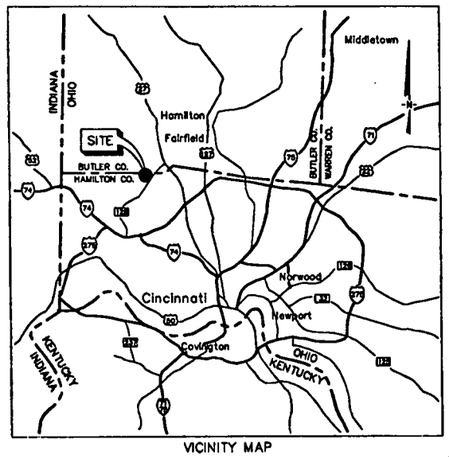
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
ON-SITE DISPOSAL FACILITY-PHASE IV

4009

FLUOR FERNALD, INC. PROJECT NUMBER 20104
HAMILTON COUNTY AND BUTLER COUNTY, OHIO
CONSTRUCTION CONTRACT NO. FSC-653

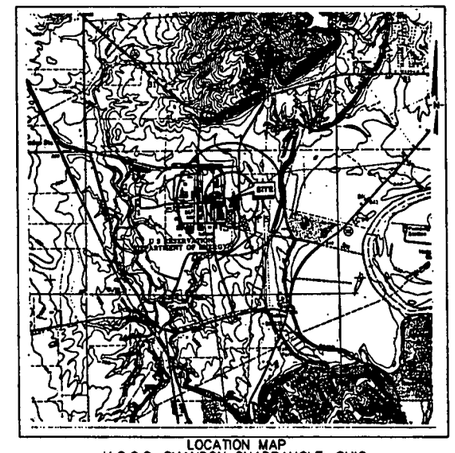


VICINITY MAP

6 3 0 6 12
SCALE IN MILES

CONSTRUCTION DRAWING INDEX

SHEET NO.	REVISION NO.	FEMP DRAWING NO.	TITLE
GENERAL			
X-1	0	90X-6000-X-00326	TITLE SHEET I
X-2	0	90X-6000-X-00327	TITLE SHEET II
X-3	0	90X-6000-X-00328	LEGEND AND SYMBOLS
CIVIL			
G-1	0	90X-6000-G-00329	SITE DEVELOPMENT PLAN I
G-2	0	90X-6000-G-00330	SITE DEVELOPMENT PLAN II
G-3	0	90X-6000-G-00331	SUBGRADE GRADING PLAN – CELL 4 LINER
G-4	0	90X-6000-G-00332	SUBGRADE GRADING PLAN – CELL 5 LINER
G-5	0	90X-6000-G-00333	COMPACTED CLAY LINER GRADING PLAN – CELLS 4 AND 5
G-6	0	90X-6000-G-00334	CELL OUTLET GRADING PLANS I
G-7	0	90X-6000-G-00335	CELL OUTLET GRADING PLANS II
G-8	0	90X-6000-G-00336	IMPACTED MATERIAL HAUL ROAD GRADING PLANS AND DETAILS
G-9	0	90X-6000-G-00337	OSDF NORTH-SOUTH SECTIONS
G-10	0	90X-6000-G-00338	OSDF EAST-WEST SECTIONS
G-11	0	90X-6000-G-00339	CELL PERIMETER SECTIONS I
G-12	0	90X-6000-G-00340	CELL PERIMETER SECTIONS II
G-13	0	90X-6000-G-00341	LINER SYSTEM DETAILS I
G-14	0	90X-6000-G-00342	LINER SYSTEM DETAILS II
G-15	0	90X-6000-G-00343	LINER SYSTEM DETAILS III
G-16	0	90X-6000-G-00344	LINER SYSTEM DETAILS IV
G-17	0	90X-6000-G-00345	SURFACE-WATER MANAGEMENT SYSTEM DETAILS I
G-18	0	90X-6000-G-00346	SURFACE-WATER MANAGEMENT SYSTEM DETAILS II
G-19	0	90X-6000-G-00347	SURFACE-WATER MANAGEMENT SYSTEM DETAILS III
G-20	0	90X-6000-G-00348	SURFACE-WATER MANAGEMENT SYSTEM DETAILS IV
G-21	0	90X-6000-G-00349	HORIZONTAL MONITORING WELL DETAILS – CELL 6
G-22	0	90X-6000-G-00350	MISCELLANEOUS LINER SYSTEM AND ROAD DETAILS
G-23	0	90X-6000-G-00351	IMPACTED MATERIAL PLACEMENT DETAILS
G-24	0	90X-6000-G-00352	CHAIN LINK FENCE AND GATE DETAILS
G-25	0	90X-6000-G-00353	SUBGRADE GRADING PLAN – CELL 2 CAP
G-26	0	90X-6000-G-00354	CONTOURING LAYER GRADING PLAN – CELL 2
G-27	0	90X-6000-G-00355	COMPACTED CLAY CAP GRADING PLAN – CELL 2
G-28	0	90X-6000-G-00356	FINAL COVER GRADING PLAN – CELL 2
G-29	0	90X-6000-G-00357	CELL PERIMETER DETAILS
G-30	0	90X-6000-G-00358	FINAL COVER SYSTEM DETAILS



LOCATION MAP
U.S.G.S. SHANDON QUADRANGLE, OHIO

2000 1000 0 2000 4000
SCALE IN FEET

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JAB	B	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	B	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	B	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	B	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	JAB	DKP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: TITLE SHEET I

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO
JOHN E. BEECH
E-56348
REGISTERED PROFESSIONAL ENGINEER

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE, ATLANTA, GEORGIA 30342-1523

PROJECT NO.:	20104
CONTRACT NO.:	95PS005026
FEMP DRAWING NO.:	90X-6000-X-00326
GEOSYNTEC PROJECT NO.:	GG1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0100
SHEET NO.:	X-1
REVISION NO.:	0

FOR INFORMATION ONLY

FLUOR FERNALD, INC.

FLUOR FERNALD, INC.
P.O. BOX 398704
CINCINNATI, OHIO 45239

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE, N.E., SUITE 200
ATLANTA, GEORGIA 30342-1523

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CERTIFIED-FOR-CONSTRUCTION

4009

REFERENCE DRAWING INDEX

SHEET NO.	REVISION NO.	FEMP DRAWING NO.	TITLE
REFERENCE			
FINAL DESIGN PACKAGE			
X-4	0	90X-6000-X-00004	SITE PLAN
X-7	0	90X-6000-X-00006	GEOTECHNICAL DATA POINT LOCATION PLAN
X-8	0	90X-6000-X-00007	GREAT MIAMI AQUIFER GROUND-WATER CONTOUR MAP
X-9	0	90X-6000-X-00008	PERCHED ZONE POTENTIOMETRIC SURFACE MAP
X-10	0	90X-6000-X-00009	BROWN TILL/GRAY TILL INTERFACE CONTOUR MAP
X-11	0	90X-6000-X-00010	GRAY TILL ISOPACH MAP
X-12	0	90X-6000-X-00011	SURFACE GEOLOGY MAP
X-13	0	90X-6000-X-00012	GEOLOGIC SECTION A-A
X-14	0	90X-6000-X-00013	GEOLOGIC SECTION B-B
X-15	0	90X-6000-X-00014	GEOLOGIC SECTION C-C AND D-D
ON-SITE DISPOSAL FACILITY - PHASE I			
X-1A	2	90X-6000-X-00070	TITLE SHEET
X-2B	0	90X-6000-X-00071	LEGEND AND SYMBOLS
G-2A	0	90X-6000-G-00072	SITE DEVELOPMENT PLAN
G-5A	1	90X-6000-G-00073	SUBGRADE GRADING PLAN I
G-5B	2	90X-6000-G-00074	SUBGRADE GRADING PLAN II
G-5C	0	90X-6000-G-00075	SUBGRADE GRADING PLAN III
G-14	0	90X-6000-G-00199	IMPACTED MATERIAL HAUL ROAD GRADING PLAN
G-15A	2	90X-6000-G-00077	OSDF SECTIONS
G-41A	0	90X-6000-G-00089	SEDIMENTATION BASIN DETAILS
ON-SITE DISPOSAL FACILITY - PHASE II			
G-5D	0	90X-6000-G-00204	SUBGRADE GRADING PLAN
G-6A	0	90X-6000-G-00205	COMPACTED CLAY LINER GRADING PLAN
G-20B	2	90X-6000-G-00212	CELL PERIMETER DETAILS I
G-21B	0	90X-6000-G-00213	CELL PERIMETER DETAILS II
G-21C	0	90X-6000-G-00214	CELL PERIMETER DETAILS III
G-30B	2	90X-6000-G-00220	STORM-WATER MANAGEMENT SYSTEM DETAILS
ENCHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM			
X-2	0	90X-6000-X-00240	LEGEND AND SYMBOLS
G-3	0	90X-6000-G-00281	LTS PIPE PLAN AND PROFILE STATIONS 0+00 TO 5+00
G-4	0	90X-6000-G-00282	LTS PIPE PLAN AND PROFILE STATIONS 5+00 TO 11+00
G-5	0	90X-6000-G-00283	LTS PIPE PLAN AND PROFILE STATIONS 11+00 TO 17+00
G-6	0	90X-6000-G-00284	LTS PIPE PLAN AND PROFILE STATIONS 17+00 TO 23+00
G-7	0	90X-6000-G-00285	LTS PIPE PLAN AND PROFILE STATIONS 23+00 TO 29+00
G-8	0	90X-6000-G-00286	LTS PIPE PLAN AND PROFILE STATIONS 29+00 TO 34+24.34
G-14	0	90X-6000-G-00251	VALVE HOUSE AND CONTROL VALVE HOUSE GENERAL LAYOUTS
G-20	0	90X-6000-G-00292	SURFACE-WATER MANAGEMENT SYSTEM DETAILS
E-1	0	90X-6000-E-00258	OVERHEAD POWER TRANSMISSION SYSTEM PLAN
M-3	0	90X-6000-M-00265	VALVE HOUSE MECHANICAL DETAILS II
ON-SITE DISPOSAL FACILITY - PHASE III			
X-3	1	90X-6000-X-00295	LEGEND AND SYMBOLS
G-1	1	90X-6000-X-00296	SITE DEVELOPMENT PLAN
G-2	1	90X-6000-X-00297	SUBGRADE GRADING PLAN I
G-3	1	90X-6000-X-00298	SUBGRADE GRADING PLAN II
G-6	1	90X-6000-G-00301	CONTOURING LAYER GRADING PLAN
G-7	1	90X-6000-G-00302	FINAL COVER GRADING PLAN
G-15	1	90X-6000-G-00310	CELL PERIMETER DETAILS I
G-22	1	90X-6000-G-00317	FINAL COVER SYSTEM DETAILS
G-23	1	90X-6000-G-00318	SURFACE-WATER MANAGEMENT SYSTEM DETAILS I
G-24	1	90X-6000-G-00319	SURFACE-WATER MANAGEMENT SYSTEM DETAILS II
G-25	1	90X-6000-G-00320	SURFACE-WATER MANAGEMENT SYSTEM DETAILS III
G-29	0	90X-6000-G-00325	COMPACTED CLAY CAP GRADING PLAN
G-66	2	90X-6000-G-00324	HORIZONTAL MONITORING WELL AND MISCELLANEOUS DETAILS / - CELLS 4 AND 5

SHEET NO.	REVISION NO.	FEMP DRAWING NO.	TITLE
REFERENCE			
INTERIM LEACHATE COLLECTION SYSTEM			
-	1	90X-5500-G-00536	INTERIM LCS COVER SHEET
-	1	90X-5500-G-00537	INTERIM LCS PLAN AND PROFILE, SHEET 1 OF 3
-	1	90X-5500-G-00538	INTERIM LCS PLAN AND PROFILE, SHEET 2 OF 3
-	1	90X-5500-G-00539	INTERIM LCS PLAN AND PROFILE, SHEET 3 OF 3
CONSTRUCTION LAYDOWN AREA			
-	1	90X-5500-G-00543	ON-SITE DISPOSAL FACILITY CONSTRUCTION LAYDOWN AREA ACCESS ROAD PLAN AND PROFILE SHEET 1 OF 2
-	1	90X-5500-G-00544	ON-SITE DISPOSAL FACILITY CONSTRUCTION LAYDOWN AREA ACCESS ROAD PLAN AND PROFILE SHEET 2 OF 2
-	0	90X-5500-G-00545	ON-SITE DISPOSAL FACILITY CONSTRUCTION LAYDOWN AREA ACCESS ROAD CROSS SECTIONS SHEET 1 OF 2
-	0	90X-5500-G-00546	ON-SITE DISPOSAL FACILITY CONSTRUCTION LAYDOWN AREA ACCESS ROAD CROSS SECTIONS SHEET 2 OF 2
-	0	90X-5500-G-00547	ON-SITE DISPOSAL FACILITY CONSTRUCTION LAYDOWN AREA PLAN AND PROFILE
EXISTING UTILITIES			
-	1	91X-5900-G-00232	CIVIL MASTER PLAN
-	-	SKG-04391	EXISTING UTILITIES - REFERENCE DRAWINGS - OVERALL PLAN
-	-	SKG-04392	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 1 OF 6
-	-	SKG-04393	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 2 OF 6
-	-	SKG-04394	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 3 OF 6
-	-	SKG-04395	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 4 OF 6
-	-	SKG-04396	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 5 OF 6
-	-	SKG-04397	EXISTING UTILITIES - REFERENCE DRAWINGS - SHEET 6 OF 6
-	13	22X-5500-P-00659	MASTER GRID OF UNDERGROUND UTILITY PLANS
-	16	22C-5500-P-00661	GRID 2 - UNDERGROUND UTILITIES
-	19	22C-5500-P-00662	GRID 3 - UNDERGROUND UTILITIES
-	18	22C-5500-P-00663	GRID 4 - UNDERGROUND UTILITIES
-	19	22A-5500-P-00664	GRID 5 - UNDERGROUND UTILITIES
-	15	22H-5500-P-00666	GRID 7 - UNDERGROUND UTILITIES
-	13	22H-5500-P-00667	GRID 8 - UNDERGROUND UTILITIES
-	10	22A-5500-P-00707	GRID 32 - UNDERGROUND UTILITIES
-	2	90X-5500-E-00522	ELECTRICAL POWER FOR OSDF
-	0	90X-5500-E-00542	ELECTRIC FOR OSDF AIR MONITORS
G0013	3	93X-5900-G-00286	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 13
G0021	6	93X-5900-G-00294	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 21
G0029	5	93X-5900-G-00302	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 29
G0030	5	93X-5900-G-00303	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 30
G0037	6	93X-5900-G-00310	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 37
G0038	5	93X-5900-G-00311	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 38
G0045	6	93X-5900-G-00318	CIVIL EXISTING SITE AND UTILITY PLAN - GRID 45
E0018	3	96X-5900-E-00356	13.2 kV ELECTRICAL MASTER PLOT
LEACHATE TRANSMISSION SYSTEM			
-	2	92X-5900-G-00254	PLAN AND PROFILE, SHEET 1 OF 4
-	3	92X-5900-G-00261	PLAN AND PROFILE, SHEET 2 OF 4
-	3	92X-5900-G-00268	PLAN AND PROFILE, SHEET 3 OF 4
-	2	92X-5900-G-00262	PLAN AND PROFILE, SHEET 4 OF 4
MISCELLANEOUS			
-	7	75A-5500-G-00441	AREA 1 PHASE 1 SITE PLAN 3 OF 3
-	2	15X-5500-X-00450	AREA 1 PHASE 1 (EAST) DETAIL SHEET 1
-	3	00X-5500-G-01843	FEMP ON-SITE EASEMENTS AND RIGHT-OF-WAYS
-	D	90X-6000-G-00359	TOPOGRAPHY BASED ON 12 JANUARY 2000 FLYOVER

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	ENG. BY	APP. BY
D	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLS	B	DJS	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLS	B	DJS	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLS	B	DJS	JFB
B	01.31.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLS	B	DJS	JFB
A	01.27.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLS	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE: TITLE SHEET II

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION UNLESS SEALED.

SIGNATURE
DATE

STATE OF OHIO
JOHN T. BEECH
E-56246
PROFESSIONAL ENGINEER

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, SUITE 1, ATLANTA, GA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-X-00327
GEOSYNTEC PROJECT NO.:	001342-16.3
GEOSYNTEC DOCUMENT NO.:	FQ1-0101
SHEET NO.:	X-2
REVISION NO.:	0

000002

CERTIFIED-FOR-CONSTRUCTION

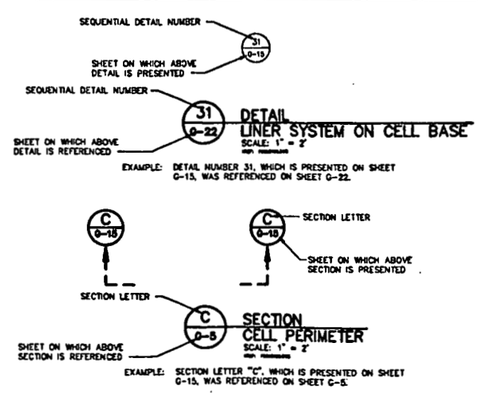
SYMBOLS LEGEND

EXISTING		NEW
	IMPACTED MATERIAL DISPOSAL LIMIT	
	BATTERY LIMIT	
	BORROW AREA LIMIT	
	FEMP PROPERTY LINE	
	BUTLER COUNTY/HAMILTON COUNTY LINE	
	ADJACENT LANDOWNER PROPERTY LINE	
	FENCE	
	RAD FENCE	
W	NON-POTABLE CONSTRUCTION WATER LINE	
	FENCE GATE	
	RAILROAD TRACK	
	PAVED ROAD, SIDEWALK OR PARKING LOT	
	UNPAVED ROAD, SIDEWALK OR PARKING LOT	
	CENTERLINE OR BASELINE	
	PERIMETER BERM BASELINE	
	SLOPE CREST OR TOE	
ILTS	ILTS PIPE	
EPLTS	EPLTS PIPE	
E	UTILITY EASEMENT	
	WATER TABLE OR PIEZOMETRIC SURFACE	
	DECIDUOUS TREE	
	CONIFEROUS TREE	
	TREE LINE	
	PARKING LOT STRIPING	
1	CELL DESIGNATION	1
	TRAILER OR BUILDING	
	DRAINAGE FLOW DIRECTION	
	HEADWALL	
	SIGN	
	POST	
	SLOPE INDICATOR	CREST TOE
PILE	PILE	
	TRANSMISSION TOWER	
	CATCH BASIN	
	MANHOLE	
	POWER POLE	
2421	TYPE 2 MONITORING WELL	
3471	TYPE 3 MONITORING WELL	
1740	GEOTECHNICAL BORING	
11478	CONE PENETROMETER TEST SOUNDING	
BM-10	BENCHMARK	
11546	LYSIMETER	
	MONITORING WELL	
117-15	PIEZOMETER	
	VALVE HOUSE	
	LEACHATE TRANSMISSION SYSTEM PERMANENT LIFT STATION	
	CONSTRUCTION CONTROL POINT	
	DRAINAGE CHANNEL GRAVITY INLET STRUCTURE	
	CULVERT	
	VEGETATION	
	HORIZONTAL MONITORING WELL WITH COVER SLAB	

SYMBOLS LEGEND (CONTINUED)

SYMBOL	COMPONENT
	PRIMARY GEOMEMBRANE LINER
	SECONDARY GEOMEMBRANE LINER
	PRIMARY GEOSYNTHETIC CLAY LINER
	SECONDARY GEOSYNTHETIC CLAY LINER
	GEOTEXTILE FILTER
	GEOTEXTILE CUSHION
	SUPPLEMENTAL GEOTEXTILE CUSHION
	SUBGRADE
	COMPACTED CLAY LINER/PROTECTIVE CLAY LAYER
	LDS DRAINAGE LAYER
	LDS DRAINAGE CORRIDOR
	LCS DRAINAGE LAYER
	LCS DRAINAGE CORRIDOR
	PROTECTIVE LAYER (IMPACTED)
	PROTECTIVE LAYER (NON-IMPACTED GRANULAR)
	PROTECTIVE LAYER (NON-IMPACTED NON-GRANULAR)
	SELECT IMPACTED MATERIAL
	TRENCH BACKFILL
	PIPE EMBEDMENT FILL
	GEOMEMBRANE CAP
	GEOSYNTHETIC CLAY CAP
	COMPACTED CLAY CAP
	COVER DRAINAGE LAYER
	BIOINTRUSION BARRIER
	GRANULAR FILTER
	TOPSOIL
	CONTOURING LAYER
	RIPRAP LIMIT
	RIPRAP
	EROSION MAT

DETAIL AND SECTION IDENTIFICATION LEGEND



ABBREVIATIONS

ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
BAMP	BORROW AREA MANAGEMENT AND RESTORATION PLAN
BCY	BULK CUBIC YARDS
℄	BASELINE
BM	BENCH MARK
CFC	CERTIFIED-FOR-CONSTRUCTION
℄	CENTERLINE
CLR	CLEARANCE
CMP	CORRUGATED METAL PIPE
CO.	COUNTY
CPT	CONE PENETROMETER TEST
CQC	CONSTRUCTION QUALITY CONTROL
CSA	CONSTRUCTION SITE ACCESS
CVH	CONTROL VALVE HOUSE
D	DEPTH
DECON	DECONTAMINATION
DIA.	DIAMETER
DOE	DEPARTMENT OF ENERGY
DOT	DEPARTMENT OF TRANSPORTATION
E	EASTING
EL	ELEVATION
EPA	ENVIRONMENTAL PROTECTION AGENCY
EPLTS	ENHANCED PERMANENT LEACHATE TRANSMISSION SYSTEM
FEMP	FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
HDPE	HIGH DENSITY POLYETHYLENE
GIS	GRAVITY INLET STRUCTURE
H:V	HORIZONTAL TO VERTICAL LENGTH RATIO FOR A SLOPE
ID	INSIDE DIAMETER
ILTS	INTERIM LEACHATE TRANSMISSION SYSTEM
IMP	IMPACTED MATERIAL PLACEMENT
INC.	INCORPORATED
IP	IRON PIN
LCS	LEACHATE COLLECTION SYSTEM
LDS	LEAK DETECTION SYSTEM
LTS	LEACHATE TRANSMISSION SYSTEM
(MAX)	MAXIMUM
(MIN)	MINIMUM
N	NORTHING
NAD	NORTH AMERICAN DATUM
NGVD	NATIONAL GEODETIC VERTICAL DATUM
NO.	NUMBER
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
ODOT	OHIO DEPARTMENT OF TRANSPORTATION
OMTA	OSDF MATERIAL TRANSFER AREA
OSDF	ON-SITE DISPOSAL FACILITY
PLS	PERMANENT LIFT STATION
RAD	RADIOLOGICAL
RCP	REINFORCED CONCRETE PIPE
REV.	REVISION
RLCS	REDUNDANT LEACHATE COLLECTION SYSTEM
(TYP)	TYPICAL
WAC	WASTE ACCEPTANCE CRITERIA
W.E.	WATER ELEVATION
VH	VALVE HOUSE
6"/10"	6"/10" NOMINAL PIPE SIZE (CARRIER/CONTAINMENT)

CONTOUR LEGEND

EXISTING		NEW
590	EXISTING GROUND ELEVATION (FEET)	
580	SUBGRADE ELEVATION (FEET)	580
590	COMPACTED CLAY LINER ELEVATION (FEET)	590
500	LEACHATE COLLECTION SYSTEM ELEVATION (FEET)	500
585	PROTECTIVE LAYER ELEVATION (FEET)	585
600	CONTOURING LAYER ELEVATION (FEET)	600
590	FINISHED GRADE ELEVATION (FEET)	590
640	COMPACTED CLAY CAP LAYER ELEVATION (FEET)	640

4009

GENERAL NOTES

NOTES:

1. TOPOGRAPHY SHOWN ON CONSTRUCTION DRAWINGS IS BASED ON 12 JANUARY 2000 FLYOVER.
2. ELEVATIONS ARE IN FEET ABOVE SEA LEVEL DATUM. (NOTE: "SEA LEVEL DATUM" REFERS TO NATIONAL GEODETIC VERTICAL DATUM [NGVD]).
3. GRID COORDINATE SYSTEM CORRESPONDS TO STATE PLANAR NORTH AMERICAN DATUM (NAD) 1983 OHIO SOUTH.
4. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY.
5. SURVEY COORDINATES AND DIMENSIONS SHALL BE USED FOR CONSTRUCTION. DRAWINGS SHALL NOT BE SCALED TO OBTAIN LOCATIONS AND DIMENSIONS.
6. BATTERY LIMIT DEFINES LIMIT OF THIS WORK PACKAGE FOR OSDF AND SUPPORT FACILITIES AND LOCATION OF INTERFACES WITH OTHER WORK PACKAGES. CONTRACTOR SHALL PERFORM DUST CONTROL WITHIN BATTERY LIMIT AS SPECIFIED IN PART 6 OF CONTRACT DOCUMENT.
7. THE TERM "IMPACTED MATERIAL" REFERS TO THAT MATERIAL MEETING OSDF WASTE ACCEPTANCE CRITERIA (WAC) DESTINED FOR OSDF DISPOSAL. "SELECT IMPACTED MATERIAL" LOCATIONS SHOWN ON THESE DRAWINGS SHALL CONSIST OF IMPACTED MATERIAL. IMPACTED MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	TMM	SI	DJS	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	TMM	SI	DJS	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	TMM	SI	DJS	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	TMM	SI	DJS	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	JAB	DKP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
LEGEND AND SYMBOLS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

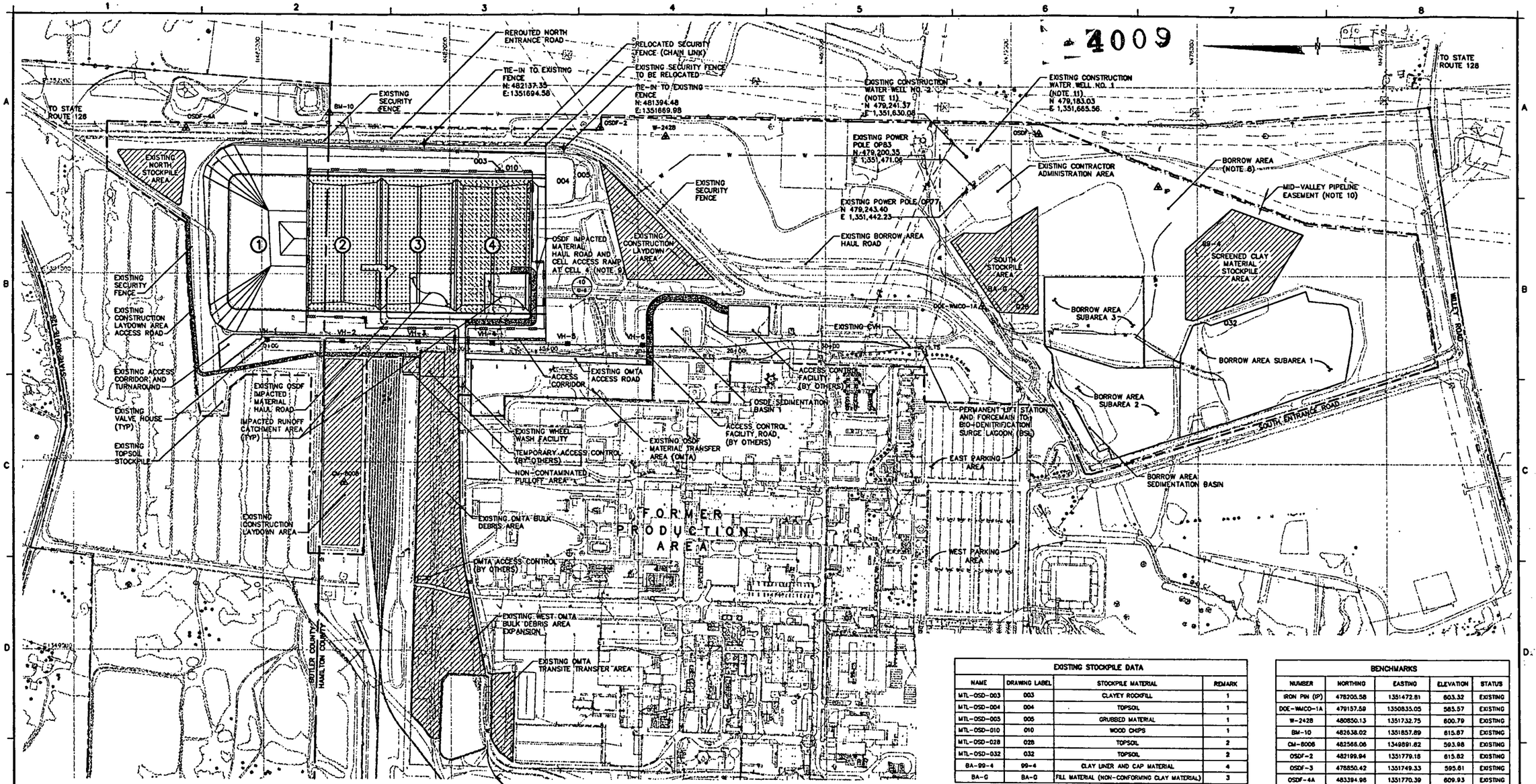
STATE OF OHIO
JOHN E. BEECH
E-58246
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEO SYNTEC CONSULTANTS
1255 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30043 USA

PROJECT NO.:	20104
CONTRACT NO.:	95P5005028
FEMP DRAWING NO.:	90X-8000-X-00328
GEOSYNTEC PROJECT NO.:	001342-16.3
GEOSYNTEC DOCUMENT NO.:	FQI-0102
SHEET NO.:	X-3
REVISION NO.:	0

000003

CERTIFIED-FOR-CONSTRUCTION



EXISTING STOCKPILE DATA			
NAME	DRAWING LABEL	STOCKPILE MATERIAL	REMARK
MTL-OSD-003	003	CLAYEY ROCKFILL	1
MTL-OSD-004	004	TOPSOIL	1
MTL-OSD-005	005	GRUBBED MATERIAL	1
MTL-OSD-010	010	WOOD CHIPS	1
MTL-OSD-028	028	TOPSOIL	2
MTL-OSD-032	032	TOPSOIL	2
BA-99-4	99-4	CLAY LINER AND CAP MATERIAL	4
BA-G	BA-G	FILL MATERIAL (NON-CONFORMING CLAY MATERIAL)	3

BENCHMARKS				
NUMBER	NORTHING	EASTING	ELEVATION	STATUS
IRON PIN (IP)	478205.58	1351472.81	603.32	EXISTING
DOE-WMCO-1A	479157.59	1350835.05	585.57	EXISTING
W-2428	480850.13	1351732.75	600.79	EXISTING
BM-10	482638.02	1351857.89	615.87	EXISTING
CM-8006	482568.06	1349891.82	593.98	EXISTING
OSDF-2	482199.94	1351779.18	615.82	EXISTING
OSDF-3	478850.42	1351749.33	595.81	EXISTING
OSDF-4A	483394.96	1351770.39	609.93	EXISTING

LEGEND

- BUTLER COUNTY/HAMILTON COUNTY LINE
- FEMP PROPERTY LINE
- BATTERY LIMIT
- IMPACTED MATERIAL DISPOSAL LIMIT
- BORROW AREA LIMIT
- RADIOLOGICAL CONTROL LIMIT/FENCE (NOTE 7)
- W — NON-POTABLE CONSTRUCTION WATER LINE
- ILTS — EXISTING ILTS PIPE
- 134+00 — EXISTING EPLTS PIPE
- OSDF-4A — BENCHMARK
- ② — ON-SITE DISPOSAL FACILITY CELL DESIGNATION
- CELL 4 LINER SYSTEM
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP OR HAUL ROAD
- IMPACTED MATERIAL PLACEMENT AREA CELLS 2, 3 AND 4

NOTES:

1. PURPOSE OF THIS DRAWING IS TO CONCEPTUALLY ILLUSTRATE SITE DEVELOPMENT FOR OSDF-PHASE IV WITH SUPPORT FACILITIES INCLUDING BUT NOT LIMITED TO HAUL ROADS, EQUIPMENT WASH FACILITY, CONTRACTOR ADMINISTRATION AREA, PARKING AREAS, CONSTRUCTION LAYDOWN AREA, ACCESS CONTROL FACILITY, RADIOLOGICAL CONTROL LIMIT/FENCE, EXISTING STOCKPILES AND SEDIMENTATION BASINS. SIZE AND LOCATION OF SUPPORT FACILITIES MAY VARY FROM THOSE SHOWN.
2. CONTRACTOR SHALL CONTAIN AND CONTROL WATER GENERATED DURING CONSTRUCTION AND FILLING OF OSDF IN ACCORDANCE WITH SPECIFICATION SECTIONS 02270 AND 13010.
3. CONTRACTOR SHALL SUBMIT EARTHWORK WORK PLAN IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
4. EXISTING CONTOURS ARE NOT SHOWN FOR CLARITY. EXISTING CONTOURS ARE SHOWN ON GRADING PLANS. ADDITIONAL EXISTING CONDITIONS ARE SHOWN ON REFERENCE DRAWINGS. EXISTING CONDITIONS SHALL BE VERIFIED IN ACCORDANCE WITH SPECIFICATION SECTION 02100.
5. IMPACTED RUNOFF CATCHMENT AREA IN ACTIVE CELL SHALL REMAIN OPEN UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED IN ADJACENT UPGRADIENT CELL AND IMPACTED RUNOFF CATCHMENT AREA IN FUTURE CELL IS CONSTRUCTED AND OPERATIONAL.
6. STATEMENT OF WORK FOR OSDF-PHASE IV CONSTRUCTION IS SPECIFIED IN PART 6 OF CONTRACT DOCUMENT.
7. RADIOLOGICAL CONTROL LIMIT/FENCE INDICATES LIMIT OF RADIOLOGICAL CONTROL FOR IMPACTED MATERIAL HAULING AND PLACEMENT. RAD FENCE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
8. BORROW AREA MANAGEMENT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13000.
9. FOR OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP GRADING PLAN, SEE DRAWING G-8.
10. CONTRACTOR SHALL LOCATE MID-VALLEY PIPELINE EASEMENT IN ACCORDANCE WITH SPECIFICATION SECTION 02100. CONTRACTOR SHALL NOT ENTER PIPELINE EASEMENT.
11. CONSTRUCTION WATER SHALL BE OBTAINED FROM EXISTING WELL HOUSES LOCATED WEST OF FORMER PRODUCTION AREA AT LOCATIONS N 480,784.4 AND E 1,348,403.7 AND N 481,454.8 AND E 1,350,487.4 AND EXISTING CONSTRUCTION WATER WELLS NO. 1 AND NO. 2 SHOWN ON THIS DRAWING.

