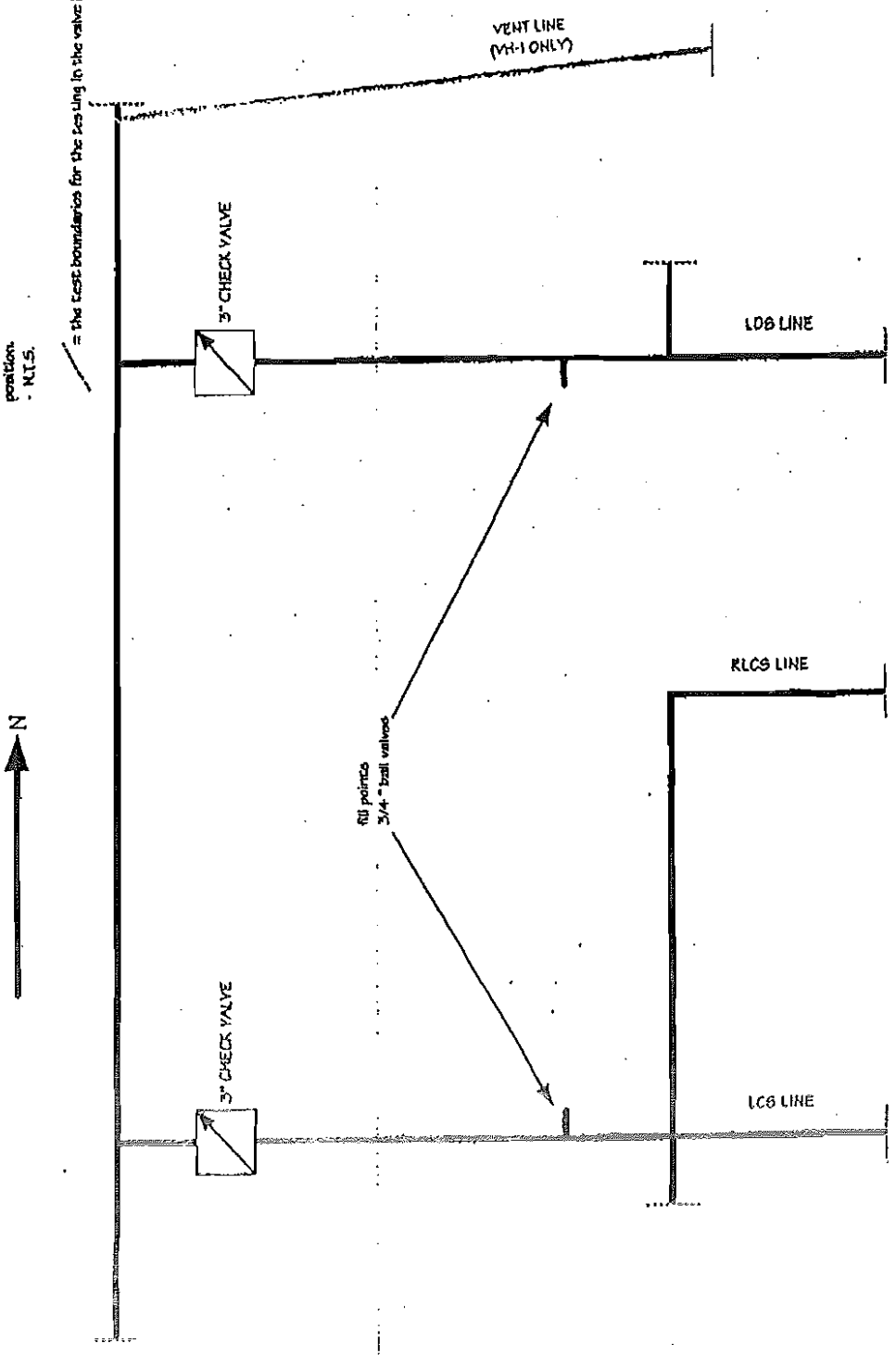


5245 Wadsworth Rd. P.O. Box 13565, Northridge Station Dayton, Ohio 45413-0565 (937) 274-1987 FAX (937) 274-7392

RIECK
Mechanical Electrical Services, Inc.
Planners, Constructors & Maintainers

Notes:
- The two fill points will be interconnected with a piece of copper pipe/tubing. The pressure gauge will be attached such that it will be measuring the pressure from both fill points to insure that the check valves do not interfere with identifying any possible pressure drops.
- Any additional outlets will be capped or otherwise isolated to allow the testing of the system with the valves in the open position.
- N.T.S.

= the test boundaries for the testing in the valve house.



GENERALIZED DIAGRAM ILLUSTRATING TEST SETUP
FOR HYDROSTATIC TESTING OF CARBON STEEL PIPE
FOR THE EPLTS VALVE HOUSES

5245 Wadsworth Rd. P.O. Box 13565, Northridge Station Dayton, Ohio 45413-0565 (937) 274-1987 FAX (937) 274-7392

APPENDIX E

APPENDIX E

FIELD TEST RESULTS

COMPACTED FILL

- **Nuclear Moisture/Density Test Results**
- **Drive Cylinder Test Results**

NUCLEAR MOISTURE/DENSITY TEST RESULTS

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.: 02

DESCRIPTION: EPLTS DATE: 13 day June month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 98 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): 6"

MATERIAL SOURCE: Welch MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 Stone

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28800 CORRECTION FACTOR Y = N/A QA ID: TTO

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
578	45' N of Pole 745	6 / 1		4.1	136.4	6.9	151.1	141.3	103.6	P				
579	" " " 744	6 / 1				5.0	144.6	137.1	100.5	P				
580	@ Pole 744	6 / 2				3.6	141.6	136.7	100.2	P				
581	@ Pole 746	6 / 2				4.3	141.1	135.3	99.2	P				
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

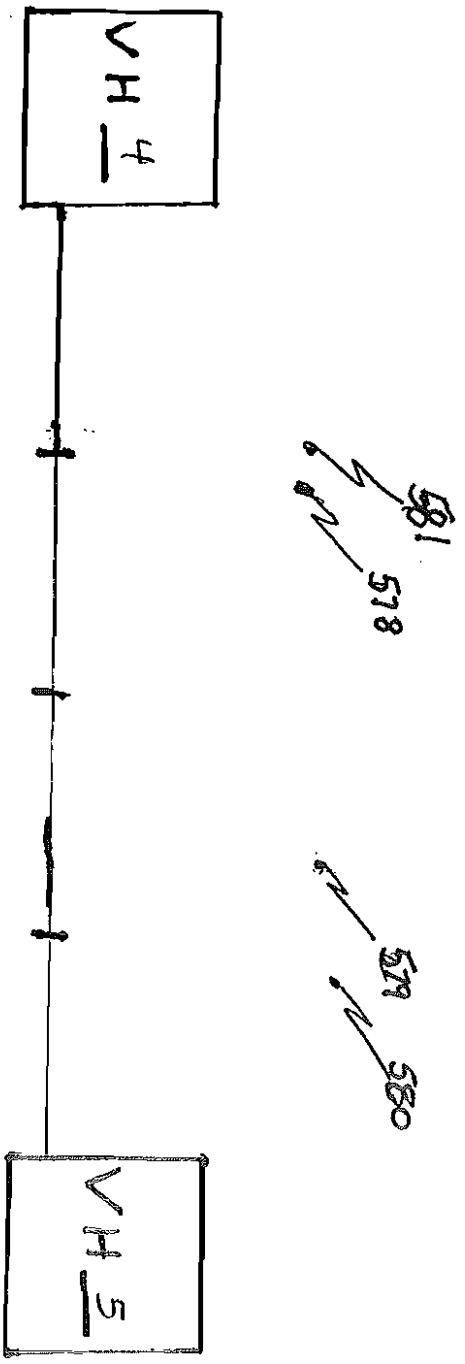
GEOSYNTEC CONSULTANTS

Page ____ of ____

Written by: ____ Date: ___/___/___ (YY MM DD) Reviewed by: ____ Date: ___/___/___ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



Not to 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 PROJECT NO.: GQ1341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 12 day June month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 98 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ±8

MATERIAL SOURCE: EP-19 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: TQ/Q

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
574	21'N of Pole 744	8 / 1	EP19	13.0	122.0	~~12.2~~ TP 11.1	132.9	119.6	98.1	✓				
575	24'S of Pole 745	8 / 1	"	"	"	12.3	135.1	120.3	98.6	✓				
576	STA 25+60	8 / Grade	~~17.9~~ EP-33	17.9	109.4	13.8	118.8	104.4	95.4	✓				
577	STA 25+00	8 / Grade	~~17.9~~ EP-33	17.9	109.4	12.6	118.2	104.9	96.0	✓				

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

CHECKED BY: CJ

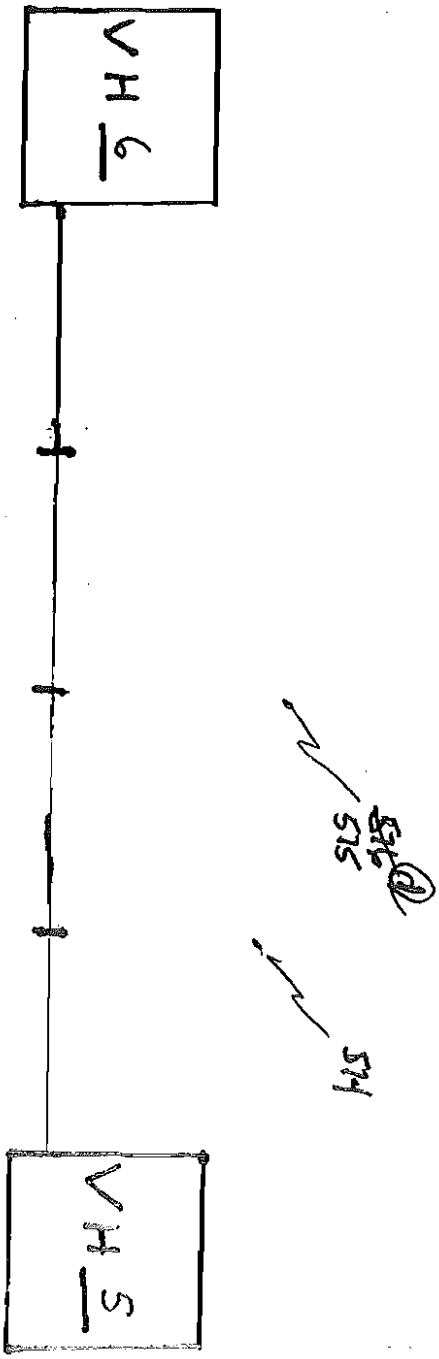
GEOSYNTEC CONSULTANTS

Page ____ of ____

Written by: T. Dickman Date: 01 / Jun 4 / 2 (YY MM DD) Reviewed by: ____ Date: __ / __ / __ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



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22

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.: 02

DESCRIPTION: EPLTS DATE: 31 day MAY month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 98 % COMPACTION / MOISTURE RANGE: ±3% LIFT THICKNESS (LOOSE/COMPACTED): ±6

MATERIAL SOURCE: Welch MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Roadway (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28800 CORRECTION FACTOR Y = N/A QA ID: 70

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
571	15' S of Pole 750 in Road	6 / 2	304	Stone	136.4	3.8	150.6	145.1	106.4	✓				
572	@ Pole 749 in Road	6 / 1	"	"	"	4.7	153.9	147.0	107.8	✓				
573	6' S. of Pole 749	6 / 2	"	"	"	5.2	146.9	139.6	102.4	✓				
		/												
		/												
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		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

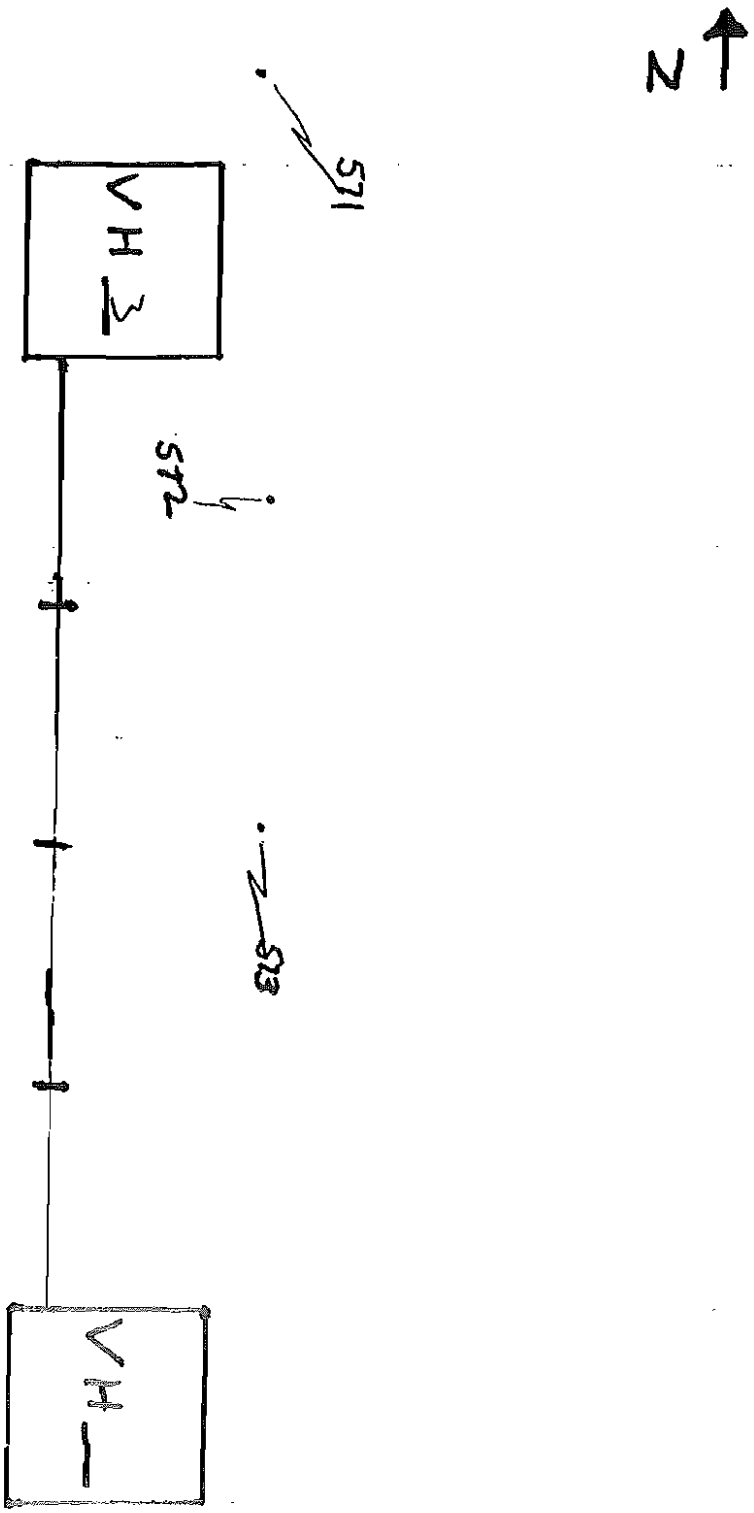
CHECKED BY: [signature]

SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

Written by: TD Date: 01/05/30 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



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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 PROJECT NO.: GQ1341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 30 day MAY month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~98~~ 95 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ± 6

MATERIAL SOURCE: EP-14 / 304 Stone MATERIAL TYPE: (FILL) / SUBGRADE / (SUBBASE) / CLAY / (OTHER:) Roadway
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28800 CORRECTION FACTOR Y = N/A QA ID: TD

TEST NO.	TEST LOCATION	LIFT #/ PROBE DEPTH/ ~~LIFT NO.~~ TO	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
565	12'E of ℄ of UH3	3/10	EP-14	11.2	125.7	11.0	138.4	124.7	99.2	✓				
566	15'E of 10'S of UH3	4/10	↓	↓	↓	13.3	127.7	112.7	89.7		✓	3		
567	15'E + 10'S of UH3	4/10				12.6	135.7	120.5	95.9	✓			✓	
568	65'E of ℄ of UH3	4/10				10.2	134.5	122.1	97.1	✓				
569	12'N + 12'E of UH3	5/8	↓	↓	↓	10.0	138.7	126.1	100.3	✓				
570	9'E + 6'N of ℄ of UH3	1/6		304	136.4 Stone	4.2	150.5	144.5	105.9	✓				
		/												
		/												
		/												
		/												

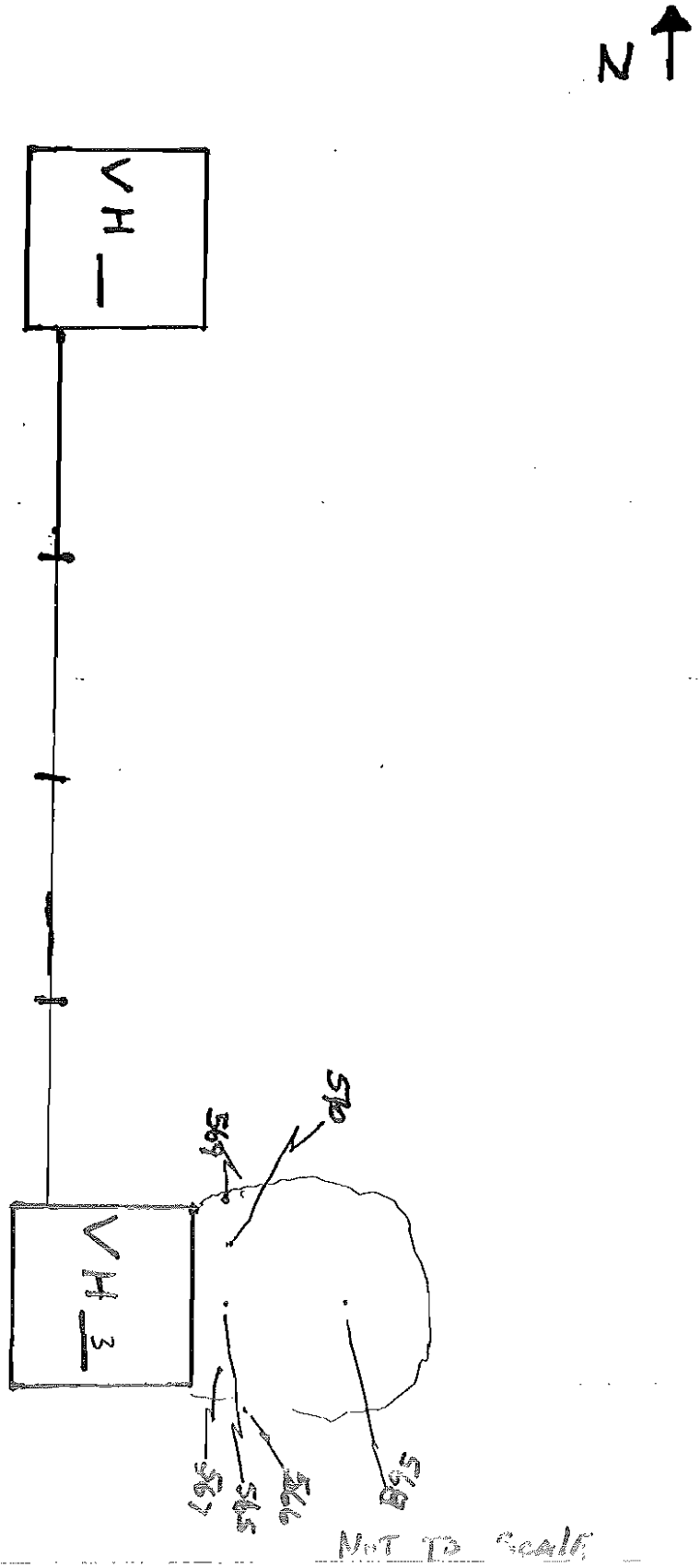
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

Tests 2, 3, 5 + 6 = 98% Compaction

GEOSYNTEC CONSULTANTS

Written by: T. Dickman Date: 01 / 1mm4 / 30 (YY MM DD) Reviewed by: _____ Date: / / (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



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.: 02

DESCRIPTION: EPLTS DATE: 29 day MAY month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~98~~ 95 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ± 8

MATERIAL SOURCE: EP-14 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

NUCLEAR GAUGE TYPE: Troxler 3440 GAUGE SERIAL NO. 28800 CORRECTION FACTOR Y = N/A QA ID: TKO

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
563	48' E of UH3 N. of ℄	1 / 6	EP14	11.2	125.7	10.7	132.3	119.5	95.1	✓				
564	30' E " @ N Edge of BLD	2 / 6	EP14	11.2 ~~11.5~~	125.7	11.5	134.5	120.7	96.0	✓				
		/												
		/												
		/												
		/												
		/												
		/												
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		/												

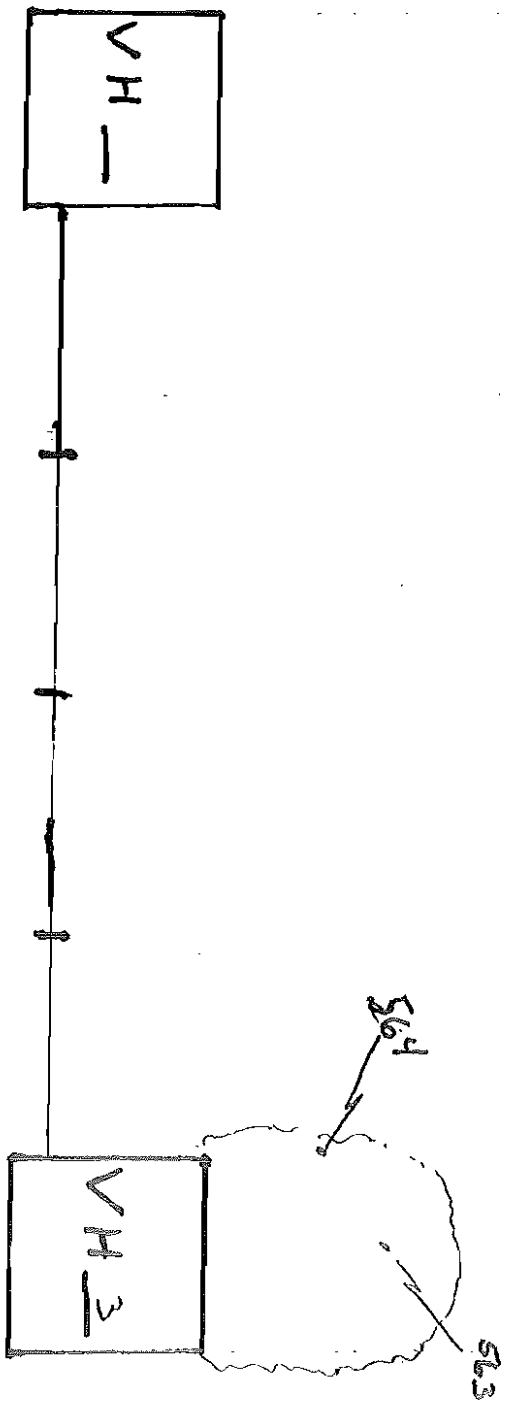
COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

Written by: T. Dickman Date: 01 / MAY / 27 (YY / MM / DD) Reviewed by: _____ Date: 01 / / (YY / MM / DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ ~~1029~~ 1341 Task No.: 4.2

N



Not To 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 PROJECT NO.: GQ1341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 14 day MAY month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~98~~ 95 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ±6

MATERIAL SOURCE: Welch MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: ROADWAY

NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 28820 CORRECTION FACTOR Y = N/A QA ID: TO

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
1	10' So. of VH2 & Roadway	6 / 1		4.1	136.4	2.9	137.1	133.3	97.7		✓	2		
2	" "	6 / 1				4.4	142.6	136.6	100.1	✓			✓	
3	8' N of VH1 & Roadway	6 / 1				3.7	147.5	142.2	104.2	✓				
4	E of VH 2 & Roadway	6 / 2				4.5	148.1	141.7	103.9	✓				
5	So End of VH1 6' East	6 / 2				3.2	139.0	134.7	98.7	✓				
6	50' E of S. End of VH2	8 / TOP	EP-8	12.4	121.9	7.2	132.7	123.7	101.5	✓				
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

Test #6 = 95% Compact min. on soil Backfill

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 — PROJECT NO.: ~~G00109~~ 1341 TO — TASK NO.: 04.2

DESCRIPTION: Phase II — DATE: 10 day MAY month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: EP-8 — MATERIAL TYPE: (FILL) / SUBGRADE / ~~SUBBASE~~ / CLAY / OTHER: _____ (CIRCLE ONE) — LIFT THICKNESS (LOOSE/COMPACTED): ±8

% COMPACTION: 95 + 98% — MOISTURE RANGE: N/A — ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 — NUCLEAR GAUGE SERIAL NO. 28800 — COR. FACTOR: N/A — QA ID: TD

TEST NO.	TEST LOCATION (See sketch)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
556	33' E of UH2	8"/1	EP-5 ~~EP-8~~	11.7 ~~12.7~~	125.2 ~~121.9~~	8.5	137.7	126.9	101.0 ~~104.9~~	P				
557	55' E of UH2	8"/2	"	~~11.7~~	~~125.6~~	10.2	141.2	128.1	102.0 ~~105.1~~	P				
558	15' E of UH2	8"/3	EP-8	12.4	121.9	7.2	132.2	123.2	101.1	P				
559	6' E of UH2	8"/4	"	"	"	10.1	131.4	119.3	97.9	TD	F	560	✓	
560	6' E of UH2	8"/4	"	"	"	10.0	137.7	125.1	102.7	P				
561	10' E of UH2	8/5				9.4	134.5	122.9	100.9	P				
562	54' E of UH2	8/5				11.5	138.0	123.7	101.5	P				

COMMENTS: Tests # 1, 2 and 7 were 95% compaction
Tests # 3, 4, 5, 6 = 98% compaction (last lift prior to 304 stone placement

CHECKED BY: _____

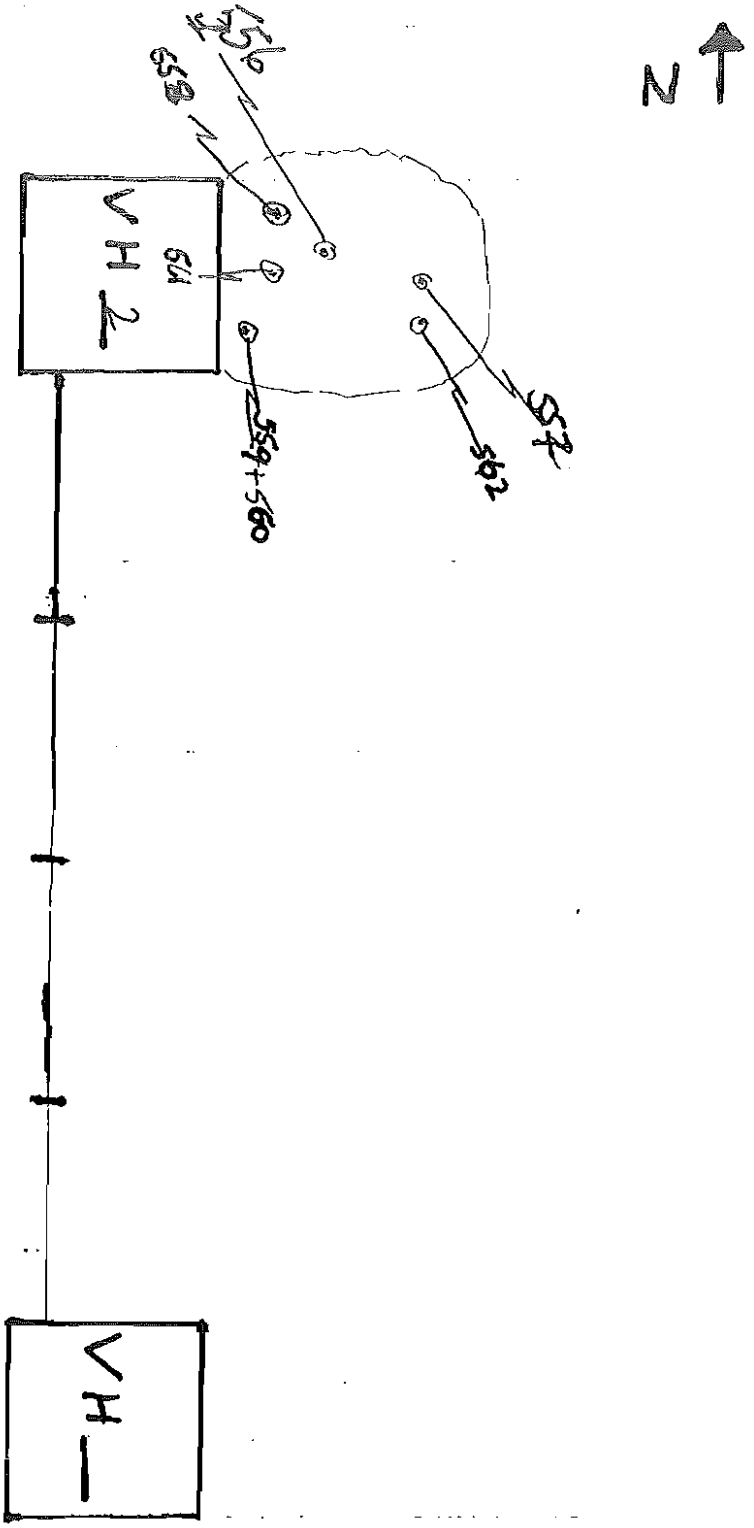
SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

Page ___ of ___ PROD #7284 Vol. 3

Written by: Tony Pickman Date: 01 / 05 / 10 (YY MM DD) Reviewed by: _____ Date: ~~01 / 05 / 10~~ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GG 1089 Task No.: 4.2



Page 2 of 2

NOT TO 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 PROJECT NO.: GQ1341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 7 day MAY month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 98 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE / COMPACTED): 18

MATERIAL SOURCE: EP-27 MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

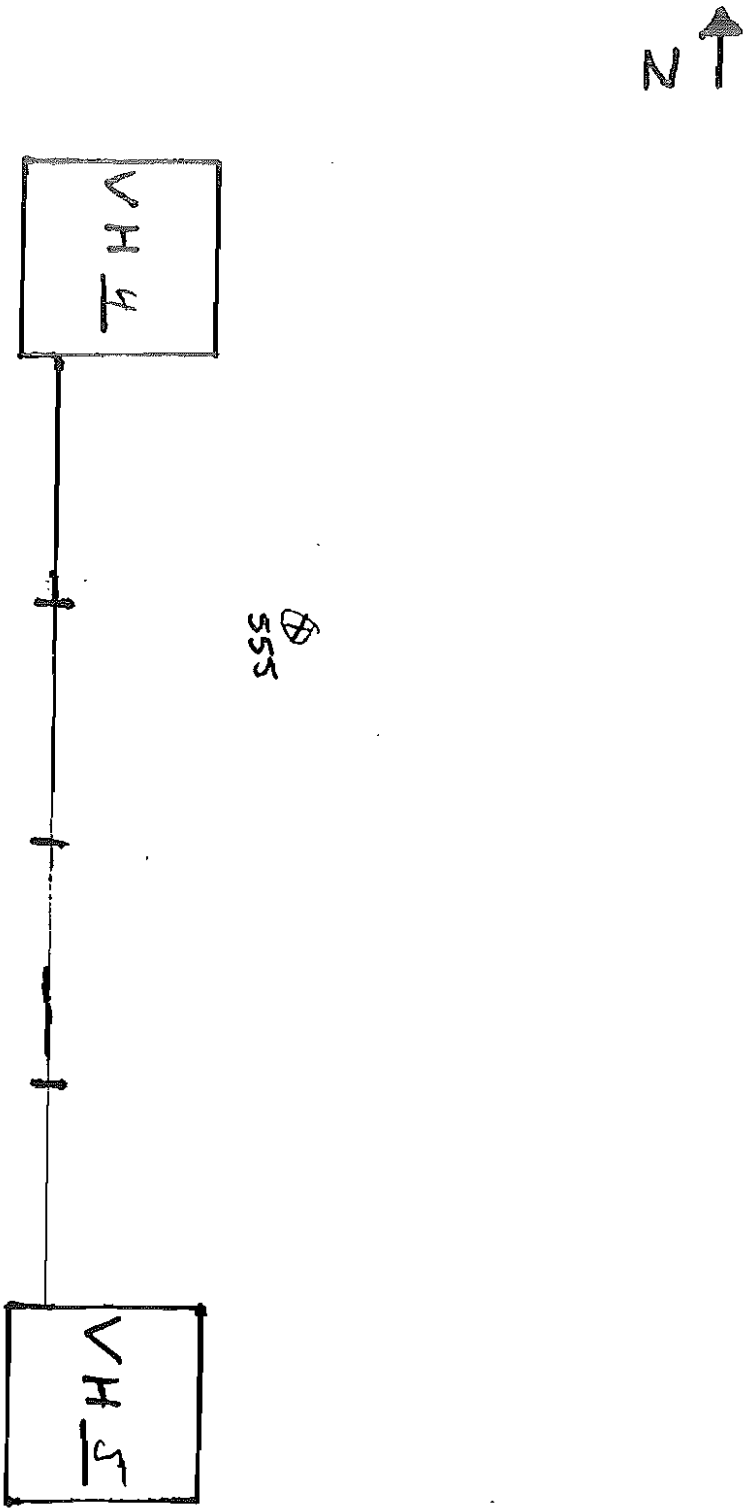
NUCLEAR GAUGE TYPE: TROXLER 3440 GAUGE SERIAL NO. 28800 CORRECTION FACTOR Y = N/A QA ID: TP

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
555	80' S. of Pole 746	8 / 1	~~EP 27~~	~~17.2~~	~~114.0~~	9.6	126.4	115.3	~~103.9~~ ~~99.5~~ 100.5	✓				
		/	EP10	15.3	114.7									
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												
		/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

Written by: _____ Date: __/__/__ (YY MM DD) Reviewed by: _____ Date: 01/05/01 (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GE 1029 Task No.: 4.2



NOT TO 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 PROJECT NO.: GQ1341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 24 day APRIL month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~98~~ 95 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ±8

MATERIAL SOURCE: EP-5 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: ~~YD~~

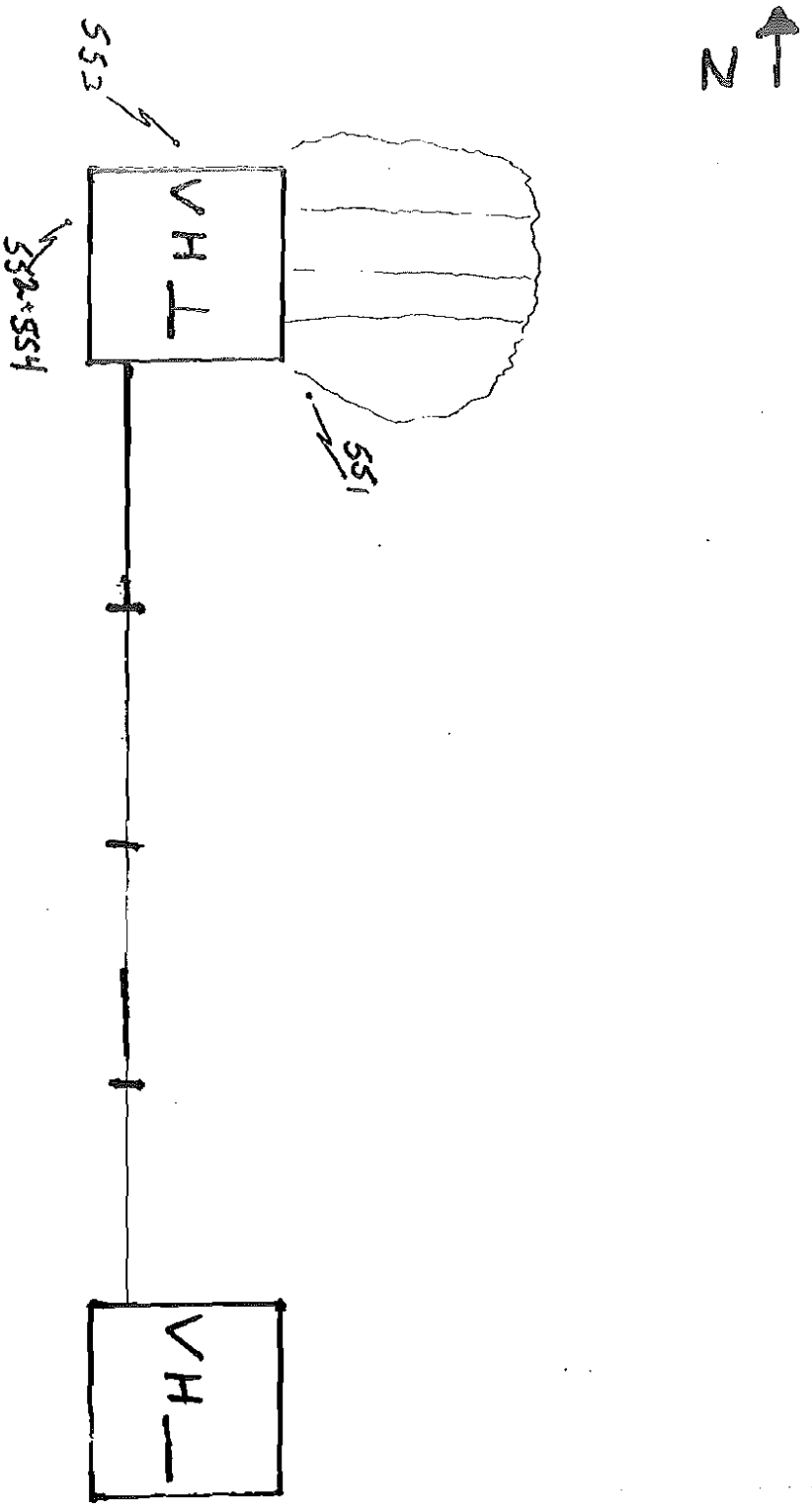
	TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
1	551	15'S + 15'E of UH1	8/	EP-5	11.7	125.6	11.4	140.3	125.9	100.3	✓				
2	552	6'W + 4' from N corner UH1	8/GRADE	"	"	"	16.5	133.7	114.8	91.4		✓	554	✓	
3	553	3'N & UH1	8/GRADE	"	"	"	6.3	127.5	119.9	95.5	✓				
4	554	6'W + 4'F N. Corner UH1	8/GRADE	"	"	"	8.5	132.7	122.2	97.3	✓				
			/												
			/												
			/												
			/												
			/												
			/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

Tests # Have 98% Compaction for Roadways (551)

Written by: T. Dickson Date: / / YY MM DD Reviewed by: Date: 01/19/99 YY MM DD

Client: Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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.: 02

DESCRIPTION: EPLTS DATE: 23 day April month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 ~~95~~ 98 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ±8

MATERIAL SOURCE: EP-5 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: TQ/QA

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
542	50'E of VH1 ℄	8/4	EP-5	11.7	125.6	10.3	135.6	122.9	97.9	✓				
543	15'E of VH1 ℄	8/~~8~~ 7	EP5	11.7	125.6	12.7	135.8	120.5	95.9	✓				
544	60'E " " N of ℄	8/5	EP-5	11.7	125.6	11.8	134.9	120.7	96.1	✓				
545	12'E " " 5' N of ℄	8/~~8~~ 4	EP-5	11.7	125.6	11.5	135.8	121.8	96.9		✓	546	✓	
546	" " "	8/~~8~~ 4	EP-5	11.7	125.6	11.6	137.4	123.0	98.1	✓		~~546~~	✓	
547	55'E " " 8' S of ℄	8/6	EP-5	11.7	125.6	8.0	130.7	121.1	96.4	✓				
548	10'E " 10' N of ℄	8/5	EP-5	11.7	125.6	10.3	137.5	124.7	99.3	✓				
~~549~~	~~10'E " 10' N of ℄~~	~~8/5~~	~~TD~~											
549	40'E of VH1 ℄	8/7	EP-5	11.7	125.6	9.0	132.5	121.6	96.8	✓				
550	@ Road 15' S of Door	8/6	EP-5	11.7	125.6	9.9	130.3	118.6	94.4		✓	551	✓	

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

~~#5~~ 4, 5, 7, 9 Are in The Roadway Area. Needs 98% Compaction (last lift prior to 304 stone placement.

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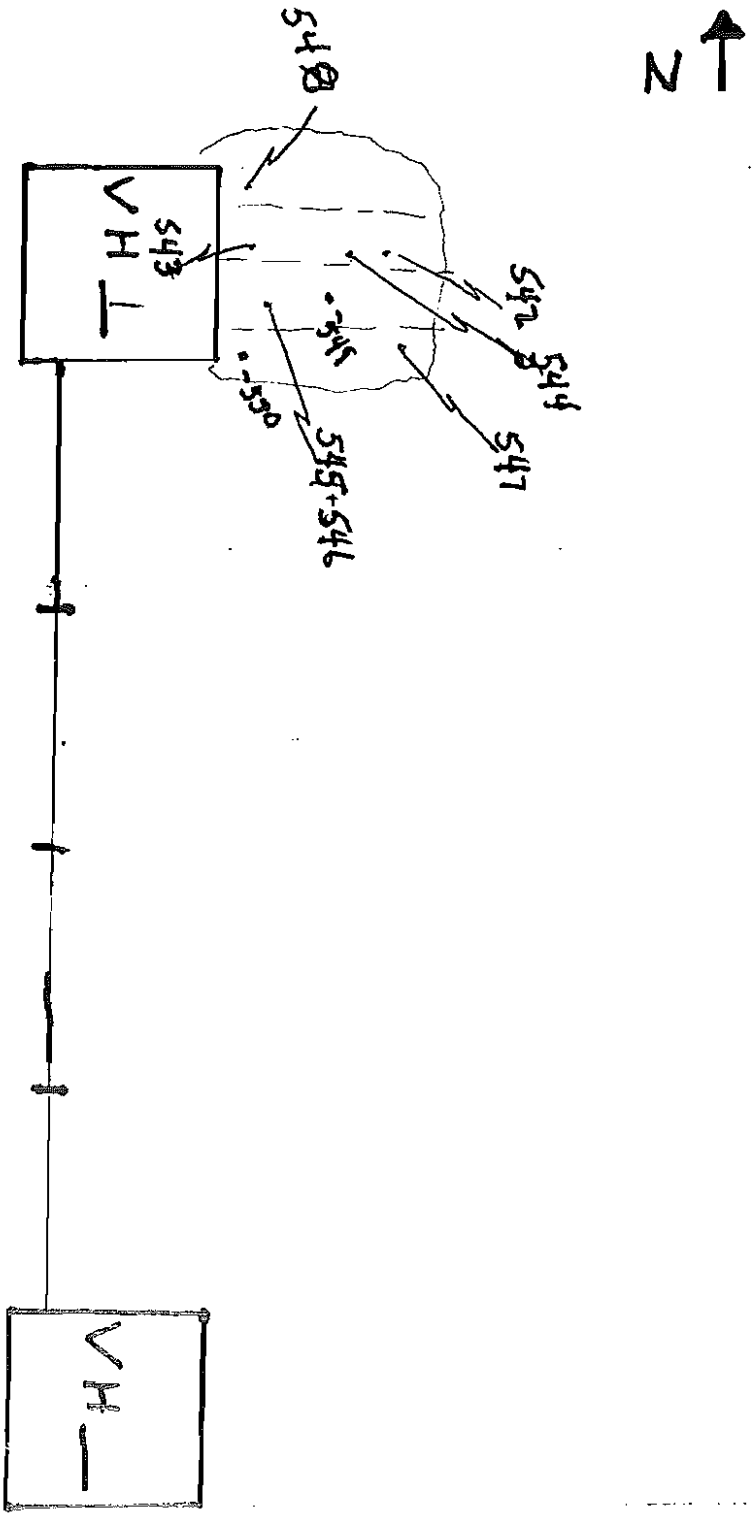
Page ____ of ____

Written by: ____ Date: ___/___/___ (YY MM DD) Reviewed by: ____ Date: ___/___/___ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO 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 PROJECT NO.: G01341 TASK NO.: 02

DESCRIPTION: EPLTS DATE: 20 day APR month 01 year

SPECIFICATION REQUIREMENTS: ASTM D 698 / ASTM D 1557 95 % COMPACTION / MOISTURE RANGE: N/A LIFT THICKNESS (LOOSE/COMPACTED): ±8

MATERIAL SOURCE: EP-5 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: TO

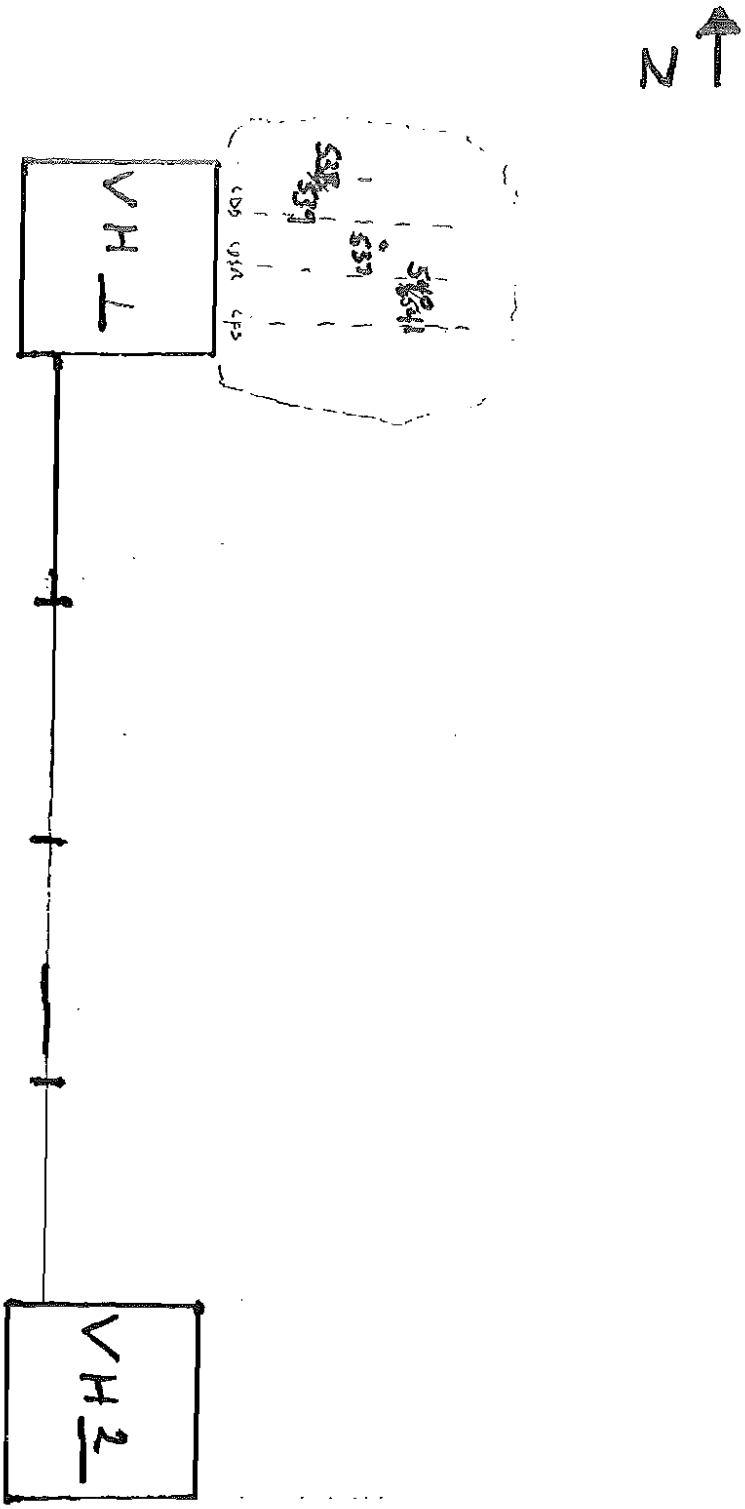
	TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (1) (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
1	537	40' E 5'N of VH1	8 / 1	EP5	11.7	125.6	12.9	136.1	120.5	96.0	✓				
2	538	32' E 3'N of VH1	8 / 2				12.1	133.4	119.0	94.7		✓	3	✓	
3	539	" "	8 / 2				12.3	135.7	120.9	96.2	✓			✓	
4	540	50' E Center of VH1	8 / 3				14.1	129.9	113.8	90.6		✓	5	✓	
5	541	" " "	8 / 3				13.7	136.4	120.0	95.5	✓			✓	
			/												
			/												
			/												
			/												
			/												

COMMENTS: (1) FIELD MOISTURE CONTENT (FMC) = GAUGE READING/CORRECTED MOISTURE (Y)

GEOSYNTEC CONSULTANTS

Written by: Tony D. Date: / / YY MM DD Reviewed by: Date: 01/APR/20 YY MM DD

Client: Project: E.P.L.T.S. Project/Proposal No.: GO 1029 Task No.: 4.2



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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 PROJECT NO.: 6Q1341 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 5 day April month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: off-site MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
535	Road ~20 SE of VH-6	6"/1	Test	4.1	136.4	3.3	138.9	134.5	98.6	✓				
536	Road ~20 S of VH-6	6"/2	Strip	4.1	136.4	2.8	138.0	134.2	98.4	✓				

COMMENTS:

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 PROJECT NO.: 6Q1341 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 3 day ~~March~~ April month 2001 year KS

SPECIFICATION REQUIREMENTS

SOURCE: on-site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
534	Roadway South of VH-6	8"/Subgrade ~~Below~~ Stone	EP-21	14.1	118.3	11.9	131.7	117.7	99.5	✓			

COMMENTS:

CHECKED BY: [signature]

SHEET NO. 1 OF 1

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 PROJECT NO.: _____ TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 02 day APR month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: ~~EPC + EP21~~ ON Site MATERIAL TYPE: (FILL) / (SUBGRADE) / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: _____ ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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		PASS	FAIL
530	20'S 10'E of 846	8/1	EP 6	15.5	112.	15.0	125.7	110.2	98.4	✓				
531	155+5'E "	8/2	↓	↓	↓	14.2	131.3	115.0	102.7	✓				
532	25' S of E of 846	8/3	EP 21	14.1	118.3	12.1	136.2	121.5	102.7	✓				
533	24' S ~~of~~ 3'W "	8/4	↓	↓	↓	10.1	138.0	125.3	105.6	✓				

COMMENTS: Test 3 MATERIAL CHANGED

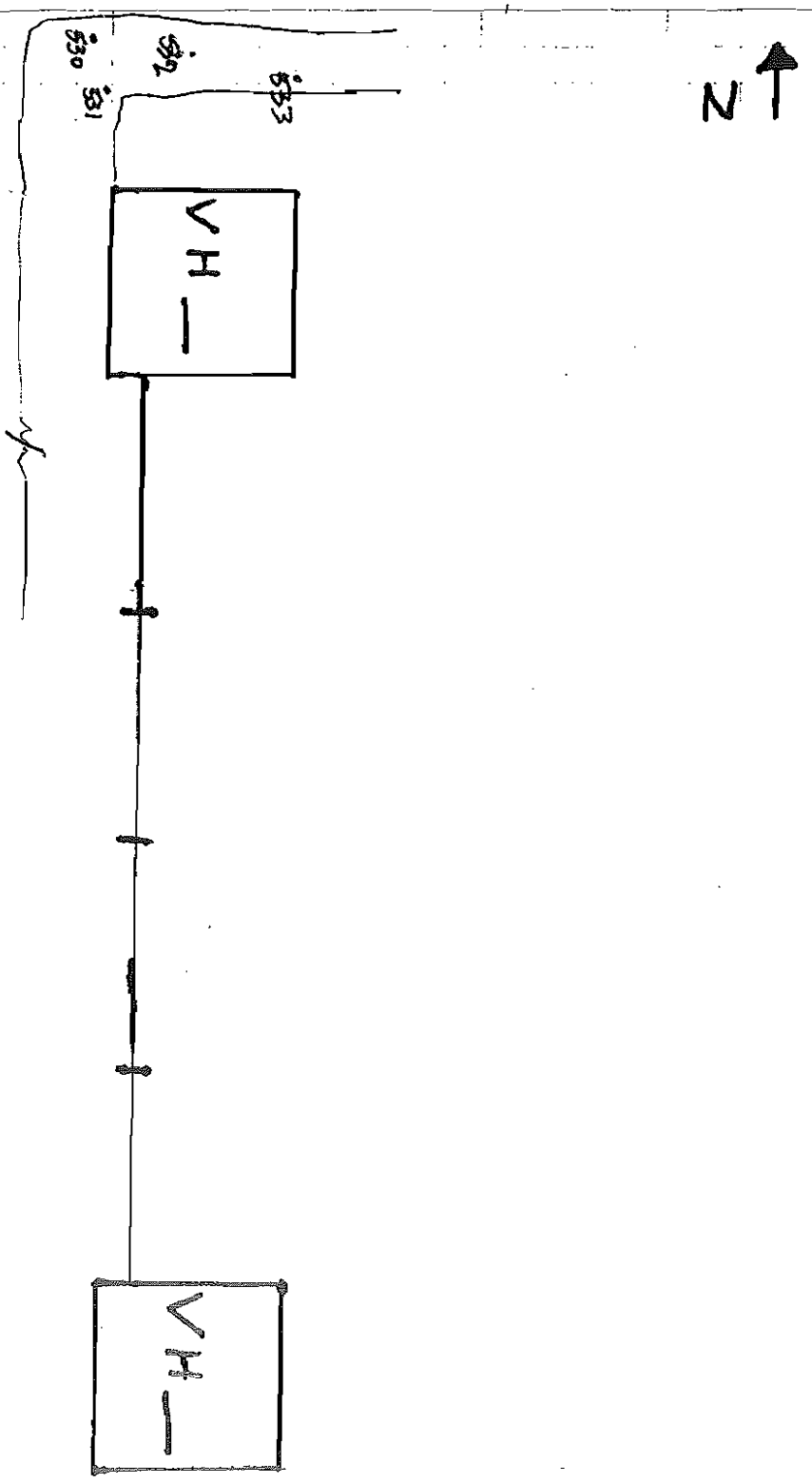
©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: _____ SHEET NO. 1 OF 2

GeoSyntec Consultants

Page ____ of ____

Written by: ____ Date: ___/___/___ (YY MM DD) Reviewed by: ____ Date: ___/___/___ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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

PROJECT NO.: GQ~~0409~~ 1029 TP TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 29 day MARCH month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch

MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 Stone (CIRCLE ONE)

LIFT THICKNESS (LOOSE/COMPACTED): ±6

% COMPACTION: 95

MOISTURE RANGE: N/A

ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: N/A

QA ID: TP

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		PASS	FAIL
527	36' So of Pole 743	6"/2	*	4.1	136.4	2.5	135.6	132.3	96.9		✓	528	✓	
528	60' " "	6"/2		↓	↓	3.7	147.9	142.6	104.4	✓			✓	
529	30' So of V44	6"/2				3.5	142.7	137.9	101.0	✓				

COMMENTS: *Ave. Value As per ODOT 304.05

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SHEET NO. 1 OF 1

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 PROJECT NO.: G01029 TASK NO.: 04.2

DESCRIPTION: EPLTS CONSTRUCTION DATE: 29 day MARCH month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: WELCH SAND & GRAVEL MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / (OTHER: 304 STONE) LIFT THICKNESS (LOOSE / (COMPACTED): 6"

% COMPACTION: ≥98% MOISTURE RANGE: NA ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE) (ODOT TEST STRIP)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: NA QA ID: TBD

TEST NO.	304 STONE ROAD RUNNING N-S (TEST LOCATION) JUST EAST OF VHs	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
520	STA 19+80	6"/L-1	TEST STRIP	4.1	136.4	2.5	139.2	135.8	99.6	P	–	—	—	–
521	STA 19+00	6"/L-1	TEST STRIP	4.1	136.4	3.6	142.5	137.5	100.8	P	–	—	—	–
522	STA 18+15	6"/L-1	TEST STRIP	4.1	136.4	2.6	138.8	135.3	99.2	P	–	—	—	–
523	STA 20+00	6"/L-2	TEST STRIP	4.1	136.4	2.1	139.5	136.6	100.1	P	–	—	—	–
524	STA 19+25	6"/L-2	TEST STRIP	4.1	136.4	2.4	140.5	137.2	100.6	P	–	—	—	–
525	STA 18+50	6"/L-2	TEST STRIP	4.1	136.4	2.4	137.4	134.2	98.4	P	–	—	—	–
526	STA 18+00	6"/L-2	TEST STRIP	4.1	136.4	2.8	144.1	140.2	102.8	P	–	—	—	–

COMMENTS: TEST STRIP Value Reached as per ODOT 304.05

CHECKED BY: [illegible]

SHEET NO. 1 OF 1

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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 28 day March month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: on-site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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			
519	Road between VW-5/VW-6 ~15' E of St. 19+00	8" / 1	EP-35	16.0	112.5	9.8	125.5	114.3	101.6	✓				

COMMENTS:

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 PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 16 day March month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±6

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20929 COR. FACTOR: N/A QA ID: YO

	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 (%)	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
1	513	N. End of VHS in Roadway	6"/ 1	*	*	132.9	5.2	142.7	135.7	102.1	✓				
2	514	@ Pole #743 in N.S. Roadway	6"/ 1	↓	↓	↓	7.5	142.6	132.7	99.9	✓				
3	515	90' S. of Pole 743 on N.S Road	6"/ 1	↓	↓	↓	8.2	138.6	128.1	96.4	✓	✓	516	✓	
4	516	"	6"/ 1	↓	↓	↓	4.8	144.8	138.1	103.9	✓			✓	
	517	5' E of VH Door	6"/ 2	↓	↓	↓	3.9	140.9	135.7	102.1	✓				
	518	25' S of VHS on N.S. Roadway	6" 2	↓	↓	↓	5.2	148.1	140.8	106.0	✓				

COMMENTS: * Ave. Value As per ODOT 304.05

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SHEET NO. 1 OF 1

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 PROJECT NO.: ~~G00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 15 day MARCH month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER 304 (CIRCLE ONE) LIFT THICKNESS (LOOSE / COMPACTED): ±6

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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		PASS	FAIL
510	45' E of UH5 in Roadway	6/ 1	*	*	132.9	3.7	132.8	128.1	96.4		✓	511	✓	
511	"	6/ 1	↓	↓	↓	4.0	136.3	131.0	98.6	✓			✓	
512	39' E of UH5 in Roadway	6/ 2	↓	↓	↓	4.1	137.8	132.5	99.7	✓				

COMMENTS: * Ave Proctor Value as per ODOT 304.05

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 14 day March month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: on-site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95/98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
Δ	507	Road 10' E of St. 16+50	8"/1	EP-31	18.5	106.5	17.0	125.5	107.3	100.7 ~~95.8~~ KS	✓				
Δ	508	Road 10' E of St. 17+50	8"/1	EP-31	18.5	106.5	17.6	125.8	107.0	100.5 ~~95.6~~ KS	✓				
	509	Road 10' E of St. 17+00	8"/2	EP-31	18.5	106.5	15.8	127.5	110.1	103.3 ~~98.3~~ KS	✓				
				~~F~~ KS											

COMMENTS: Δ - drive ring sample taken

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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 PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 13 day MARCH month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 LIFT THICKNESS (LOOSE/COMPACTED): ±6

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YD

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		
504	30' West of T-98 Parking Lot	6" / 1	*	*	132.9	4.8	142.9	136.4	102.6	✓			
505	110' W. of T98 parking Lot	6" / 1	↓	↓	↓	4.7	137.7	131.5	99.0	✓			
506	45' W. of T98 Parking Lot	6 / 2	↓	↓	↓	5.1	139.2	132.5	99.7	✓			

COMMENTS: E-W Roadway in Front of VHS 1st Lift of 304 Stone
* Ave Value as per ODOT 304.05

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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G0~~0409~~ 10290 TASK NO.: .04.2

DESCRIPTION: EPLTS DATE: 12 day MAR month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: EP10 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8

(CIRCLE ONE)

% COMPACTION: 95/98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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		PASS	FAIL
502	E.S.I.OC VA15	8"/1 of 2	EP10-6	15.5	112.0	18.3	125.8	106.3	94.9		✓			
503	"	" "	"	"	"	18.3	126.2	106.7	~~95.9~~ 95.2	✓				

COMMENTS:

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SHEET NO. 1 OF 2

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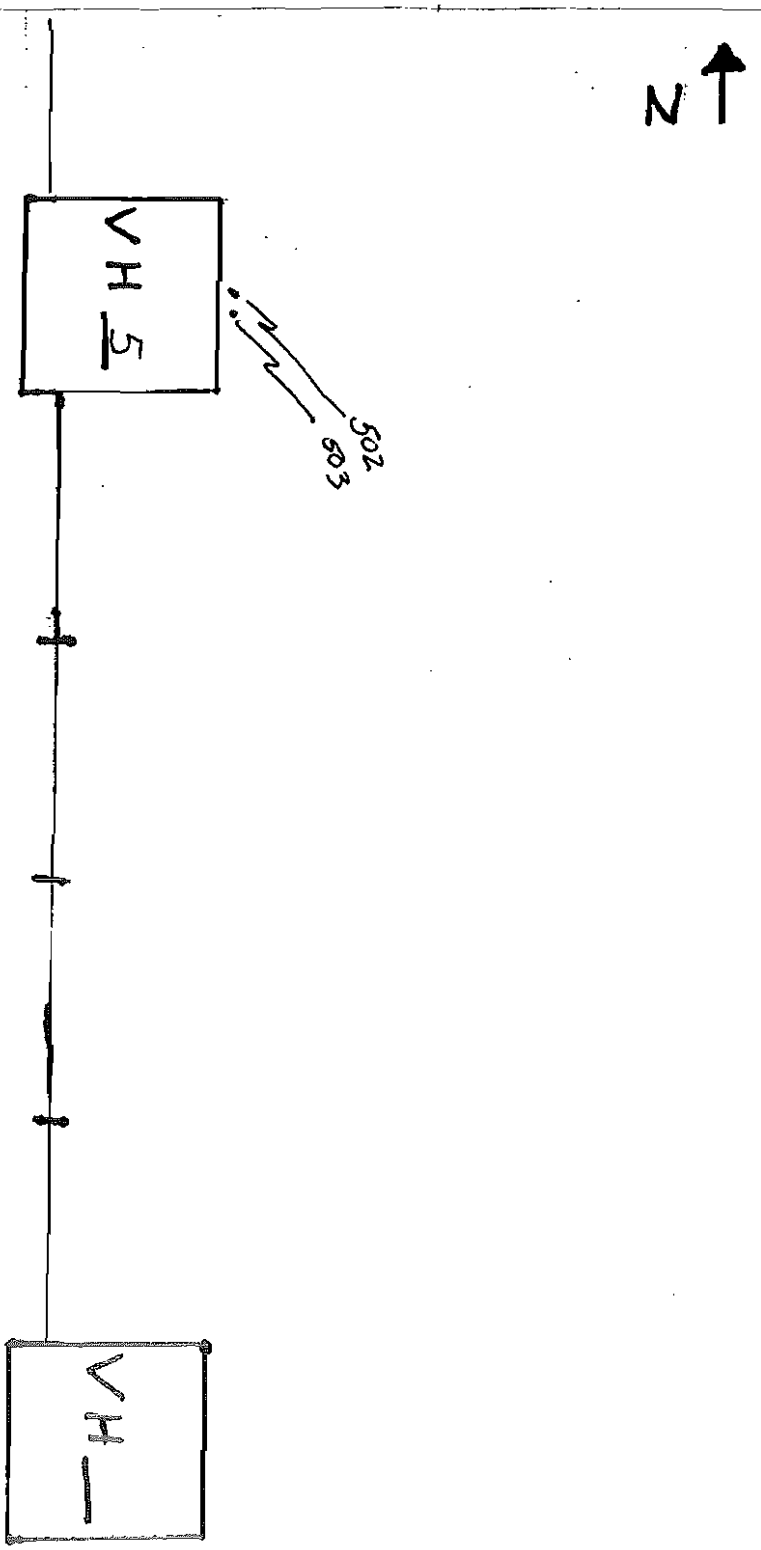
Written by: T. Dickman Date: 01/03/12 (YY MM DD) Reviewed by: ____ Date: __/__/__ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



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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 PROJECT NO.: GQ0409 TASK NO.: 04,2

DESCRIPTION: 2 PLTS DATE: 08 day MARCH month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / (SUBBASE) / CLAY / OTHER: 304/clay (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): + See Below

% COMPACTION: 98% MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: TO

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		PASS	FAIL
499	E Roadway By Pole 747	6"/1	*	*	132.9	3.6	145.6	140.6	105.8	✓				
500	50' S. of VH4 (12+60)	8"/	EP-17	12.1	122.6	6.3	128.6	120.9	98.6	✓				
501	" "	6"/2	*	*	132.9	4.3	147.0	~~140.7~~ 140.9	~~105.9~~ 106.0	✓				

COMMENTS: Tested 6" ± of 304 Stone and 8" ± Lift of Soil for Roadway
*Ave density Value as per ODOT 304.05

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FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G21029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 29 day Jan month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch/on site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
-98	@ 20+60	6"/1	EP-6	15.5	112.0	18.5	126.6	106.8	95.4	✓				

COMMENTS:

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SHEET NO. 1 OF 1

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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 PROJECT NO.: 6R1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 25 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: on-site / off-site MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): 8"-10"

% COMPACTION: 95/98 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
490	VH-5 north side	8"/1	EP-27	18.5	106.5	16.6	121.6	104.3	97.9	✓				
491	VH-5 east side	8"/1	↓	↓	↓	18.3	124.8	105.5	99.0	✓				
492	VH-5 South side	8"/1	↓	↓	↓	16.7	123.4	105.7	99.2	✓				
493	VH-5 west side	8"/1	↓	↓	↓	17.5	124.4	105.8	99.4	✓				
494	VH-5 east side	8"/2	EP-6	15.5	112.0	16.2	133.2	114.6	102.3	✓				
495	VH-5 north side	8"/2	EP-27	18.5	106.5	14.2	119.4	104.5	98.1	✓				
496	VH-5 West side	8"/2	↓	↓	↓	16.7	123.4	105.7	99.2	✓				
497	VH-5 South side	8"/2	↓	↓	↓	16.8	124.5	106.6	~~99.9~~ 100.1	✓				

COMMENTS: all tests were taken on the backfill over the grounding wire trench around VH-5.