REMARKS:

1. STOCKPILE TO BE REMOVED BY OTHERS.
2. STOCKPILE TO REMAIN.
3. STOCKPILE TO BE USED IN OSDF CONSTRUCTION.
4. STOCKPILE TO BE SCREENED AND USED IN OSDF CONSTRUCTION.

000004

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
D	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DCP	JAB	B	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	JAB	B	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	JAB	B	DJB	JFB
B	01.03.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	JAB	B	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DCP	JAB	DHP	DCP	JFB

200 100 0 200 400
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

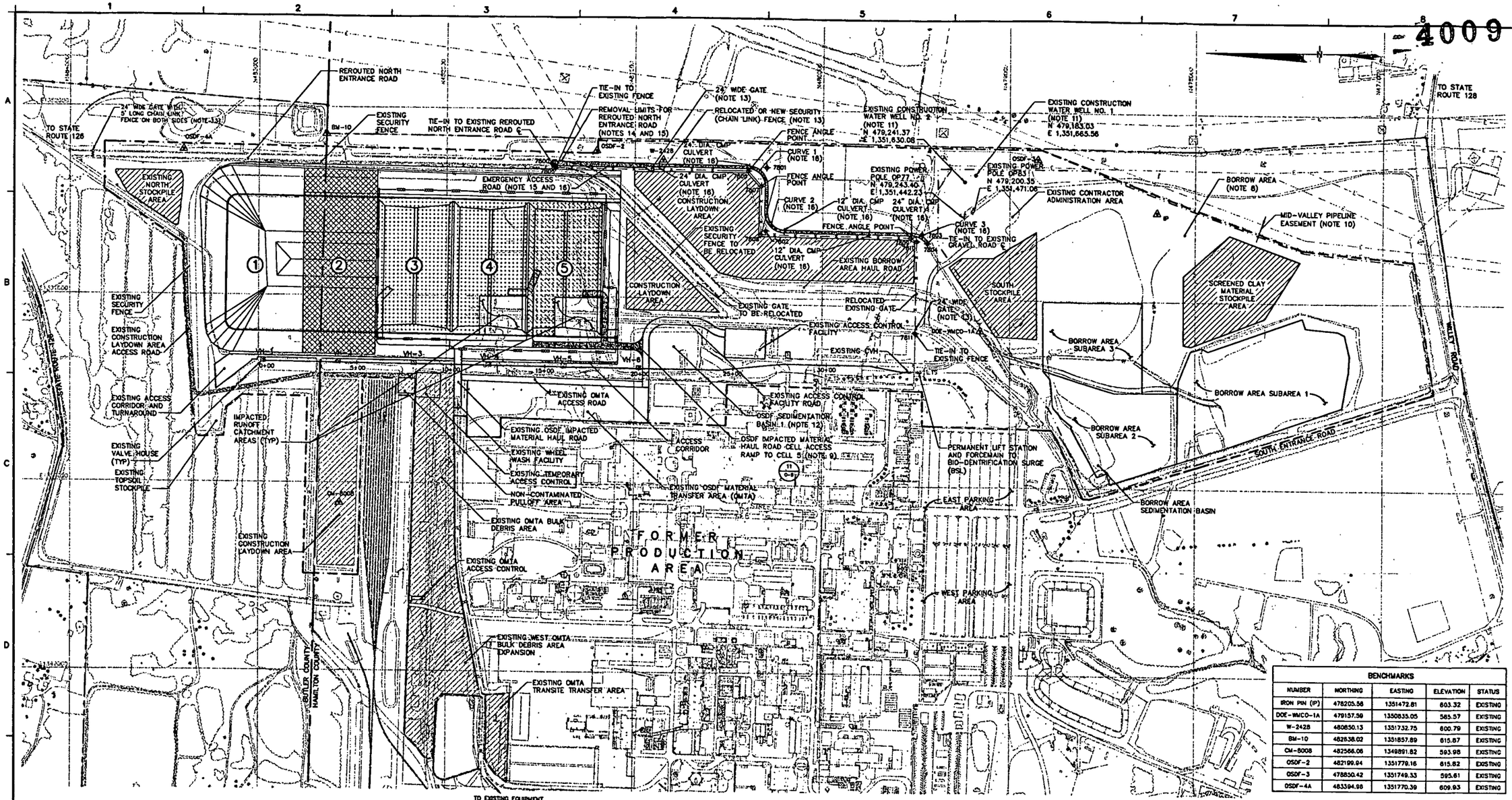
TITLE:
SITE DEVELOPMENT PLAN I

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN BECCH E-58348 — REGISTERED PROFESSIONAL ENGINEER

GEO SYNTEC CONSULTANTS
1900 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30043 USA

PROJECT NO.:	20104
CONTRACT NO.:	95P5005028
FEMP DRAWING NO.:	90X-5000-G-00329
GEOSYNTEC PROJECT NO.:	GG1342-16.3
GEOSYNTEC DOCUMENT NO.:	FD1-0103
SHEET NO.:	G-1
REVISION NO.:	0



BENCHMARKS				
NUMBER	NORTHING	EASTING	ELEVATION	STATUS
IRON PIN (IP)	478205.56	1351472.81	603.32	EXISTING
DOE-WMCO-1A	479157.59	1350835.05	585.57	EXISTING
W-2428	480850.13	1351732.75	600.79	EXISTING
BM-10	482538.02	1351857.89	615.87	EXISTING
CM-8008	482566.06	1349891.82	593.98	EXISTING
OSDF-2	482199.94	1351779.16	615.82	EXISTING
OSDF-3	478850.42	1351749.33	595.61	EXISTING
OSDF-4A	483394.98	1351770.39	609.93	EXISTING

LEGEND

- BUTLER COUNTY/HAMILTON COUNTY LINE
- FEMP PROPERTY LINE
- BATTERY LIMIT
- IMPACTED MATERIAL DISPOSAL LIMIT
- BORROW AREA LIMIT
- RADIOLOGICAL CONTROL LIMIT/FENCE (NOTE 7)
- W — NON-POTABLE CONSTRUCTION WATER LINE
- P.TS — EXISTING ILTS PIPE
- 15+00 — EXISTING EPLTS PIPE
- OSDF-4A — BENCHMARK
- 2 — ON-SITE DISPOSAL FACILITY CELL DESIGNATION
- CELL 5 LINER SYSTEM
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP OR HAUL ROAD
- IMPACTED MATERIAL PLACEMENT AREA CELLS 3, 4 AND 5
- CELL 2 FINAL COVER SYSTEM (NOTE 6)

CONTROL POINTS			
POINT NO.	NORTHING	EASTING	DESCRIPTION
7800	481442.17	1351709.34	CL ROAD TIE-IN
7801	480299.32	1351896.16	CL ROAD PI (CURVE 1)
7802	480303.44	1351358.41	CL ROAD PI (CURVE 2)
7803	479471.98	1351348.24	CL ROAD PI (CURVE 3)
7804	479443.15	1351301.12	CL ROAD TIE-IN
7805	481422.99	1351886.17	FENCE TIE-IN
7806	480399.56	1351677.23	FENCE ANGLE
7807	480328.04	1351596.50	FENCE ANGLE
7808	480331.19	1351336.74	FENCE ANGLE
7809	479532.63	1351325.98	FENCE ANGLE
7810	479500.59	1351310.63	FENCE ANGLE
7811	479506.58	1350820.72	FENCE TIE-IN

NOTES:

1. PURPOSE OF THIS DRAWING IS TO CONCEPTUALLY ILLUSTRATE SITE DEVELOPMENT FOR OSDF-PHASE IV WITH SUPPORT FACILITIES INCLUDING BUT NOT LIMITED TO HAUL ROADS, EQUIPMENT WASH FACILITY, CONTRACTOR ADMINISTRATION AREA, PARKING AREAS, CONSTRUCTION LAYDOWN AREA, ACCESS CONTROL FACILITY, RADIOLOGICAL CONTROL LIMIT/FENCE, EXISTING STOCKPILES AND SEDIMENTATION BASINS. SIZE AND LOCATION OF SUPPORT FACILITIES MAY VARY FROM THOSE SHOWN.
2. CONTRACTOR SHALL CONTAIN AND CONTROL WATER GENERATED DURING CONSTRUCTION AND FILLING OF OSDF IN ACCORDANCE WITH SPECIFICATION SECTIONS 02270 AND 13010.
3. CONTRACTOR SHALL SUBMIT EARTHWORK WORK PLAN IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
4. EXISTING CONTOURS ARE NOT SHOWN FOR CLARITY. EXISTING CONTOURS ARE SHOWN ON GRADING PLANS. ADDITIONAL EXISTING CONDITIONS ARE SHOWN ON REFERENCE DRAWINGS. EXISTING CONDITIONS SHALL BE VERIFIED IN ACCORDANCE WITH SPECIFICATION SECTION 02100.
5. IMPACTED RUNOFF CATCHMENT AREA IN ACTIVE CELL SHALL REMAIN OPEN UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED IN ADJACENT UPGRADIENT CELL AND IMPACTED RUNOFF CATCHMENT AREA IN FUTURE CELL IS CONSTRUCTED AND OPERATIONAL.
6. STATEMENT OF WORK FOR OSDF-PHASE IV CONSTRUCTION IS SPECIFIED IN PART 6 OF CONTRACT DOCUMENT.
7. RADIOLOGICAL CONTROL LIMIT/FENCE INDICATES LIMIT OF RADIOLOGICAL CONTROL FOR IMPACTED MATERIAL HAULING AND PLACEMENT. RAD FENCE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
8. BORROW AREA MANAGEMENT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13000.
9. FOR OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP GRADING PLAN, SEE DRAWING G-8.
10. CONTRACTOR SHALL LOCATE MID-VALLEY PIPELINE EASEMENT IN ACCORDANCE WITH SPECIFICATION SECTION 02100. CONTRACTOR SHALL NOT ENTER PIPELINE EASEMENT.
11. CONSTRUCTION WATER SHALL BE OBTAINED FROM EXISTING WELL HOUSES LOCATED WEST OF FORMER PRODUCTION AREA AT LOCATIONS N 480,784.4 AND E 1,348,403.7 AND N 481,454.8 AND E 1,350,487.4 AND EXISTING CONSTRUCTION WATER WELLS NO. 1 AND NO. 2 SHOWN ON THIS DRAWING.
12. FOR OSDF SEDIMENTATION BASIN 1 MODIFICATION GRADING PLAN, SEE DRAWING G-4.
13. GATE AND FENCE SHALL BE AS SHOWN ON DRAWING G-24.
14. FOR REMOVAL LIMITS OF REROUTED NORTH ENTRANCE ROAD, SEE DRAWING G-4.
15. COMPLETE CONSTRUCTION OF THE EMERGENCY ACCESS ROAD BEFORE REMOVAL OF REROUTED NORTH ENTRANCE ROAD WITHIN LIMITS SHOWN ON DRAWING G-4.
16. FOR EMERGENCY ACCESS ROAD, TYPICAL CROSS-SECTION AND CULVERT REQUIREMENTS, SEE DRAWING G-22. CENTERLINE RADIUS OF CURVES 1, 2 AND 3 IS 100 FEET.

000005

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	OFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	SLS	SI	DJS	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLS	SI	DJS	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLS	SI	DJS	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLS	SI	DJS	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	SLS	DKP	DOP	JFB

200 100 0 200 400
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
SITE DEVELOPMENT PLAN II

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN BEECH E-68248 — REGISTERED PROFESSIONAL ENGINEER — SEAL

GEOSYNTEC CONSULTANTS
2955 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30341-1634

PROJECT NO.:	20104
CONTRACT NO.:	95P5005028
FEMP DRAWING NO.:	90X-5000-C-00330
GEOSYNTEC PROJECT NO.:	001342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0105
SHEET NO.:	G-2
REVISION NO.:	0

CERTIFIED-FOR-CONSTRUCTION

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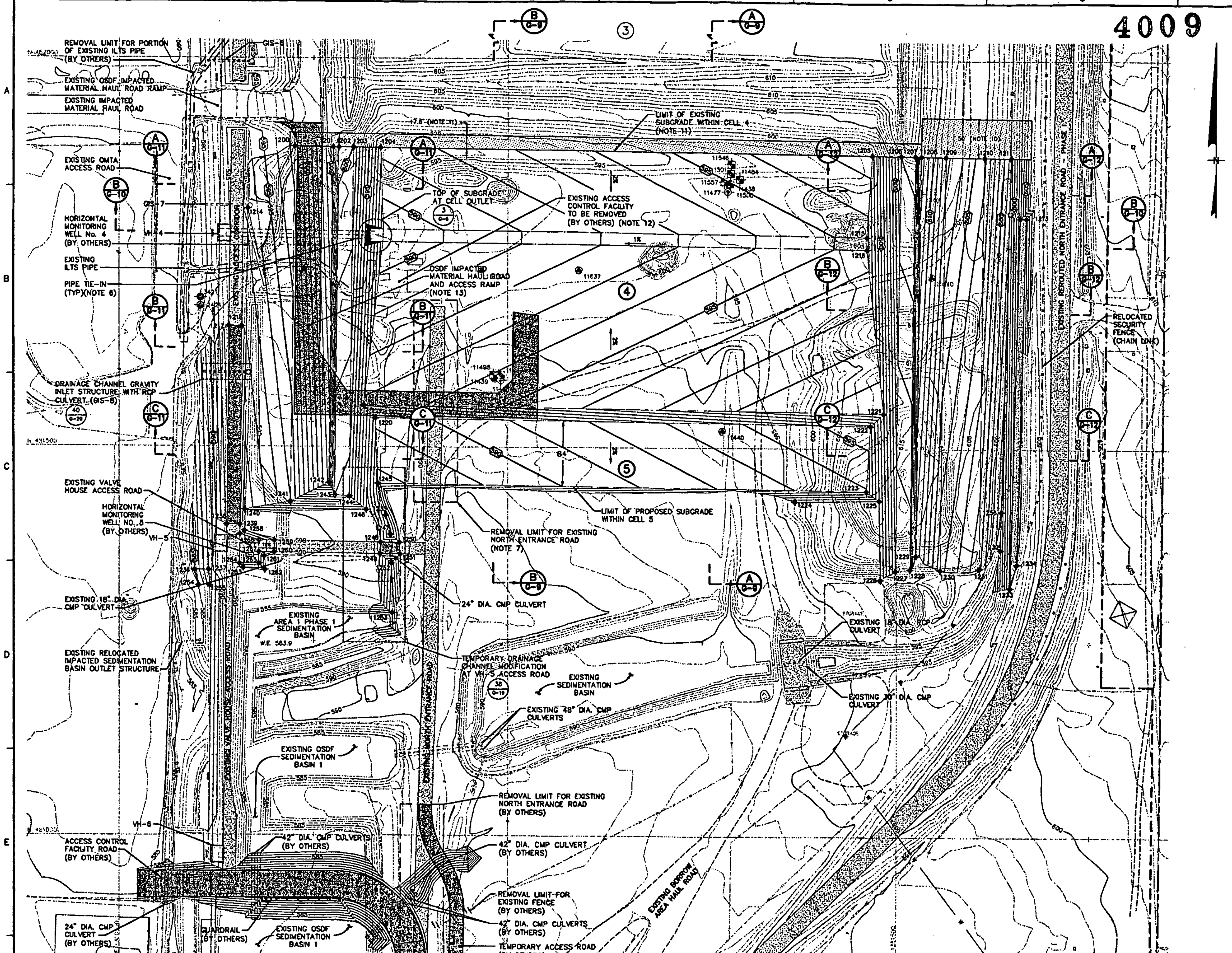


GEOTECHNICAL DATA POINTS (NOTE 4)

POINT NO.	NORTHING	EASTING	ELEVATION
CONE PENETRATION TESTS			
11438	481840.50	1351282.87	598.63
11439	481588.29	1350882.38	594.13
11440	481521.72	1351276.13	594.81
11632	481727.87	1350737.81	593.08
11637	481728.08	1351080.92	596.81
11638	481727.25	1350865.57	597.97
11640	481721.89	1351545.34	602.43
GEOTECHNICAL BORINGS			
1740	481828.43	1351530.98	-
11476	481588.40	1350890.71	593.85
11477	481830.10	1351281.28	597.88
LYSIMETERS			
11546	481885.49	1351288.00	598.88
11557	481842.72	1351278.70	598.90
11484	481848.22	1351298.70	598.90
11498	481593.19	1350981.00	594.80
11499	481583.33	1350981.00	594.70
11500	481840.13	1351284.30	598.90
11501	481853.43	1351285.20	598.00
TYPE 2 MONITORING WELLS			
2421	481881.28	1350805.32	-
TYPE 3 MONITORING WELLS			
3421	481892.05	1350805.70	-

SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
1200	481888.58	1350726.33	597.40
1201	481885.88	1350775.27	605.56
1202	481885.87	1350783.08	600.38
1203	481885.64	1350801.78	599.89
1204	481885.21	1350836.64	601.27
1205	481877.80	1351487.88	597.58
1206	481877.04	1351505.38	607.01
1207	481876.81	1351524.08	607.39
1208	481878.72	1351531.88	612.58
1209	481878.33	1351563.51	607.31
1210	481875.72	1351613.59	604.31
1211	481875.29	1351640.28	608.53
1212	481797.86	1351659.84	602.69
1213	481797.88	1351667.84	602.89
1214	481806.77	1350666.00	583.23
1215	481772.70	1351480.91	585.43
1216	481758.70	1351481.21	585.43
1217	481855.71	1350841.65	594.10
1218	481655.80	1350858.15	594.10
1219	481553.48	1350814.83	593.22
1220	481536.93	1350829.90	588.28
1221	481545.32	1351482.62	599.80
1222	481529.15	1351466.08	595.64
1223	481445.21	1351480.88	593.92
1224	481431.34	1351388.69	598.00
1225	481433.26	1351477.22	598.00
1226	481331.42	1351479.03	598.00
1227	481342.93	1351498.85	603.01
1228	481344.87	1351517.59	603.40
1229	481362.30	1351525.60	608.72
1230	481344.34	1351557.00	603.32
1231	481345.82	1351607.12	600.33
1232	481370.40	1351634.54	598.00
1233	481321.48	1351646.87	600.31
1234	481351.86	1351658.70	600.48
1235	481411.89	1350843.02	587.00
1236	481341.48	1350597.37	585.00
1237	481341.26	1350615.37	588.00
1238	481398.73	1350838.52	592.18
1239	481398.82	1350855.02	592.18
1240	481419.02	1350881.26	590.33
1241	481429.22	1350720.74	593.97
1242	481453.85	1350769.98	602.31
1243	481437.81	1350777.58	597.00
1244	481436.24	1350798.28	596.62
1245	481452.09	1350832.91	587.64
1246	481419.12	1350818.03	591.00
1247	481387.33	1350849.64	588.88
1248	481377.31	1350839.18	590.00
1249	481362.32	1350835.50	590.00
1250	481377.01	1350800.68	590.00
1251	481362.01	1350851.84	590.00
1252	481350.30	1350850.74	586.11
1253	481288.99	1350851.87	585.11
1254	481321.42	1350802.45	585.00
1255	481321.24	1350818.88	588.00
1256	481419.44	1351635.87	598.33
1257	481387.48	1350855.14	592.00
1258	481381.75	1350661.29	590.00
1259	481378.97	1350700.27	590.00
1260	481363.97	1350700.04	590.00
1261	481358.81	1350887.09	589.54
1262	481341.81	1350887.80	589.01
1263	481344.08	1350859.49	590.00
1264	481349.53	1350854.41	591.80
1265	481349.80	1350879.86	592.17
1266	481379.09	1350880.27	592.00
1267	481384.24	1350880.06	592.00

LEGEND

- EXISTING GROUND ELEVATION (FEET)
- EXISTING SUBGRADE ELEVATION (FEET)
- SUBGRADE ELEVATION (FEET) (NOTE 1)
- FEMP PROPERTY LINE
- BATTERY LIMIT
- PERIMETER BERM BASELINE
- EXISTING EPLTS PIPE
- EXISTING ILTS PIPE
- SLOPE CREST, BREAK, OR TOE
- HORIZONTAL MONITORING WELL WITH COVER SLAB
- EXISTING GEOTECHNICAL DATA POINTS AND MONITORING WELLS (NOTE 4)
- CELL DESIGNATION
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP OR HAUL ROAD
- BERM CREST
- GRADING TRANSITION AREA

NOTES:

1. CLEARING, GRUBBING AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
2. ACTIVE VERTICAL MONITORING WELLS AND PIEZOMETERS WITHIN CONSTRUCTION AREA WILL BE ABANDONED BY OWNER PRIOR TO CONSTRUCTION IN THAT AREA.
3. CONTRACTOR SHALL LOCATE AND REMOVE EXISTING SUBDRAIN TILE SYSTEM WITHIN CONSTRUCTION AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02200. REFER TO REFERENCE DRAWINGS SKG-04391 THROUGH SKG-04397 FOR LOCATION OF SUBDRAIN TILE SYSTEM.
4. CONTRACTOR SHALL REMOVE GROUT USED TO BACKFILL GEOTECHNICAL DATA POINTS AND MONITORING WELLS LOCATED WITHIN PERIMETER BERM BASELINE TO A MINIMUM DEPTH OF 3 FEET BELOW SUBGRADE ELEVATIONS.
5. CONTRACTOR SHALL DEWATER EXCAVATIONS AND MANAGE COLLECTED WATER IN ACCORDANCE WITH SPECIFICATION SECTION 02200. GROUNDWATER LEVELS IN BROWN AND GRAY TILL LAYERS VARY DURING YEAR AND MAY BE HIGHER THAN THOSE SHOWN ON REFERENCE DRAWINGS. LEVELS MAY APPROACH GROUND SURFACE DURING PERIODS OF HEAVY PRECIPITATION.
6. LDS, LCS AND RLCS PIPES SHALL TIE INTO EXISTING PIPES. CONSTRUCTION CONTROL POINTS FOR PIPE TIE-INS ARE SHOWN ON DRAWING G-7.
7. ROAD PAVEMENT COURSES AND ASSOCIATED IMPACTED MATERIAL FOR EXISTING NORTH ENTRANCE ROAD SHALL BE REMOVED WITHIN LIMIT SHOWN. REMOVAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200. CONTRACTOR SHALL PLACE REMOVED MATERIAL IN A STOCKPILE OR ACTIVE CELL AS APPROVED BY CONSTRUCTION MANAGER.
8. CONTRACTOR SHALL LOCATE EXISTING UNDERGROUND UTILITIES WITHIN CONSTRUCTION AREA SHOWN ON REFERENCE DRAWINGS SKG-04391 THROUGH SKG-04397. CONTRACTOR SHALL REMOVE UNDERGROUND UTILITIES IN CONSTRUCTION AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02200 AND AS APPROVED BY CONSTRUCTION MANAGER.
9. FOR LOCATION OF RELOCATED SECURITY FENCE, SEE DRAWING G-1.
10. CONTRACTOR SHALL TRANSITION PROPOSED SUBGRADE ELEVATIONS TO TIE-IN WITH EXISTING GROUND ELEVATIONS WITHIN AREA SHOWN.
11. CONTRACTOR SHALL TIE PROPOSED SUBGRADE ELEVATIONS TO TIE-IN WITH EXISTING SUBGRADE ELEVATIONS APPROXIMATELY 17.5 FEET NORTH OF LIMIT LINE SHOWN.
12. EXISTING ACCESS CONTROL FACILITY INCLUDING TRAILERS, EQUIPMENT WASH FACILITY, ILTS PIPE, AND FENCE WITHIN THE LIMITS OF CELL 4 SUBGRADE TO BE REMOVED BY OTHERS.
13. FOR OSDF IMPACTED MATERIAL HAUL ROAD AND ACCESS RAMP GRADING PLAN, SEE DRAWING G-8.

000006

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JHO	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JJA	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JJA	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	JJA	DKP	DGP	JFB

50 25 0 50 100
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: SUBGRADE GRADING PLAN – CELL 4 LINER

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

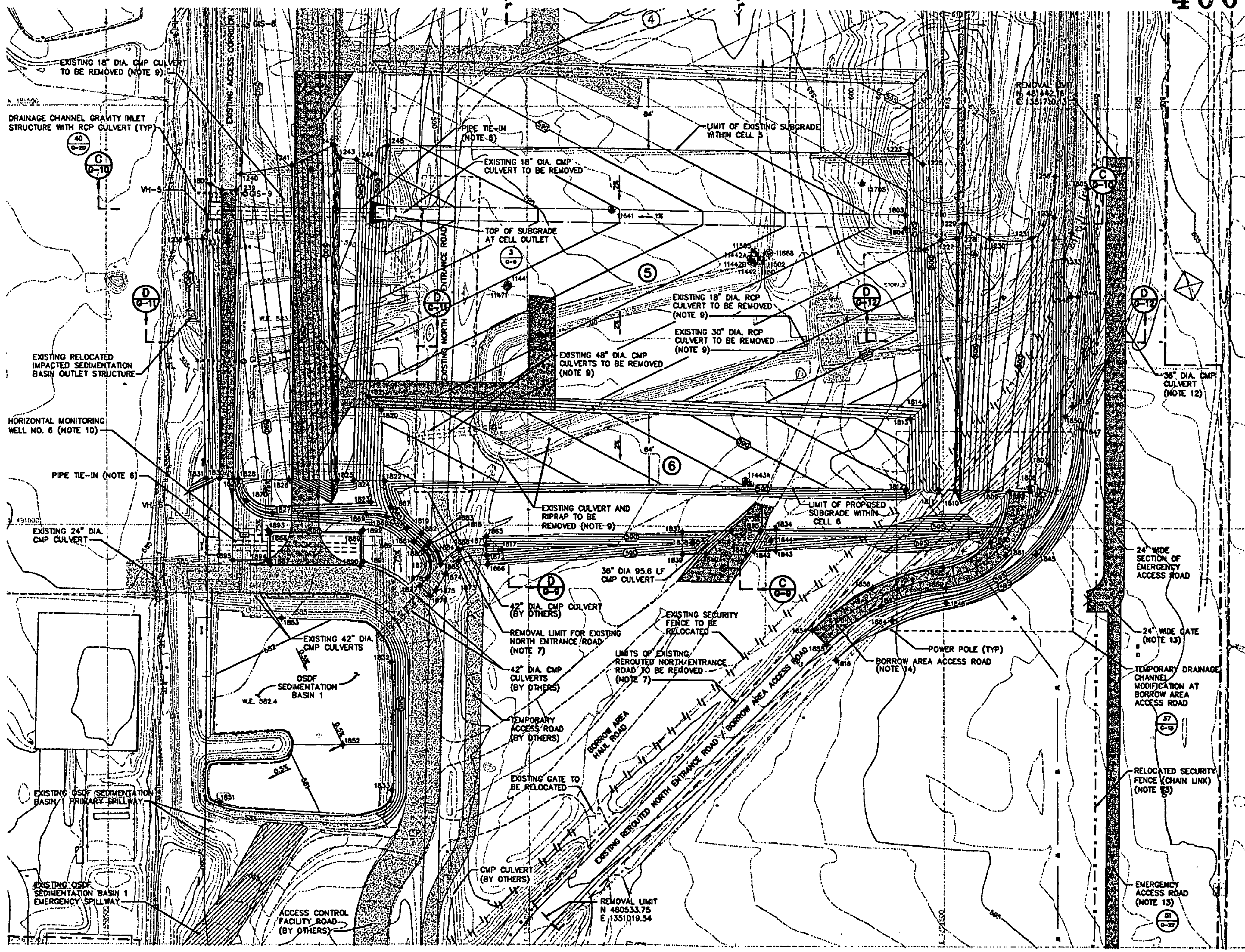
SIGNATURE
20 Aug 2004
DATE

STATE OF OHIO JOHN F. BEECH E-68246 REGISTERED PROFESSIONAL ENGINEER

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-G-00331
GEOSYNTEC PROJECT NO.:	GQ1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0109
SHEET NO.:	G-3
REVISION NO.:	0

4009



SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
1223	481445.21	1351480.88	593.92
1225	481433.28	1351477.22	598.00
1226	481331.42	1351479.03	598.00
1227	481342.93	1351498.85	603.01
1228	481344.87	1351517.89	603.40
1229	481382.30	1351825.60	608.72
1230	481344.34	1351557.00	603.32
1231	481345.92	1351607.12	600.33
1232	481370.40	1351634.84	598.00
1233	481321.44	1351646.87	600.31
1234	481351.84	1351655.70	600.48
1236	481341.48	1350597.37	585.00
1237	481341.28	1350615.37	588.00
1238	481309.73	1350638.52	592.18
1239	481308.52	1350655.02	592.18
1240	481418.02	1350661.28	590.33
1241	481429.22	1350720.74	593.97
1242	481453.65	1350769.98	602.31
1243	481437.81	1350777.58	597.00
1244	481438.24	1350796.28	598.62
1245	481452.88	1350832.81	587.64
1246	481418.12	1350818.03	591.00
1256	481419.44	1351635.87	598.33
1801	481351.18	1350821.04	589.00
1802	481408.43	1350825.23	590.00
1803	481372.73	1351458.02	592.43
1804	481358.73	1351458.32	592.43
1805	481404.97	1351674.24	603.00
1806	481188.83	1351698.18	598.68
1807	481079.51	1351628.61	594.53
1808	481048.22	1351603.49	598.11
1809	481044.05	1351553.33	601.07
1810	481044.83	1351513.82	601.14
1811	481044.76	1351485.20	600.77
1812	481045.24	1351455.78	590.92
1813	481129.18	1351481.20	592.84
1814	481145.35	1351477.93	598.90
1815	481144.78	1351655.68	601.25
1816	480841.52	1351372.01	592.08
1817	480970.92	1350967.35	584.65
1818	480975.08	1350877.71	583.89
1819	480998.21	1350854.24	584.00
1820	481138.98	1350825.01	588.28
1821	481163.81	1350809.94	590.22
1822	481052.92	1350828.02	584.64
1823	481027.18	1350812.28	589.40
1824	481053.38	1350791.80	593.74
1825	481053.80	1350772.80	594.12
1826	481054.28	1350718.18	591.18
1827	481014.53	1350696.32	586.58
1828	481055.01	1350658.81	587.60
1829	481055.08	1350630.81	589.60
1830	481055.28	1350634.31	589.60
1831	481055.48	1350618.74	587.00
1832	480837.00	1350835.30	581.83
1833	480884.01	1350835.17	581.48
1834	480997.25	1351300.59	593.65
1835	480994.84	1351280.80	595.00
1836	480995.25	1351246.84	595.00
1837	480992.90	1351187.13	592.12
1838	480980.18	1351189.13	587.89
1839	480968.35	1351187.13	592.18
1840	480967.03	1351215.91	595.00
1841	480966.43	1351284.63	595.00
1842	480970.63	1351273.62	593.18
1843	480971.05	1351300.59	593.38
1844	480983.98	1351294.59	589.22
1845	480968.59	1351611.00	593.44
1846	480909.65	1351502.99	592.81
1847	481117.89	1351686.78	596.80
1848	481276.31	1351654.38	603.00
1849	481275.89	1351682.38	603.00
1850	481133.00	1351848.95	601.10
1851	480989.33	1350832.78	580.80
1852	480738.31	1350777.61	581.30

SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
1853	480859.47	1350709.78	582.14
1854	480876.90	1351344.38	595.36
1855	480859.62	1351381.05	598.38
1856	480927.10	1351418.91	598.60
1857	480905.81	1351428.38	598.61
1858	480952.18	1351499.70	597.63
1859	480928.38	1351502.83	597.82
1860	480902.81	1351856.80	598.91
1861	480967.02	1351574.87	598.91
1862	481043.54	1351579.42	600.00
1863	481043.35	1351603.42	600.00
1864	480888.80	1351438.81	592.47
1865	480988.57	1350948.83	589.88
1866	480952.75	1350950.18	589.88
1867	481021.89	1350835.57	584.32
1868	481009.85	1350830.18	584.41
1869	481013.18	1350808.31	584.80
1870	481028.84	1350868.23	587.14
1871	480978.18	1350948.30	-
1872	480984.17	1350948.78	-
1873	480957.09	1350915.47	-
1874	480941.87	1350899.83	-
1875	480922.41	1350888.90	-
1876	480918.20	1350881.91	-
1877	480927.86	1350869.18	-
1878	480937.20	1350877.91	-
1879	480956.69	1350881.85	-
1880	480970.14	1350874.21	-
1881	480980.63	1350862.54	-
1882	480989.29	1350870.33	-
1883	480980.20	1350880.98	-
1884	480968.48	1350890.18	-
1885	480953.38	1350884.17	-
1886	480971.21	1350918.88	-
1887	480953.35	1350884.20	590.78
1888	480990.75	1350894.20	590.78
1889	480990.75	1350789.20	590.78
1890	480951.80	1350799.10	590.78
1891	480958.52	1350802.84	588.08
1892	480994.17	1350802.62	589.14
1893	480994.17	1350890.78	589.14
1894	480958.40	1350890.21	588.87
1895	480958.38	1350849.63	588.97

LEGEND

- 600 — EXISTING GROUND ELEVATION (FEET)
- 590 — EXISTING SUBGRADE ELEVATION (FEET)
- 590 — SUBGRADE ELEVATION (FEET) (NOTE 1)
- FEMP PROPERTY LINE
- BATTERY LIMIT
- PERIMETER BERM BASELINE
- EXISTING EPLTS PIPE
- ILTS — EXISTING ILTS PIPE
- SLOPE CREST, BREAK, OR TOE
- HORIZONTAL MONITORING WELL WITH COVER SLAB
- 11705, 11433, 11480, 14968, 11502, 2439 — EXISTING GEOTECHNICAL DATA POINTS AND MONITORING WELLS (NOTES 2 AND 4)
- 5 — CELL DESIGNATION
- ACCESS CORRIDOR, ACCESS ROAD, ACCESS RAMP OR HAUL ROAD
- BERM CREST
- RIPRAP LIMIT

NOTES:

1. CLEARING, GRUBBING AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
2. ACTIVE VERTICAL MONITORING WELLS AND PIEZOMETERS WITHIN CONSTRUCTION AREA WILL BE ABANDONED BY OWNER PRIOR TO CONSTRUCTION IN THAT AREA.
3. CONTRACTOR SHALL LOCATE AND REMOVE EXISTING SUBDRAIN TILE SYSTEM WITHIN CONSTRUCTION AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02200. REFER TO REFERENCE DRAWINGS SKG-04391 THROUGH SKG-04397 FOR LOCATION OF SUBDRAIN TILE SYSTEM.
4. CONTRACTOR SHALL REMOVE GROUT USED TO BACKFILL GEOTECHNICAL DATA POINTS AND MONITORING WELLS LOCATED WITHIN PERIMETER BERM BASELINE TO A MINIMUM DEPTH OF 3 FEET BELOW SUBGRADE ELEVATIONS.
5. CONTRACTOR SHALL DEWATER EXCAVATIONS AND MANAGE COLLECTED WATER IN ACCORDANCE WITH SPECIFICATION SECTION 02200. GROUNDWATER LEVELS IN BROWN AND GRAY TILL LAYERS VARY DURING YEAR AND MAY BE HIGHER THAN THOSE SHOWN ON REFERENCE DRAWINGS. LEVELS MAY APPROACH GROUND SURFACE DURING PERIODS OF HEAVY PRECIPITATION.
6. LDS, LCS AND RLCS PIPES SHALL TIE INTO EXISTING PIPES. CONSTRUCTION CONTROL POINTS FOR PIPE TIE-INS ARE SHOWN ON DRAWING G-7.
7. ROAD PAVEMENT COURSES AND ASSOCIATED IMPACTED MATERIAL FOR EXISTING NORTH ENTRANCE ROAD AND EXISTING REROUTED NORTH ENTRANCE ROAD SHALL BE REMOVED WITHIN LIMIT SHOWN. REMOVAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200. CONTRACTOR SHALL PLACE REMOVED MATERIAL IN A STOCKPILE OR ACTIVE CELL AS APPROVED BY CONSTRUCTION MANAGER.
8. CONTRACTOR SHALL LOCATE EXISTING UNDERGROUND UTILITIES WITHIN CONSTRUCTION AREA SHOWN ON REFERENCE DRAWINGS SKG-04391 THROUGH SKG-04397. CONTRACTOR SHALL REMOVE UNDERGROUND UTILITIES IN CONSTRUCTION AREA IN ACCORDANCE WITH SPECIFICATION SECTION 02200 AND AS APPROVED BY CONSTRUCTION MANAGER.
9. CONTRACTOR SHALL REMOVE EXISTING CULVERT AND ASSOCIATED RIPRAP AND STOCKPILE MATERIAL AT LOCATION APPROVED BY CONSTRUCTION MANAGER.
10. FOR CONSTRUCTION OF HORIZONTAL MONITORING WELL, SEE DRAWING G-21.
11. FOR OSDF IMPACTED MATERIAL HAUL ROAD AND ACCESS RAMP GRADING PLAN, SEE DRAWING G-8.
12. FOR CULVERT AND OTHER REQUIREMENTS, SEE DRAWING G-22. REGRADE GROUND IN VICINITY OF CULVERT TO PROVIDE MINIMUM 3 FEET HEIGHT BETWEEN CULVERT INVERT AND OVERTOPPING ELEVATION OF CHANNEL SIDESLOPE.
13. FOR LOCATION OF EMERGENCY ACCESS ROAD AND CHAIN LINK SECURITY FENCE AND GATES, SEE DRAWING G-2.
14. FOR CONSTRUCTION OF BORROW AREA ACCESS ROAD, SEE DRAWING G-18.

GEOTECHNICAL DATA POINTS (NOTE 6)

POINT NO.	NORTHING	EASTING	ELEVATION
CONE PENETRATION TEST			
11441	481287.11	1350978.33	588.95
11633	481338.60	1350644.59	588.86
11641	481377.18	1351103.61	591.10
11645	481328.61	1351539.10	598.87
11442A	481318.43	1351270.73	593.28
11442B	481318.53	1351270.71	593.21
11442	481315.22	1351278.01	593.18
11443	481049.44	1351289.27	—
11443A	481054.27	1351284.28	—
11443B	481051.14	1351284.02	—
PIEZOMETERS			
POINT NO.	NORTHING	EASTING	ELEVATION
11705	481410.54	1351404.44	598.18
11706	481425.81	1350742.84	590.92
GEOTECHNICAL BORINGS			
POINT NO.	NORTHING	EASTING	ELEVATION
1496	481044.42	1351635.97	—
1497	481344.42	1351635.86	
11471	481285.02	1350978.10	589.01
11684	481339.62	1350644.79	588.90
11688	481328.34	1351293.21	593.78
11689	481325.78	1351533.64	598.88

GEOTECHNICAL DATA POINTS (NOTE 6)

POINT NO.	NORTHING	EASTING	ELEVATION
LYSIMETERS			
11502	481317.85	1351282.90	593.80
11503	481328.89	1351275.80	593.90
TYPE 1 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
1190	481317.57	1351282.97	593.70
TYPE 2 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
2439	481123.85	1350730.35	-
TYPE 4 MONITORING WELLS			
POINT NO.	NORTHING	EASTING	ELEVATION
4439	481113.88	1350730.35	-

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CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JMS	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JMD	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	AJA	DKP	DGP	JFB.

50 25 0 50 100
SCALE IN FEET

OWNER/FACILITY:

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:

FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: SUBGRADE GRADING PLAN – CELL 5 LINER

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

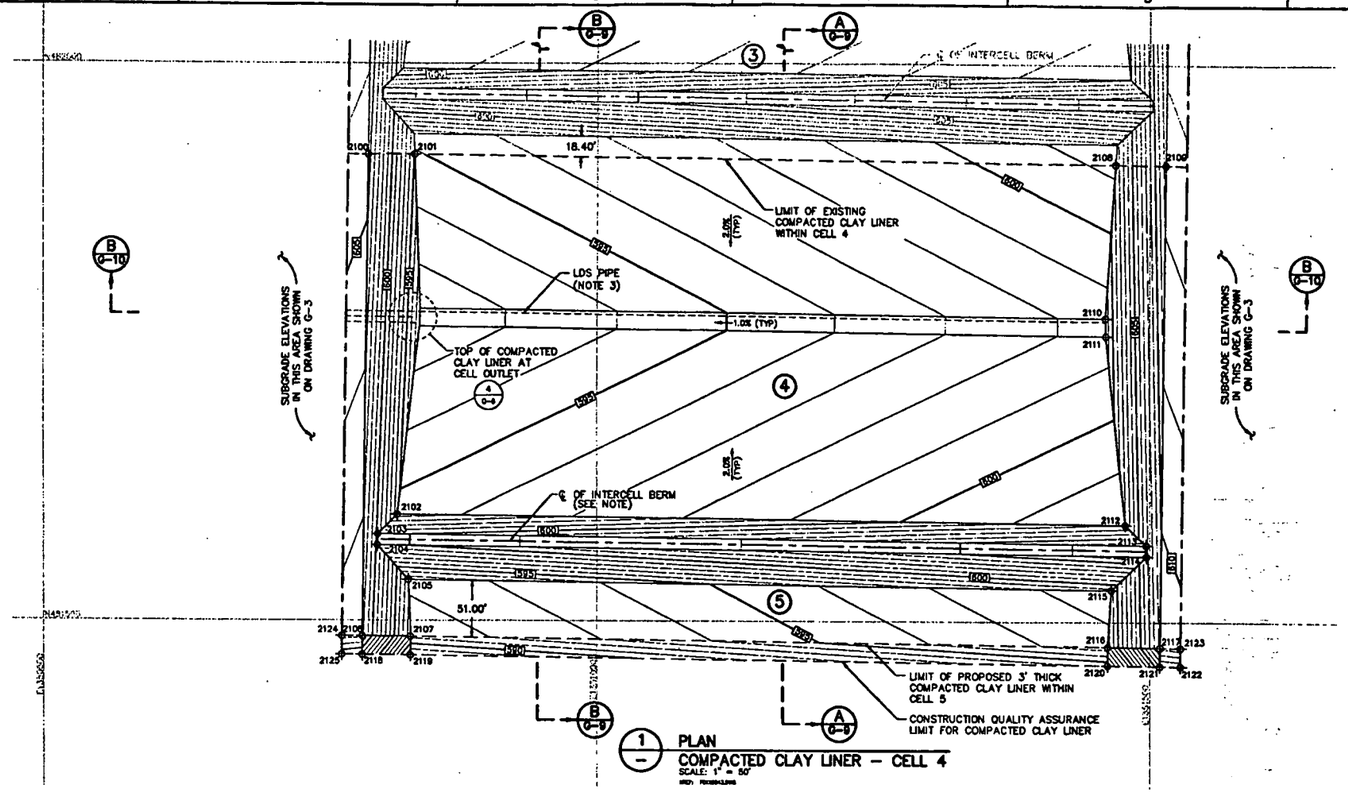
SIGNATURE: J.F. Beech
DATE: 20 Aug 2004

SEAL: STATE OF OHIO – JOHN F. BEECH – E-58248 – REGISTERED PROFESSIONAL ENGINEER

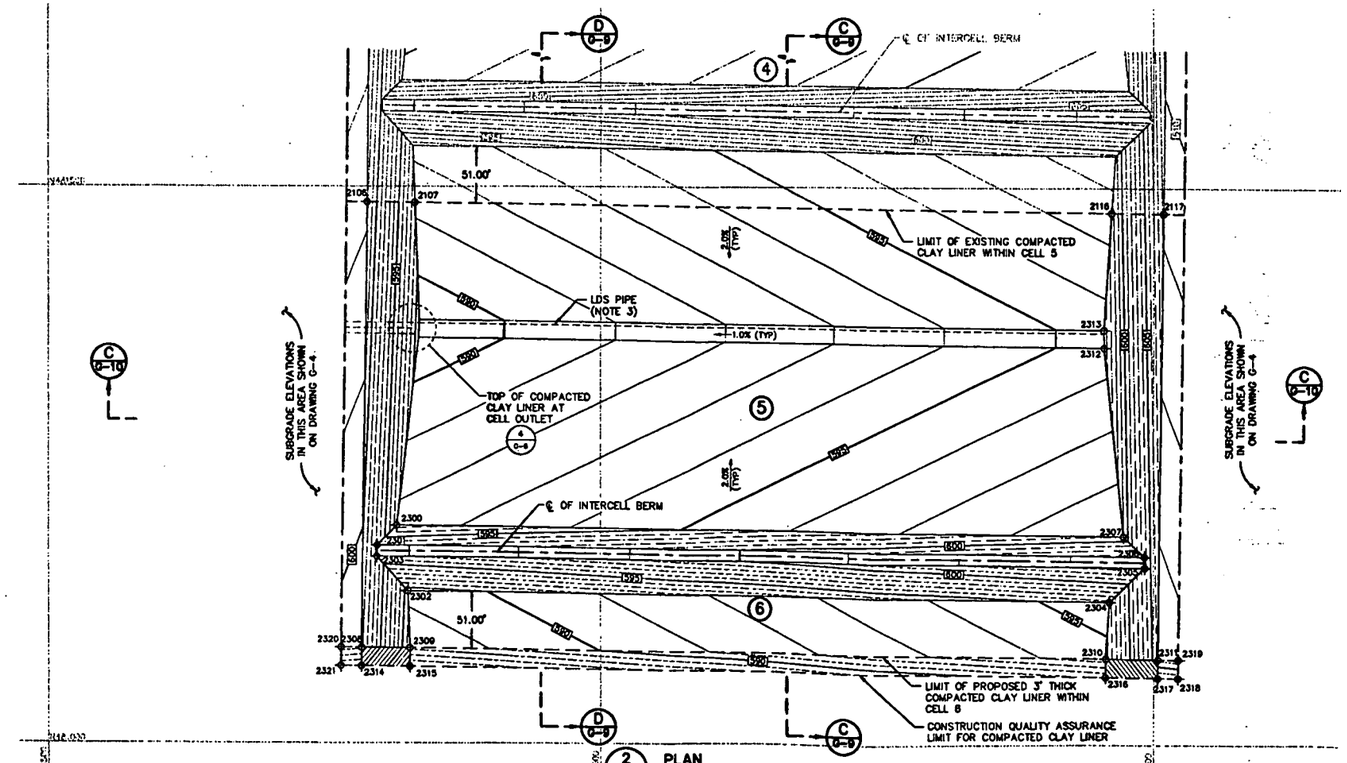
GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA, 30342, USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-G-00332
GEOSYNTEC PROJECT NO.:	GO1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0110
SHEET NO.:	G-4
REVISION NO.:	0

4009



1 PLAN
COMPACTED CLAY LINER – CELL 4
SCALE: 1" = 50'



2 PLAN
COMPACTED CLAY LINER – CELL 5
SCALE: 1" = 50'

LEGEND

- 610 — EXISTING COMPACTED CLAY LINER (FEET) (NOTE 2)
- 600 — COMPACTED CLAY LINER (FEET) (NOTE 2)
- PERIMETER BERM BASELINE
- 2112 — CONSTRUCTION CONTROL POINT
- 4 — CELL DESIGNATION

COMPACTED CLAY LINER CONSTRUCTION CONTROL POINTS

CELL 4				CELL 5			
POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING	ELEVATION
2100	481918.60	1350793.71	605.44	2106	481486.03	1350788.42	602.20
2101	481918.08	1350835.81	594.92	2107	481485.50	1350832.09	591.28
2102	481595.35	1350820.13	595.43	2116	481477.79	1351462.40	597.58
2103	481577.74	1350802.28	599.71	2117	481477.22	1351508.96	609.22
2104	481567.74	1350801.85	599.70	2300	481195.38	1350815.25	592.43
2105	481536.52	1350830.26	592.27	2301	481177.77	1350797.37	596.71
2106	481486.03	1350788.42	602.20	2302	481138.55	1350825.38	589.27
2107	481485.50	1350832.09	591.28	2303	481187.77	1350796.96	596.70
2108	481910.34	1351469.38	601.25	2304	481128.79	1351460.79	595.63
2109	481909.79	1351514.24	612.47	2305	481159.27	1351492.35	603.86
2110	481772.68	1351460.52	598.42	2306	481169.28	1351492.16	603.86
2111	481756.73	1351460.83	598.43	2307	481187.33	1351473.26	599.01
2112	481587.30	1351478.14	602.01	2308	481086.08	1350763.53	599.20
2113	481569.25	1351497.05	606.66	2309	481085.53	1350827.20	588.28
2114	481559.24	1351497.24	606.66	2310	481077.82	1351457.50	594.56
2115	481526.76	1351465.68	598.63	2311	481077.25	1351504.07	606.22
2116	481477.79	1351462.40	597.58	2312	481358.76	1351455.94	595.43
2117	481477.22	1351508.96	609.22	2313	481372.71	1351455.63	595.42
2118	481469.37	1350788.22	598.87	2314	481069.39	1350763.33	595.87
2119	481468.83	1350831.89	587.95	2315	481068.86	1350827.00	584.95
2120	481461.12	1351465.19	594.25	2316	481061.15	1351457.32	591.26
2121	481460.58	1351508.75	605.89	2317	481060.59	1351503.87	602.89
2122	481460.34	1351526.80	606.26	2318	481060.37	1351521.90	603.26
2123	481477.00	1351527.00	609.59	2319	481077.03	1351522.11	606.59
2124	481486.25	1350770.38	602.56	2320	481086.28	1350765.49	599.56
2125	481469.59	1350770.18	599.23	2321	481069.61	1350765.29	596.23

NOTES:

1. THIS DRAWING SHOWS GRADING AND CONSTRUCTION CONTROL POINTS FOR COMPACTED CLAY LINER FOR CELLS 4 AND 5 AND TEMPORARY TERMINATION FOR CELLS 5 AND 6.
2. COMPACTED CLAY LINER ELEVATIONS CORRESPOND TO TOP OF COMPACTED CLAY LINER.
3. LDS PIPE CONSTRUCTION CONTROL POINTS ARE SHOWN ON DRAWINGS G-6 AND G-7.
4. FOR CONCURRENT CONSTRUCTION OF CELLS 4 AND 5, THE INTERCELL BERM SHALL BE MODIFIED AS SHOWN ON DRAWING G-22.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE IN FEET: 50 25 0 50 100

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
COMPACTED CLAY LINER GRADING PLAN – CELLS 4 AND 5

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN BEECH E-54248 — REGISTERED PROFESSIONAL ENGINEER — SEAL

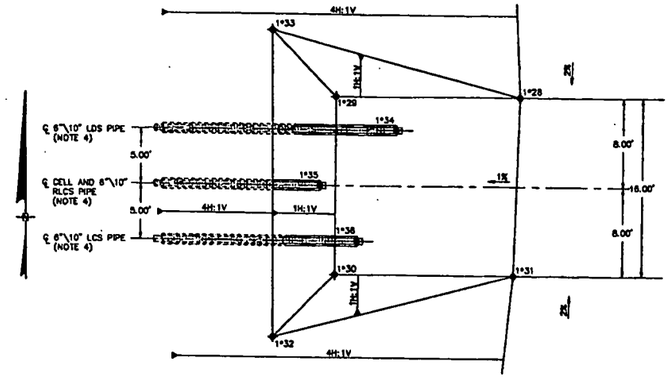
GEO SYNTEC CONSULTANTS
1255 LAKE HEARN DRIVE
ATLANTA, GEORGIA, 30319 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005026
FDMP DRAWING NO.:	20X-5000-D-00333
GEOSYNTEC PROJECT NO.:	G01342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0113
SHEET NO.:	G-5
REVISION NO.:	0

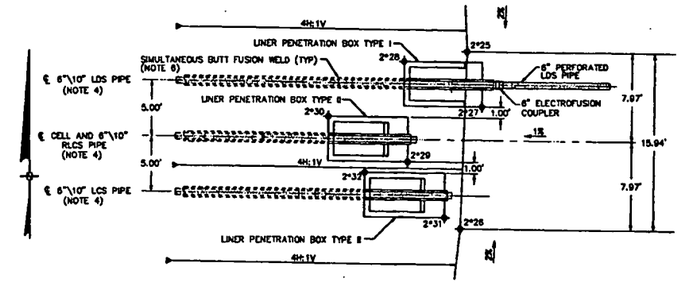
000008

CERTIFIED–FOR–CONSTRUCTION

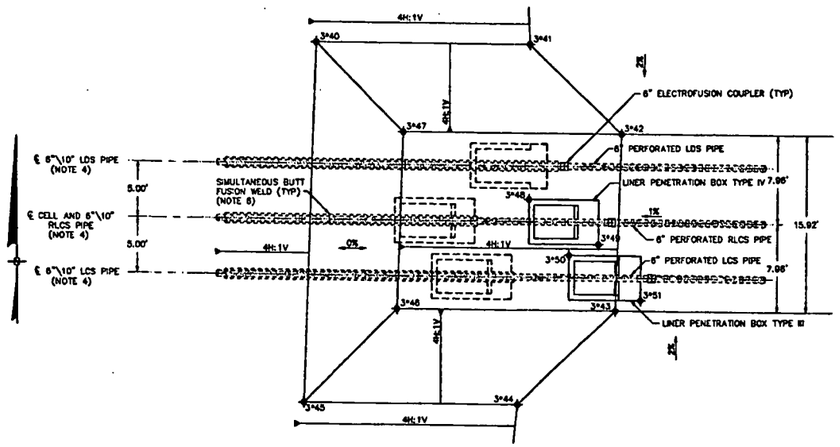
4009



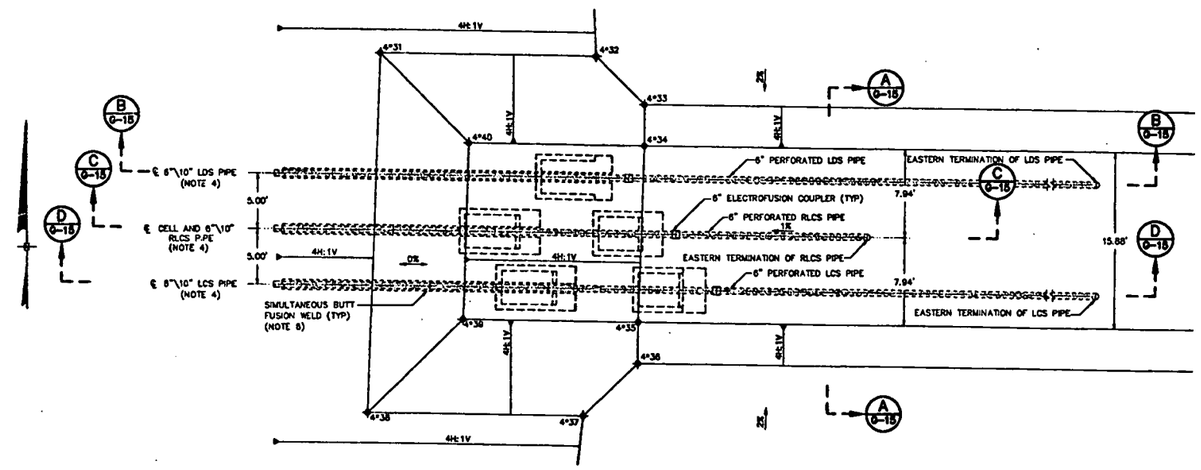
3/0-4 3/0-3 PLAN
TOP OF SUBGRADE AT CELL OUTLET
SCALE: 1" = 5'



4/0-5 PLAN
TOP OF COMPACTED CLAY LINER AT CELL OUTLET
SCALE: 1" = 5'



5/- PLAN
TOP OF LDS DRAINAGE LAYER AT CELL OUTLET
SCALE: 1" = 5'



6/- PLAN
TOP OF LCS DRAINAGE LAYER AT CELL OUTLET
SCALE: 1" = 5'

CELL 4 CONSTRUCTION CONTROL POINTS			
TOP OF SUBGRADE AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
1428	481780.29	1350840.40	589.22
1429	481780.49	1350823.67	589.06
1430	481764.49	1350823.47	589.06
1431	481764.29	1350839.74	589.22
1432	481758.92	1350817.82	594.64
1433	481786.46	1350817.88	594.92
1434	481777.42	1350829.10	592.11
1435	481772.51	1350821.95	594.04
1436	481757.47	1350825.37	593.08
TOP OF COMPACTED CLAY LINER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
2425	481780.25	1350840.75	592.23
2426	481764.32	1350840.10	592.22
2427	481775.28	1350842.06	592.20
2428	481779.35	1350835.13	593.64
2429	481770.35	1350835.19	593.65
2430	481774.44	1350827.98	593.47
2431	481765.30	1350838.61	592.69
2432	481769.39	1350831.40	594.51
TOP OF LDS DRAINAGE LAYER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
3440	481788.49	1350821.04	598.27
3441	481788.25	1350840.58	593.38
3442	481780.14	1350848.60	593.31
3443	481764.23	1350848.14	593.30
3444	481755.84	1350839.21	593.38
3445	481756.08	1350819.71	598.26
3446	481764.47	1350828.30	598.26
3447	481780.39	1350828.96	598.27
3448	481774.29	1350840.18	595.53
3449	481770.21	1350846.40	593.98
3450	481769.24	1350839.91	594.47
3451	481765.16	1350830.38	593.29
TOP OF LCS DRAINAGE LAYER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
4431	481788.47	1350821.16	599.27
4432	481788.23	1350840.70	594.39
4433	481783.87	1350845.11	594.34
4434	481780.17	1350845.07	595.27
4435	481764.30	1350844.42	595.27
4436	481760.59	1350844.37	594.34
4437	481755.88	1350839.33	594.39
4438	481756.10	1350819.83	599.26
4439	481764.49	1350828.43	599.26
4440	481780.37	1350829.08	599.27

CELL 5 CONSTRUCTION CONTROL POINTS			
TOP OF SUBGRADE AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
1528	481380.32	1350835.51	586.22
1529	481380.52	1350818.78	586.06
1530	481384.52	1350818.58	586.06
1531	481384.32	1350834.85	586.22
1532	481358.95	1350812.93	591.64
1533	481386.51	1350812.99	591.92
1534	481377.45	1350824.22	589.11
1535	481372.54	1350817.06	591.04
1536	481367.50	1350820.49	590.08
TOP OF COMPACTED CLAY LINER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
2525	481380.28	1350835.87	589.23
2526	481384.35	1350835.21	589.22
2527	481375.29	1350837.19	589.20
2528	481379.38	1350830.24	590.64
2529	481370.38	1350830.30	590.65
2530	481374.47	1350823.09	592.47
2531	481365.33	1350833.72	589.69
2532	481369.42	1350826.51	591.51
TOP OF LDS DRAINAGE LAYER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
3540	481388.52	1350816.16	595.27
3541	481388.28	1350835.70	590.38
3542	481380.17	1350843.92	590.31
3543	481384.28	1350843.27	590.30
3544	481355.87	1350834.34	590.38
3545	481356.11	1350814.83	595.26
3546	481384.50	1350823.43	595.26
3547	481380.42	1350824.98	595.27
3548	481374.32	1350835.28	592.53
3549	481370.24	1350841.52	590.98
3550	481369.27	1350839.02	591.47
3551	481365.18	1350845.47	590.29
TOP OF LCS DRAINAGE LAYER AT CELL OUTLET			
POINT NO.	NORTHING	EASTING	ELEVATION
4531	481388.50	1350816.29	596.27
4532	481388.26	1350835.82	591.39
4533	481383.90	1350840.24	591.34
4534	481380.20	1350840.19	592.27
4535	481384.33	1350839.54	592.27
4536	481360.62	1350839.48	591.34
4537	481355.88	1350834.45	591.39
4538	481356.12	1350814.96	596.26
4539	481384.52	1350823.55	596.26
4540	481380.40	1350824.20	596.27

LEGEND

4*40 ✦ CONSTRUCTION CONTROL POINT (SEE NOTE 5)

NOTES:

1. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
2. FOR LINER PENETRATION BOX DETAILS, SEE DRAWING G-16.
3. TRENCH FOR LDS, LCS AND RLCS PIPES IS NOT SHOWN ON THIS DRAWING FOR CLARITY. TRENCHING AND BACKFILLING FOR LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTIONS 02215 AND 02225.
4. LDS, LCS AND RLCS PIPES SHALL TIE INTO EXISTING PIPES. TIE-IN LOCATIONS ARE SHOWN IN CONSTRUCTION CONTROL POINT TABLE PRESENTED ON DRAWING G-7.
5. THE "*" SYMBOL REPRESENTS THE CELL IN WHICH THE APPROPRIATE OUTLET CONTROL POINTS ARE LOCATED.
6. SIMULTANEOUS BUTT FUSION WELDS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13005.

000009

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
D	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JAG	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLS	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	JAB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE:
CELL OUTLET GRADING PLANS I

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

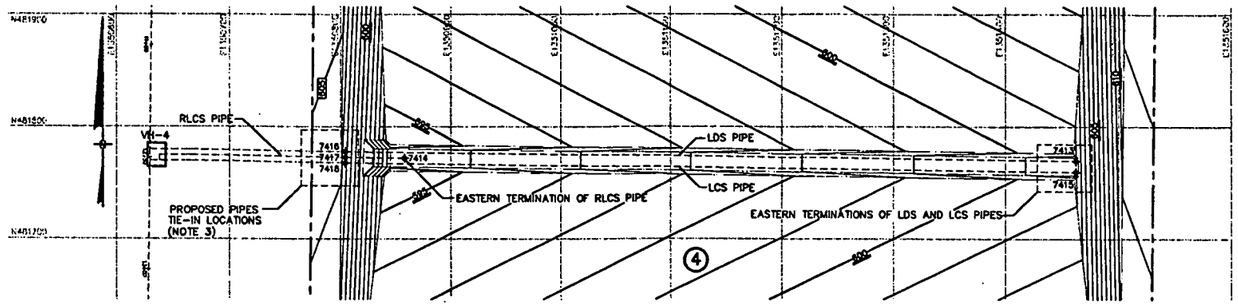
SIGNATURE
DATE

STATE OF OHIO
JOHN BEECH
E-58248
REGISTERED PROFESSIONAL ENGINEER
SEAL

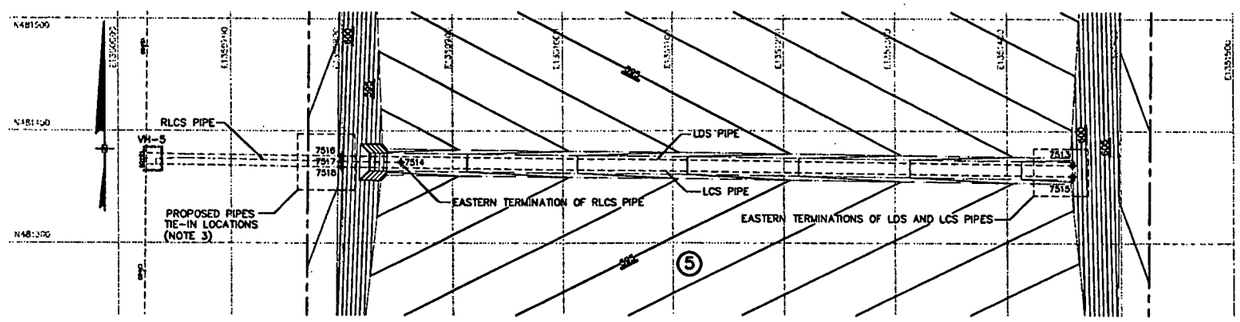
GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
EMP DRAWING NO.:	90X-8000-G-00334
GEOSYNTEC PROJECT NO.:	001342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0116
SHEET NO.:	G-8
REVISION NO.:	0

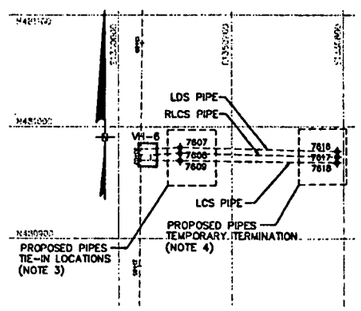
4009



7 PLAN
CONSTRUCTION CONTROL POINT LOCATIONS FOR CELL 4 LDS, LCS AND RLCS PIPES
SCALE: 1" = 50'



8 PLAN
CONSTRUCTION CONTROL POINT LOCATION FOR CELL 5 LCS, LDS AND RLCS PIPES
SCALE: 1" = 50'



9 PLAN
CONSTRUCTION CONTROL POINT LOCATIONS FOR CELL 6 LDS, LCS AND RLCS PIPES
SCALE: 1" = 50'

EXISTING LDS, LCS AND RLCS PIPES TIE-IN LOCATIONS (NOTE 3)			
CELL 4			
POINT NO.	NORTHING	EASTING	ELEVATION
7416	481777.72	1350804.34	861.83
7417	481772.78	1350804.17	863.84
7418	481767.78	1350804.10	863.72
CELL 5			
POINT NO.	NORTHING	EASTING	ELEVATION
7516	481377.71	1350799.36	868.75
7517	481372.87	1350799.25	870.83
7518	481367.79	1350799.22	869.98
CELL 6			
POINT NO.	NORTHING	EASTING	ELEVATION
7607	480981.52	1350434.45	884.20
7606	480976.38	1350434.45	884.16
7605	480969.70	1350434.38	884.36
LDS, LCS AND RLCS PIPES EASTERN TERMINATIONS			
CELL 4			
POINT NO.	NORTHING	EASTING	ELEVATION
7413	481769.88	1351457.48	886.44
7414	481772.08	1350837.17	884.38
7415	481758.88	1351442.41	889.45
CELL 5			
POINT NO.	NORTHING	EASTING	ELEVATION
7513	481368.71	1351457.98	889.44
7514	481373.11	1350833.28	881.39
7515	481358.71	1351437.52	888.45
LDS, LCS AND RLCS PIPES TEMPORARY TERMINATION (NOTE 4)			
CELL 6			
POINT NO.	NORTHING	EASTING	ELEVATION
7618	480978.00	1350794.41	865.83
7617	480973.87	1350794.28	867.84
7616	480967.81	1350794.18	866.75

NOTES:

1. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
2. TRENCH FOR LDS, LCS AND RLCS PIPES IS NOT SHOWN ON THIS DRAWING FOR CLARITY. TRENCHING AND BACKFILLING FOR LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTIONS 02215 AND 02225.
3. LDS, LCS AND RLCS PIPES SHALL TIE INTO EXISTING PIPES. TIE-IN LOCATIONS ARE SHOWN IN CONSTRUCTION CONTROL POINT TABLE PRESENTED ON THIS DRAWING. TIE-IN CONSTRUCTION CONTROL POINTS REPRESENT OUTSIDE BOTTOM OF 10-INCH PIPE. CONTRACTOR SHALL REMOVE END CAPS OR OTHER TEMPORARY PROTECTION INSTALLED IN EXISTING PIPES PRIOR TO TIE-INS. AS-BUILT TIE-IN LOCATIONS MAY VARY SLIGHTLY FROM CONSTRUCTION CONTROL POINTS GIVEN ON THIS DRAWING.
4. LDS, LCS AND RLCS TEMPORARY TERMINATIONS SHALL BE CAPPED IN ACCORDANCE WITH SPECIFICATION SECTION 02605.