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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 PROJECT NO.: 6Q1029 TASK NO.: 04.7

DESCRIPTION: EPLTS DATE: 24 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: off-site (304 stone) MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): 8"-10"

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (CIRCLE ONE) B C / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
486	10' west ~~E of~~ of ℄ @ St. 27+35	8"/	EP-30	8.2	135.4	5.2	143.1	136.1	100.5	✓				
487	10' East of ℄ @ St. 27+35	8"/	↓	↓	↓	4.9	143.2	136.5	100.8	✓				
488	10' west of ℄ @ St. 27+25	8"/	↓	↓	↓	5.2	144.8	137.6	101.6	✓				
489	10' East of ℄ @ St. 27+25	8"/	↓	↓	↓	5.0	143.4	136.6	100.9	✓				

COMMENTS:

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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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 23 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: on-site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

TEST NO.	TEST LOCATION ~~See Sketch~~ KS	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
479	VH-5 ~~West~~ East Side	8"/1	EP-6	15.5	112.0	19.9	129.9	108.3	96.7	✓				
480	VH-5 South Side	8"/1	↓	↓	↓	18.9	130.0	109.4	97.7	✓				
481	VH-5 North Side	8"/1				17.6	130.2	110.7	98.9	✓				
482	VH-5 East Side	8"/2				18.1	130.5	110.5	98.6	✓				
483	VH-5 South Side	8"/2				16.5	132.2	113.4	101.3	✓				
484	VH-5 North Side	8"/2				19.9	129.0	107.6	96.1	✓				
485	VH-5 West Side	8"/6				18.1	132.7	112.4	100.4	✓				

COMMENTS:

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 PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 22 day JAN month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20 979 COR. FACTOR: N/A QA ID: JP

	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 (%)	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
1	474	W. Side VH 5	12" / 1	EP-6	15.5	112.0	16.3	132.6	114.0	101.8	P				
2	475		12" / 2				16.1	129.6	111.7	99.7	P				
3	476		10" / 3				17.3	130.1	110.9	99.0	P				
4	477		10" / 4				16.3	134.8	115.9	103.5	P				
5	478		10 / 5				15.6	~~120.30~~ 127.3	110.3	98.5	P				

COMMENTS: Note: 10" 12" Lifts Were Placed To Choke off Incoming Water. Probe Depth Accordingly

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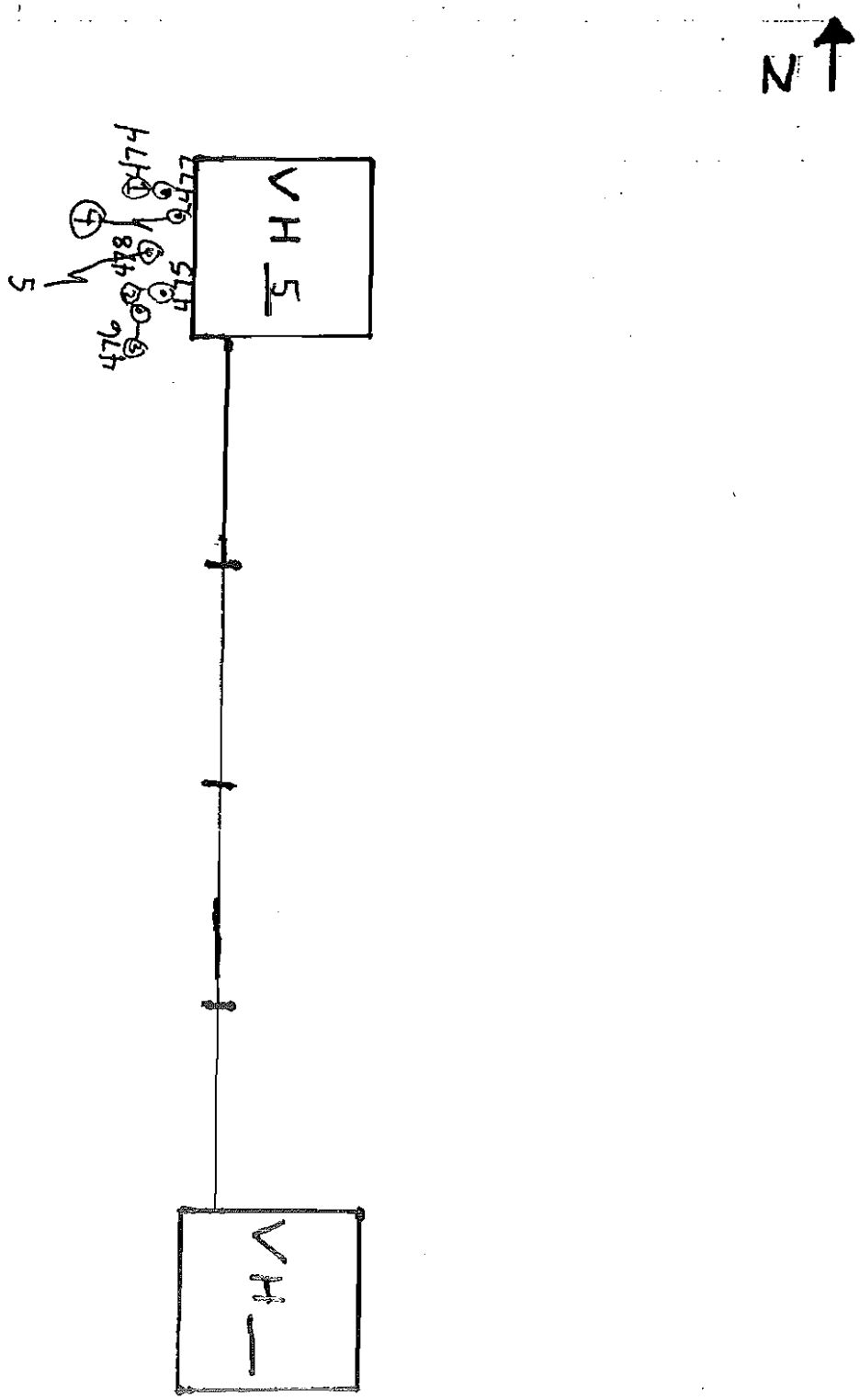
Page ____ of ____

Written by: TD Date: 01 / 1 / 22 (YY MM DD) Reviewed by: ____ Date: __ / __ / __ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



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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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 17 day JAN month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch Sand & gravel MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YD

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			
-73	℄ 22+80	8/GRADE	~~EP-3~~ EP-3	18.5	~~106.0~~ 106.5	18.4	122.3	103.4	~~92.1~~ 97.0	✓				

COMMENTS:

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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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 16 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch/on site mtx MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
	463	℄@ St. 23+50	8"/~~8~~ 3	EP-21	14.1	118.3	12.8	136.5	121.0	102.3	✓				
	464	℄@ St. 23+50	8"/~~8~~ 4	EP-6	15.5	112.0	15.8	132.5	114.4	102.1	✓				
	465	℄@ St. 23+50	8"/~~8~~ 5	↓	↓		15.2	129.9	112.7	100.7	✓				
	466	℄@ St. 23+50	8"/~~8~~ 6	EP-21	14.1	118.3	15.8	135.4	116.9	98.8	✓				
	467	℄@ St. 23+50	8"/~~8~~ 7	↓	↓	↓	14.9	134.6	117.1	99.0	✓				
	468	℄@ St. 23+50	8"/~~8~~ 8	↓	↓	↓	16.6	135.2	116.6	98.1	✓				
*	469	℄@ St. 23+50	8"/~~8~~ 9	EP-6	15.5	112.0	15.4	130.2	112.8	100.7	✓				
	470	℄@ St. 22+25	8"/ 2	EP-31	18.5	106.5	23.3	125.3	101.6	95.4	✓				
*	471	℄@ St. 23+50	8"/~~8~~ 10	EP-6	15.5	112.0	16.3	132.2	113.7	101.5	✓				
	472	℄@ St. 23+50	8"/Grade	EP-21	14.1	118.3	16.5	135.7	116.5	98.5	✓				

COMMENTS: * Drive ring samples taken

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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 PROJECT NO.: 621029 TASK NO.: 04.D

DESCRIPTION: EPLTS DATE: 12 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: off site (Welch) MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
459	℄ @ St 23+25	8"/3	EP-6	15.5	112.0	15.2	123.5	107.2	95.7	✓			
460	℄ @ St 23+25	8"/4	↓	↓	↓	19.3	129.5	108.6	96.9	✓			
461	℄ @ St. 22+00	8"/3	↓	↓	↓	15.5	131.4	113.7	101.6	✓			
462	℄ @ St 23+25	8"/5	↓	↓	↓	18.1	131.6	111.4	99.5	✓			

COMMENTS:

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SHEET NO. 1 OF 1

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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 PROJECT NO.: G01029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 11 day JAN month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: WELSH / ON-SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): ±8"
(CIRCLE ONE)

% COMPACTION: ≥ 95.0% MOISTURE RANGE: NA ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: NA QA ID: TBD/CS

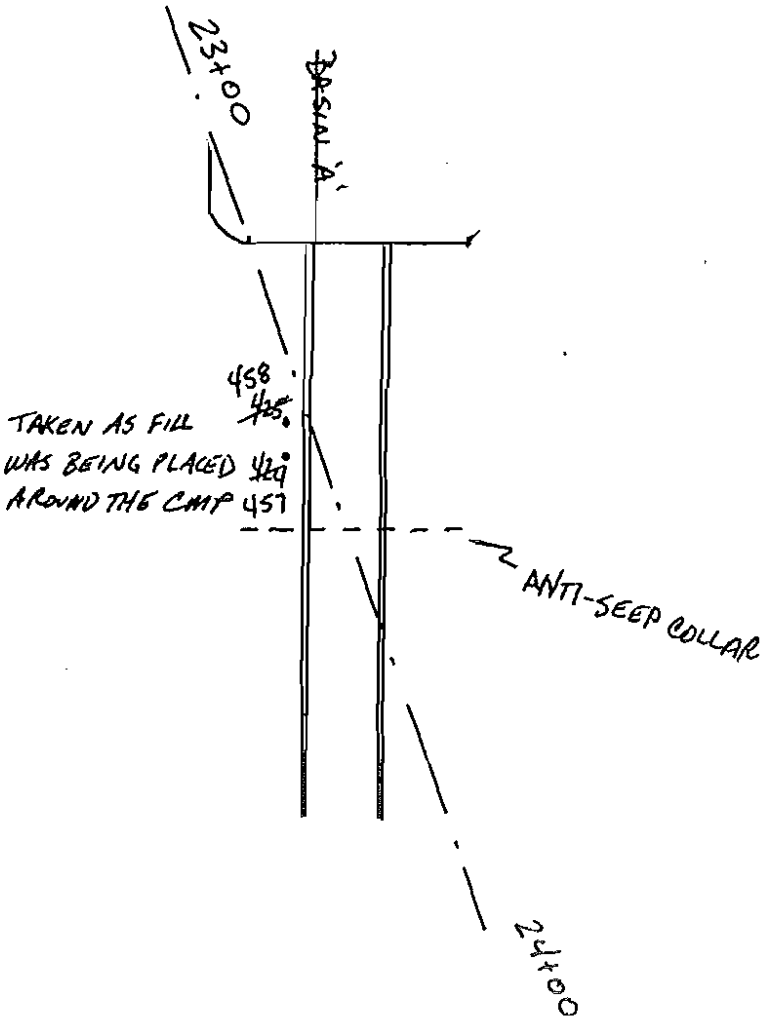
	TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
				SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
453	~~420~~	Sta. 26+25	8"/6	EP-6	15.5	112.0	15.6	126.8	109.7	97.9	P	—	—	—	—
454	~~421~~	STA 26+00	8"/GRADE	EP-33	17.9	109.4	19.0	118.7	99.8	91.2		F	577	✓	—
455	~~422~~	STA 25+60	8"/GRADE	EP-33	17.9	109.4	15.7	118.1	102.1	93.3		F	576	✓	—
456	~~423~~	STA 25+40	8"/GRADE	EP-6	15.5	112.0	14.7	124.4	108.5	96.9	P	—	—	—	—
457	~~424~~	{See location	8"/1	EP-6	15.5	112.0	18.1	131.7	111.5	99.6	P	—	—	—	—
458	~~425~~	MAP}	8"/2	EP-6	15.5	112.0	16.1	129.5	111.5	99.6	P	—	—	—	—

COMMENTS: NA = NOT APPLICABLE

GEOSYNTEC CONSULTANTS

Written by: CL Date: 01/1/11 (YY MM DD) Reviewed by: CL Date: 01/1/11 (YY MM DD)

Client: Fluor Project: EPLTS Project/Proposal No.: GQ1029 Task No.: 04.2



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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 10 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: off-site (Weigh) MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
447 ~~444~~	℄ @ St. 27+50	8"/4	EP-6	15.5	112.0	16.4	125.8	108.0	96.5	✓			
448 ~~445~~	℄ @ St 27+50	8"/5	↓	↓	↓	14.6	131.8	114.9	102.6	✓			
449 ~~446~~	℄ @ St. 26+00	8"/3				19.2	130.6	109.6	97.8	✓			
450 ~~447~~	℄ @ St. 26+25	6"/1				17.1	132.4	113.1	101.0	✓			
451 ~~448~~	℄ @ St. 26+00	8"/4				14.7	129.9	113.3	101.2	✓			
452 ~~449~~	℄ @ St 27+00	8"/5				17.2	130.3	111.2	99.3	✓			

COMMENTS:

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 9 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: Off-site (Welsh) MATERIAL TYPE: (FILL) SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
444 ~~441~~	℄ @ St. 27+50	6"/1	EP-6	15.5	112.0	15.0	126.8	110.2	98.4	✓				
445 ~~442~~	℄ @ St. 27+50	8"/2	↓	↓	↓	16.8	133.4	114.1	101.9	✓				
446 ~~443~~	℄ @ St. 27+50	8"/3	↓	↓	↓	17.0	132.5	113.3	101.1	✓				

COMMENTS:

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 8 day Jan month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: off-site (welsh) MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
442 ~~409~~ @	℄ @ St. 22+25	8/3	EP-6	15.5	112.0	16.8	126.8	106.7	95.3	✓			
443 ~~410~~ @	℄ @ St. 22+75	8/3	↓	↓	↓	15.9	130.4	112.6	100.5	✓			
		~~13~~ KS											

COMMENTS:

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: [signature] SHEET NO. 1 OF 1

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 — PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II — DATE: 8 day JAN month 01 year

SPECIFICATION REQUIREMENTS

SOURCE: Pitch — MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) — LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% — MOISTURE RANGE: N/A — ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 — NUCLEAR GAUGE SERIAL NO. 20979 — COR. FACTOR: N/A — QA ID: TP

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
~~407~~	E 23+00	8/ 2	EP-26	~~18.5~~ 15%	~~114.5~~	14.1	129.9	113.9	~~101.1~~ 99.4	✓				
~~408~~	E 22+50	8/ 2	EP-31	18.5	106.5	18.7	120.1	~~101.5~~ 101.2	~~95.1~~ 95.0	✓				

COMMENTS:

CHECKED BY: _____

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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 6 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: Trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
436	℄ @ St. 20+75	6"/1	EP-31	18.5	106.5	19.6	121.4	101.5	95.3	✓				
437	℄ @ St. 21+50	6"/1	EP-10	15.3	114.7	16.8	130.8	112.0	97.6	✓				
438	℄ @ St. 22+50	6"/1	EP-31	18.5	106.5	20.5	128.5	106.6	100.1	✓				
439	℄ @ St 24+50	6"/1	↓	↓	↓	18.4	125.9	106.3	99.8	✓				

COMMENTS:

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 2 day Jan month 2001 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
434 ~~405~~	℄ @ St. 24+25	8"/3	EP-31	18.8	106.5	17.4	119.4	101.7	95.5	✓			
435 ~~406~~	℄ @ St. 25+00	8"/3	↓	↓	↓	18.6	126.1	106.3	99.8	✓			
		~~6"/1~~ KS											

COMMENTS:

CHECKED BY: [signature]

SHEET NO. 1 OF 1

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 29 day ~~Jan~~ Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
430	~~401~~	℄ @ St. 25+00	6"/1	EP-31	18.8	106.5	20.0	123.7	103.0	96.7	✓				
431	~~402~~	℄ @ St. 24+50	6"/1	↓	↓	↓	18.2	125.7	106.4	99.9	✓				
432	~~403~~	℄ @ St. 24+25	8"/2	↓	↓	↓	18.8	127.5	107.3	100.8	✓				
433	~~404~~	℄ @ St. 25+00	8"/2	↓	↓	↓	17.9	124.0	103.4	97.1	✓				

COMMENTS:

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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 15 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
424 ~~395~~	℄ @ St. 27+25	6"/1	EP-31	18.8	106.5	19.8	121.1	101.1	~~95.6~~ 95.0	P		
425 ~~396~~	℄ @ St. 27+00	8"/2				20.0	119.7	99.7	~~94.6~~ 93.7	F		
426 ~~397~~	℄ @ St. 27+75	6"/1				19.7	121.4	101.4	~~95.8~~ 95.2	P		
427 ~~398~~	℄ @ St. 27+00	8"/3				19.5	118.5	99.1	~~93.7~~ 93.1	F		
428 ~~399~~	℄ @ St. 27+00	8"/4				19.5	119.9	100.3	~~94.8~~ 94.2	F		
429 ~~400~~	℄ @ St. 27+75	8"/2				19.7	121.4	101.4	~~95.8~~ 95.2	P		

COMMENTS: ☆ This material was removed on 9 Jan 2001 105.877

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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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 09 day DEC month 2002 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6-8

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____ (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
405	(A) CVH (1) LG SOUTH	8" / L6	EP 27	17.2	111.0	14.3	127.2	111.3	100.3	P				
406	(B) CVH (1) SOUTH	8" / L7	EP 27	17.2	111.0	15.3	125.4	108.8	97.9	P				
407	(C) CVH (1) EAST	8" / L9	EP 27	17.2	111.0	15.5	128.7	111.5	100.4	P				
408	(D) CVH (1) SOUTH	8" / L8	EP 27	17.2	111.0	16.5	123.1	105.7	95.2	P				
409	(E) CVH (1) WEST	8" / L9	EP 27	17.2	111.0	14.9	129.1	112.4	101.2	P				
410	(F) TRENCH	8" /	EP 27	17.2	111.0	16.1	124.6	107.3	96.7	P				
411	(G) CVH (1) EAST	8" / L10	EP 27	17.2	111.0	16.9	128.2	109.7	98.8	P				
412	(H) CVH (1) SOUTH	8" / L9	EP 27	17.2	111.0	13.8	123.4	108.4	97.7	P				
413	(I) CVH (1) SOUTH	8" / L10	EP 27	17.2	111.0	13.5	122.7	108.2	97.4	P				
414	(J) CVH (1) WEST	8" / L10	EP 27	17.2	111.0	15.8	126.3	109.1	98.3	P				

COMMENTS: (1) CVH = CONTROL VALVE HOUSE

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 PROJECT NO.: G01029 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 09 day DEC month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6-8

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

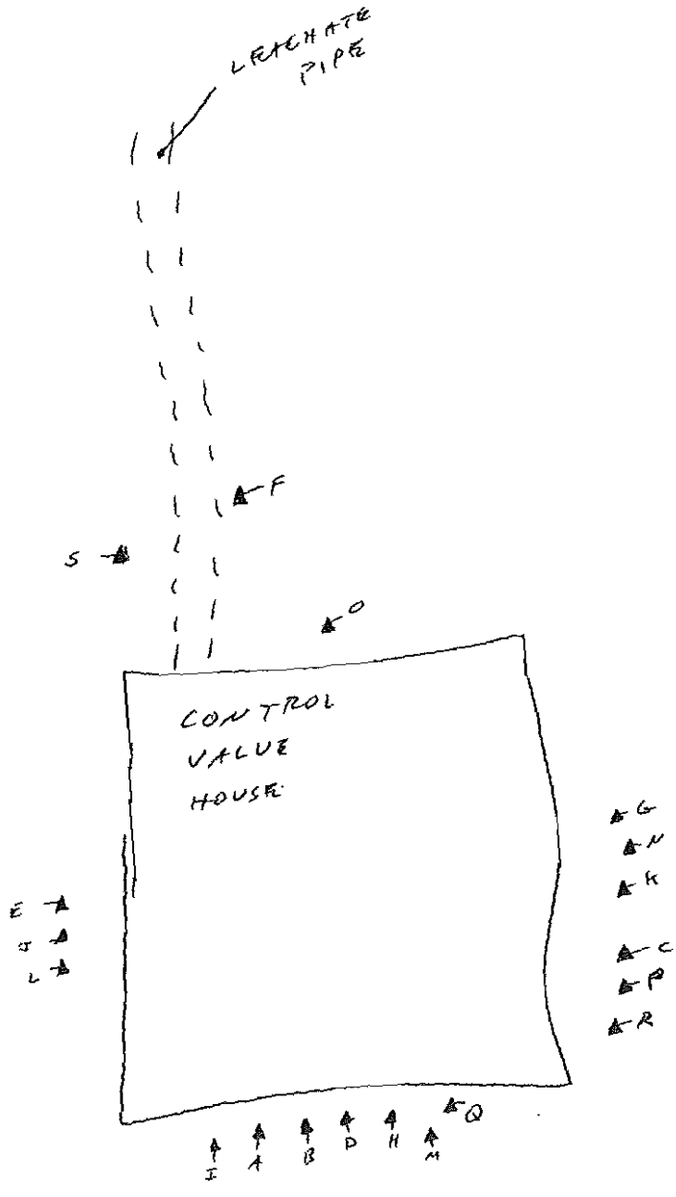
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

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		PASS	FAIL
415	(H) CVH EAST	8" / L11	EP27	17.2	111.0	16.0	127.0	109.5	98.7	P				
416	(L) CVH WEST	8" / L11	EP 27	17.2	111.0	14.8	126.9	110.5	99.6	P				
417	(M) CVH SOUTH	8" / L11	EP 27	17.2	111.0	16.4	128.3	110.3	99.3	P				
418	(N) CVH EAST	8" / L12	EP 27	17.2	111.0	~~15.1~~ 15.1 MH	122.7	106.6	96.0	P				
419	(O) CVH NORTH	8" / L10	EP 27	17.2	111.0	13.1	131.5	116.3	104.8	P				
420	(P) CVH EAST	8" / L12	EP 27	17.2	111.0	15.6	130.2	112.6	101.4	P				
421	(Q) CVH SOUTH	8" / L12	EP 27	17.2	111.0	16.0	130.9	112.9	101.7	P				
422	(R) CVH EAST	8" / L13	EP 27	17.2	111.0	14.6	131.4	114.6	103.2	P				
423	(S) TRENCH	8" /	EP 27	17.2	111.0	15.0	126.9	110.3	99.4	P				
~~424~~	(T)													

COMMENTS:

NUCLEAR DENSITY
TEST LOCATIONS
09 DEC 2000

NOT TO SCALE



▲ - TEST LOCATION

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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 8 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6"-8" (8)

% COMPACTION: 95-98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

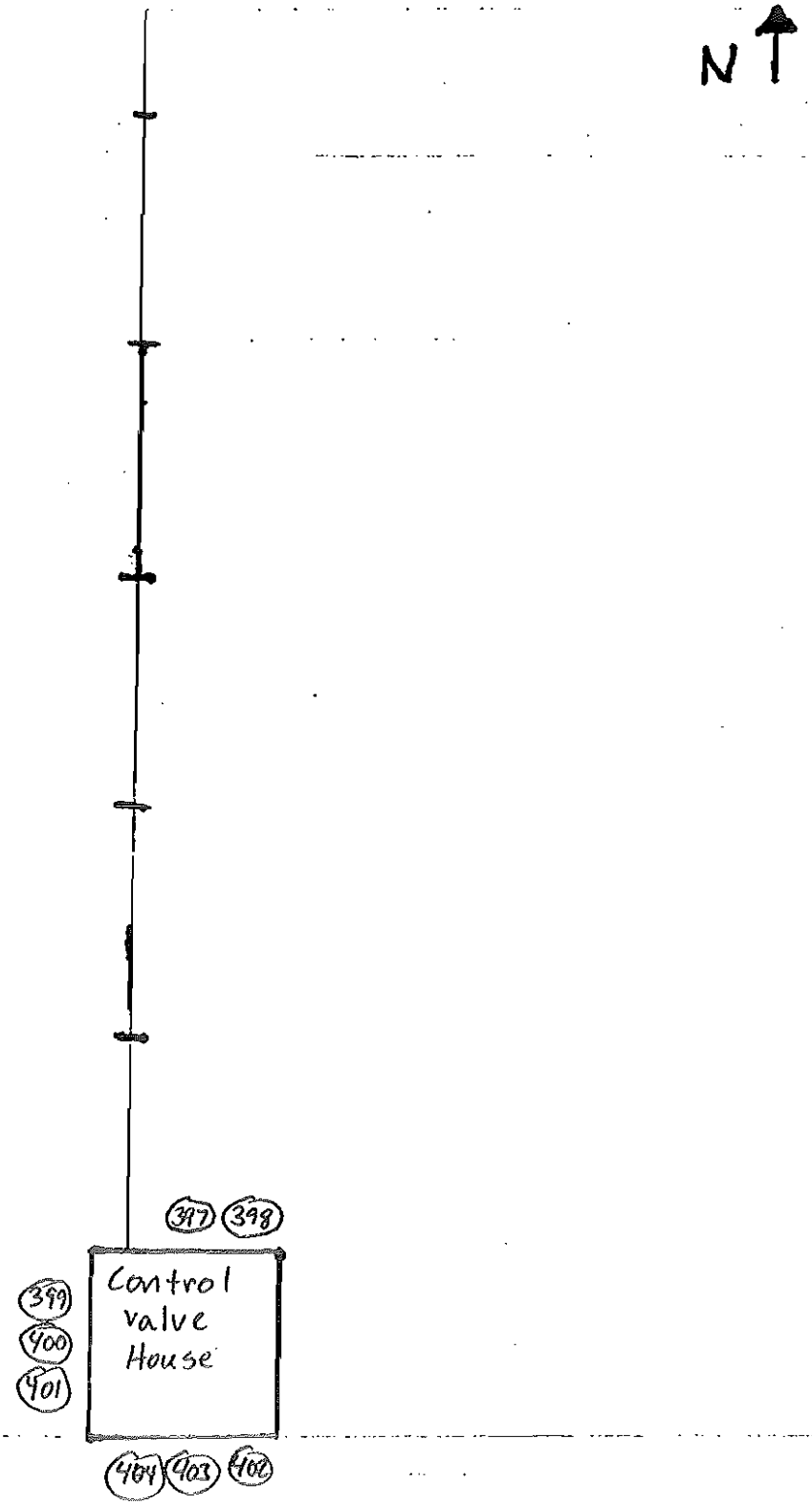
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
397	CVH - North	8"/5	EP-28	15.1	116.0	14.6	134.7	117.5	101.3	P				
398	CVH - North	8"/6	↓	↓	↓	14.3	134.3	117.5	101.3	P				
399	CVH - West	8"/6				15.4	131.6	114.0	98.3	P				
400	CVH - West	8"/7				14.5	130.1	113.6	98.0	P				
401	CVH - West	8"/8				15.7	130.9	113.1	97.5	P				
402	CVH - South	8"/3				14.8	131.3	114.4	98.6	P				
403	CVH - South	8"/4	EP-27	17.2	111.0	15.3	126.5	109.7	98.8	P				
404	CVH - South	8"/5	EP-28	15.1	116.0	14.4	128.2	112.1	96.6	P				

COMMENTS: CVH - Control Valve House

GEOSYNTEC CONSULTANTS

Written by: M. Humphries Date: 00/Dec/08 (YY/MM/DD) Reviewed by: _____ Date: __/__/__ (YY/MM/DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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 PROJECT NO.: 691029 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 07 day DEC month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6-8"

% COMPACTION: 95 - 98% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
N/A	(A) TRENCH *	8" /	EP 27	17.2	111.0	17.7	118.8	101.0	91.0*	P*				
N/A	(B) 304 STONE	4" / L1	TEST STRIP		128.2	~~4.0~~ 4.0 MH	131.5	126.4	98.6	P				
N/A	(C) 304 STONE	4" / L1	TEST STRIP		128.2	3.9	133.3	128.4	100.1	P				
N/A	(D) 304 STONE	4" / L2	TEST STRIP		128.2	3.6	135.9	131.2	102.4	P				
N/A	(E) 304 STONE	4" / L2	TEST STRIP		128.2	3.9	131.5	126.5	98.7	P				
N/A	(F) 304 STONE	4" / L3	TEST STRIP		128.2	3.6	130.6	126.1	98.3	P				
N/A	(G) 304 STONE	4" / L3	TEST STRIP		128.2	3.8	130.7	125.9	98.2	P				
395	(H) CVH (1) SOUTH	8" / L1	EP 27	17.2	111.0	16.9	123.4	105.6	95.1	P				
396	(I) CVH SOUTH	8" / L2	EP 27	17.2	111.0	16.8	124.8	106.9	96.3	P				

COMMENTS: * AS PER FDF CONSTRUCTION'S VERBAL APPROVAL THIS IS A PASSING TEST DUE TO FROZEN GROUND

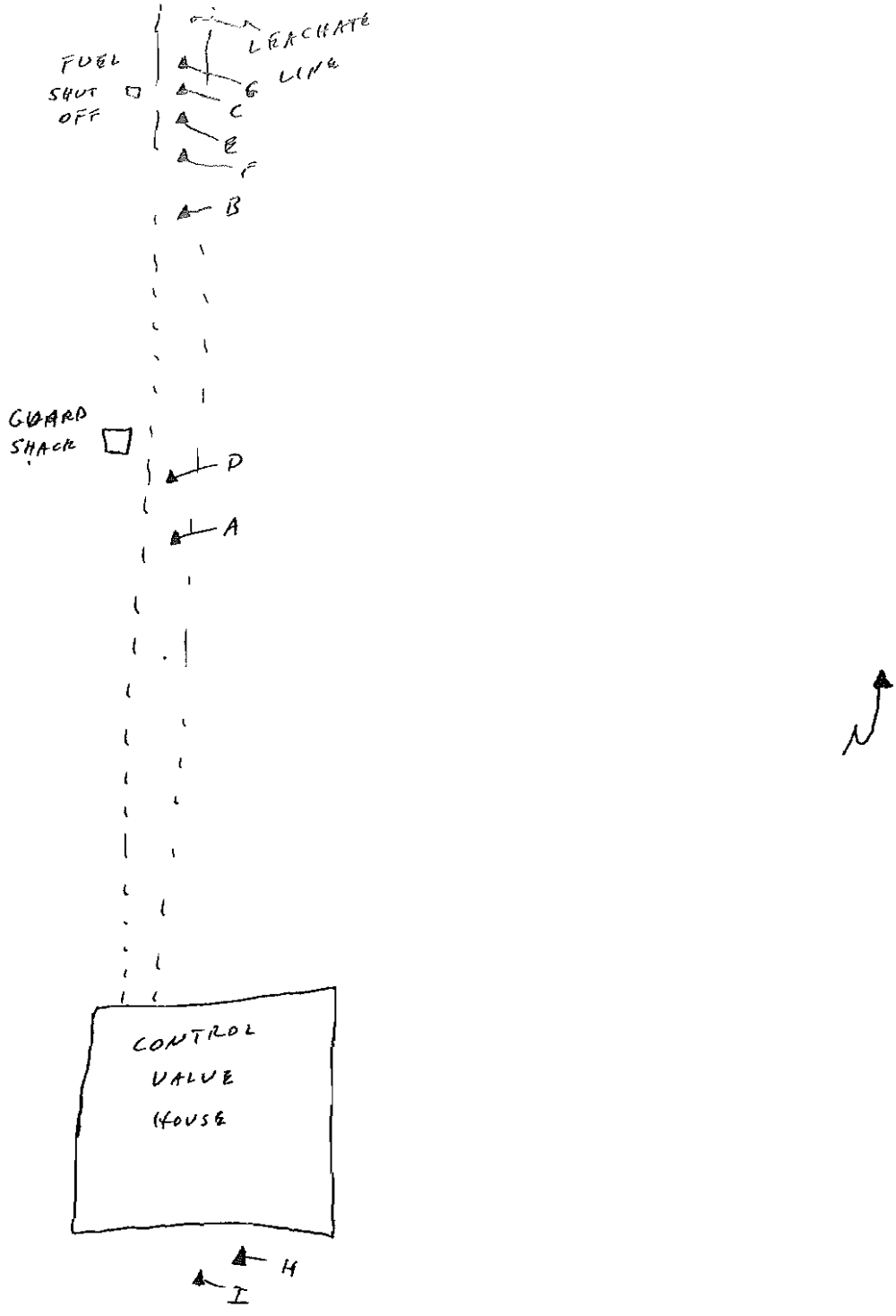
(1) CONTROL VALVE HOUSE

* These tests are null and void, placed during frozen conditions, on frozen ground, material placed was frozen. CB

NUCLEAR DENSITY
FIELD TEST LOCATIONS

07 DEC 2000

(NOT TO SCALE)



▲ - TEST LOCATION

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 PROJECT NO.: GQ1029 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 06 day DEC month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: SOIL - ON SITE; 304 STONE - OFF SITE (WERSH) MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6-8

% COMPACTION: 95- FOR SOIL 98- 304 STONE MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
394	A. CVH ① WEST	8" / L3	EP 27	17.2	111.0	11.2	118.1	106.2	95.7	P				
394 TO BE REMOVED	B TRENCH	4" / L2	*		128.2	4.1	135.0	129.7	101.1	P				
TO BE REMOVED	C. TRENCH	4" / L2	*		128.2	3.6	132.6	128.1	99.9	P				

COMMENTS: ① CVH = CONTROL VALVE HOUSE

* AS PER TEST STRIP PER ODOT REGS

304 Stone placed Frozen on frozen ground

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 PROJECT NO.: G-91029 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 05 day DEC month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER ~~28800~~ 3440 MH NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
389	A. TRENCH	8" / 5	EP 27	17.2	111.0	13.3	121.9	107.5	96.9	P				
390	B. CVH ① WEST	8" / 1	EP 27	17.2	111.0	21.1	127.4	105.2	94.8		F	391	✓	
391	C CVH ① WEST	~~8~~ 6" / 1	EP 27	17.2	111.0	21.4	129.1	106.3	95.8	P		~~390~~	✓	
392	D CVH ① WEST	~~8~~ 6" / 1	EP 27	17.2	111.0	20.8	130.4	107.9	97.2	P				
393	E CVH ① WEST	~~8~~ 6" / 2	EP 27	17.2	111.0	20.0	133.4	111.2	100.2	P				

COMMENTS: ① CVH = CONTROL VALVE HOUSE

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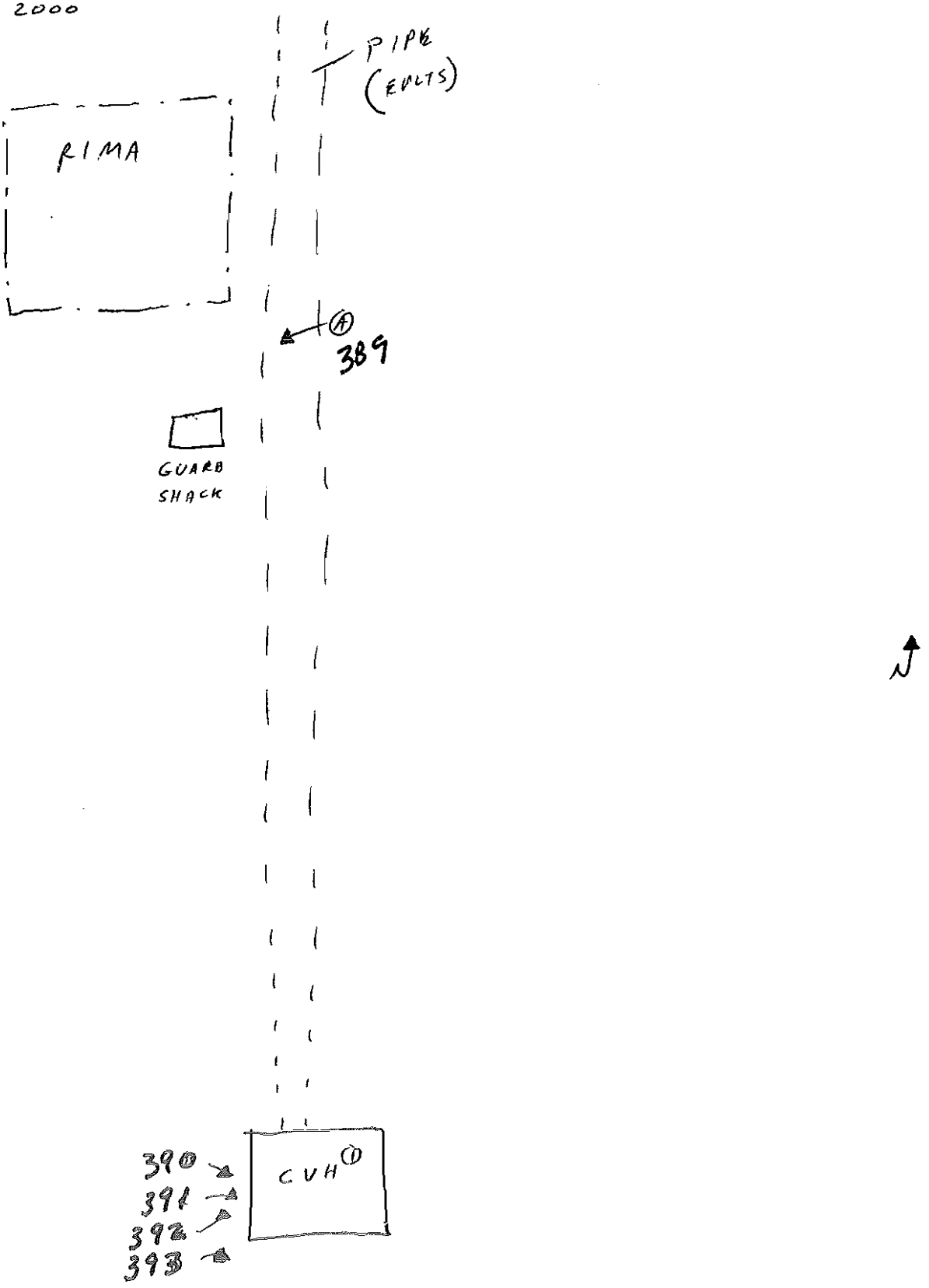
NUCLEAR DENSITY
TEST LOCATIONS
15 DEC 2000



△ = TEST LOCATION

① CONTROL VALVE HOUSE

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 4 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Excavation Spoils MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95/98@ subgrade MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: N/A QA ID: KS

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		
383	℄ St. 33+00	8"/7	EP-28	15.1	116.0	13.4	129.1	113.9	98.2	✓			
384	℄ St. 30+00	8"/10	↓	↓	↓	16.6	130.1	111.6	96.2	✓			
385	℄ St. 29+75	8"/4	EP-27	17.2	111.0	18.4	126.4	106.8	96.2	✓			
386	℄ St. 28+00	8"/4	↓	↓	↓	15.0	125.7	109.3	98.5	✓			
387	℄ St. 32+75	8"/8	↓	↓	↓	19.5	126.4	105.8	95.3	✓			
388	℄ St. 29+25	8"/5	↓	↓	↓	17.4	125.6	107.0	96.4	✓			

COMMENTS:

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SHEET NO. 1 OF 1

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 PROJECT NO.: 6Q1029 TASK NO.: 4.2

DESCRIPTION: EPLTS DATE: 2 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: excavation Spoils MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: fill LIFT THICKNESS (LOOSE/COMPACTED): 8" (CIRCLE ONE)

% COMPACTION: 95/98 @ subgrade MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
365	℄ St. 33+50	8"/3	EP-28	15.1	116.0	14.6	130.0	113.4	97.8	✓					
366	℄ St. 30+50	8"/8	EP-27	17.2	111.0	18.3	125.8	106.3	95.8	✓					
367	℄ St. 31+50	8"/6				17.8	127.2	108.0	97.3	✓					
368	℄ St. 33+00	8"/4				17.3	125.0	106.6	96.0	✓					
369	℄ St. 31+00	8"/7				17.3	128.1	109.3	98.4	✓					
370	℄ St. 30+50	8"/SG				16.6	128.2	109.9	99.0	✓					
371	Control VH east side ~~℄ St.~~	8"/8				14.9	123.6	107.6	96.9	✓					
372	Control VH east side	8"/9				16.8	129.0	110.4	99.5	✓					
373	℄ St. 33+00	8"/5				16.6	128.0	109.8	98.9	✓					
374	℄ St. 31+50	8"/8				18.0	125.3	106.2	95.7	✓					

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

SG - Subgrade

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 PROJECT NO.: GQ1029 TASK NO.: 4.2

DESCRIPTION: EPLTS DATE: 1 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Excavation Spoils MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: Fill LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C (CIRCLE ONE) / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
350	Control VA east side	8"/7	EP-27	17.2	111.0	16.0	131.2	113.2	102.0	✓					
351	℄ St. 30+00	8"/1				15.7	125.8	108.7	97.9	✓					
352	℄ St. 30+50	8"/2				15.5	126.4	109.5	98.6	✓					
353	℄ St. 30+50	8"/3				15.8	129.8	112.1	101.0	✓					
354	℄ St. 32+00	8"/1				14.7	125.4	109.3	98.5	✓					
355	℄ St. 33+75	8"/1				15.6	123.4	106.8	96.2	✓					
356	℄ St 31+00	8"/2				17.0	128.9	110.2	99.3	✓					
357	℄ St. 30+50	8"/4				17.7	124.2	105.5	95.0	✓					
358	℄ St. 31+00	8"/3				18.5	125.1	105.6	95.1	✓					
359	℄ St. 30+00	8"/5				18.5	128.6	108.5	97.8	✓					

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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 PROJECT NO.: GQ 1029 TASK NO.: 4.2

DESCRIPTION: EPLTS DATE: 1 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Excavation Spoils MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: fill LIFT THICKNESS (CIRCLE ONE) (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
360	℄ St 33+75	8"/2	EP-27	17.2	111.0	13.5	125.3	110.4	99.4	✓					
361	℄ St 31+00	8"/4	↓	↓	↓	18.0	125.3	106.2	95.7	✓					
362	℄ St 30+50	8"/6				18.5	125.1	105.6	95.1	✓					
363	℄ St. 31+00	8"/5				16.2	127.1	109.4	98.6	✓					
364	℄ St. 30+25	8"/7				18.4	127.2	107.4	96.8	✓					

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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 PROJECT NO.: 6Q 1029 TASK NO.: 4.2

DESCRIPTION: EPLTS DATE: 30 day Nov month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: excavation Spoils MATERIAL TYPE: (CIRCLE ONE) IMPACTED MATERIAL / OTHER: fill LIFT THICKNESS (CIRCLE ONE) (LOOSE) / COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *		PASS	FAIL
344	Control UH east side	8"/1	EP-27	17.2	111.0	16.1	126.8	109.2	98.4	✓					
345	↓	8"/2	↓	↓	↓	16.4	130.0	111.7	100.6	✓					
346		8"/3				16.9	130.0	111.2	100.1	✓					
347		8"/4				15.8	127.3	109.9	99.0	✓					
348		8"/5				16.8	129.0	110.4	99.5	✓					
349	↓	8"/6	↓	↓	↓	14.7	127.7	111.3	100.3	✓					

COMMENTS: * RUNNING AVERAGE IS FOR LAST TEN TESTS

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 PROJECT NO.: 6Q1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 2 day Dec month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: excavation Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95/98 @ Subgrade MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 28800 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
375	℄ St. 30+00	8"/9	EP-27	17.2	111.0	18.4	125.2	105.7	95.3	✓				
376	℄ St. 33+25	8"/6	↓	↓	↓	15.9	126.7	109.3	98.5	✓				
377	℄ St. 29+50	8"/1	↓	↓	↓	16.3	127.1	109.3	98.5	✓				
378	℄ St. 28+00	8"/1	EP-28	15.1	116.0	15.7	129.8	112.2	96.7	✓				
379	℄ St. 29+50	8"/2	↓	↓	↓	14.8	132.6	115.5	99.6	✓				
380	℄ St. 27+50	8"/2	↓	↓	↓	16.4	132.4	113.7	98.0	✓				
381	℄ St. 29+50	8"/3	↓	↓	↓	14.8	129.3	112.6	97.1	✓				
382	℄ St. 28+00	8"/3	EP-27	17.2	111.0	18.3	125.2	105.8	95.3	✓				

COMMENTS:

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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) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MK TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 21 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: OFF SITE/Welch MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MK

TEST NO.	TEST LOCATION REFER TO MAP	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		PASS	FAIL
343	UHG EAST	8" / 1	EP-6	15.5	112.0	12.5	126.6	112.6	100.5	P				

COMMENTS:

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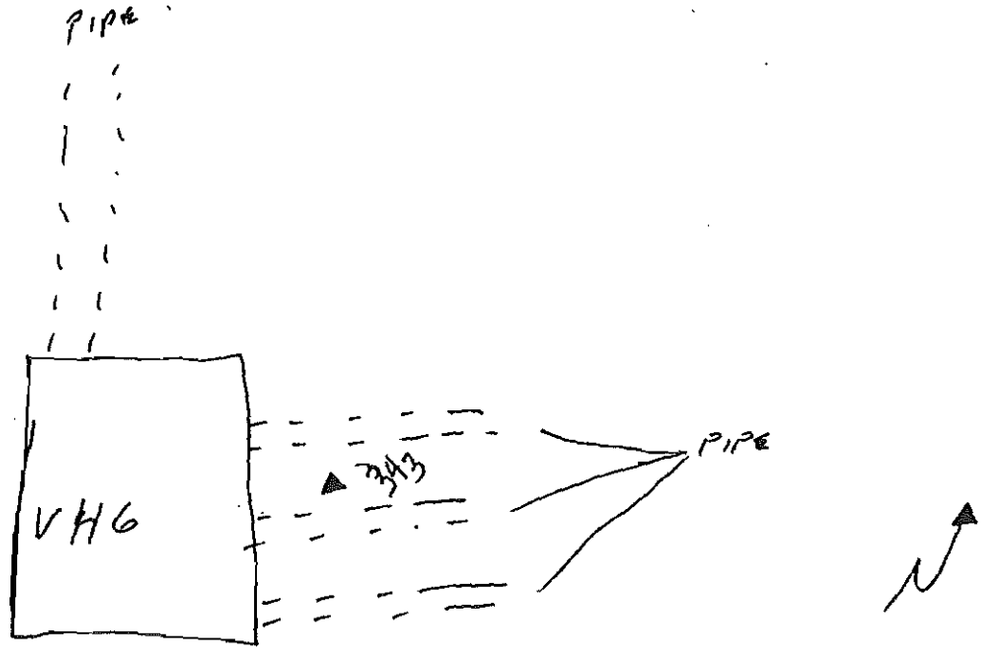
SHEET NO. 1 OF 2

NUCLEAR DENSITY
TEST LOCATION
21 NOV 2000



▲ TEST LOCATION

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 PROJECT NO.: G00~~409~~ 1029 TASK NO.: 0

DESCRIPTION: EPLTS DATE: 20 day NOV month 00 y

SPECIFICATION REQUIREMENTS

SOURCE: off site/Welch MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±

(CIRCLE ONE)

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

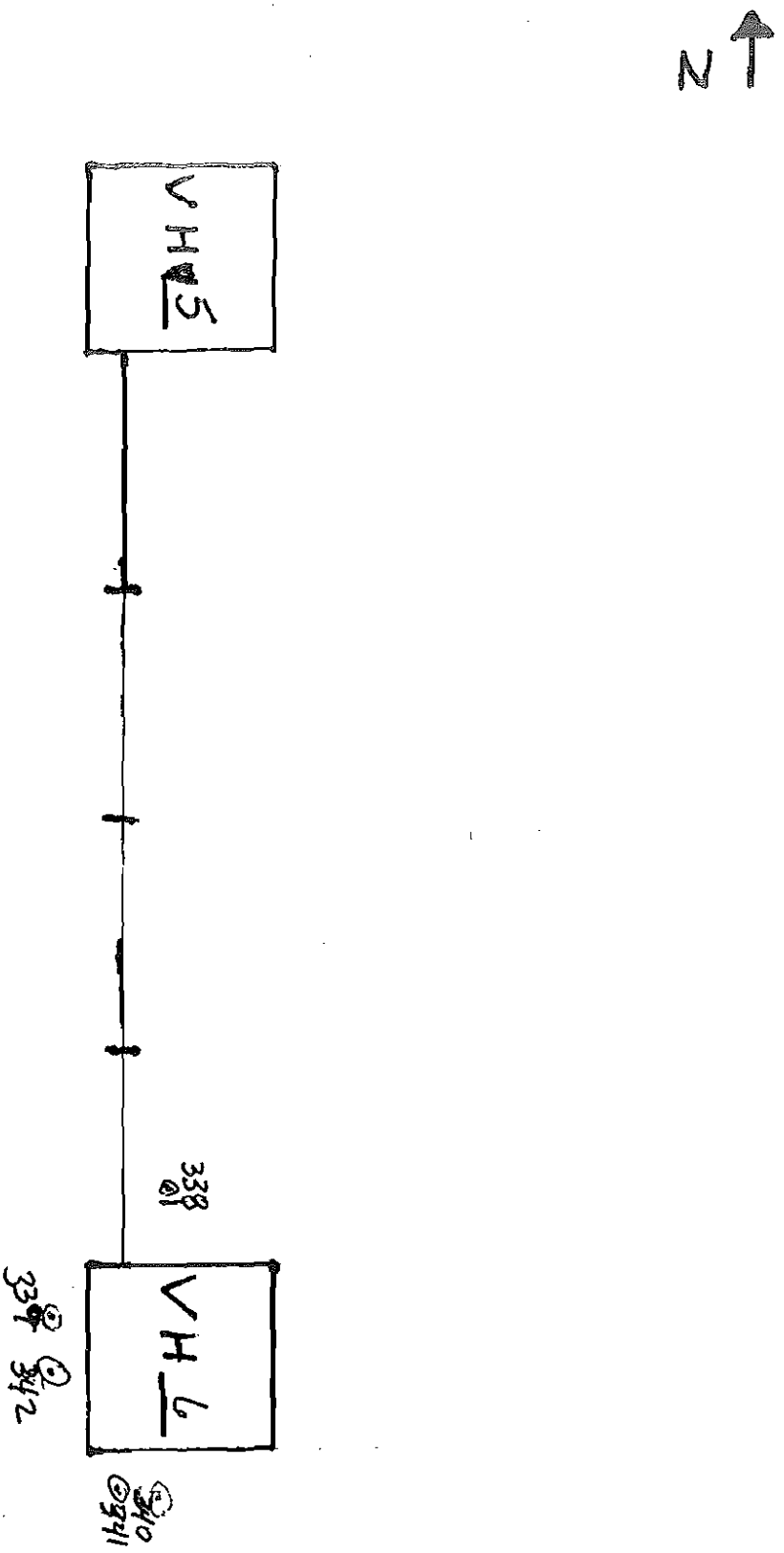
NUCLEAR GAUGE TYPE: TROXPR 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS	RETEST FA
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL			
338	N side of UH6	5/12	EP-6	15.5	112.0	15.0	135.4	117.7	105.1	✓				
339	W. side of UH6	8/10				16.2	132.4	112.3	100.3	✓				
340	S. side of UH6	8/6				13.2	129.5	114.8	102.5	✓				
341	" "	8/7				16.5	132.0	113.3	101.2	✓				
342	W. " "	8/11				14.6	131.2	114.6	102.3	✓				
~~—~~	~~N. " "~~	~~8/13~~										~~Void~~		

COMMENTS:

Written by: Tom Dickman Date: 00/06/20 (YY MM DD) Reviewed by: _____ Date: / / (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MH TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 20 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: OFFSITE, Welch MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
319	A VH6 WEST	8" / 3RD	EP-6	15.5	112.0	17.0	125.1	106.9	95.5	P				
320	B VH6 NORTH	8" / 5	↓	↓	112.0	14.5	132.7	116.0	103.5	P				
321	C VH6 WEST	8" / 4			112.0	13.9	130.4	114.5	102.2	P				
322	D VH6 NORTH	8" / 6			112.0	14.3	130.9	114.5	102.3	P				
323	E VH6 WEST	8" / 5			112.0	14.6	128.5	112.1	100.1	P				
324	F VH6 SOUTH	8" / 1			112.0	15.1	125.9	109.4	97.7	P				
325	G VH6 NORTH	8" / 7			112.0	17.3	129.6	110.5	98.6	P				
326	H VH6 SOUTH	8" / 2			112.0	16.0	126.8	109.3	97.6	P				
327	I VH6 WEST	8" / 6			112.0	16.4	130.3	112.0	100.0	P				
328	J VH6 NORTH	8" / 8	↓	↓	112.0	17.7	131.4	111.6	99.6	P				

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MH TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 20 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: OFF SITE, Welch MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

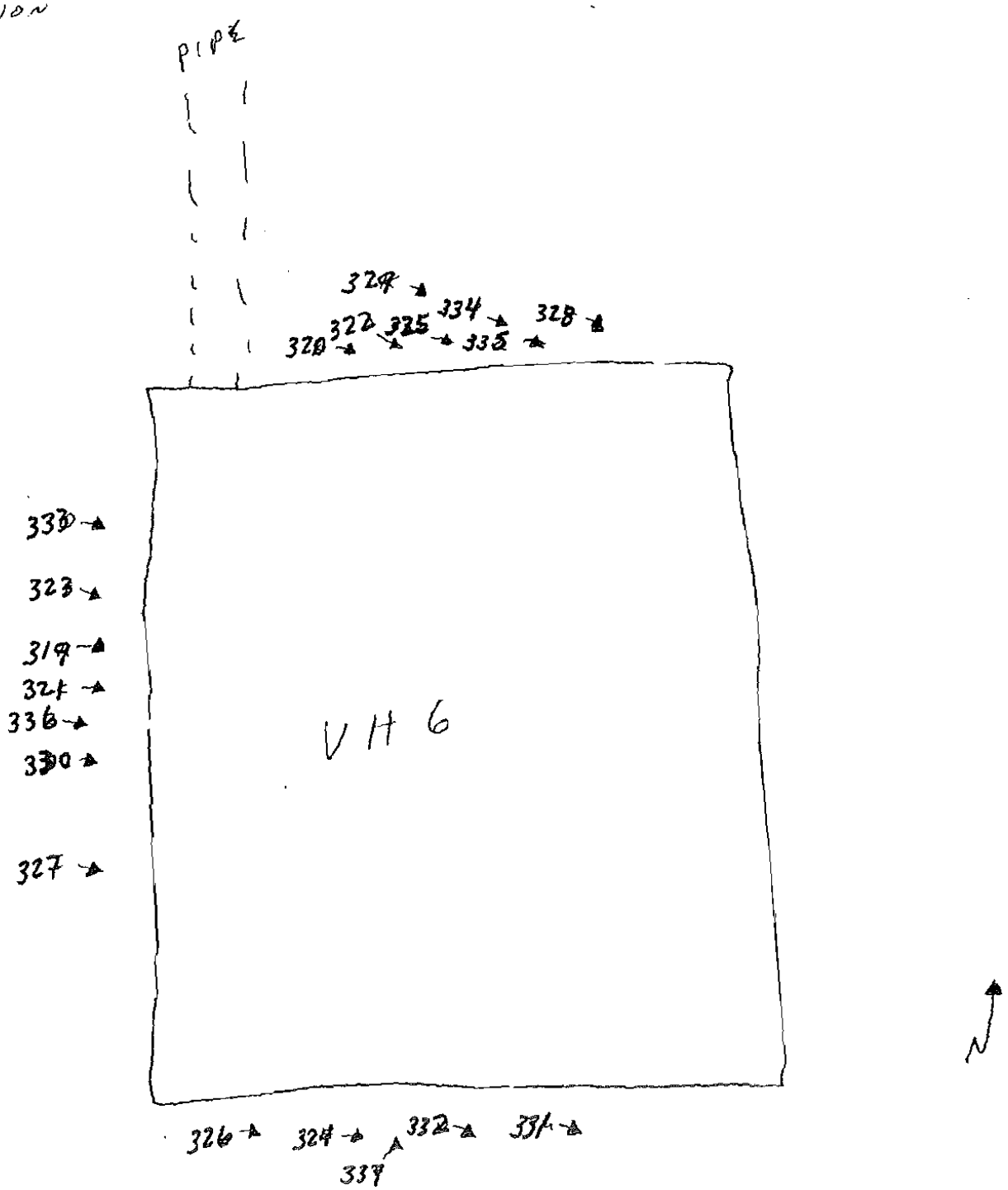
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
329	K VH6 NORTH	8" / 9	EP-6	112.0	112.0	17.0	132.3	113.0	100.9	P				
330	L VH6 WEST	8" / 7	↓	↓	112.0	15.6	133.2	115.3	102.9	P				
331	M VH6 SOUTH	8" / 3	↓	↓	112.0	15.3	123.6	107.2	95.7	P				
332	N VH6 SOUTH	8" / 4	↓	↓	112.0	14.6	130.9	114.2	102.0	P				
333	O VH6 WEST	8" / 8	↓	↓	112.0	14.6	126.4	110.3	98.5	P				
334	P VH6 NORTH	8" / 10	↓	↓	112.0	13.9	129.0	113.3	101.1	P				
335	Q VH6 NORTH	8" / 11	↓	↓	112.0	15.7	129.7	~~112.6~~ 112.1	~~100.5~~ 100.1	P				
336	R VH6 WEST	8" / 9	↓	↓	112.0	15.1	133.9	116.3	103.9	P				
337	S VH6 SOUTH	8" / 5	↓	↓	112.0	15.9	130.0	112.2	100.1	P				
	~~T VH6 ~~	~~8" /~~												