LEGEND

- 605 — COMPACTED CLAY LINER ELEVATION (FEET)
- 600 — LEACHATE COLLECTION SYSTEM ELEVATION (FEET)
- PERIMETER BERM BASELINE
- 7418 — CONSTRUCTION CONTROL POINT
- EXISTING EPLTS PIPE
- 4 — CELL DESIGNATION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
D	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLS	SI	DJS	JFB
B	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLS	SI	DJS	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJS	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJS	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	JAB	DGP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
CELL OUTLET GRADING PLANS II

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
30 Aug 2004
DATE

STATE OF OHIO
JOHN FRANCIS BERRY
E-36248
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1900 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30329 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	DOX-6000-G-00335
GEOSYNTEC PROJECT NO.:	GO1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0127
SHEET NO.:	G-7
REVISION NO.:	0

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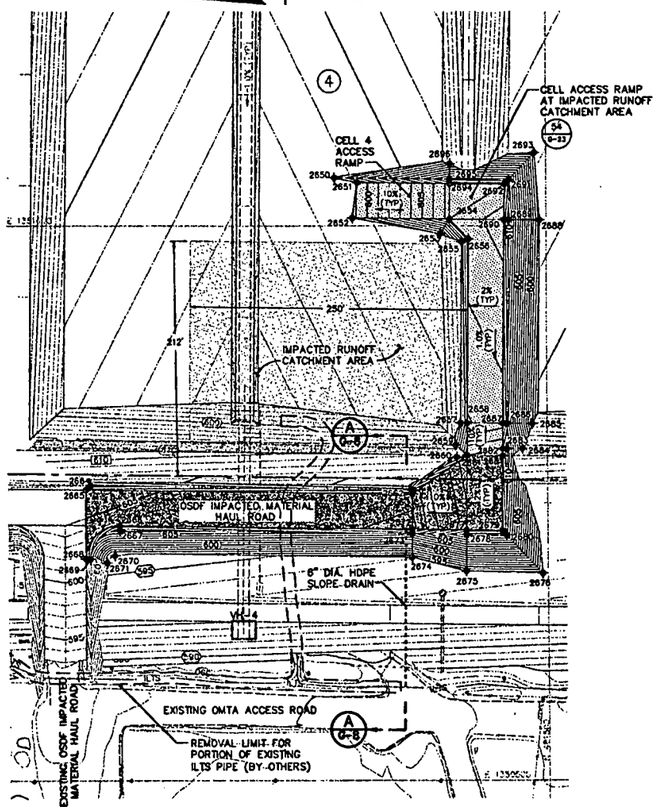
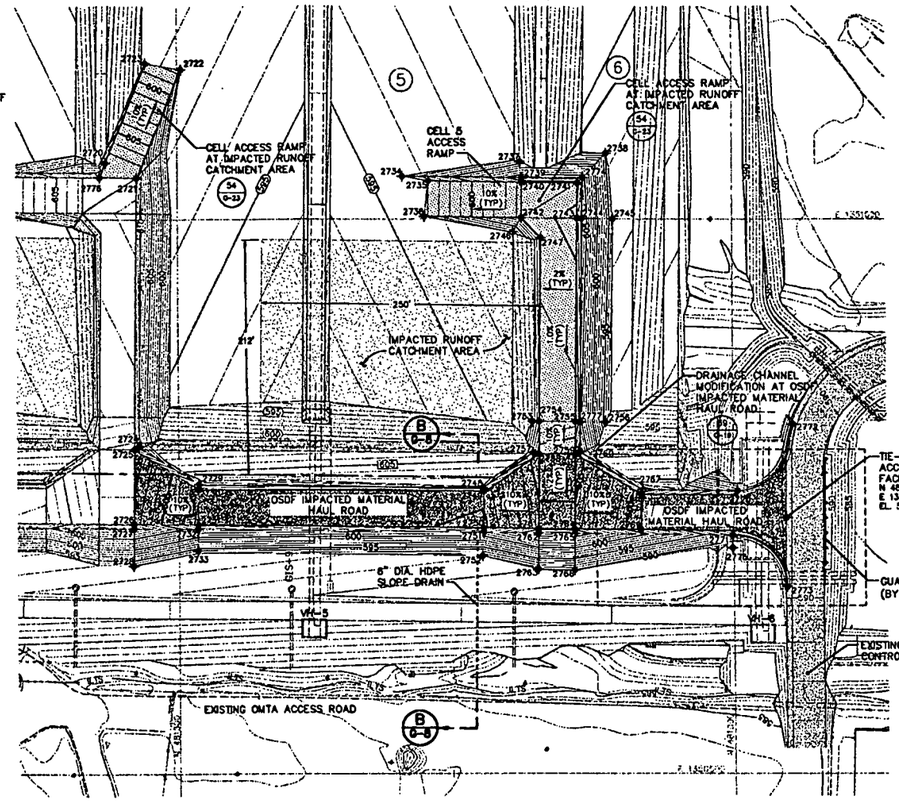
CERTIFIED-FOR-CONSTRUCTION



10 PLAN
0-1
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP AT CELL 4
SCALE: 1" = 50'



11 PLAN
0-2
OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP AT CELL 5
SCALE: 1" = 50'

LEGEND

4009

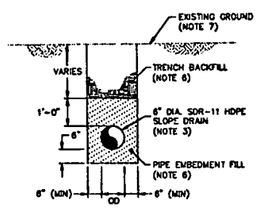
- 600 — EXISTING GROUND ELEVATION (FEET)
- 600 — FINISHED GRADE ELEVATION (FEET)
- 595 — EXISTING SUBGRADE ELEVATION (FEET)
- 585 — EXISTING COMPACTED CLAY LINER/PROTECTIVE CLAY LAYER ELEVATION (FEET)
- 585 — EXISTING PROTECTIVE LAYER ELEVATION (FEET) (NOTE 2)
- PERIMETER BERM BASELINE
- EXISTING LTS PIPE
- ILTS — EXISTING ILTS PIPE
- 2650 — CONSTRUCTION CONTROL POINT
- IMPACTED MATERIAL HAUL ROAD (NOTE 1)
- CELL ACCESS RAMP
- 4 — EXISTING CELL DESIGNATION

OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP CONSTRUCTION CONTROL POINTS

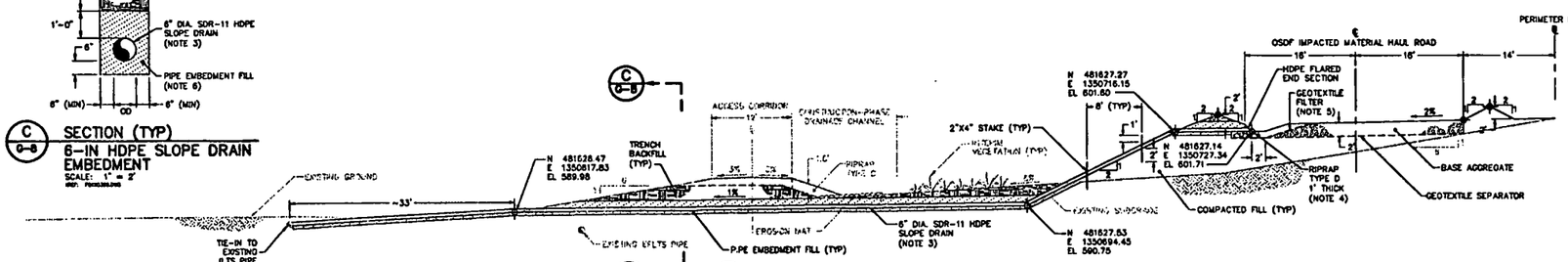
CELL 4				CELL 5			
POINT NO.	NORTHING	EASTING	ELEVATION	POINT NO.	NORTHING	EASTING	ELEVATION
2650	481690.39	1351043.38	599.00	2720	481565.56	1351050.79	608.00
2651	481669.78	1351039.11	599.07	2721	481537.23	1351037.49	607.40
2652	481674.17	1351007.18	598.87	2722	481496.81	1351134.87	597.81
2653	481594.72	1350993.51	600.13	2723	481528.87	1351140.51	598.31
2654	481586.83	1351005.10	607.40	2724	481538.19	1350795.45	610.88
2655	481575.88	1350985.77	604.54	2725	481540.22	1350792.79	608.88
2656	481569.83	1350988.15	607.57	2726	481541.05	1350725.30	607.51
2657	481577.86	1350822.70	602.91	2727	481541.09	1350721.30	609.51
2658	481571.86	1350822.63	605.91	2728	481541.80	1350687.78	592.75
2659	481562.41	1350802.53	602.78	2729	481481.09	1350760.82	604.42
2660	481561.39	1350791.56	610.08	2730	481481.87	1350756.57	602.28
2661	481572.22	1350793.18	608.88	2731	481482.06	1350724.58	601.81
2662	481622.51	1350752.30	605.31	2732	481482.11	1350720.58	603.81
2663	481621.25	1350758.28	603.29	2733	481482.34	1350701.38	594.00
2664	481912.74	1350765.84	607.59	2734	481294.26	1351038.52	595.62
2665	481916.76	1350751.59	605.60	2735	481270.47	1351034.23	596.00
2666	481886.64	1350729.52	604.64	2736	481274.20	1351002.27	595.67
2667	481886.53	1350725.52	608.64	2737	481188.03	1351051.87	599.00
2668	481917.12	1350699.79	601.87	2738	481111.78	1351059.09	595.00
2669	481913.14	1350699.40	603.87	2739	481188.46	1351037.20	606.40
2670	481890.97	1350702.54	595.00	2740	481186.47	1351033.20	604.40
2671	481886.29	1350695.66	596.00	2741	481137.26	1351032.80	604.40
2672	481621.64	1350726.28	602.85	2742	481186.86	1351001.21	604.40
2673	481621.59	1350722.28	604.85	2743	481000.61	1350988.38	605.38
2674	481621.95	1350701.17	594.10	2744	481133.65	1351000.56	607.38
2675	481573.49	1350688.72	593.02	2745	481105.79	1351000.22	593.45
2676	481504.90	1350686.71	592.44	2746	481184.75	1350988.30	597.13
2677	481573.04	1350725.59	607.51	2747	481189.86	1350983.26	604.57
2678	481573.09	1350721.59	609.00	2748	481222.54	1350757.41	602.42
2679	481541.05	1350725.30	607.51	2749	481221.54	1350754.80	601.00
2680	481537.09	1350721.25	609.51	2750	481221.87	1350721.39	599.85
2681	481540.22	1350792.79	608.86	2751	481221.70	1350717.39	601.89
2682	481540.14	1350799.18	608.86	2752	481222.72	1350698.17	591.04
2683	481536.14	1350799.14	610.86	2753	481177.71	1350817.81	600.00
2684	481522.48	1350799.25	604.00	2754	481171.89	1350817.74	602.91
2685	481513.15	1350821.91	597.20	2755	481138.89	1350817.35	603.55
2686	481535.88	1350822.18	608.55	2756	481113.18	1350817.02	594.28
2687	481539.86	1350822.23	606.55	2757	481177.18	1350789.69	607.56
2688	481505.77	1351005.10	599.46	2758	481172.25	1350788.29	605.86
2689	481533.62	1351005.45	610.38	2759	481140.25	1350787.90	605.88
2690	481537.82	1351005.49	608.38	2760	481136.22	1350790.56	607.86
2691	481533.18	1351041.44	609.29	2761	481173.07	1350720.80	604.51
2692	481537.23	1351037.49	607.40	2762	481173.12	1350716.80	606.51
2693	481510.17	1351065.83	597.17	2763	481173.52	1350684.36	590.25
2694	481586.44	1351038.09	597.40	2764	481141.07	1350720.80	604.51
2695	481586.40	1351042.09	609.40	2765	481141.12	1350716.41	606.51
2696	481586.22	1351056.01	602.44	2766	481141.53	1350683.40	590.00
				2767	481080.54	1350755.67	601.35
				2768	481081.70	1350751.68	599.25
				2769	481082.09	1350719.69	598.61
				2770	480996.48	1350754.91	592.93
				2771	481001.01	1350714.67	592.79
				2772	480948.58	1350815.09	592.00
				2773	480953.35	1350868.43	592.00
				2774	481132.70	1351037.35	606.00
				2775	481001.06	1350703.37	589.23
				2776	481370.88	1351037.90	607.40
				2777	481135.89	1350817.35	605.55

NOTES:

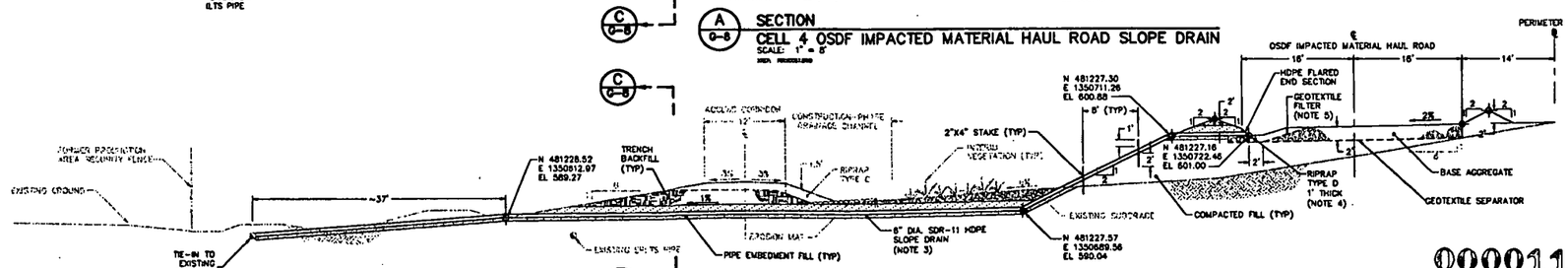
1. CONTOURS WITHIN SHADED REGION ON OSDF IMPACTED MATERIAL HAUL ROAD AND CELL ACCESS RAMP REPRESENT TOP OF BASE AGGREGATE. BASE AGGREGATE FOR THE CELL ACCESS RAMP SHALL BE 6 INCHES THICK AND UNDERLAIN BY GEOTEXTILE SEPARATOR. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02230.
2. FOR PROTECTIVE LAYER, SEE NOTE 3 ON SHEET G-8.
3. HDPE SLOPE DRAIN SHALL BE SDR-11 AND IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
4. RIPRAP APRON SHALL BE CONSTRUCTED AT INLET OF 6-INCH HDPE SLOPE DRAIN. RIPRAP APRON SHALL BE 4 FEET WIDE AND CENTERED ON 6-INCH HDPE SLOPE DRAIN. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
5. GEOTEXTILE FILTER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02714.
6. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
7. CONTRACTOR SHALL RE-ESTABLISH EXISTING GRADES, RIPRAP, VEGETATION, GEOTEXTILE SEPARATOR AND BASE AGGREGATE WITHIN AREA OF SLOPE DRAIN TRENCH EXCAVATION. BASE AGGREGATE THICKNESS SHALL BE 2 FEET FOR OSDF IMPACTED MATERIAL HAUL ROAD AND 1 FOOT FOR ACCESS CORRIDOR.



C
0-8
SECTION (TYP)
6-IN HDPE SLOPE DRAIN EMBEDMENT
SCALE: 1" = 2'



A
0-8
SECTION
CELL 4 OSDF IMPACTED MATERIAL HAUL ROAD SLOPE DRAIN
SCALE: 1" = 5'



B
0-8
SECTION
CELL 5 OSDF IMPACTED MATERIAL HAUL ROAD SLOPE DRAIN
SCALE: 1" = 5'

000011

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVIL BY	APP. BY
D	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JMD	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JMD	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JMD	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JMD	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
IMPACTED MATERIAL HAUL ROAD
GRADING PLANS AND DETAILS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

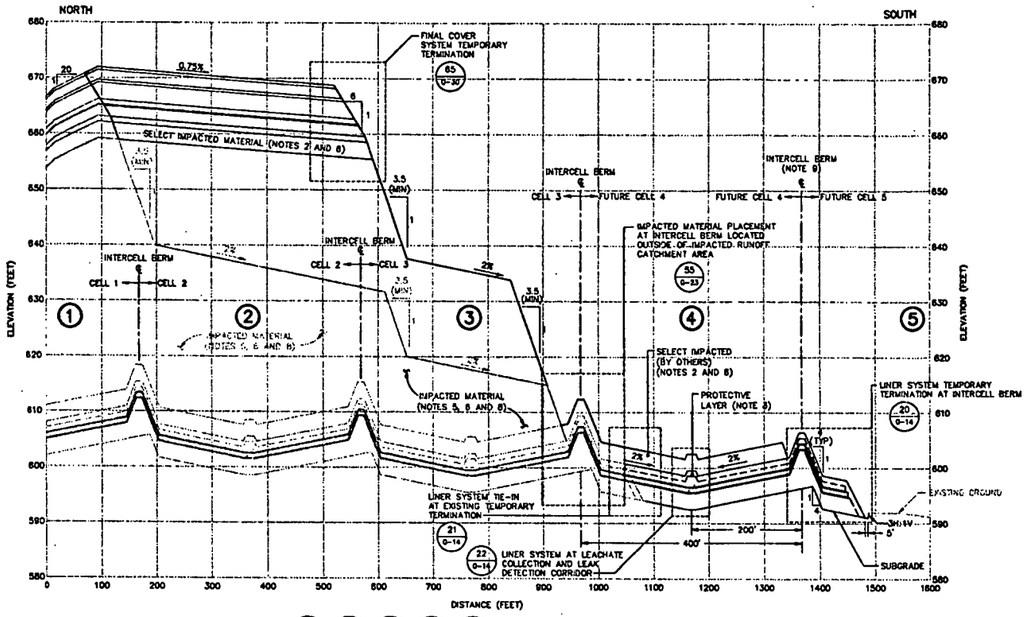
SIGNATURE
20 Aug 2008
DATE

STATE OF OHIO
JOHN H. BEECH
E-68248
REGISTERED PROFESSIONAL ENGINEER
SEAL

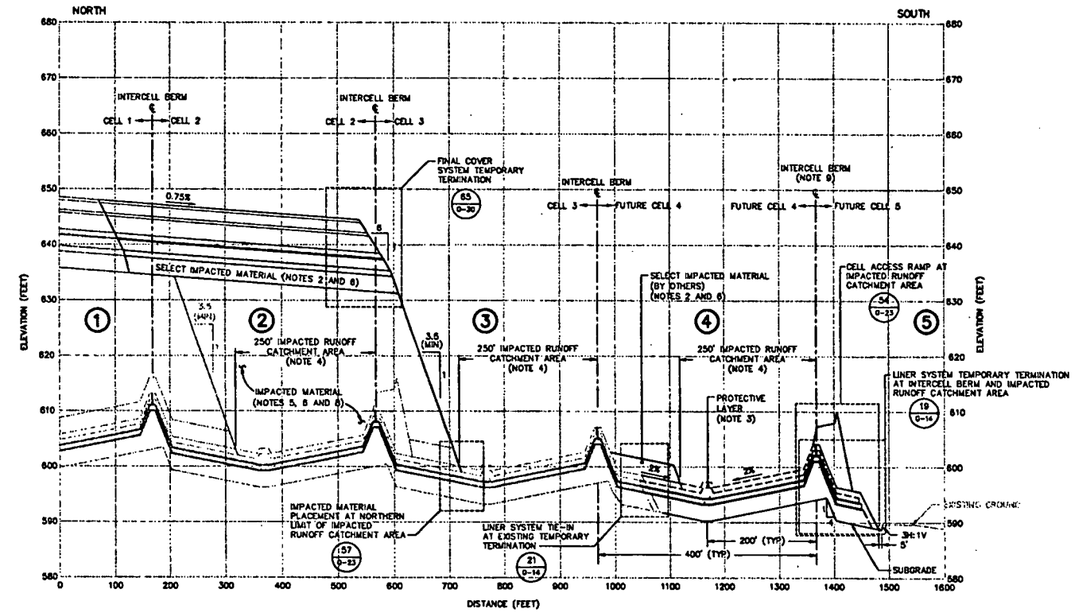
GEOSYNTEC CONSULTANTS
3165 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-G-00336
GEOSYNTEC PROJECT NO.:	GG1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-05D5
SHEET NO.:	G-8
REVISION NO.:	0

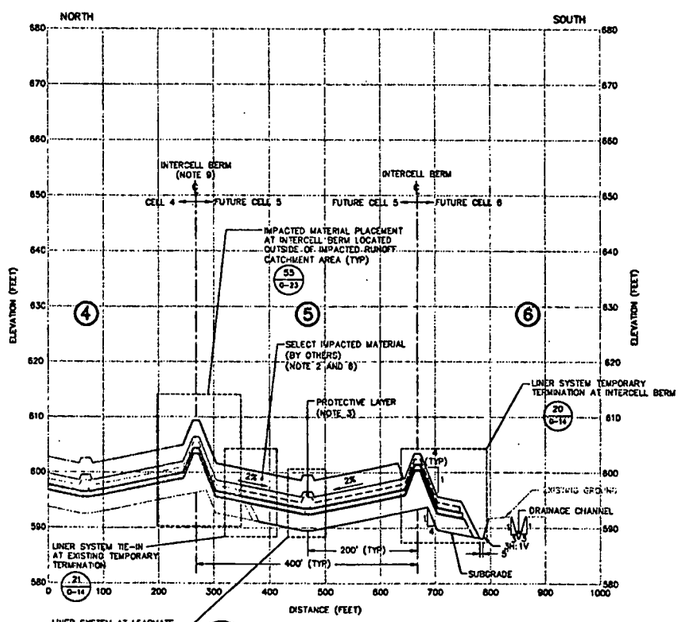
4009



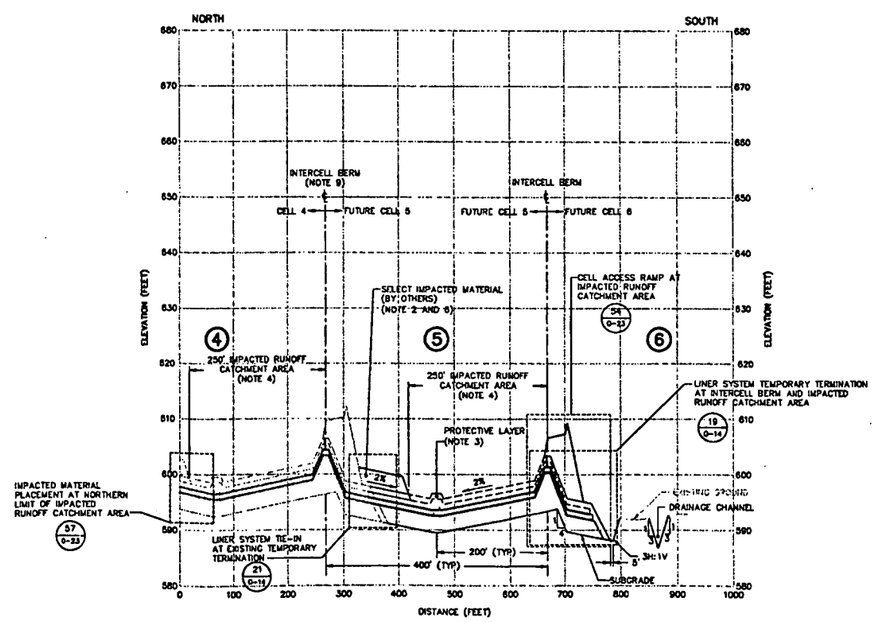
A D-3 A D-25 A D-26 A D-27 A D-28 **SECTION**
NORTH-SOUTH CELL 4
HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 10'



B D-3 B D-25 B D-26 B D-27 B D-28 **SECTION**
NORTH-SOUTH CELL 4 AT IMPACTED RUNOFF CATCHMENT AREA
HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 10'



C D-4 **SECTION**
NORTH-SOUTH CELL 5
HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 10'



D D-4 **SECTION**
NORTH-SOUTH CELL 5 AT IMPACTED RUNOFF CATCHMENT AREA
HORIZONTAL SCALE: 1" = 100'
VERTICAL SCALE: 1" = 10'

NOTES:

1. SECTIONS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. A MINIMUM THICKNESS OF 3 FEET OF SELECT IMPACTED MATERIAL SHALL BE PLACED ABOVE PROTECTIVE LAYER AND BELOW CONTOURING LAYER. THICKNESS OF SELECT IMPACTED MATERIAL OVERLYING PROTECTIVE LAYER MAY BE REDUCED TO 2 FEET IF FIRST LIFT OF IMPACTED MATERIAL TO BE PLACED OVER SELECT IMPACTED MATERIAL IS CATEGORY 1 IMPACTED MATERIAL.
3. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING ACTIVE CELL AREAS EXCLUDING CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
4. IMPACTED RUNOFF CATCHMENT AREA IN ACTIVE CELL SHALL REMAIN OPEN UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED IN ADJACENT UPGRADIENT CELL AND IMPACTED RUNOFF CATCHMENT AREA IN FUTURE CELL IS CONSTRUCTED AND OPERATIONAL.
5. IMPACTED MATERIAL INTERIM SLOPES SHALL BE NO STEEPER THAN 3.5H:1V. INTERIM SLOPE CONFIGURATION SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY AND MAY VARY BASED ON SEQUENCE AND SCHEDULE FOR REMOVAL OF IMPACTED MATERIAL FROM OPERABLE UNITS.
6. IMPACTED MATERIAL PLACEMENT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
7. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605 AND TERMINATE AT UPGRADIENT END WITH A 6-INCH MOLDED END CAP.
8. EXISTING IMPACTED MATERIAL GRADES SHOWN ARE APPROXIMATE.
9. FOR CONCURRENT CONSTRUCTION OF CELLS 4 AND 5, INTERCELL BERM SHALL BE CONSTRUCTED AS SHOWN ON DRAWING C-22.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
D	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	B	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JHS	B	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	B	DJB	JFB
B	01.03.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	B	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

100 50 0 100 200 HORIZONTAL SCALE IN FEET
10 5 0 10 20 VERTICAL SCALE IN FEET

OWNER/F.ADMIN:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: OSDF NORTH-SOUTH SECTIONS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE: J. Beech
DATE: May 2004

STATE OF OHIO — JOHN BEECH E-58246 — REGISTERED PROFESSIONAL ENGINEER

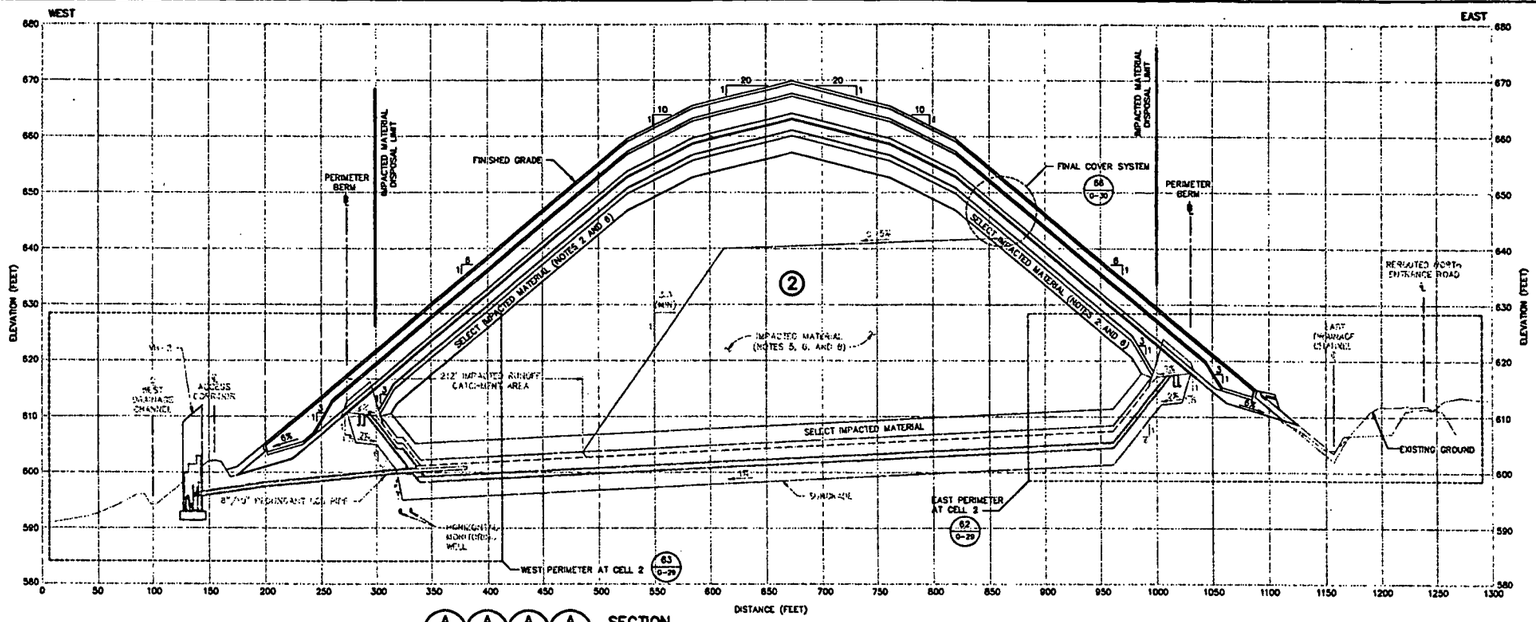
GEOSYNTEC CONSULTANTS
3100 LAKE HELENE DRIVE ATLANTA, GEORGIA 30062 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-C-00337
GEOSYNTEC PROJECT NO.:	001342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0213
SHEET NO.:	C-9
REVISION NO.:	0

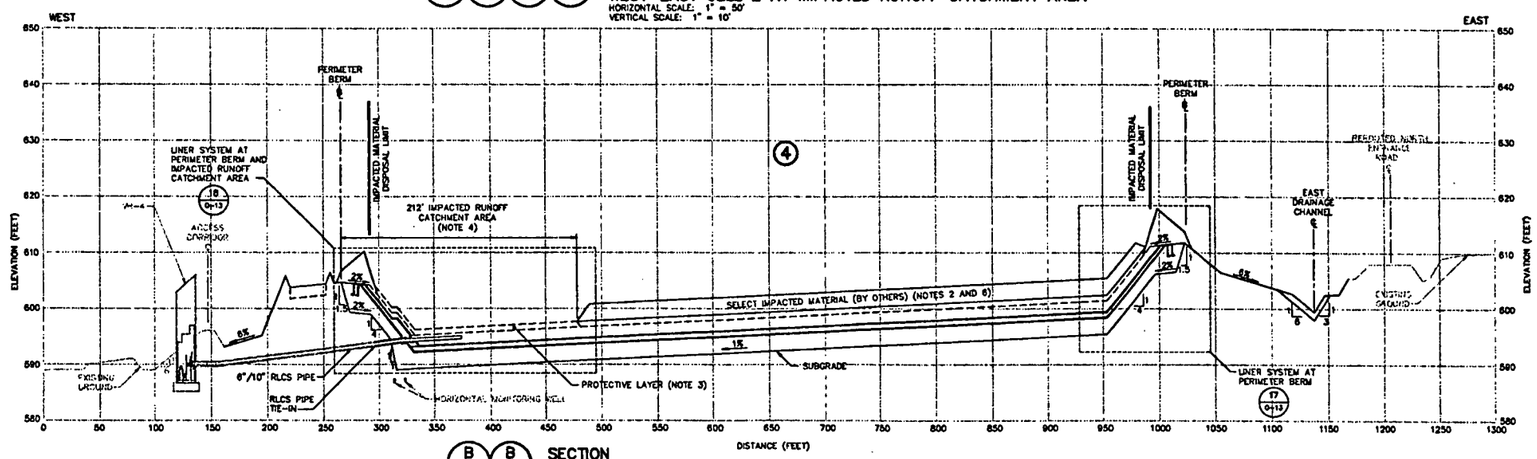
000012

CERTIFIED-FOR-CONSTRUCTION

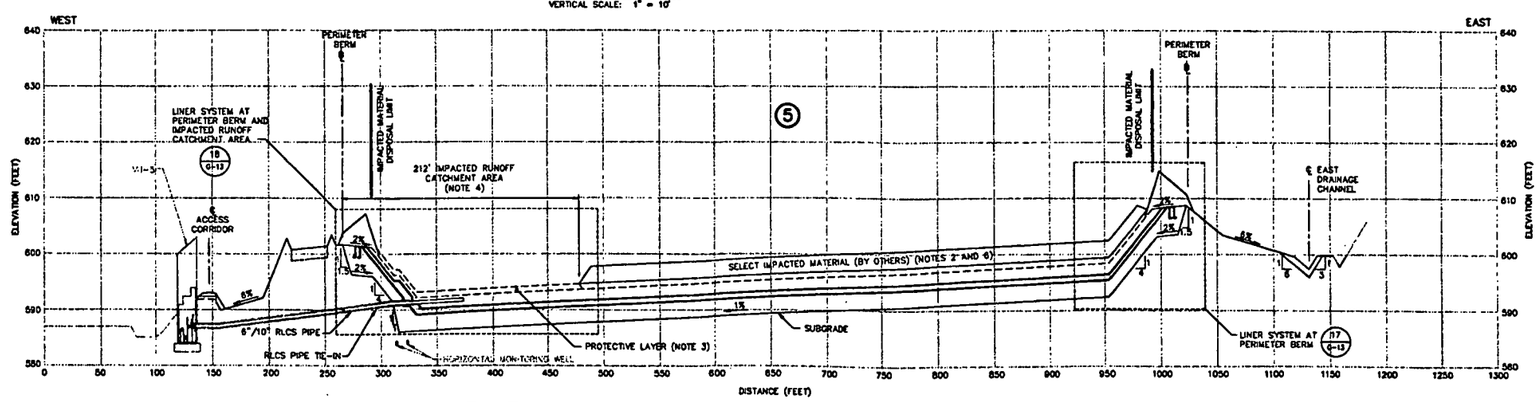
4009



A 0-25 A 0-26 A 0-27 A 0-28 **SECTION**
WEST-EAST CELL 2 AT IMPACTED RUNOFF CATCHMENT AREA
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



B 0-3 B 0-8 **SECTION**
WEST-EAST CELL 4 AT IMPACTED RUNOFF CATCHMENT AREA
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'



C 0-4 C 0-8 **SECTION**
WEST-EAST CELL 5 AT IMPACTED RUNOFF CATCHMENT AREA
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 10'

NOTES:

1. SECTIONS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. A MINIMUM THICKNESS OF 3 FEET OF SELECT IMPACTED MATERIAL SHALL BE PLACED ABOVE PROTECTIVE LAYER AND BELOW CONTOURING LAYER. THICKNESS OF SELECT IMPACTED MATERIAL OVERLYING PROTECTIVE LAYER MAY BE REDUCED TO 2 FEET IF FIRST LIFT OF IMPACTED MATERIAL TO BE PLACED OVER SELECT IMPACTED MATERIAL IS CATEGORY 1 IMPACTED MATERIAL.
3. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING ACTIVE CELL AREAS EXCLUDING CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
4. IMPACTED RUNOFF CATCHMENT AREA IN ACTIVE CELL SHALL REMAIN OPEN UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED IN ADJACENT UPGRADIENT CELL AND IMPACTED RUNOFF CATCHMENT AREA IN FUTURE CELL IS CONSTRUCTED AND OPERATIONAL.
5. IMPACTED MATERIAL INTERIM SLOPES SHALL BE NO STEEPER THAN 3.5H:1V. INTERIM SLOPE CONFIGURATION SHOWN IS FOR ILLUSTRATIVE PURPOSES ONLY AND MAY VARY BASED ON SEQUENCE AND SCHEDULE FOR REMOVAL OF IMPACTED MATERIAL FROM OPERABLE UNITS.
6. IMPACTED MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
7. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605 AND TERMINATE AT THE UPGRADIENT END WITH A 6-INCH MOLDED END CAP.
8. EXISTING IMPACTED MATERIAL GRADES SHOWN ARE APPROXIMATE.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JHS	B	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JHS	B	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	B	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	B	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	SLB	DHP	DOP	JFB

50 25 0 50 100 HORIZONTAL SCALE IN FEET
10 5 0 10 20 VERTICAL SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE: OSDF WEST-EAST SECTIONS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
DATE

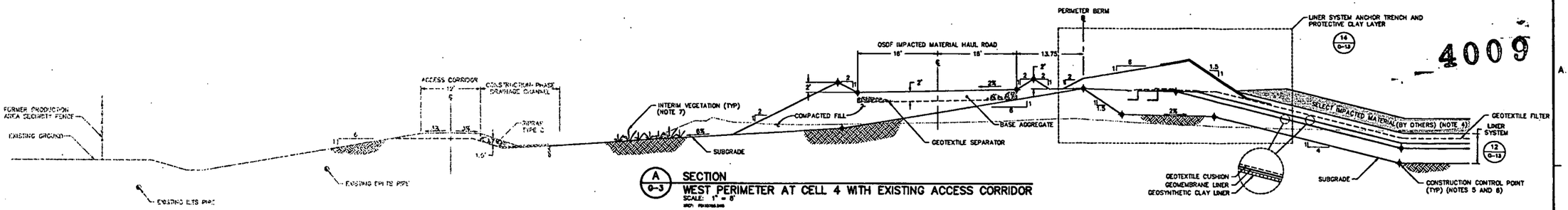
STATE OF OHIO — JOHN F. BEECH — E-58246 — REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1100 LAKE HUNTER DRIVE
JOLIET, GEORGIA 30435 USA

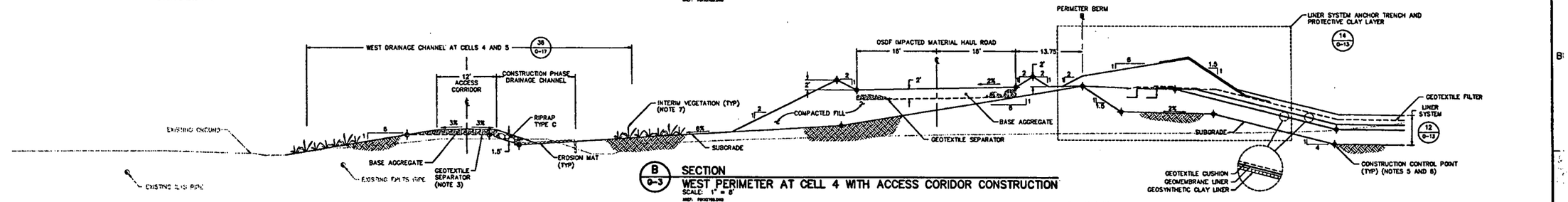
PROJECT NO.:	29104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-6000-D0338
GEOSYNTEC PROJECT NO.:	001342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0215
SHEET NO.:	C-10
REVISION NO.:	0

000013

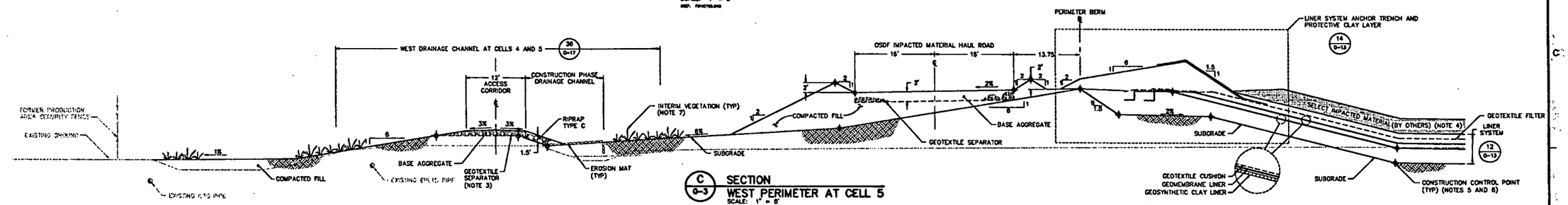
CERTIFIED-FOR-CONSTRUCTION



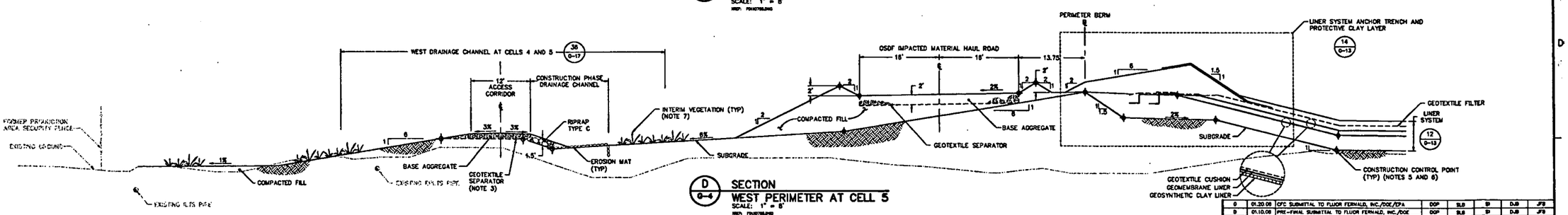
A 0-3 SECTION
WEST PERIMETER AT CELL 4 WITH EXISTING ACCESS CORRIDOR
SCALE: 1" = 8'



B 0-3 SECTION
WEST PERIMETER AT CELL 4 WITH ACCESS CORIDOR CONSTRUCTION
SCALE: 1" = 8'



C 0-3 SECTION
WEST PERIMETER AT CELL 5
SCALE: 1" = 8'



D 0-4 SECTION
WEST PERIMETER AT CELL 5
SCALE: 1" = 8'

NOTES:

1. SECTIONS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
3. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION 02230.
4. A MINIMUM THICKNESS OF 3 FEET OF SELECT IMPACTED MATERIAL SHALL BE PLACED ABOVE PROTECTIVE LAYER AND BELOW CONTOURING LAYER. THICKNESS OF SELECT IMPACTED MATERIAL OVERLYING PROTECTIVE LAYER MAY BE REDUCED TO 2 FEET IF FIRST LIFT OF IMPACTED MATERIAL TO BE PLACED OVER SELECT IMPACTED MATERIAL IS CATEGORY 1 IMPACTED MATERIAL. IMPACTED MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
5. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4, G-5 AND G-8.
6. CONSTRUCTION CONTROL POINTS FOR OSDF IMPACTED MATERIAL HAUL ROAD ARE PROVIDED ON DRAWING G-8.
7. INTERIM VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.