COMMENTS:

CHECKED BY: [illegible]

NUCLEAR DENSITY
TEST LOCATION



1 - TEST LOCATION

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 17 day Nov month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch Sand & Gravel MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A 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: N/A QA ID: CJ

TEST NO.	TEST LOCATION See location Map	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
312	North side of VH-6	6"/2	EP-10	15.3	114.7	~~125.5~~ 14.7	125.5	109.4	95.4	P				
313	West side of VH-6	6"/1	EP-10	15.3	114.7	16.6	127.6	109.4	95.4	P				
314	North - VH-6	6"/3	EP-10	15.3	114.7	17.9	~~109.5~~ 129.1	109.5	95.5	P				
315	West side of VH-6	6"/2	EP-10	15.3	114.7	17.1	130.6	111.5	97.2	P				
316	North VH-6	6"/4	EP-10	15.3	114.7	17.4	129.6	110.4	96.2	P				
317	Roadway	6"/2	EP-10	15.3	114.7	15.3	128.4	111.4	97.1	P				
318	Roadway	6"/2	EP-10	15.3	114.7	14.9	127.7	111.1	96.9	P				

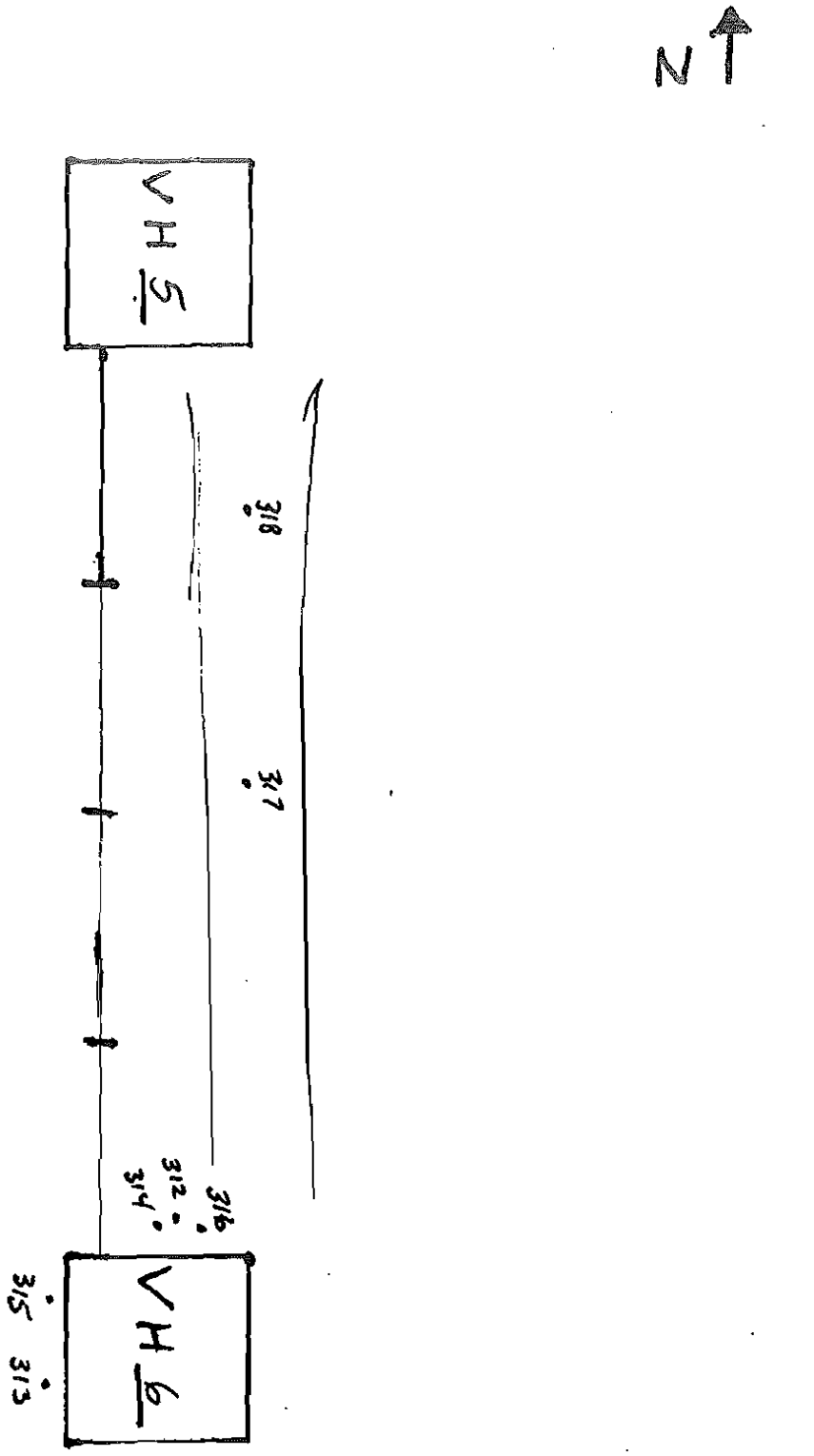
COMMENTS:

CHECKED BY: CJ

SHEET NO. ____ OF ____

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: 60 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MY TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 17 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

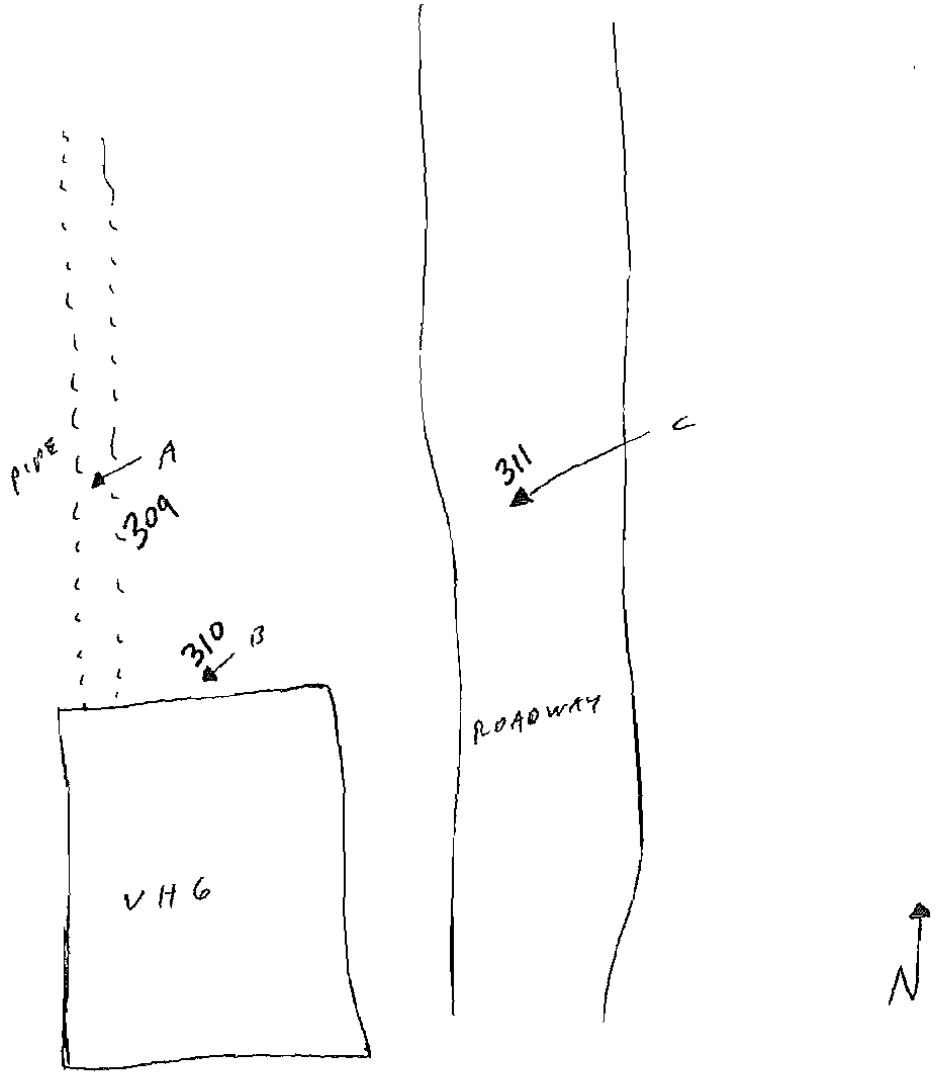
% COMPACTION: 95, 98 ROADWAY MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MY

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
309	A TRENCH	8" / 2	EP 10	15.3	114.7	13.8	128.4	112.8	98.4	P				
310	B UHG NORTH	8" / 2	EP 10	15.3	114.7	17.3	128.5	109.6	95.5	P				
311	C ROADWAY	8" / 2	EP 10	15.3	114.7	14.0	128.7	112.9	98.4	P				

COMMENTS:

NUCLEAR DENSITY
TEST LOCATION
17 NOV 2000



▲ — TEST LOCATION

7.&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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 16 day Nov month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
304	See location Map	6"/2	EP-10	15.3	114.7	12.8	133.9	118.7	103.5	P				
305	" " "	6"/2	EP-10	15.3	114.7	13.6	132.2	116.4	101.5	P				
306	" " "	6"/3	EP-10	15.3	114.7	11.4	129.1	115.9	101.0	P				
307	" " "	6"/3	EP-10	15.3	114.7	12.4	129.8	115.5	100.7	P				
308	" " "	6"/3	EP-10	15.3	114.7	12.6	128.7	114.3	99.7	P				

COMMENTS:

Written by: _____ Date: __/__/__ (YY MM DD) Reviewed by: _____ Date: 00/11/16 (YY MM DD)

Client: _____ Project: E.P.I.T.S. Project/Proposal No.: G-@ 1029 Task No.: 4.2

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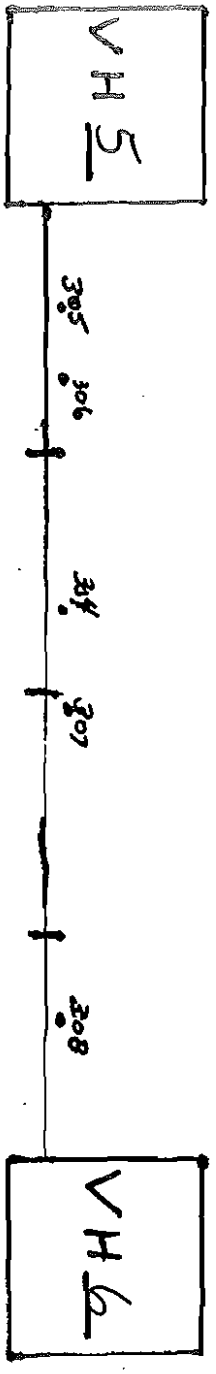

NOT TO SCALE

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

PROJECT NO.: GO~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 14 day Nov month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: C. VH Spoils

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE)

LIFT THICKNESS (LOOSE / COMPACTED): ±8

% COMPACTION: 95

MOISTURE RANGE: N/A

ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: N/A

QA ID: VD

	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 (%)	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
1	297	W. of W. Perimeter Gate @ ℄ of EPLTS PPL STA 23+10	8"/1	EP-10	15.3	114.7	14.2	130.6	114.4	99.7	✓				
2	298	↓	8"/2	↓	↓	↓	15.5	132.3	114.6	99.9	✓				
3	299	↓	8"/3	↓	↓	↓	15.6	132.8	114.9	100.1	✓				
4	300	↓	8"/4	↓	↓	↓	14.5	130.6	114.1	99.5	✓				

COMMENTS:

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SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 16 day NOV month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
301	(A) UH6 NORTH	6" / 2	EP 10	15.3	114.7	19.7	120.2	100.4	87.5		F	310	✓	
302	(B) UH6 SOUTH	6" / 1	EP 10	15.3	114.7	18.6	125.1	105.4	91.9		F	REMOVED (1)		
303	(C) TRENCH	6" / 2	EP 10	15.3	114.7	15.7	126.4	109.3	95.3	P				

COMMENTS:

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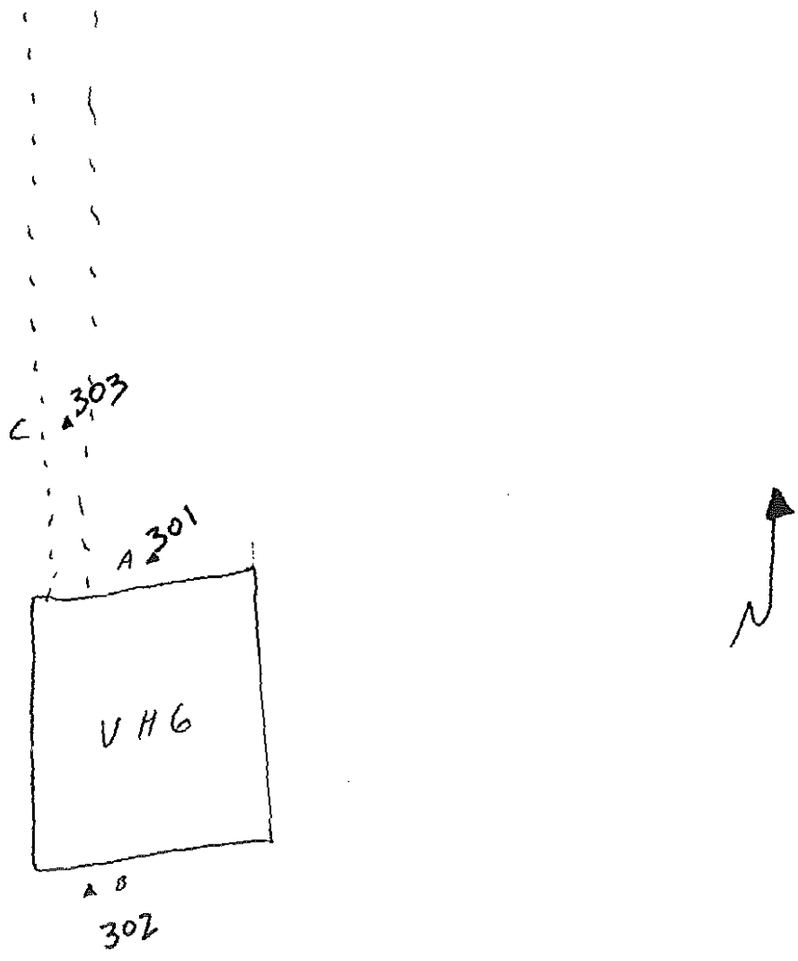
NUCLEAR DENSITY
TEST LOCATION
16 NOV 00



▲ TEST LOCATION

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 II

PROJECT NO.: ~~GQ0409~~ GQ1029 MB TASK NO.: 04.2

DATE: 08 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MB

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
295	(A) TRENCH BACKFILL	6" / 1st LIFT	EP10	15.3	114.7	11.7	124.3	111.3	97.0	P				
296	(B) TRENCH BACKFILL	6" / 2nd LIFT	EP10	15.3	114.7	12.7	126.8	112.5	98.1	P				

COMMENTS:

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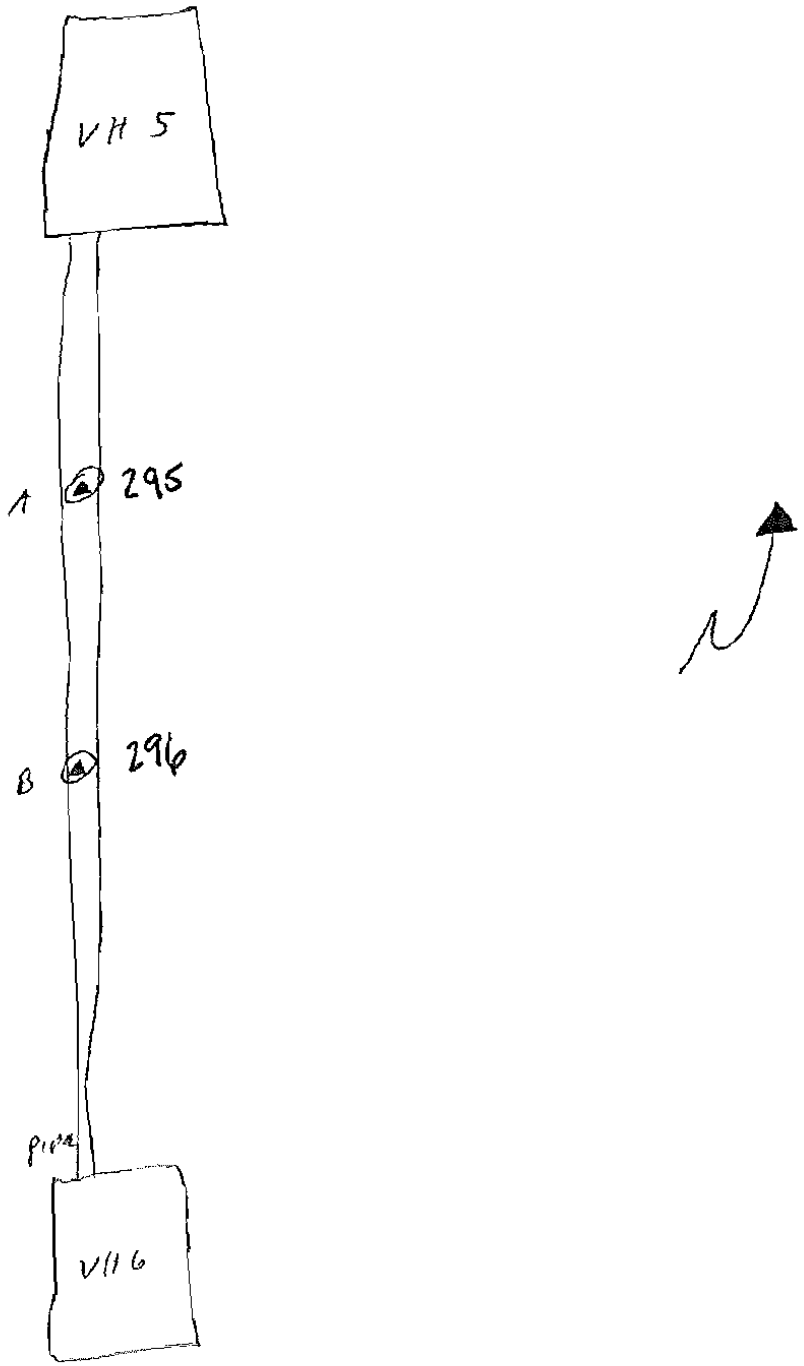
FIELD NUCLEAR DENSITY
TEST LOCATIONS
28 NOV 2000



△ TEST LOCATION

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ 48 TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 06 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

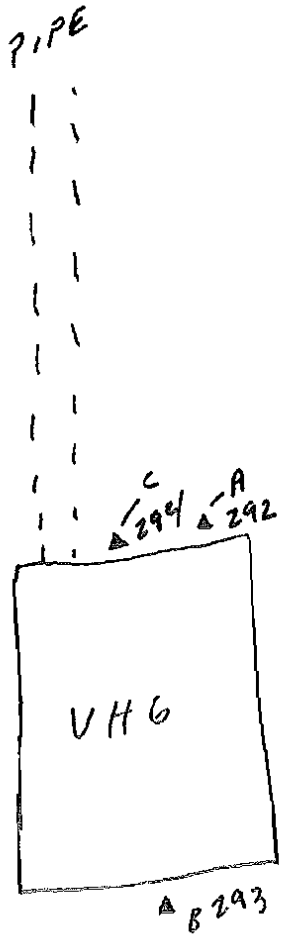
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
292	(A) UHG NORTH	8" / 2	EP10	15.3	114.7	11.8	130.8	117.0	102.0	P				
293	(B) UHG SOUTH	8" / 1	EP10	15.3	114.7	15.2	128.5	111.5	97.2	P				
294	(C) UHG NORTH	8" / 3	EP10	15.3	114.7	15.8	128.1	110.7	96.5	P				

COMMENTS:

NUCLEAR DENSITY TEST LOCATIONS

06 NOV 2000



▲ - TEST LOCATION

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MH TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 03 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 6" ~~12"~~ MH

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
291	ROAD OVER EPLT	4" / 23	1M-70	6.8	141.7	6.0	149.8	141.4	99.8	P				

COMMENTS:

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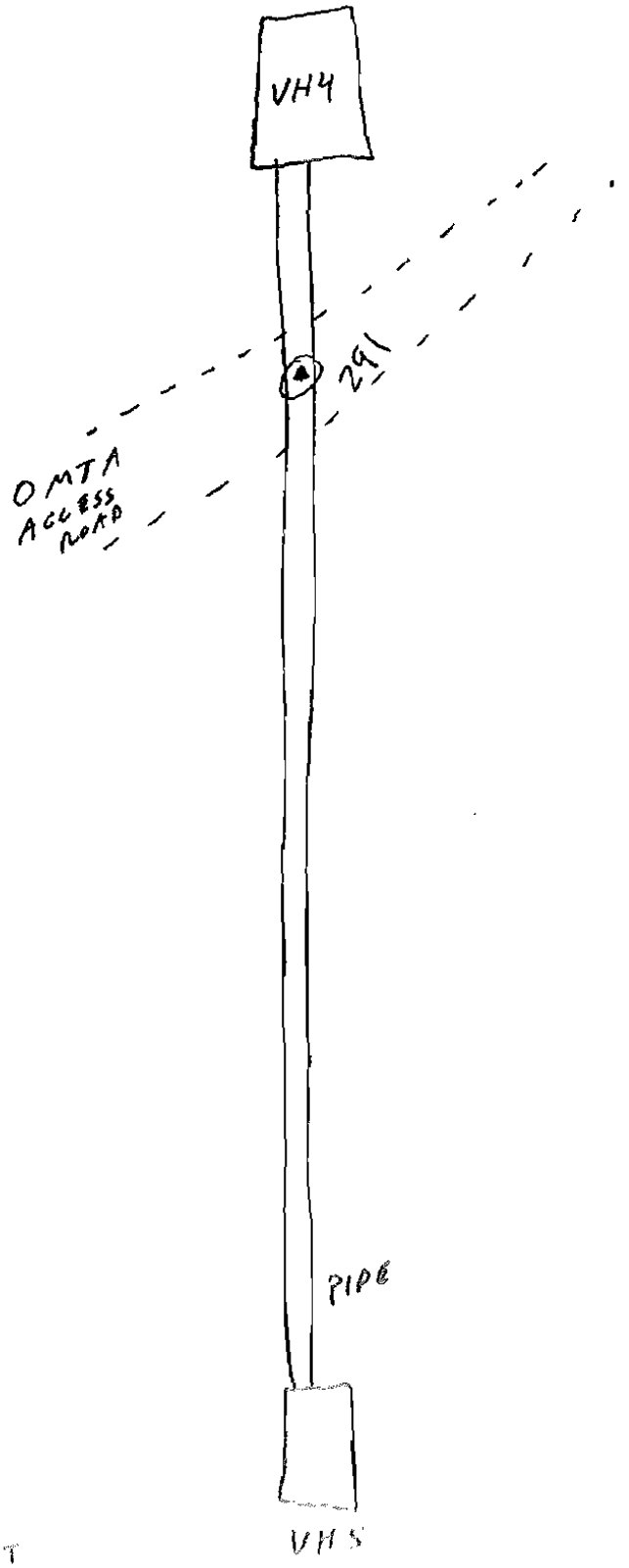
SHEET NO. 1 OF 2

NUCLEAR DENSITY TEST LOCATION
3 NOV 2000



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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 2 day Nov month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Onsite/Various MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A 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: N/A 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
285 ~~277~~	East side of VH5	8"/1	EP-23	15.8	106.0	15.0	121.2	105.3	99.3	P				
286 ~~278~~	Umatta Haul Rd	8"/1	IM-70	6.8	141.7	5.6	152.3	144.2	101.8	P				
287 ~~279~~	Umatta Haul Rd	8"/2	IM-70	6.8	141.7	3.6	133.6	129.0	96.0		F	290 ~~282~~	P	
288 ~~280~~	East Side of VH5	8"/2	EP-10	15.3	114.7	14.4	125.1	109.4	95.4	P				
289 ~~281~~	N. side of VH6	8"/1	EP-10	15.3	114.7	16.4	127.2	109.2	95.2	P				
290 ~~282~~	Umatta Haul Rd	8"/2	IM-70	6.8	141.7	3.2	144.2	139.7	98.6	P				
~~283~~														
~~284~~														

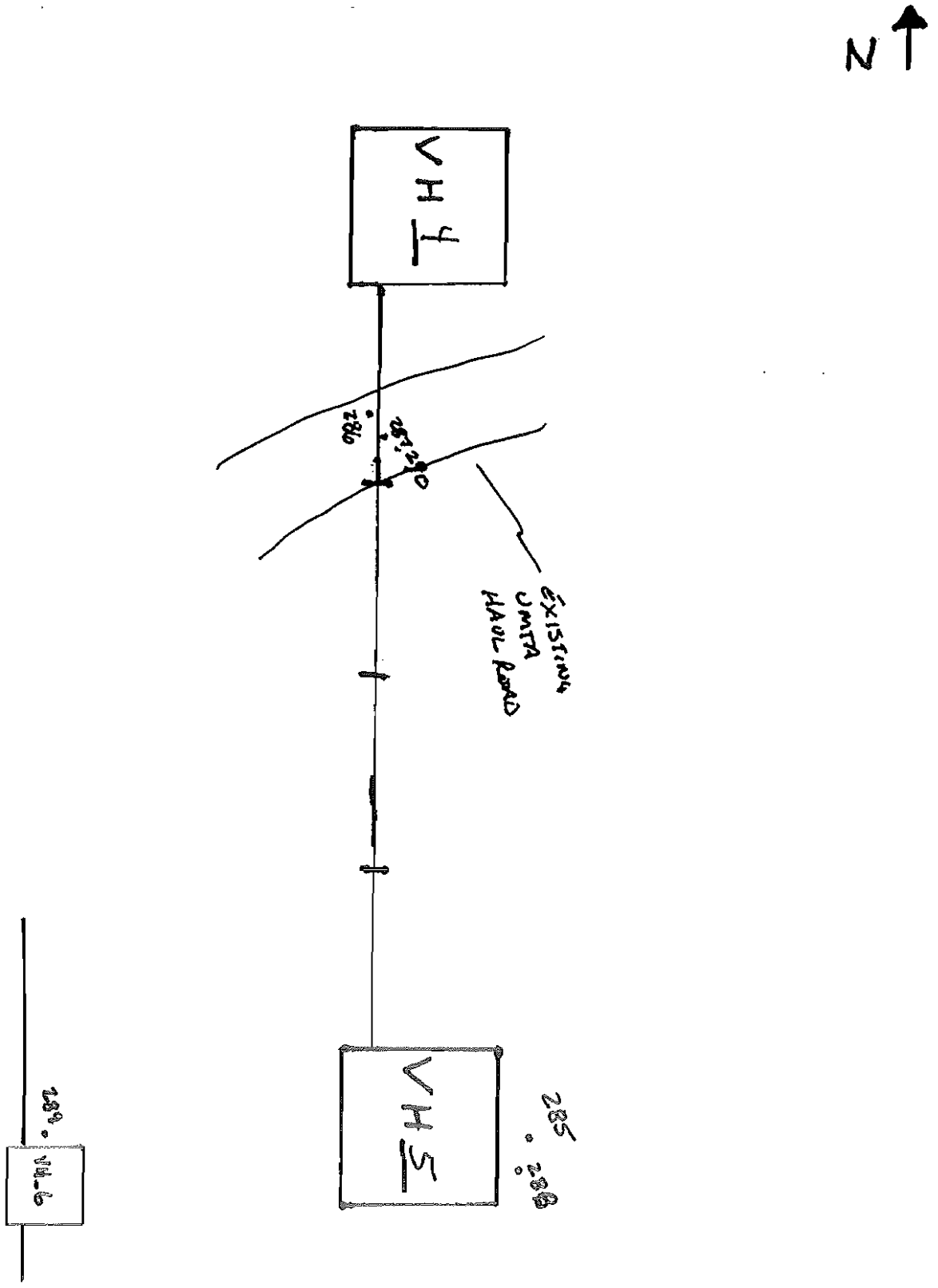
COMMENTS:

CHECKED BY: CL

SHEET NO. ____ OF ____

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) G Q1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 02 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

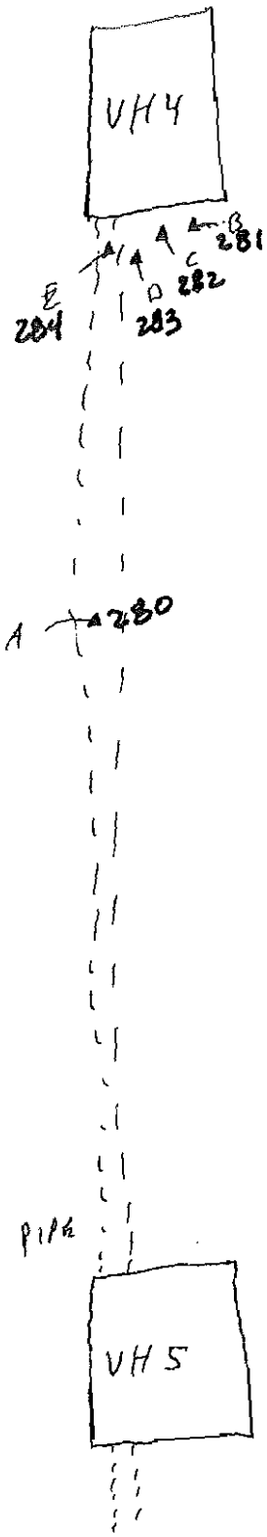
TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
280	A TRENCH	8" / 1	EP23	15.8	106.0	12.7	115.5	102.6	96.8	P				
281	B UH4 SOUTH	8" / 8	EP10	15.3	114.7	13.9	126.1	110.8	96.6	P				
282	C UH4 SOUTH	8" / 9	EP10	15.3	114.7	16.2	126.6	109.0	95.0	P				
283	D UH4 SOUTH	8" / 10	EP10	15.3	114.7	14.8	131.1	114.2	99.6	P				
284	E UH4 SOUTH	8" / 11	EP10	15.3	114.7	16.2	131.7	113.4	98.9	P				

COMMENTS:

CHECKED BY: MH

NUCLEAR DENSITY TEST LOCATIONS

Φ2 NOV



GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ MH TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 01 day NOV month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 6-8"

(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
272	A TRENCH N. VHS	8" / 1	EP 10	~~15.3~~ 15.8 ①	~~114.7~~ 106.0 ①	15.1	121.8	105.8	~~92.2~~ 99.8 ①	P	~~F~~ ①			
273	B VHS NORTH SIDE	8" / 4	EP 10	15.3	114.7	12.7	127.6	113.2	98.7	P				
274	C. VHS NORTH SIDE	8" / 5	EP10	15.3	114.7	13.4	132.2	116.6	101.7	P				
275	D TRENCH N. VHS	6" / 1	EP10	15.3	114.7	13.5	125.6	110.6	96.4	P				
276	E VHS NORTH SIDE	8" / 6	EP10	15.3	114.7	12.8	132.5	117.5	102.4	P				
277	F VHS NORTH SIDE	8" / 7	EP10	~~15.3~~ 15.8 ①	~~114.7~~ 106.0 ①	13.1	121.3	107.2	~~93.5~~ 101.2 ①	P	~~F~~ ①			
278	G. VHS NORTH SIDE	8" / 7	EP10	15.3	114.7	13.2	127.6	112.7	98.2	P				
279	H TRENCH N. VHS	~~8~~ 6" ① / 2	EP10	15.3	114.7	13.9	125.1	109.8	95.8	P				

COMMENTS: ① SIX INCH LIFT TO FINISH GRADE.

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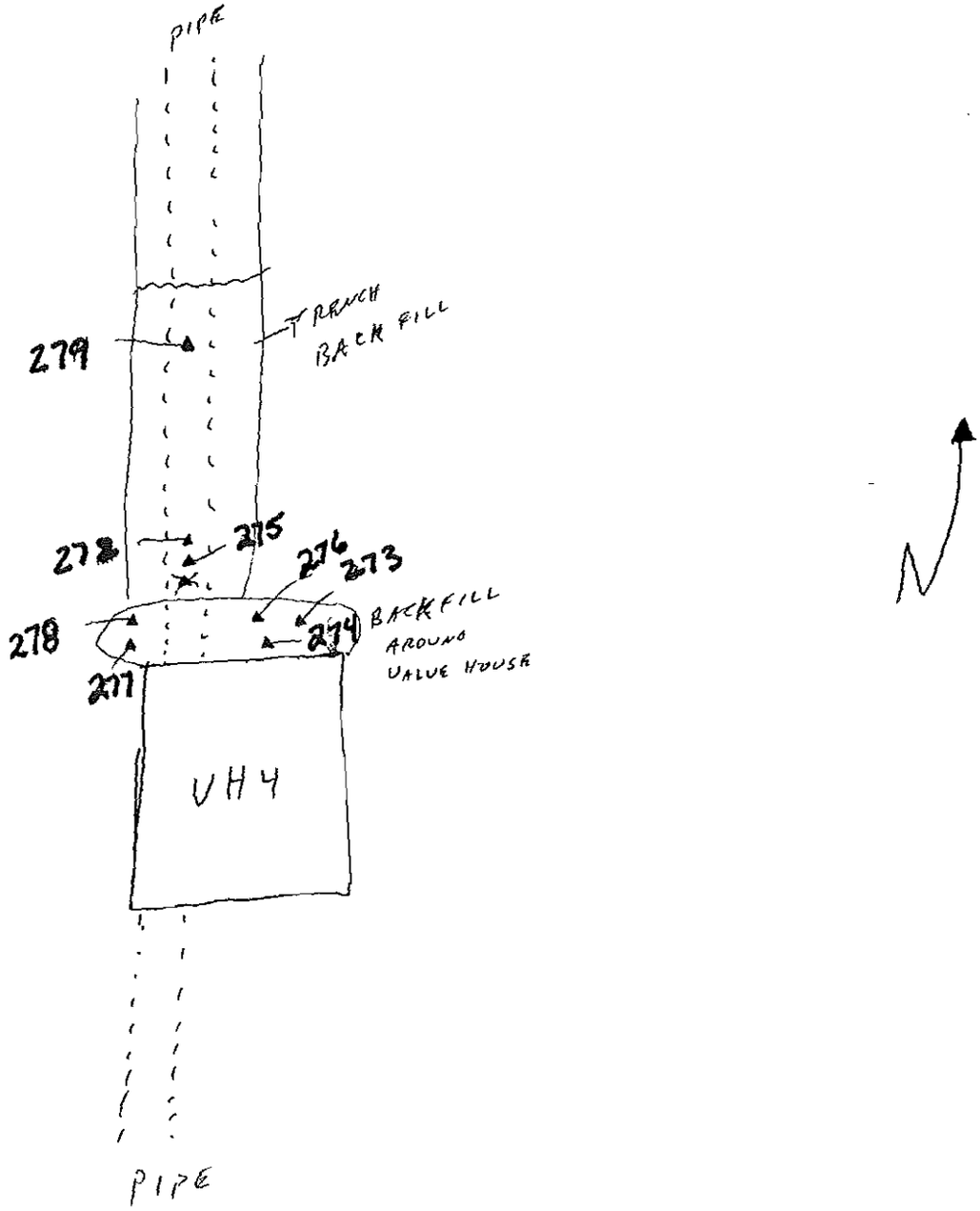
SHEET NO. 1 OF 2

NUCLEAR DENSITY TEST LOCATIONS

01 NOV 2000



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

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 1 day 11 month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: EP 10 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±8

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

	TEST NO.	TEST LOCATION See Attached Station	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
1	265	N. Side V.H. 5	8"/~~8~~4	EP-10	15.3	114.7	12.1	133.3	118.9	103.6	✓				
2	266	"	8"/~~8~~ 5				13.9	119.8	106.0	92.4		✓	267		
3	267	"	8"/~~8~~ 5				13.8	130.1	114.3	99.7	✓			✓	
4	268	≈300' S. of VH4 c/L	8"/1				10.7	121.6	110.8	96.6	✓				
5	269	≈200' S of VH4 c/L	8"/1 EP-23		15.8	106.0	14.0	116.0	101.8	~~88.7~~ 96.0		✓	270	✓	
6	270	≈210' S of VH4 c/L	8"/1 EP-23		15.8	106.0	14.9	120.4	104.8	~~91.7~~ 98.9	✓		~~271~~	✓	✓
7	271	≈210' S of VH4 c/L	8/1 EP-23		15.8	106.0	16.1	122.1	105.2	~~91.7~~ 99.2	✓				✓

COMMENTS: Test 269, 270, and 271 were found to be passing after a 1pt. Proctor of the material was run.

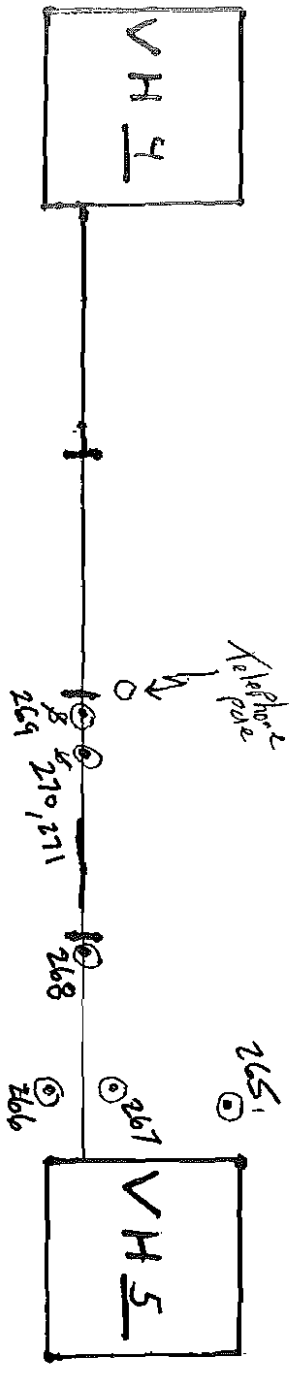
CHECKED BY: _____

SHEET NO. _____ OF _____

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: G-Q 1089 Task No.: 4.2

N



NOT TO SCALE

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II / EPLTS DATE: 31 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch S&G / on site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A 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: N/A QA ID: CL

TEST NO.	TEST LOCATION (See location map)	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		PASS	FAIL
260	VH-5 N. Side	8"/1	EP-6	15.5	112.0	16.1	126.0	108.5	96.8	P				
261	VH-4 ~~North~~ East Side	8"/1	EP-6	15.5	112.0	13.5	129.3	113.9	101.7	P				
262	VH5 N. Side	8"/2	EP-6	15.5	112.0	16.7	124.6	106.7	95.3	P				
263	VH-4 ~~North~~ East Side	8"/2	EP-6	15.5	112.0	15.4	124.6	108.0	96.4	P				
264	VH5 N. Side	8"/3	EP-6	15.5	112.0	15.3	122.8	106.5	95.1	P				

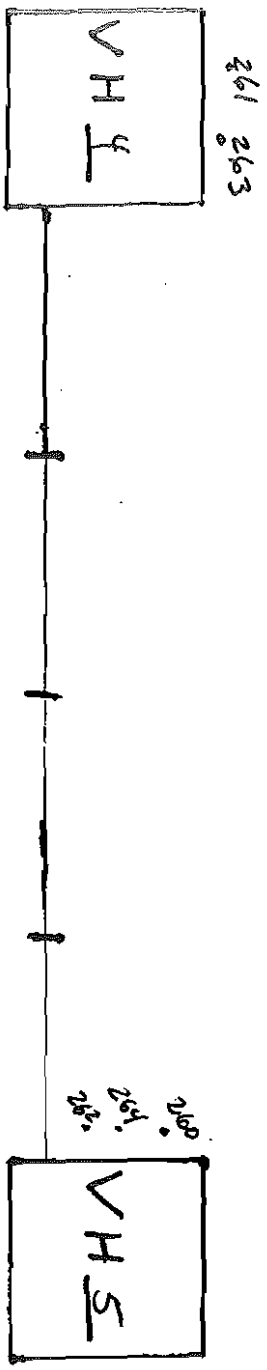
COMMENTS:

CHECKED BY: CL

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GO 1089 Task No.: 4.2

N



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II / EPLTS DATE: 31 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95%, 98% ROADWAY MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

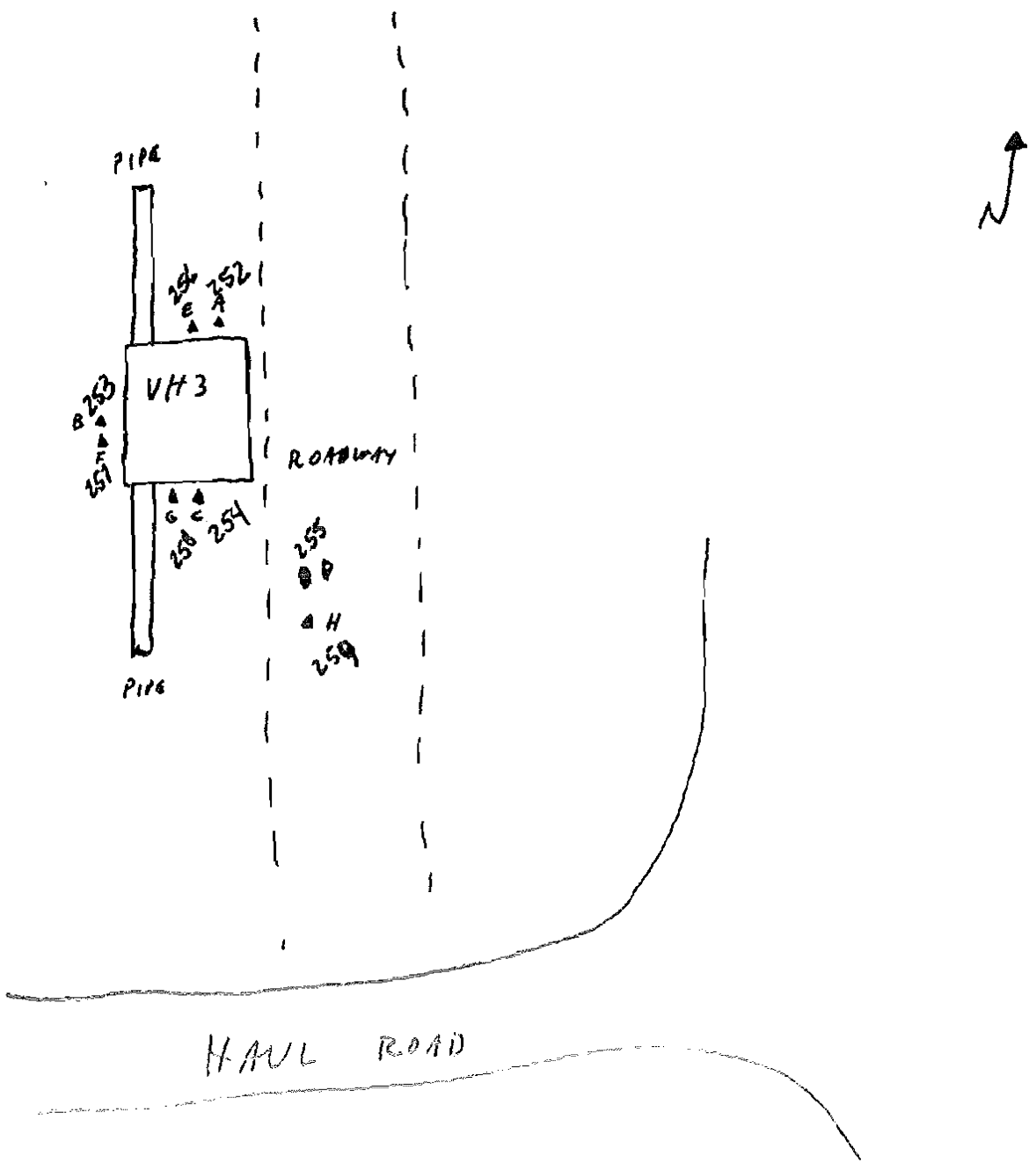
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
252	(A) NORTH ~~EAST~~ SIDE UH3	8" / 2nd	EP6	15.5	112.0	11.1	130.4	117.4	104.8	P				
253	(B) WEST SIDE UH3	8" / 2nd	EP6	15.5	112.0	16.3	133.8	115.0	102.7	P				
254	(C) SOUTH SIDE UH3	8" / 2nd	EP6	15.5	112.0	15.4	132.2	114.6	102.3	P				
255	(D) ROADWAY	8" / 1st	EP6	15.5	112.0	14.6	131.2	114.4	102.2	P				
256	(E) NORTH SIDE UH3	8" / 3rd	EP6	15.5	112.0	11.1	135.1	121.6	108.5	P				
257	(F) WEST SIDE UH3	8" / 3rd	EP6	15.5	112.0	14.3	125.2	109.6	97.8	P				
258	(G) SOUTH SIDE UH3	8" / 3rd	EP6	15.5	112.0	14.2	127.9	111.9	100.0	P				
259	(H) ROADWAY	8" / 2nd	EP6	15.5	112.0	14.1	129.6	113.6	101.4	P				

COMMENTS:

NUCLEAR DENSITY TEST LOCATIONS

31 OCT 2000



GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 30 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
249	A ROADWAY NORTH WAY	8" / 11	EP10	15.3	114.7	15.4	130.1	112.7	98.3	P				
250	B "	8" / 12	EP10	15.3	114.7	14.5	129.3	112.9	98.4	P				
251	C "	8" / 13	EP10	15.3	114.7	14.5	130.7	114.2	99.5	P				

COMMENTS:

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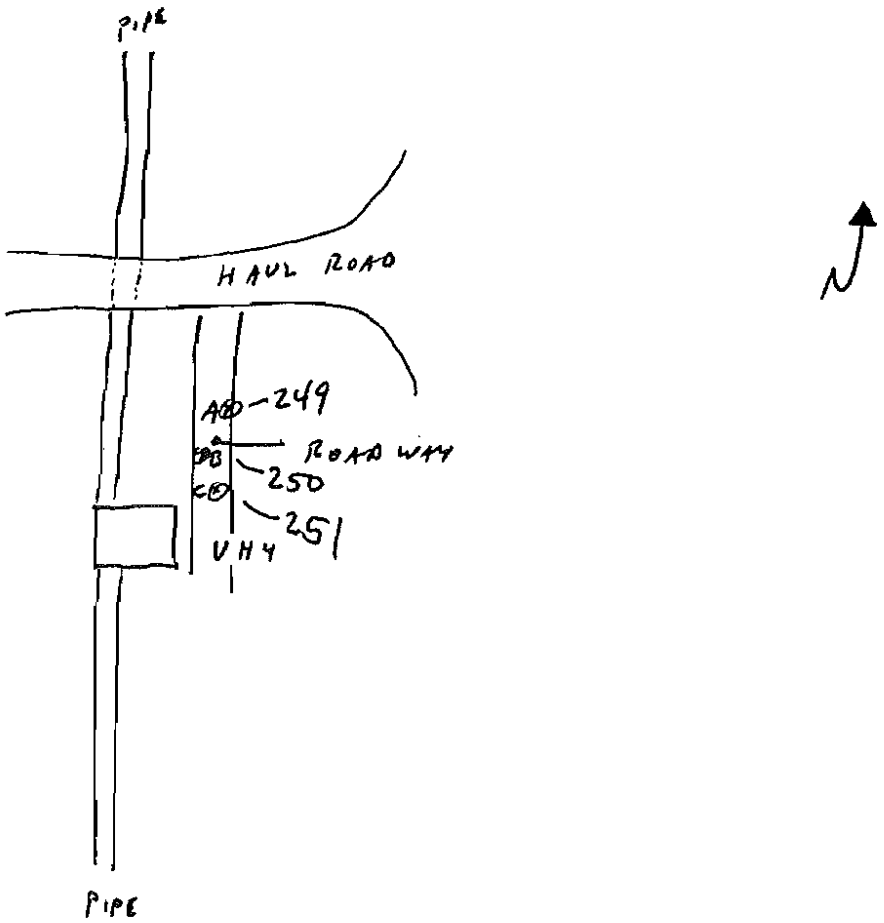
NUCLEAR DENSITY TEST LOCATION



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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 22 day OCT month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VH 5 Soil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ± 8
(CIRCLE ONE)

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YO

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 (%)	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
248	N. Side of VH5	8"/1	EP-6	15.3	112.0	16.7	126.5	108.3	96.7	✓				
2														
3														
4														
5														
6														

COMMENTS:

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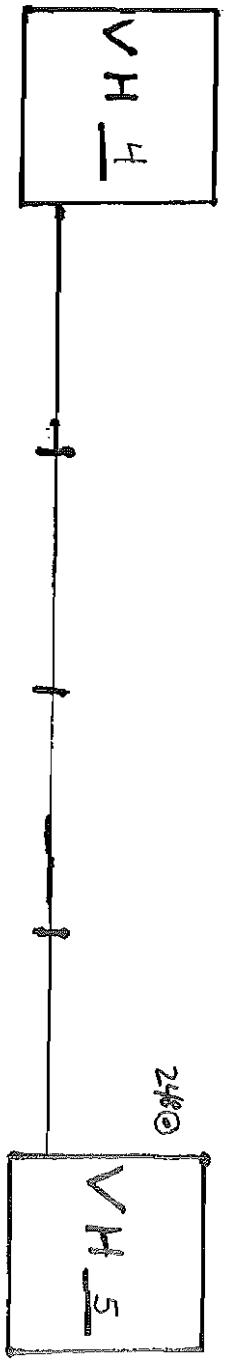
Page____ of____

Written by:_____ Date: __/__/__ (YY MM DD) Reviewed by:_____ Date: __/__/__ (YY MM DD)

Client:_____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



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NOT TO SCALE

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 II

PROJECT NO.: ~~GQ0409~~ GQ1029 MH TASK NO.: 04.2

DATE: 26 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
246	BACKFILL A NORTH UHG	8" 1 ~~15~~	EP6	15.5	112.0	17.1	132.7	113.3	101.1	P				
247	BACKFILL B NORTH UHG	8" 1 ~~14~~ 2	EP6	15.5	112.0	15.2	131.7	114.3	102.1	P				

COMMENTS:

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SHEET NO. 1 OF 2

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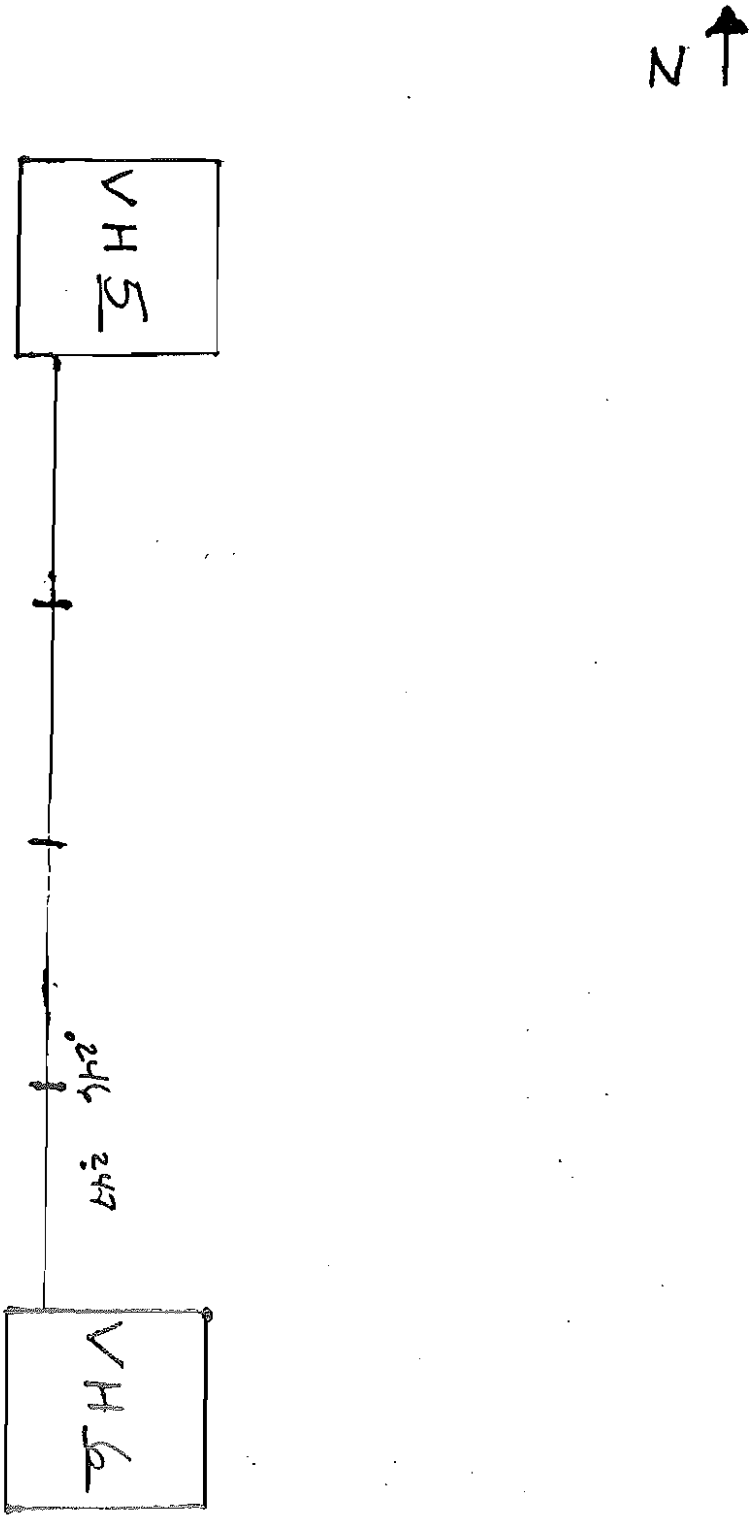
Page_____of_____

Written by:_____ Date: __/__/__ (YY MM DD) Reviewed by:_____ Date: __/__/__ (YY MM DD)

Client:_____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



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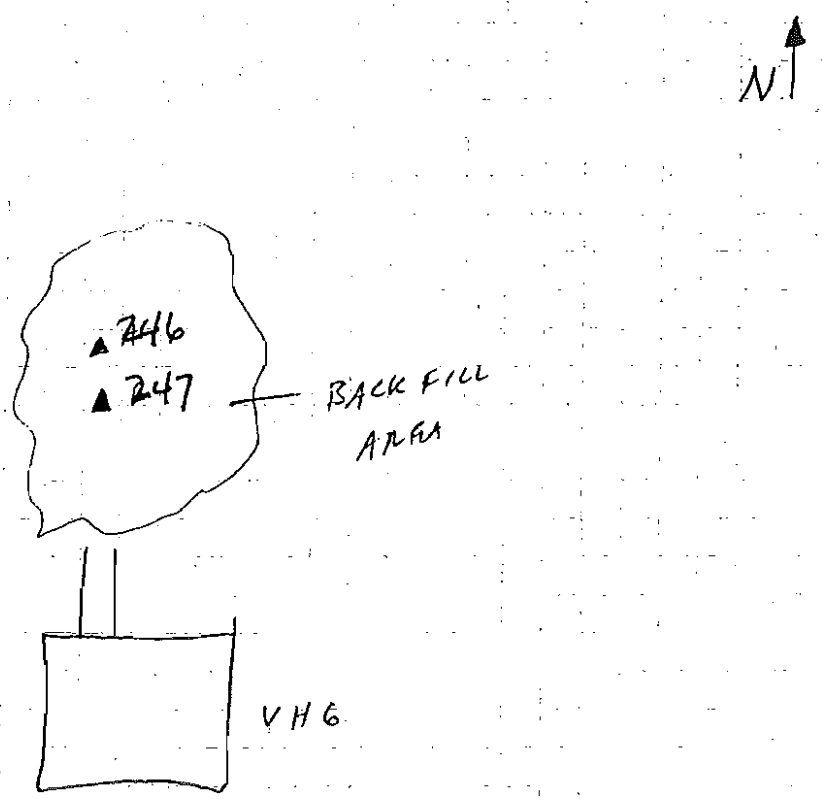
Page_____of_____

Written by:_____ Date: __/__/__ (YY MM DD) Reviewed by:_____ Date: __/__/__ (YY MM DD)

Client:_____ Project:_____ Project/Proposal No.:_____ Task No.:_____

26 OCT 2000



GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 25 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	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		PASS	FAIL
244	A TRENCH	6" / 1ST	EP6	15.5	112.0	15.8	128.5	111.0	99.1	✓P				
245	B TRENCH	6" / 2ND	EP6	15.5	112.0	16.2	127.8	110.0	98.2	✓P				

COMMENTS:

CHECKED BY:

SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

Page ____ of ____

Written by: ____ Date: ___/___/___ (YY MM DD) Reviewed by: ____ Date: ___/___/___ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

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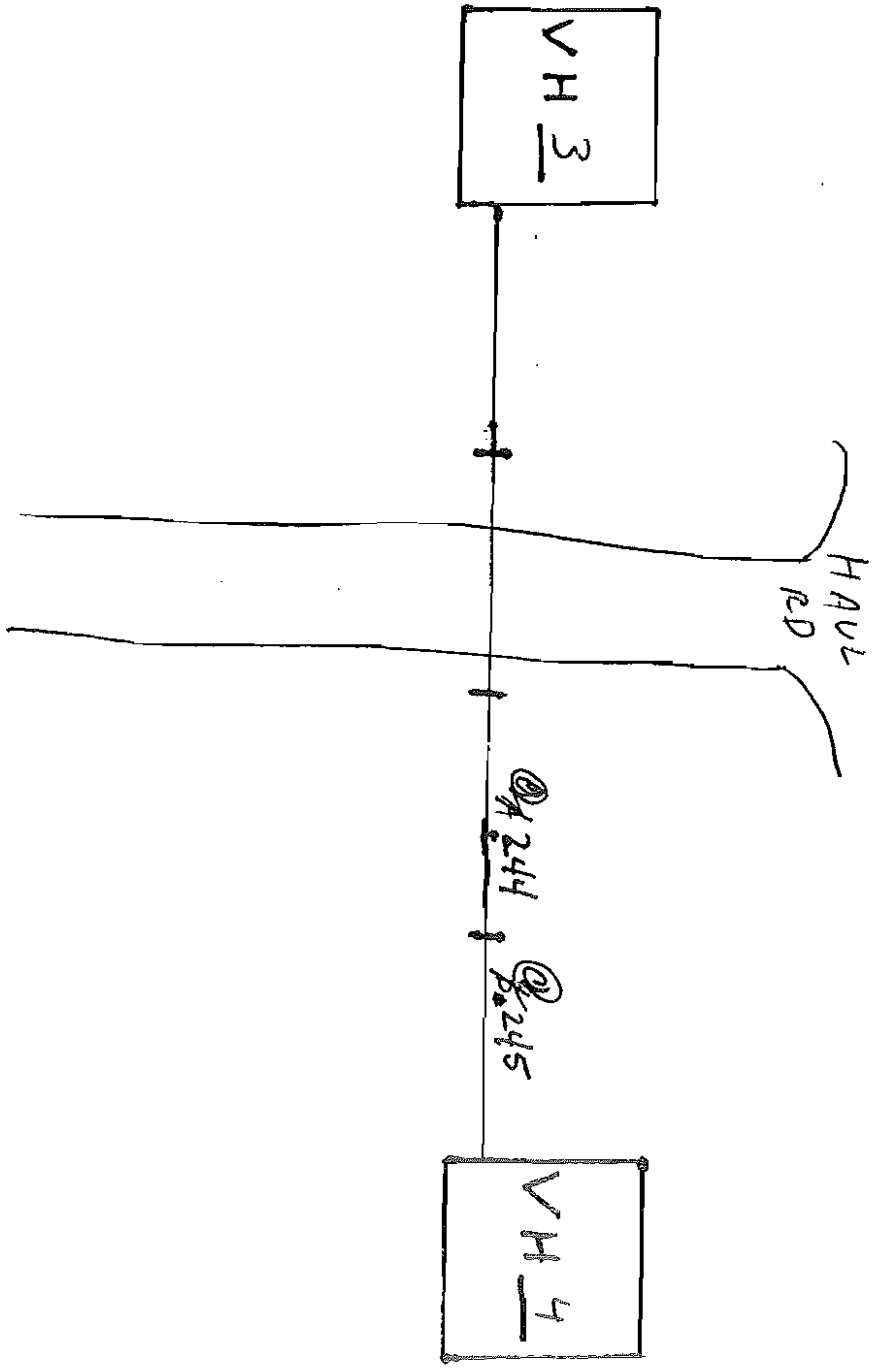


NOT TO SCALE

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 PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 25 day Oct month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: OFFSite Stockpile EP-6 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8"
(CIRCLE ONE)

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: 70

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
238	45'E of cl 300'S of UH3	8"/3	~~EP-17~~ ~~EP-6~~	~~12.1~~ ~~15.3~~	~~122.6~~ ~~112.0~~	15.3	137.6	~~119.4~~ ~~106.6~~	~~97.4~~ ~~106.6~~	✓				
239	N. Side of UH 4	8"/8	EP-6	~~15.5~~ ~~15.3~~	112.0	17.6	129.5	110.1	98.3	✓	✓			
240	N. Side of UH 4	8"/9	EP-6	~~15.5~~ ~~15.3~~	112.0	20.9	128.4	106.5	95.1	✓	✓			
241	N. Side of UH4	8"/10	EP-6	~~15.5~~ ~~15.3~~	112.0	17.4	127.3	108.4	96.8	✓	✓			
242	20'E of cl 260'S of UH3	8"/4	EP-6	~~15.5~~ ~~15.3~~	112.0	19.6	131.5	110.0	98.2	✓	✓			
243	20' NW of GIS #7	8"/4	EP-6	~~15.5~~ ~~15.3~~	112.0	12.8	127.3	112.8	100.7	✓	✓			

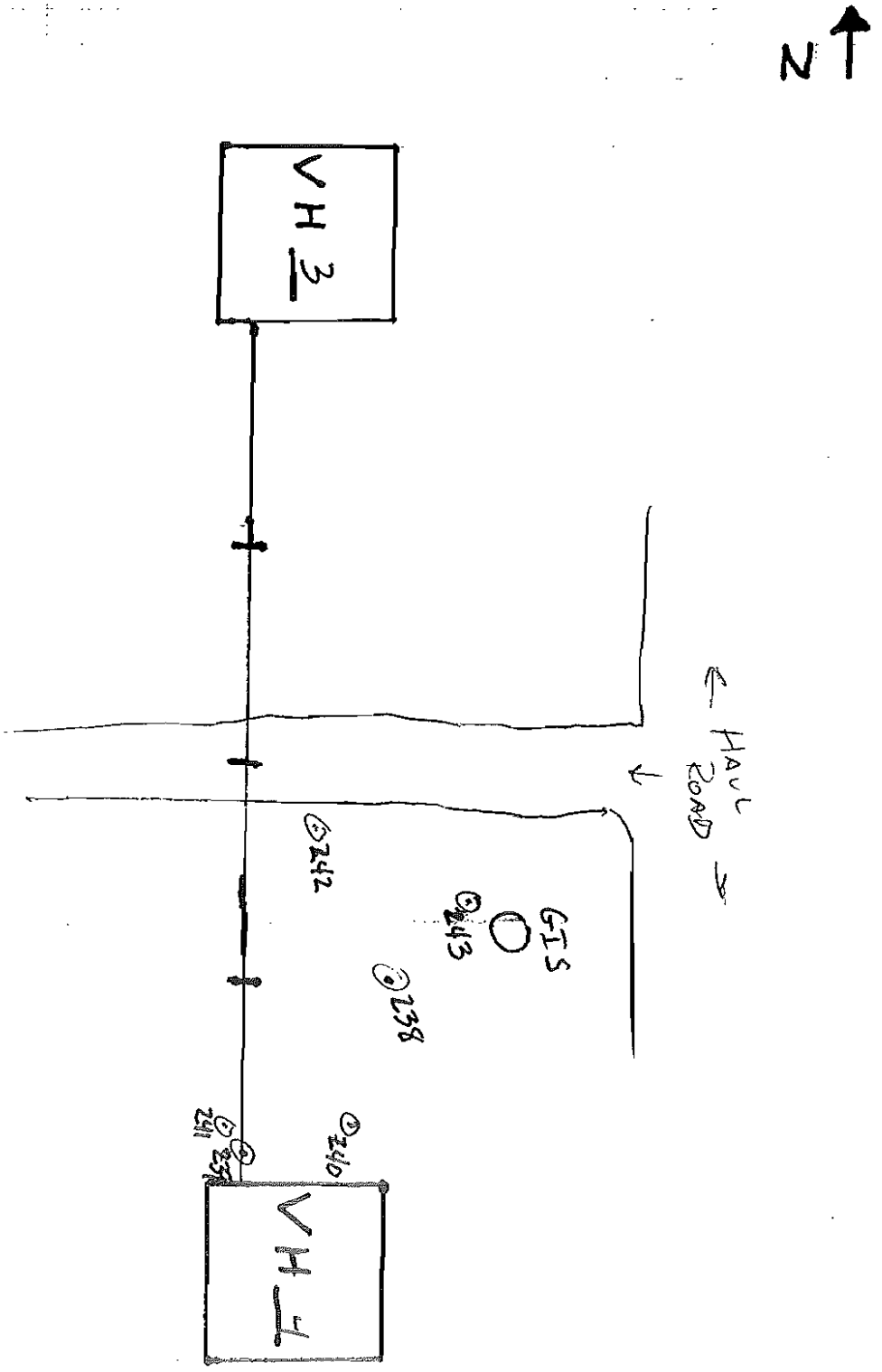
COMMENTS: #238 was taken on a mixed material consisting of trench excavation and the south SP from offsite

GEOSYNTEC CONSULTANTS

Page ____ of ____

Written by: Tony Dickman Date: 00 / 10 / 25 (YY / MM / DD) Reviewed by: ____ Date: __ / __ / __ (YY / MM / DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) G01029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 23 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MG

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
234	A G156	6" / 1	EP5	11.7	125.6	11.1	135.2	121.7	96.9	P				
235	B G156	6" / 1	EP5	11.7	125.6	11.3	138.3	124.3	98.9	P				

COMMENTS:

CHECKED BY: SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

Page____ of____

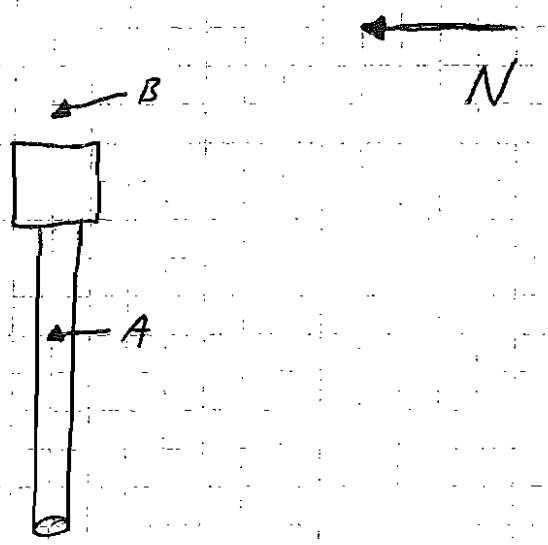
Written by:_____ Date: __/__/__ (YY MM DD) Reviewed by:_____ Date: __/__/__ (YY MM DD)

Client:_____ Project:_____ Project/Proposal No.:_____ Task No.:_____

G 15 6

STORM LINE

▲ N.O.G. TEST LOCATION



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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 23 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site Material MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
236	GIS #6	8"/2	EP-5	11.7	125.6	11.9	136.1	121.7	96.9	P				
237	Top of Clay Plug ℄ ~Sta 10+20	8"/~~2~~ 1	EP-5	11.7	125.6	10.9	140.0	126.3	100.5	P				

COMMENTS:

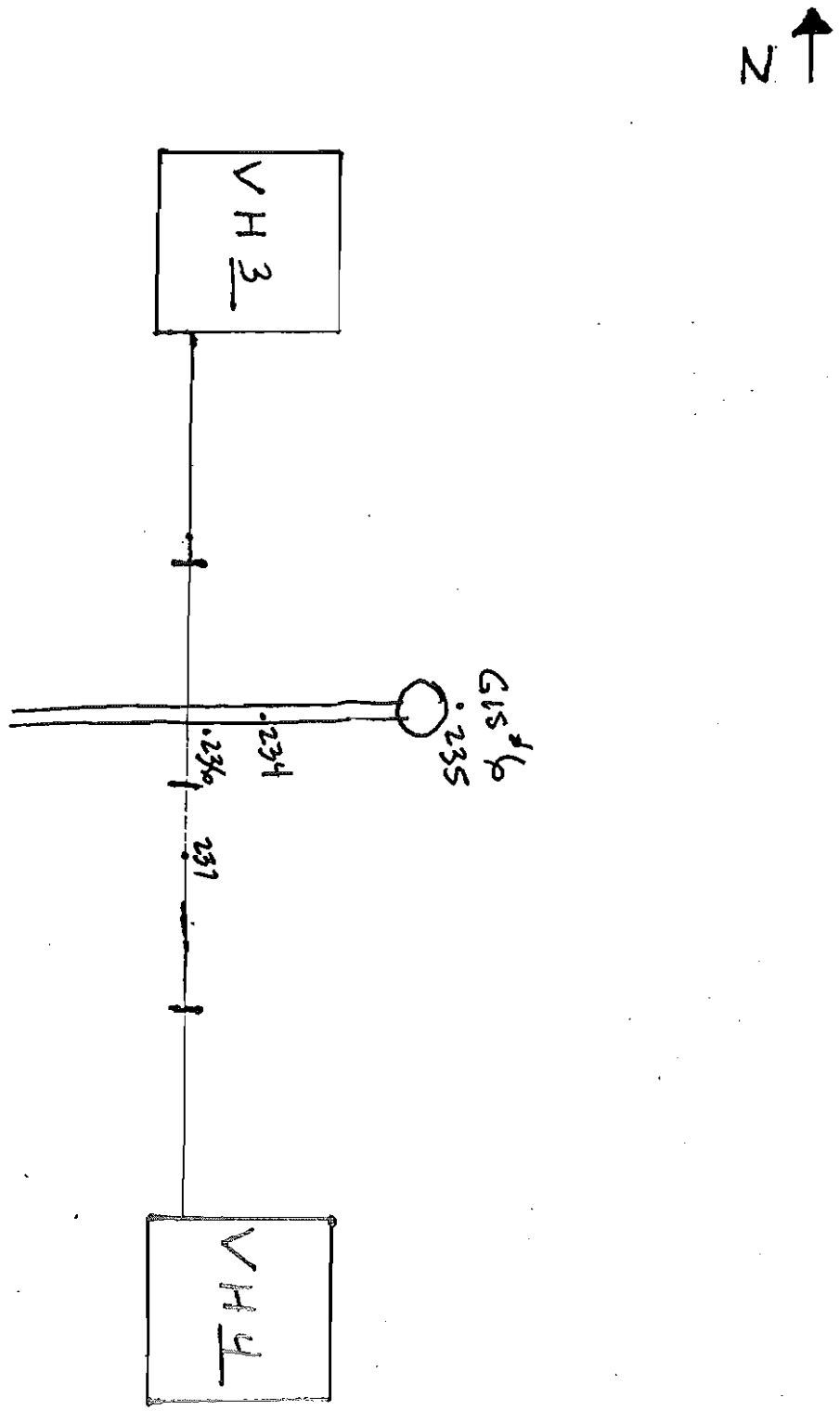
CHECKED BY: [illegible]

SHEET NO. 1 OF 2

GeoSyntec Consultants

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



Not To Scale

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 13 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch Sand & Gravel MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A 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: N/A QA ID: CL

TEST NO.	TEST LOCATION See location map	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
219	VH-1	8"/3rd	8" EP6	15.5	112.0	19.5	124.7	104.3	93.2		F	553	✓	
220	VH-1	8"/3rd	8" EP6	15.5	112.0	16.1	122.5	105.5	94.2		F	552		✓
221	VH-1	8"/3rd	8 EP6	15.5	112.0	8.5	118.8	109.5	97.8	P				
222	VH-2	8"/1st	EP6	15.5	112.0	12.3	123.4	109.9	98.1	P				
223	VH-2	8"/1st	EP6	15.5	112.0	11.7	123.1	110.3	98.4	P				
224	VH-2	8"/1st	EP-6	15.5	112.0	10.7	120.1	108.5	96.9	P				
225	GIS-ff	8"/Final	EP6	15.5	112.0	12.0	124.4	111.1	99.2	P				
226	VH-2	8"/2nd	EP6	15.5	112.0	12.3	127.2	113.2	101.1	P				
227	VH-2	8"/2nd	EP-6	15.5	112.0	9.5	125.9	115.0	102.7	P				
228	VH-2	8"/2nd	EP6	15.5	112.0	9.0	120.1	110.2	98.4	P				

COMMENTS: Test around Valve houses were trench backfill after the grounding ~~Ep~~ cables were in place.

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 13 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch Sand & Gravel MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
229	20'W of VH3 EPLTS	8"/Final	EP6	15.5	112.0	14.1	128.4	112.5	100.5	P				
230	75'W of VH3 EPLTS	8"/Final	EP6	15.5	112.0	13.5	125.0	110.1	98.3	P				
231	VH-3 1	8"/1st-Final	EP6	15.5	112.0	14.2	124.0	108.5	96.9	P				
232	VH-3	8"/1st Final	EP-6	15.5	112.0	13.3	130.5	115.2	102.8	P				
233	VH-3	8"/1st-Final	EP-6	15.5	112.0	14.9	127.7	111.1	99.2	P				

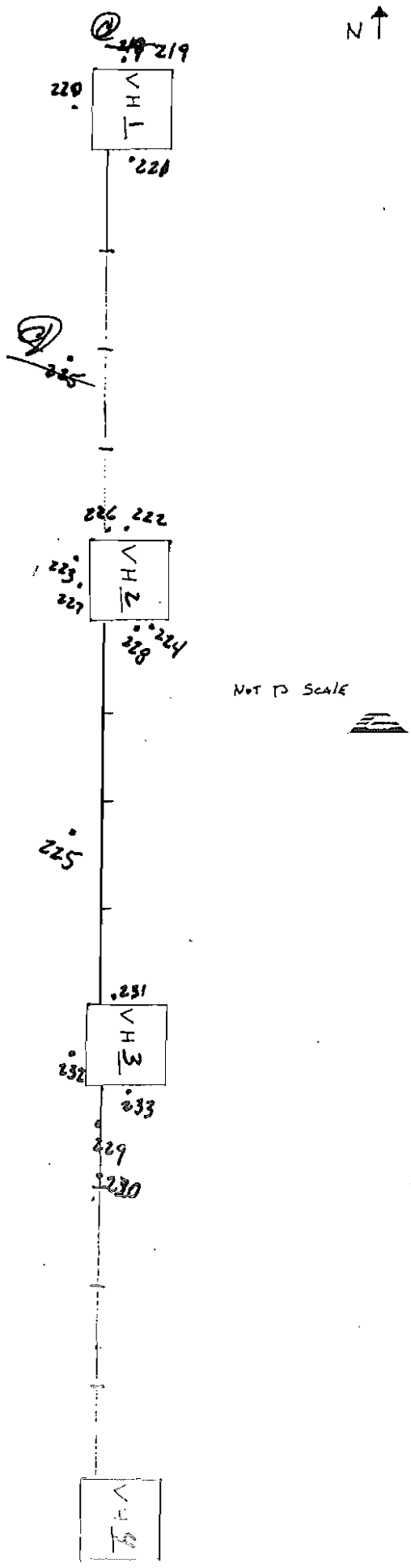
COMMENTS: as page 1 this date.

CHECKED BY: [illegible]

GEOSYNTEC CONSULTANTS Page ___ of ___

Written by: CJ Date: 04/10/13 (YY MM DD) Reviewed by: ___ Date: 04/10/13 (YY MM DD)

Client: Fluor Project: E.P.L.T.S. Project/Proposal No.: GA 1029 Task No.: 4.2



GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) G01029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~G00409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 13 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MR

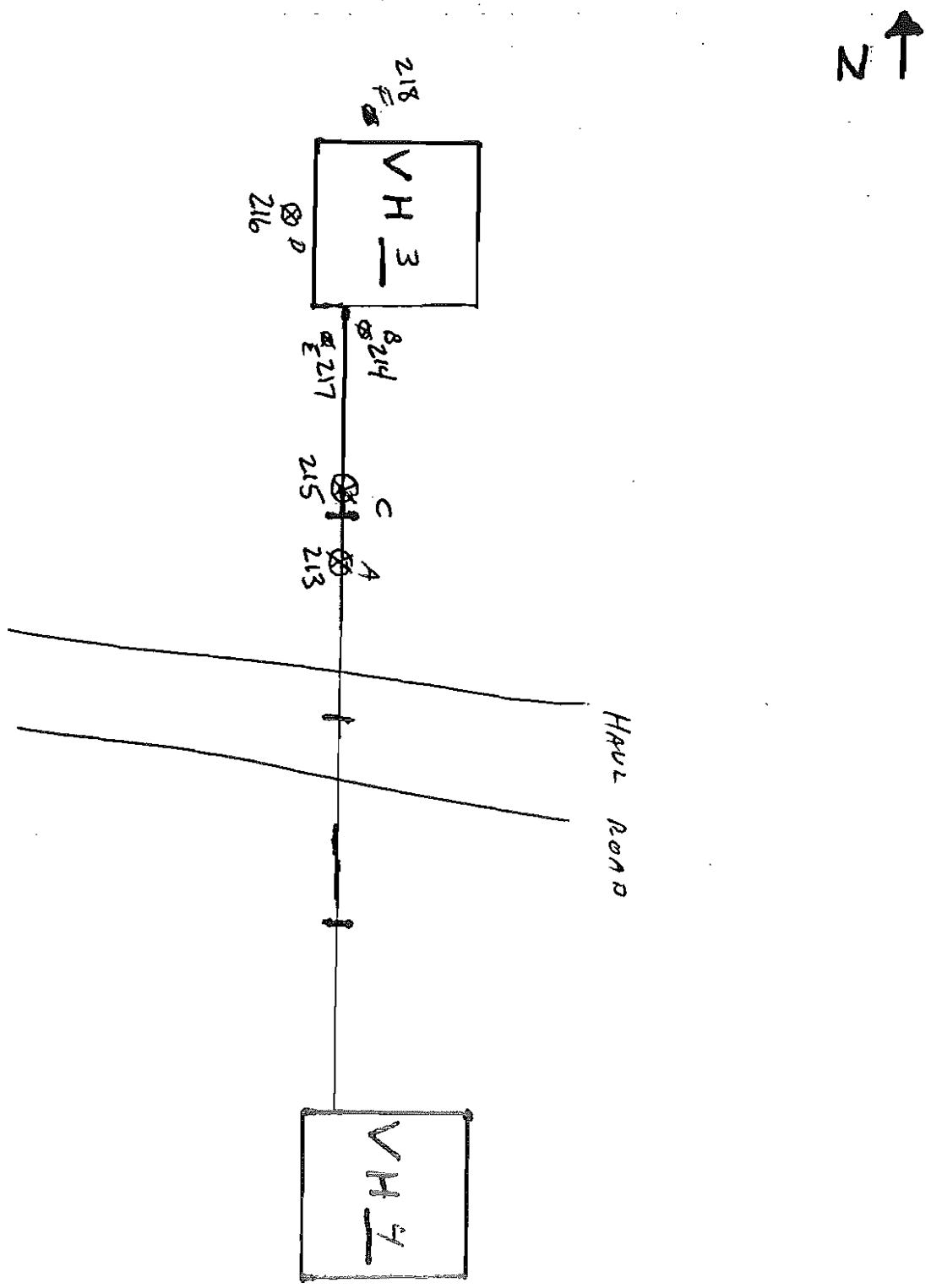
TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
213	A TRENCH	8" / 1	EP8	12.4	121.9	11.1	138.7	124.8	102.4	P				
214	B UH3 SOUTH	8" / 1	EP6	15.5	112.0	14.3	127.0	111.1	99.2	P				
215	C TRENCH	8" / 2	EP8	12.4	121.9	10.7	135.4	122.4	100.4	P				
216	D UH3 WEST	8" / 1	EP6	15.5	112.0	13.8	123.8	108.8	97.1	P				
217	E UH3 SOUTH	8" / 2	EP8	12.4	121.9	10.3	137.3	124.5	102.1	P				
218	F UH3 NORTH	8" / 2	EP8	12.4	121.9	10.8	131.2	118.4	97.1	P				

COMMENTS:

GeoSyntec Consultants

Written by: MIKE HUMPHREYS Date: / / (YY MM DD) Reviewed by: Date: 13 OCT 2000 / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) GQ1029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 13 day OCT month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION REFER TO MAP	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
210	A1 VH1 NORTH	8" / 2	EP6	15.5	112.0	14.5	130.5	114.0	101.8	P				
211	A2 VH1 WEST	8" / 2	EP6	15.5	112.0	13.9	121.7	106.8	95.4	P				
212	A3 VH1 SOUTH	8" / 2	EP6	15.5	112.0	11.6	127.7	114.4	102.1	P				

COMMENTS:

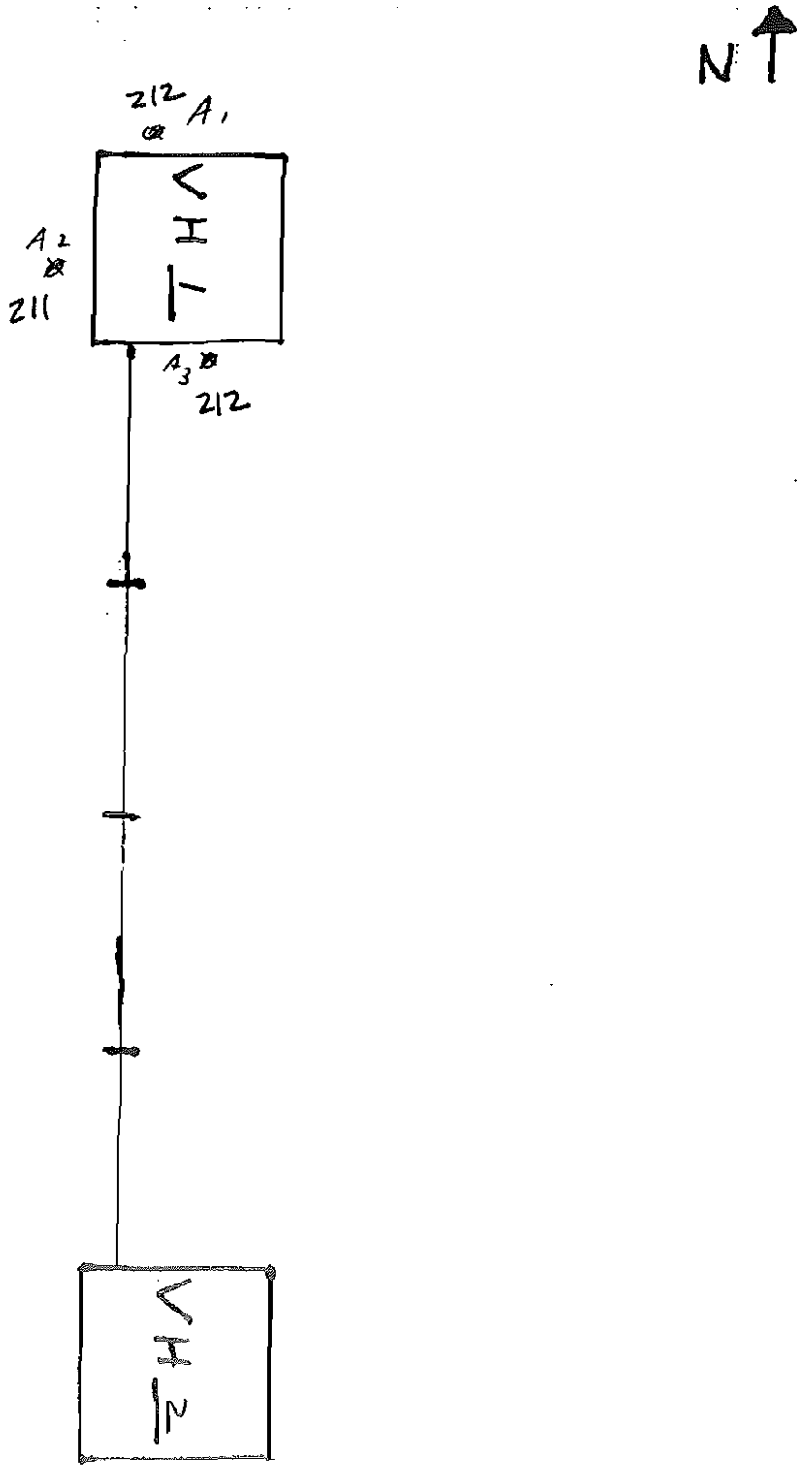
CHECKED BY:

SHEET NO. 1 OF 2

GeoSyntec Consultants

Written by: MIKE HUMPHREYS Date: 13 OCT 2000 (YY / MM / DD) Reviewed by: _____ Date: ___ / ___ / ___ (YY / MM / DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

FIELD NUCLEAR MOISTURE/DENSITY TEST LOG (ASTM D 3017 AND ASTM D 2922)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF) 601029

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ TASK NO.: 04.2

DESCRIPTION: PHASE II DATE: 10 day 10 month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: VARIOUS ON SITE MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____ (CIRCLE ONE)

NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: MH

TEST NO.	TEST LOCATION (REFER TO MAP)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	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
207	A FILL OVER PIPE	8"/1	EP 6	15.5	112.0	15.9	130.1	112.3	100.3	P				
208	B FILL OVER PIPE	8"/2	EP 6	15.5	112.0	15.3	127.9	110.9	99.0	P				
209	C FILL OVER PIPE	8"/3	EP 6	15.5	112.0	15.3	123.7	107.3	95.8	P				

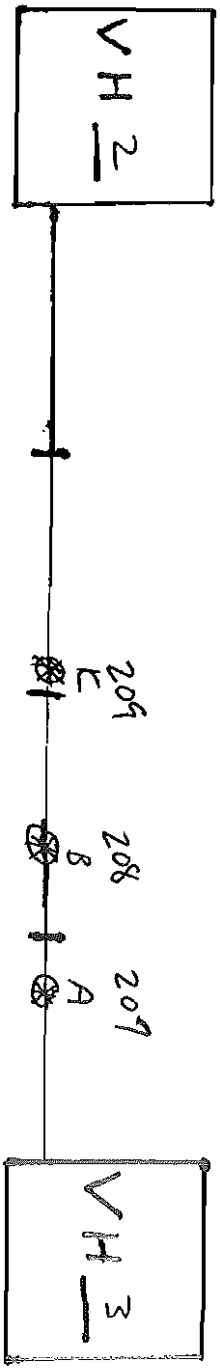
COMMENTS:

CHECKED BY: [signature]

Written by: MIKE HUMPHREYS Date: 00 / 10 / 10 (YY MM DD) Reviewed by: _____ Date: 00 / 10 / 10 (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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 PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPCTS DATE: 4 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
196	See Sketch	8"/2	EP-8	12.4	121.9	9.5	132.0	120.5	98.9	✓				
197		8"/2				9.8	133.5	121.6	99.8	✓				
198		8"/5				10.4	131.7	119.3	97.9	✓				
199		8"/3				16.5	136.2	116.9	95.9	✓				
200		8"/6				11.1	131.2	118.1	96.9	✓				
201		8"/3				10.8	133.5	120.5	98.8	✓				
202		8"/3				14.0	132.2	116.0	95.2	✓				
203		8"/5				14.6	134.5	117.4	96.3	✓				
204		8"/7				11.4	132.0	118.5	~~97.4~~ 97.2	✓				
205		8"/8				10.6	131.6	119.0	97.6	✓				

COMMENTS:

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 PROJECT NO.: ~~G00409~~ 1629 TASK NO.: 04.2

DESCRIPTION: EPCTS DATE: 4 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

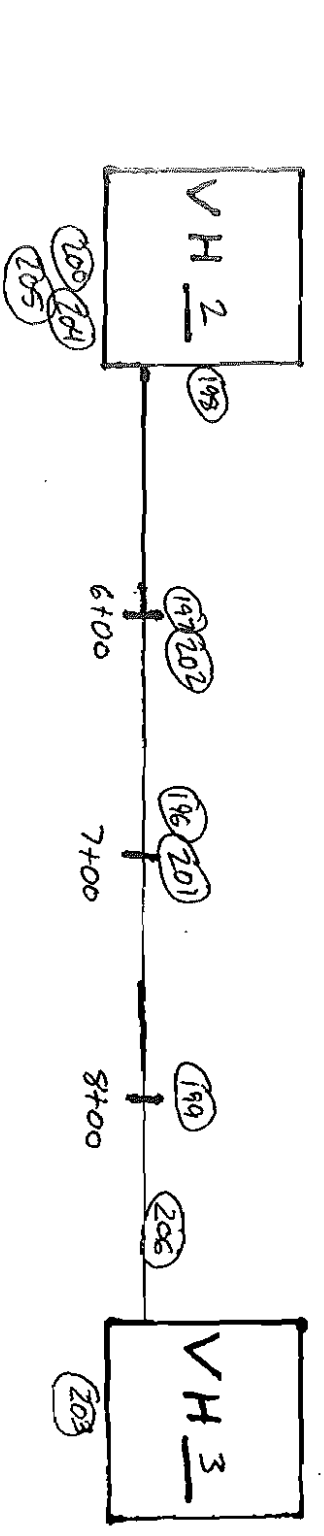
NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS | FAIL		PASS | FAIL
206	See Sketch	8"/4	EP-8	12.4	121.9	14.6	137.1	119.6	98.1	✓		

COMMENTS:

Written by: Ken Sparks Date: 00 10 14 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GO 1029 Task No.: 1.2



NOT TO SCALE

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 PROJECT NO.: ~~G00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 3 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
192	See Sketch	8"/2	EP-8	12.4	121.9	10.4	135.5	122.7	100.7	✓			
193	↓	8"/2	↓	↓	↓	11.0	135.3	121.9	100.0	✓			
194		8"/2				13.5	135.8	119.7	98.2	✓			
195		8"/3				13.0	134.1	118.7	97.4	✓			

COMMENTS:

CHECKED BY: [illegible]

SHEET NO. 1 OF 2

Written by: KS + TD Date: 09 / 10 / 03 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GG 1029 Task No.: 4.2

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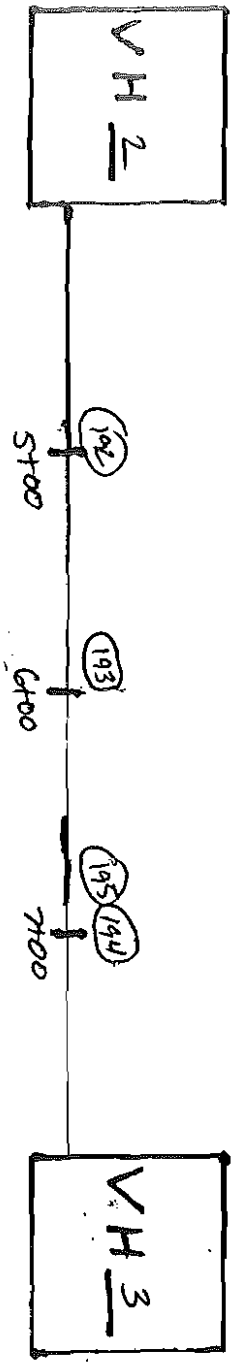

NOT TO SCALE

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~~3 of 3~~ TD

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 PROJECT NO.: ~~G00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPCTS DATE: 2 day Oct month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: French Sports MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

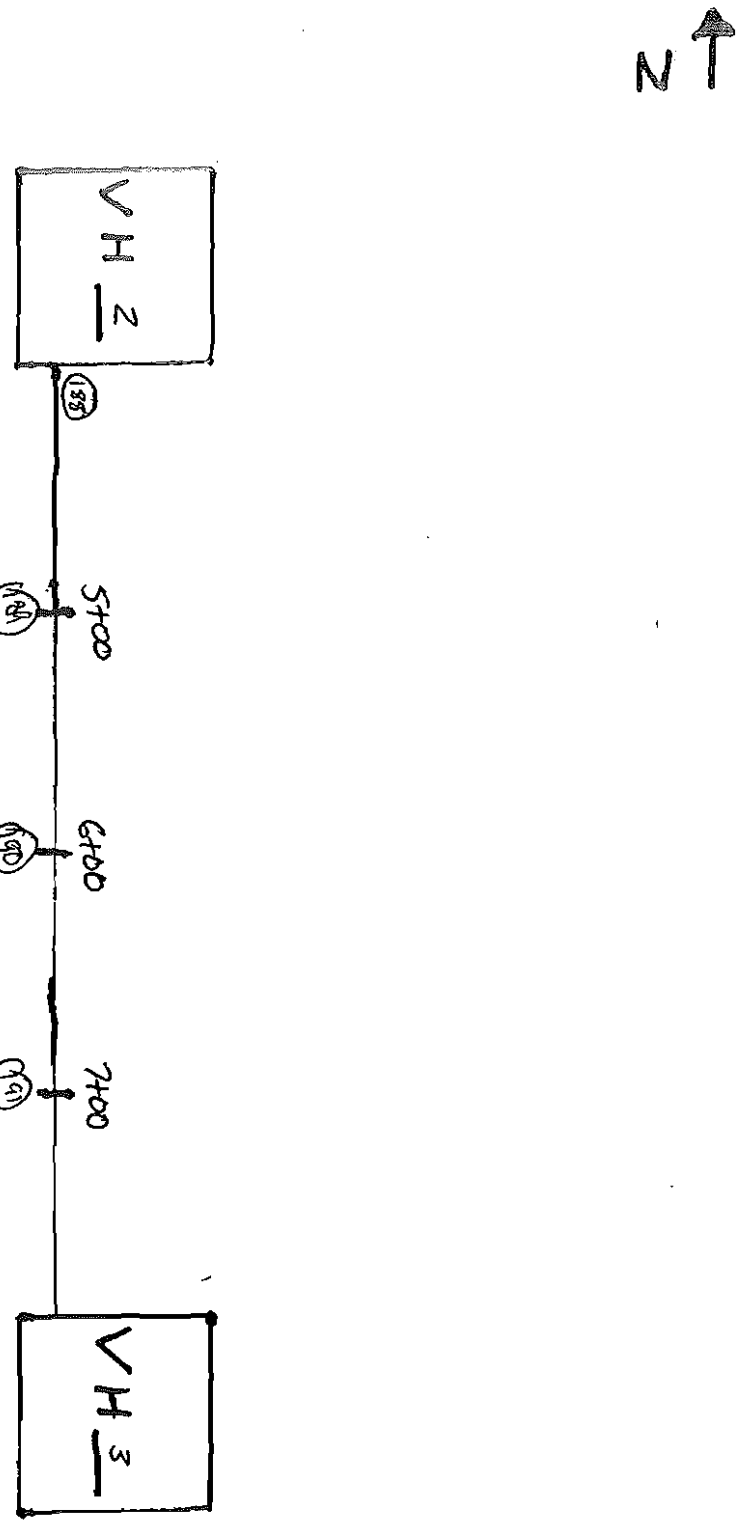
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
88	See Sketch	8"/4	EP-8	12.4	121.9	11.7	130.0	116.4	95.5	✓				
89	↓	8"/1	↓	↓	↓	12.0	130.2	116.2	95.3	✓				
90		8"/1				11.4	130.5	117.1	96.0	✓				
91		8"/1				9.9	129.0	117.4	96.3	✓				

COMMENTS:

CHECKED BY: [illegible]

Written by: Ken Sparks Date: 00/OCT/2 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GG 1089 Task No.: 1.2



NOT TO SCALE

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 PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 30 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: off-site MATERIAL TYPE: FILL / SUBGRADE / SUBBASE / CLAY / OTHER: 304 Stone (CIRCLE ONE) LIFT THICKNESS (LOOSE / COMPACTED): 8"

% COMPACTION: 98 MOISTURE RANGE: N/A ASTM D 698: A B (C) / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

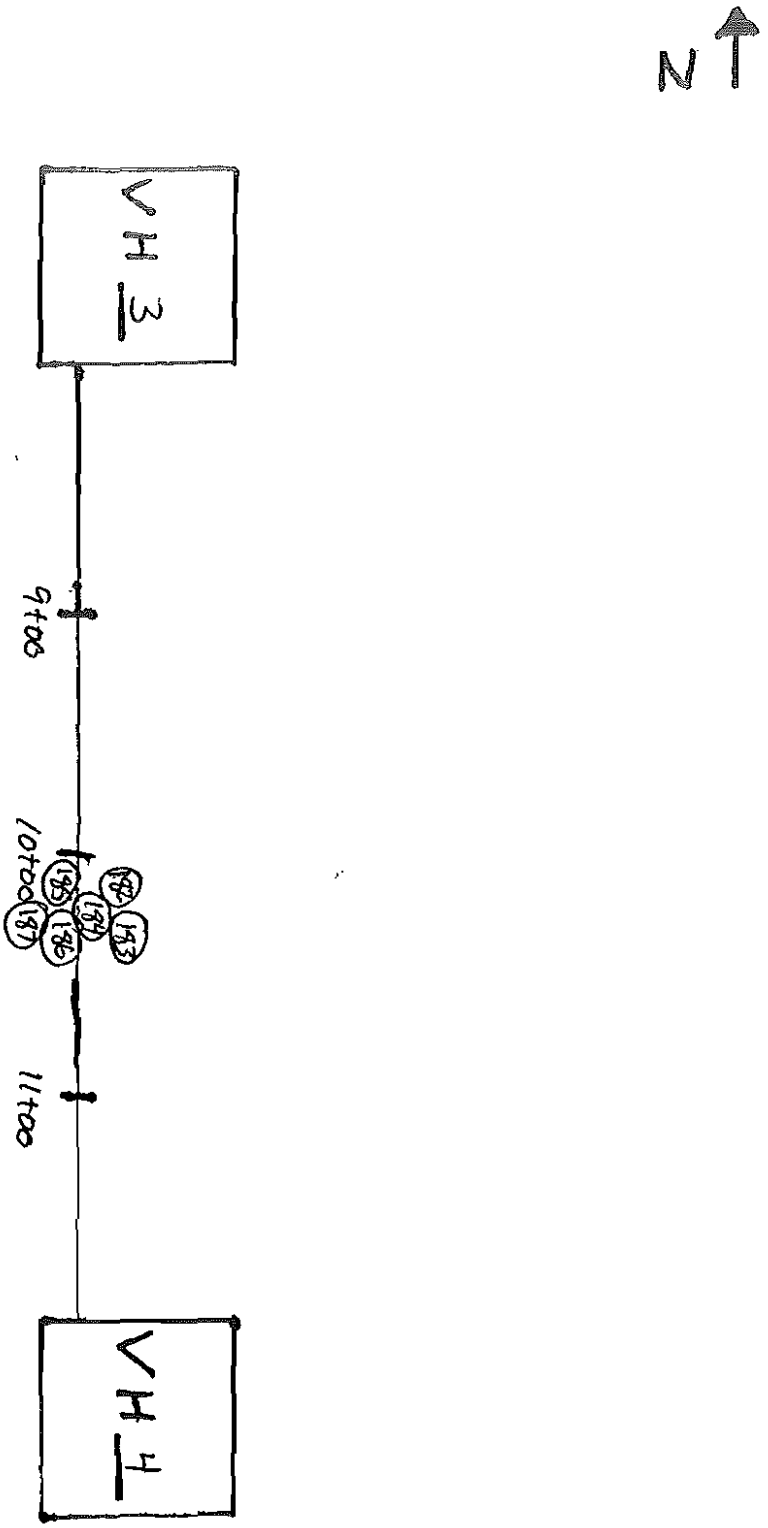
TEST NO.	TEST LOCATION,	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
82	See Sketch	8"/1	IM-70	6.8	141.8	4.1	139.0	133.5	94.1	✓	✓	183		✓
83	↓	8"/1	↓	↓	↓	6.0	145.3	137.1	96.7	✓	✓	~~182~~ 184	✓	
84		8"/1				4.9	141.7	135.1	95.3	✓	✓	~~182~~ ~~183~~ 185	✓	✗
85		8"/1				5.1	147.6	140.5	99.1	✓		~~184~~	✗	
186		8"/2				3.8	150.1	144.6	101.9	✓				
187	↓	8"/3	↓	↓	↓	4.3	145.8	139.8	98.6	✓				

COMMENTS:

CHECKED BY: [illegible]

Written by: Ken Sparks Date: 00 / Sept / 30 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: 60 1029 Task No.: 4.2



NOT TO SCALE

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 PROJECT NO.: GQ~~0409~~ 1029 TO TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 29 day Sept month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: Various MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±8"

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TO

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
	See Attached Sketch		SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
181	Between UA 3+4 @ Haul RD	6"/1	EP6	15.5	112.0	16.3	121.4	104.4	93.2		✓	N/A		

COMMENTS: Material was removed - No retest

GEOSYNTEC CONSULTANTS

Page ____ of ____

Written by: ____ Date: ___/___/___ (YY/MM/DD) Reviewed by: ____ Date: 29 / Sept / 2000 (YY/MM/DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N

2 of 2

NOT TO SCALE

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 PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04,2

DESCRIPTION: Phase II DATE: 22 day Sept month ____ year

SPECIFICATION REQUIREMENTS

SOURCE: ____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: ____ LIFT THICKNESS (LOOSE/COMPACTED): ±8"
(CIRCLE ONE)

% COMPACTION: 90 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: 40

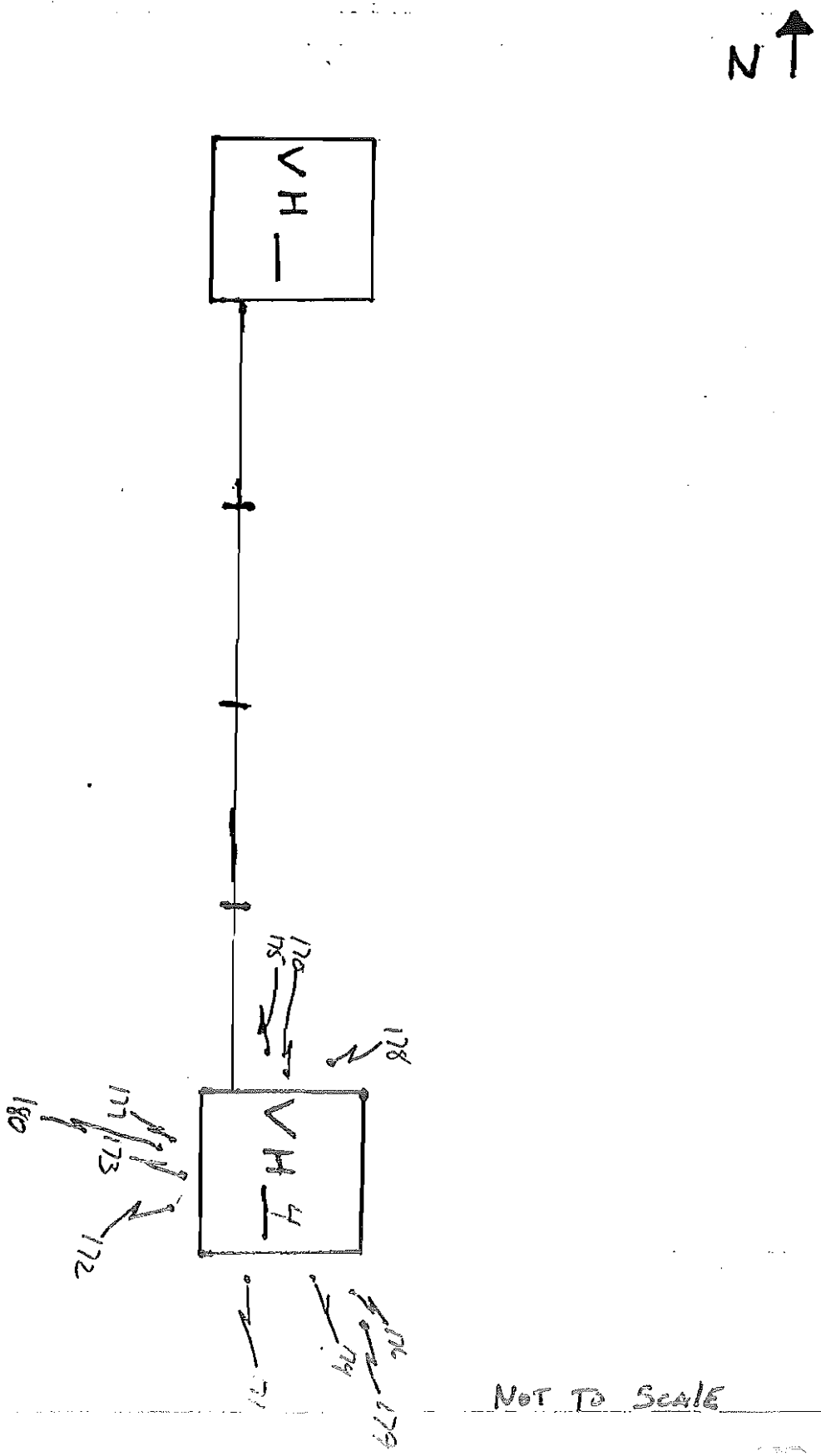
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
	See Attached Sketch		SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
70	VH4 N. WALL	8"/3	EP-6	16.0	112.0	14.0	121.7	106.8	95.3	P				
71	VH4 S. WALL	8"/3				13.4	128.9	113.7	101.5	P				
72	VH4 W WALL	8"/3				13.9	131.0	115.0	102.6	P				
73	"	8"/4				14.6	128.0	111.7	99.7	P				
74	VH4 S. WALL	8"/4				15.9	130.3	112.4	100.4	P				
75	VH4 N. WALL	8"/4				15.4	129.5	112.3	100.3	P				
76	VH4 S. WALL	8"/5				14.3	128.8	~~114.5~~ 112.7	~~102.2~~ 100.6	P				
77	VH4 W. WALL	8"/5				14.2	125.1	109.5	97.8	P				
78	VH4 N. WALL	8"/5				14.8	124.1	108.1	96.5	P				
79	VH4 S. WALL	8"/6				11.7	130.4	116.8	104.3	P				
80	VH4 W. WALL	8"/6				13.4	128.8	113.6	101.4	P				

COMMENTS:

©GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: ____ SHEET NO. 1 OF 2

Written by: Tony Dickman Date: 001 SEPT 22 (YY MM DD) Reviewed by: _____ Date: / / (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.7



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

PROJECT NO.: G00409 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 21 day Sept month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE)/COMPACTED): ± 8"

% COMPACTION: 90% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____ (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

TEST NO.	TEST LOCATION See Sketch Attached	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		
68	N. WAH VH 5	8"/1	EP-6	16.0	112.0	14.1	123.3	108.0	96.5	P			
69	N WAH VH 5	8"/2	"	"	"	14.4	125.4	109.6	97.9	P			

COMMENTS:

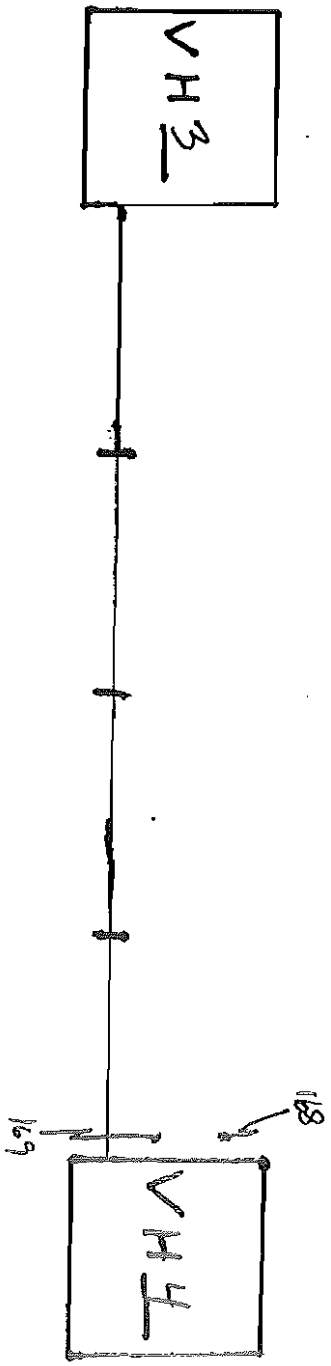
GeoSyntec Consultants

Page ____ of ____

Written by: Tony D. Date: 00 / Sept 29 (YY MM DD) Reviewed by: ____ Date: __ / __ / __ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



2 of 2

NOT TO SCALE

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 21 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: CJ

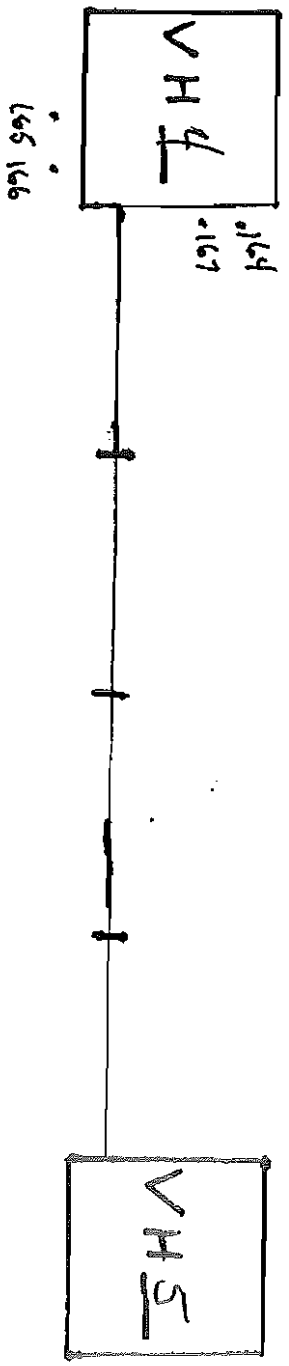
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
64	See Attached Sketch	8"/1	EP-6	16.0	112.0	12.8	123.3	109.3	97.6	✓				
65	" " "	8"/1	"	"	"	15.5	127.3	110.2	98.4	✓				
66	" " "	8"/2	"	"	"	16.3	127.1	109.3	97.6	✓				
67	" " "	8"/2	"	"	"	13.7	124.4	109.4	97.7	✓				

COMMENTS:

Written by: _____ Date: ___/___/___ (YY MM DD) Reviewed by: _____ Date: ___/___/___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



2 of 2

NOT TO SCALE

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 PROJECT NO.: GQ0409 TASK NO.: 04 ·2

DESCRIPTION: EPLTS DATE: 19 day Sept month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: 1143 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8"
(CIRCLE ONE)

% COMPACTION: _____ MOISTURE RANGE: ~N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

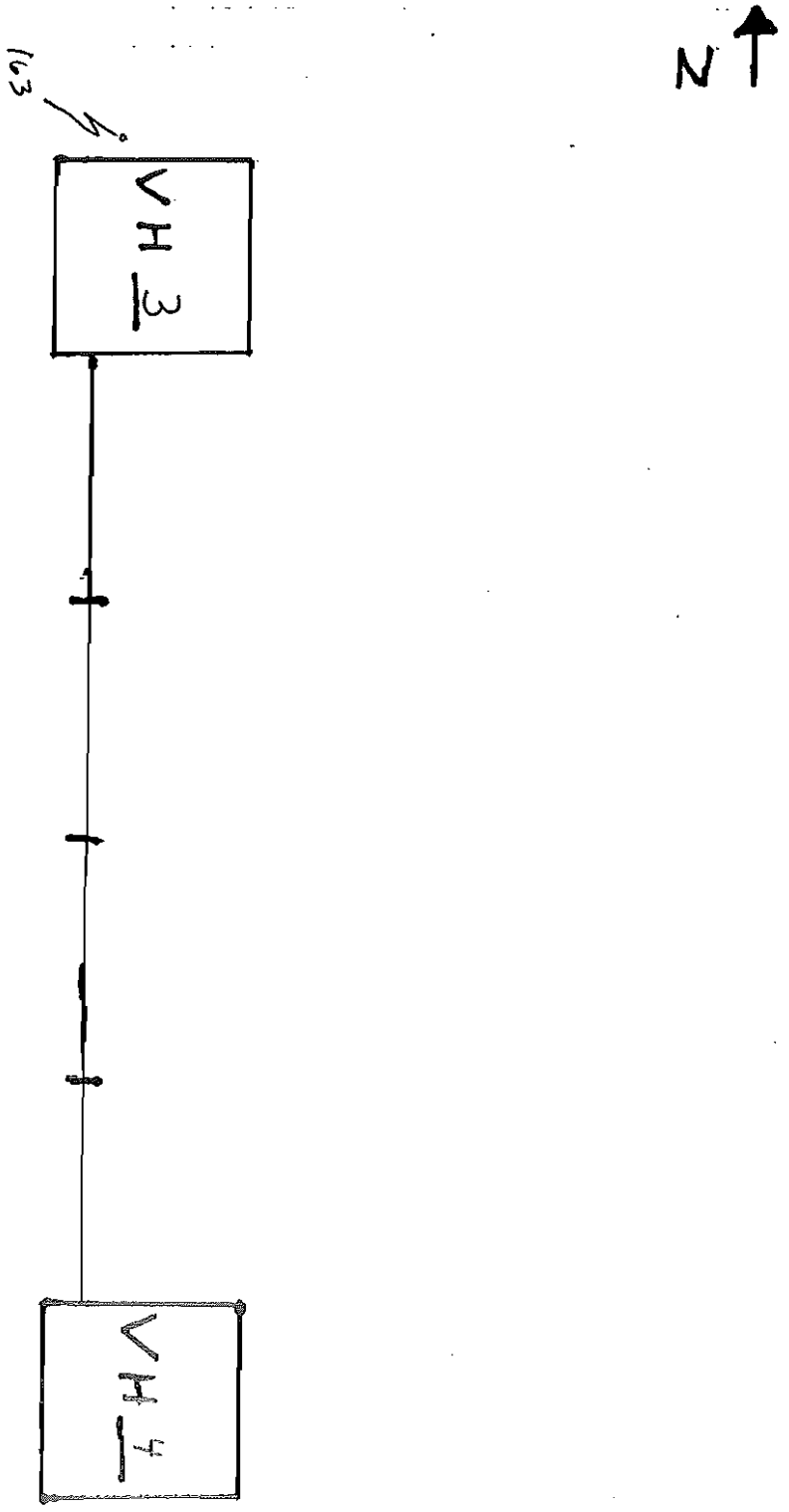
NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. _____ COR. FACTOR: N/A QA ID: MO

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
143	N. Side VH2	8"/4	EP7	13.8	119.7	11.0	133.1	119.9	~~103.5~~ 100.2	P				

COMMENTS:

Written by: Tony D Date: 00 / SEPT / 14 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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 PROJECT NO.: GQ~~0409~~ 1029 TO TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 13 day Sept month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: UH3 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 90% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
156	E. Side UH3	8/4	EP7	13.8	119.7	12.5	130.6	116.3	97.2 ~~100.4~~ @	P				
157	S. Side UH3	8/4	EP5	11.7	125.6	8.2	135.3	125.1	99.6 ~~108.0~~ @	P				
158	" "	8/5	EP7	13.8	119.7	10.9	131.5	118.6	99.1 ~~102.4~~ @	P				
159	E. Side UH3	8/5	EP5	11.7	125.6	11.4	142.7	128.1	102.0 ~~110.6~~ @	P				
160	W. Side UH3	8/4	EP7	13.8	119.7	11.9	134.4	120.2	100.3 ~~103.8~~ @	P				
161	" "	8/5	↓	↓	↓	11.6	130.0	116.5	97.3 ~~100.6~~ @	P				
162	S. Side UH3	8/6				11.2	133.1	119.7	100.0 ~~103.4~~ @	P				

COMMENTS: Test 157, 158, 159 TO Large Sheep Foot used for Compaction. Test 156 + 160-162 Small walk behind used. All the same material.

CHECKED BY: CA

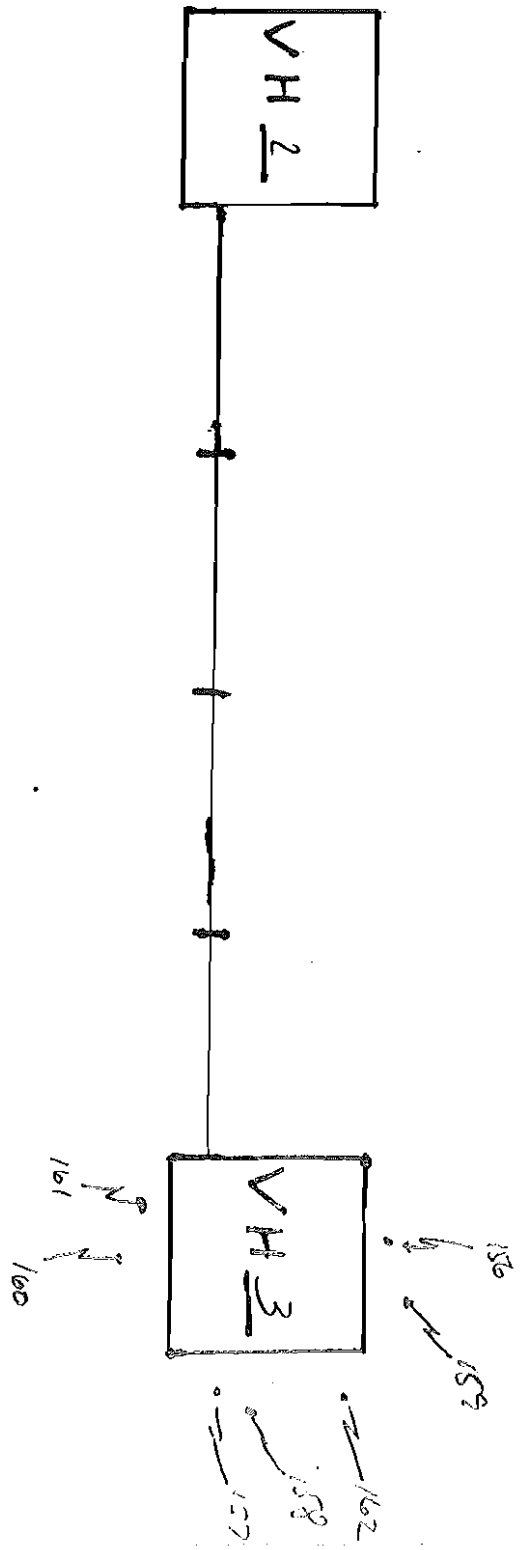
SHEET NO. 1 OF 2

GeoSyntec Consultants

Written by: T. Dickman Date: 00 / Sept / 13 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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

PROJECT NO.: ~~GQ0409~~ 1029 KS TASK NO.: 04.1

DESCRIPTION: EPLTS

DATE: 13 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: VH-3 Spoils

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____

LIFT THICKNESS (LOOSE / COMPACTED): 8"

% COMPACTION: 95

MOISTURE RANGE: N/A

ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
53	See Sketch	8"/3	EP-7	13.8	119.7	11.6	131.0	117.4	98.1	✓				
54		8"/3	EP-13	15.8	115.8	11.7	124.6	111.6	96.4	✓				
55		8"/3				13.1	127.2	112.5	97.1	✓				

COMMENTS:

CHECKED BY: [signature]

SHEET NO. 1 OF 2

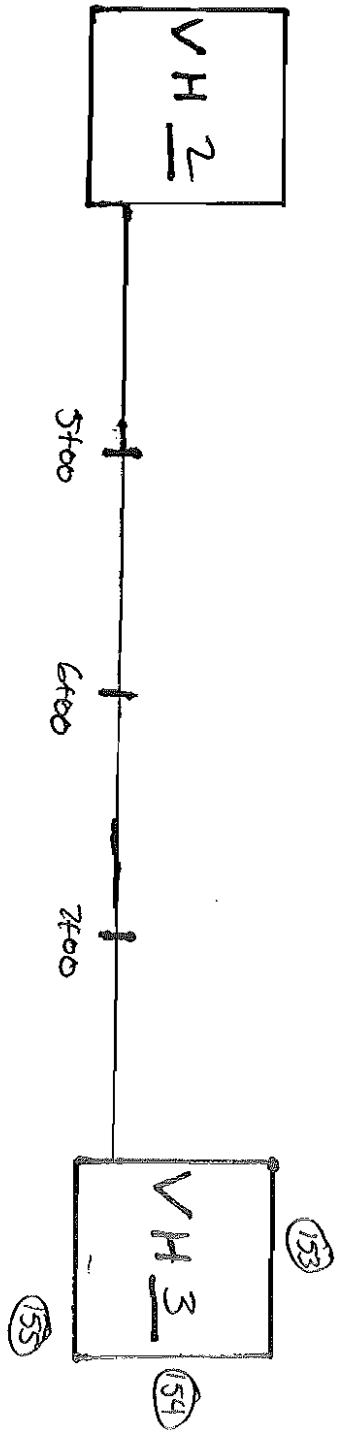
GEOSYNTEC CONSULTANTS

Page____ of____

Written by: Ken Sparks Date: 00 / Sept / 13 (YY MM DD) Reviewed by: ____ Date: __ / __ / __ (YY MM DD)

Client: ____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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 — PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS — DATE: ~~7~~ 11 KS day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: VH-3 ~~etc~~ KS 9/10/00 Spoils — MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) — LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 — MOISTURE RANGE: N/A — ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 — NUCLEAR GAUGE SERIAL NO. 20979 — COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
143	See Sketchs	8"/1	EP-7	13.8	119.7	9.2	131.3	120.2	100.0	✓				
144		8"/1	↓	↓	↓	10.7	131.2	118.6	99.1	✓				
145		8"/2	EP-13	15.8	115.8	15.6	127.2	110.1	95.1	✓				
146		8"/2	EP-7	~~13.8~~ 11.7	~~119.7~~ 125.6	9.8	136.7	124.5	~~104.0~~ 99.1	✓				
147		8"/10	EP-5	~~11.7~~ 11.7	~~125.6~~ 125.6	9.7	139.6	127.3	101.4	✓				
148		8"/1	EP-7	~~13.8~~ 13.8	~~119.7~~ 119.7	8.6	123.8	114.0	95.2	✓				
149		8"/1	↓	↓ 13.8	↓ 119.7	10.3	127.4	115.5	96.5	✓				
150 *		8"/2	EP-13	15.8	115.8	12.6	123.8	109.9	~~95.0~~ 94.9	✓	FC			
151		8"/2	EP-7	13.8	119.7	10.9	127.0	114.5	~~95.2~~ 95.9					
152	↓	8"/3	EP-13	15.8	115.8	13.4	127.0	112.0	96.7	✓				

COMMENTS: * guage reported 95.0% compaction, recalculating with the wet density and moisture content yeilds 94.9% due to rounding error.