000014

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REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
B	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JAB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	MLG	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: CELL PERIMETER SECTIONS I

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION UNLESS SEALED.

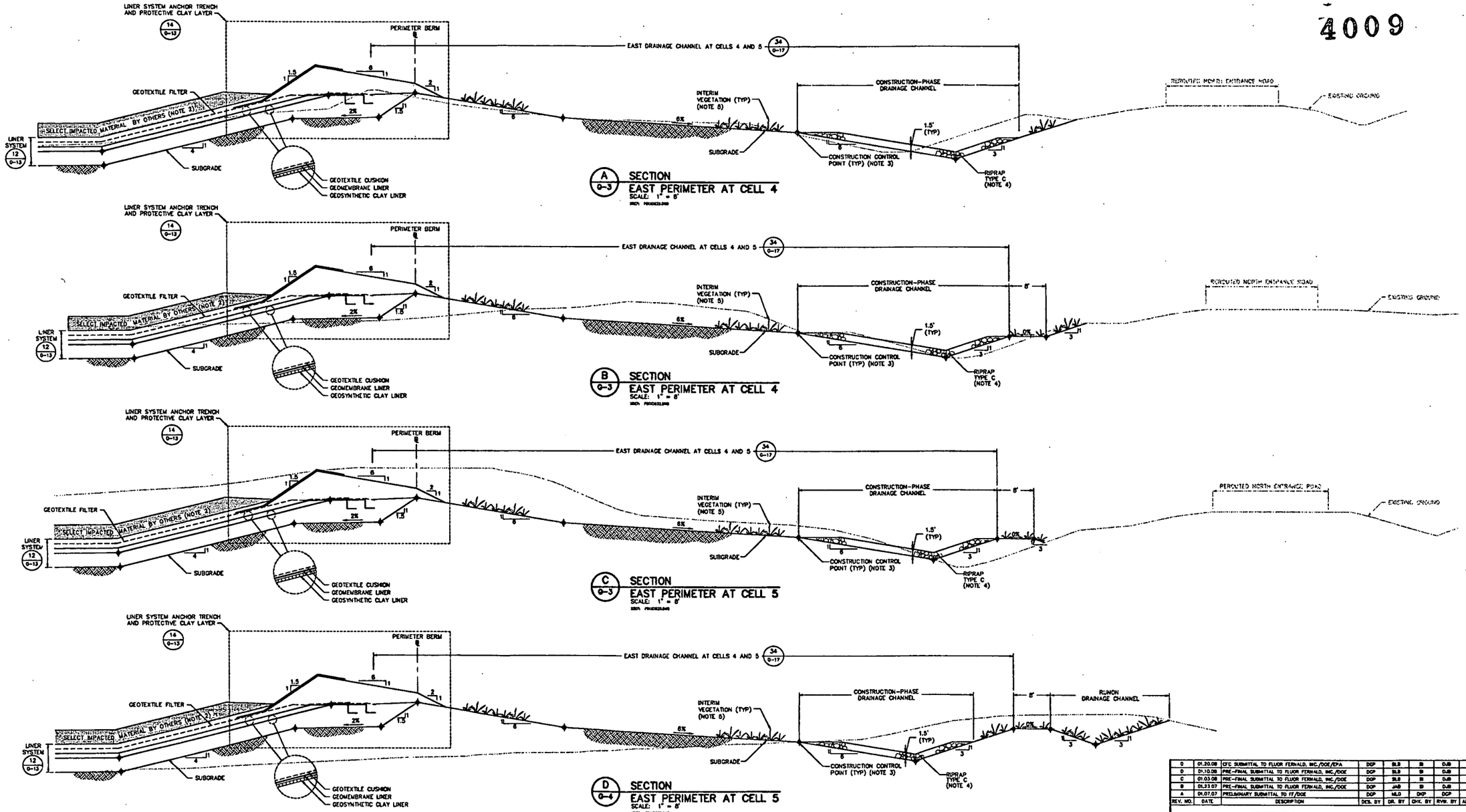
SIGNATURE
20 Aug 2008
DATE

STATE OF OHIO
JOHN BEECH
E-58246
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
ATLANTA, GEORGIA

PROJECT NO.:	20104
CONTRACT NO.:	95P5005028
FEMP DRAWING NO.:	90X-8000-G-00339
GEOSYNTEC PROJECT NO.:	GO1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0187
SHEET NO.:	G-11
REVISION NO.:	0

4009



NOTES:

1. SECTIONS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. A MINIMUM THICKNESS OF 3 FEET OF SELECT IMPACTED MATERIAL SHALL BE PLACED ABOVE PROTECTIVE LAYER. THICKNESS OF SELECT IMPACTED MATERIAL OVERLYING PROTECTIVE LAYER MAY BE REDUCED TO 2 FEET IF FIRST LIFT OF IMPACTED MATERIAL TO BE PLACED OVER SELECT IMPACTED MATERIAL IS CATEGORY 1 IMPACTED MATERIAL. IMPACTED MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
3. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4, G-5 AND G-6.
4. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
5. INTERIM VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.

000015

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DCP	SLB	BI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	SLB	BI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	SLB	BI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	JAB	BI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DCP	MLG	DCP	DCP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE: CELL PERIMETER SECTIONS II

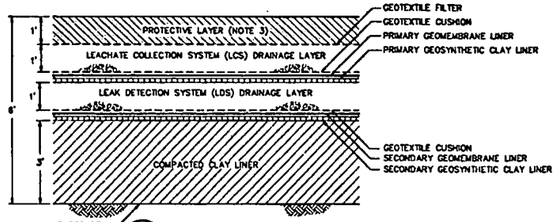
THIS DRAWING MAY NOT BE USED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
20 May 2008
DATE

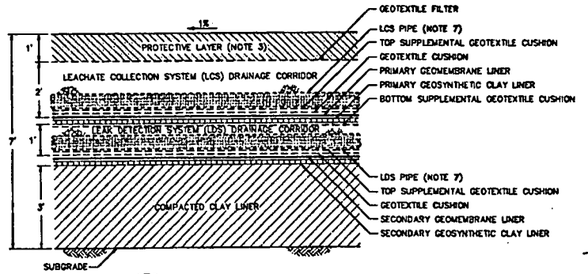
STATE OF OHIO
JOHN T. BEECH
E-58348
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
2955 LAKE VIEW DRIVE
ATLANTA, GEORGIA 30341 USA

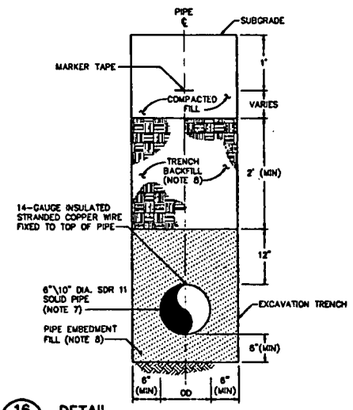
PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-5000-G-00340
GEOSYNTEC PROJECT NO.:	GD1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0188
SHEET NO.:	G-12
REVISION NO.:	0



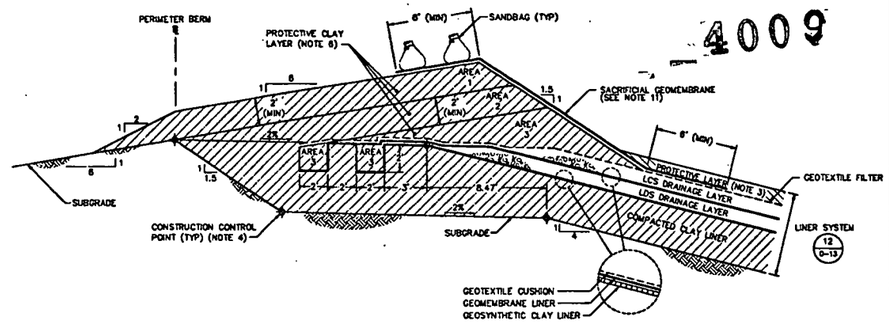
12 / G-11 DETAIL
LINER SYSTEM
SCALE: 1" = 2'



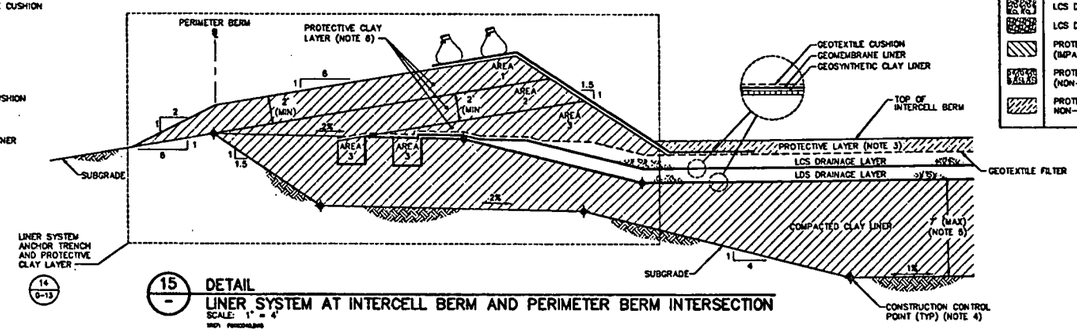
13 / - DETAIL
LINER SYSTEM WITH LCS AND LDS PIPES
SCALE: 1" = 2'



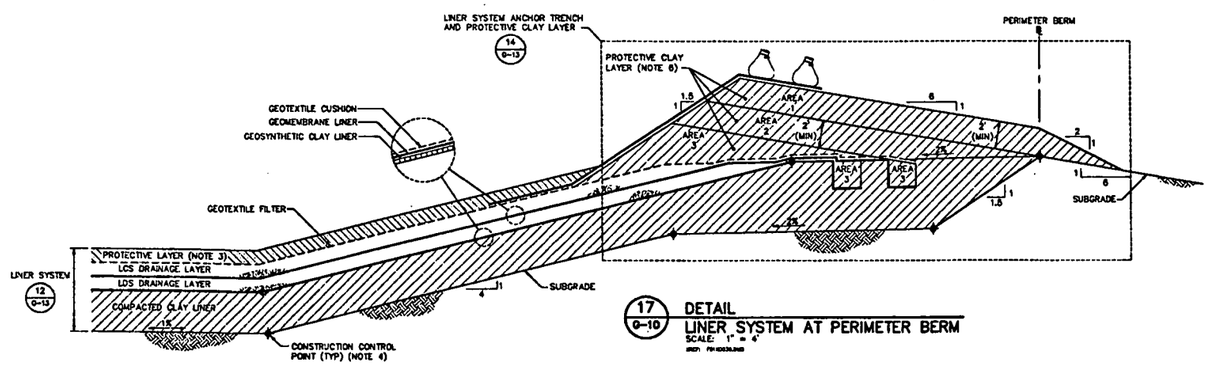
16 / G-15 DETAIL
LDS, LCS OR RLCS PIPE EMBEDMENT
SCALE: 1" = 1'



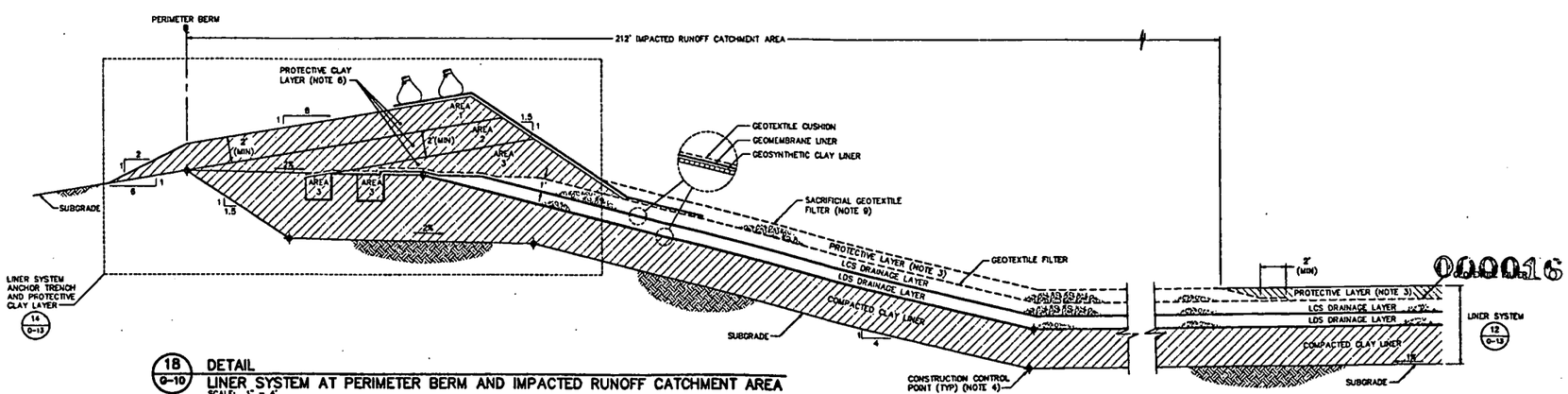
14 / G-11 DETAIL
LINER SYSTEM ANCHOR TRENCH AND PROTECTIVE CLAY LAYER
SCALE: 1" = 4'



15 / - DETAIL
LINER SYSTEM AT INTERCELL BERM AND PERIMETER BERM INTERSECTION
SCALE: 1" = 4'



17 / G-10 DETAIL
LINER SYSTEM AT PERIMETER BERM
SCALE: 1" = 4'



18 / G-10 DETAIL
LINER SYSTEM AT PERIMETER BERM AND IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'

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LINER SYSTEM COMPONENT SUMMARY (NOTE 2)

SYMBOL	COMPONENT	MATERIAL	SPECIFICATION SECTION
GEOSYNTHETICS (NOTE 10)			
	PRIMARY GEOMEMBRANE LINER	TEXTURED 80-mil HDPE	02770
	SECONDARY GEOMEMBRANE LINER	TEXTURED 80-mil HDPE	02770
	PRIMARY GEOSYNTHETIC CLAY LINER	INTERNALLY-REINFORCED SODIUM MONTMORILLONITE CORE WITH WOVEN GEOTEXTILE SIDE AGAINST OVERLYING GEOMEMBRANE AND NONWOVEN SIDE AGAINST UNDERLYING SOIL	02772
	SECONDARY GEOSYNTHETIC CLAY LINER	INTERNALLY-REINFORCED SODIUM MONTMORILLONITE CORE WITH WOVEN GEOTEXTILE SIDE AGAINST OVERLYING GEOMEMBRANE AND NONWOVEN SIDE AGAINST UNDERLYING SOIL	02772
	GEOTEXTILE FILTER	POLYPROPYLENE OR POLYESTER NEEDLE-PUNCHED NONWOVEN GEOTEXTILE	02714
	GEOTEXTILE CUSHION	POLYPROPYLENE OR POLYESTER NEEDLE-PUNCHED NONWOVEN GEOTEXTILE	02714
	SUPPLEMENTAL GEOTEXTILE CUSHION	POLYPROPYLENE OR POLYESTER NEEDLE-PUNCHED NONWOVEN GEOTEXTILE	02714
SOILS			
SYMBOL	COMPONENT	MATERIAL	SPECIFICATION SECTION
	SUBGRADE	IN-SITU/ON-SITE MATERIAL	02200
	COMPACTED CLAY LINER/ PROTECTIVE CLAY LAYER	ON-SITE STOCKPILES	02225
	LDS DRAINAGE LAYER	OFF-SITE MATERIAL	02710
	LDS DRAINAGE CORRIDOR	OFF-SITE MATERIAL	02710
	LCS DRAINAGE LAYER	OFF-SITE MATERIAL	02710
	LCS DRAINAGE CORRIDOR	OFF-SITE MATERIAL	02710
	PROTECTIVE LAYER (IMPACTED)	ON-SITE MATERIAL	13010
	PROTECTIVE LAYER (NON-IMPACTED GRANULAR)	OFF-SITE MATERIAL	02240
	PROTECTIVE LAYER (NON-IMPACTED NON-GRANULAR)	ON-SITE STOCKPILE	02240

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. LINER SYSTEM COMPONENT SUMMARY IS PROVIDED FOR INFORMATION PURPOSES ONLY. SPECIFICATION SECTIONS SHALL BE REFERENCED FOR DETAILED MINIMUM REQUIREMENTS FOR EACH MATERIAL.
3. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING ACTIVE CELL AREAS EXCLUDING CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
4. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4, G-5 AND G-6.
5. THICKNESS OF COMPACTED CLAY LINER ALONG CENTERLINE OF INTERCELL BERM VARIES FROM A MINIMUM OF 3 FEET TO A MAXIMUM OF 7 FEET.
6. PROTECTIVE CLAY LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02225. EQUIPMENT USED ABOVE GEOMEMBRANE LINER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02770.
7. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
8. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
9. SACRIFICIAL GEOTEXTILE FILTER SHALL BE INSTALLED OVER GRANULAR PROTECTIVE LAYER WITHIN IMPACTED RUNOFF CATCHMENT AREA.
10. GEOSYNTHETICS FOR THE LINER SYSTEM WILL BE SUPPLIED BY FLUOR FERNALD, INC., AS SPECIFIED IN PART 6 OF THE CONTRACT DOCUMENTS.
11. SACRIFICIAL GEOMEMBRANE SHALL CONSIST OF HIGH DENSITY POLYETHYLENE APPROVED BY CONSTRUCTION MANAGER AND PROVIDED BY FLUOR FERNALD, INC. CONTRACTOR SHALL SECURE IN PLACE SACRIFICIAL GEOMEMBRANE WITH SANDBAGS TO PREVENT DAMAGE BY WIND.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVWL BY	APP. BY
0	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE: LINER SYSTEM DETAILS I

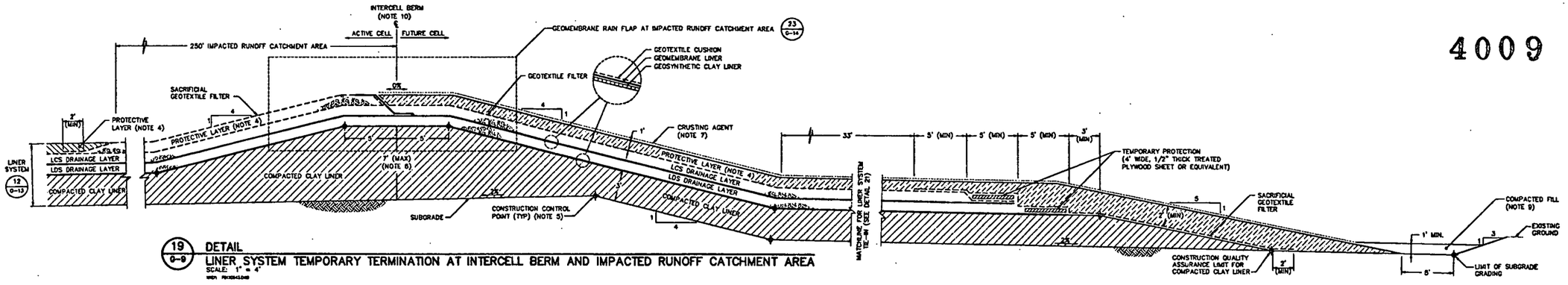
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN BEECH E-56246 — REGISTERED PROFESSIONAL ENGINEER

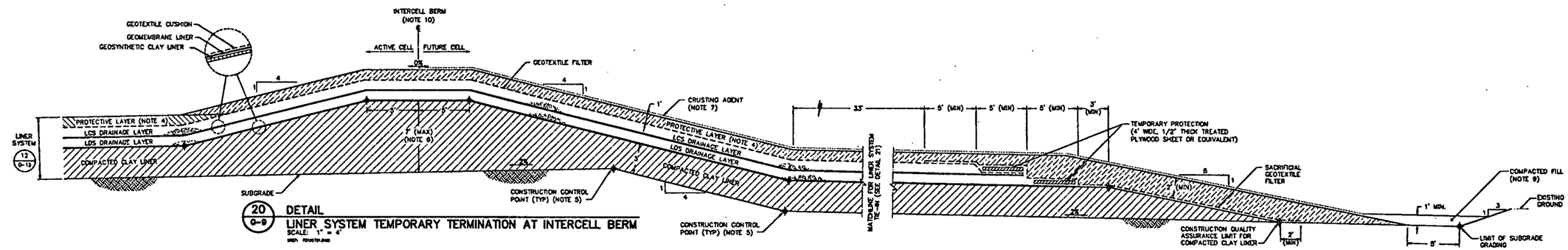
GEOSYNTEC CONSULTANTS
1000 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005026
FEMP DRAWING NO.:	90X-5000-G-00341
GEOSYNTEC PROJECT NO.:	GO1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0160
SHEET NO.:	G-13
REVISION NO.:	0

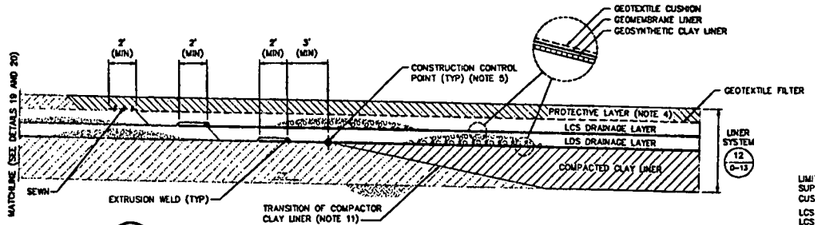
4009



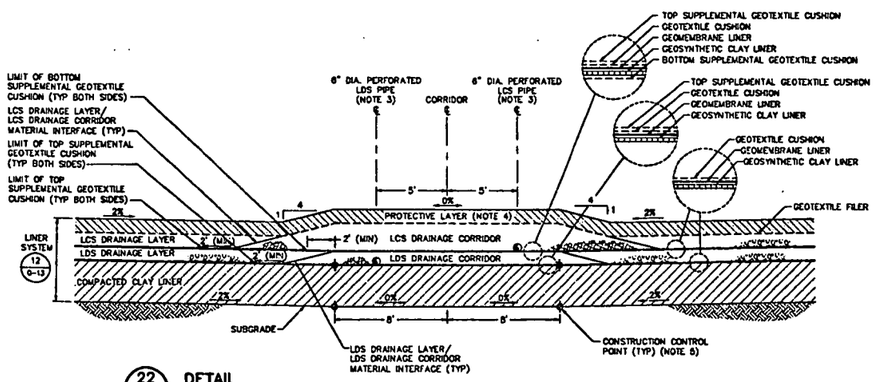
19 G-9 DETAIL
LINER SYSTEM TEMPORARY TERMINATION AT INTERCELL BERM AND IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'



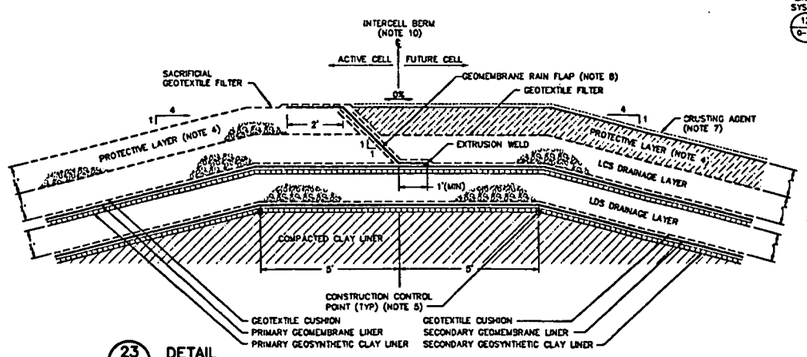
20 G-9 DETAIL
LINER SYSTEM TEMPORARY TERMINATION AT INTERCELL BERM
SCALE: 1" = 4'



21 G-9 DETAIL
LINER SYSTEM TIE-IN AT EXISTING TEMPORARY TERMINATION
SCALE: 1" = 4'



22 G-9 DETAIL
LINER SYSTEM AT LEACHATE COLLECTION AND LEAK DETECTION CORRIDOR
SCALE: 1" = 4'



23 G-14 DETAIL
GEOMEMBRANE RAIN FLAP AT IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 2'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. MATERIAL IN DRAINAGE LAYERS AND DRAINAGE CORRIDORS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02710.
3. LDS AND LCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02805.
4. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING ACTIVE CELL AREAS EXCLUDING ACTIVE CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
5. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4, G-5 AND G-8.
6. THICKNESS OF COMPACTED CLAY LINER ALONG CENTERLINE OF INTERCELL BERM VARIES FROM A MINIMUM OF 3 FEET TO A MAXIMUM OF 7 FEET.
7. CRUSTING AGENT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
8. RAIN FLAP SHALL BE CONTINUOUSLY EXTRUSION WELDED TO PRIMARY GEOMEMBRANE LINER ALONG INTERCELL BERM. FLAP SHALL TIE-IN TO GEOMEMBRANE AT CREST OF PERIMETER BERM AND EXTEND 212 FEET EAST FROM WEST PERIMETER BERM BASELINE.
9. CONTRACTOR SHALL PLACE COMPACTED FILL TO PROVIDE POSITIVE DRAINAGE TO TEMPORARY DRAINAGE CHANNEL.
10. FOR CONCURRENT CONSTRUCTION OF CELLS 4 AND 5, THE INTERCELL BERM SHALL BE MODIFIED AS SHOWN ON DRAWING G-22.
11. CONSTRUCT TRANSITION FROM EXISTING FULL-DEPTH SECTION OF COMPACTED CLAY LINER TO AND ADJACENT SECTION OF COMPACTED CLAY LINER SECTION IN ACCORDANCE WITH SPECIFICATION SECTION 02223.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	SLB	DKP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
LINER SYSTEM DETAILS II

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN E. BEECH E-58246 — REGISTERED PROFESSIONAL ENGINEER

GEOSYNTEC CONSULTANTS

PROJECT NO.:	20104
CONTRACT NO.:	05PS005028
FEMP DRAWING NO.:	90X-5000-C-00342
GEOSYNTEC PROJECT NO.:	GG1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0161
SHEET NO.:	G-14
REVISION NO.:	0

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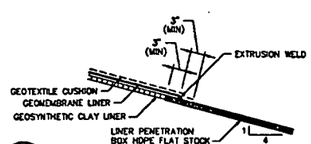
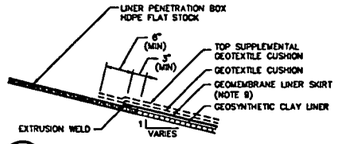
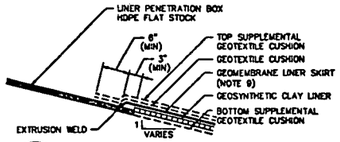
CERTIFIED-FOR-CONSTRUCTION



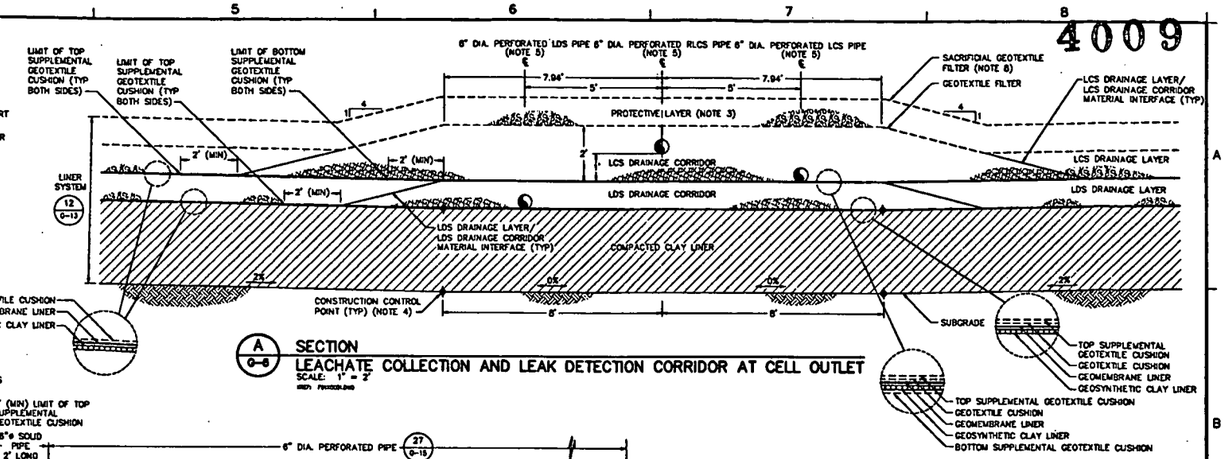
24 / G-15 DETAIL
LINER SYSTEM GEOSYNTHETICS TERMINATION TYPE I AT LINER PENETRATION
SCALE: 1" = 1'



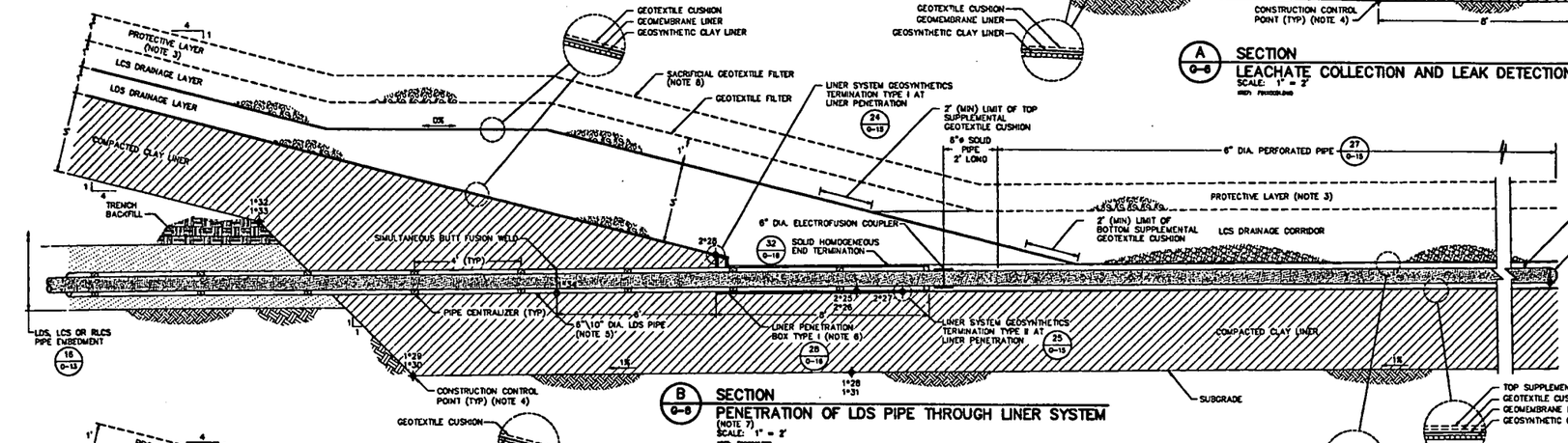
25 / G-15 DETAIL
LINER SYSTEM GEOSYNTHETICS TERMINATION TYPE II AT LINER PENETRATION
SCALE: 1" = 1'