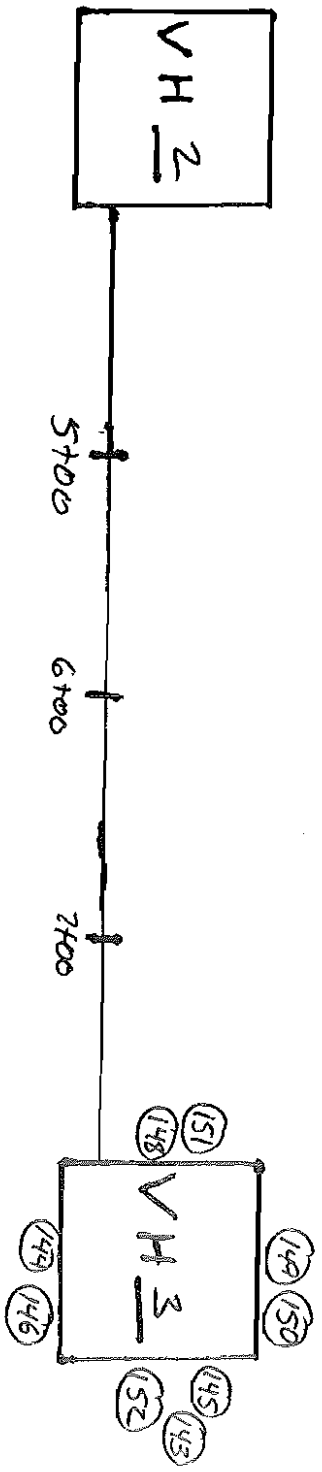
CHECKED BY: [signature]

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 / Sept / 11 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N

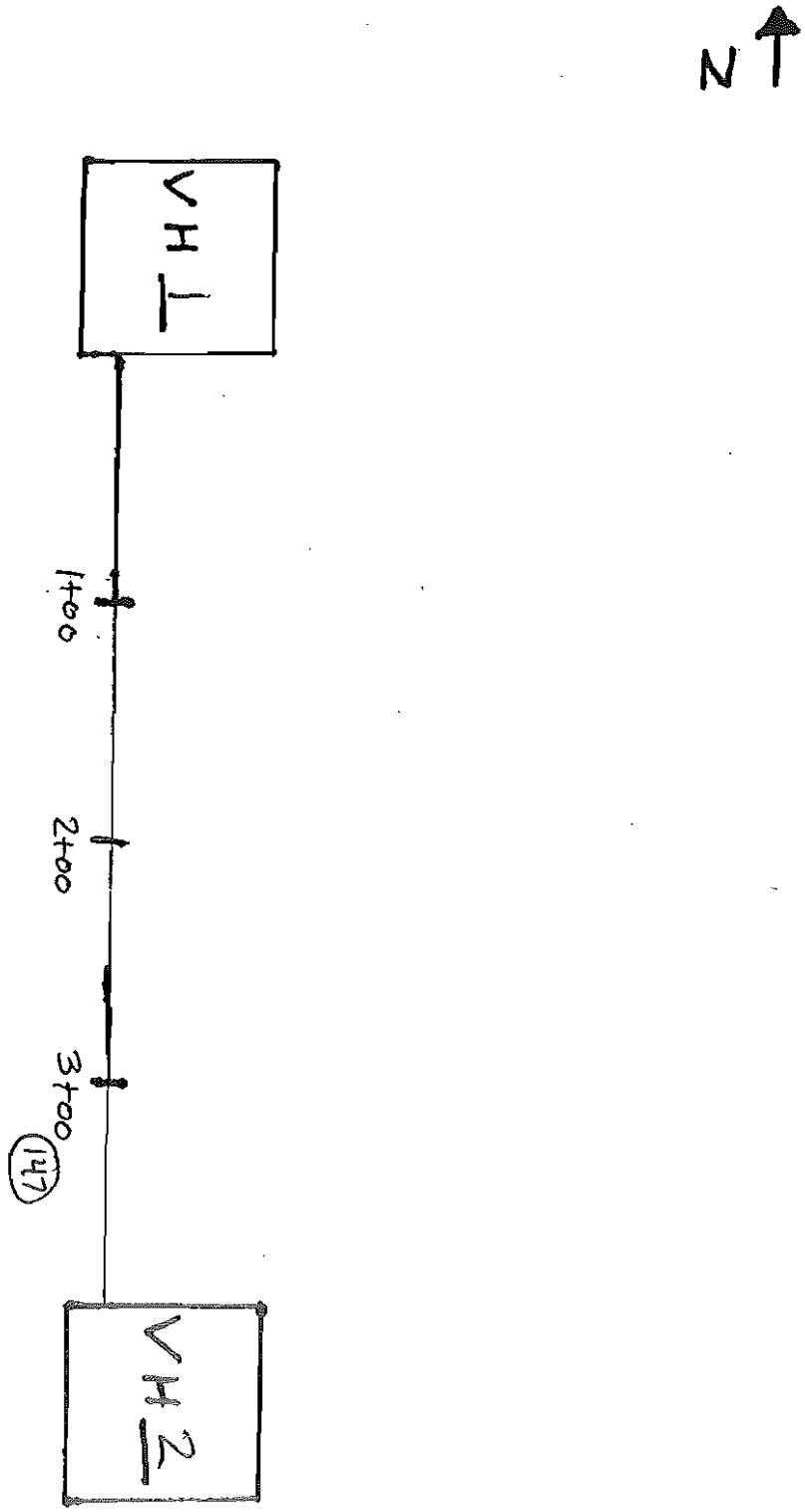


NOT TO SCALE

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00/Sept/11 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



Not To Scale

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 PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 6 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
	See Sketch		SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
136		8"/9	EP-13	15.8	115.8	13.0	128.4	113.6	98.1	✓				
137		8"/10	↓	↓	↓	13.3	130.0	114.7	99.0	✓				
138		8"/9	↓	↓	↓	14.7	135.0	117.7	101.6	✓				
139	GIS #2	8"/1	EP-7	13.8	119.7	12.0	128.6	114.8	95.9	✓				
140	GIS #2	8"/2	↓		↓	10.5	135.3	122.4	102.2	✓				
141	GIS #3	8"/1				9.0	130.2	119.5	99.8	✓				
142	GIS #3	8"/2	↓		↓	11.8	130.2	~~117.6~~ 116.5	~~98.2~~ 97.3	✓				

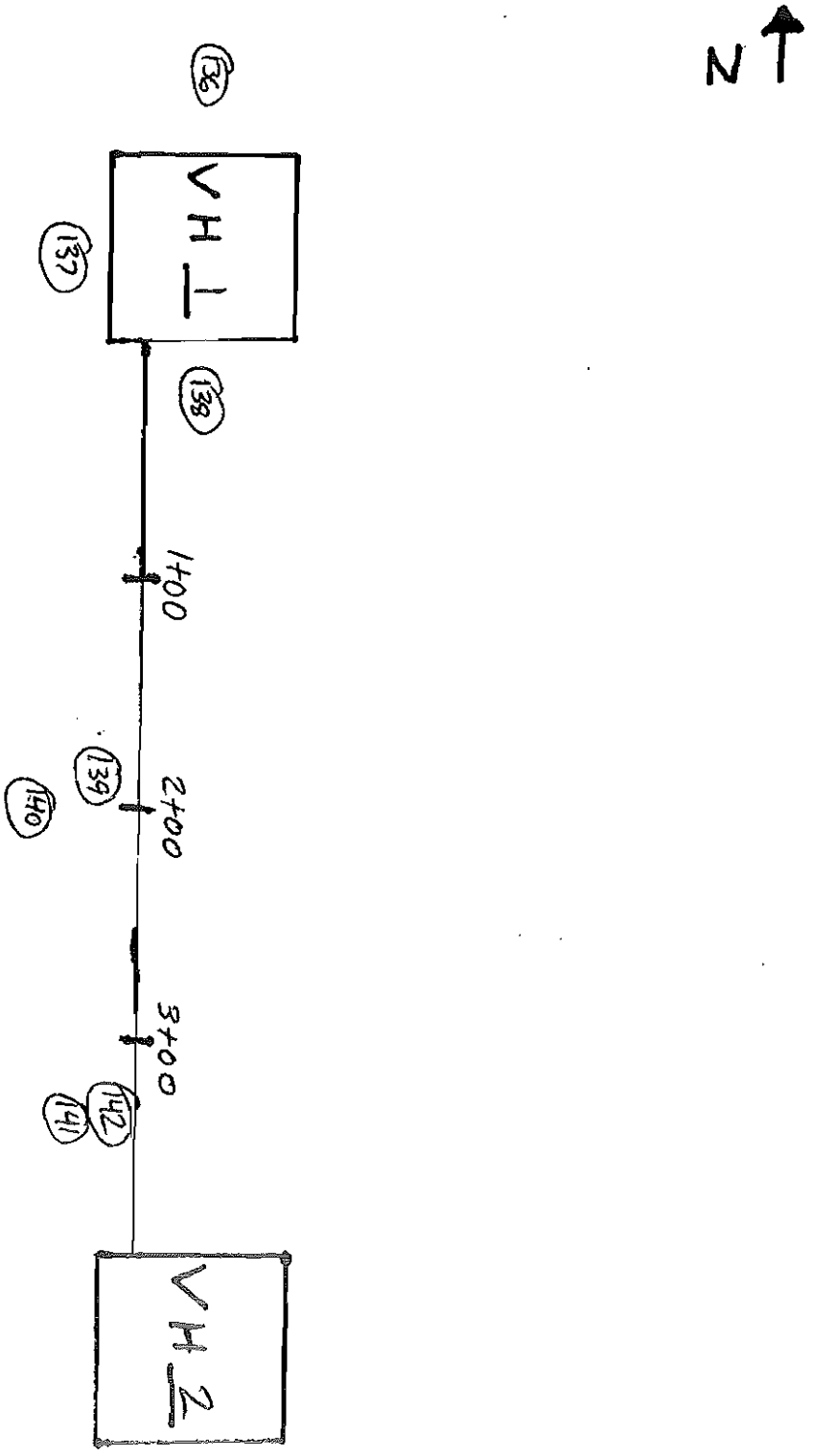
COMMENTS:

CHECKED BY: [signature]

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 (YY) 15 (MM) Sept 16 (DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



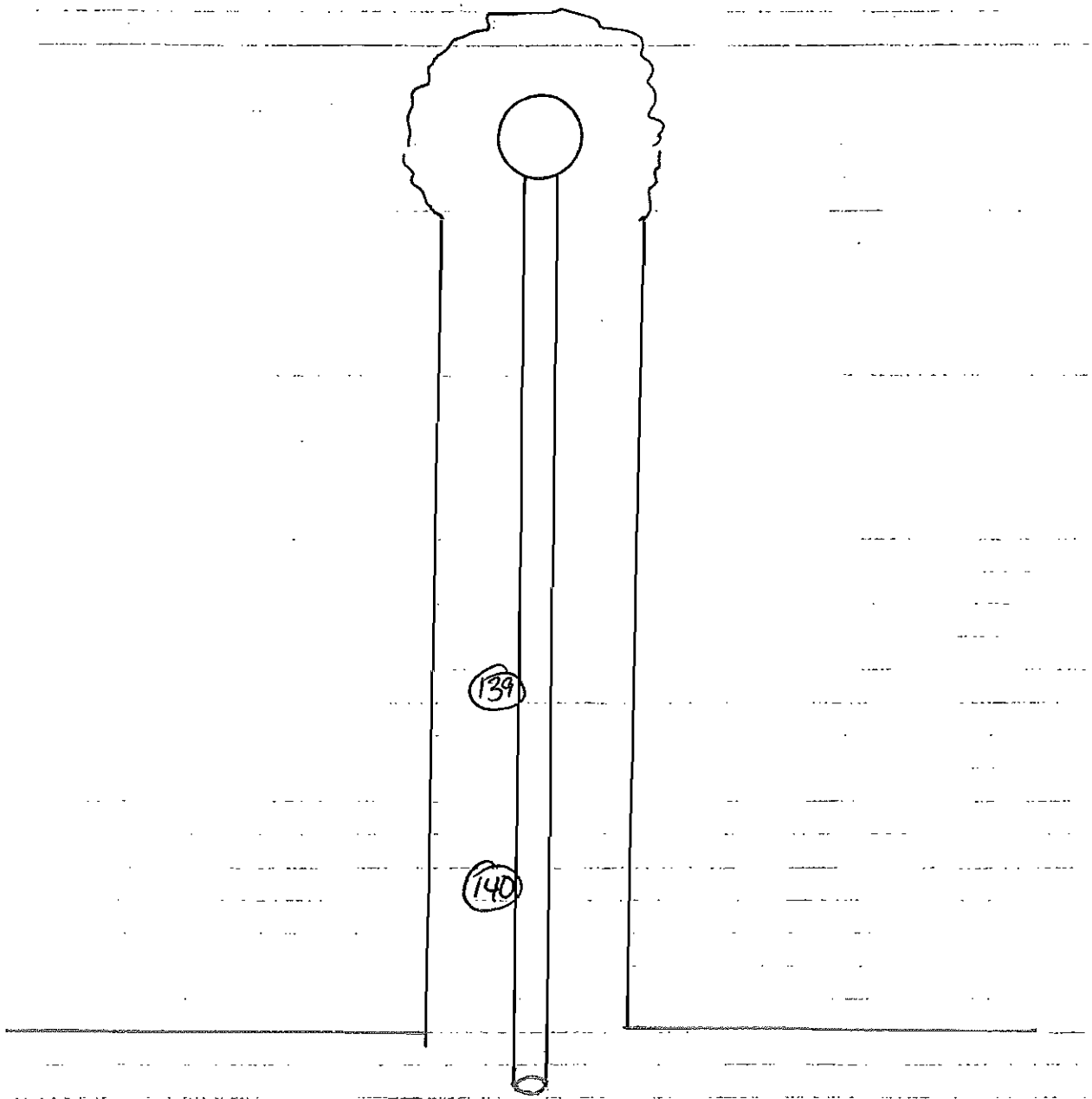
NOT TO SCALE

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 / Sept / 6 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: EPLTS Project/Proposal No.: GQ 1029 Task No.: 04.2

GIS STUCTURE #2



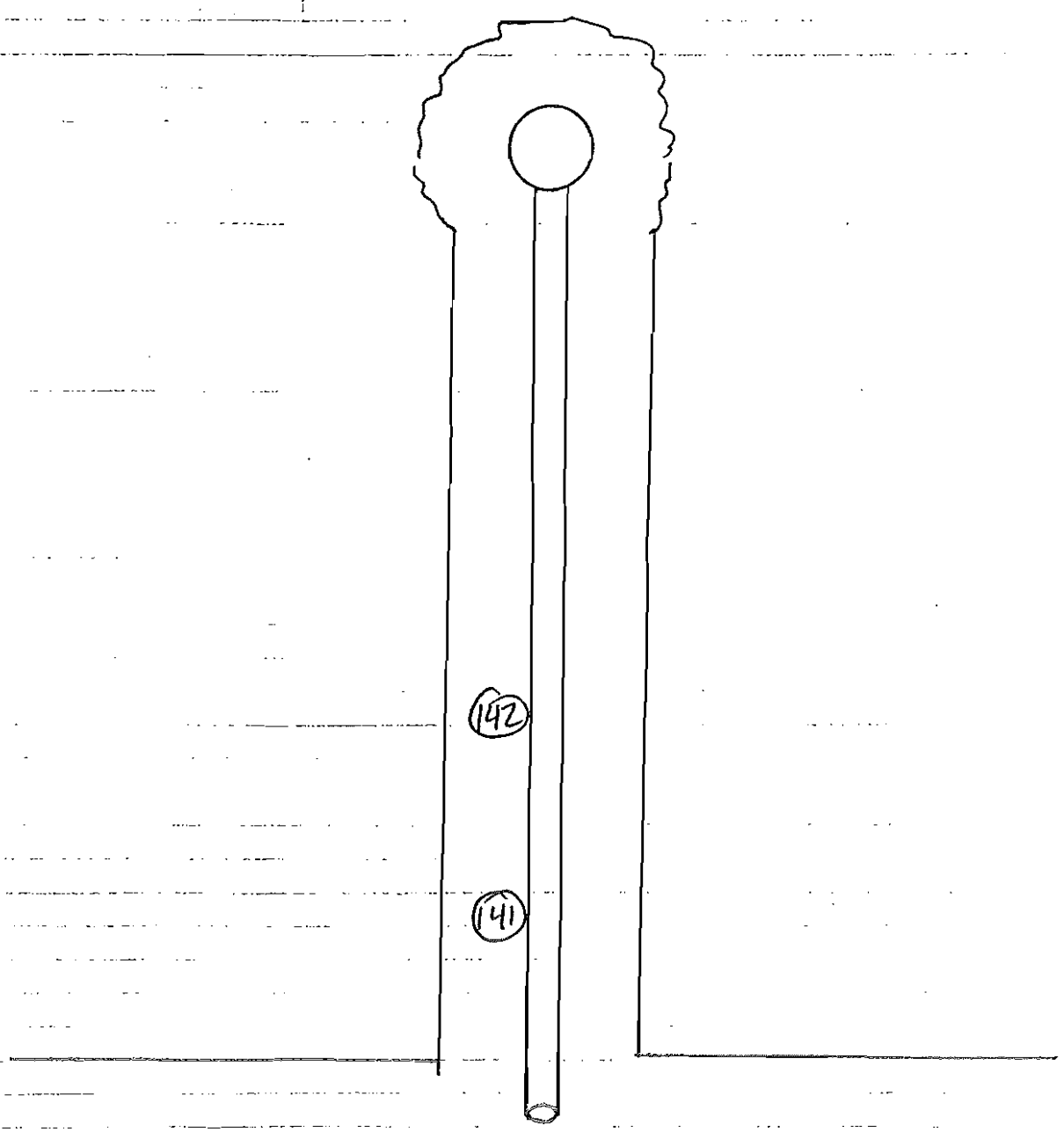
Rip Rap Channel

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 / Sept / 6 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: EPLTS Project/Proposal No.: GQ1029 Task No.: 04.2

GIS STUCTURE



Rip Rap Channel

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 PROJECT NO.: ~~GQ0409~~ 1029 KS TASK NO.: 04.Z

DESCRIPTION: EPLTS DATE: 5 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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			
123	Vlt-1 SW corner	8"/1	EP-13	15.8	115.8	14.6	128.3	111.9	96.6	✓		~~121~~	✓	
124	St. 1+00 ℄	8"/5	EP-7	13.8	119.7	11.7	137.4	123.0	102.7	✓				
125	St. 2+00 ℄	8"/5	↓	↓	↓	10.5	134.5	121.8	101.7	✓				
126	St. 3+00 ℄	8"/5				9.1	130.5	119.6	100.0	✓				
127	Vlt-1 SW corner	8"/2				11.7	134.2	120.1	100.0	✓				
128	↓	8"/3	EP-13	15.8	115.8	16.1	132.5	114.1	98.6	✓				
129		8"/4				18.9	131.7	~~110.9~~ 110.8	95.7	✓				
130	St. 0+50 ℄	8"/6	EP-7	13.8	119.7	14.3	132.3	115.7	96.7	✓				
131	St. 1+50 ℄	8"/6	EP-13	15.8	115.8	7.5	121.2	112.7	97.3	✓				
132	St. 2+50 ℄	8"/6	EP-7	13.8	119.7	10.5	131.0	118.5	98.9	✓				

COMMENTS: Test 123 taken after area was re-compacted.

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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 PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 5 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"c
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

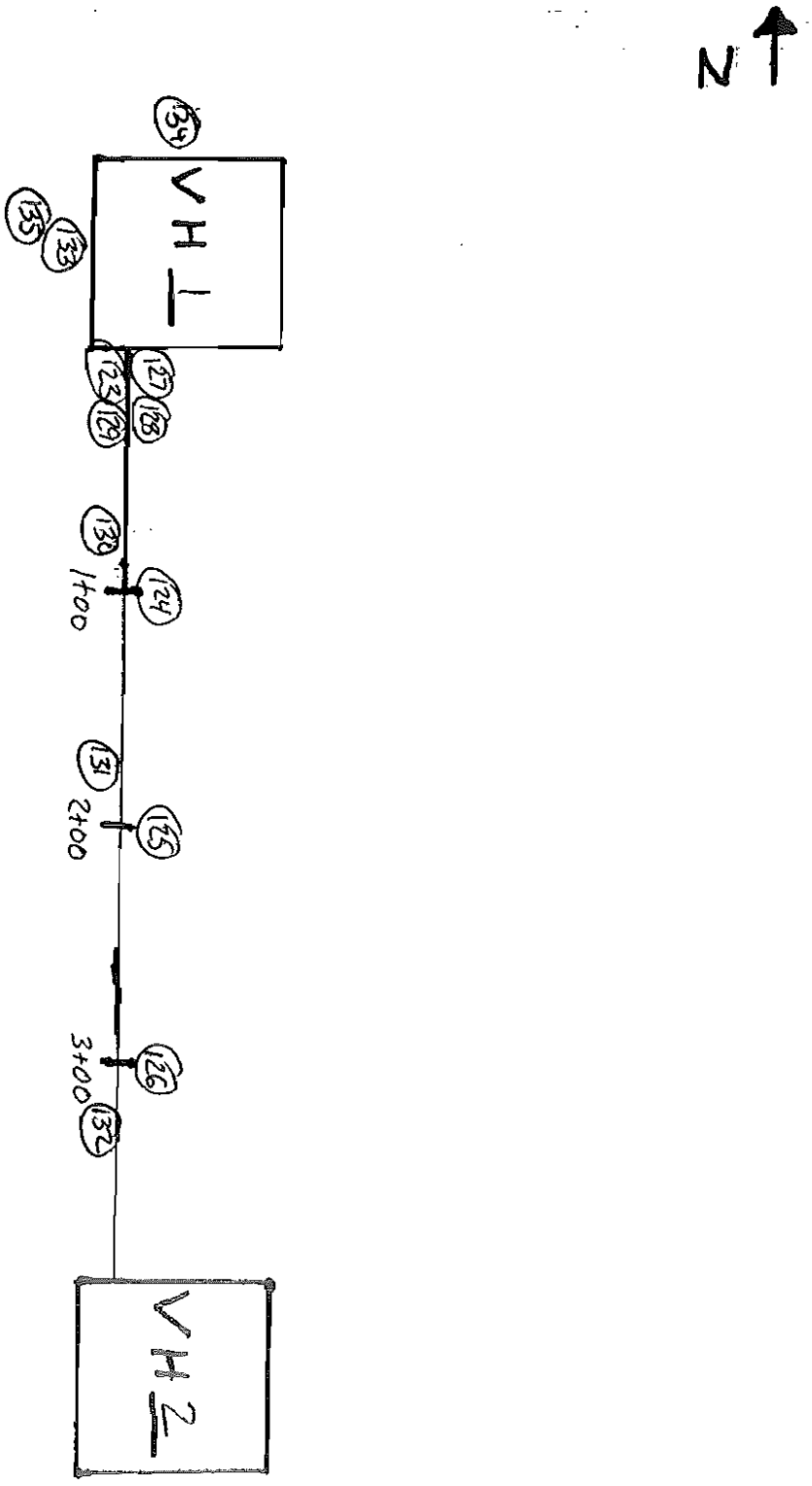
TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
133	VH-1 West Wall	8"c/8	EP-13	15.8	115.8	16.2	129.9	111.8	96.5	✓				
134	VH-1 Northwall	8"/8	↓	↓	↓	15.2	131.6	114.3	98.7	✓				
135	VH-1 West Wall	8"/9	↓	↓	↓	14.7	129.7	113.0	97.6	✓				

COMMENTS:

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 / ~~Aug~~ Sept / ~~31~~ 5 (YY / MM / DD) Reviewed by: _____ Date: __ / __ / __ (YY / MM / DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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 PROJECT NO.: G0~~0409~~ 1039 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 1 day Sept month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

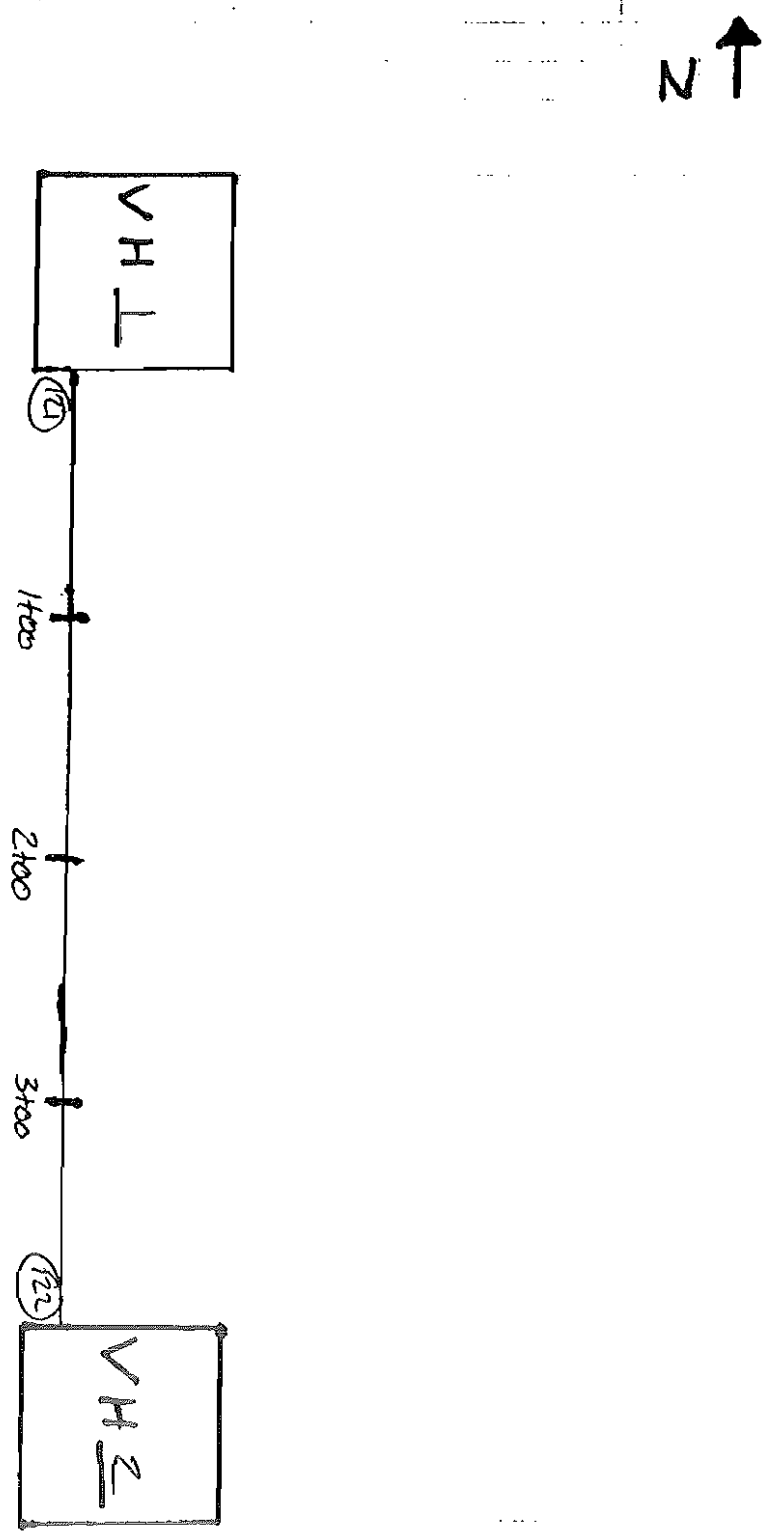
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
121	VH-1 SW Corner	8"/1	EP-13	15.8	115.8	11.7	122.8	109.9	94.9	✓		✓	123	✓	
122	VH-2 NW Corner	8"/1	EP-7	13.8	119.7	12.4	136.5	121.4	101.4	✓					

COMMENTS:

GeoSyntec Consultants

Written by: Ken Sparks Date: 00 / Sept / 1 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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 — PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS — DATE: 31 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE / COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	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
115	St. ~~0+00~~ 1+75 ℄ KS 8/31/00	8"/3	EP-7	13.8	119.7	11.2	130.4	117.2	97.9 ~~100.2~~ KS 8/31/00	✓			✓	
116	St. 1+75 ℄	8"/3	↓	↓	↓	9.2	125.2	114.7	~~98.0~~ 95.8					
117	St. 2+75 ℄	8"/3				8.6	128.7	118.4	98.9 ~~101.2~~ KS 8/31/00	✓				
118	St. 1+00 ℄	8"/4				11.4	127.2	114.2	~~97.6~~ 95.0					
119	St. 2+00 ℄	8"/4				11.5	132.4	118.7	99.2 ~~101.5~~ KS 8/31/00	✓				
120	St. 3+00 ℄	8"/4	↓	↓	↓	12.4	136.5	121.4	101.4 ~~103.8~~ KS 8/31/00	✓				

COMMENTS:

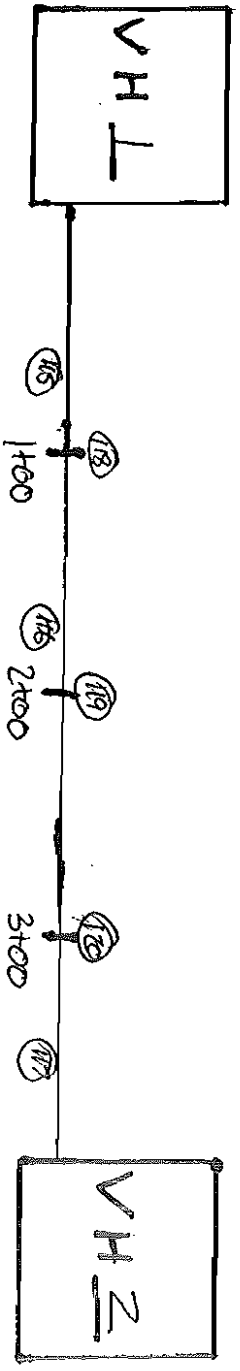
CHECKED BY: [signature]

GEOSYNTEC CONSULTANTS

Written by: Ken Sparks Date: 00 / ~~Sept~~ Aug / 31 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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 PROJECT NO.: GQ~~0400~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 30 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: trench Spoils MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
109	St. 0+50 ℄	8"/1	EP-13	15.8	115.8	14.8	129.7	113.0	97.6	✓				
110	St. 1+50 ℄	8"/1	↓	↓	↓	14.8	129.6	112.9	97.5	✓				
111	St. 2+50 ℄	8"/1	↓	↓	↓	9.8	126.8	115.4	99.7	✓				
112	St. 1+00 ℄	8"/2	EP-7	13.8	119.7	11.5	127.8	114.7	~~97.1~~ 95.8	✓				
113	St. 2+00 ℄	8"/2	↓	↓	↓	10.8	128.4	115.9	~~100.0~~ 96.8	✓				
114	St. 3+00 ℄	8"/2	↓	↓	↓	13.4	131.8	116.3	~~100.4~~ 97.1	✓				

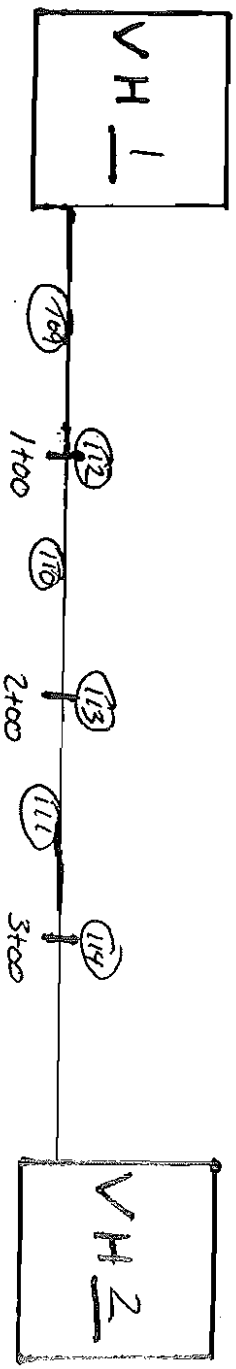
COMMENTS:

GeoSyntec Consultants

Written by: Ken Sparks Date: 00 / Aug / 30 (YY MM DD) Reviewed by: _____ Date: / / (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: 6 PLTS DATE: 29 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: Pipeline Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ± 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

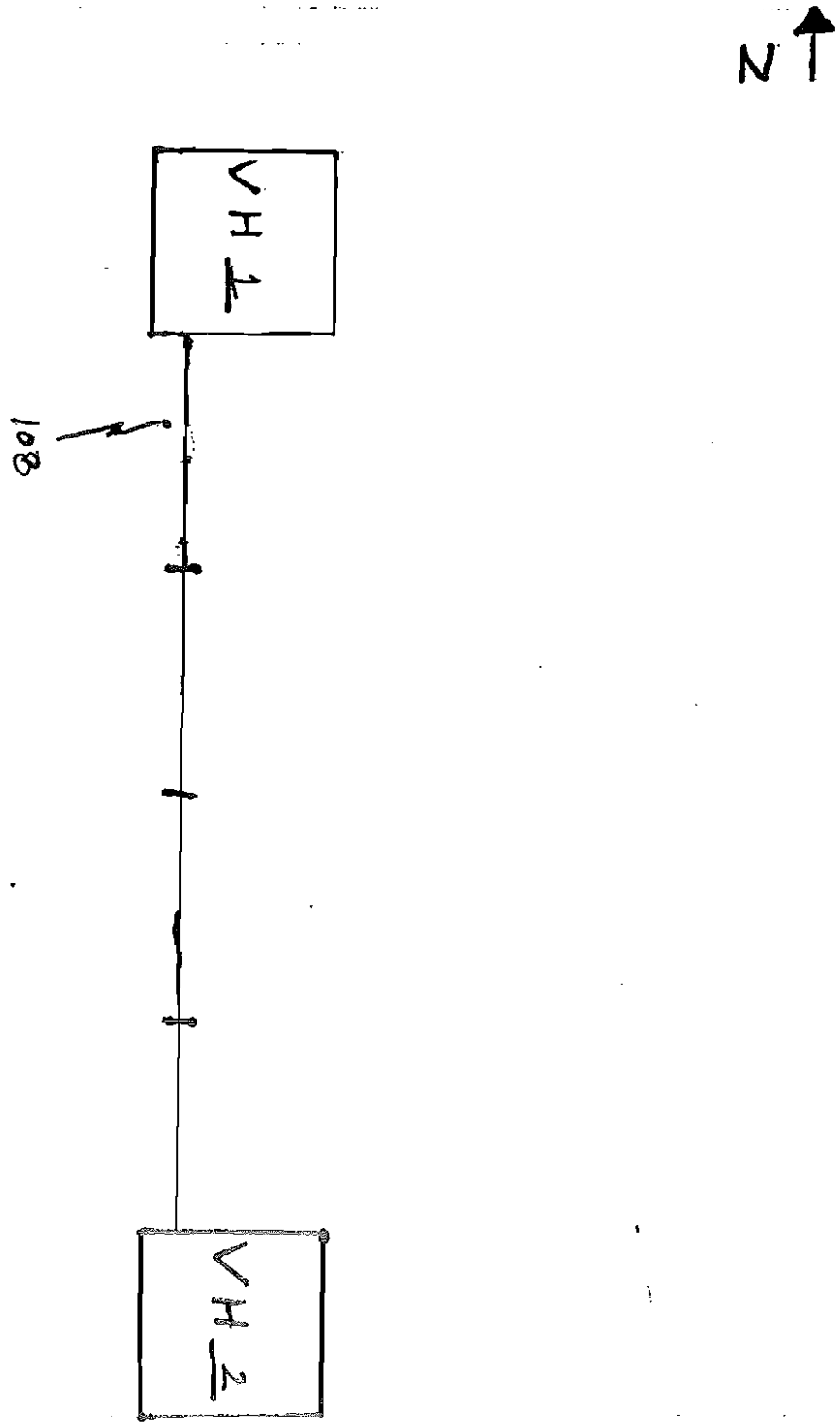
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
108	UH1 TO UH2 Trench	10"/1	EP 7	13.8	119.7	7.2	117.6	109.7	91.6		F	109	✓	

COMMENTS: 10" Depth is Being used Due to the ±/12" Lift of BACKFILL MATERIAL Being PLACED OVER The Pipeline

Written by: T. Dickman Date: 00 / AUG / 29 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



Density Test Locations

NOT TO SCALE

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 PROJECT NO.: G~~00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 29 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
~~04~~ 107	St. 20+75 ℄	8"/3	EP-7	13.8	119.7	12.1	132.6	118.2	98.7	✓				

COMMENTS:

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

PROJECT NO.: G0~~0409~~ 1029 ks TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 25 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE (CIRCLE ONE): FILL / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	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
105	Culvert under aggregate road from VH-5 to N Entrance Rd.	8"/2	~~EP-6~~ EP-10 @	~~15.5~~ 16.0	~~12.0~~ 112.8 @	12.3	122.0	~~109.4~~ 108.6	~~98.0~~ 96.3	✓				
106	St. 22+00 ℄	8"/2	~~EP-10~~ @	~~16.0~~ 15.5 @	~~112.8~~ 112.0	15.4	131.7	114.2 @	~~102.0~~ 101.2	✓				

COMMENTS:

CHECKED BY: CJ

SHEET NO. 1 OF 1

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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: E.P.L.T.S. DATE: 25 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VARIOUS MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ± 8"
(CIRCLE ONE)

% COMPACTION: 95% ~~97~~ 98% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TO

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		PASS	FAIL
104	12'E + 8'N of Stake 72	8"/1	~~EP-6~~ EP-7	~~13.5~~ 13.6	~~112.0~~ 119.7	13.8	133.1	117.0	~~104.4~~ 97.7	P				

COMMENTS:

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

PROJECT NO.: G00409 1029 TASK NO.: 04.2

DESCRIPTION: ~~Phase II~~ EPLTS

DATE: 23 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: UH2 Soil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE / COMPACTED): ± 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: no

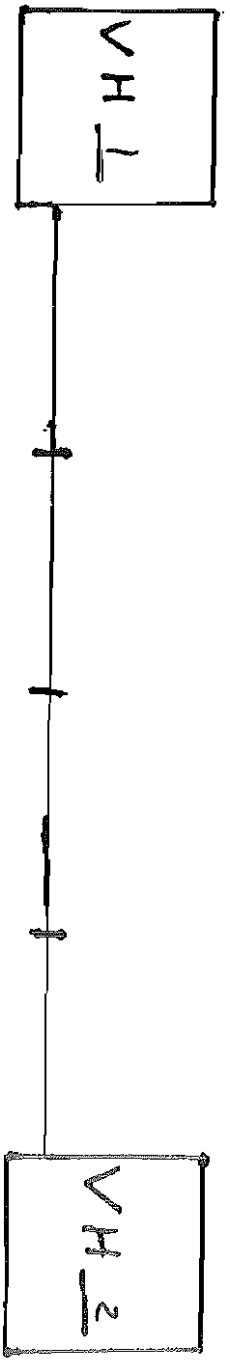
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST PASS / FAIL
	See Attached Sketch		SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		
103		8"/no 45	EP 7	13.8	119.7	11.2	134.8	121.2	101.3	P			

COMMENTS:

Written by: Tony Dickman Date: 00 / Aug / 23 (YY / MM / DD) Reviewed by: _____ Date: __ / __ / __ (YY / MM / DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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

PROJECT NO.: G00409 1029 TASK NO.: 04.2

DESCRIPTION: ~~Phase II~~ EPLTS

DATE: 22 day Aug month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VH Stockpiles MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C _____
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 29079 COR. FACTOR: N/A QA ID: TP

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
89	VH2 W. wall	8"/4	EP 7	13.8	119.7	9.8	132.3	120.5	100.7	P				
90	↓	8"/5	↓	↓	↓	9.8	133.5	121.7	101.6	P				
91	↓	8"/6	↓	↓	↓	10.9	137.3	123.8	103.4	P				
92	VH1 N. wall	8"/6	↓	↓	↓	11.1	137.5	123.8	103.4	P				
93	VH1 W. wall	8"/6	↓	↓	↓	9.7	133.4	121.6	101.6	P				
94	VH2 S. wall	8"/1	↓	↓	↓	10.7	129.0	116.5	97.4	P				
95	↓	8"/2	↓	↓	↓	9.3	129.8	118.2	98.8	P				
96	VH2 E. wall	8"/1	↓	↓	↓	10.1	132.0	120.0	100.2	P				
97	↓	8"/2	↓	↓	↓	9.5	128.8	117.7	98.3	P				
98	↓	8"/3	↓	↓	↓	11.4	132.0	118.5	99.0	P				

COMMENTS:

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

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.7

DESCRIPTION: ~~PHASE II~~ EPLTS

DATE: 22 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: UH Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE)/COMPACTED): ±8

(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. _____ COR. FACTOR: N/A QA ID: TD

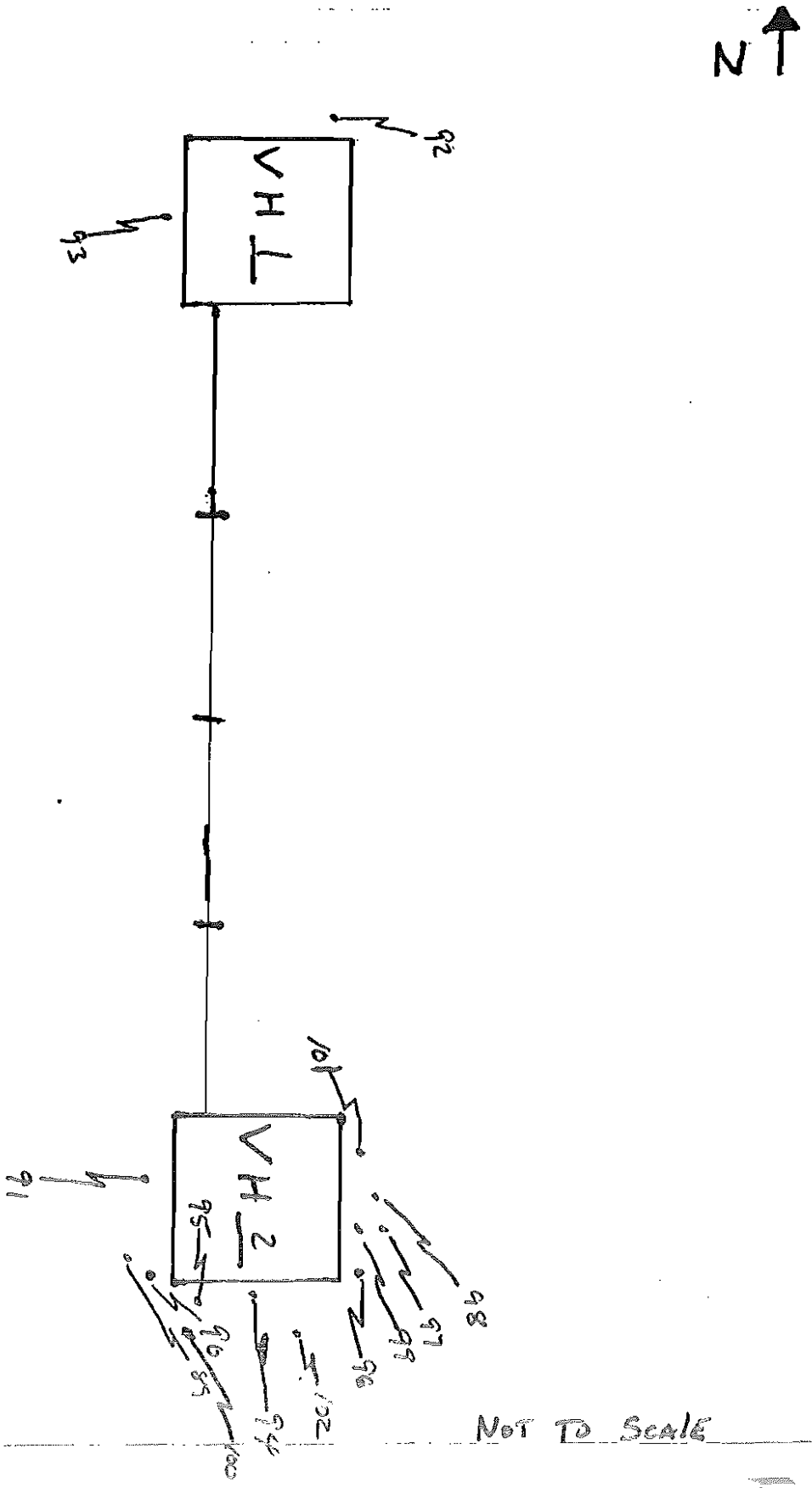
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
99	UH2 E. wall	8"/4	EP7	13.8	119.7	11.9	135.5	120.9	101.0	P				
100	UH2 S. wall	8"/3	↓	↓	(R) 126.6	12.0	143.0	127.7 ~~129.7~~	101.7 ~~106.7~~	P				
101	UH2 E wall	8"/5			125.6	12.8	138.1	122.5	~~97.5~~ 102.3	P				
102	UH2 S. w	8"/4	↓	↓	↓ 119.7	10.8	127.6	117.0	97.7	P				

COMMENTS:

CHECKED BY: [signature]

Written by: Tony Dickman Date: 00 / AUG / 22 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



PAGE 3 of 3

NOT TO SCALE

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

PROJECT NO.: G00~~0409~~ 1029 TASK NO.: 04

DESCRIPTION: Phase II

DATE: 21 day Aug month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VH2 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8

(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: NA QA ID: PD

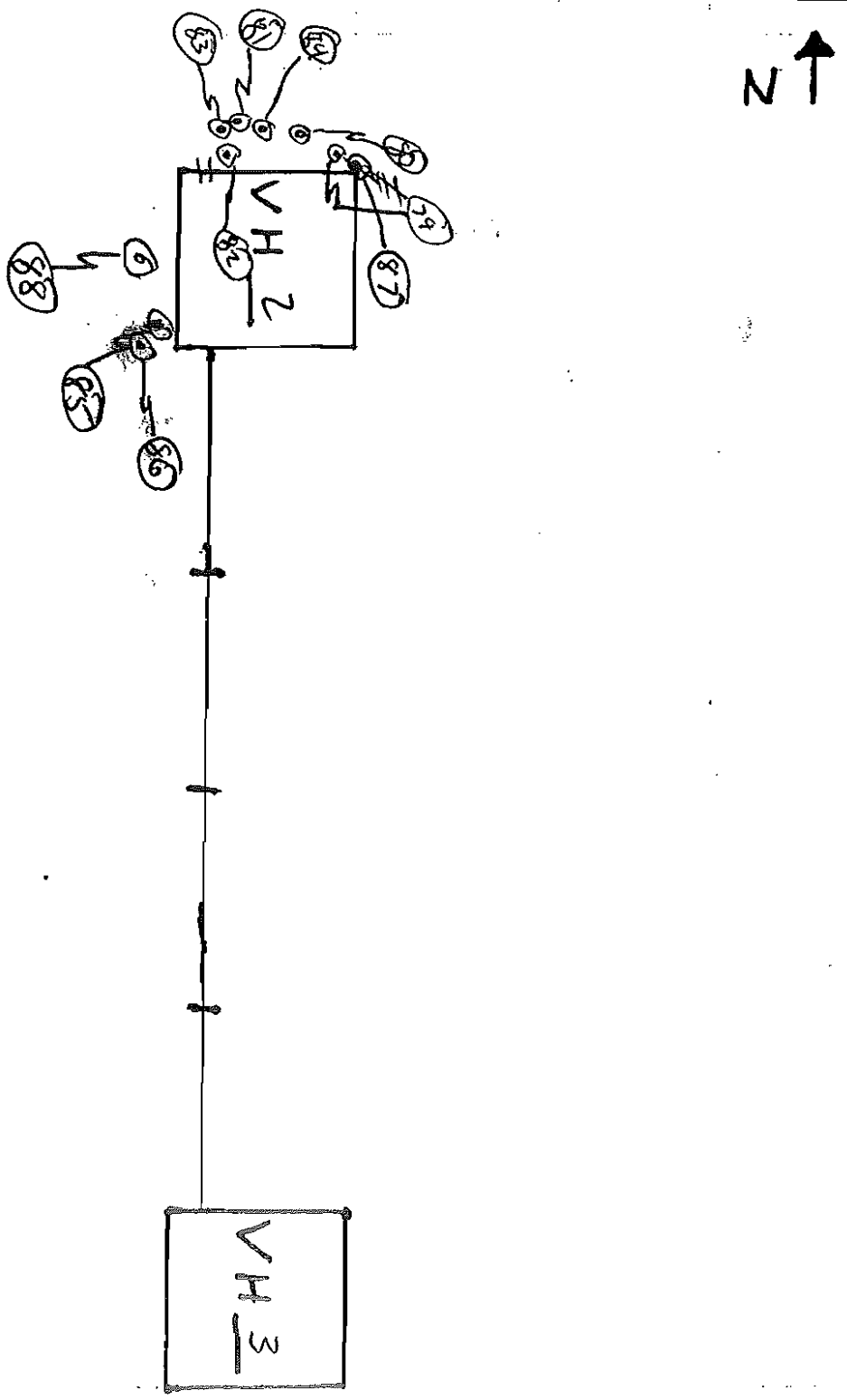
TEST NO.	TEST LOCATION (See attached sketch)	PROBE DEPTH/ LIFT NO.	LAB RESULTS: SAMPLE NO.	LAB RESULTS: OMC (%)	LAB RESULTS: MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS: FMC (%)	FIELD TEST RESULTS: WET UNIT WT (PCF)	FIELD TEST RESULTS: DRY UNIT WT (PCF)	FIELD TEST RESULTS: PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
79	VH2 N. wall	8"/1	EP7	13.8	119.7	11.7	136.8	122.4	102.3	P				
80		8"/2				11.3	128.1	115.1	96.2	P				
81		8"/3				12.6	139.7	124.1	103.7	P				
82		8"/4				13.3	135.8	119.8	100.1	P				
83		8"/5				9.4	122.0	111.5	93.1		F	84	P	
84		8"/5				10.7	132.9	120.0	100.3	P				
85	VH2 W. wall	8"/1				11.2	129.4	116.4	97.2	P				
86		8"/2				10.7	~~129.7~~ 130.1 (A)	~~116.1~~ ~~130.7~~ 117.5	~~98.6~~ 98.2	P				
87	VH2 N. wall	8"/6				12.4	130.1	115.7	96.7	P				
88	VH2 W. wall	8"/3				8.8	126.8	116.5	97.4	P				

COMMENTS:

CHECKED BY: [signature]

Written by: Tony Dickman Date: 00 / Aug / 21 (YY / MM / DD) Reviewed by: _____ Date: __ / __ / __ (YY / MM / DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



Density Test Locations NOT TO SCALE

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

PROJECT NO.: ~~G00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 17 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: VH-1 Spoils pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8±1
(CIRCLE ONE)

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

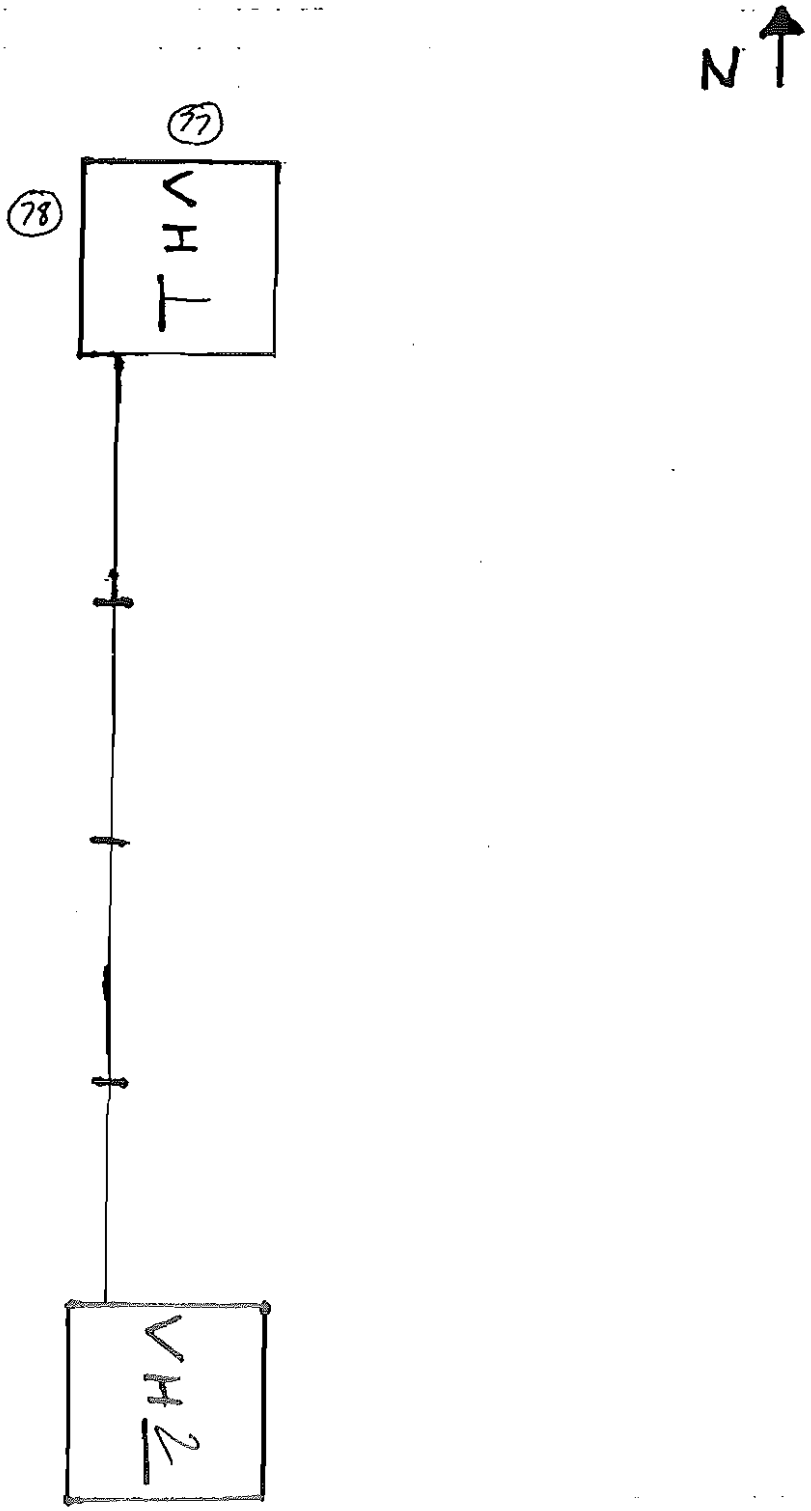
NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
77	VH-1 North Wall	8"/4	EP-7	13.8	119.7	11.6	130.1	116.6	97.4	✓				
78	VH-1 NW of W wall	6"/4	↓	↓	↓	13.3	132.7	117.2	97.9	✓				

COMMENTS:

Written by: Ken Sparks Date: 00/Aug/17 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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

PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 16 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: VH-1 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE) (COMPACTED): 8±

(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
71	VH-1 NW of N wall	8"/1	EP7	13.8	119.7	13.3	133.3	117.6	98.2	✓				
72	VH-1 NW of W wall	8"/1	↓	↓	↓	14.3	133.4	116.6	97.4	✓				
73	VH-1 NW of N wall	8"/2				14.2	134.0	117.4	98.1	✓				
74	VH-1 NW of W wall	8"/2				13.2	133.1	117.6	98.2	✓				
75	VH-1 NW of N wall	8"/3				13.6	133.2	117.3	98.0	✓				
76	VH-1 NW of W wall	8"/3				13.2	133.9	118.3	98.8	✓				

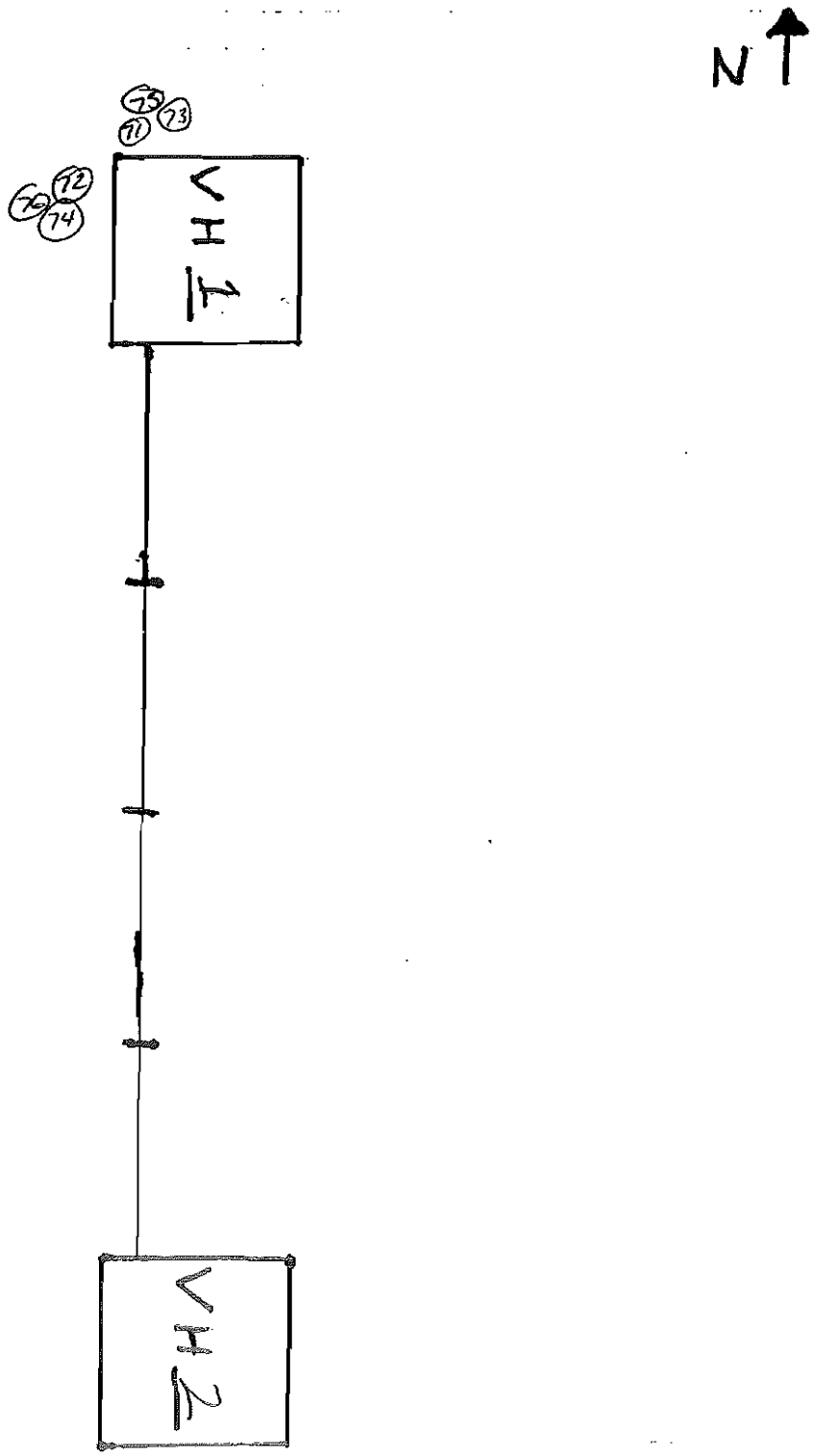
COMMENTS:

GeoSyntec Consultants

Page ____ of ____

Written by: _____ Date: 00 / Aug / 16 (YY MM DD) Reviewed by: _____ Date: ___ / ___ / ___ (YY MM DD)

Client: _____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



Not to Scale

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: E.P.L.T.S. DATE: 15 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VH1 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C
(CIRCLE ONE)

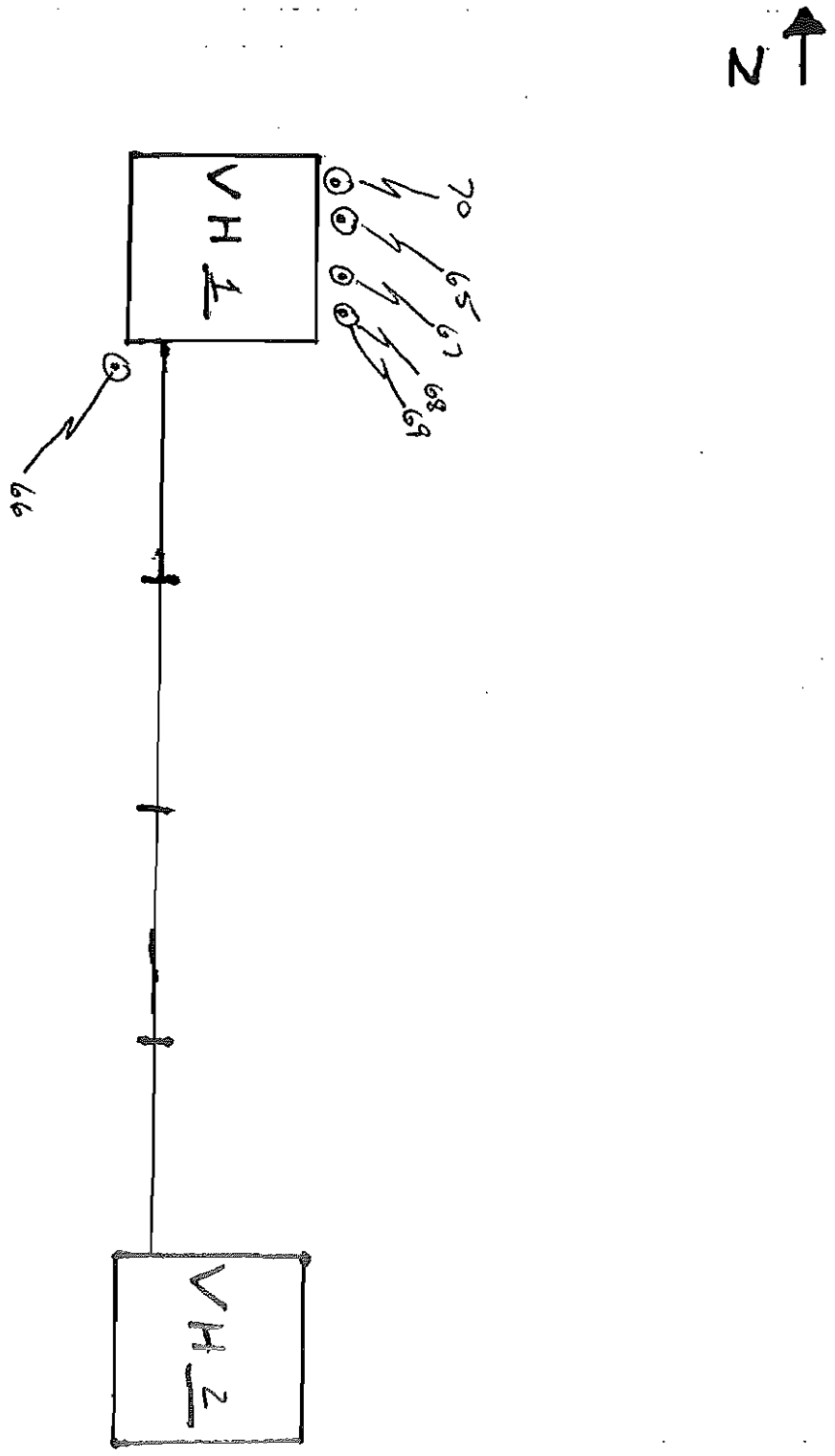
NUCLEAR GAUGE TYPE: TROXLER 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: 40

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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
65	VH1 S. Side	8"/4	EP 7	13.8	119.7	9.4	128.0	117.0	97.7	P				
66	VH1 E. Side	8"/8	↓	↓	↓	12.0	130.5	116.5	97.3	P				
67	VH1 E. Side	8"/5				13.6	135.6	119.4	99.7	P				
68	VH1 E. Side	8"/6				15.8	128.6	111.1	92.8		F	69	P	
69	VH1 E. Side	8"/6				14.9	132.1	114.9	96.0	P				
70	VH1 E. Side	8"/7				15.9	132.6	114.4	95.6	P				

COMMENTS:

Written by: T. D. Date: 00/Aug/15 (YY MM DD) Reviewed by: Date: ~~00/Aug/15~~ 70 (YY MM DD)

Client: Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2



NOT TO SCALE

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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: EPCTS DATE: 14 day AUG month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: VH1 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YO

TEST NO.	TEST LOCATION See Sketch	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RETEST NO.	RETEST PASS	RETEST FAIL
61	VH1 So. Side	8"/4	~~EP6~~ EP7	15.5	~~112.0~~ 119.7	14.6	137.4	114.7	~~102.4~~ 95.8	P				
62	↓	8"/5	EP7	13.8	119.7	10.7	130.6	118.0	98.5	P				
63		8"/6	↓	↓	↓	11.0	133.1	119.9	100.1	P				
64		8"/7				14.0	132.6	116.3	97.1	P				

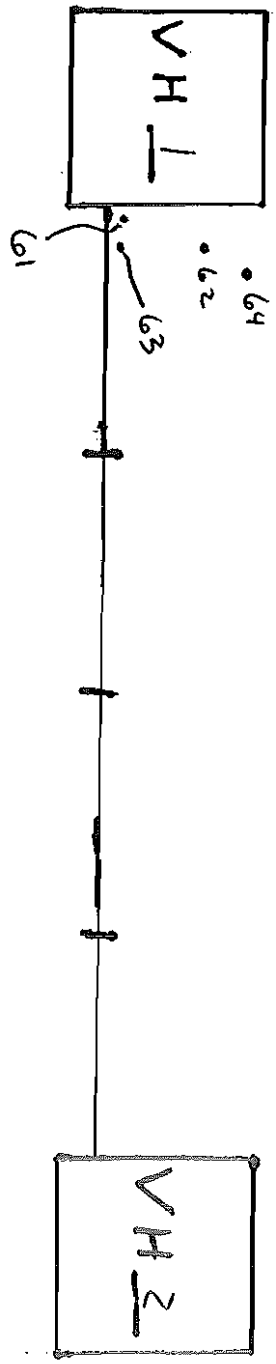
COMMENTS:

CHECKED BY: [signature]

Written by:_____ Date: ___/___/___ (YY MM DD) Reviewed by:_____ Date: ___/___/___ (YY MM DD)

Client:_____ Project: E.P.L.T.S. Project/Proposal No.: GQ 1029 Task No.: 4.2

N



NOT TO SCALE

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

PROJECT NO.: G0~~0409~~ 1039 KS 8/9/00 TASK NO.: 04

DESCRIPTION: EPLTS

DATE: 9 day Aug month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 8-12

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 29 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
~~1-58~~ ~~59~~	SE Corner VH-1	8"/2	EP-7	13.8	119.7	14.8	138.0	~~120.4~~ 130.2	100.4	P				
~~2-59~~ ~~60~~	SW Corner VH-1	8"/2	EP-5	11.7	125.6	12.2	138.0	123.1	98.0	P				
~~3-60~~ ~~61~~	West side VH-1	8"/3	EP-7	13.8	119.7	16.6	135.1	~~115.5~~ 115.8	~~99.0~~ 96.8	P				

COMMENTS:

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 PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: E.P.L.T.S. DATE: 27 day Jul month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±8"

% COMPACTION: 95% MOISTURE RANGE: n/a ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YD

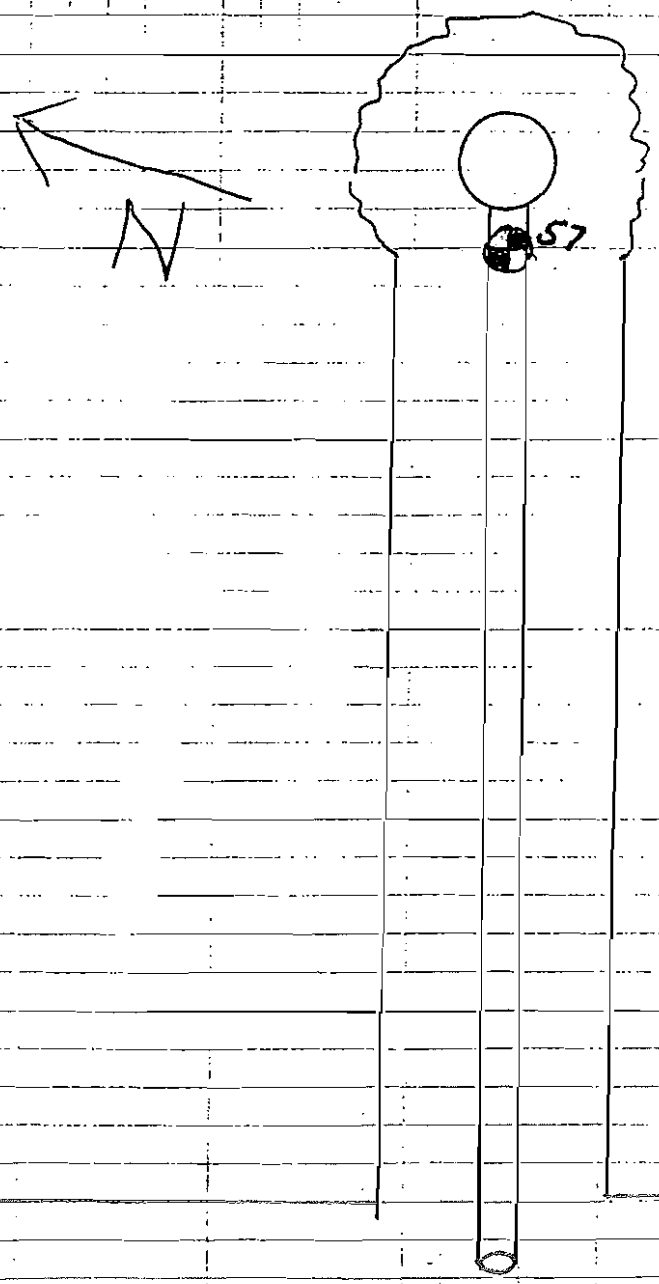
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
~~P-58~~ 57 (B) P-57	GIS #7 See sketch	8"/1	EP-6	15.5	112.0	12.3	127.1	113.2	101.1	P				

COMMENTS:

Written by: _____ Date: __/__/__ (YY MM DD) Reviewed by: _____ Date: 00/07/27 (YY MM DD)

Client: _____ Project: EPLTS Project/Proposal No.: GQ1029 Task No.: 4.2

GIS STUCTURE #7



Rip Rap Channel

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 PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II / EPLTS DATE: 26 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): 8" (circle one)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (circle one)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
~~57~~ 56	40' east of ℄ 12+00	8" / 1	EP-6	15.5	112.0	16.3	128.3	~~109.5~~ 110.3	~~98.1~~ 98.5	✓			

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO.: 2-20-FNM CHECKED BY: _____ SHEET NO. 1 OF 1

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

PROJECT NO.: ~~GQ0409~~ 1029 ks TASK NO.: 04.2

DESCRIPTION: Phase II / EPCTS

DATE: 25 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE) / COMPACTED): ~~12"~~ 8"

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
~~55~~ 54	75' east of ℄ 1075	8"/4	EP-6	15.5	112.0	14.9	133.0	~~116.0~~ 115.8	~~103.6~~ 103.4	✓				
~~56~~ 55	10' east of GIS#7	8"/1	EP-6	15.5	112.0	16.0	131.3	113.2	101.1	✓				

COMMENTS:

CHECKED BY: [signature]

SHEET NO. 1 OF 1

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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 PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II EPCTS DATE: 24 day July month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE)/COMPACTED): ± 8
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: ND ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: ND

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		PASS	FAIL
53	STA 11+10 @ ℄	8"/3	EP-6	15.5	112.0	12.4	129.3	~~116.9~~ 115.0	~~104.4~~ 102.7	P				

COMMENTS: DRIVE TUBE #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

PROJECT NO.: ~~GQ0409~~ 1029 KS TASK NO.: 04.2

DESCRIPTION: Phase II / EPLTS

DATE: 24 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KS

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		
~~5352~~	35' east of ℄ 10+75	8"/2	EP-6	15.5	112.0	9.4	123.5	112.9	100.8	✓			

COMMENTS:

©GEO SYNTEC CONSULTANTS FILE NO.: 2-20-FNM

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SHEET NO. 1 OF 1

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 PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II EPLTS DATE: 21 day July month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: UH4 Excavation MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: 3440 Troxler NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YD

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		
5251	STA. 11+14 ℄	10"/1	EP6	15.5	112.0	17.2	125.3	107.0	95.5	✓			

COMMENTS:

CHECKED BY: _____

SHEET NO. 1 OF 1

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

PROJECT NO.: G0~~8409~~ 1629 TASK NO.: 04.2

DESCRIPTION: Phase II / EPLTS

DATE: 18 day July month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: _____ MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ±8
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TO

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		PASS	FAIL
50	STA. 16+82.6 W.L.	8"/1	EP-6	15.5	112.0	14.5	133.5	116.6	104.1	P				

COMMENTS:

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SHEET NO. 1 OF 1

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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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II / EPLTS DATE: 18 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
49	17+30.10' east of ℄	8"/~~65~~ KS 5/18/00	EP-6	15.5	112.0	16.6	130.5	111.9	99.9	✓		47	✓	

COMMENTS:

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

PROJECT NO.: GQ~~0400~~ 1029 TASK NO.: 04, 2

DESCRIPTION: Phase II / EPLTS

DATE: 17 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"

% COMPACTION: 95 % MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
46	17+75 10' east of ℄	8"/4	EP-6	15.5	112.0	17.0	130.4	111.4	99.5	✓				
47	17+25 ℄	8"/5	↓	↓	↓	16.1	122.5	~~106~~ 105.5 (1)	~~95.0~~ 94.2 (1)		✓	49	✓	
48	17+50 ℄	8"/5	↓	↓	↓	14.9	132.0	115.1	102.7	✓				

COMMENTS:

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 PROJECT NO.: ~~GQ0409~~ GQ1029 TASK NO.: 04

DESCRIPTION: Phase II DATE: 17 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"

(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
41	17+05 15'E ℄	8"/2	EP-6	15.5	112.0	16.1	129.5	111.5	99.5	✓				
42	17+80 ℄	8"/2	↓	↓	↓	14.5	129.2	112.8	100.7	✓				
43	17+10 ℄	8"/3				15.9	128.6	111.0	99.1	✓				
44	17+75 10'E ℄	8"/3				16.3	129.4	111.3	99.3	✓				
45	17+25 3'E ℄	8"/4				14.5	132.0	115.3	103.0	✓				

COMMENTS:

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

PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II - EPLTS

DATE: 17 day July month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE / COMPACTED): 8" / ±12"

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: TD

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		PASS	FAIL
42	STA 17+90 15' E ℄	10"/1	EP6	15.5	112.0	11.9	126.1	112.7	~~100.6~~ 100.6	P				

COMMENTS:

CHECKED BY: [illegible]

SHEET NO. 1 OF 1

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 PROJECT NO.: ~~GQ0409~~ GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 11 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile EP-6 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12~~ 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KRS

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		PASS	FAIL
38	St. 21+50	8"/1	EP-6	15.5	112.0	15.2	132.1	114.7	102.4	✓				
39	St. 19+25	8"/1	EP-6	15.5	112.0	14.8	131.0	114.1	101.8	✓				

COMMENTS:

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

PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II/EPLTS

DATE: 10 day 7 month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: Stockpile EP-6 KS 7/13/00

MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE)

LIFT THICKNESS (LOOSE / COMPACTED): ~~12"~~ 8"

% COMPACTION: ~~90%~~ 95%

MOISTURE RANGE: N/A

ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440

NUCLEAR GAUGE SERIAL NO. 20979

COR. FACTOR: N/A

QA ID: YD

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		PASS	FAIL
37	STA 19+85 Rear c/l	10"/1	EP6	15.5	112.0	16.8	134.1	114.8	102.5	P				

COMMENTS:

CHECKED BY: [signature]

SHEET NO. 1 OF 1

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 PROJECT NO.: ~~G00409~~ 1029 YD TASK NO.: 04.2

DESCRIPTION: Phase II / GPLTS DATE: 8 day 7 month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Spoil Pile UH 2+3 MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ±12.8' (2)

% COMPACTION: 95 MOISTURE RANGE: n/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: n/A QA ID: 4D

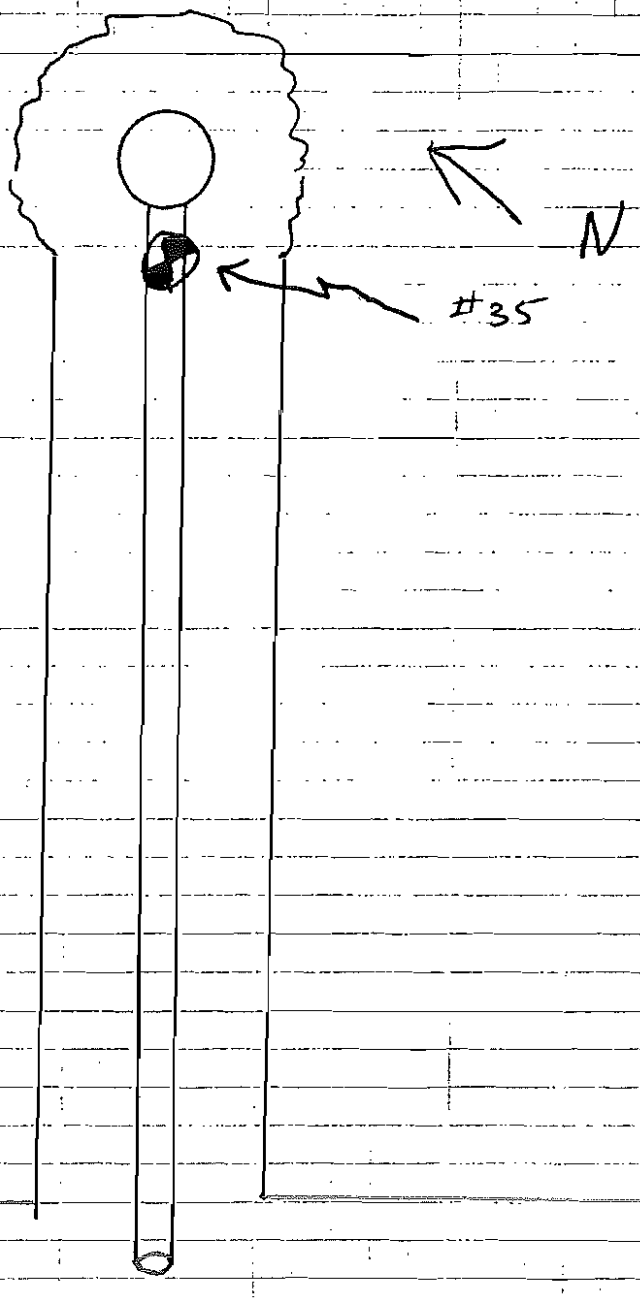
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
33	STA 9+50 6' W C/L	10/6	EP 7	13.8	119.7	13.4	139.0	122.5	102.4	P				
34	STA 9+50 51' W C/L	10/1	↓	↓	↓	14.3	137.1	119.9	100.2	P				
35	G15 6 See Sketch	10/6	↓	↓	↓	11.4	136.6	122.6	102.4	P				

COMMENTS:

Written by: Tony D Date: __/__/__ (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: _____ Project: EPLTS Project/Proposal No.: GE1029 Task No.: 4.2

GIS STUCTURE



Rip Rap Channel

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 PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 7 day July month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On-site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"

% COMPACTION: 95 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: 3440 Troxler NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: KRS/CS

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			
PL-29	ST 9+75 20'E of CL	8"/5	EP-5	11.7	125.6	~~96~~ 12.1	135.3	120.7	96.1	✓				
PL-30	ST 9+25 @ CL	10"/5	↓	↓	↓	10.6	140.0	126.6	100.8	✓				
PL-31		12"/6	↓	↓	↓	11.4	133.6	119.9	95.5	✓				
PL-32		12"/6	EP-7	13.8	119.7	12.5	130.8	116.2	97.1	✓				

COMMENTS:

CHECKED BY: [illegible]

SHEET NO. 1 OF 1

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 PROJECT NO.: ~~G00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II/EPLTS DATE: 6 day 7 month 00 year

SPECIFICATION REQUIREMENTS

SOURCE: LH3 Spoil Pile MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: * ON EPLTS LIFT THICKNESS (LOOSE)/COMPACTED): ± ~~12"~~ 8" (2)

(CIRCLE ONE)

% COMPACTION: 95-90 MOISTURE RANGE: N/A ASTM D 698: A (B) C / ASTM D 1557: A B C

(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: n/a QA ID: YD

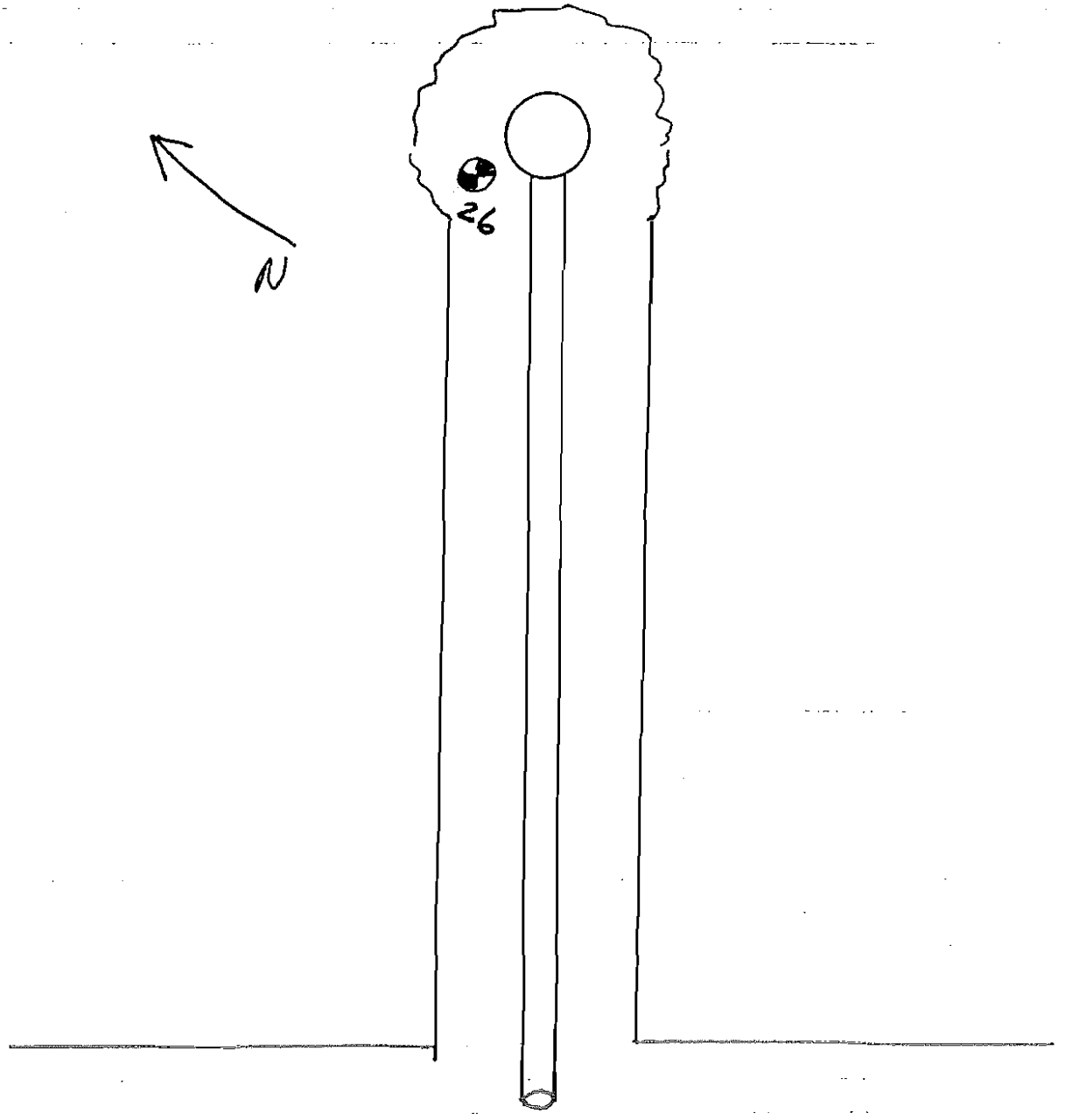
TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS			FIELD TEST RESULTS						RETEST NO.	RETEST	
			SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
26	G-15 #6 see sketch	10"/3/4	EP-7	13.8	119.7	7.1	123.3	115.1 ~~115.3~~	~~96.8~~ 96.2	P				
27	STA 9 ≈ 15' W of CL	10/3/4	EP 5	11.7	125.6	10.7	144.9	130.9	104.2	P				
28	STA. 9+48 ≈ 15' W of CL	10"/3/4	EP 5	11.7	125.6	10.7	138.5	125.1	99.6	P				

COMMENTS:

Written by: TD Date: 00 / 07 / 06 (YY MM DD) Reviewed by: _____ Date: ~~00 / 07 / 07~~ (YY MM DD)

Client: _____ Project: _____ Project/Proposal No.: GQ 1029 Task No.: 4, 3

GIS STUCTURE



Rip Rap Channel

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 PROJECT NO.: GQ1029 TASK NO.: 42

DESCRIPTION: EPLTS DATE: 30 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site MATERIAL TYPE: ~~IMPACTED MATERIAL~~ / OTHER: Backfill/Compacted Fill (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ± 12" 8" @

% COMPACTION: 95% MOISTURE RANGE: N/A ASTM D 698: A B C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: N/A QA ID: YO

TEST NO.	TEST LOCATION	PROBE DEPTH/ LIFT NO.	LAB RESULTS SAMPLE NO.	OMC (%)	MAX DRY UNIT WT (PCF)	FIELD TEST RESULTS FMC (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL	RUN. AVG. *	RETEST NO.	RETEST PASS	RETEST FAIL
* 22	ST 9+75 ℄	10"/3	EP5	11.7	125.6	7.5	136.6	127.0	101.1	P					
23	ST 9+75 25'W of ℄	10"/3	EP5	11.7	125.6	8.1	138.3	127.9	101.8	P		NA			
24	ST 9+00 10'E of ℄	10"/3	EP5	11.7	125.6	8.6	141.2	130.0	103.5	P					
* 25	ST 9+00 3'W of ℄	10"/3	EP5	11.7	125.6	9.9	138.8	126.3	100.6	P					

COMMENTS: ~~* RUNNING AVERAGE IS FOR LAST TEN TESTS~~ @ * on EPLTS Line, others are at 2 tests per acre frequency

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II/EPLTS DATE: 29 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On-Site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: *EPLTS Line LIFT THICKNESS: (LOOSE/COMPACTED): 8"

(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: N/A 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
*EP-18	9+49 2' W of ℄ Trench EPLTS Piping	8"/1	EP 5	11.7	125.6	9.6	138.7	126.5	100.7	P				
EP-19	8+75 8' W of ℄ Trench	8"/1	↓	↓	↓	10.4	137.9	124.9	99.4	P				
*EP-20	9+75 on ℄ trench EPLTS pipline	8"/2				11.2	138.8	124.8	99.4	P				
EP-21	9+25 7' W of ℄ Trench	8"/2				11.1	138.9	125.0	99.5	P				

COMMENTS: * ℄ of EPLTS, others on 2 test per acre frequency

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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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 16 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: Trench (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): 12" 8"

% COMPACTION: 95% MOISTURE RANGE: ±3% ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
PL-17	GLS #1/See Map	8"/2	EP-7/OSDF-10	13.8	119.7	16.1	136.3	117.3	98.0	✓				

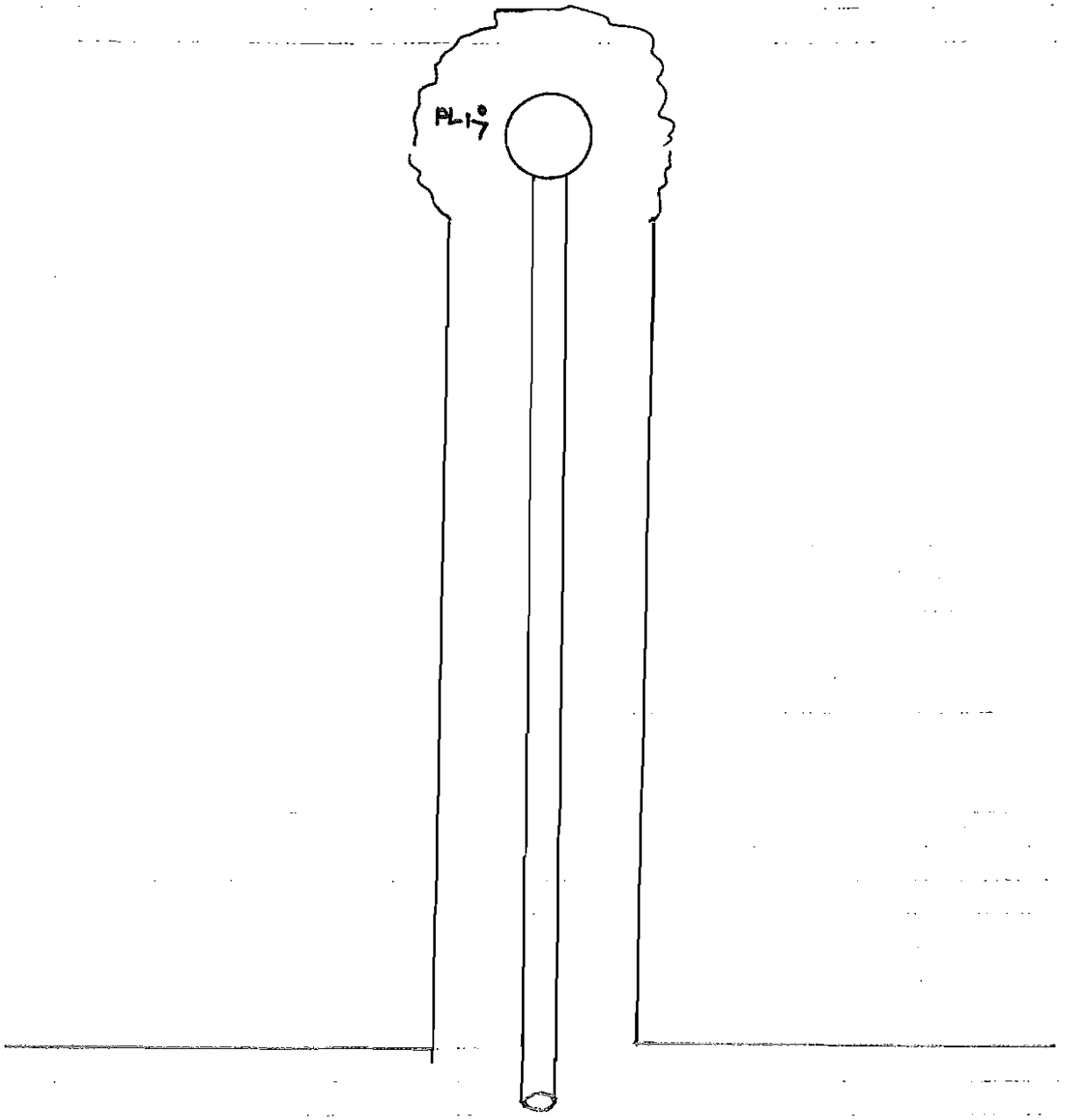
COMMENTS:

GeoSyntec Consultants

Written by: C. Sukow Date: 00 / 06 / 16 (YY MM DD) Reviewed by: _____ Date: __ / __ / __ (YY MM DD)

Client: Fluor Fernald Project: EPLTS Project/Proposal No.: GQ029 Task No.: 04.2

G15 STUCTURE



Rip Rap Channel

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: ~~Phase~~ EPLTS DATE: 15 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On Site MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: Trench (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8" (C)

% COMPACTION: 95% MOISTURE RANGE: ±3% ASTM D 698: A (B) C / ASTM D 1557: A B C (CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 20979 COR. FACTOR: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
PL-13	GIS #5/see Map	8"/1	EP-5	11.7	125.6	12.4	138.1	122.9	97.9	✓				
PL-14	↓	8"/2	EP-7/OSDF 10	13.8	119.7	12.2	134.1	119.5	99.8	✓				
PL-15	↓	8"/1	EP-7/OSDF10	"	"	11.0	128.0	115.3	96.3	✓				
PL-16	↓	8"/2	EP7/OSDF-10	13.8	119.7	11.9	127.9	114.2	95.5	✓				

COMMENTS: EP-7 was a 1 point sample closely falling on the curve for OSDF-10 (26 July 1997)

CHECKED BY: [illegible]

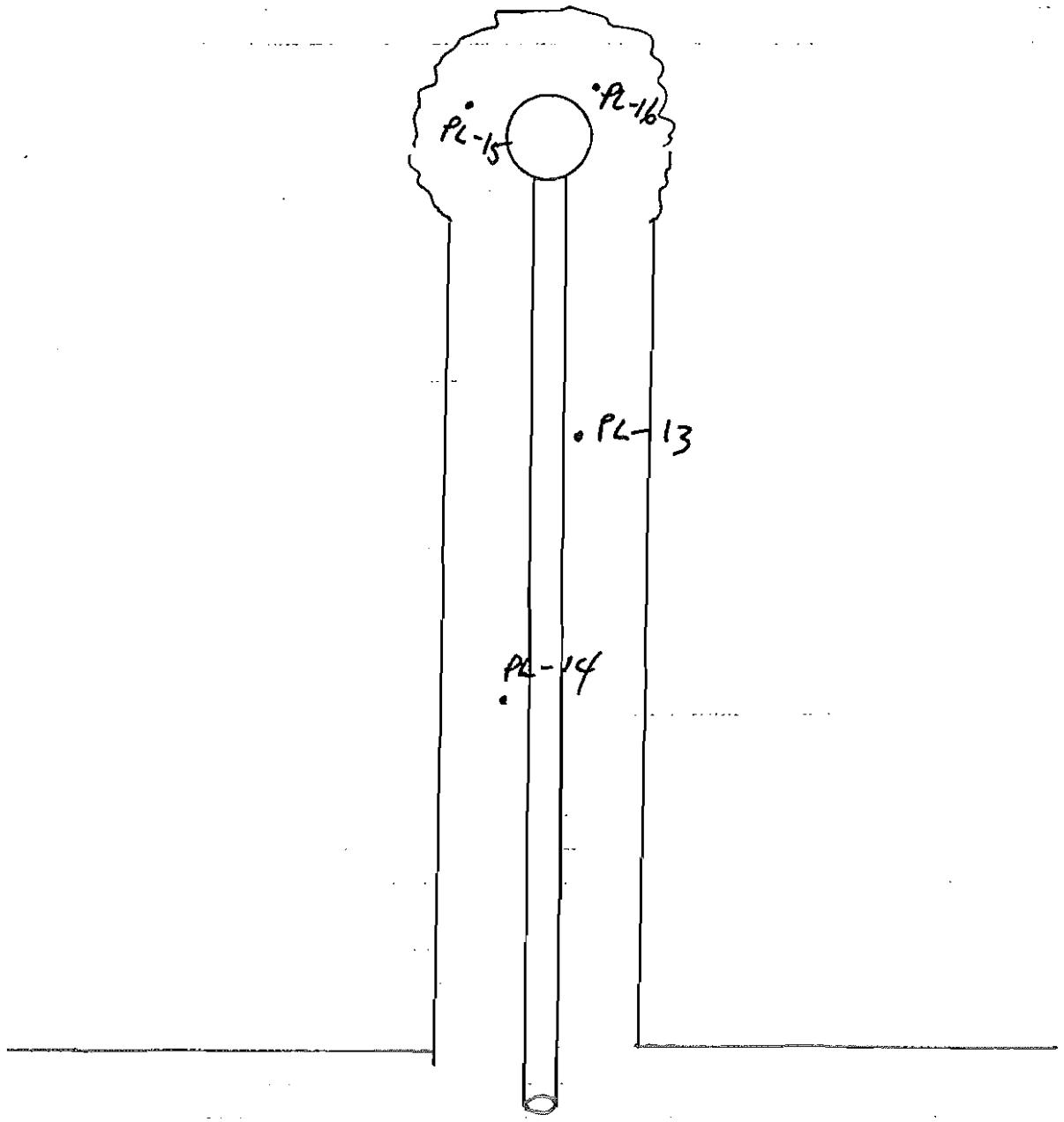
SHEET NO. 1 OF 2

GEOSYNTEC CONSULTANTS

Written by: C. Sullow Date: 00 06 15 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: Fluor Fernald Project: EPCTS Project/Proposal No.: G2029 Task No.: 04.2

G15 STUCTURE



Rip Rap Channel

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: Phase II DATE: 14 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: On-Site Material MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ (CIRCLE ONE) LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 8"

% COMPACTION: 95% MOISTURE RANGE: ±3% 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
PL-10	See loc. log. GIS #3.	8"/4	EP-5	11.7	125.6	8.9	132.9	122.0	97.1	✓				
PL-11	"	8"/1	EP-7/OSDF-10	13.8	119.7	12.9	129.4	114.6	95.8	✓				
PL-12	"	8"/2	"	13.8	119.7	10.9	127.8	115.2	96.3	✓				

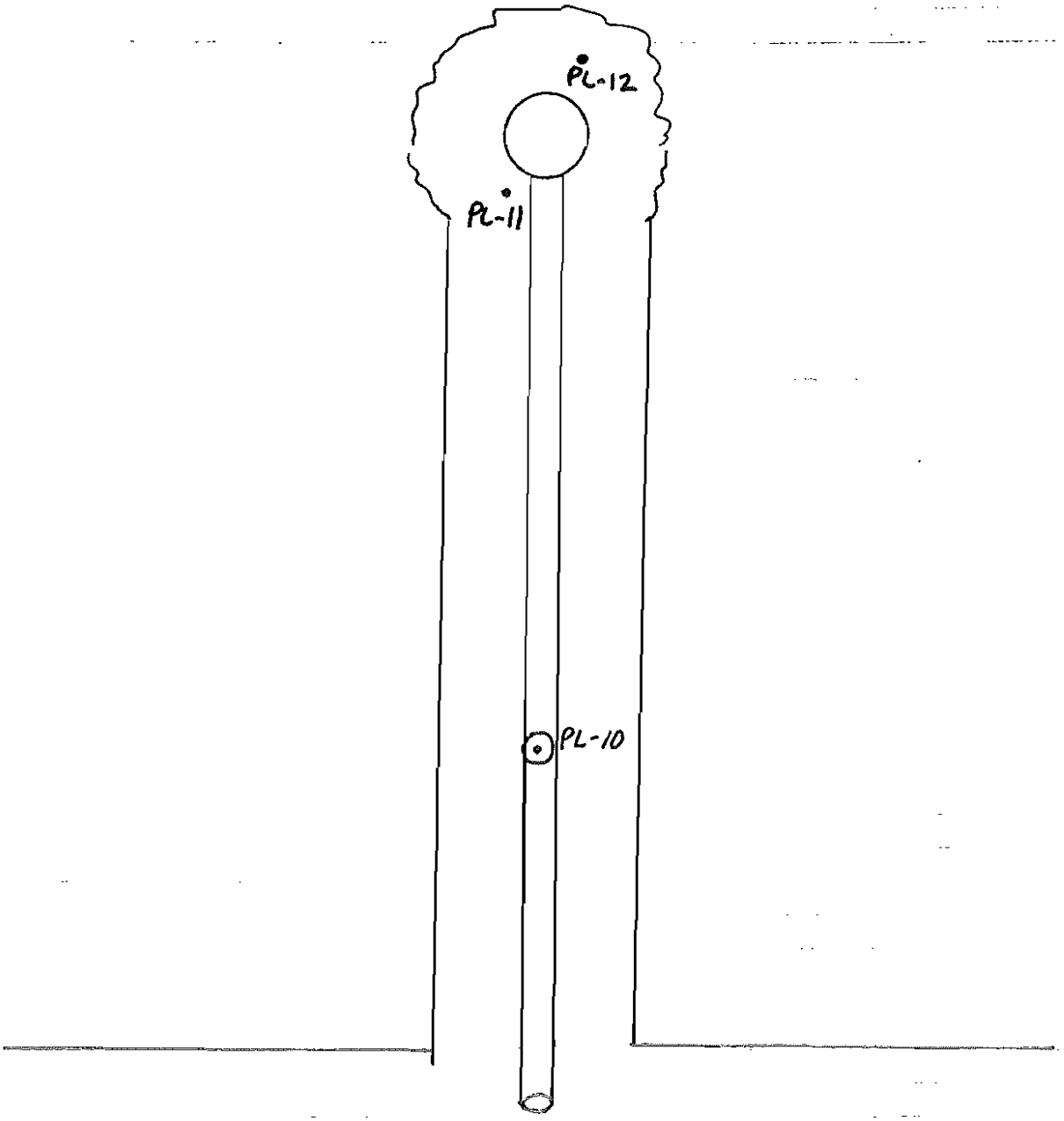
COMMENTS: EP-7 was a 1 point that fell on the curve for OSDF-10 (26 July 1997)

GEOSYNTEC CONSULTANTS

Written by: C. Sukow Date: 00/06/14 (YY MM DD) Reviewed by: Date: / / (YY MM DD)

Client: Fluor Fern. Project: EPLTS Project/Proposal No.: GQ1029 Task No.: 04-2

GIS STUCTURE #3



Rip Rap Channel

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 PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 13 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welch S&G MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: Trench Fill LIFT THICKNESS (LOOSE/COMPACTED): ~~12"~~ 9"

(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: ±3% 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: 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 (%)	WET UNIT WT (PCF)	DRY UNIT WT (PCF)	PERCENT COMPACT (%)	PASS	FAIL		PASS	FAIL
PL-7 ~~PL-6~~	GLS #3 See loc. map	8"/~~9~~ 1	E-65	11.7	125.6	9.4	135.0	123.4	98.2	✓				

COMMENTS:

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 PROJECT NO.: G00~~409~~ 1024 TD TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 13 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welsh S/G MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: _____ LIFT THICKNESS (LOOSE)/COMPACTED): ~~12~~ 8" (B)
(CIRCLE ONE)

% COMPACTION: 95% MOISTURE RANGE: + - 5% ASTM D 698: A (B) C / ASTM D 1557: A B C
(CIRCLE ONE)

NUCLEAR GAUGE TYPE: Troxler 3440 NUCLEAR GAUGE SERIAL NO. 26979 COR. FACTOR: N/A QA ID: TD

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		PASS	FAIL
PLS 88	G15 3	8"/2	~~8~~ EP65	11.7	125.6	9.2	134.1	122.9	97.8 ~~98.3~~	P				
PLS 89	G15 3	8"/3	EP65	11.7	125.6	9.2	132.8	121.7	~~97.3~~ 96.9	P				

COMMENTS:

CHECKED BY: [illegible]

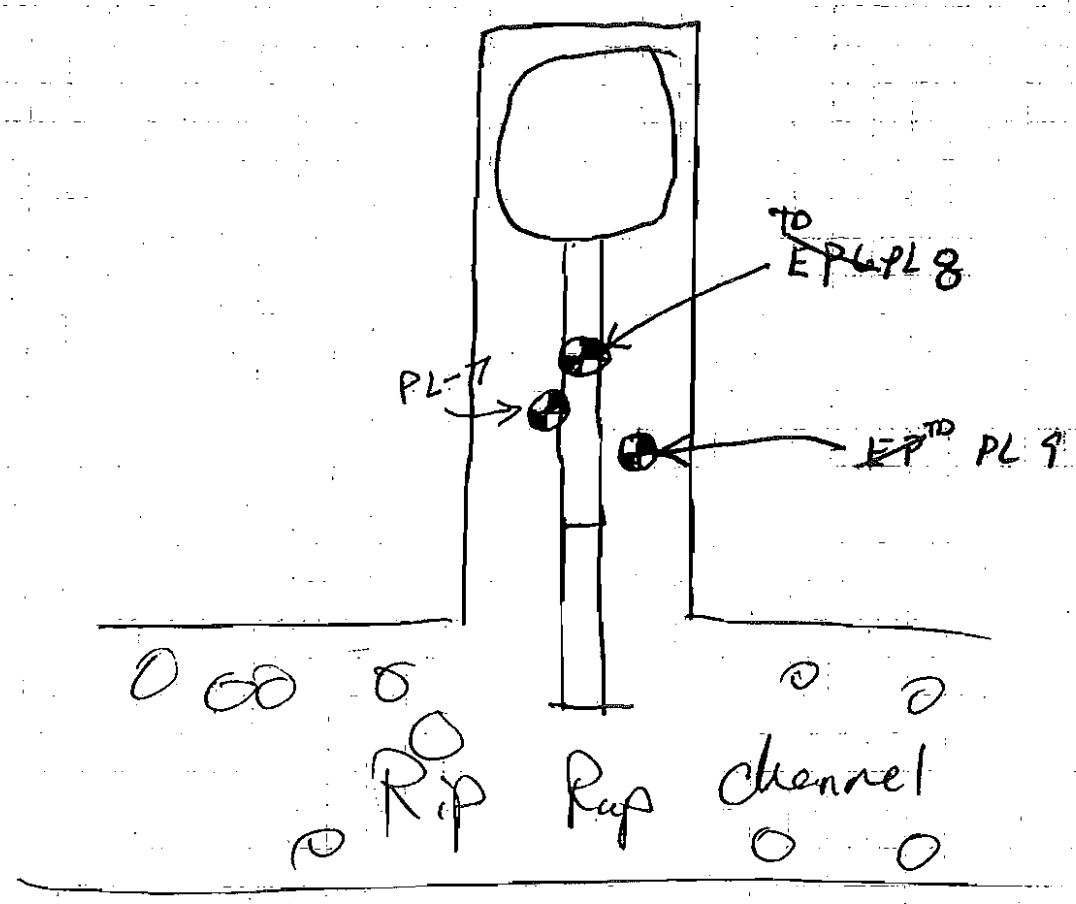
SHEET NO. 1 OF 3

GEOSYNTEC CONSULTANTS

Written by: TD Date: 00/06/13 (YY MM DD) Reviewed by: _____ Date: __/__/__ (YY MM DD)

Client: Fluor Fern Project: EPLTS Project/Proposal No.: GQ1029 Task No.: 04.2

GIS 13



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 — PROJECT NO.: ~~GQ0409~~ GQ 1029 — TASK NO.: 04

DESCRIPTION: EPLTS — DATE: 8 day June month 2000 year

SPECIFICATION REQUIREMENTS

SOURCE: Welsh S&G — MATERIAL TYPE: (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: Trench Fill (CIRCLE ONE) — LIFT THICKNESS: (LOOSE / COMPACTED): ~~12"~~ 8"

% COMPACTION: 95% — MOISTURE RANGE: ±3% — 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: 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 (%)	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
PL-1	GIS #1/See layout map	8"/1	EP-5	11.7	125.6	13.3	129.6	114.4	91.1		✓	PL-2	✓	
-2	↓	8"/1	EP-5	"	"	10.5	135.1	122.3	97.4	✓		~~PL~~		
-3		8"/2	EP-5	"	"	9.1	135.8	124.5	99.1	✓				
-4		8"/3	EP-5	"	"	13.7	131.7	~~115.4~~ 115.8	~~91.9~~ 92.2		✓	PL-5	✓	
-5		8"/3	EP-5	"	"	9.6	135.7	123.8	98.6	✓				
-6		8"/4	EP-5	"	"	10.1	134.9	122.5	97.5	✓				

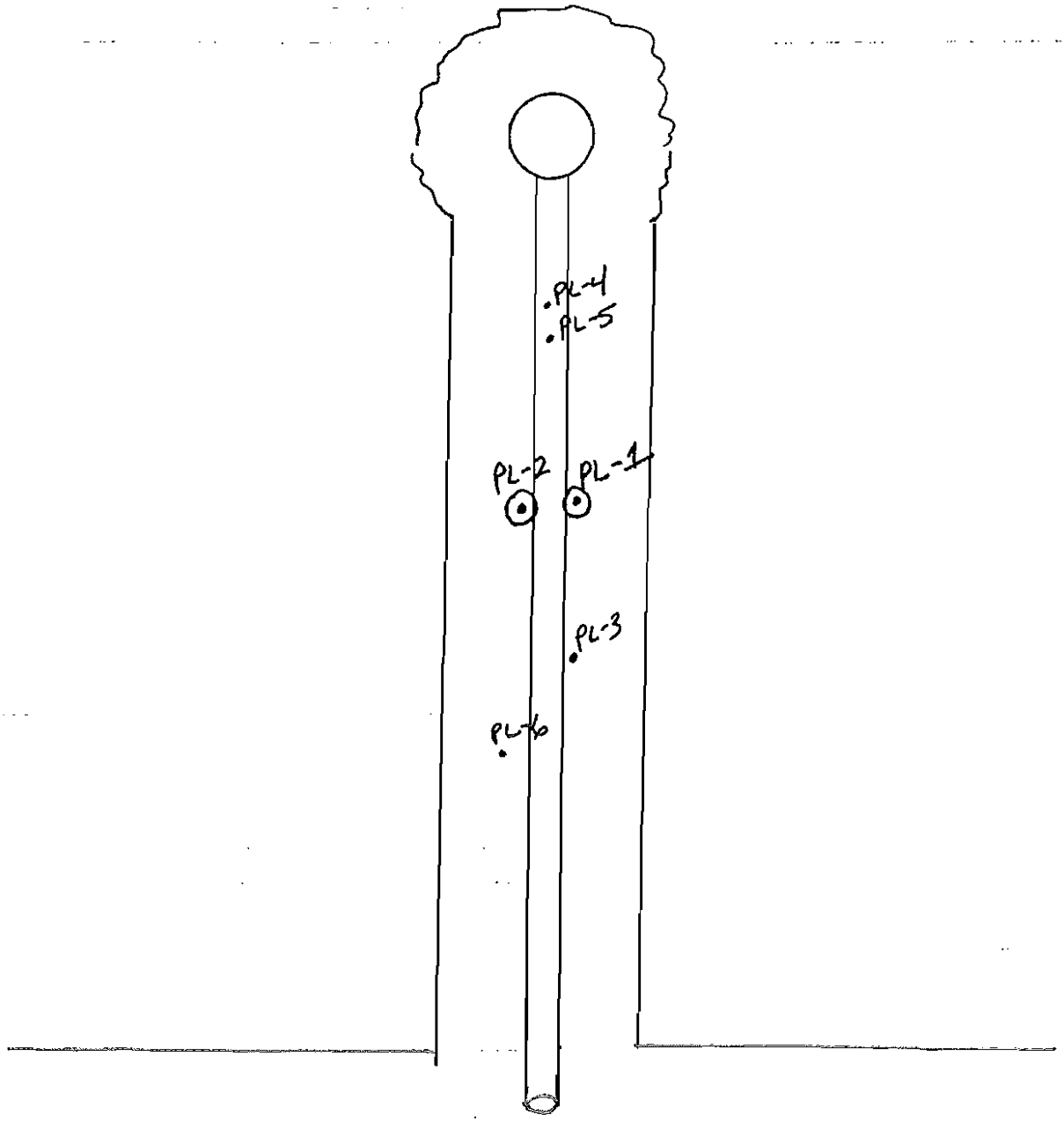
COMMENTS:

GeoSyntec Consultants

Written by: C. Sukow Date: 00/06/08 (YY MM DD) Reviewed by: Date: 00/06/08 (YY MM DD)

Client: Fluor Fern. Project: GQ1029-04.2 EPLTS Project/Proposal No.: Task No.:

GIS STUCTURE #1



Rip Rap Channel

DRIVE CYLINDER TEST RESULTS

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 60131 TASK NO.: 64-2

DESCRIPTION: Phase II DATE: 10 day May month 2001 year

TEST NO.: Test #5 Taken 5/10/01 Epts DT-27

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: N/A

FDT LOCATION: 6' E of VH 2 FDT TEST NO.: 560

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 01-3 VOLUME[1]	(cf)	.03346	E	WET UNIT WEIGHT = D/A	(lbs) 139.9
B	WEIGHT OF SAMPLE & CYLINDER 2340.4	(lbs)	6.04 1.36	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) 126.6
C	WEIGHT OF CYLINDER 615.5	(lbs)	6.75	G		
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.68			

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: DCE

O	WT. OF TARE NO. 216	(grams)	8.6	R	WT. OF WATER = P–Q	(grams) 49.5
P	WT. OF WET SOIL & TARE	(grams)	531.3	S	WT. OF DRY SOIL = Q–O	(grams) 473.2
Q	WT. OF DRY SOIL & TARE	(grams)	481.8	T	MOISTURE CONTENT = (R/S)X100	(%) 10.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. ~~125.6~~ 121.9 (pcf) OPTIMUM MOISTURE CONTENT ~~11.7~~ 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DCE

DELTA MOISTURE CONTENT = T – U		.50	U	FDT MOISTURE CONTENT	(%) 10.0
FDT WET UNIT WT.	(pcf)	137.7	V	FDT DRY UNIT WT.	(pcf) 125.1
DELTA DRY UNIT WT. = F – V		1.5		FDT #	560

COMMENTS:

3

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 6Q1341 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 10 day May month 2001 year

TEST NO.: #3 EPLTS Taken 5-10-01 DT-26

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: ~~0% to 3~~ N/A

FDT LOCATION: 15'E of VH-2 FDT TEST NO.: 558

FIELD TEST DATA – ASTM D 2937 QA ID: DHE

A	CYLINDER NO. 01-04 VOLUME[1] (cf)	0.03355	E	WET UNIT WEIGHT = D/A (lbs)	134.7
B	WEIGHT OF SAMPLE & CYLINDER 2658.5 (lbs)	5.86	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	~~74.4~~
C	WEIGHT OF CYLINDER 608.6 (lbs)	1.34	G		124.3
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.52			

1.1 Compact. on

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. 33 (grams)	8.1	R	WT. OF WATER = P–Q (grams)	38.2
P	WT. OF WET SOIL & TARE (grams)	498.8	S	WT. OF DRY SOIL = Q–O (grams)	452.5
Q	WT. OF DRY SOIL & TARE (grams)	460.6	T	MOISTURE CONTENT = (R/S)X100 (%)	8.4 ~~8.11~~

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 121.9 (pcf) OPTIMUM MOISTURE CONTENT 12.4 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: DLE

DELTA MOISTURE CONTENT = T – U		~~0.9~~ 1.2	U	FDT MOISTURE CONTENT (%)	7.2
FDT WET UNIT WT. (pcf)		132.2	V	FDT DRY UNIT WT. (pcf)	123.2
DELTA DRY UNIT WT. = F – V		1.1		FDT #	558

COMMENTS:

(2)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G01841 TASK NO.: 4.2

DESCRIPTION: Ep/+S DATE: 10 day MAY month 01 year

TEST NO.: Ep-8 #2 Sample Taken 10/May/2001 DT-25

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / ~~SUBGRADE~~ / ~~SUBBASE~~ CLAY / OTHER: Ep-8 Proctor

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

FDT LOCATION: 557 55' E of VH-2 FDT TEST NO.: 557

FIELD TEST DATA – ASTM D 2937 0.03359 QA ID:

A	CYLINDER NO. 01-2 VOLUME[1] (cf)	0.03359	E	WET UNIT WEIGHT = D/A (lbs)	143.2
B	WEIGHT OF SAMPLE & CYLINDER (lbs) 2283.9	6.14	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	128.8
C	WEIGHT OF CYLINDER (lbs) 605.3	1.33	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.81			

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. #18 (grams)	8.40	R	WT. OF WATER = P–Q (grams)	55.4
P	WT. OF WET SOIL & TARE (grams)	557.40	S	WT. OF DRY SOIL = Q–O (grams)	493.6
Q	WT. OF DRY SOIL & TARE (grams)	502.0	T	MOISTURE CONTENT = (R/S)X100 (%)	11.2

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 125.6 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U		1.0	U	FDT MOISTURE CONTENT (%)	10.2
FDT WET UNIT WT. (pcf)		141.2	V	FDT DRY UNIT WT. (pcf)	128.1
DELTA DRY UNIT WT. = F – V		0.7		FDT #	557

COMMENTS:

(1)

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: 601341 TASK NO.: 4.2

DESCRIPTION: EPTS DATE: ~~8~~ 10 day ~~10~~ May month 01 year

TEST NO.: EP-8 sample #1 of 10/may/2001 DT-24

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / ~~SUBBASE~~ / CLAY / OTHER: EP-8 Proctor

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

FDT LOCATION: 33' E of W#2 FDT TEST NO.: 556

FIELD TEST DATA – ASTM D 2937 QA ID:

A	CYLINDER NO. 01-1 VOLUME[1] (cf)	0.03350	E	WET UNIT WEIGHT = D/A (lbs)	139.4
B	WEIGHT OF SAMPLE & CYLINDER 2735.8 g (lbs)	6.03	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	123.4
C	WEIGHT OF CYLINDER 616.3 g (lbs)	1.36	G		
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.67			

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. #31 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	51.6
P	WT. OF WET SOIL & TARE (grams)	456.6	S	WT. OF DRY SOIL = Q–O (grams)	396.7
Q	WT. OF DRY SOIL & TARE (grams)	405.0	T	MOISTURE CONTENT = (R/S)X100 (%)	13.0

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 125.6 (pcf) OPTIMUM MOISTURE CONTENT 11.7 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	4.5	U	FDT MOISTURE CONTENT (%)	8.5
FDT WET UNIT WT. (pcf)	132.2	V	FDT DRY UNIT WT. (pcf)	126.9
DELTA DRY UNIT WT. = F – V	3.5		FDT #	556

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. GQ1341 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 7 day May month 2001 year

TEST NO.: NDT 555 DT #23

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: Between VH4 on 5

% COMPACTION: 95% MOISTURE CONTENT RANGE:

FDT LOCATION: 80' S of Pole 746 FDT TEST NO.: #1 (7 May 2001) NDT 555

FIELD TEST DATA – ASTM D 2937 QA ID: TD/DLG

A	CYLINDER NO. 01-2 VOLUME[1]	(cf)	0.03359	E	WET UNIT WEIGHT = D/A	(lbs) 125.3
B	WEIGHT OF SAMPLE & CYLINDER 2513.0	(lbs)	5.54	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf) ~~111.57~~
C	WEIGHT OF CYLINDER 605.3	(lbs)	1.33	G		111.6
D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.21			

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. 33	(grams)	8.10	R	WT. OF WATER = P–Q	(grams) 34.93
P	WT. OF WET SOIL & TARE	(grams)	326.89	S	WT. OF DRY SOIL = Q–O	(grams) 283.86
Q	WT. OF DRY SOIL & TARE	(grams)	291.96	T	MOISTURE CONTENT = (R/S)X100	(%) 12.30 1.12

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 114.7 (pcf) OPTIMUM MOISTURE CONTENT 15.3 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

DELTA MOISTURE CONTENT = T – U	2.7	U	FDT MOISTURE CONTENT	(%)	9.6
FDT WET UNIT WT. (pcf)	126.4	V	FDT DRY UNIT WT.	(pcf)	115.3
DELTA DRY UNIT WT. = F – V	~~-3.73~~ -3.78		FDT #		

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO. 6Q1341 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 23 day APR month 01 year

TEST NO.: ~~4~~ 5 MH 546 ~~#10~~ DT #22

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRLCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: EP-5

% COMPACTION: ? (95) %c = 98.1 MOISTURE CONTENT RANGE: N/A

FDT LOCATION: 12' E + 5' N of ℄ of VH1 FDT TEST NO.: 546

FIELD TEST DATA – ASTM D 2937 QA ID: MH

A	CYLINDER NO. Q1-1 VOLUME(1) (cf)	0.03350		E	WET UNIT WEIGHT = D/A (lbs)	130.15	
B	WEIGHT OF SAMPLE & CYLINDER 2595.2 (lbs)	5.72		F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	113.7	
C	WEIGHT OF CYLINDER 616.3g (lbs)	1.36		G	PERCENT COMPACTION = F\L (%)	~~92.4~~ N/A	
D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.36			PASS\FAIL	~~F~~ N/A	

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: MH

O	WT. OF TARE NO. 216 (grams)	8.59	R	WT. OF WATER = P–Q (grams)	46.35
P	WT. OF WET SOIL & TARE (grams)	374.30	S	WT. OF DRY SOIL = Q–O (grams)	319.36
Q	WT. OF DRY SOIL & TARE (grams)	327.95	T	MOISTURE CONTENT = (R/S)X100 (%)	14.5

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. ~~121.8~~ MH 123.0 (pcf) OPTIMUM MOISTURE CONTENT ~~11.6~~ MH 11.6 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: MH

DELTA MOISTURE CONTENT = T – U	2.9		U	FDT MOISTURE CONTENT (%)	11.6
FDT WET UNIT WT. (pcf)	137.4		V	FDT DRY UNIT WT. (pcf)	123.0
DELTA DRY UNIT WT. = F – V	-9.3				

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1341 TASK NO.: 4.2

DESCRIPTION: EPLTS DATE: 23 day APR month 01 year

TEST NO.: 544 #81

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER: EP-5

% COMPACTION: 95% ? % c = 96.1 MOISTURE CONTENT RANGE: N/A

FDT LOCATION: 60' E JUST N. of ℄ FDT TEST NO.: NDT 544

FIELD TEST DATA – ASTM D 2937 QA ID: MH

A	CYLINDER NO. 01-2 VOLUME[1] (cf)	0.03359	E	WET UNIT WEIGHT = D/A (lbs)	134.6
B	WEIGHT OF SAMPLE & CYLINDER 2652.9 (lbs)	5.85	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	119.1
C	WEIGHT OF CYLINDER 605.3 (lbs)	1.33	G	PERCENT COMPACTION = F\L (%)	98.7 NE
D	WEIGHT OF WET SAMPLE = B-C (lbs)	4.52		PASS\FAIL	P N/A

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: MH

O	WT. OF TARE NO. 33 (grams)	8.1	R	WT. OF WATER = P-Q (grams)	45.78
P	WT. OF WET SOIL & TARE (grams)	405.6	S	WT. OF DRY SOIL = Q-O (grams)	351.72
Q	WT. OF DRY SOIL & TARE (grams)	359.82	T	MOISTURE CONTENT = (R/S)X100 (%)	13.02

PROCTOR TEST DATA: [L] MAXIMUM DRY UNIT WT. 120.7 (pcf) OPTIMUM MOISTURE CONTENT 11.8 (%)

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: MH

DELTA MOISTURE CONTENT = T - U	1.22	U	FDT MOISTURE CONTENT (%)	11.8
FDT WET UNIT WT. (pcf)	134.9	V	FDT DRY UNIT WT. (pcf)	120.7
DELTA DRY UNIT WT. = F - V	-1.6			

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 14 day March month 2001 year

SOURCE: ON SITE QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: 10' E of ℄ @ St. 1715 EPLTS-508 TEST NO.: DT-20

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 01-2 VOLUME[1]	(cf)	0.03359	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.23
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.56	E	WET UNIT WEIGHT = D/A	(lbs)	125.9
C	WEIGHT OF CYLINDER	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	~~20.3~~ 104.7 KS

NOTE: 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/DLE

O	WT. OF TARE NO. 101	(grams)	8.2	R	WT. OF WATER = P–Q	(grams)	57.0
P	WT. OF WET SOIL & TARE	(grams)	345.8	S	WT. OF DRY SOIL = Q–O	(grams)	280.6
Q	WT. OF DRY SOIL & TARE	(grams)	288.8	T	MOISTURE CONTENT = (R/S)X100	(%)	20.3

PROCTOR TEST DATA _____ MAXIMUM DRY UNIT WT. (pcf) _____ OPTIMUM MOISTURE CONTENT (%) KS/DLE

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.		508	U	MOISTURE CONTENT (%)	17.6
WET UNIT WT.	(pcf)	125.8	V	DRY UNIT WT. (pcf)	107.0
DELTA DRY UNIT WT. = F – V		-2.3		DELTA MOISTURE CONTENT = T – U	2.7

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 14 day March month 2001 year

SOURCE: on-site-drainage swale Spoils QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: 10' E of ℄ @ St. 16+50 EPLTS-507 TEST NO.: DT-19

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 01-1 VOLUME[1]	(cf)	0.03350	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.17
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.53	E	WET UNIT WEIGHT = D/A	(lbs)	124.5
C	WEIGHT OF CYLINDER	(lbs)	1.36	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	102.6

NOTE: 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/OLF

O	WT. OF TARE NO. 30	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	66
P	WT. OF WET SOIL & TARE	(grams)	348.7	S	WT. OF DRY SOIL = Q–O	(grams)	280.4
Q	WT. OF DRY SOIL & TARE	(grams)	288.7	T	MOISTURE CONTENT = (R/S)X100	(%)	21.4

PROCTOR TEST DATA _____ MAXIMUM DRY UNIT WT. (pcf) _____ OPTIMUM MOISTURE CONTENT (%) _____

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.		507	U	MOISTURE CONTENT	(%) 17.0
WET UNIT WT.	(pcf)	125.5	V	DRY UNIT WT.	(pcf) 107.3
DELTA DRY UNIT WT. = F – V		-4.7		DELTA MOISTURE CONTENT = T – U	4.4

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 08 day MAR month 01 year

SOURCE: QA ID: YA

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER: Roadway Base

% COMPACTION: 98% MOISTURE CONTENT RANGE: N/A

TEST LOCATION: 50' So. of VH 4 & Roadway EPLTS-500 TEST NO.: (DT 18)?

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 0011 VOLUME(1)	(cf)	0.03336	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.53
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.86	E	WET UNIT WEIGHT = D/A	(lbs)	135.8
C	WEIGHT OF CYLINDER	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1÷(T/100)]	(pcf)	122.8

NOTE: 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. 24	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	43.3
P	WT. OF WET SOIL & TARE	(grams)	458.5	S	WT. OF DRY SOIL = Q–O	(grams)	406.9
Q	WT. OF DRY SOIL & TARE	(grams)	415.2	T	MOISTURE CONTENT = (R/S)X100	(%)	10.6

PROCTOR TEST DATA EP-17 MAXIMUM DRY UNIT WT. (pcf) 122.6 OPTIMUM MOISTURE CONTENT (%) 12.1

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

TEST NO.		500	U	MOISTURE CONTENT	(%)	6.3
WET UNIT WT.	(pcf)	128.6	V	DRY UNIT WT.	(pcf)	120.9
DELTA DRY UNIT WT. = F – V	1.9	~~120.9~~		DELTA MOISTURE CONTENT = T – U		4.3

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 17 day JA month 01 year

SOURCE: EP-31 QA ID: TD

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 97.1 MOISTURE CONTENT RANGE: 18.4

TEST LOCATION: 22+80 ℄ TEST NO.: DT-17

FIELD TEST DATA – ASTM D 2937 QA ID: TD

A	CYLINDER NO. 00-11 VOLUME(1) (cf)	.03336	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.46
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.21	E	WET UNIT WEIGHT = D/A (lbs)	133.7
C	WEIGHT OF CYLINDER 605.16 (lbs)	.75	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	109.7

NOTE: 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. 8 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	54.9
P	WT. OF WET SOIL & TARE (grams)	314.3	S	WT. OF DRY SOIL = Q–O (grams)	251.1
Q	WT. OF DRY SOIL & TARE (grams)	259.4	T	MOISTURE CONTENT = (R/S)X100 (%)	21.9

PROCTOR TEST DATA EP-31 MAXIMUM DRY UNIT WT. (pcf) 106.5 OPTIMUM MOISTURE CONTENT (%) 18.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

TEST NO.		473	U	MOISTURE CONTENT (%)	18.4
WET UNIT WT.	(pcf)	122.3	V	DRY UNIT WT. (pcf)	103.4
DELTA DRY UNIT WT. = F – V		6.3		DELTA MOISTURE CONTENT = T – U	3.5

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.Z

DESCRIPTION: EPLTS DATE: 16 day Jan month 2001 year

SOURCE: Welch (off-site) ~~(on-site Mine~~ KS QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: E @ St. TEST NO.: DT-16

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 00-11 VOLUME[1]	(cf)	0.03336	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.26
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.59	E	WET UNIT WEIGHT = D/A	(lbs)	127.7
C	WEIGHT OF CYLINDER	(lbs)	~~1.33~~ KS 1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	109.2

NOTE: 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. 215	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	62.2
P	WT. OF WET SOIL & TARE	(grams)	438.4	S	WT. OF DRY SOIL = Q–O	(grams)	367.9
Q	WT. OF DRY SOIL & TARE	(grams)	376.2	T	MOISTURE CONTENT = (R/S)X100	(%)	16.9

PROCTOR TEST DATA EP-6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.			471	U	MOISTURE CONTENT	~~16.3~~ KS (%)	16.3
WET UNIT WT.	~~132.2~~ KS	(pcf)	132.2	V	DRY UNIT WT.	~~113.7~~ KS (pcf)	113.7
DELTA DRY UNIT WT. = F – V			-4.5		DELTA MOISTURE CONTENT = T – U		0.6

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~C00409~~ G91029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 16 day Jan month 2001 year

SOURCE: welch (off-site) ~~on-site mixes~~ QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: ℄ @ St. 23+50 TEST NO.: DT-15

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 99-4 VOLUME(1)	(cf)	0.03344	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.38
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.71	E	WET UNIT WEIGHT = D/A	(lbs)	131.0
C	WEIGHT OF CYLINDER	(lbs)	1.33 ~~602.0~~ KS	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	112.8

NOTE: 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. 21	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	45.3
P	WT. OF WET SOIL & TARE	(grams)	335.0	S	WT. OF DRY SOIL = Q–O	(grams)	281.4
Q	WT. OF DRY SOIL & TARE	(grams)	289.7	T	MOISTURE CONTENT = (R/S)X100	(%)	16.1

PROCTOR TEST DATA EP-6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.			469	U	MOISTURE CONTENT	(%)	15.4
WET UNIT WT.	~~130.2~~ KS	(pcf)	130.2	V	DRY UNIT WT.	(pcf)	112.8
DELTA DRY UNIT WT. = F – V			Ø		DELTA MOISTURE CONTENT = T – U		0.7

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ 1029 KS TASK NO.: 04.7

DESCRIPTION: ~~PHASE II~~ KS EPLTS DATE: 16 day Jan month ~~1999~~ 2001 KS year

SOURCE: Welch/on-site mix QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: ℄ @ St. 23+50 TEST NO.: (464) DT-14

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 00-11 VOLUME[1] (cf)	0.0336	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.21
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.54	E	WET UNIT WEIGHT = D/A (lbs)	126.2
C	WEIGHT OF CYLINDER (lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	106.9

NOTE: 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. 104 (grams)	8.2	R	WT. OF WATER = P–Q (grams)	45.4
P	WT. OF WET SOIL & TARE (grams)	306.1	S	WT. OF DRY SOIL = Q–O (grams)	252.5
Q	WT. OF DRY SOIL & TARE (grams)	260.7	T	MOISTURE CONTENT = (R/S)X100 (%)	18.0

PROCTOR TEST DATA EP6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.	464	U	MOISTURE CONTENT ~~15.8~~ KS (%)	15.8
WET UNIT WT. ~~132.5~~ KS (pcf)	132.5	V	DRY UNIT WT. ~~114.4~~ KS (pcf)	114.4
DELTA DRY UNIT WT. = F – V	-7.5		DELTA MOISTURE CONTENT = T – U	2.2

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: GQ~~0409~~ 1029 KS TASK NO.: 04.2

DESCRIPTION: ~~PHASE II~~ KS EPLTS DATE: 16 day Jan month ~~1999~~ 2001 KS year

SOURCE: Welch / on-site mix QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: ℄ @ St. 23+50 TEST NO.: (463) DT-13

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 99-4 VOLUME[1] (cf)	0.03344	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.40
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.73	E	WET UNIT WEIGHT = D/A (lbs)	131.6
C	WEIGHT OF CYLINDER (lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	114.2

NOTE: 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. ~~8-3KS~~ 103 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	55.6
P	WT. OF WET SOIL & TARE (grams)	429.1	S	WT. OF DRY SOIL = Q–O (grams)	365.2
Q	WT. OF DRY SOIL & TARE (grams)	373.5	T	MOISTURE CONTENT = (R/S)X100 (%)	15.2

PROCTOR TEST DATA EP-21 MAXIMUM DRY UNIT WT. (pcf) 118.3 OPTIMUM MOISTURE CONTENT (%) 14.1

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.		463	U	MOISTURE CONTENT ~~12.8~~ KS (%)	12.8
WET UNIT WT. ~~136.5~~ KS (pcf)		136.5	V	DRY UNIT WT. ~~121.0~~ KS (pcf)	121.0
DELTA DRY UNIT WT. = F – V		~~8~~ KS-6.8		DELTA MOISTURE CONTENT = T – U	2.4

COMMENTS:

GEOSYNTEC CONSULTANTS FILE NO. 2-18-FOC CHECKED BY: (U) SHEET NO. 1 OF 1

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.2

DESCRIPTION: Phase III DATE: 7 day Dec month 2001 year

SOURCE: EPLTS, Pipeline Trench / Test # 353 QA ID: DLE

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: 353 TEST NO.: ~~355~~ DT # 12

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. ~~1400~~ 00 11 VOLUME[1]	(cf)	0.03336	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.48 ~~4.48 lbs~~
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.81 LB 2639.0 gm	E	WET UNIT WEIGHT = D/A	(lbs)	2033.9 134.3 ~~133.7~~
C	WEIGHT OF CYLINDER	(lbs)	1.33 LB. 605.1 gm	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	116.5 ~~116.0~~

NOTE: 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. # 18	(grams)	8.4	R	WT. OF WATER = P–Q	(grams)	56.8
P	WT. OF WET SOIL & TARE	(grams)	436.3	S	WT. OF DRY SOIL = Q–O	(grams)	371.1
Q	WT. OF DRY SOIL & TARE	(grams)	379.5	T	MOISTURE CONTENT = (R/S)X100	(%)	15.3%

PROCTOR TEST DATA ~~HLOKS~~ MAXIMUM DRY UNIT WT. (pcf) ~~117.2~~ 111.0 KS OPTIMUM MOISTURE CONTENT (%) 17.2

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: KS

TEST NO.		353	U	MOISTURE CONTENT	(%) 15.8
WET UNIT WT.	(pcf)	129.8	V	DRY UNIT WT.	(pcf) 112.1
DELTA DRY UNIT WT. = F – V		~~3.9~~ 4.4		DELTA MOISTURE CONTENT = T – U	0.5

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 042

DESCRIPTION: Phase III EPLTS DATE: 7 day Dec month 2000 year

SOURCE: EPLTS, Pipeline Trench, Test #350 QA ID: DLE

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: 350 TEST NO.: ~~#350~~ DT #11

FIELD TEST DATA – ASTM D 2937 QA ID: DLE

A	CYLINDER NO. 99.4 VOLUME[1]	(cf)	0.03344	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.41 ~~4.8 LBS~~
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.71 LBS 2580.6	E	WET UNIT WEIGHT = D/A	(lbs)	1988.4 131.9 ~~143.5~~
C	WEIGHT OF CYLINDER	(lbs)	1.3 LBS 602.2	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	114.2 ~~124.2~~

NOTE: 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. 8	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	49.1
P	WT. OF WET SOIL & TARE	(grams)	373.9	S	WT. OF DRY SOIL = Q–O	(grams)	316.5
Q	WT. OF DRY SOIL & TARE	(grams)	324.8	T	MOISTURE CONTENT = (R/S)X100	(%)	15.5

PROCTOR TEST DATA ~~111.0~~ MAXIMUM DRY UNIT WT. (pcf) 111.0 ~~112~~ LBS OPTIMUM MOISTURE CONTENT (%) 17.2

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

TEST NO.			350	U	MOISTURE CONTENT	(%)	16.0
WET UNIT WT.		(pcf)	131.2	V	DRY UNIT WT.	(pcf)	113.2
DELTA DRY UNIT WT. = F – V			~~1.0~~ 1.0		DELTA MOISTURE CONTENT = T – U		0.5

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: PHASE II - EPCTS DATE: 21 day NOV month 2000 year

SOURCE: VARIOUS - EPCTS QA ID: MH/SQ

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: N/A

TEST LOCATION: VH-6, ~~WEST~~ EAST, FIRST LIFT TEST NO.: DT #10

FIELD TEST DATA - ASTM D 2937 QA ID: SQ

A	CYLINDER NO. 00-11 VOLUME[1]	(cf)	0.03336	D	WEIGHT OF WET SAMPLE = B-C	(lbs)	4.28
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.61	E	WET UNIT WEIGHT = D/A	(lbs)	128.3
C	WEIGHT OF CYLINDER	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	111.7

NOTE: 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: SQ

O	WT. OF TARE NO. 21	(grams)	8.30	R	WT. OF WATER = P-Q	(grams)	55.28
P	WT. OF WET SOIL & TARE	(grams)	434.0	S	WT. OF DRY SOIL = Q-O	(grams)	370.42
Q	WT. OF DRY SOIL & TARE	(grams)	378.72	T	MOISTURE CONTENT = (R/S)X100	(%)	14.9

PROCTOR TEST DATA EP-6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE - ASTM D 2922 AND D 3017 QA ID: MH

TEST NO.		PL-343	U	MOISTURE CONTENT (%)	12.5
WET UNIT WT.	(pcf)	126.6	V	DRY UNIT WT. (pcf)	112.6
DELTA DRY UNIT WT. = F - V		-0.9		DELTA MOISTURE CONTENT = T - U	2.4

COMMENTS: APPROX 1/4" LAYER OF SAND NOTED IN CENTER OF SAMPLE

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: PHASE II EPCTS DATE: 02 day NOV month 2000 year

SOURCE: QA ID: MH/SQ

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: N/A

TEST LOCATION: SOUTH VH-4, L-11 TEST NO.: 284 #9

FIELD TEST DATA – ASTM D 2937 QA ID: SQ

A	CYLINDER NO. 00-11 VOLUME[1]	(cf)	0.03334	D	WEIGHT OF WET SAMPLE = B–C	(g) (lbs)	1960.8 4.33
B	WEIGHT OF SAMPLE & CYLINDER	(g) (lbs)	2565.9 5.66	E	WET UNIT WEIGHT = D/A	(lbs)	129.8
C	WEIGHT OF CYLINDER	(g) (lbs)	605.1 1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	110.9

NOTE: 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: SQ

O	WT. OF TARE NO. 227	(grams)	8.29	R	WT. OF WATER = P–Q	(grams)	50.59
P	WT. OF WET SOIL & TARE	(grams)	356.2	S	WT. OF DRY SOIL = Q–O	(grams)	297.32 ~~527.16~~
Q	WT. OF DRY SOIL & TARE	(grams)	305.61	T	MOISTURE CONTENT = (R/S)X100	(%)	17.0

PROCTOR TEST DATA EP-10 MAXIMUM DRY UNIT WT. (pcf) 114.7 OPTIMUM MOISTURE CONTENT (%) 15.3

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

TEST NO.		284	U	MOISTURE CONTENT	(%)	16.2
WET UNIT WT.	(pcf)	131.7	V	DRY UNIT WT.	(pcf)	113.4
DELTA DRY UNIT WT. = F – V		-2.5		DELTA MOISTURE CONTENT = T – U		0.8

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 6 day Oct month 2000 year

SOURCE: QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: West of VH-3 TEST NO.: 203 DT #8

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 99-4 VOLUME(1)	(cf)	0.03344	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.48
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.81	E	WET UNIT WEIGHT = D/A	(lbs)	134.0
C	WEIGHT OF CYLINDER	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	115.5

NOTE: 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. 225	(grams)	8.3	R	WT. OF WATER = P–Q	(grams)	48.7
P	WT. OF WET SOIL & TARE	(grams)	361.8	S	WT. OF DRY SOIL = Q–O	(grams)	304.8
Q	WT. OF DRY SOIL & TARE	(grams)	313.1	T	MOISTURE CONTENT = (R/S)X100	(%)	16.0

PROCTOR TEST DATA EP-8 MAXIMUM DRY UNIT WT. (pcf) 121.9 OPTIMUM MOISTURE CONTENT (%) 12.4

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CB

TEST NO.			203	U	MOISTURE CONTENT	(%)	14.6
WET UNIT WT.		(pcf)	134.5	V	DRY UNIT WT.	(pcf)	117.4
DELTA DRY UNIT WT. = F – V			1.9		DELTA MOISTURE CONTENT = T – U		1.4

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 2 day Oct month 2000 year

SOURCE: ON SITE QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: South of VH-2 TEST NO.: 188 DT #7

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. ~~03336~~ 00-11 VOLUME[1] (cf)	.03336	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.50
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.83	E	WET UNIT WEIGHT = D/A (lbs)	134.9
C	WEIGHT OF CYLINDER (lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	118.4

NOTE: 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. 211 (grams)	7.6	R	WT. OF WATER = P–Q (grams)	46.7
P	WT. OF WET SOIL & TARE (grams)	390.3	S	WT. OF DRY SOIL = Q–O (grams)	335.8
Q	WT. OF DRY SOIL & TARE (grams)	343.4	T	MOISTURE CONTENT = (R/S)X100 (%)	13.9

PROCTOR TEST DATA EP-8 MAXIMUM DRY UNIT WT. (pcf) 121.9 OPTIMUM MOISTURE CONTENT (%) 12.4

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CS

TEST NO.		188	U	MOISTURE CONTENT (%)	11.7
WET UNIT WT. (pcf)		130.0	V	DRY UNIT WT. (pcf)	116.4
DELTA DRY UNIT WT. = F – V		2.0		DELTA MOISTURE CONTENT = T – U	2.2

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 13 day Sept month 00 year

SOURCE: Spoil Pile For UH3 QA ID: TD

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 90 MOISTURE CONTENT RANGE:

TEST LOCATION: W. Side of UH3 TEST NO.: ~~Hot~~ DT #6

FIELD TEST DATA – ASTM D 2937 QA ID: TD

A	CYLINDER NO. 99.4 VOLUME[1] (cf) grams 2567.376 = 5.66		0.03344	D	WEIGHT OF WET SAMPLE = B–C (lbs)		4.33
B	WEIGHT OF SAMPLE & CYLINDER (lbs) 6022 grams =		5.66	E	WET UNIT WEIGHT = D/A (lbs)		129.5
C	WEIGHT OF CYLINDER (lbs)		1.328	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)		113.2

NOTE: 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: TD

O	WT. OF TARE NO. #1 (grams)		8.25	R	WT. OF WATER = P–Q (grams)		39.5
P	WT. OF WET SOIL & TARE (grams)		321.66	S	WT. OF DRY SOIL = Q–O (grams)		273.9
Q	WT. OF DRY SOIL & TARE (grams)		282.2	T	MOISTURE CONTENT = (R/S)X100 (%)		14.4

PROCTOR TEST DATA #P7 MAXIMUM DRY UNIT WT. (pcf) 119.7 OPTIMUM MOISTURE CONTENT (%) 11.7

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: TD

TEST NO.		#61	~~Hot~~ #6	U	MOISTURE CONTENT	(%)	11.6
WET UNIT WT.	(pcf)	130.0		V	DRY UNIT WT.	(pcf)	116.5
DELTA DRY UNIT WT. = F – V		3.3			DELTA MOISTURE CONTENT = T – U		2.8

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: ~~PHASE II~~ EPLTS DATE: 10 day: Sept month ~~1999~~ 2000 year

SOURCE: VH-3 Spoils QA ID: KS

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: VH-3 east side TEST NO.: 150 DT-5

FIELD TEST DATA – ASTM D 2937 QA ID: KS

A	CYLINDER NO. 00-11 VOLUME[1] (cf)	0.0336	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.28
B	WEIGHT OF SAMPLE & CYLINDER (lbs)	5.61	E	WET UNIT WEIGHT = D/A (lbs)	127.4
C	WEIGHT OF CYLINDER (lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	107.5

NOTE: 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. ~~00-11~~ #216 (grams)	8.3	R	WT. OF WATER = P–Q (grams)	50.9
P	WT. OF WET SOIL & TARE (grams)	334.4	S	WT. OF DRY SOIL = Q–O (grams)	275.2
Q	WT. OF DRY SOIL & TARE (grams)	283.5	T	MOISTURE CONTENT = (R/S)X100 (%)	18.5

PROCTOR TEST DATA EP-13 MAXIMUM DRY UNIT WT. (pcf) 115.8 OPTIMUM MOISTURE CONTENT (%) 15.8

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CL

TEST NO.		150	U	MOISTURE CONTENT (%)	12.6
WET UNIT WT.	(pcf)	123.8	V	DRY UNIT WT. (pcf)	109.9
DELTA DRY UNIT WT. = F – V		~~12.0~~ 2.4		DELTA MOISTURE CONTENT = T – U	5.9

COMMENTS: Sample #5

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 22 day Aug month 00 year

SOURCE: UH2 QA ID: TD

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: UH2 S. WALL TEST NO.: DR#4

FIELD TEST DATA - ASTM D 2937 QA ID: TD

A	CYLINDER NO. 99-4 VOLUME[1]	(cf)	0.03344	D	WEIGHT OF WET SAMPLE = B-C	(lbs)	4.43
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.76	E	WET UNIT WEIGHT = D/A	(lbs)	132.5
C	WEIGHT OF CYLINDER	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	119.3 ~~106.4~~

NOTE: 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. 103	(grams)	8.4	R	WT. OF WATER = P-Q	(grams)	32.4
P	WT. OF WET SOIL & TARE	(grams)	334.9	S	WT. OF DRY SOIL = Q-O	(grams)	294.1 ~~24.0~~
Q	WT. OF DRY SOIL & TARE	(grams)	302.5	T	MOISTURE CONTENT = (R/S)X100	(%)	11.0 ~~135.0~~

PROCTOR TEST DATA _____ MAXIMUM DRY UNIT WT. (pcf) _____ OPTIMUM MOISTURE CONTENT (%) _____

COMPARISON WITH NUCLEAR GAUGE - ASTM D 2922 AND D 3017 QA ID: TD

TEST NO.			100	U	MOISTURE CONTENT	(%)	12.0
WET UNIT WT.		(pcf)	143.0	V	DRY UNIT WT.	(pcf)	129.7
DELTA DRY UNIT WT. = F - V			10.4		DELTA MOISTURE CONTENT = T - U		1.0

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 21 day Aug month 2000 year

SOURCE: ON SITE QA ID: TD

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 95% MOISTURE CONTENT RANGE: N/A

TEST LOCATION: PL-79 (Nuke Test) TEST NO.: DT-3

FIELD TEST DATA – ASTM D 2937 QA ID: TD/DLE

A	CYLINDER NO. 99-4 VOLUME[1] (cf)	~~99-4~~ 0.03344	D	WEIGHT OF WET SAMPLE = B–C (lbs)	4.47
B	WEIGHT OF SAMPLE & CYLINDER 2607.0 (lbs)	5.8	E	WET UNIT WEIGHT = D/A (lbs)	133.7
C	WEIGHT OF CYLINDER 602.0 (lbs)	~~602.2~~ 1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	120.8

NOTE: 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/CS

O	WT. OF TARE NO. M (grams)	13.6	R	WT. OF WATER = P–Q (grams)	92.7
P	WT. OF WET SOIL & TARE (grams)	974.7	S	WT. OF DRY SOIL = Q–O (grams)	868.4
Q	WT. OF DRY SOIL & TARE (grams)	882.0	T	MOISTURE CONTENT = (R/S)X100 (%)	10.7

PROCTOR TEST DATA EP-7 MAXIMUM DRY UNIT WT. (pcf) 119.7 OPTIMUM MOISTURE CONTENT (%) 13.8

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: CS

TEST NO.	79	U	MOISTURE CONTENT (%)	11.7
WET UNIT WT. (pcf)	136.8	V	DRY UNIT WT. (pcf)	122.4
DELTA DRY UNIT WT. = F – V	~~122.4~~ 1.6		DELTA MOISTURE CONTENT = T – U	1.0

COMMENTS:

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 04.1

DESCRIPTION: EPLTS DATE: 24 day Jul month 00 year

SOURCE: VHY Soil Pile QA ID: TO

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) (FILL) / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 90% MOISTURE CONTENT RANGE: N/A

TEST LOCATION: STA 11+10 ℄ LIFT 3 TEST NO.: EPLTS 54 ~~53~~ / DT #2

FIELD TEST DATA – ASTM D 2937 QA ID: TO

A	CYLINDER NO. 99-4 VOLUME(1)	(cf)	.03344	D	WEIGHT OF WET SAMPLE = B–C	(lbs)	4.67
B	WEIGHT OF SAMPLE & CYLINDER	(lbs)	5.40	E	WET UNIT WEIGHT = D/A	(lbs)	121.7
C	WEIGHT OF CYLINDER 6022	(lbs)	1.33	F	DRY UNIT WEIGHT = E/[1+(T/100)]	(pcf)	102.7

NOTE: 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. 18	(grams)	8.4	R	WT. OF WATER = P–Q	(grams)	46.4
P	WT. OF WET SOIL & TARE	(grams)	305.3	S	WT. OF DRY SOIL = Q–O	(grams)	250.5
Q	WT. OF DRY SOIL & TARE	(grams)	258.9	T	MOISTURE CONTENT = (R/S)X100	(%)	18.5

PROCTOR TEST DATA EP6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID:

TEST NO.		DL-53	U	MOISTURE CONTENT (%)	12.4
WET UNIT WT.	(pcf)	129.3	V	DRY UNIT WT. (pcf)	115.0
DELTA DRY UNIT WT. = F – V		12.3		DELTA MOISTURE CONTENT = T – U	6.1

COMMENTS: Large Void in Cyl. Due to Rock

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

DETERMINATION OF DENSITY (DRIVE CYLINDER) (ASTM D 2937)

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO: ~~GQ0409~~ GQ1029 TASK NO.: 042

DESCRIPTION: Phase II DATE: 18 day July month 00 year

SOURCE: ~~STATION 16+82 6' W. of C/L 90~~ Stockpile EP-6 QA ID: YD

SPECIFICATION REQUIREMENTS:

MATERIAL TYPE: (CIRCLE ONE) FILL / SUBGRADE / SUBBASE / CLAY / OTHER:

% COMPACTION: 90 MOISTURE CONTENT RANGE: N/A

TEST LOCATION: STATION 16+82 6' W of CL TEST NO.: PL-50 / DT #1

FIELD TEST DATA – ASTM D 2937 QA ID: TD

A	CYLINDER NO. 99-4 VOLUME[1] (cf)	0.03344	D	WEIGHT OF WET SAMPLE = B−C (lbs)	~~4.484.97~~ 2628.9
B	WEIGHT OF SAMPLE & CYLINDER 5.80 (lbs)	2630.9	E	WET UNIT WEIGHT = D/A (lbs)	~~60692.8~~ 135
C	WEIGHT OF CYLINDER 1.3265 (lbs)	602.0 GRAM	F	DRY UNIT WEIGHT = E/[1+(T/100)] (pcf)	113.9

NOTE: 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. 228 (grams)	8.0	R	WT. OF WATER = P−Q (grams)	66.9
P	WT. OF WET SOIL & TARE (grams)	454.8	S	WT. OF DRY SOIL = Q−O (grams)	379.9
Q	WT. OF DRY SOIL & TARE (grams)	387.9	T	MOISTURE CONTENT = (R/S)X100 (%)	17.6

PROCTOR TEST DATA EP-6 MAXIMUM DRY UNIT WT. (pcf) 112.0 OPTIMUM MOISTURE CONTENT (%) 15.5

COMPARISON WITH NUCLEAR GAUGE – ASTM D 2922 AND D 3017 QA ID: TD/CA

TEST NO. 51		PL-50	U	MOISTURE CONTENT (%)	14.5
WET UNIT WT. 133.5	(pcf)	133.5	V	DRY UNIT WT. 116.6 (pcf)	116.6
DELTA DRY UNIT WT. = F − V		~~0.05~~ 2.7		DELTA MOISTURE CONTENT = T − U	3.1

COMMENTS:

PLACEMENT FORMS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CDF KBT ~~CONCRETE~~ PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ1Ø29 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: Ø9 day OCT month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: CLSM- CDF MATERIAL (FLOWABLE FILL)

COMPRESSIVE STRENGTH: _____ (psi) AT _____ (days) SLUMP RANGE (in.): _____ to _____ AIR CONTENT (%): _____

FIELD AND LABORATORY: CONCRETE SUPPLIER: MIAMI VALLEY READY MIX TESTING LABORATORY GEOSYNTEC/FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
72	63650	6.50	1520	1555	1625	1605	A	60	64	Ø	8½" DIA.	—	P / —	TBD	6
69	63652	8.00	1611	1630	1655	—	A	60	—	Ø	—	—	P / —	TBD	—

LOCATION NOTES: (A) MUDMAT FOR THE CONTROL VALVE HOUSE.

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

OSDF ~~CONCRETE~~ PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 KS TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 18 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 20 (psi) AT 90 (days) SLUMP RANGE (in.): N/A to _____ AIR CONTENT (%): N/A

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	Flowability ASTM C 143 ~~SLUMP~~ KS (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
75	67399	10	1156	1235	1245	1240		75°	78°	—	4	N/A		KS	6
73	67400	10	1226	1303	1315	1305		75°	78°	—	8	N/A		KS	—

LOCATION NOTES: VH-6

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

KS 8/11/00

CDF ~~CONCRETE~~ PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04

DESCRIPTION: Phase II

DATE: 11 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: KS 8/11/00 ~~4250~~ (psi) AT _____ (days) SLUMP RANGE (in.): N/A to _____ AIR CONTENT (%): N/A

FIELD AND LABORATORY: CDF ~~CONCRETE~~ 8/11/00 SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: Spread ~~ASTM C 143 SLUMP~~ KS 8/11/00 (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
78	67283	10	0207	1428	1435	1435		82°	78°	—	8"	—	P	KS	6

LOCATION NOTES: VH-5

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04

DESCRIPTION: Phase II

DATE: 24 day July month 00 year

DESIGN MIX DATA: DESIGN MIX NO.: Flowable Fill

COMPRESSIVE STRENGTH: _____ (psi) AT _____ (days) SLUMP RANGE (in.): 4 1/2 to _____ AIR CONTENT (%): _____

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME				LOCATION	TEMPERATURE		TESTING					
			LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
69	67046	10	1210	1245	1255	1250		76°F	77°F	0	4		P		
75	67045	10	1156	1225	1235	No									

LOCATION NOTES: 7" SPREAD

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ~~0405~~ 1024 TASK NO.: 04-2

DESCRIPTION: Phase II DATE: 7 day 7 month 00 year

DESIGN MIX DATA: DESIGN MIX NO.: Control Fill

COMPRESSIVE STRENGTH: _____ (psi) AT _____ (days) SLUMP RANGE (in.): 5 to _____ AIR CONTENT (%): _____

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
25	66818	10	1342	1331	1340	Y		83°F	79°F	0		—		TD	6 ~~TD~~ 5
26	66819	10	1306	1350	1405	N		—	—						

~~LOCATION~~ TO NOTES: 9¼" W slump 4.5

VH 3 mud mat Cyls A to E

CONTROLLED DENSITY FILL

- **Placement Forms**
- **CDF Test Reports**

CDF TEST REPORTS

Fuller Mossbarger Scott & May
FMSM ENGINEERS

10018 International Boulevard
Cincinnati, Ohio 45246
(513) 860-1070

REPORT OF TEST ON CLSM-CDF MATERIAL

RECEIVED
SEP 2 1 2000

Cylinder/Set No. G-1

Project Number CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer

Material Supplier Miami Valley

Producer Certification Number 20 psi

Mixture Certification Number

Location of CLSM-CDF Valve house #2

FIELD DATA

Date Sampled 6/20/00

Flowability (in.)

Wet Unit Weight (pcf)

Truck No. 25

Ticket No.

Ambient Temp.(°F)

CLSM-CDF Temp.(°F)

Technician

Time of Test

LABORATORY DATA

Cylinder No.	1	2	3	4	5	6
Date Received	6/22/00	6/22/00	6/22/00	6/22/00	6/22/00	6/22/00
Date Tested	6/23/00	6/27/00	7/04/00	7/20/00	7/20/00	9/18/00
Test Age (days)	3	7	14	30	30	90
Dry Unit Weight (pcf)						
Maximum Load (lbs.)	300	353	398	497	505	608
Compressive Strength (psi)	40	50	60	70	70	90
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

10018 International Boulevard
Cincinnati, Ohio 45246
(513) 860-1070

REPORT OF TEST ON CLSM-CDF MATERIAL

RECEIVED
OCT 11 2000

Cylinder/Set No. G-2

Project Number CN2000001

PROJECT DATA

Project Name Fluor Fernald

Contractor Staver

Designer GeoSyntec

Material Supplier Miami Valley

Producer Certification Number N-A

Mixture Certification Number N-A

Location of CLSM-CDF VH-3 mud mat

FIELD DATA

Date Sampled 7/7/00

Flowability (in.) 4.5"

Wet Unit Weight (pcf) N-A

Truck No. 75

Ticket No. 66818

Ambient Temp.(°F) 79°F

CLSM-CDF Temp.(°F) 83°F

Technician TD

Time of Test 1:35 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D	E	
Date Received	7/10/00	7/10/00	7/10/00	7/10/00	7/10/00	
Date Tested	7/11/00	7/21/00	7/21/00	8/06/00	10/5/00	
Test Age (days)	4	7	14	30	90	
Dry Unit Weight (pcf)						
Maximum Load (lbs.)	200	273	381	485	585	
Compressive Strength (psi)	30	40	50	70	80	
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

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Cincinnati, Ohio 45246
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NOV 0 2 2000

REPORT OF TEST ON CLSM-CDF MATERIAL

Cylinder/Set No. G-3

Project Number CN2000001

PROJECT DATA

Project Name Fluor Fernald

Contractor Staver

Designer GeoSyntec

Material Supplier Miami Valley

Producer Certification Number

Mixture Certification Number

Location of CLSM-CDF VH4 Flowable Fill

FIELD DATA

Date Sampled 7/24/00

Flowability (in.) 4"

Wet Unit Weight (pcf)

Truck No. 69

Ticket No. 67046

Ambient Temp.(°F) 76°F

CLSM-CDF Temp.(°F) 77°F

Technician TD

Time of Test 12:50 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D	E	
Date Received	7/26/00	7/26/00	7/26/00	7/26/00	7/26/00	
Date Tested	7/28/00	7/32/00	8/07/00	8/24/00	10/24/00	
Test Age (days)	4	7	14	30	90	
Dry Unit Weight (pcf)						
Maximum Load (lbs.)	200	205	205	400	485	
Compressive Strength (psi)	30	30	30	60	70	
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

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FMSM ENGINEERS

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Cincinnati, Ohio 45246
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REPORT OF TEST ON CLSM-CDF MATERIAL

RECEIVED
DEC 19 2000

Cylinder/Set No. G-4

Project Number CN2000001

PROJECT DATA

Project Name Fluor Fernald

Contractor Staver

Designer GeoSyntec

Material Supplier Miami Valley

Producer Certification Number -

Mixture Certification Number -

Location of CLSM-CDF VH5 Flowable Fill

FIELD DATA

Date Sampled 8/11/00

Flowability (in.) 8"

Wet Unit Weight (pcf) -

Truck No. 78

Ticket No. 67283

Ambient Temp.(°F) 83°F

CLSM-CDF Temp.(°F) 78°F

Technician K.Sparks

Time of Test 2:40 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D	E	F
Date Received	8/14/00	8/14/00	8/14/00	8/14/00	8/14/00	8/14/00
Date Tested	8/12/00	8/18/00	8/25/00	9/10/00	10/10/00	11/09/00
Test Age (days)	2	7	14	30	60	90
Dry Unit Weight (pcf)						
Maximum Load (lbs.)	300	340	380	419	500	570
Compressive Strength (psi)	40	50	50	60	70	80
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

10018 International Boulevard
Cincinnati, Ohio 45246
(513) 860-1070

REPORT OF TEST ON CLSM-CDF MATERIAL

RECEIVED
OCT 19 2000

Cylinder/Set No. G-5

Project Number CN2000001

PROJECT DATA

Project Name Fluor Fernald

Contractor Staver

Designer GeoSyntec

Material Supplier Miami Valley

Producer Certification Number -

Mixture Certification Number -

Location of CLSM-CDF VH6 Flowable Fill

FIELD DATA

Date Sampled 8/18/00

Flowability (in.) 4"

Wet Unit Weight (pcf) -

Truck No. 75

Ticket No. 67399

Ambient Temp.(°F) 74°F

CLSM-CDF Temp.(°F) 78°F

Technician K.Sparks

Time of Test 12:41 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D	E	
Date Received	8/20/00	8/20/00	8/20/00	8/20/00	8/20/00	
Date Tested	8/20/00	8/25/00	9/01/00	9/17/00	10/17/00	
Test Age (days)	2	7	14	30	60	
Dry Unit Weight (pcf)						
Maximum Load (lbs.)	296	470	540	600	680	
Compressive Strength (psi)	40	70	80	90	96	
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

10018 International Boulevard
Cincinnati, Ohio 45246
(513) 860-1070

REPORT OF TEST ON CLSM-CDF MATERIAL

RECEIVED
JAN 17 2001

Cylinder/Set No. G-6

Project Number CN2000001

PROJECT DATA

Project Name Fluor Fernald

Contractor Staver

Designer GeoSyntec

Material Supplier Miami Valley

Producer Certification Number -

Mixture Certification Number -

Location of CLSM-CDF Mudmat for control valve house

FIELD DATA

Date Sampled 10/9/00

Flowability (in.) 8-1/2"

Wet Unit Weight (pcf) -

Truck No. 72

Ticket No. 63650

Ambient Temp.(°F) 60°F

CLSM-CDF Temp.(°F) 64°F

Technician

Time of Test 4:10 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D	E	F
Date Received	10/13/00	10/13/00	10/13/00	10/13/00	10/13/00	10/13/00
Date Tested	10/13/00	10/16/00	10/23/00	11/09/00	12/09/00	01/09/01
Test Age (days)	4	7	14	30	60	90
Dry Unit Weight (pcf)	2.9	2.9	2.9	3.0	2.9	2.9
Maximum Load (lbs.)	29	37	70	100	150	210
Compressive Strength (psi)	4	5	10	10	20	30
Removeability Modulus						

REMARKS:

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

CONCRETE

- Placement Forms
- Concrete Test Reports

PLACEMENT FORMS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1341 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 7 day June month 61 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
55	66025	3½	0850	0930	10:00			78°	75°		8	7.4	✓	TD	—

LOCATION NOTES: STOP PAD + well PAD @ V43

Driver ADVISED A TRAINEE WAS OPERATING The BATCH PLANT.

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1341 TASK NO.: 04.1

DESCRIPTION: Phase II

DATE: 25 day ~~may~~ month 01 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
55	65880	7	0730	0810	0911	N		55	69	0	3 3/4	6.8	✓	TD	—

LOCATION NOTES: Step Pads for VH1 + 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1341 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 27 day April month 01 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 3.3

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY: N/A

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
81	65528	5	0908		1030			56	72	—	4"	3.3		TD	0

LOCATION NOTES: STOP PADS FOR VH 4, VH 5, AND VH 6

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 5 day JAN month 01 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): to AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY Fm SM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
62	64471	4	1430	1455	1503	1455		43°F	52°F	0	2 1/4	3.5	✓	80	4

LOCATION NOTES: Concrete Anchor @ STA 23+27

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~GQ0409~~ 1029 KS TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 10 day Jan month 2001 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): N/A to N/A AIR CONTENT (%): N/A

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
81	64489	3	1407	1435	1447	1440		44°	58°	—	2¼	5.2	P	KS	4

LOCATION NOTES: cover @ ~St 23+~~25~~ KS 50

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 042

DESCRIPTION: Phase II DATE: 28 day Dec month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4,000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Vally TESTING LABORATORY Fm Sm

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
62	64435	10	1013	1050	1105	Y		8	32°F	—	7 3/4	5.4	F	TD	3
81	64436	10	1132	1210		Y		8	47°F	10	4 3/4				1

LOCATION NOTES: Concrete Cover - Sta ~~23+27~~ 24+35 to 25+15

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 15 day Dec month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
78	64426	9	1349	1416	1450	1420		40°	65°	—	4"	5.9%	P	KS	4

LOCATION NOTES: Concrete Culvert @ ~~[illegible]~~ & St. 27+50
Set # 22

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 16 day Nov month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
25	64182	8	1259	1340	1420	Y		55°	76°	—	3½	4.7	P	TD	4
72	64184	8	1358	1440	1500										

LOCATION NOTES: CVH E+W WALLS

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II DATE: 8 day Nov month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5" to 7" AIR CONTENT (%): 5 ± 1

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
7W	64084	7	0805	0840	—	Y		57°F	77°F	—	4"	5.7	✓	TD	4
28	64085	7	0847	—	—	N									
09	64086	7	0947	—	1055	N									

LOCATION NOTES: C. UH N+S WALL

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: G0~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 19 day Oct month 2002 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5" to 7" AIR CONTENT (%): 5±1

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY Fansm

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
25	63812	7	1137	1208	1254	YES		79	70	0	5 1/2	6 1/2			
39	~~39~~ 63815	7	1223	AM 1305 ~~1248~~	1340	no		79	—	—	—	—			
25	63819	5	1324	1354	1419	no		81	—	—	—	—			

LOCATION NOTES: CVH Floor Slab

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04

DESCRIPTION: Phase II

DATE: 12 day OCT month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5" to 7" AIR CONTENT (%): 5 ± 1

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
35	63725	6.5	1416	1503	1600	Y		65°	74°		6 3/4"	6.75%	P	TD	4
62	63729	6.5	1515	1610	1630	N									

LOCATION NOTES: UH6 E+W WALL

Note: Took Air Test Twice 1st was 7% 2nd was 6.75 Air suppose To Be 5 ± 1

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G01029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 09 day OCT month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5 to 7 AIR CONTENT (%): 5±2

FIELD AND LABORATORY: CONCRETE SUPPLIER: MIAMI VALLEY READY MIX TESTING LABORATORY GEOSYNTEC / FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
25	63642	6.50	1250	1330	1415	1345	A	59	65	0	7	5.0	P -	TBD	4
55	63645	6.50	1345	1430	1515	—	A	60	—	2	—	—	P -	TBD	0

LOCATION NOTES: A VALVE HOUSE #6 - NORTH & SOUTH WALLS

* 1% NON CHLORIDE CALCIUM ADDED TO THE MIX DUE TO COLDER WEATHER.

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1024 TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 3 day Oct month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
76	68048	6.5	1331	1400	1440	1405		81°	82°	—	5.75	5.7	✓	KS	4
22	68049	6.5	1417	1445	1535	—		81°	—	—	—	—	—	KS	—

LOCATION NOTES: VH-5 East + West Walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 28 day Sept month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): ~~5"~~ 3" to ~~8~~ 7" AIR CONTENT (%): 7.6 / 5.5 (5±1)

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
76	68009	6.5	1:56	1428	~~1430~~ TD	yes		71°	75°	NO	6 3/4	7.6	F	TD	4
↓	↓	↓	↓	↓	1519	↓		↓	↓	↓	↓	~~8~~ 7.6	F	TD	↓
72	68010	6.5	3:12	1543	1625	NO		↓	—		—	5.5	P		0

LOCATION NOTES: N. + S. Walls of VH 5

Truck #76 Had High Air Content - Retested With Same Result

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: Phase II

DATE: 15 day Sept month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 5 (4±1) AIR CONTENT (%): (5±1)

FIELD AND LABORATORY: CONCRETE SUPPLIER: MIAMI VALLEY TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
33	67810	4	1316	1340	1358	N		67°						JD	
62	67812	4	1403	1421	1446	Y			75		4 3/4	5.4		JD	4
25	67815	5	1447	1512	1529	N								JD	

LOCATION NOTES: East + West walls of U.H. 4

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 8 day Sept. month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
73	67699	4	0831	0900	0928	0905		~~67~~ 70°	82°	—	5.25	5.9	✓	KS	4
33	67701	4	0928	0959	1023	—		71°	—	—	—	—	— / —	KS	—
25	67702	5	1029	1058	1125	—		71°	—	—	—	—	— / —	KS	—

LOCATION NOTES: VH-4 North and South walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ 6029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 1 day Sept month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
62	67633	10	0759	0837	0905	0845		75°	83°	5	6.5	5.5	✓	KS	4
76	67635	10	0855	0928	0948	—		75°	—	—	—	—	—	KS	—
78	67636	10	0923	0956	1007	—		76°	—	—	—	—	—	KS	—
62	67659	10	1011	1044	1105	—		76°	—	5	—	—	—	KS	—

LOCATION NOTES: VH-6 Floor Slab

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: ERTS

DATE: 31 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
69	—	4	—	1245	—	1250		85°	92	—	—	—	✓ Temp	KS	—
72	67610	4	1246	1308	1352	1310		86°	89	—	5.5	5.6	✓	KS	4
69	67614	5	1328	1426	1450	—		86°	—	—	—	—	—	KS	—
72	67617	5	1453	—	—	—		86°	—	—	—	—	✓ Slump	KS	—
25	67620	4	1552	1620	1635	—		86°	—	—	—	—	—	KS	—

LOCATION NOTES: VH-3 East + west walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

Grout ~~CONCRETE~~ PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 30 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: N/A (psi) AT - (days) SLUMP RANGE (in.): N/A to _____ AIR CONTENT (%): N/A

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY N/A

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
78	67568	6.5	0907	0935	1300	N/A		83°	N/A	5@1011	N/A	N/A	N/A	KS	N/A
										3@1020					

LOCATION NOTES: VH-1 Floor

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPCTS

DATE: 29 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (°F/C)	ASTM C 1064 CONCRETE (°F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
78	67542	4	0832	0913	0937	0915		73°	82	—	6.25	4.5	✓	KS	4
62	67545	4	0922	0945	1025	—		75°	—	—	—	—	—	KS	—
76	67548	5	1024	1050	1118	—		76°	—	—	—	—	—	KS	—

LOCATION NOTES: VH-3 North + South walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~GQ0409~~ 1029KS TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 18 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.: N/A

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
76	67392	10	0730	0805	0832	0810		65°	81°	—	7	6.2	✓	KS	4
75	67399	10	0810	0853	0915	—		69°	—	—	—	—		KS	4
73	67396	10	0841	0930	0947	—		71°	—	—	—	—		KS	—
76	67398	10	0909	0955	1035	—		72°	—	—	—	—		KS	—

LOCATION NOTES: VH-5 footing Slab

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: GQ~~0409~~ 1029 TASK NO.: 04

DESCRIPTION: Phase II

DATE: 10 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
76	67253	4	0715	0805	0845	0809		72°	80°	—	5.5	5.4	P	KS	4
73	67257	4	0909	0957	1039	—		73°	—	64 oz PL	—	—	P	KS	—
72	67260	5	1022	1102	1125	—		75°	—	—	—	—	P	KS	—

LOCATION NOTES: VH-2 East + West Walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ0409 TASK NO.: 04.2

DESCRIPTION: ~~2~~ Phase II EPITS DATE: 4 day Aug month 00 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY Fmsm

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
78	67230	10	1340	1430	2:20			80°	84°					TD	
73	67232	10	02:12	1450	3:10	Y 1500		~~84°~~ 84/00			6 3/4"	3.5%		TD	4
76	67234	10	02:42	3:15	3:30									TD	
75	67235	10	03:06	3:35	3:47									TD	

LOCATION NOTES: VH4 Floor

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: ~~C00409~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 4 day Aug month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
73	67220	4	0904	0940	1015	0949		64°	80°	—	7	5.0	P	KS	4
78	67224	4	1006	1045	1130	—		—	—	48 oz Plast.	—	—	—	CS	—
73	67226	5	1109	1145	—	—		—	—	—	—	—	—	CS	—

LOCATION NOTES: VH-2 North + South Walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: ~~GQ0409~~ 1029 KS 8/3/00 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 3 day Aug. month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 3-5

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
75	67195	6	0701	0800	0831	0805		68°	80°	—	5.25"	4.5	P	KS	4
24	67199	6	0810	0845	0940	0905		65°	—	60 oz Pl	5.0"	—	—	KS	—

LOCATION NOTES: VH-1 East + West Walls

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~GQ0400~~ 1029 ks TASK NO.: 04.2

DESCRIPTION: EPLTS

DATE: 27 day July month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): ~~3.0~~ ks 3.0 to 7.0 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

			TIME				LOCATION	TEMPERATURE		TESTING					
TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	LOAD BATCHED	BEGIN PLACEMENT	FINISH PLACEMENT	SAMPLED		AMBIENT (F/C)	ASTM C 1064 CONCRETE (F/C)	WATER ADDED (gal)	ASTM C 143 SLUMP (in.)	ASTM C 173 AIR CONTENT (%)	PASS/ FAIL	QA ID	NO. OF CYLINDERS
24	67114	4	8:12	8:55	9:42	9:05		65°	80°	—	4.0	5.0	P	KS	4
70	67116	4	8:51	9:50	10:23	—		—	—	ks 3/20/00 +3	+6.0	—	—	—	—
* 75	67117	5	9:34	10:26	11:04	—		—	—	—	—	—	—	—	—
24	67122	5	10:59	11:35	11:27	—		—	—	* 128 oz	—	—		QI	—
33	67127	2	1229	1250	1320	—		—	—	—	—	—	—	—	—

LOCATION NOTES: Walls for VH-1 north side + South side

* truck sent away before it could be completely unloaded due to 90 time limit

* 128 oz of plastisizer added to 5 yards

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: G~~0400~~ 1029 TASK NO.: 04.2

DESCRIPTION: EPLTS DATE: 13 day July month 00 year

DESIGN MIX DATA: DESIGN MIX NO.: 4000 2% MR AIR Mi

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5" to +- 2 AIR CONTENT (%):

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
78	66883	10	0609	0700	0715	Y		71°F	83	0	7 3/8	3.75		TD	4
76	66882	10	0551	0630	0650	N									
75	66884	10	0626	0725	0740	N									
73	66885	10	0642	0750	0800	N									

LOCATION NOTES: VH 3 Footer

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO

PROJECT NO.: ~~GQ0409~~ 1029 TASK NO.: 04.2

DESCRIPTION: VH-2

DATE: 30 day June month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 3 to 7 AIR CONTENT (%): 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd^3)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (°F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (°F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
75	66726	8	8:15	8:55	9:05	9:00		64°	82°	—	6.25	5.0	P	KRS	4
78	66725	8	7:59	0835	0850	No									
	66728	8				No									
73	66730	8	0857	0925	0955	No									
75	66734	3	1041	10:45	1100	No									

LOCATION NOTES: Footing for Valve House 2

GEOSYNTEC CONSULTANTS

FLUOR DANIEL FERNALD

CONCRETE PLACEMENT FORM

PROJECT: ON-SITE DISPOSAL FACILITY (OSDF)

LOCATION: FERNALD, OHIO PROJECT NO.: GQ0409 TASK NO.: 04

DESCRIPTION: EPLTS DATE: 27 day 6 month 2000 year

DESIGN MIX DATA: DESIGN MIX NO.:

COMPRESSIVE STRENGTH: 4000 (psi) AT 28 (days) SLUMP RANGE (in.): 5.0 to 7.0 AIR CONTENT (%): ~~HH~~ KS 6/27/00 4-6

FIELD AND LABORATORY: CONCRETE SUPPLIER: Miami Valley TESTING LABORATORY FMSM

TRUCK NO.	TICKET NO.	SIZE OF LOAD (yd³)	TIME: LOAD BATCHED	TIME: BEGIN PLACEMENT	TIME: FINISH PLACEMENT	TIME: SAMPLED	LOCATION	TEMPERATURE: AMBIENT (F/C)	TEMPERATURE: ASTM C 1064 CONCRETE (F/C)	TESTING: WATER ADDED (gal)	TESTING: ASTM C 143 SLUMP (in.)	TESTING: ASTM C 173 AIR CONTENT (%)	TESTING: PASS/FAIL	TESTING: QA ID	TESTING: NO. OF CYLINDERS
76	66647	8.0	8:20	8:50	9:03	8:55		71°	78°	—	6.5	5.4	P	KRS	4

LOCATION NOTES: Footing for VH-1

CONCRETE TEST REPORTS

Fuller Mossbarger Scott & May
FMSM ENGINEERS

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REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F1

Project No. CN2000001

PROJECT DATA

Project Name: Fernald
Contractor: STAVER
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE
Supplied Strength & Type: 4,000 AE
Location of Concrete: Footing for VH-1

FIELD DATA

Date Sampled: 6/27/00
Slump: 6-1/2"
Air Content: 5.4%
Truck No.: 76
Ticket No.: 66647
Ambient Temp.: 71°F
Concrete Temp.: 78°F
Technician: KS
Time of Test: 8:55 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	6/28/00	6/28/00	6/28/00			
Date Tested	6/29/00	7/04/00	7/25/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	62,000	102,000	135,500			
Compressive Strength, psi	2,190	3,610	4,790			
Cylinder Weight in Lbs.	27.8	27.6	27.8			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F2

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete Valve house 2 footing

FIELD DATA

Date Sampled 6/30/00

Slump 6.75"

Air Content 5%

Truck No. 75

Ticket No. 66726

Ambient Temp. 64°F

Concrete Temp. 82°F

Technician KS(GeoSyntec)

Time of Test 9:00 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	7/05/00	7/05/00	7/05/00			
Date Tested	7/05/00	7/07/00	7/28/00			
Age When Tested, Days	5	7	28			
Maximum Load, Pounds	106,500	125,500	145,000			
Compressive Strength, psi	3,770	4,440	5,130			
Cylinder Weight in Lbs.	27.9	28.0	28.1			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F3

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000
Supplied Strength & Type: 4,000
Location of Concrete: VH3 - Footer

FIELD DATA

Date Sampled: 7/13/00
Slump: 7-3/8"
Air Content: 3.75%
Truck No.: 78
Ticket No.: 66883
Ambient Temp.: 71°F
Concrete Temp.: 83°F
Technician: TD (GeoSyntec)
Time of Test: 7:10 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	7/14/00	7/14/00	7/14/00			
Date Tested	7/15/00	7/20/00	8/10/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	102,500	111,500	160,000			
Compressive Strength, psi	3,630	3,940	5,660			
Cylinder Weight in Lbs.	28.5	28.5	28.5			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

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Cylinder/Set No. F4

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE
Supplied Strength & Type: 4,000 AE
Location of Concrete: VH-1 wall (N&S)

FIELD DATA

Date Sampled: 7/27/00
Slump: 4"
Air Content: ~~8"~~ 5%
Truck No.: 24
Ticket No.: 67114
Ambient Temp.: 65°F
Concrete Temp.: 80°F
Technician: K. Sparks
Time of Test: 9:10 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	7/28/00	7/28/00	7/28/00			
Date Tested	7/31/00	8/03/00	8/24/00			
Age When Tested, Days	4	7	28			
Maximum Load, Pounds	110,000	120,500	145,000			
Compressive Strength, psi	3,890	4,260	5,130			
Cylinder Weight in Lbs.	28.5	28.5	28.5			
Type of Break	Shear & Cone	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

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SEP 5 2000

Cylinder/Set No. F5

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE
Supplied Strength & Type: 4,000 AE
Location of Concrete: VH-1 east and west walls

FIELD DATA

Date Sampled: 8/3/00
Slump: 5.25"
Air Content: 4.5%
Truck No.: 75
Ticket No.: 67195
Ambient Temp.: 68°F
Concrete Temp.: 80°F
Technician: K. Sparks
Time of Test: 8:00 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/04/00	8/04/00	8/04/00			
Date Tested	8/05/00	8/10/00	8/31/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	85,000	117,500	181,000			
Compressive Strength, psi	3,010	4,160	5,910			
Cylinder Weight in Lbs.	28.5	28.5	28.7			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

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SEP 06 2000

Cylinder/Set No. F6

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000
Supplied Strength & Type: 4,000
Location of Concrete: VH-2 north and south walls

FIELD DATA

Date Sampled: 8/4/00
Slump: 7"
Air Content: 5.0%
Truck No.: 73
Ticket No.: 67220
Ambient Temp.: 64°F
Concrete Temp.: 80°F
Technician: K. Sparks
Time of Test: 9:49 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/05/00	8/05/00	8/05/00			
Date Tested	8/06/00	8/11/00	9/01/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	75,000	100,000	125,000			
Compressive Strength, psi	2,650	3,540	4,420			
Cylinder Weight in Lbs.	28.4	28.0	28.4			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
SEP 06 2000

Cylinder/Set No. F7

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000

Supplied Strength & Type 4,000

Location of Concrete VH-4 floor

FIELD DATA

Date Sampled 8/4/00

Slump 7"

Air Content 3.5%

Truck No. 78

Ticket No. 67230

Ambient Temp. 80°F

Concrete Temp. 84°F

Technician TD

Time of Test 3:00 p.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/05/00	8/05/00	8/05/00			
Date Tested	8/06/00	8/11/00	9/01/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	101,500	132,500	160,000			
Compressive Strength, psi	3,590	4,690	5,660			
Cylinder Weight in Lbs.	28.9	28.9	28.9			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
SEP 13 2000

Cylinder/Set No. F8

Project No. CN2000001

PROJECT DATA

Project Name: Fluor Fernald
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 Ae
Supplied Strength & Type: 4,000 AE
Location of Concrete: VH2 east and west walls

FIELD DATA

Date Sampled: 8/10/00
Slump: 5.5"
Air Content: 5.4%
Truck No.: 76
Ticket No.: 67253
Ambient Temp.: 72°F
Concrete Temp.: 80°F
Technician: KS
Time of Test: 8:10 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/11/00	8/11/00	8/11/00			
Date Tested	8/12/00	8/18/00	9/08/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	92,000	98,000	121,500			
Compressive Strength, psi	3,250	3,470	4,300			
Cylinder Weight in Lbs.	28.1	28.1	28.2			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
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SEP 19 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F9

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH-5 footing slab

FIELD DATA

Date Sampled 8/18/00

Slump 7"

Air Content 6.2%

Truck No. 76

Ticket No. 67392

Ambient Temp. 65°F

Concrete Temp. 81°F

Technician KS

Time of Test 8:10 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/18/00	8/18/00	8/18/00			
Date Tested	8/20/00	8/25/00	9/15/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	75,000	113,500	136,500			
Compressive Strength, psi	2,650	4,010	4,830			
Cylinder Weight in Lbs.	27.3	27.5	27.5			
Type of Break	Shear	Shear	Shear			

REMARKS

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SEP 28 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F10

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH-3 north and south walls

FIELD DATA

Date Sampled 8/29/00

Slump 6.25"

Air Content 4.5%

Truck No. 78

Ticket No. 67542

Ambient Temp. 73°F

Concrete Temp. 82°F

Technician KS

Time of Test 9:15 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	8/30/00	8/30/00	8/30/00			
Date Tested	8/31/00	9/05/00	9/26/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	80,000	100,000	125,500			
Compressive Strength, psi	2,830	3,540	4,440			
Cylinder Weight in Lbs.	28.4	28.6	28.6			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
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RECEIVED
OCT 05 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F11

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH-3 east and west walls

FIELD DATA

Date Sampled 8/31/00

Slump 5.5"

Air Content 5.6%

Truck No. 72

Ticket No. 67610

Ambient Temp. 85°F

Concrete Temp. 89°F

Technician KS

Time of Test 1:20 p.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	9/01/00	9/01/00	9/01/00			
Date Tested	9/02/00	9/07/00	9/28/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	52,500	88,500	116,500			
Compressive Strength, psi	1,860	3,130	4,120			
Cylinder Weight in Lbs.	28.2	28.7	28.7			
Type of Break	Shear	Shear	Shear			

REMARKS

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OCT 06 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F12

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE
Supplied Strength & Type: 4,000 AE
Location of Concrete: VH-6 floor slab

FIELD DATA

Date Sampled: 9/1/00
Slump: 6.5" @
Air Content: 5.5% @
Truck No.: 62 @
Ticket No.: 67633 @
Ambient Temp.: 75°F
Concrete Temp.: 83°F @
Technician: KS
Time of Test: 0845 @

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	9/02/00	9/02/00	9/02/00			
Date Tested	9/05/00	9/08/00	9/29/00			
Age When Tested, Days	4	7	28			
Maximum Load, Pounds	94,000	116,000	125,500			
Compressive Strength, psi	3,320	4,100	4,440			
Cylinder Weight in Lbs.	28.2	28.4	28.3			
Type of Break	Shear	Shear	Shear			

REMARKS

Thos. A. Hart

FULLER, MOSSBARGER, SCOTT AND MAY
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OCT 11 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F13

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH-4 north and south walls

FIELD DATA

Date Sampled 9/8/00

Slump 5.25"

Air Content 5.9%

Truck No. 73

Ticket No. 67699

Ambient Temp. 70°F

Concrete Temp. 82°F

Technician K. Sparks

Time of Test 9:05 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	9/09/00	9/09/00	9/09/00			
Date Tested	9/11/00	9/15/00	10/6/00			
Age When Tested, Days	3	7	28			
Maximum Load, Pounds	89,500	106,000	130,000			
Compressive Strength, psi	3,170	3,750	4,600			
Cylinder Weight in Lbs.	27.7	28.0	27.9			
Type of Break	Shear	Shear	Shear			

REMARKS

M. A. Haus

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
OCT 24 2000

Cylinder/Set No. F14

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH-4 east and west walls

FIELD DATA

Date Sampled 9/15/00

Slump 4.75"

Air Content 5.4%

Truck No. 62

Ticket No. 67812

Ambient Temp. 67°F

Concrete Temp. 75°F

Technician TD

Time of Test 2:30 p.m.