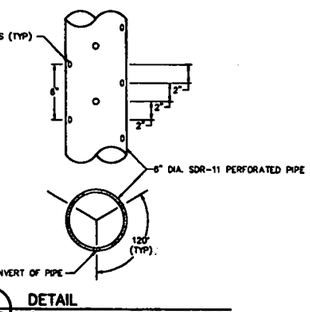
26 / G-15 DETAIL
LINER SYSTEM GEOSYNTHETICS TERMINATION TYPE III AT LINER PENETRATION
SCALE: 1" = 1'



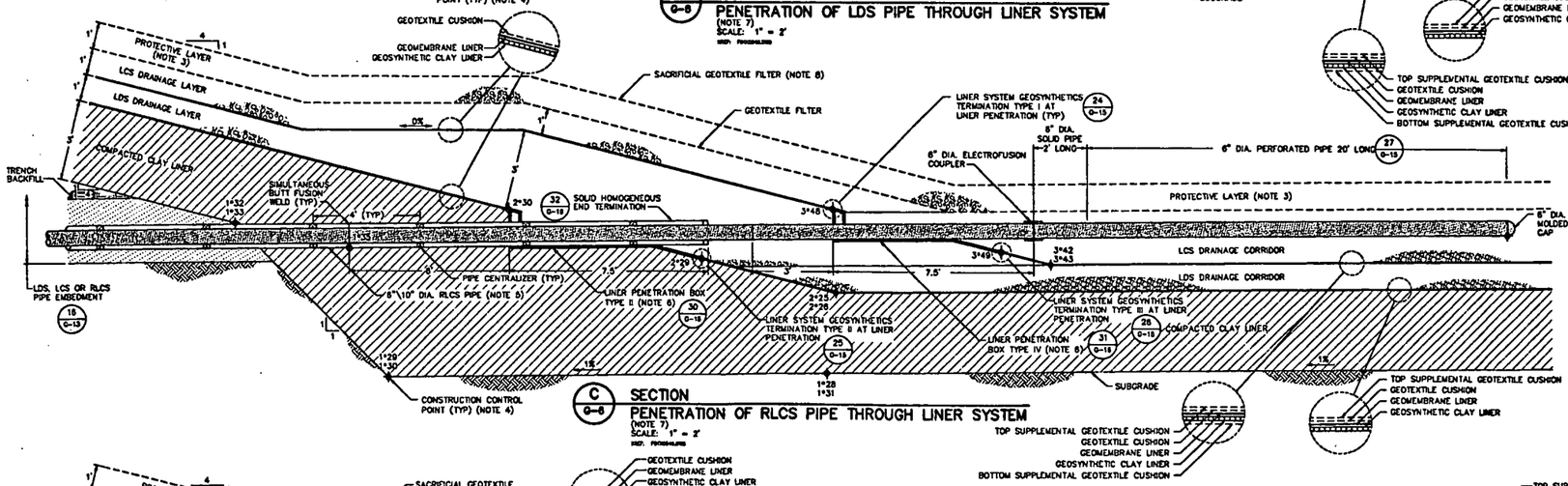
A / G-8 SECTION
LEACHATE COLLECTION AND LEAK DETECTION CORRIDOR AT CELL OUTLET
SCALE: 1" = 2'



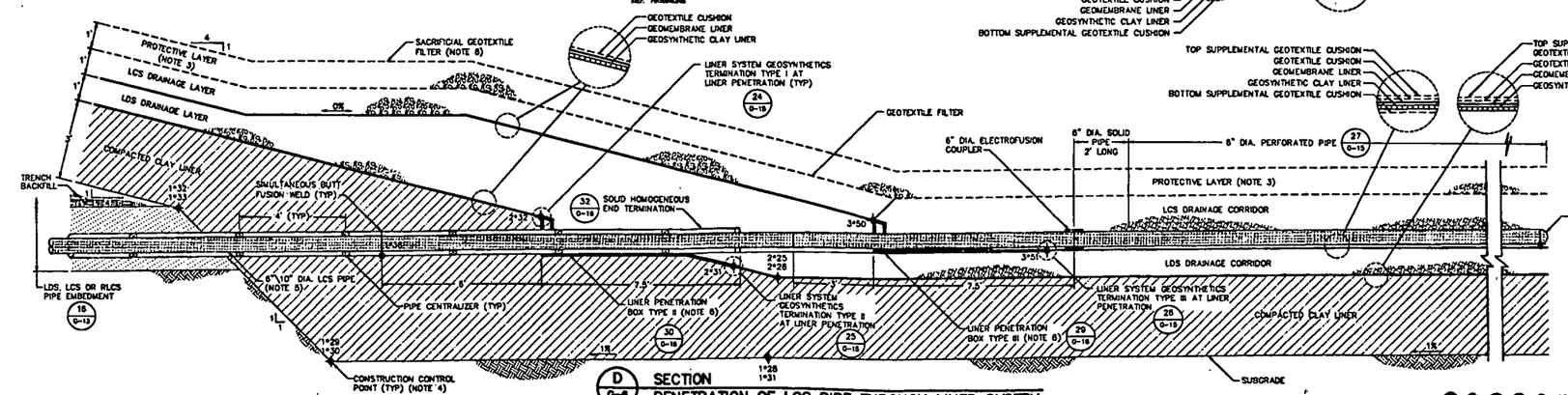
B / G-8 SECTION
PENETRATION OF LDS PIPE THROUGH LINER SYSTEM
(NOTE 7)
SCALE: 1" = 2'



27 / G-15 DETAIL
6-INCH PERFORATED PIPE
SCALE: 1" = 6"



C / G-8 SECTION
PENETRATION OF RLCS PIPE THROUGH LINER SYSTEM
(NOTE 7)
SCALE: 1" = 2'



D / G-8 SECTION
PENETRATION OF LCS PIPE THROUGH LINER SYSTEM
(NOTE 7)
SCALE: 1" = 2'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. MATERIAL IN DRAINAGE LAYERS AND DRAINAGE CORRIDORS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02710.
3. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING CELL AREAS EXCLUDING CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
4. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4, G-5 AND G-6. CONSTRUCTION CONTROL POINTS FOR LINER PENETRATION BOXES AND LDS, LCS AND RLCS PIPES ARE PROVIDED ON DRAWINGS G-6 AND G-7. THE "*" SYMBOL REPRESENTS THE CELL IN WHICH THE APPROPRIATE CONTROL POINTS ARE LOCATED.
5. LDS, LCS AND RLCS PIPES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
6. LINER PENETRATION BOXES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13005. 6-INCH PIPE SEGMENTS AND SOLID HOMOGENEOUS END TERMINATIONS SHALL BE FACTORY WELDED TO LINER PENETRATION BOXES AND EXTEND BETWEEN SIMULTANEOUS BUTT FUSION WELDS AND ELECTROFUSION COUPLERS AS SHOWN. SOLID HOMOGENEOUS END TERMINATIONS AND PIPE CENTRALIZERS SHALL BE INSTALLED AS SHOWN.
7. HORIZONTAL MONITORING WELL IS NOT SHOWN IN THIS SECTION FOR CLARITY.
8. SACRIFICIAL GEOTEXTILE FILTER SHALL BE INSTALLED OVER GRANULAR PROTECTIVE LAYER WITHIN IMPACTED RUNOFF CATCHMENT AREA.
9. GEOMEMBRANE LINER SKIRT SHALL BE FACTORY WELDED TO LINER PENETRATION BOX. GEOMEMBRANE LINER SKIRT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02770 AND WILL BE PROVIDED BY FLUOR FERNALD, INC. GEOMEMBRANE LINER SKIRT SHALL BE A MINIMUM 7 FEET WIDE BY 7 FEET LONG.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
LINER SYSTEM DETAILS III

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION UNLESS SEALED.

STATE OF OHIO — JOHN R. BEECH E-58346 — REGISTERED PROFESSIONAL ENGINEER

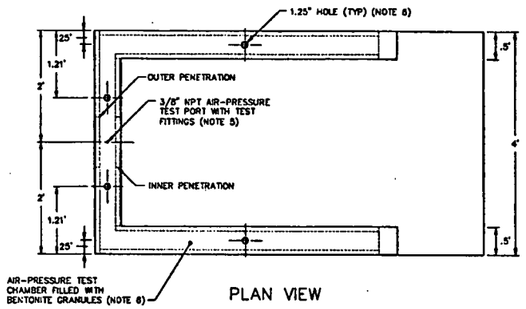
GEOSYNTEC CONSULTANTS

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FERNP DRAWING NO.:	90X-6000-G-00343
GEOSYNTEC PROJECT NO.:	GC1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0162
SHEET NO.:	G-15
REVISION NO.:	0

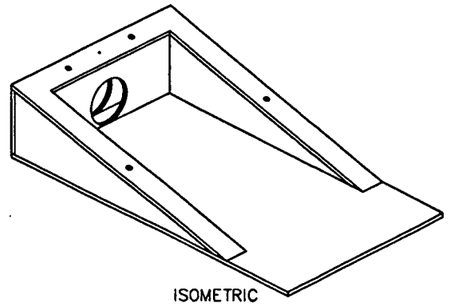
000018

CERTIFIED-FOR-CONSTRUCTION

4009



PLAN VIEW



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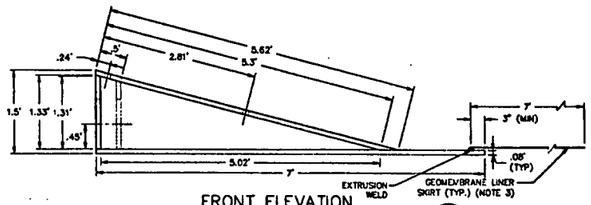
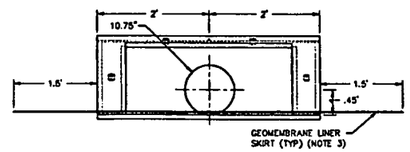
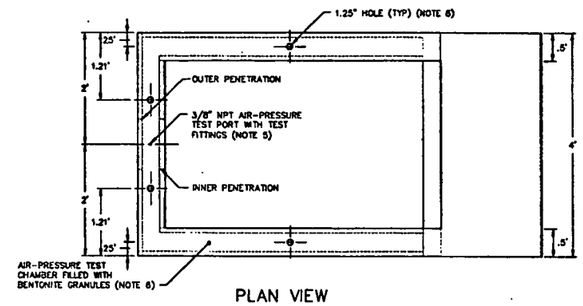


FRONT ELEVATION

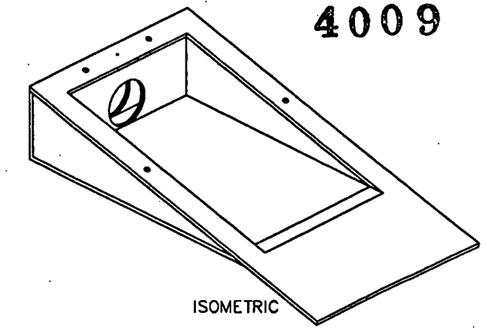


RIGHT ELEVATION

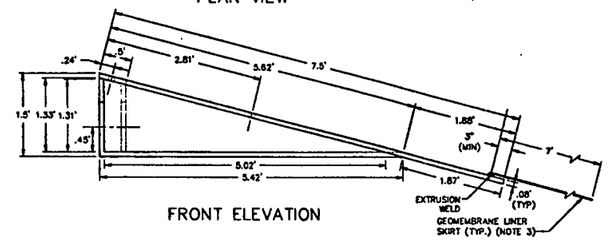
28 / G-15 DETAIL
LINER PENETRATION BOX TYPE I
SCALE: 1" = 1'



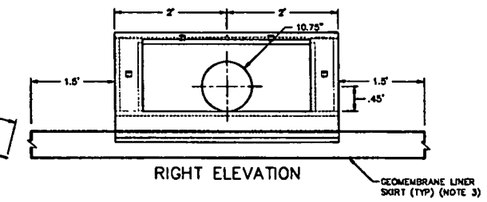
PLAN VIEW



ISOMETRIC

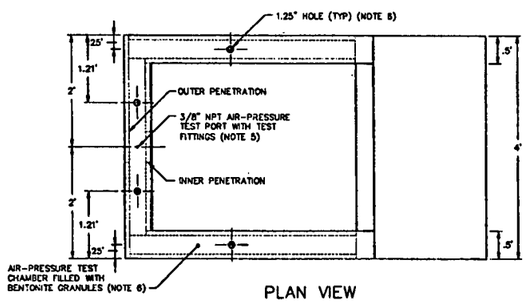


FRONT ELEVATION

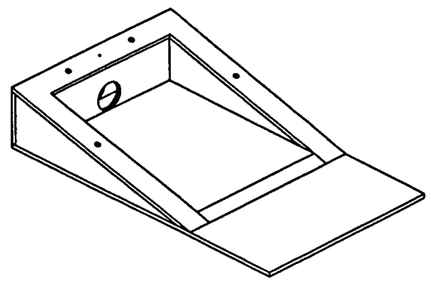


RIGHT ELEVATION

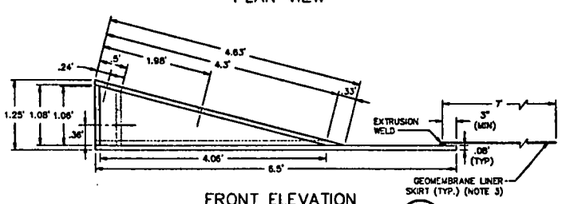
30 / G-15 DETAIL
LINER PENETRATION BOX TYPE II
SCALE: 1" = 1'



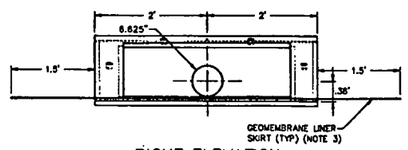
PLAN VIEW



ISOMETRIC

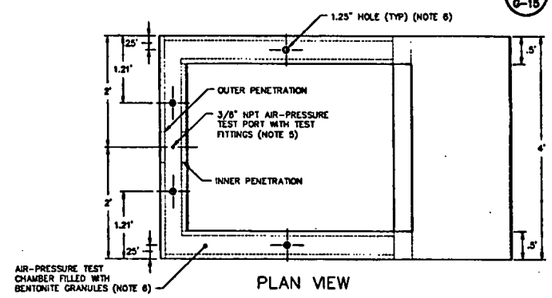


FRONT ELEVATION

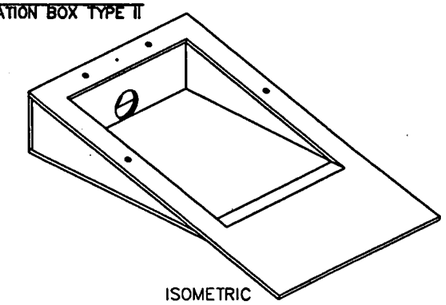


RIGHT ELEVATION

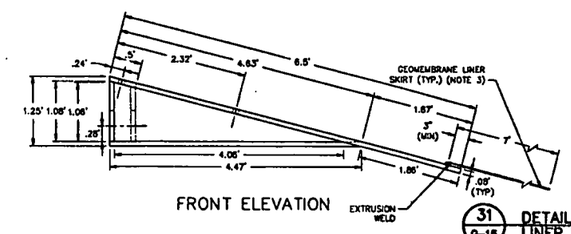
29 / G-15 DETAIL
LINER PENETRATION BOX TYPE III
SCALE: 1" = 1'



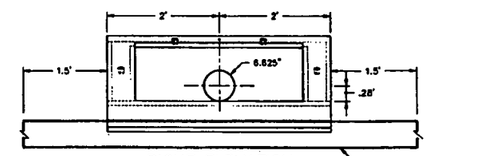
PLAN VIEW



ISOMETRIC

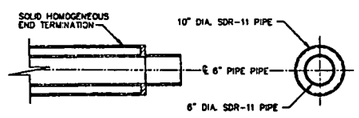


FRONT ELEVATION



RIGHT ELEVATION

31 / G-15 DETAIL
LINER PENETRATION BOX TYPE IV
SCALE: 1" = 1'



32 / G-15 DETAIL
SOLID HOMOGENEOUS END TERMINATION
SCALE: 1" = 1'

NOTES:

1. LINER PENETRATION BOXES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13005.
2. SOLID HOMOGENEOUS END TERMINATION SHALL BE FACTORY WELDED TO LINER PENETRATION BOXES WITH LENGTHS SHOWN ON DRAWING G-15. PIPES ARE NOT SHOWN ON THIS DRAWING FOR CLARITY. SOLID HOMOGENEOUS END TERMINATIONS AND PIPE CENTRALIZES SHALL BE INSTALLED AS SHOWN ON DRAWING G-15 AND IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
3. GEOMEMBRANE LINER SKIRT SHALL BE FACTORY WELDED TO LINER PENETRATION BOX. GEOMEMBRANE LINER SKIRT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02770 AND WILL BE PROVIDED BY FLUOR FERNALD, INC. GEOMEMBRANE LINER SKIRT SHALL BE A MINIMUM 7 FEET WIDE BY 7 FEET LONG. THE EXTRUSION WELDS SHALL BE TESTED PRIOR TO DELIVERY.
4. LINER PENETRATION BOXES SHALL BE CONSTRUCTED USING 1-INCH THICK HDPE FLAT STOCK.
5. LINER PENETRATION BOXES AND ATTACHED CONTAINMENT PIPING SHALL BE AIR-PRESSURE TESTED IN FIELD AFTER INSTALLATION.
6. AIR-PRESSURE TEST CHAMBER SHALL BE BACKFILLED WITH BENTONITE GRANULES USING 1.25-INCH HOLES AFTER AIR-PRESSURE TESTING IS COMPLETED. EACH HOLE SHALL BE SEALED WITH HDPE EXTRUDATE AFTER BENTONITE FILLING IS COMPLETED.
7. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.

000019

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JMO	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JMO	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	SLB	DKP	DOP	JFB

2 1 0 2 4
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE:
LINER SYSTEM DETAILS IV

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

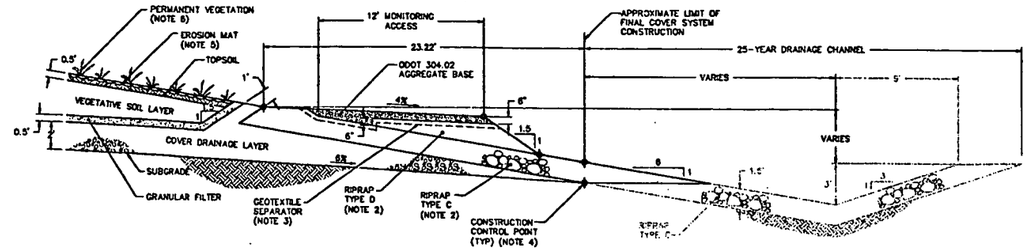
SIGNATURE
20 Aug 2008
DATE

STATE OF OHIO
JOHN F. BEECH
E-58246
REGISTERED PROFESSIONAL ENGINEER
SEAL

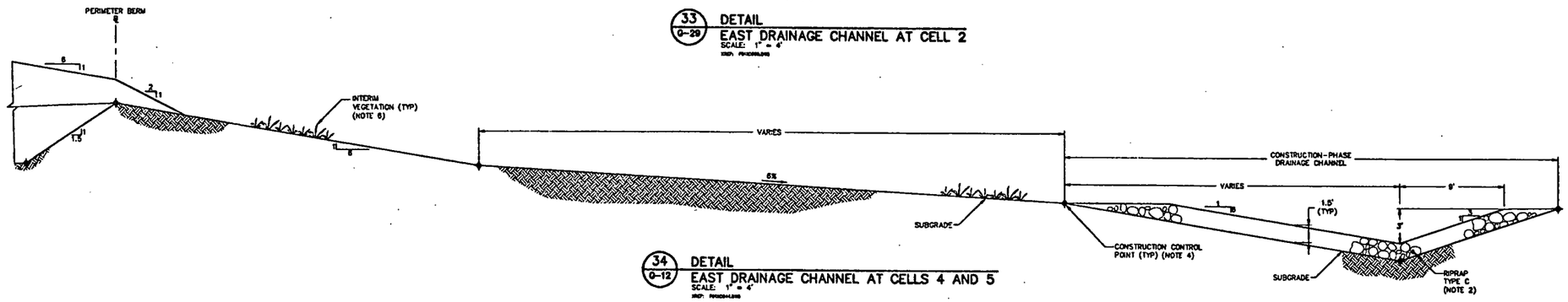
GEO SYNTEC CONSULTANTS
3100 LAKE SIDE DRIVE
ATLANTA, GEORGIA 30339 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-8000-C-00344
GEOSYNTEC PROJECT NO.:	GG1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0163
SHEET NO.:	G-15
REVISION NO.:	0

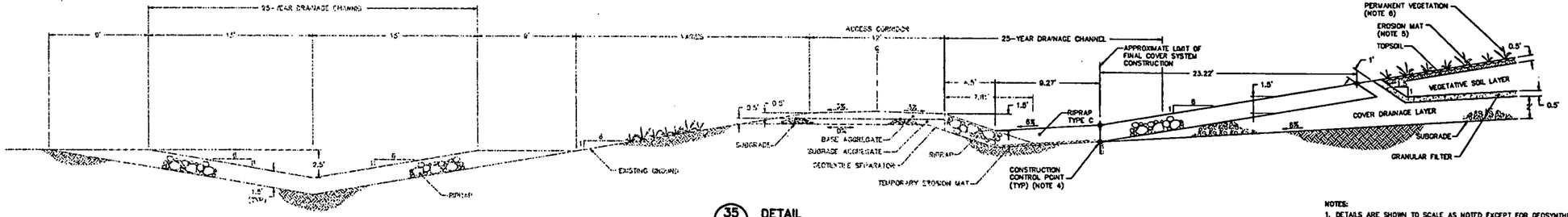
4009



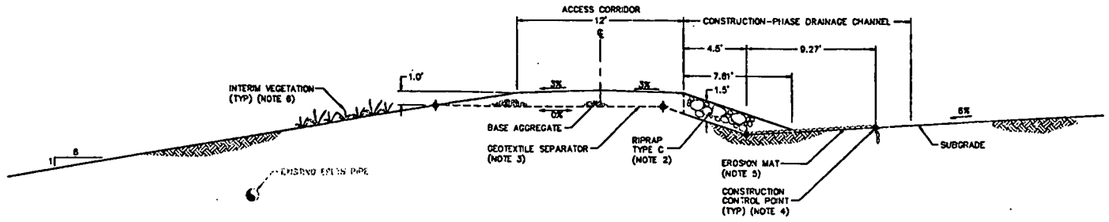
33 / 0-29 DETAIL
EAST DRAINAGE CHANNEL AT CELL 2
SCALE: 1" = 4'



34 / 0-12 DETAIL
EAST DRAINAGE CHANNEL AT CELLS 4 AND 5
SCALE: 1" = 4'



35 / 0-29 DETAIL
WEST DRAINAGE CHANNEL AT CELL 2
SCALE: 1" = 4'



36 / 0-11 DETAIL
WEST DRAINAGE CHANNEL AT CELLS 4 AND 5
SCALE: 1" = 4'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
3. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02230.
4. CONSTRUCTION CONTROL POINTS FOR SUBGRADE ARE PROVIDED ON DRAWINGS G-3, G-4 AND G-8.
5. EROSION MAT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
6. INTERIM AND PERMANENT VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JAB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	MLG	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	MLG	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	MLG	DKP	DOP	JFB

SCALE AS SHOWN

OWNER/AGENCY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
SURFACE-WATER MANAGEMENT SYSTEM DETAILS I

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
DATE

STATE OF OHIO
JOHN J. BEECH
E-58248
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1000 WEST NEWPORT CENTER
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-5000-G-00345
GEOSYNTEC PROJECT NO.:	GO1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0178
SHEET NO.:	G-17
REVISION NO.:	0

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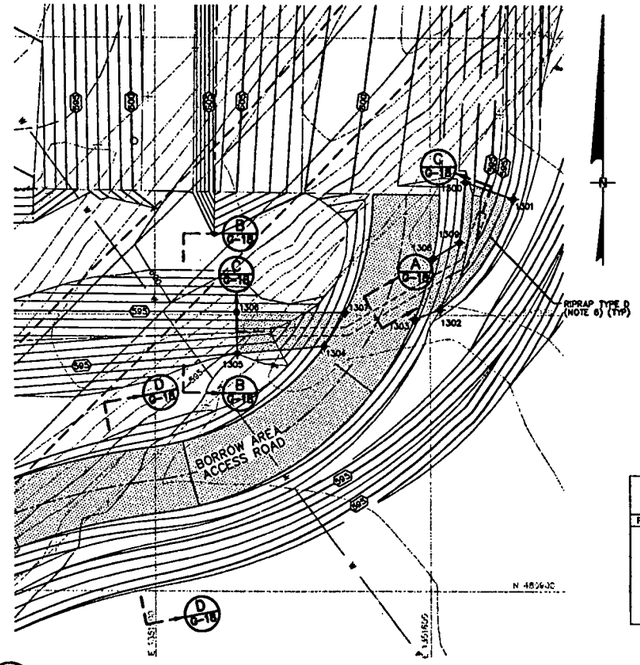
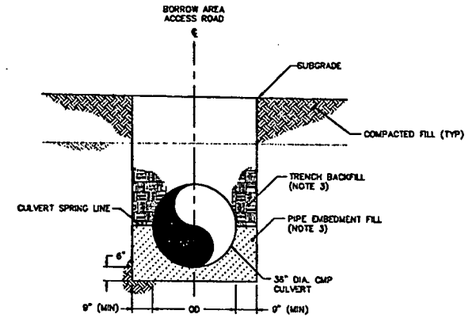
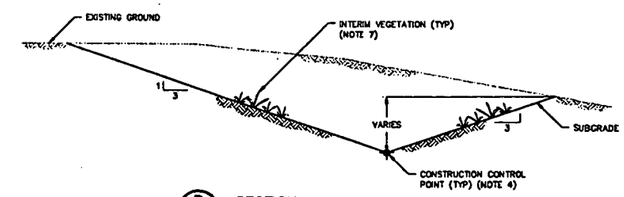


37 / G-4 **PLAN**
TEMPORARY DRAINAGE CHANNEL MODIFICATION AT BORROW AREA ACCESS ROAD
SCALE: 1" = 20'

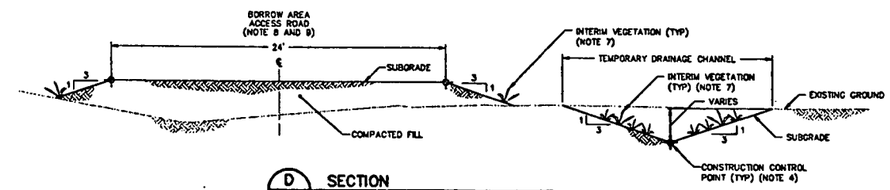
CONSTRUCTION CONTROL POINTS			
POINT NO.	NORTHING	EASTING	ELEVATION
1300	481047.99	1351612.72	597.00
1301	481041.97	1351630.37	597.00
1302	481001.86	1351603.73	597.00
1303	480998.39	1351594.42	599.40
1304	480988.81	1351561.60	599.04
1305	480988.05	1351529.89	595.00
1306	481001.07	1351529.74	595.00
1307	481000.95	1351569.14	599.27
1308	481020.51	1351601.19	599.70
1309	481026.27	1351610.63	597.00



A / G-18 **SECTION**
36-IN CMP CULVERT EMBEDMENT AT BORROW AREA ACCESS ROAD
SCALE: 1" = 2'



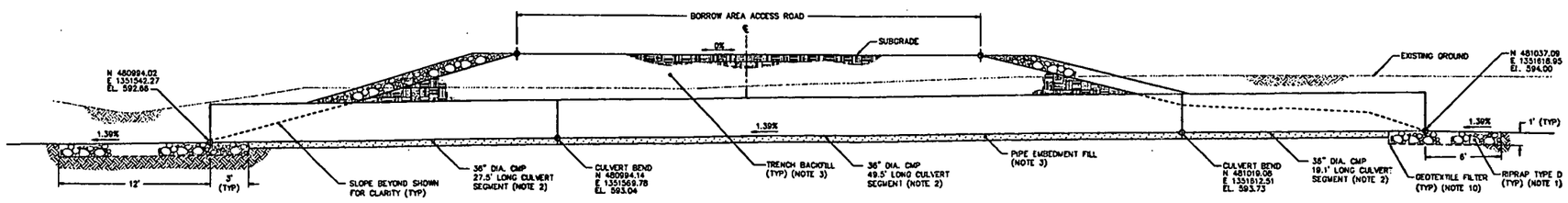
B / G-18 **SECTION**
TEMPORARY DRAINAGE CHANNEL SOUTH OF CELL 5
SCALE: 1" = 4'



D / G-18 **SECTION**
BORROW AREA ACCESS ROAD
SCALE: 1" = 4'

NOTES:

1. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
2. CORRUGATED METAL PIPE CULVERTS AND JOINTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02721.
3. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
4. CONSTRUCTION CONTROL POINTS FOR SUBGRADE PROVIDED ON DRAWINGS G-4.
5. CONTRACTOR SHALL TRANSITION SUBGRADE ELEVATIONS TO EXISTING GROUND ELEVATIONS WITHIN AREA SHOWN.
6. CONTRACTOR SHALL PLACE RIPRAP TYPE D WITHIN AREA SHOWN.
7. INTERIM VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.
8. CLEARING, GRUBBING AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. UPPER 6" TOPSOIL SHALL BE REMOVED AND STOCKPILED AS DIRECTED BY THE CONSTRUCTION MANAGER.
9. COMPACTED FILL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
10. GEOTEXTILE FILTER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.



C / G-18 **SECTION**
BORROW AREA ACCESS ROAD AT 36-IN CMP CULVERT CROSSING
SCALE: 1" = 4'

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DCP	JAB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	JAB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	MLG	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DCP	MLG	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DCP	MLG	DKP	DCP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
SURFACE-WATER MANAGEMENT SYSTEM DETAILS II

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
20 May 2008
DATE

STATE OF OHIO
JOHN R. BEECH
E-56348
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-5000-G-00346
GEOSYNTEC PROJECT NO.:	GO1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0165
SHEET NO.:	G-18
REVISION NO.:	0

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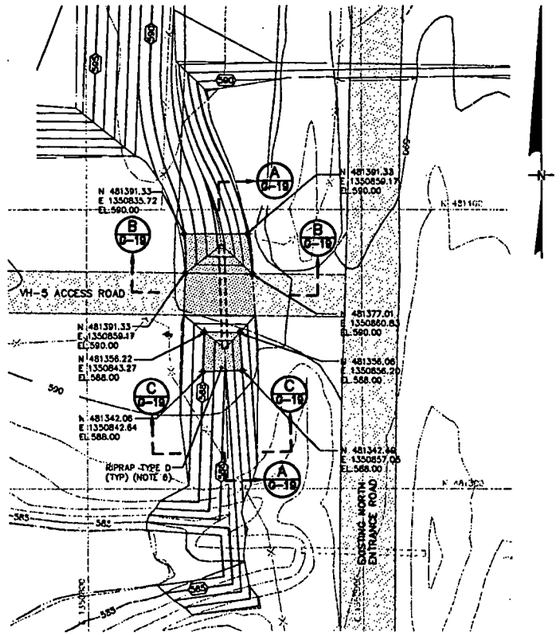
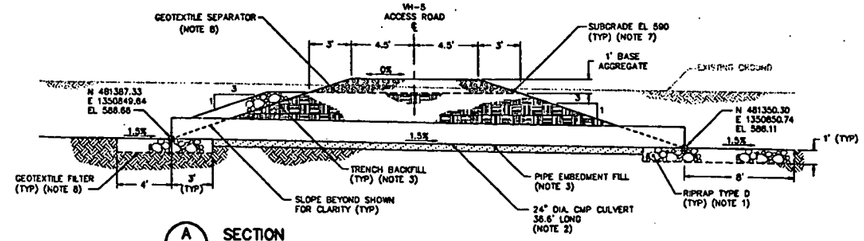
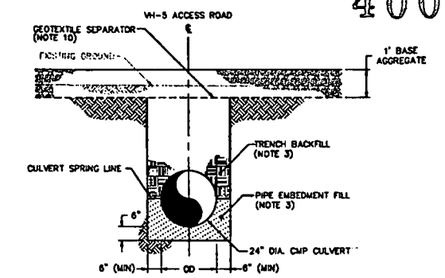


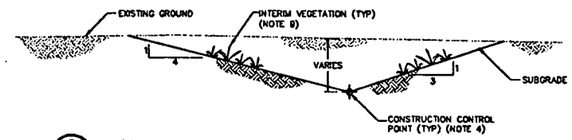
38 / G-3 PLAN
TEMPORARY DRAINAGE CHANNEL MODIFICATION AT VH-5 ACCESS ROAD
SCALE: 1" = 20'



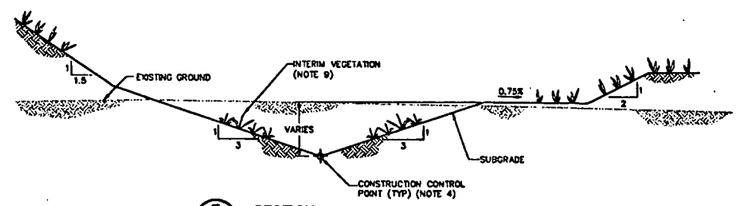
A / G-19 SECTION
VH-5 ACCESS ROAD AT 24-IN DIA. CMP CULVERT CROSSING
SCALE: 1" = 4'



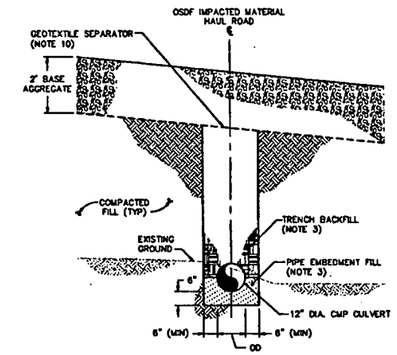
B / G-19 SECTION
24-IN DIA. CMP CULVERT EMBEDMENT AT VH-5 ACCESS ROAD
SCALE: 1" = 2'



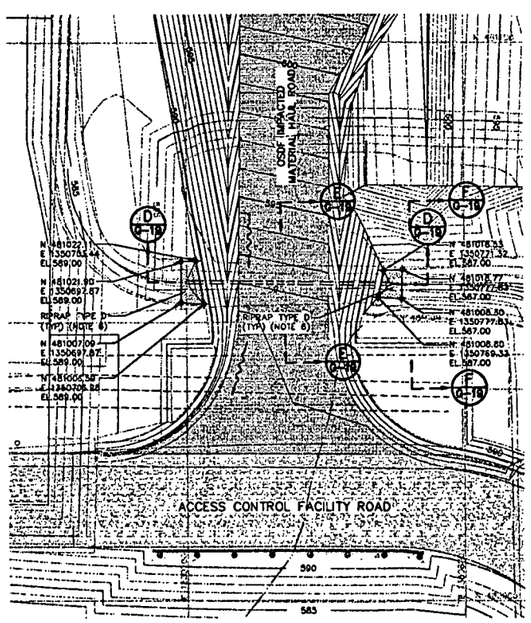
C / G-19 SECTION
TEMPORARY DRAINAGE CHANNEL AT VH-5 ACCESS ROAD
SCALE: 1" = 4'



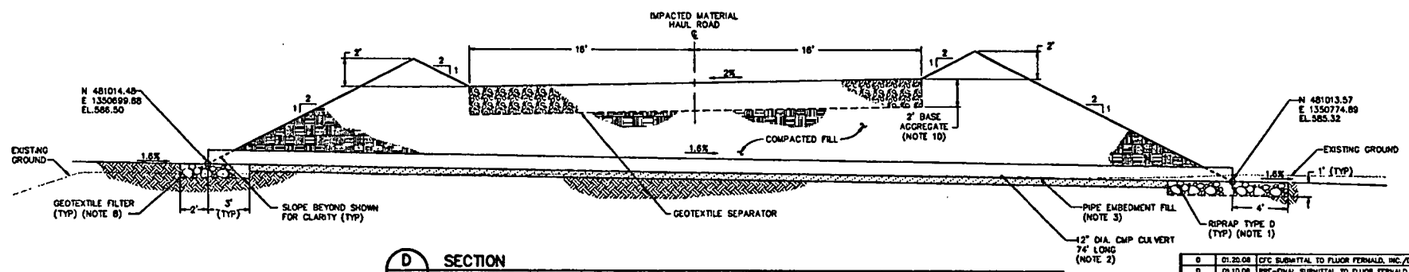
F / G-19 SECTION
TEMPORARY DRAINAGE CHANNEL AT OSDF IMPACTED MATERIAL HAUL ROAD
SCALE: 1" = 4'



E / G-19 SECTION
12-IN DIA. CMP CULVERT EMBEDMENT AT OSDF IMPACTED MATERIAL HAUL ROAD
SCALE: 1" = 2'



39 / G-8 PLAN
TEMPORARY DRAINAGE CHANNEL MODIFICATION AT OSDF IMPACTED MATERIAL HAUL ROAD
SCALE: 1" = 20'



D / G-19 SECTION
OSDF IMPACTED MATERIAL HAUL ROAD AT 12-IN DIA. CMP CULVERT CROSSING
SCALE: 1" = 4'

NOTES:

1. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
2. CORRUGATED METAL PIPE CULVERTS AND JOINTS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS SECTION 02721.
3. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
4. CONSTRUCTION CONTROL POINTS FOR SUBGRADE ARE PROVIDED ON DRAWINGS G-3, G-4 AND G-8.
5. CONTRACTOR SHALL TRANSITION SUBGRADE ELEVATIONS TO EXISTING GROUND ELEVATIONS WITHIN AREA SHOWN.
6. CONTRACTOR SHALL PLACE RIPRAP TYPE D WITHIN AREA SHOWN.
7. CONTRACTOR SHALL REESTABLISH SUBGRADE FOR VH-5 ACCESS ROAD TO ELEVATION 590.
8. GEOTEXTILE FILTER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02714.
9. INTERIM VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.
10. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH WITH SPECIFICATION SECTION 02230.