BORATORY DATA

Cylinder No.	A	B	C			
Date Received	9/18/00	9/18/00	9/18/00			
Date Tested	9/18/00	9/22/00	10/18/00			
Age When Tested, Days	3	7	28			
Maximum Load, Pounds	87,000	121,000	155,000			
Compressive Strength, psi	3,080	4,280	5,480			
Cylinder Weight in Lbs.	28.5	28.7	28.0			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
FMSM ENGINEERS

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REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F15

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete North and south walls of VH-5

FIELD DATA

Date Sampled 9/28/00

Slump 6-3/4"

Air Content 7.6%

Truck No. 76

Ticket No. 68009

Ambient Temp. 71°F

Concrete Temp. 75°F

Technician TD

Time of Test 2:40 p.m.

\BORATORY DATA

Cylinder No.	A	B	C			
Date Received	9/29/00	9/29/00	9/29/00			
Date Tested	10/2/00	10/5/00	10/26/00			
Age When Tested, Days	3	7	28			
Maximum Load, Pounds	80,000	95,500	122,500			
Compressive Strength, psi	2,830	3,380	4,330			
Cylinder Weight in Lbs.	27.4	27.6	27.7			
Type of Break	Shear	Shear	Shear			

REMARKS

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NOV 0 3 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F16

Project No. CN2000001

PROJECT DATA

Project Name: EPLTS
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE
Supplied Strength & Type: 4,000 AE
Location of Concrete: VH-5 E&W walls

FIELD DATA

Date Sampled: 10/3/00
Slump: 5.75"
Air Content: 5.7%
Truck No.: 76
Ticket No.: 68048
Ambient Temp.: 81°F
Concrete Temp.: 82°F
Technician: KS
Time of Test: 2:05 p.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	10/4/00	10/04/00	10/04/00			
Date Tested	10/6/00	10/10/00	10/31/00			
Age When Tested, Days	3	7	28			
Maximum Load, Pounds	80,000	92,000	130,000			
Compressive Strength, psi	2,830	3,250	4,600			
Cylinder Weight in Lbs.	28.0	28.1	28.2			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

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REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F17

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete Valve house #6 - north and south walls

FIELD DATA

Date Sampled 10/9/00

Slump 7"

Air Content 5%

Truck No. 25

Ticket No. 63642

Ambient Temp. 59°F

Concrete Temp. 65°F

Technician TB

Time of Test 1:45 p.m.

BORATORY DATA

Cylinder No.	A	B	C			
Date Received	10/10/00	10/10/00	10/10/00			
Date Tested	10/11/00	10/16/00	11/06/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	60,500	105,000	125,000			
Compressive Strength, psi	2,140	3,710	4,420			
Cylinder Weight in Lbs.	28.3	28.4	28.4			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
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NOV 13 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F18

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete VH6 east and west wall

FIELD DATA

Date Sampled 10/12/00

Slump 6-3/4"

Air Content 6.75%

Truck No. 25

Ticket No. 63725

Ambient Temp. 65°F

Concrete Temp. 74°F

Technician TD

Time of Test 3:10 p.m.

BORATORY DATA

Cylinder No.	A	B	C			
Date Received	10/13/00	10/13/00	10/13/00			
Date Tested	10/19/00	11/09/00	11/09/00			
Age When Tested, Days	7	28	28			
Maximum Load, Pounds	102,500	120,000	120,500			
Compressive Strength, psi	3,630	4,240	4,260			
Cylinder Weight in Lbs.	27.9	28.	28.			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

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NOV 2 1 2000

REPORT OF TEST ON CONCRETE CYLINDERS

Cylinder/Set No. F19

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000 AE

Supplied Strength & Type 4,000 AE

Location of Concrete Control valve house floor slab

FIELD DATA

Date Sampled 10/19/00

Slump 5-1/2"

Air Content 6.5%

Truck No. 25

Ticket No. 63812

Ambient Temp. 79°F

Concrete Temp. 70°F

Technician CS

Time of Test 12:30 p.m.

BORATORY DATA

Cylinder No.	A	B	C			
Date Received	10/20/00	10/20/00	10/20/00			
Date Tested	10/21/00	10/26/00	11/16/00			
Age When Tested, Days	2	7	28			
Maximum Load, Pounds	85,500	93,000	130,000			
Compressive Strength, psi	3,020	3,290	4,600			
Cylinder Weight in Lbs.	29.3	27.8	28.0			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
DEC 13 2000

Cylinder/Set No. F20

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000

Supplied Strength & Type 4,000

Location of Concrete Control V.H. North & South walls

FIELD DATA

Date Sampled 11/8/00

Slump 4"

Air Content 5.7%

Truck No. 76

Ticket No. 64084

Ambient Temp. 57°F

Concrete Temp. 77°F

Technician TD

Time of Test 8:50 a.m.

LABORATORY DATA

Cylinder No.	A	B				
Date Received	11/09/00	11/09/00				
Date Tested	11/11/00	12/06/00				
Age When Tested, Days	7	28				
Maximum Load, Pounds	126,500	140,500				
Compressive Strength, psi	4,470	4,970				
Cylinder Weight in Lbs.	28.7	28.8				
Type of Break	Shear	Shear				

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
DEC 19 2000

Cylinder/Set No. F21

Project No. CN2000001

PROJECT DATA

Project Name EPLTS

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000

Supplied Strength & Type 4,000

Location of Concrete CVH E&W walls

FIELD DATA

Date Sampled 11/16/00

Slump 3-1/2"

Air Content 4.7%

Truck No. 25

Ticket No. 64182

Ambient Temp. 55°F

Concrete Temp. 76°F

Technician TD

Time of Test 2:35 p.m.

\BORATORY DATA

Cylinder No.	A	B	C			
Date Received	11/17/00	11/17/00	11/17/00			
Date Tested	11/28/00	11/28/00	12/14/00			
Age When Tested, Days	12	12	28			
Maximum Load, Pounds	147,500	150,000	165,500			
Compressive Strength, psi	5,220	5,310	5,850			
Cylinder Weight in Lbs.	28.9	28.9	29.0			
Type of Break	Shear	Shear	Shear			

REMARKS

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REPORT OF TEST ON CONCRETE CYLINDERS

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JAN 18 2001

Cylinder/Set No. F22

Project No. CN2000001

PROJECT DATA

Project Name: Fernald
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000
Supplied Strength & Type: 4,000
Location of Concrete: Concrete cover at Sta. 27+50

FIELD DATA

Date Sampled: 12/15/00
Slump: 4"
Air Content: 5.8%
Truck No.: 78
Ticket No.: 64426
Ambient Temp.: 44°F
Concrete Temp.: 65°F
Technician: KS
Time of Test: 1420

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	12/16/00	12/16/00	12/16/00			
Date Tested	12/22/00	01/12/01	01/12/01			
Age When Tested, Days	7	28	28			
Maximum Load, Pounds	113,000	133,500	140,000			
Compressive Strength, psi	4,000	4,720	4,950			
Cylinder Weight in Lbs.	27.9	28.3	28.1			
Type of Break	Shear	Shear	Shear			

REMARKS

M. A. Harris

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
JAN 31 2001

Cylinder/Set No. F23

Project No. CN2000001

PROJECT DATA

Project Name: Fernald
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE at 28 days
Supplied Strength & Type: 4,000 AE at 28 days
Location of Concrete: Station 24+35 to 25+15

FIELD DATA

Date Sampled: 12/28/00
Slump: 4 3/4 (OK)
Air Content: N A
Truck No.: 81
Ticket No.: 64436
Ambient Temp.: 8°F
Concrete Temp.: ~~32°F~~ 47°F
Technician: TD
Time of Test: 12:15 p.m.

LABORATORY DATA

Cylinder No.	A					
Date Received	12/29/00					
Date Tested	01/25/01					
Age When Tested, Days	28					
Maximum Load, Pounds	75,000					
Compressive Strength, psi	2,650					
Cylinder Weight in Lbs.	28.9					
Type of Break	Shear					

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY ENGINEERS, INC.

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
FEB 27 2001

Cylinder/Set No. F24

Project No. CN2000001

PROJECT DATA

Project Name: Fernald
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE at 28 days
Supplied Strength & Type: 4,000 AE at 28 days
Location of Concrete: SP4 24+35 and 25+15

FIELD DATA

Date Sampled: 12/28/00
Slump: 7-3/4"
Air Content: 5.4%
Truck No.: 62
Ticket No.: 64435
Ambient Temp.: 8°F
Concrete Temp.: 32°F
Technician: TD
Time of Test: 11:00 a.m.

LABORATORY DATA

Cylinder No.	A	B	C			
Date Received	01/02/01	01/02/01	01/02/01			
Date Tested	01/25/01	01/25/01	02/22/01			
Age When Tested, Days	28	28	56			
Maximum Load, Pounds	42,500	42,000	65,000			
Compressive Strength, psi	1,500	1,490	2,300			
Cylinder Weight in Lbs.	29.2	29.1	29.0			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

Fuller Mossbarger Scott & May
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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
FEB 0 7 2001

Cylinder/Set No. F25

Project No. CN2000001

PROJECT DATA

Project Name Fernald

Contractor Staver

Designer GeoSyntec

Concrete Supplier Miami Valley

Specified Strength & Type 4,000

Supplied Strength & Type 4,000

Location of Concrete Concrete cover station 23 and 27 to 24 and 10

FIELD DATA

Date Sampled 1/5/01

Slump 2-1/4"

Air Content 3.5%

Truck No. 62

Ticket No. 64471

Ambient Temp. 42°F

Concrete Temp. 52°F

Technician TD

Time of Test 3:00 p.m.

BORATORY DATA

Cylinder No.	A	B	C	D		
Date Received	01/08/01	01/08/01	01/08/01			
Date Tested	01/08/01	01/12/01	02/02/00			
Age When Tested, Days	2	7	28	Hold		
Maximum Load, Pounds	88,000	145,000	162,500			
Compressive Strength, psi	3,110	5,130	5,750			
Cylinder Weight in Lbs.	28.8	29.3	29.4			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY

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REPORT OF TEST ON CONCRETE CYLINDERS

RECEIVED
FEB 0 2 2001

Cylinder/Set No. F26

Project No. CN2000001

PROJECT DATA

Project Name: Fernald
Contractor: Staver
Designer: GeoSyntec
Concrete Supplier: Miami Valley
Specified Strength & Type: 4,000 AE at 28 days
Supplied Strength & Type: 4,000 AE at 28 days
Location of Concrete: 23+50 CMP support

FIELD DATA

Date Sampled: 1/10/01
Slump: 2-1/4"
Air Content: 5.2%
Truck No.: 81
Ticket No.: 64489
Ambient Temp.: 44°F
Concrete Temp.: 58°F
Technician: KS
Time of Test: 2:40 p.m.

LABORATORY DATA

Cylinder No.	A	B	C	D		
Date Received	01/16/01	01/16/01	01/16/01			
Date Tested	01/17/01	02/07/01	02/07/01			
Age When Tested, Days	7	28	28	Hold		
Maximum Load, Pounds	92,000	149,500	150,500			
Compressive Strength, psi	3,250	5,290	5,320			
Cylinder Weight in Lbs.	28.5	28.5	28.5			
Type of Break	Shear	Shear	Shear			

REMARKS

FULLER, MOSSBARGER, SCOTT AND MAY
ENGINEERS, INC.

PAINTING FIELD REPORTS

EPLTS – VALVE HOUSE # 2 EPOXY – FINISH COAT (MIL THICKNESS) 3-8-01			
LDS	RLCS	LCS	LTSM
11.0	9.9	9.9	11.1
10.7	10.7	10.6	11.3
9.7	10.8	10.1	11.0
AVG. 10.46	AVG. 10.46	AVG. 10.2	AVG. 11.13

EPLTS – VALVE HOUSE # 3 EPOXY – FINISH COAT			
LDS	RLCS	LCS	LTSM
12.0	8.5	9.1	9.2
11.0	10.5	11.3	8.0
15.3	9.7	12.4	8.3
AVG. 12.76	AVG. 9.56	AVG. 10.93	AVG. 8.5

EPLTS – VALVE HOUSE # 4 EPOXY – FINISH COAT			
LDS	RLCS	LCS	LTSM
8.0	8.6	12.0	9.9
8.1	8.6	11.6	12.0
8.6	9.3	8.9	11.1
AVG. 8.23	AVG. 8.83	AVG. 10.83	AVG. 11.0

EPLTS – VALVE HOUSE # 5 EPOXY – FINISH COAT			
LDS	RLCS	LCS	LTSM
9.4	12.0	11.7	15.5
9.8	14.7	11.4	9.8
10.9	15.5	11.3	11.9
AVG. 10.03	AVG. 14.06	AVG. 11.46	AVG. 12.4

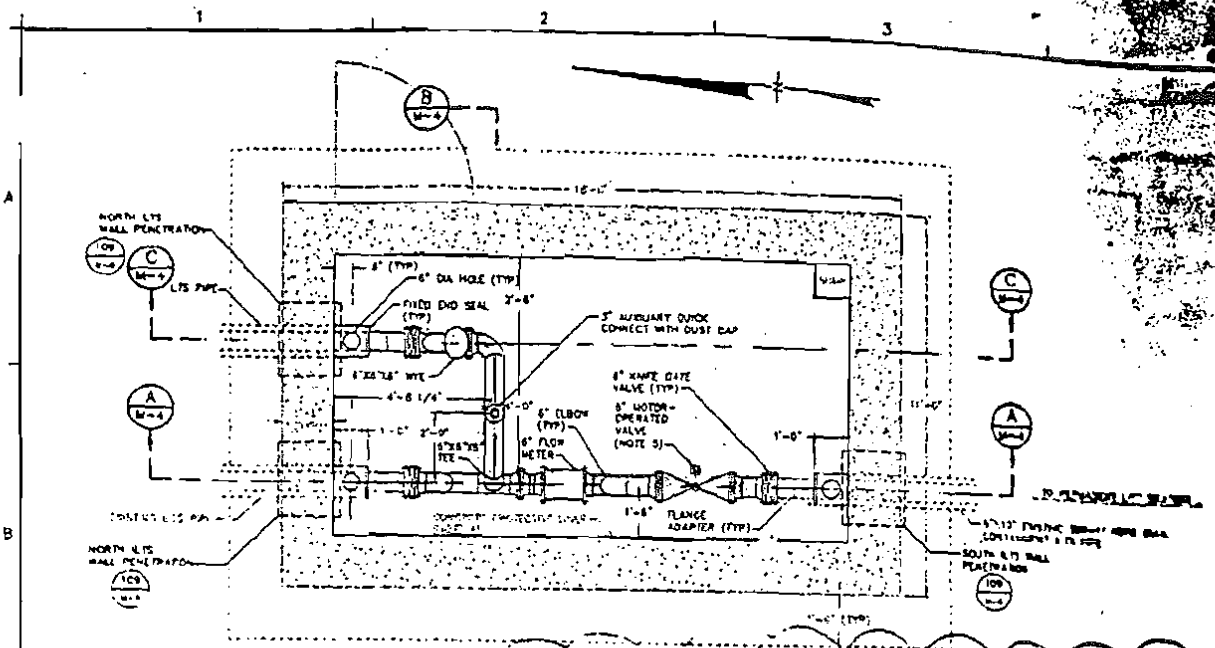
EPLTS – VALVE HOUSE # 6 EPOXY – FINISH COAT			
LDS	RLCS	LCS	LTSM
9.8	9.7	13.0	9.0
9.3	10.6	11.1	11.6
9.2	10.8	14.7	12.7
AVG. 9.43	AVG. 10.36	AVG. 12.93	AVG. 11.1

EPLTS – CONTROL VALVE HOUSE EPOXY – FINISH COAT (MIL THICKNESS) 3-8-01			
11.7			
10.3			
13.6			
AVG. 11.86			

EPLTS – VALVE HOUSE # 1 EPOXY – FINISH COAT			
LDS / STACK	RLCS	LCS	LTSM
8.1	12.0	9.2	8.5
14.6 9.4	11.5	11.3	8.2
10.6 8.7	10.8	11.0	12.5
AVG.11.1 13.4	AVG. 11.43	AVG. 10.5	AVG. 10.5
AVG. 10.5			

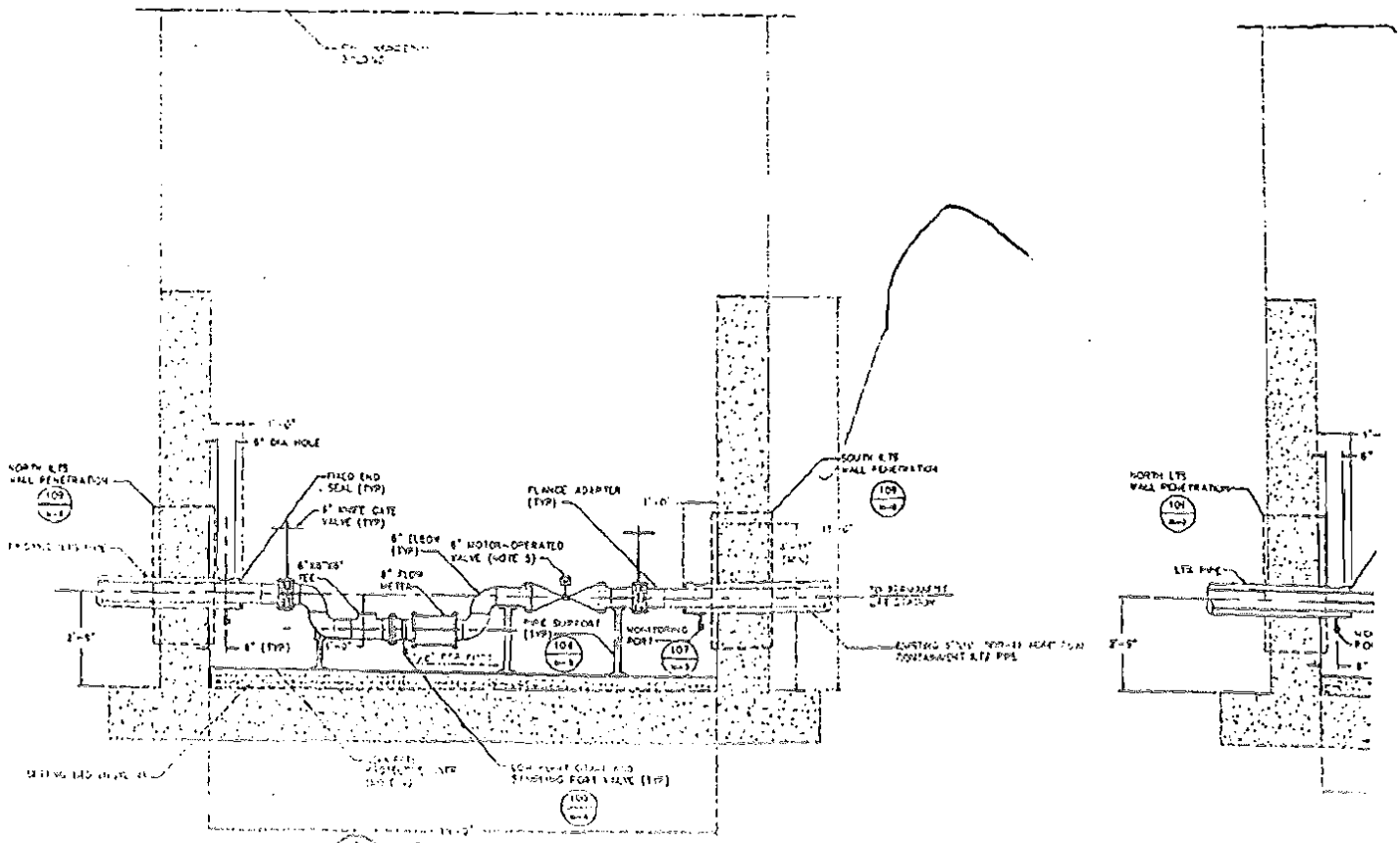
EPLTS – CONTROL VALVE HOUSE EPOXY – PRIMER COAT (MIL THICKNESS) 3-8-01			
10.9			
10.8			
8.1			
AVG. 9.93			

EPLTS – VALVE HOUSE # 1 EPOXY – PRIMER COAT			
LDS	RLCS	LCS	LTSM
5.8 STACK	5.1	5.5	6.3
5.7 4.8	5.5	8.	6.4
6.5 4.4	6.4	7.4	5.9
AVG. 6 5.9	AVG. 5.6	AVG. 6.96	AVG. 5.03
AVG. 5.03			

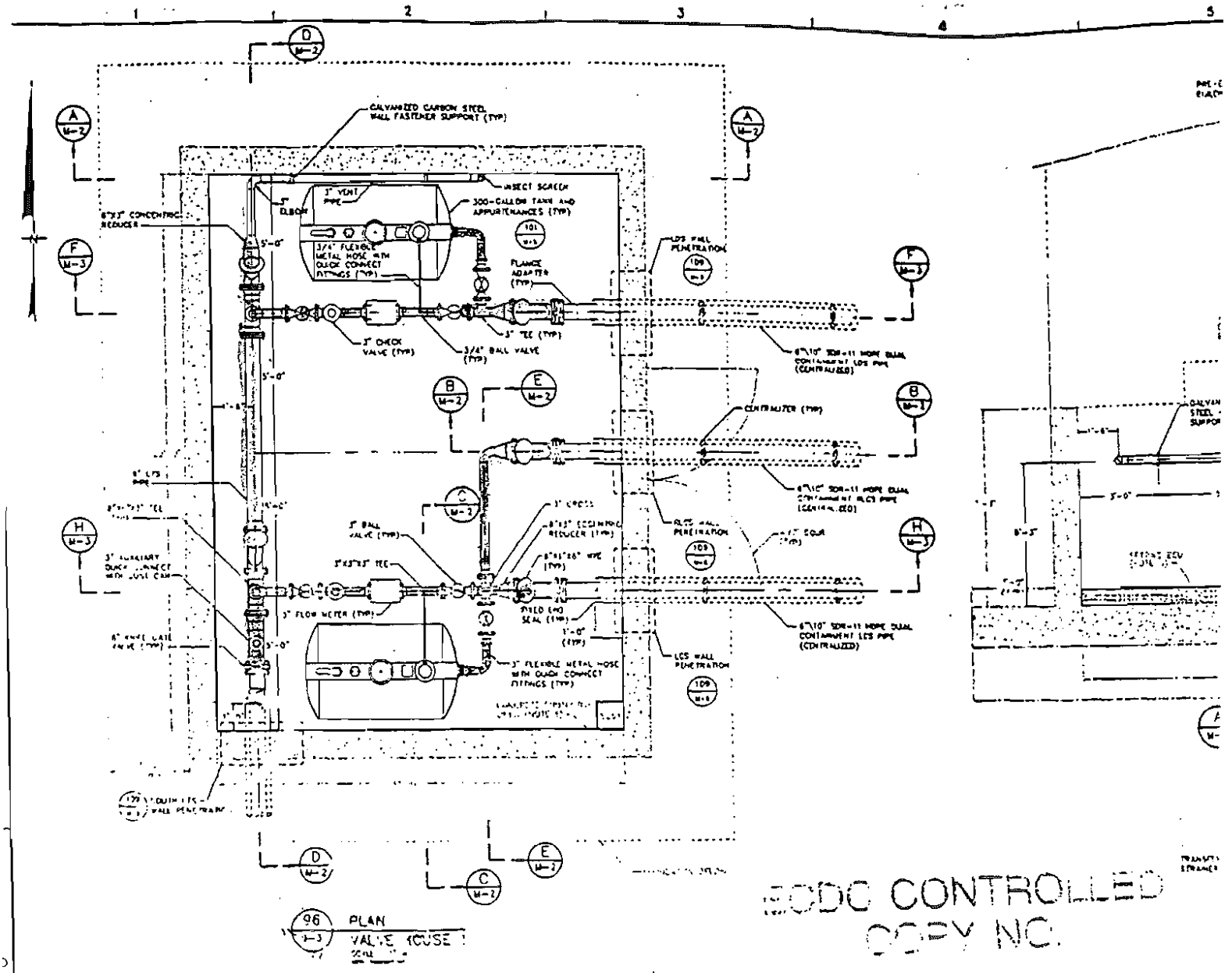


98 PLAN
CONTROL VALVE HOUSE

CONTROLLED
COPY NO.
8812



A SECTION
CONTROL VALVE HOUSE



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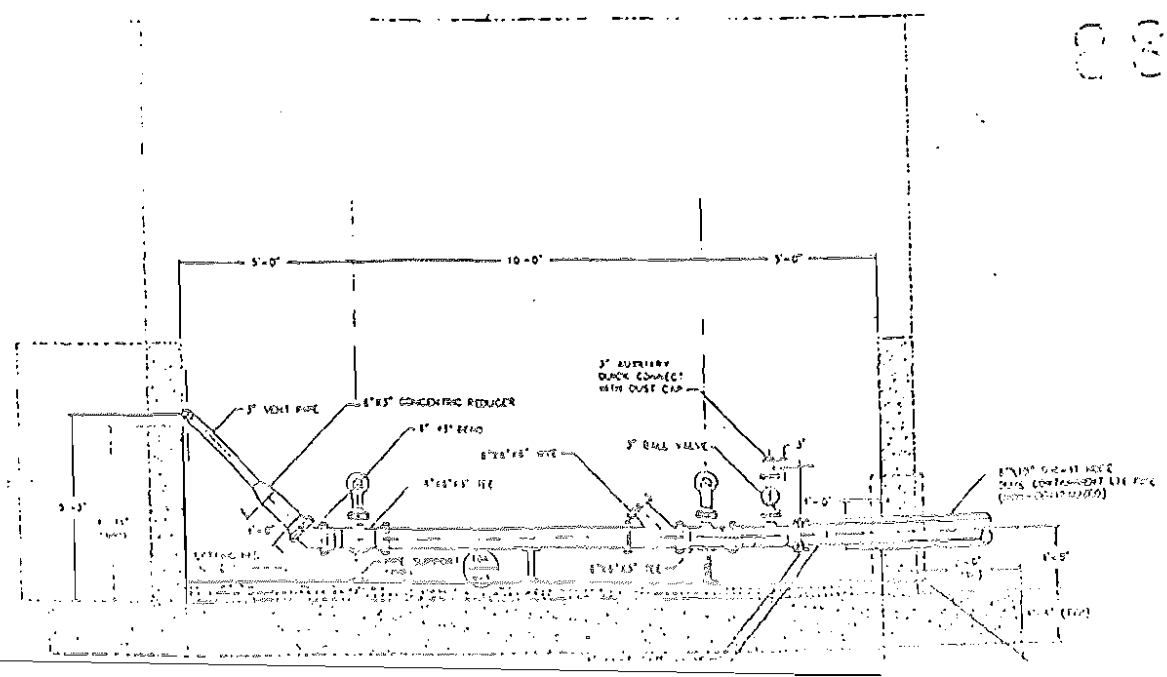

QUALITY E`LUATION PLAN

QEP No. 2008036 Rev. 0

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

2. Item/Title/Description: RECEIPT INSPECTION OF PRIMER AND EPOXY COATINGS

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
1.	Verify the material that is delivered for coating the piping has the following brand name: • Dura-Pox Water Based Epoxy Primer Part A B70-710 Part B B70V710	X MKU 2-26-01		Satisfactory Sherwin Williams

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 2-26-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON Frank Thompson — Date: 3-14-01

RECORD

P1/1

QUALITY EVALUATION PLAN

QEP No. 2008037 Rev. 0

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

2. Item/Title/Description: RECEIPT INSPECTION OF FINISH AND EPOXY COATINGS

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
1.	Verify the material that is delivered for coating the piping has the following brand name: • EPO – PLEX MULTI-MIL Water Based Epoxy Finish Part A B71-100 Part B B71V100	x MKV 2-28-01		Verification of Materials was done the day finish coat was started Sherwin Williams

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 3-14-01 ~~2-28-01~~ MKV

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

RECORD

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QUALITY E' 'UATION PLAN

QEP No. 2008038 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #6			using wire brush and sandpaper
1.	ITEM PREPARED FOR PRIMING: All Carbonsteel LDS, RLCS, LCS LTSM Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. **(Note: Do not use hydrocarbons solvents for cleaning)** RECORD THE TYPE OF SOLVENT USED: None	X MKG 2-26-01		Removing all rust and stickers using a dull scraper for sticker removal
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	X MKG 2-26-01		60°F in 1/2 VH 6
3.	Verify the prepared surface is free of moisture.	X MKG 2-26-01		no moisture on any pipe

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 2-26-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

P1/1

QUALITY E LUATION PLAN

QEP No. 2008039 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #5			
1.	ITEM PREPARED FOR PRIMING: LDS, LCS, LCSR Carbon Steel LTB Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. **(Note: Do not use hydrocarbons solvents for cleaning)** RECORD THE TYPE OF SOLVENT USED: No solvent uses	X MKU Main 2-27-01		
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	X MKU 2-27-01		All carbon steel scraped sanded and wire brushed. Dusted with a brush and wiped off with a cloth to remove excess dust.
3.	Verify the prepared surface is free of moisture.	X MKU 2-27-01		No moisture on pipe

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 2-27-01

14. QA Team Coach (Completed QEP) FRANK THOMPSON (Signature) Frank Thompson — Date: 3-14-01

RECORD

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QUALITY EVALUATION PLAN

PROD #7284 Vol. 3

QEP No. 2008040 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/20/01

6. Reviewed By: JIM JENKINS — Date: 2/20/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: # 4			
1.	ITEM PREPARED FOR PRIMING: Carbon Steel Pipe LDS, LCS, LCSR, LTS Main. Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. (Note: Do not use hydrocarbons solvents for cleaning) RECORD THE TYPE OF SOLVENT USED: None use	X MKG 2-28-01		All pipe (Carbon Steel) was scraped, wire brushed, sanded and dusted. Valve House was washed down prior to starting the primer.
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	X MKG 2-28-01		Primer starts 3-1-01
3.	Verify the prepared surface is free of moisture.	X MKG 2-28-01		no moisture

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 2-28-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) Frank Thompson — Date: 3-14-01

RECORD p 1/1

QUALITY EVALUATION PLAN

QEP No. 2008041 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/14/01

6. Reviewed By: JIM JENKINS — Date: 2/20/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: VH3			
	ITEM PREPARED FOR PRIMING: PIPING / FLANGES / SUPPORTS			
1.	Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. (Note: Do not use hydrocarbons solvents for cleaning) RECORD THE TYPE OF SOLVENT USED: WATER	PW 3/2/01		
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	PW 3/2/01		All rust, scale, labels removed
3.	Verify the prepared surface is free of moisture.	PW 3/2/01		

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/2/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) — Date: 3-14-01

RECORD

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QUALITY E' LUATION PLAN

QEP No. 2008042 Rev. ____

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/21/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #2			
1.	ITEM PREPARED FOR PRIMING: All Carbon Steel, LDS, LCS, LCSK, LTSMain. Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. (Note: Do not use hydrocarbons solvents for cleaning) RECORD THE TYPE OF SOLVENT USED: None	X MKV 3-5-01		
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	X MKV 3-5-01		Scraped, Brushed, dusted and wiped before Priming
3.	Verify the prepared surface is free of moisture.	X MKV 3-5-01		no moisture

13. QA Team Member (Printed Name) Muriel K. Vigo (Signature) Muriel K. Vigo — Date: 3-5-2001

14. QA Team Coach (Completed QEP): FRANK THOMPSON Frank Thompson — Date: 3-14-01

RECORD

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QUALITY E' 'UATION PLAN

QEP No. 2008043 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #1			
1.	ITEM PREPARED FOR PRIMING: All carbon steel, LDS, LCS, LCSR, LTS Main. Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. (Note: Do not use hydrocarbons solvents for cleaning) RECORD THE TYPE OF SOLVENT USED: None	X MKG 3-6-01		Scraped, sanded dusted and wiped
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	X MKG 3-6-01		Sat.
3.	Verify the prepared surface is free of moisture.	X MKG 3-6-01		no moisture or oil

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 3-6-2001

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) Frank Thompson — Date: 3-14-01

RECORD

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QUALITY EVALUATION PLAN

QEP No. 2008044 Rev. 0

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

2. Item/Title/Description: PREPARATION OF BASEMETAL PRIOR TO APPLICATION OF EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: CONTROL V.H.			
	ITEM PREPARED FOR PRIMING: STEEL PIPING/FLANGES/SUPPORTS			
1.	Before hand tool cleaning, verify visible oil, grease, soluable residues, and salts are removed. Cleaning shall be accomplished by wiping or scrubbing the surface with rags or brushes wetted with solvents. (Note: Do not use hydrocarbons solvents for cleaning) RECORD THE TYPE OF SOLVENT USED: WATER	PW 3/7/01		
2.	Verify hand tool cleaning removes all loose scale, loose rust, loose paint, and other loose detrimental foreign matter. Mill scale, rust, and paint are considered adherant if they cannot be removed by lifting with a dull putty knife. Verify residual dust is removed from the surface of the cleaned area. Also remove filing or spatter and rough weld surfaces that could adversely affect a continuous coating.	PW 3/7/01		Scale, Rust, labels, etc removed
3.	Verify the prepared surface is free of moisture.	PW 3/7/01		

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/7/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature: Frank Thompson) — Date: 3-14-01

RECORD

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QUALITY EV. .UATION PLAN
(Continuation Sheet)

QEP No. 200,8045 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 7-27-0		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 7-27-0		
		@40°F / @77°F / @100°F		
	To touch: 1 hour / 45 minutes / 15 minutes			
	To handle: 5 hours / 4-1/2 hours / 45 minutes			
	To recoat			
	• Minimum: 6 hours / 6 hours / 1-1/2 hours			
	• Maximum: 30 hours / 30 days / 30 days			
	To cure: 7 days / 7 days / 7 days			
	Pot life: 6 hours / 4 hours / 1-1/2 hours			
	Sweat-in-time: 30 minutes / none / none			
	Sweat time: 30 mins MIX COMPLETE TIME: 0858/0938 BEGIN COATING: 0951/1216			
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 7-27-0		Thinned 5%, water was used.
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKU 7-27-0		Verified by Fluor and GeoSyntec

RECORD

QUALITY E' LUATION PLAN

QEP No. 2005045 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 3-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #6			
	DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 55° RELATIVE HUMIDITY: 74% outside DEW POINT: DNV AIR TEMPERATURE: 38°F-% 58%			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKG 2-27-01		Verified by Comm Center and Heat Gun
2.	Verify the surface to be primed is free of moisture and oil.	X MKG 2-27-01		

13. QA Team Member (Printed Name): Muriel K. Nigus (Signature): Muriel K. Nigus — Date: 2-27-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

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P1/1

FS-F-4400

QUALITY EVALUATION PLAN

QEP No. 2005045 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 3-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #6			
	DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 55° RELATIVE HUMIDITY: 74% outside DEW POINT: DNV AIR TEMPERATURE: 38°F 58%			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKG 2-27-01		Verified by Comm Center and Heat Gun
2.	Verify the surface to be primed is free of moisture and oil.	X MKG 2-27-01		

13. QA Team Member (Printed Name): Muriel K. Nigus (Signature): Muriel K. Nigus — Date: 2-27-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2005045 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKO 7-27-04		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKO 7-27-04		
		@40°F / @77°F / @100°F		
	To touch: 1 hour / 45 minutes / 15 minutes			
	To handle: 5 hours / 4-1/2 hours / 45 minutes			
	To recoat			
	• Minimum: 6 hours / 6 hours / 1-1/2 hours			
	• Maximum: 30 hours / 30 days / 30 days			
	To cure: 7 days / 7 days / 7 days			
	Pot life: 6 hours / 4 hours / 1-1/2 hours			
	Sweat-in-time: 30 minutes / none / none			
	Sweat time: 30 mins MIX COMPLETE TIME: 0858/0938 BEGIN COATING: 0951/1216			
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKO 7-27-04		Thinned 5%, water was used.
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKO 7-27-04		Verified by Fluor and GeoSyntec

RECORD

QUALITY E' LUATION PLAN

QEP No. 2008046 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #5 DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer Primer used shall be DURA-POX WATERBASED EPOXY PRIMER SURFACE TEMPERATURE: 68° RELATIVE HUMIDITY: 54% DEW POINT: DNV AIR TEMPERATURE: 42.4°/63° outside			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKG 2-27-01		Verified by Comm. Center and Heat Gun
2.	Verify the surface to be primed is free of moisture and oil.	X MKG 2-27-01		

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 2-27-01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 20C8046 Rev. C

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
3.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 2-27-01		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 2-27-01		
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 2-27-01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKU 2-27-01		Verified by Fluor and GeoSyntec

	@40°F	@77°F	@100°F
To touch	1 hour	45 minutes	15 minutes
To handle	5 hours	4-1/2 hours	45 minutes
To recoat			
• Minimum	6 hours	6 hours	1-1/2 hours
• Maximum	30 hours	30 days	30 days
To cure	7 days	7 days	7 days
Pot life	6 hours	4 hours	1-1/2 hours
Sweat-in-time	30 minutes	none	none

Sweat time: 30 MIN MIX COMPLETE TIME: 1345/1415 BEGIN COATING: 1430

RECORD

QUALITY E' LUATION PLAN

QEP No. 200 8047 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #4			
	DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer outside Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 60 RELATIVE HUMIDITY: 89% DEW POINT: DNW AIR TEMPERATURE: 209°F 1/3 / 58°F 1/3 V+H4			Verified by Comm. Center and Heat Gun
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKV 3-1-01		Heaters are in use so there is no visible moisture on any of the pipes
2.	Verify the surface to be primed is free of moisture and oil.	X MKV 3-1-01		

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 3-1-01

14. QA Team Coach (Completed QEP) FRANK THOMPSON (Signature) Frank Thompson — Date: 3-14-01

RECORD

QUALITY E\ UATION PLAN
(Continuation Sheet)

QEP No. 200 8047 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 3-1-01		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 3-1-01		
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 3-1-01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKU 3-1-01		Verified by Fluor and GeoSyntec

	@40°F	@77°F	@100°F
To touch	1 hour	45 minutes	15 minutes
To handle	5 hours	4-1/2 hours	45 minutes
To recoat			
• Minimum	6 hours	6 hours	1-1/2 hours
• Maximum	30 hours	30 days	30 days
To cure	7 days	7 days	7 days
Pot life	6 hours	4 hours	1-1/2 hours
Sweat-in-time	30 minutes	none	none

Sweat time: 30 mins **MIX COMPLETE TIME:** 0810/0850 **BEGIN COATING:** 0855

RECORD

QUALITY EVALUATION PLAN

QEP No. 2008048 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: V.H. 3			
	DECRIBE THE TYPE OF PRIMER USED: SHERWIN WILLIAMS DURA POX EPOXY PRIMER Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 71°F RELATIVE HUMIDITY: 67% DEW POINT: 23 AIR TEMPERATURE: 67°F			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	PW 3/2/01		CONDITIONS VERIFIED BY COM. CENTER & HEAT GUN.
2.	Verify the surface to be primed is free of moisture and oil.	PW 3/2/01		

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/2/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) — Date: 3-14-01

RECORD

P1/2

QUALITY E VALUATION PLAN
(Continuation Sheet)

QEP No. 200.8048 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	PW 3/2/01		
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	PW 3/2/01		Prime coat completed by 1600.
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	PW 3/2/01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	PW 3/2/01		Thickness verified by Geomatics & Fluor.

	@40°F	@77°F	@100°F
To touch	1 hour	45 minutes	15 minutes
To handle	5 hours	4-1/2 hours	45 minutes
To recoat			
• Minimum	6 hours	6 hours	1-1/2 hours
• Maximum	30 hours	30 days	30 days
To cure	7 days	7 days	7 days
Pot life	6 hours	4 hours	1-1/2 hours
Sweat-in-time	30 minutes	none	none
Sweat time:	MIX COMPLETE TIME: 1145		BEGIN COATING: 1270

P 2/2

QUALITY EVALUATION PLAN

QEP No. 2008049 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: # 2			
	DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 65°F RELATIVE HUMIDITY: DNV DEW POINT: DNV AIR TEMPERATURE: 62°F/33°F			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	x MKV 3-5-01		Verified by Comm Center and Heat Gun.
2.	Verify the surface to be primed is free of moisture and oil.	x MKV 3-5-01		No moisture or oil on surface

13. QA Team Member (Printed Name): Marie K. Vigus (Signature): Marie K. Vigus — Date: MKV 3-14-01 3-6-2001

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

QUALITY EV UATION PLAN

(Continuation Sheet)

QEP No. 200 8049 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 3-5-01		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 3-5-01		
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 3-5-01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKU 3-5-01		Verified by Fluor and GeoSyntec

	@40°F	@77°F	@100°F
To touch	1 hour	45 minutes	15 minutes
To handle	5 hours	4-1/2 hours	45 minutes
To recoat			
• Minimum	6 hours	6 hours	1-1/2 hours
• Maximum	30 hours	30 days	30 days
To cure	7 days	7 days	7 days
Pot life	6 hours	4 hours	1-1/2 hours
Sweat-in-time	30 minutes	none	none

Sweat time: 30 mins MIX COMPLETE TIME: ~~0865/0MU~~ 1254/1324 BEGIN COATING: 1330/1620

QUALITY EVALUATION PLAN

QEP No. 2008050 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: CONTROL V. H.			
	DECRIBE THE TYPE OF PRIMER USED: DURA POX EPOXY PRIMER Primer used shall be DURA-POX WATERBASED EPOXY PRIMER			
	SURFACE TEMPERATURE: 61°F RELATIVE HUMIDITY: 53% DEW POINT: 24 AIR TEMPERATURE: 57°F			Verified by Com. Center and Heat & Gas
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	PW 3/7/01		
2.	Verify the surface to be primed is free of moisture and oil.	PW 3/7/01		

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/7/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) — Date: 3-14-01

JHS 3-14-01

PR/2

QUALITY E' LUATION PLAN
(Continuation Sheet)

QEP No. 2008050 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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	TW 3/7/01		
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	TW 3/7/01		Painting (Primer) completed @ 1447
		@40°F	@77°F	@100°F
	To touch	1 hour	45 minutes	15 minutes
	To handle	5 hours	4-1/2 hours	45 minutes
	To recoat			
	• Minimum	6 hours	6 hours	1-1/2 hours
	• Maximum	30 hours	30 days	30 days
	To cure	7 days	7 days	7 days
	Pot life	6 hours	4 hours	1-1/2 hours
	Sweat-in-time	30 minutes ✓	none	none
	Sweat time:	MIX COMPLETE TIME: 1302	BEGIN COATING: 1333	
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	TW 3/7/01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	TW 3/7/01		Thickness verified by Elmer & Geosynter.

RECORD

P2/2

QUALITY E' LUATION PLAN

QEP No. 2008051 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY PRIMER

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ PRIMER LITERATURE

5. Prepared By: MIKE GODBER — Date: 2/26/01

6. Reviewed By: JIM JENKINS — Date: 2/26/01

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

8. Approved By: VERN TURNER — Date: 2-26-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: E1 DECRIBE THE TYPE OF PRIMER USED: Dura-Pox Waterbased Epoxy Primer Primer used shall be DURA-POX WATERBASED EPOXY PRIMER SURFACE TEMPERATURE: 64°F RELATIVE HUMIDITY: 63% DEW POINT: DNV AIR TEMPERATURE: 33.5°F %/55°F %			
1.	Prior to application of primer, verify the surface temperature is a minimum of 40° F but does not exceed 100° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKG 3-7-01		Verified by Comm and Heat Gun
2.	Verify the surface to be primed is free of moisture and oil.	X MKG 3-7-01		Surface was clean free of Moisture and oil

13. QA Team Member (Printed Name) Muriel K. Vigus (Signature) Muriel K. Vigus — Date: 3-7-01

14. QA Team Coach (Completed QSP): FRANK THOMPSON (Signature) Frank Thompson — Date: 3-14-01

RECORD

P1/2

QUALITY E' 'UATION PLAN
(Continuation Sheet)

QEP No. 2008051 **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.	Prior to application of the primer coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 3-7-01		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 3-7-01		
		@40°F	**@77°F**	**@100°F**
	To touch	1 hour	45 minutes	15 minutes
	To handle	5 hours	4-1/2 hours	45 minutes
	To recoat			
	• Minimum	6 hours	6 hours	1-1/2 hours
	• Maximum	30 hours	30 days	30 days
	To cure	7 days	7 days	7 days
	Pot life	6 hours	4 hours	1-1/2 hours
	Sweat-in-time 7:28 A.M.	30 minutes	none	none
	Sweat time: 30 Mins **MIX COMPLETE TIME:** 08:04 **BEGIN COATING:** Approx. 08:15			
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 3-7-01		
6.	Verify 1 coat of primer is applied which shall have a dry coat thickness of 4 mils.	X MKU 3-7-01		Verified by Fluor and GeoSyntec

DISCORD

P 2/2

QUALITY EV UATION PLAN

QEP No. 2008052 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: # 6 DECRIBE THE TYPE OF FINISH USED: EPo-Plex Multi-Mil WBE Finish Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH SURFACE TEMPERATURE: 63°F RELATIVE HUMIDITY: 60% DEW POINT: DNV AIR TEMPERATURE: 61°F 1/s – 25.4°F 0/s			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKV 3-28-01		Verified by Comm. Center and Heat Gun
2.	Verify the surface to be finished is free of moisture and oil.	X MKV 3-28-01		no moisture or oil

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 3-14-0 ~~3-28-01~~ MKV

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

RECORD

P 1/2

QUALITY E\ .UATION PLAN
(Continuation Sheet)

QEP No. 7008052 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 2-28-01		Met
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 2-28-01		
		@50°F	@77°F	@120°F
	To touch	2 hour	1 hour	30 minutes
	To handle	16 hours	12 hours	8 hours
	To recoat			
	• Minimum	4 hours	2 hours	1 hour
	• Maximum	30 days	30 days	30 days
	To cure	30 days	14 days	7 days
	Pot life	8 hours	8 hours	4 to 3 hours
	Sweat-in-time	15 minutes	none	none
	Sweat time: 15 mins. MIX COMPLETE TIME: 0830/0835 BEGIN COATING: 0840/1225			
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 2-28-01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	X MKU 2-28-01		Verified by Fluor and GeoSyntec
	*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.			

RECORD

P 2/2

QUALITY E\ \.UATION PLAN

QEP No. 2008053 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #5			
	DECRIBE THE TYPE OF FINISH USED: EPO-PlexMulti-Mil WBE Finish Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH			
	SURFACE TEMPERATURE: 64°F RELATIVE HUMIDITY: 44% O/S DEW POINT: DNV AIR TEMPERATURE: 60° O/S F – 29.3°F O/S			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKV 2-28-01		Verified by Comm. Center and Heat Gun
2.	Verify the surface to be finished is free of moisture and oil.	X MKV 2-28-01		no moisture or oil

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 3-14-01 ~~2-28-01~~ MKV

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

RECORD

p1/2

QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2008053 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 2-28-01		Ref.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 2-28-01		

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
• Minimum	4 hours	2 hours	1 hour
• Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none

Sweat time: 15 mins MIX COMPLETE TIME: 1245/1300 BEGIN COATING: 1305/1550

5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 2-28-01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	X MKU 2-28-01		Verified by Fluor and GeoSyntec

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

RECORD

p2/2

QUALITY EVALUATION PLAN

QEP No. 2008054 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: V.H. 4			
	DECRIBE THE TYPE OF FINISH USED: SHERWIN WILLIAMS EPO PLEX MULTI-MIL EPOXY Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH			
	SURFACE TEMPERATURE: 66°F RELATIVE HUMIDITY: 67% DEW POINT: 23 AIR TEMPERATURE: 59°F			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	PW 3/2/01		Verified by Com. Center & Heat Gun.
2.	Verify the surface to be finished is free of moisture and oil.	PW 3/2/01		Surface clean, dry

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/14/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) — Date: 3-14-01

RECORD

P1/2

QUALITY E LUATION PLAN
(Continuation Sheet)

QEP No. 2008054 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	PW 3/2/01		Drop cloths, plastic, tape used.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:			
				Painting completed @ 1031.
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	PW 3/2/01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	PW 3/2/01		Two coats finish paint applied. Thickness verified by Fluor & Geosyntec

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
• Minimum	4 hours	2 hours	1 hour
• Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none
Sweat time:	MIX COMPLETE TIME: 0725		BEGIN COATING: 0750

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

RECORD

p2/2

QUALITY EV UATION PLAN

QEP No. 2008055 Rev. 3

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: # 3			
	DECRIBE THE TYPE OF FINISH USED: EPo-Plex Multi-Mil WBE Finish Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH			
	SURFACE TEMPERATURE: 65°F RELATIVE HUMIDITY: DNV DEW POINT: DNV AIR TEMPERATURE: 62°F °/s · 33°F °/s			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKG 3-5-01		Verified by Comm Center and Heat Gun
2.	Verify the surface to be finished is free of moisture and oil.	X MKG 3-5-01		no moisture or oil present

13. QA Team Member (Printed Name): Muriel K. Vigus (Signature): Muriel K. Vigus — Date: 3-14-01 ~~3-5-01~~ MKG

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

RECORD

P1/2

QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2008055 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	X MKU 3-5-01		Met.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 3-5-01		
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 3-5-01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	X MKU 3-5-01		Verified by Fluor and GeoSyntec

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
◦ Minimum	4 hours	2 hours	1 hour
◦ Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none

Sweat time: 15 mins. MIX COMPLETE TIME: 0750/0805 BEGIN COATING: 0815/1327

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

RECORD

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QUALITY EVALUATION PLAN

QEP No. 2008056 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: #2			
	DECRIBE THE TYPE OF FINISH USED: EPO-Plex Multi-Mil WBE Finish Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH			
	SURFACE TEMPERATURE: 64°F RELATIVE HUMIDITY: 75% DEW POINT: DNA AIR TEMPERATURE: 28°F ⅔ – 59°F ⅓			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	X MKU 3-6-01		Verified by Comm Center and Heat Gun
2.	Verify the surface to be finished is free of moisture and oil.	X MKU 3-6-01		no moisture or oil present

13. QA Team Member (Printed Name): Muriel K. Nigus (Signature): Muriel K. Nigus — Date: 3-14-01 ~~3-6-01~~ MKU

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature): Frank Thompson — Date: 3-14-01

RECORD

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QUALITY EV UATION PLAN
(Continuation Sheet)

QEP No. 200 8056 **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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, coors, and other parts from damage.	X MKU 3-6-01		Met.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	X MKU 3-6-01		
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	X MKU 3-6-01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	X MKU 3-6-01		Verified by Fluor and GeoSyntec

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
• Minimum	4 hours	2 hours	1 hour
• Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none

Sweat time: 15 MIX COMPLETE TIME: 0804/0819 BEGIN COATING: 0834

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

RECORD

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QUALITY EV UATION PLAN

QEP No. 2008057 Rev. ✓

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: CONTROL VALVE HOUSE DECRIBE THE TYPE OF FINISH USED: SHERWIN WILLIAMS. EPO PLEX MULTI-MIL EPOXY Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH SURFACE TEMPERATURE: 54°F RELATIVE HUMIDITY: 60% DEW POINT: 26 AIR TEMPERATURE: 77°F			
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	PW 3/8/01		Verified by Comm. Center & Heath Gun.
2.	Verify the surface to be finished is free of moisture and oil.	PW 3/8/01		Surfaces clean, dry

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/14/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature: Frank Thompson) — Date: 3-14-01

RECORD

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QUALITY E[illegible]LUATION PLAN
(Continuation Sheet)

QEP No. 200 8057 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	PW 3/8/01		Drop cloths, plastic tape used.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	PW 3/8/01		Painting completed @ 0850!
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	PW 3/8/01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	PW 3/8/01		Two coats finish paints applied. Thickness verified by Fluor & Geosyntec.

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
◦ Minimum	4 hours	2 hours	1 hour
◦ Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none
Sweat time:	MIX COMPLETE TIME: 0725		BEGIN COATING: 0745

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

RECORD

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QUALITY EVALUATION PLAN

PROD #7284 Vol. 3

QEP No. 2008058 Rev. 0

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

2. Item/Title/Description: APPLICATION OF WATER BASED EPOXY FINISH COAT

3. Project/Task: ENHANCED PERMANENT LEACHATE CONVEYANCE SYSTEM

4. Specification/Drawing/PO/Req.: SPEC SECTION 9900/ FINISH COAT LITERATURE

5. Prepared By: MIKE GODBER — Date: 3/13/01

6. Reviewed By: JIM JENKINS — Date: 3/14/01

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

8. Approved By: VERN TURNER — Date: 3-14-01

9. Char. No.	10. Evaluation Characteristic (Code/Specification, Inspection/Test/Examination Techniques, Acceptance Criteria)	11. Status SAT	11. Status UNSAT	12. General Remarks
	RECORD THE VALVEHOUSE NUMBER: VH 1			
	DECRIBE THE TYPE OF FINISH USED: SHERWIN-WILLIAMS EPO PLEX MULTI MIL EPOXY Finish used shall be EPO-PLEX MULTI – MIL WATERBASED EPOXY FINISH			
	SURFACE TEMPERATURE: 62°F RELATIVE HUMIDITY: 58% DEW POINT: 26 AIR TEMPERATURE: 60°F			Verified by Com. Center & Heat Gun.
1.	Prior to application of FINISH, verify the surface temperature is a minimum of 50° F but does not exceed 120° F; the ambient dew point is at least 5%; and the relative humidity is less than or equal to 85%.	PW 3/8/01		
2.	Verify the surface to be finished is free of moisture and oil.	PW 3/8/01		Surfaces clean, dry.

13. QA Team Member (Printed Name): PAUL VOLKER (Signature) — Date: 3/14/01

14. QA Team Coach (Completed QEP): FRANK THOMPSON (Signature) — Date: 3-14-01

RECORD

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QUALITY EVALUATION PLAN
(Continuation Sheet)

QEP No. 2008058 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.	Prior to application of the finish coat, verify clean drop cloths and other protection approved by the construction manager are in place to protect floors, doors, and other parts from damage.	PW 3/8/01		Drop cloths, plastic, tape used.
4.	Verify the following schedule is adhered to when applying @4 mils wet @ 50% humidity:	PW 3/8/01		Painting completed @ 1405.
5.	Verify all crevices, welds, and sharp angles are stripe coated to prevent early failure.	PW 3/8/01		
6.	Verify 1 coat of finish is applied which shall have a dry coat thickness of 4 mils.	PW 3/8/01		Two thin coats paint applied as finish coat. Thickness verified by Fluor & Geosynthetics.

	@50°F	@77°F	@120°F
To touch	2 hour	1 hour	30 minutes
To handle	16 hours	12 hours	8 hours
To recoat			
◦ Minimum	4 hours	2 hours	1 hour
◦ Maximum	30 days	30 days	30 days
To cure	30 days	14 days	7 days
Pot life	8 hours	8 hours	4 to 3 hours
Sweat-in-time	15 minutes	none	none
Sweat time:	MIX COMPLETE TIME: 1108		BEGIN COATING: 1125

*note: Pot life for 50 degrees and 120 degrees is per Sherwin and Williams and their Hot Line.

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