000022

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP		SI	DJS	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JLG	SI	DJS	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JLG	SI	DJS	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	SLG	SI	DJS	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	JLG	DOP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
SURFACE-WATER MANAGEMENT SYSTEM DETAILS III

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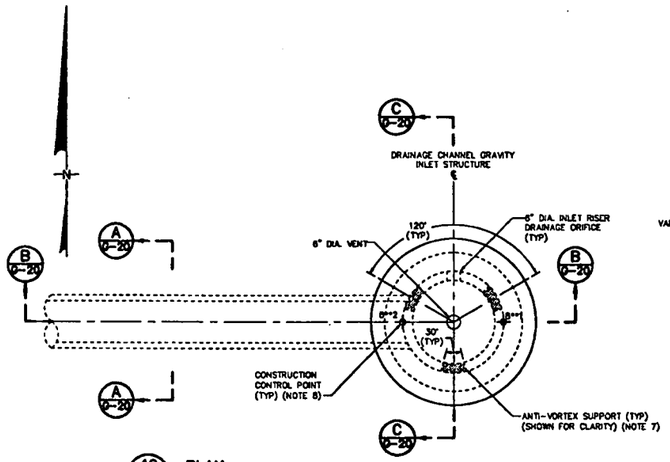
SIGNATURE
20 Aug 2004
DATE

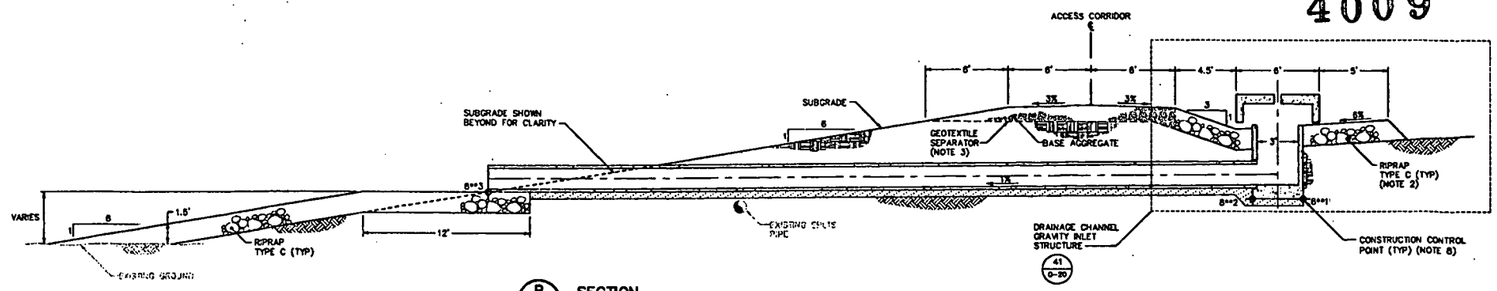
STATE OF OHIO
JOHN F. BEECH
E-58348
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

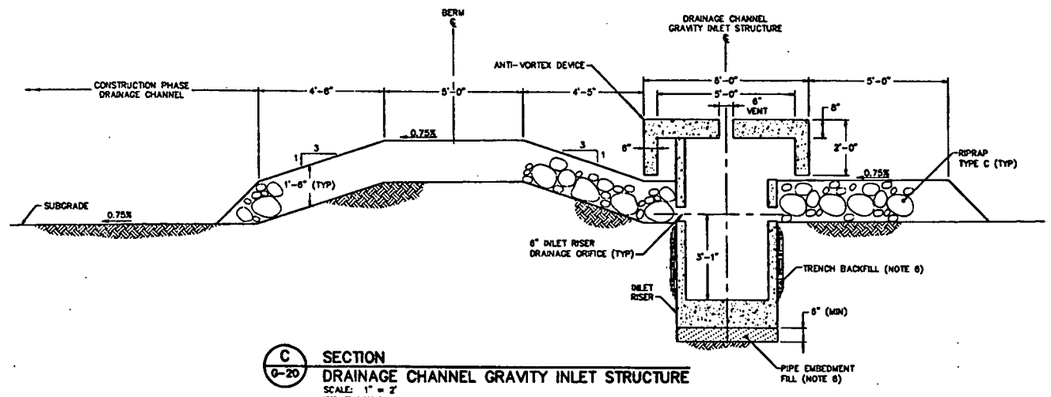
PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	901-8000-G-00347
GEOSYNTEC PROJECT NO.:	G01342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0179
SHEET NO.:	G-19
REVISION NO.:	0



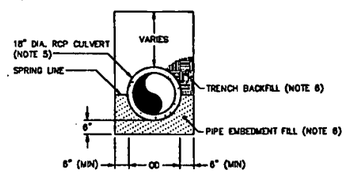
40 / 0-3 PLAN
DRAINAGE CHANNEL GRAVITY INLET STRUCTURE WITH RCP CULVERT
SCALE: 1" = 2'



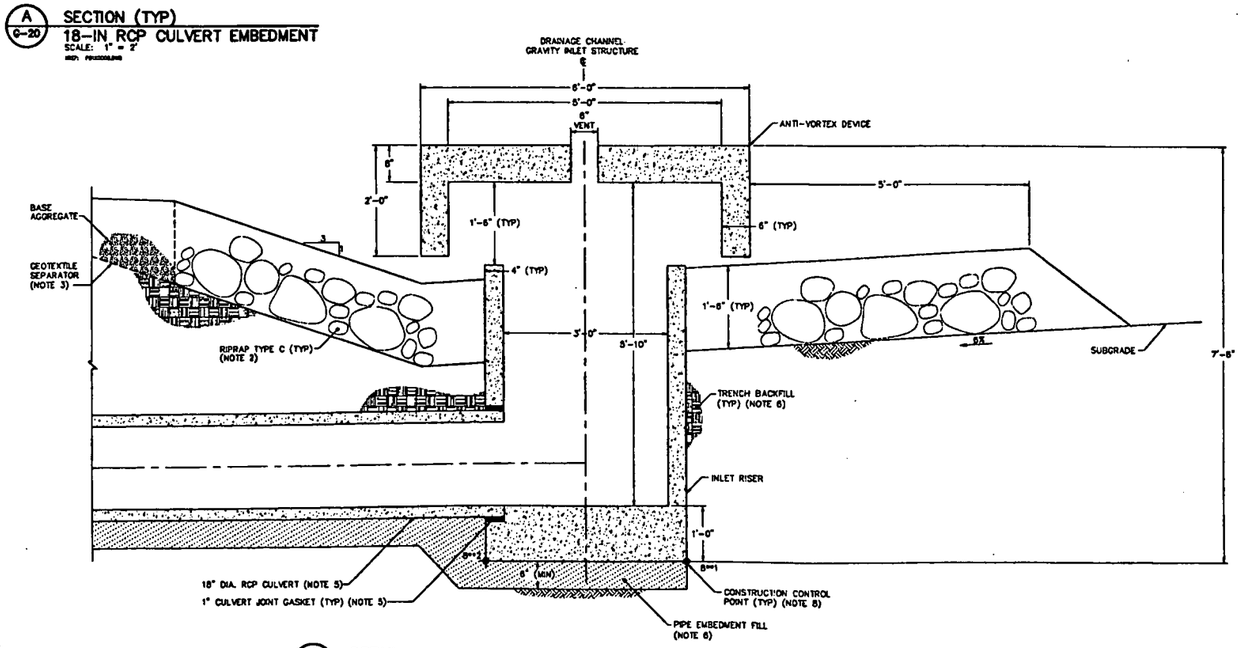
B / 0-20 SECTION
DRAINAGE CHANNEL GRAVITY INLET STRUCTURE WITH RCP CULVERT
SCALE: 1" = 4'



C / 0-20 SECTION
DRAINAGE CHANNEL GRAVITY INLET STRUCTURE
SCALE: 1" = 2'



A / 0-20 SECTION (TYP)
18-IN RCP CULVERT EMBEDMENT
SCALE: 1" = 2'



41 / 0-20 DETAIL
DRAINAGE CHANNEL GRAVITY INLET STRUCTURE
SCALE: 1" = 1'

DRAINAGE CHANNEL GRAVITY INLET STRUCTURE AND REINFORCED CONCRETE PIPE CONSTRUCTION CONTROL POINTS

GIS-8, GIS-9, GIS-10

POINT NO.	NORTHING	EASTING	ELEVATION
8081	481595.11	1350688.23	587.05
8082	481595.16	1350684.59	587.05
8083	481595.83	1350608.32	588.38
8091	481395.15	1350665.80	583.56
8092	481395.15	1350662.13	583.56
8093	481396.04	1350595.95	585.00
8101	481195.16	1350663.33	583.64
8102	481195.20	1350659.66	583.64
8103	481195.87	1350602.14	585.00

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
3. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02230.
4. DRAINAGE CHANNEL GRAVITY INLET STRUCTURE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02721.
5. REINFORCED CONCRETE PIPE CULVERT AND JOINTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02721.
6. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
7. ANTI-VORTEX SUPPORTS DO NOT APPEAR IN ALL SECTIONS. SEE PLAN ON THIS SHEET FOR LOCATIONS.
8. CONSTRUCTION CONTROL POINTS ASSOCIATED WITH DRAINAGE CHANNEL GRAVITY INLET STRUCTURE AND REINFORCED CONCRETE PIPE ARE PROVIDED IN TABLE SHOWN ON THIS DRAWING. THE "*" SYMBOL REPRESENTS THE GRAVITY INLET STRUCTURE FOR WHICH THE APPROPRIATE CONTROL POINTS ARE PROVIDED.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CTC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JAB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JAB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	UMW	DKP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: SURFACE-WATER MANAGEMENT SYSTEM DETAILS IV

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE: J.T. Beech
DATE: 30 Aug 2007

STATE OF OHIO — JOHN T. BEECH E-58248 — REGISTERED PROFESSIONAL ENGINEER — SEAL

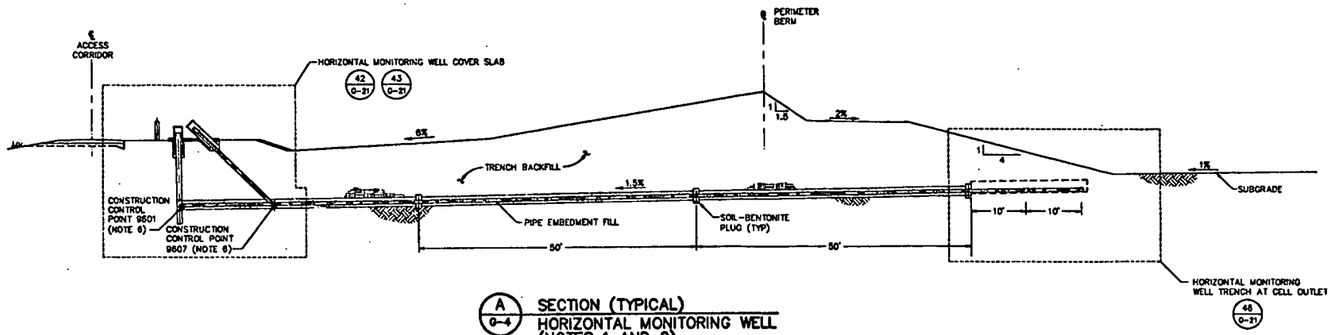
GEOSYNTEC CONSULTANTS
1255 LAKE HEARN DRIVE, SUITE 3000
ATLANTA, GEORGIA 30319 USA

PROJECT NO.:	20104
CONTRACT NO.:	05P5000028
FEMP DRAWING NO.:	8D1-8000-C-00346
GEOSYNTEC PROJECT NO.:	GG1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0156
SHEET NO.:	G-20
REVISION NO.:	0

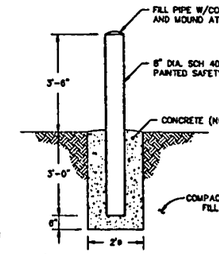
000023

CERTIFIED-FOR-CONSTRUCTION

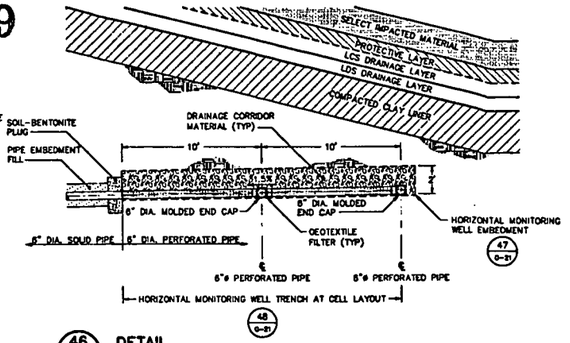
4009



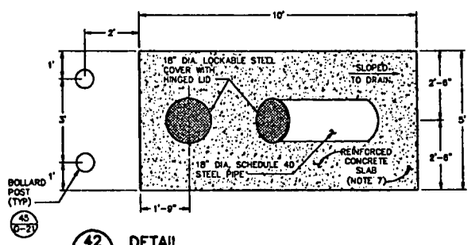
A G-4 SECTION (TYPICAL)
HORIZONTAL MONITORING WELL (NOTES 1 AND 2)
SCALE: 1" = 10'



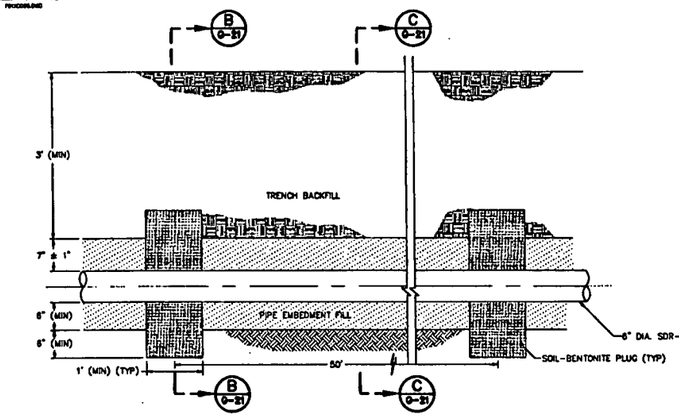
45 – DETAIL
BOLLARD POST
SCALE: 1" = 2'



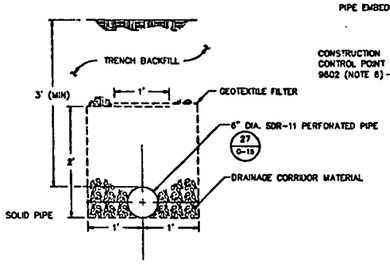
46 – DETAIL
HORIZONTAL MONITORING WELL TRENCH AT CELL OUTLET
SCALE: 1" = 1'



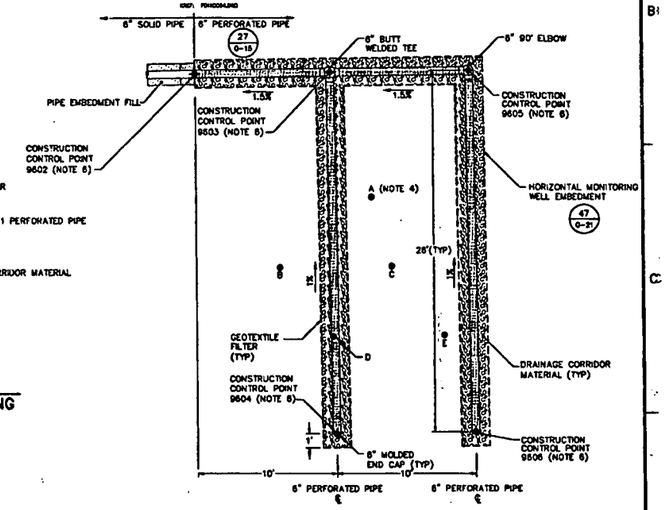
42 G-21 DETAIL
HORIZONTAL MONITORING WELL COVER SLAB
SCALE: 1" = 2'

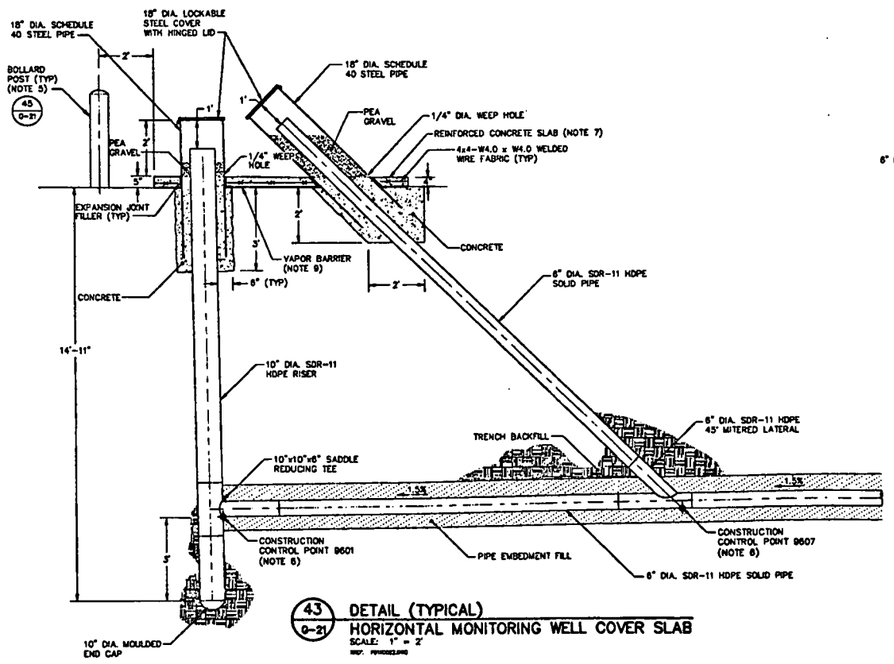


44 G-21 DETAIL
PIPE EMBEDMENT
(NOTES 1, 2, AND 3)
SCALE: 1" = 1'

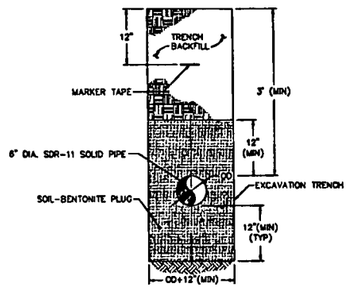


47 G-21 DETAIL
HORIZONTAL MONITORING WELL EMBEDMENT
(NOTES 1 AND 3)
SCALE: 1" = 1'

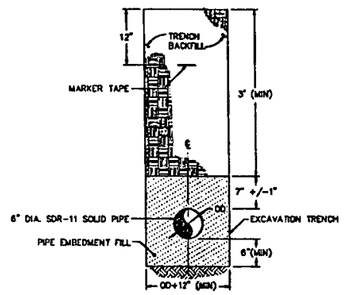




43 G-21 DETAIL (TYPICAL)
HORIZONTAL MONITORING WELL COVER SLAB
SCALE: 1" = 2'



B G-21 SECTION
PIPE EMBEDMENT WITH SOIL-BENTONITE PLUG
(NOTES 1, 2, AND 3)
SCALE: 1" = 1'



C G-21 SECTION
PIPE EMBEDMENT
(NOTES 1 AND 3)
SCALE: 1" = 1'

LOCATION OF OVERLYING FEATURE RELATIVE TO TRENCH

LEGEND:

- A LDS PIPE SECONDARY LINER PENETRATION
- B REDUNDANT LCS PIPE SECONDARY LINER PENETRATION
- C REDUNDANT LCS PIPE PRIMARY LINER PENETRATION
- D LCS PIPE SECONDARY LINER PENETRATION
- E LCS PIPE PRIMARY LINER PENETRATION

48 – PLAN
HORIZONTAL MONITORING WELL TRENCH LAYOUT AT CELL OUTLET
SCALE: 1" = 4'

NOTES:

1. TRENCHING AND BACKFILLING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
2. SOIL BENTONITE PLUGS SHALL BE LOCATED 50 FEET ON CENTER AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH SPECIFICATION SECTION 02215.
3. PIPES AND FITTINGS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02605.
4. POINTS "A" THROUGH "E" ILLUSTRATE THE HORIZONTAL LOCATIONS OF LINER PENETRATIONS SITUATED ABOVE THE HORIZONTAL MONITORING WELL TRENCH AT THE CELL OUTLET.
5. BOLLARD POST CONCRETE EMBEDMENT NOT SHOWN FOR CLARITY.
6. CONSTRUCTION CONTROL POINTS ASSOCIATED WITH HORIZONTAL MONITORING WELLS ARE PROVIDED IN TABLE SHOWN ON THIS DRAWING.
7. FURNISH CONCRETE MIX WITH A COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C39.
8. FURNISH REINFORCING WELDED STEEL WIRE FABRIC MEETING REQUIREMENTS OF ASTM 185.
9. FURNISH POLYETHYLENE SHEET FOR VAPOR BARRIERS WITH A 60 MIL MINIMUM THICKNESS.

HORIZONTAL MONITORING WELL CONSTRUCTION CONTROL POINTS

CELL NO.	POINT NO.	NORTHING	EASTING	BOTTOM OF PIPE ELEVATION
CELL 6	9601	480988.43	1350881.21	578.18
	9602	480986.69	1350803.97	580.32
	9603	480986.57	1350813.97	580.47
	9604	480960.57	1350813.65	580.73
	9605	480986.44	1350823.97	580.62
	9606	480960.45	1350823.65	580.88
	9607	480988.23	1350877.75	578.43

000024

CERTIFIED-FOR-CONSTRUCTION

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DOP	JKS	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JKS	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JKS	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DOP	JKS	SI	DJB	JFB
A	01.01.07	PRELIMINARY SUBMITTAL TO FF/DOE	DOP	JKS	DOP	DOP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
HORIZONTAL MONITORING WELL DETAILS – CELL 6

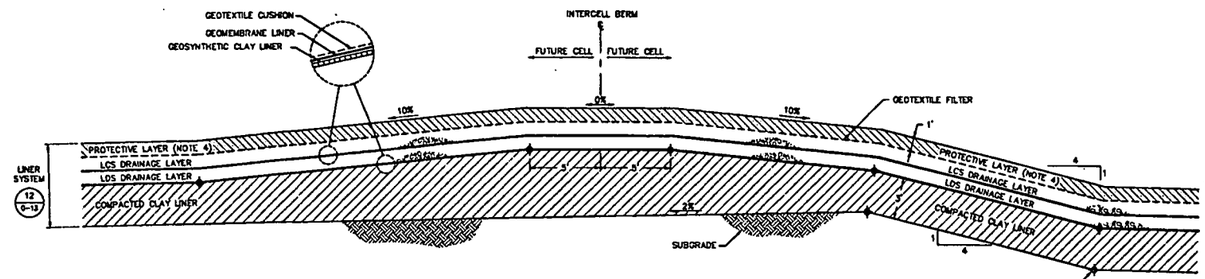
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO JOHN BEECH E-06348 REGISTERED PROFESSIONAL ENGINEER

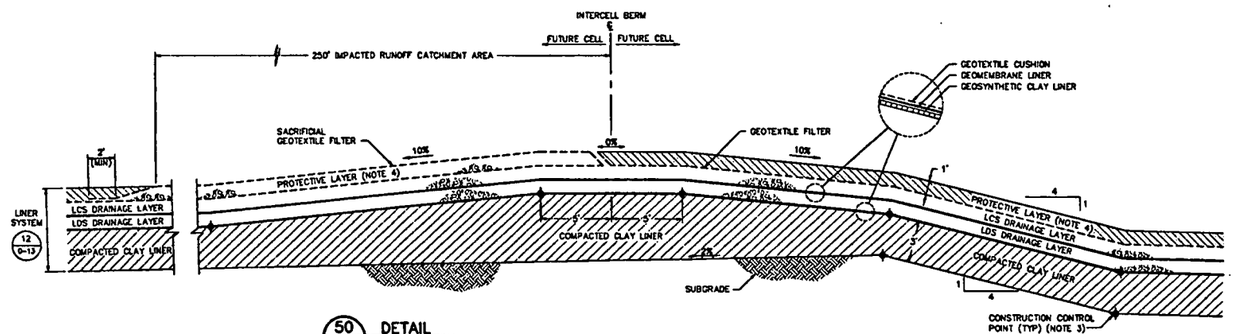
GEOSYNTEC CONSULTANTS

PROJECT NO.:	20104
CONTRACT NO.:	95P5005028
FEMP DRAWING NO.:	900X-5000-C-00349
GEOSYNTEC PROJECT NO.:	GC1342-10.3
GEOSYNTEC DOCUMENT NO.:	FD1-0171
SHEET NO.:	G-21
REVISION NO.:	0

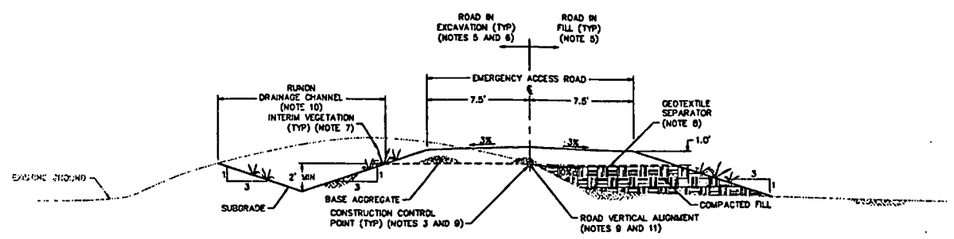
4009



49 — DETAIL
ALTERNATE LINER SYSTEM AT INTERCELL BERM FOR CONCURRENT CONSTRUCTION OF TWO CELLS
SCALE: 1" = 4'



50 — DETAIL
ALTERNATE LINER SYSTEM AT INTERCELL BERM AND IMPACTED RUNOFF CATCHMENT AREA FOR CONCURRENT CONSTRUCTION OF TWO CELLS
SCALE: 1" = 4'



51 — DETAIL
EMERGENCY ACCESS ROAD
SCALE: 1" = 4'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. MATERIAL IN DRAINAGE LAYERS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02710.
3. CONSTRUCTION CONTROL POINTS FOR SUBGRADE AND COMPACTED CLAY LINER ARE PROVIDED ON DRAWINGS G-3, G-4 AND G-5. CONTROL POINTS FOR THE ALTERNATIVE LINER SYSTEM SHALL BE PROVIDED BY THE CONSTRUCTION MANAGER IF THIS OPTION IS CHOSEN TO BE CONSTRUCTED.
4. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED GRANULAR MATERIAL IN IMPACTED RUNOFF CATCHMENT AREA AND IMPACTED MATERIAL IN REMAINING ACTIVE CELL AREAS EXCLUDING CELL AREA AT INTERCELL BERM TEMPORARY LINER SYSTEM TERMINATION. PROTECTIVE LAYER SHALL CONSIST OF NON-IMPACTED NON-GRANULAR MATERIAL IN ACTIVE AND FUTURE CELL AREAS OF TEMPORARY LINER SYSTEM TERMINATION. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240. IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
5. CLEARING, GRUBBING AND STRIPPING SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02110. UPPER 6" TOPSOIL SHALL BE REMOVED AND STOCKPILED AS DIRECTED BY THE CONSTRUCTION MANAGER.
6. EXCAVATION, FILL AND SUBGRADE PREPARATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
7. INTERIM VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.
8. BASE AGGREGATE AND GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02230.
9. FIELD DETERMINE VERTICAL ALIGNMENT OF EMERGENCY ACCESS ROAD. VERTICAL ALIGNMENT SHALL HAVE A SLOPE OF 5% OR LESS. MINIMIZE EXCAVATION AND FILLING AND BALANCE EXCAVATION AND FILL QUANTITIES.
10. DRAINAGE CHANNEL LINING SHALL BE INSTALLED IN DRAINAGE CHANNEL IN ACCORDANCE WITH REQUIREMENTS IN SECTION 4.0 OF THE OSDF SURFACE-WATER MANAGEMENT AND EROSION CONTROL PLAN. DRAINAGE CHANNEL SLOPE SHALL BE A MINIMUM OF 0.5%.
11. CULVERT SLOPE SHALL BE A MINIMUM OF 1%. THE MINIMUM COVER BETWEEN THE BOTTOM OF BASE AGGREGATE AND TOP OF CULVERT SHALL BE 2 FT. CORRUGATED METAL CULVERTS AND JOINTS SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02721. RIPRAP SHALL BE PLACED AT CULVERT INLET AND OUTLET IN ACCORDANCE WITH REQUIREMENTS IN SECTION 4.0 OF THE OSDF SURFACE-WATER MANAGEMENT AND EROSION CONTROL PLAN.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JWO	SB	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JWO	SB	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	JWO	SB	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SB	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
MISCELLANEOUS LINER SYSTEM AND ROAD DETAILS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT BIDDED OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN T. BEECH — E-58248 — REGISTERED PROFESSIONAL ENGINEER

GEOSYNTEC CONSULTANTS

PROJECT NO.:	20104
CONTRACT NO.:	85P5005028
FEMP DRAWING NO.:	90X-5000-C-00350
GEOSYNTEC PROJECT NO.:	CO1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0607
SHEET NO.:	G-22
REVISION NO.:	0

000025

CERTIFIED-FOR-CONSTRUCTION

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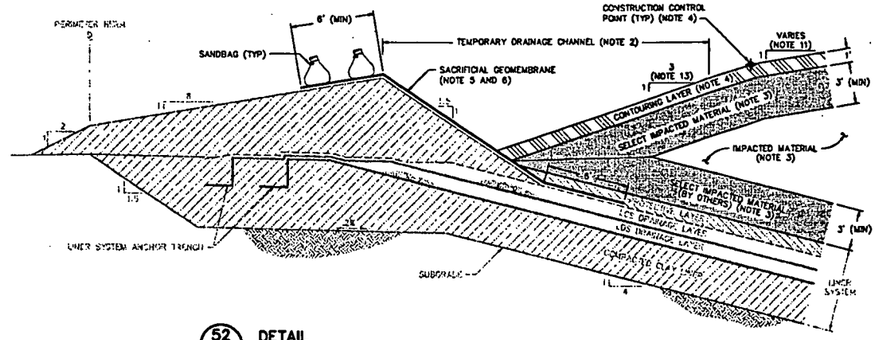
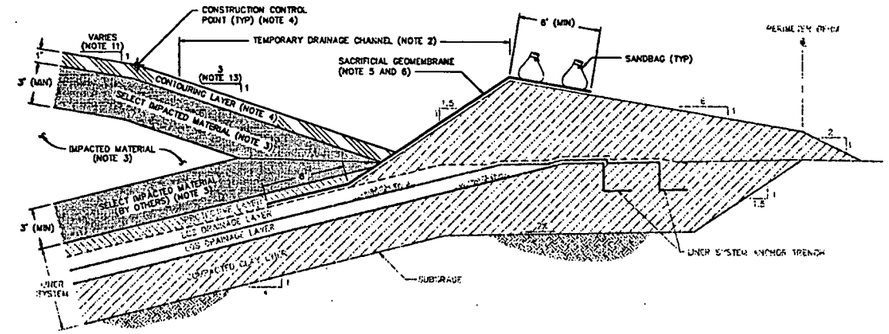
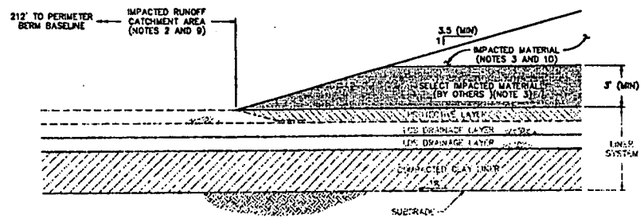


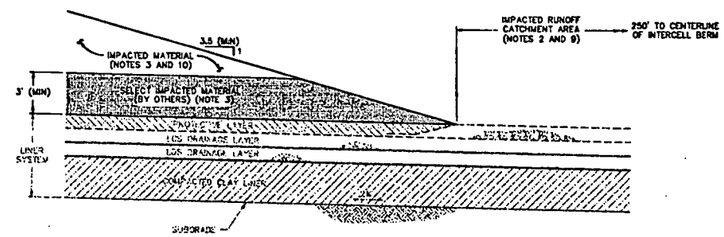
52 DETAIL
IMPACTED MATERIAL PLACEMENT AT WEST PERIMETER
SCALE: 1" = 4'



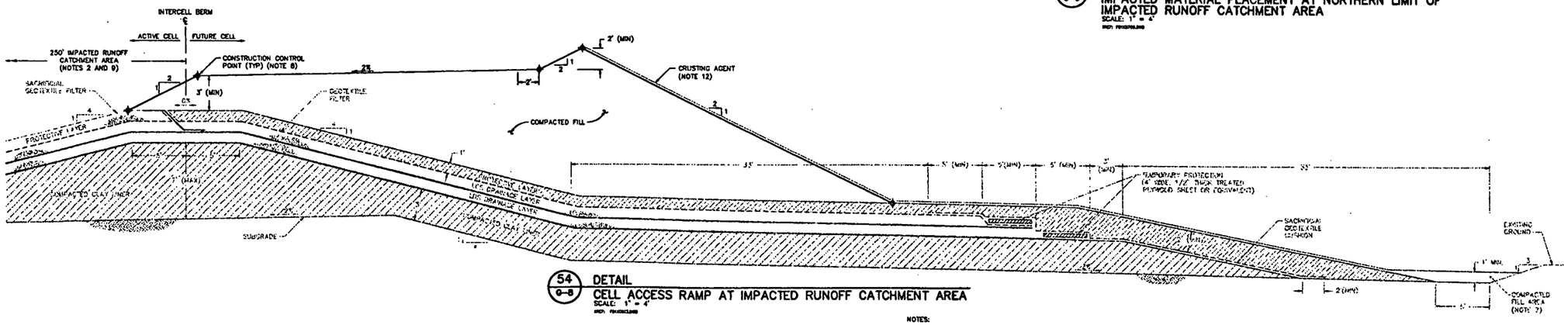
56 DETAIL
IMPACTED MATERIAL PLACEMENT AT EAST PERIMETER
SCALE: 1" = 4'



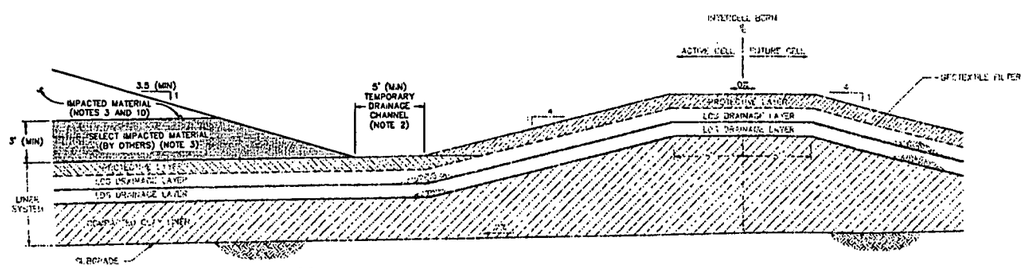
53 DETAIL
IMPACTED MATERIAL PLACEMENT AT EASTERN LIMIT OF IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'



57 DETAIL
IMPACTED MATERIAL PLACEMENT AT NORTHERN LIMIT OF IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'



54 DETAIL
CELL ACCESS RAMP AT IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'



55 DETAIL
IMPACTED MATERIAL PLACEMENT AT INTERCELL BERM LOCATED OUTSIDE OF IMPACTED RUNOFF CATCHMENT AREA
SCALE: 1" = 4'

000026

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE AS SPECIFIED IN TECHNICAL SPECIFICATIONS.
2. PURPOSE OF THIS DRAWING IS TO ILLUSTRATE PLACEMENT OF SELECT IMPACTED MATERIAL, IMPACTED MATERIAL AND CONTOURING LAYER, INGRESS TO AND EGRESS FROM CELLS AND CONCURRENT CONTROL OF IMPACTED RUNOFF IN CELLS DURING FILLING. CONTRACTOR SHALL CONTAIN AND CONTROL WATER GENERATED DURING CONSTRUCTION AND FILLING OF OSDF IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
3. A MINIMUM THICKNESS OF 3 FEET OF SELECT IMPACTED MATERIAL SHALL BE PLACED ABOVE PROTECTIVE LAYER AND BELOW CONTOURING LAYER. THICKNESS OF SELECT IMPACTED MATERIAL OVERLYING PROTECTIVE LAYER MAY BE REDUCED TO 2 FEET IF FIRST LIFT OF IMPACTED MATERIAL TO BE PLACED OVER SELECT IMPACTED MATERIAL IS CATEGORY 1 IMPACTED MATERIAL. IMPACTED MATERIAL SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
4. CONTOURING LAYER SHALL CONSIST OF NON-IMPACTED MATERIAL IN ACCORDANCE WITH SPECIFICATION SECTION 02240.
5. SACRIFICIAL GEOMEMBRANE SHALL BE USED TO CONTROL IMPACTED RUNOFF IN CELLS DURING FILLING. EXPOSED SACRIFICIAL GEOMEMBRANE SHALL BE REMOVED BY CUTTING PRIOR TO CONSTRUCTION OF COMPACTED CLAY CAP IN TEMPORARY DRAINAGE CHANNEL.
6. SACRIFICIAL GEOMEMBRANE SHALL CONSIST OF HIGH DENSITY POLYETHYLENE, AS APPROVED BY CONSTRUCTION MANAGER AND PROVIDED BY FLUOR FERNALD, INC. CONTRACTOR SHALL SECURE IN-PLACE SACRIFICIAL GEOMEMBRANE WITH SANDBAGS TO PREVENT DAMAGE FROM WIND.
7. CONTRACTOR SHALL PLACE COMPACTED FILL TO PROVIDE POSITIVE DRAINAGE TO TEMPORARY DRAINAGE CHANNEL.
8. CONSTRUCTION CONTROL POINTS FOR CELL ACCESS RAMP ARE PROVIDED ON DRAWING G-8.
9. IMPACTED RUNOFF CATCHMENT AREA IN ACTIVE CELL SHALL REMAIN OPEN UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED IN ADJACENT UPGRADIENT CELL AND IMPACTED RUNOFF CATCHMENT AREA IN FUTURE CELL IS CONSTRUCTED AND OPERATIONAL.
10. IMPACTED MATERIAL INTERIM SLOPES SHALL BE NO STEEPER THAN 3.5H:1V IN ACCORDANCE WITH SPECIFICATION SECTION 13010.
11. SLOPE OF LOWER PORTION OF FINAL COVER SYSTEM IS 6H:1V FOR EAST AND WEST PERIMETERS OF OSDF.
12. CRUSTING AGENT SHALL BE APPLIED AT LINER SYSTEM TEMPORARY TERMINATION AND BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
13. INSTALL SILT FENCE 10 FEET (MEASURED HORIZONTALLY) UPSLOPE OF 3H:1V SLOPE LIMIT. INSTALL ADDITIONAL SILT FENCES AT APPROXIMATELY 80 FEET INTERVALS FOR A TOTAL OF THREE SILT FENCES. SILT FENCES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.20.08	DFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SMT/RDO	DLP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
IMPACTED MATERIAL PLACEMENT DETAILS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
20 May 2008
DATE

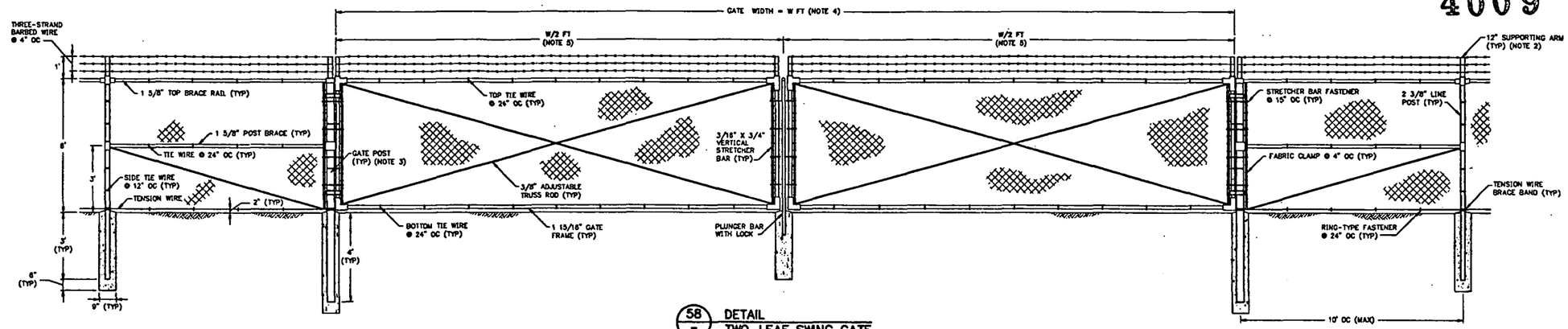
JOHN F. BEECH
E-58246
STATE OF OHIO
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEOSYNTEC CONSULTANTS
1000 ABERNATHY ROAD, SUITE 1400
ATLANTA, GEORGIA 30328 USA

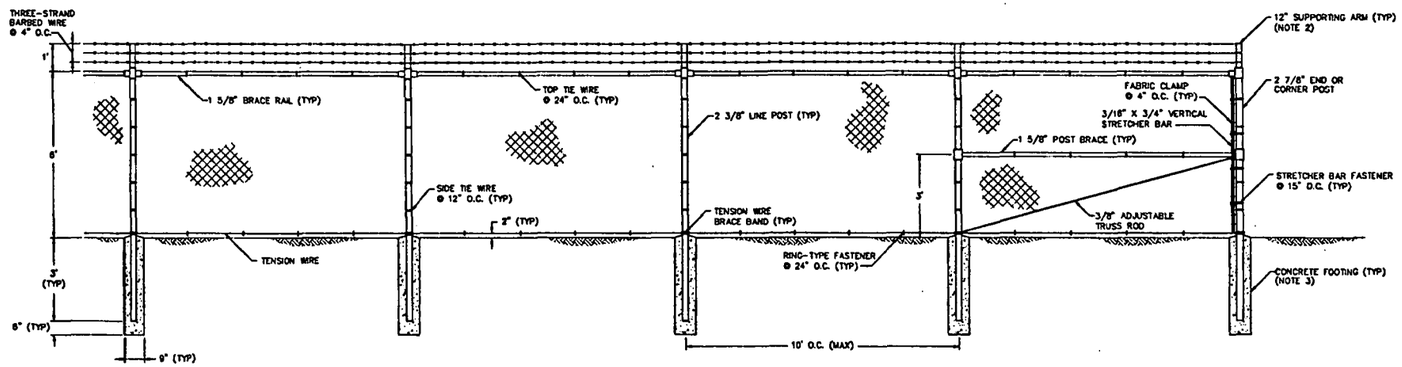
PROJECT NO.:	20104
CONTRACT NO.:	9SP5003028
FEMP DRAWING NO.:	90X-8000-G-00351
GEOSYNTEC PROJECT NO.:	001342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0172
SHEET NO.:	G-23
REVISION NO.:	0

CERTIFIED-FOR-CONSTRUCTION

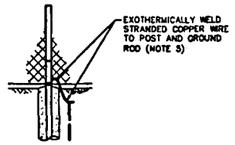
4009



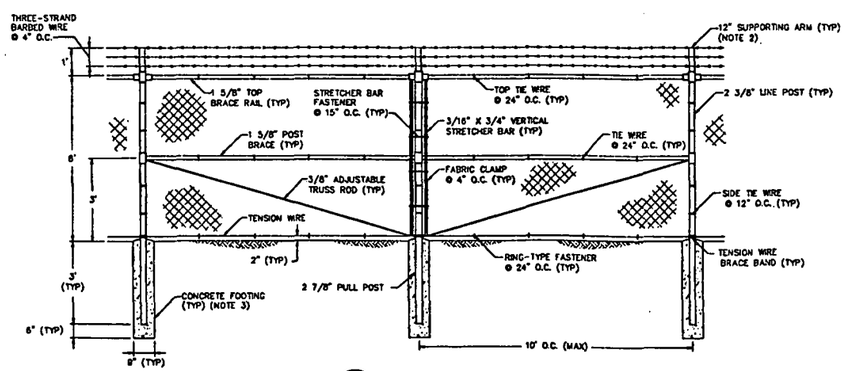
58 DETAIL
TWO-LEAF SWING GATE
SCALE: 1" = 2'



59 DETAIL
LINE POST CONNECTION TO END OR CORNER POST
SCALE: 1" = 2'



61 DETAIL
CHAIN LINK FENCE GROUND
SCALE: NTS



60 DETAIL
PULL POST
SCALE: 1" = 2'

NOTES:

1. CHAIN LINK FENCE AND GATES SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02831.
2. SUPPORTING ARMS SHALL SLOPE TO OUTSIDE OF FENCED AREA AT 45 DEGREES FROM VERTICAL.
3. EXPOSED TOPS OF CONCRETE FOOTINGS SHALL HAVE A 1-INCH CROWN TO PROMOTE DRAINAGE.
4. SEE DRAWINGS G-1 AND G-2 FOR LOCATION OF CHAIN LINK FENCE, GATES AND GATE WIDTHS.
5. GROUNDING INTERVAL SHALL BE EVERY 400 FEET ALONG FENCE, ON BOTH SIDES OF GATES AND ON BOTH SIDES OF ABOVE GROUND OR BELOW GROUND UTILITIES.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.20.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SI	DJB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
C	01.03.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
B	01.23.07	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	DGP	SLB	SI	DJB	JFB
A	01.07.07	PRELIMINARY SUBMITTAL TO FF/DOE	DGP	SLB	DKP	DGP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
CHAIN LINK FENCE AND GATE DETAILS

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN BEECH E-58348 — REGISTERED PROFESSIONAL ENGINEER

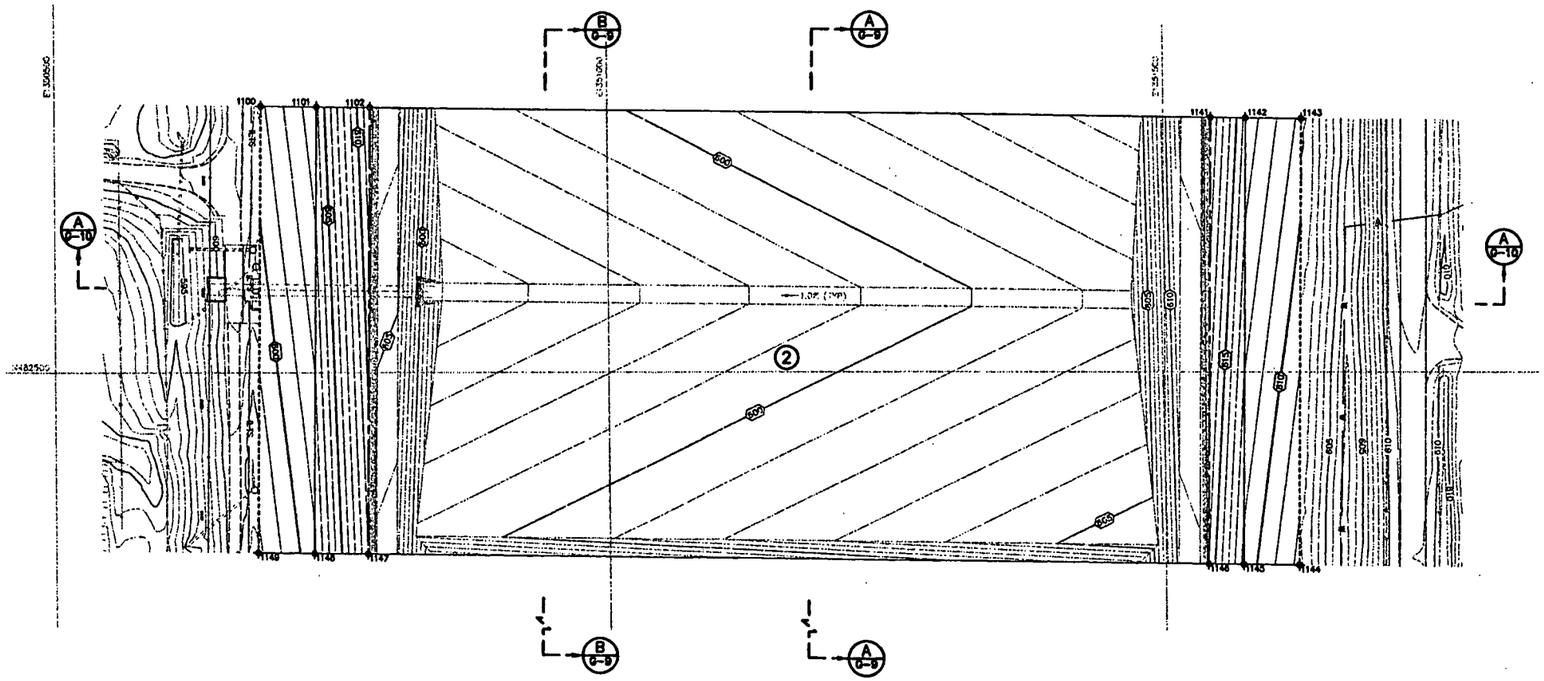
GEOSYNTEC CONSULTANTS
1100 LAKE STREET, SUITE A, ATLANTA, GEORGIA 30318 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005076
FEMP DRAWING NO.:	FOX-6000-G-00352
GEOSYNTEC PROJECT NO.:	C01342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0173
SHEET NO.:	G-24
REVISION NO.:	D

000027

CERTIFIED-FOR-CONSTRUCTION

4009



LEGEND

- SUBGRADE ELEVATION (FEET) (NOTES 1 AND 2)
- PERIMETER BERM BASELINE
- APPROXIMATE LIMIT OF FINAL COVER SYSTEM CONSTRUCTION
- 1100 CONSTRUCTION CONTROL POINT
- 2 EXISTING CELL DESIGNATION

SUBGRADE CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
1100	482738.75	1350686.65	800.78
1101	482736.14	1350736.73	803.79
1102	482737.54	1350785.67	811.94
1141	482726.32	1351542.29	618.97
1142	482727.93	1351573.91	613.70
1143	482727.32	1351624.00	610.68
1144	482327.33	1351619.11	607.69
1145	482327.94	1351569.03	610.70
1146	482326.33	1351537.41	615.97
1147	482337.58	1350780.79	608.94
1148	482336.17	1350731.85	600.79
1149	482336.79	1350681.78	597.78

NOTES:

1. SUBGRADE ELEVATIONS CORRESPOND TO TOP OF SUBGRADE, INCLUDING ANY COMPACTED FILL. SUBGRADE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02200.
2. CONTRACTOR SHALL RE-ESTABLISH SUBGRADE ELEVATIONS TO LIMITS SHOWN HEREON PRIOR TO FINAL COVER SYSTEM CONSTRUCTION.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
0	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/OPA	DGP	BLB	DJB	B	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	B	JHS	DJB	DGP	JFB
C	-	NOT ISSUED	-	-	-	-	-
B	-	NOT ISSUED	-	-	-	-	-
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	B	JHS	DJB	DGP	JFB

50 25 0 50 100
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: SUBGRADE GRADING PLAN – CELL 2 CAP

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

DRAWN BY
30 May 2004
DATE

STATE OF OHIO
JOHN F. BEECH
E-58246
REGISTERED PROFESSIONAL ENGINEER
SEAL

GEO SYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FDMP DRAWING NO.:	90X-8000-D-00353
GEOSYNTEC PROJECT NO.:	G01342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0703
SHEET NO.:	G-25
REVISION NO.:	0

000028

CERTIFIED-FOR-CONSTRUCTION

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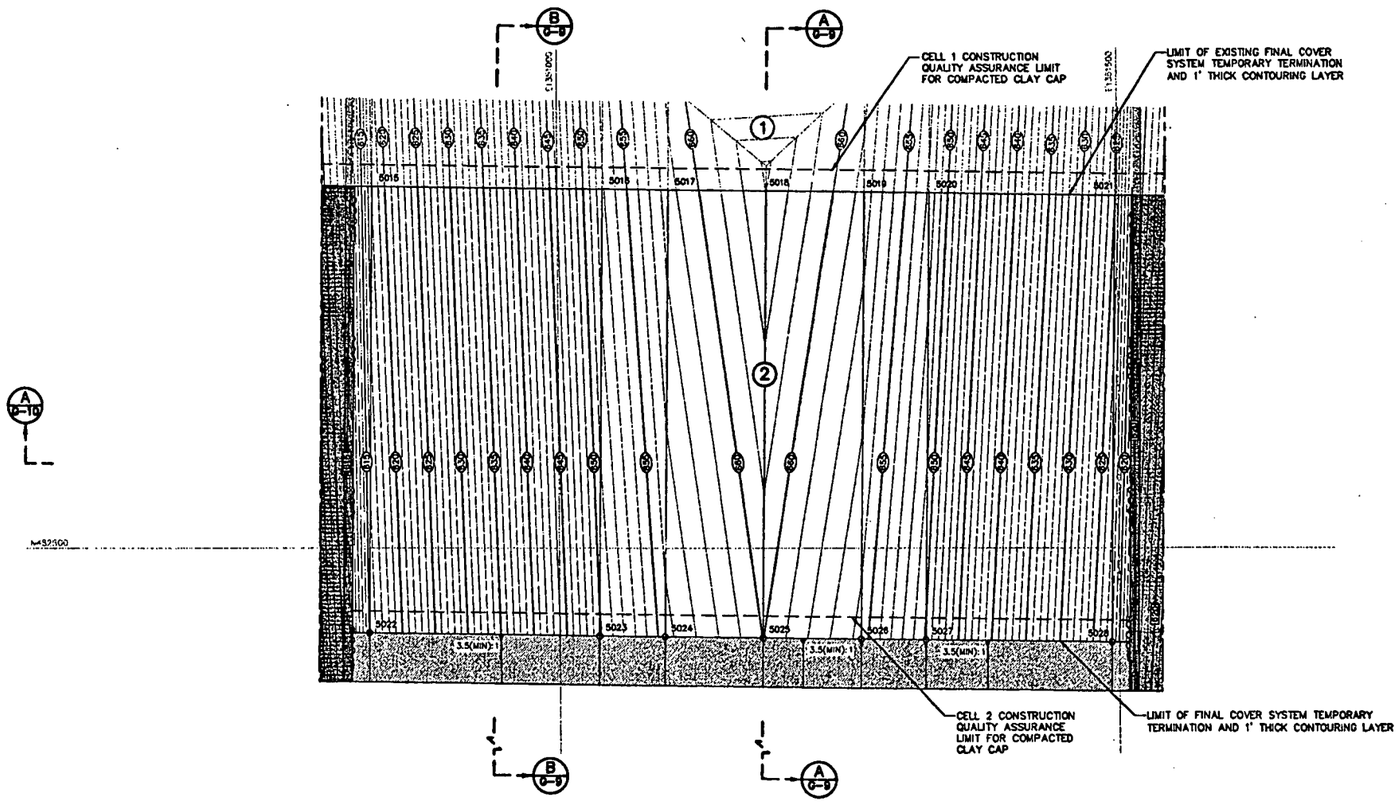


LEGEND

- 632 — EXISTING CONTOURING LAYER ELEVATION (FEET) (NOTE 2)
- 620 — PROTECTIVE CLAY LAYER ELEVATION (FEET) (NOTE 2)
- 632 — CONTOURING LAYER ELEVATION (FEET) (NOTE 2)
- PERIMETER BERM BASELINE
- 5013 — CONSTRUCTION CONTROL POINT
- 2 — CELL DESIGNATION
- DRAINAGE FLOW DIRECTION (NOTE 4)
- CONTOURING LAYER AND IMPACTED MATERIAL INTERIM GRADE (NOTE 3)
- EXISTING PROTECTIVE CLAY LAYER GRADES

CONTOURING LAYER CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
5015	482824.21	1350831.83	618.09
5016	482821.68	1351040.33	652.84
5017	482820.95	1351098.16	658.62
5018	482819.88	1351186.13	663.02
5019	482818.80	1351274.09	658.62
5020	482818.10	1351331.92	652.84
5021	482816.08	1351498.27	625.11
5022	482424.24	1350826.84	615.09
5023	482421.69	1351035.44	649.84
5024	482420.98	1351093.27	655.62
5024	482419.91	1351181.24	660.02
5026	482418.83	1351269.21	655.62
5027	482418.13	1351327.04	649.84
5028	482416.09	1351493.38	622.11

NOTES:

1. PURPOSE OF THIS DRAWING IS TO PRESENT CONSTRUCTION CONTROL POINTS FOR CONTOURING LAYER AND LIMIT OF FINAL COVER SYSTEM TEMPORARY TERMINATION FOR CELL 2.
2. PROTECTIVE CLAY LAYER AND CONTOURING LAYER ELEVATIONS CORRESPOND TO TOP OF PROTECTIVE CLAY LAYER AND CONTOURING LAYER, RESPECTIVELY.
3. CONSTRUCT INTERIM GRADES TO MEET EXISTING IMPACTED MATERIAL GRADES.
4. RUNOFF FROM NON-IMPACTED CONTOURING LAYER SHALL BE DIVERTED TO IMPACTED RUNOFF CATCHMENT AREA UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED. DRAINAGE FLOW DIRECTION INDICATES LOCATION OF TEMPORARY DRAINAGE CHANNEL THAT SHALL BE USED TO DIVERT RUNOFF FROM CONTOURING LAYER TO IMPACTED RUNOFF CATCHMENT AREA. CONTRACTOR SHALL CONTAIN AND CONTROL WATER GENERATED DURING CONSTRUCTION AND FILLING OF OSDF IN ACCORDANCE WITH SPECIFICATION SECTION 02270.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	DJB	SB	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SB	JHS	DJB	DGP	JFB
C	-	NOT ISSUED	-	-	-	-	-
B	-	NOT ISSUED	-	-	-	-	-
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SB	JHS	DJB	DGP	JFB

SCALE IN FEET: 50 25 0 50 100

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE: CONTOURING LAYER GRADING PLAN – CELL 2

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN E. BEECH — E-68346 — REGISTERED PROFESSIONAL ENGINEER

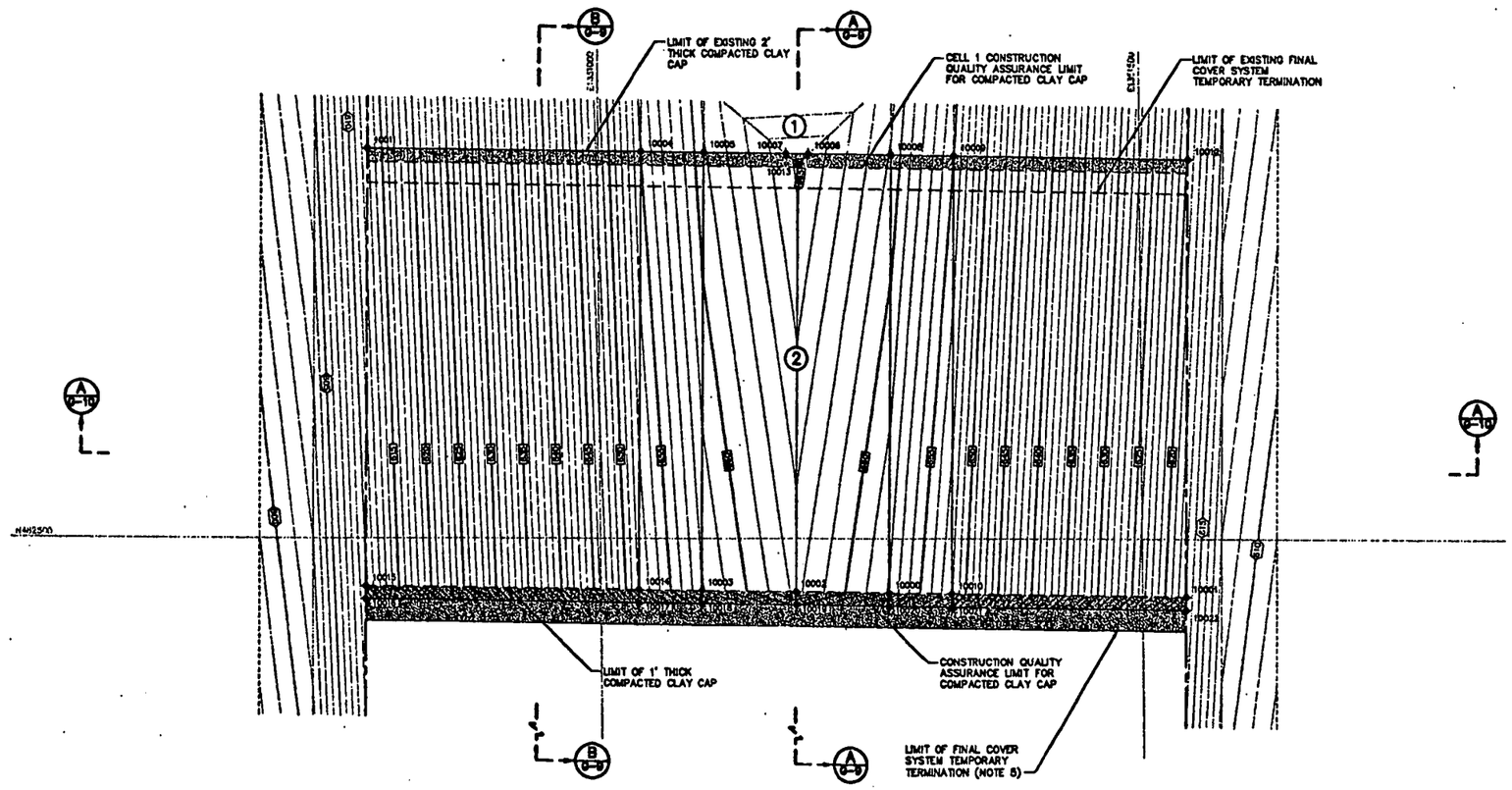
GEOSYNTEC CONSULTANTS
1100 LAKE HEARN DRIVE
ATLANTA, GEORGIA 30342 USA

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FEMP DRAWING NO.:	90X-5000-C-00354
GEOSYNTEC PROJECT NO.:	CO1342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0709
SHEET NO.:	C-28
REVISION NO.:	0

000029

CERTIFIED-FOR-CONSTRUCTION

4009



LEGEND

- 615 — SUBGRADE LAYER ELEVATION (FEET)
- 616 — COMPACTED CLAY CAP LAYER ELEVATION (FEET)
- PERIMETER BERM BASELINE
- 10004 — CONSTRUCTION CONTROL POINT
- 2 — CELL DESIGNATION
- PORTION OF FINAL COVER SYSTEM TEMPORARY TERMINATION AREA (NOTE 3)
- COMPACTED CLAY CAP TRANSITION AREA (NOTE 4)

COMPACTED CLAY CAP LAYER CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
10000	482450.33	1351269.41	657.89
10001	482447.04	1351538.88	616.88
10002	482451.41	1351181.82	652.26
10003	482452.48	1351093.84	657.89
10004	482853.16	1351040.49	655.07
10005	482852.46	1351098.73	660.89
10006	482851.26	1351186.45	664.79
10007	482851.52	1351176.17	664.72
10008	482850.30	1351274.29	660.89
10009	482849.59	1351332.53	655.07
10010	482449.63	1351327.84	652.07
10011	482856.26	1350787.12	612.83
10012	482847.01	1351543.74	619.88
10013	482842.15	1351186.40	665.31
10014	482453.19	1351038.81	652.07
10015	482456.29	1350782.24	609.83
10016	482444.29	1350782.09	607.83
10017	482441.19	1351035.46	650.04
10018	482440.48	1351093.70	655.81
10019	482439.41	1351181.48	660.28
10020	482438.34	1351269.26	655.81
10021	482437.63	1351327.50	650.04
10022	482435.04	1351538.71	614.88

NOTES:

1. PURPOSE OF THIS DRAWING IS TO PRESENT CONSTRUCTION CONTROL POINTS FOR COMPACTED CLAY CAP FOR CELL 2.
2. COMPACTED CLAY CAP ELEVATIONS CORRESPOND TO TOP OF COMPACTED CLAY CAP.
3. SHADED AREA REPRESENTS A PORTION OF TEMPORARY TERMINATION OF FINAL COVER SYSTEM. TEMPORARY TERMINATION SHALL BE CONSTRUCTED ACCORDING TO DETAIL SHOWN ON DRAWING G-30.
4. CONSTRUCT TRANSITION FROM EXISTING FULL DEPTH SECTION OF COMPACTED CLAY CAP TO ADJACENT SECTION OF COMPACTED CLAY CAP IN ACCORDANCE WITH SPECIFICATION SECTION 02223.
5. CONSTRUCTION CONTROL POINTS FOR LIMIT OF FINAL COVER SYSTEM TEMPORARY TERMINATION FOR CELL 2 ARE PROVIDED ON DRAWING G-26.

REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
C	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	GGP	SLB	DJB	B	JFB
B	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	B	JHS	DJB	GGP	JFB
D	--	NOT ISSUED	--	--	--	--	--
E	--	NOT ISSUED	--	--	--	--	--
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	B	JHS	DJB	GGP	JFB

50 25 0 50 100
SCALE IN FEET

OWNER/AGENTS:

UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:

FLUOR FERNALD, INC.

PROJECT: ON-SITE DISPOSAL FACILITY - PHASE IV

TITLE: COMPACTED CLAY CAP GRADING PLAN - CELL 2

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE
30 May 2007
DATE

STATE OF OHIO — JOHN BEECH — E-66246 — REGISTERED PROFESSIONAL ENGINEER

SEAL

GEOSYNTEC CONSULTANTS
1900 LAKE HOWELL DRIVE
ATLANTA, GEORGIA 30062 USA

PROJECT NO.:	20104
CONTRACT NO.:	89P2000028
FCMP DRAWING NO.:	DOC-8000-G-00355
GEOSYNTEC PROJECT NO.:	001342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0706
SHEET NO.:	G-27
REVISION NO.:	0

000030

CERTIFIED-FOR-CONSTRUCTION

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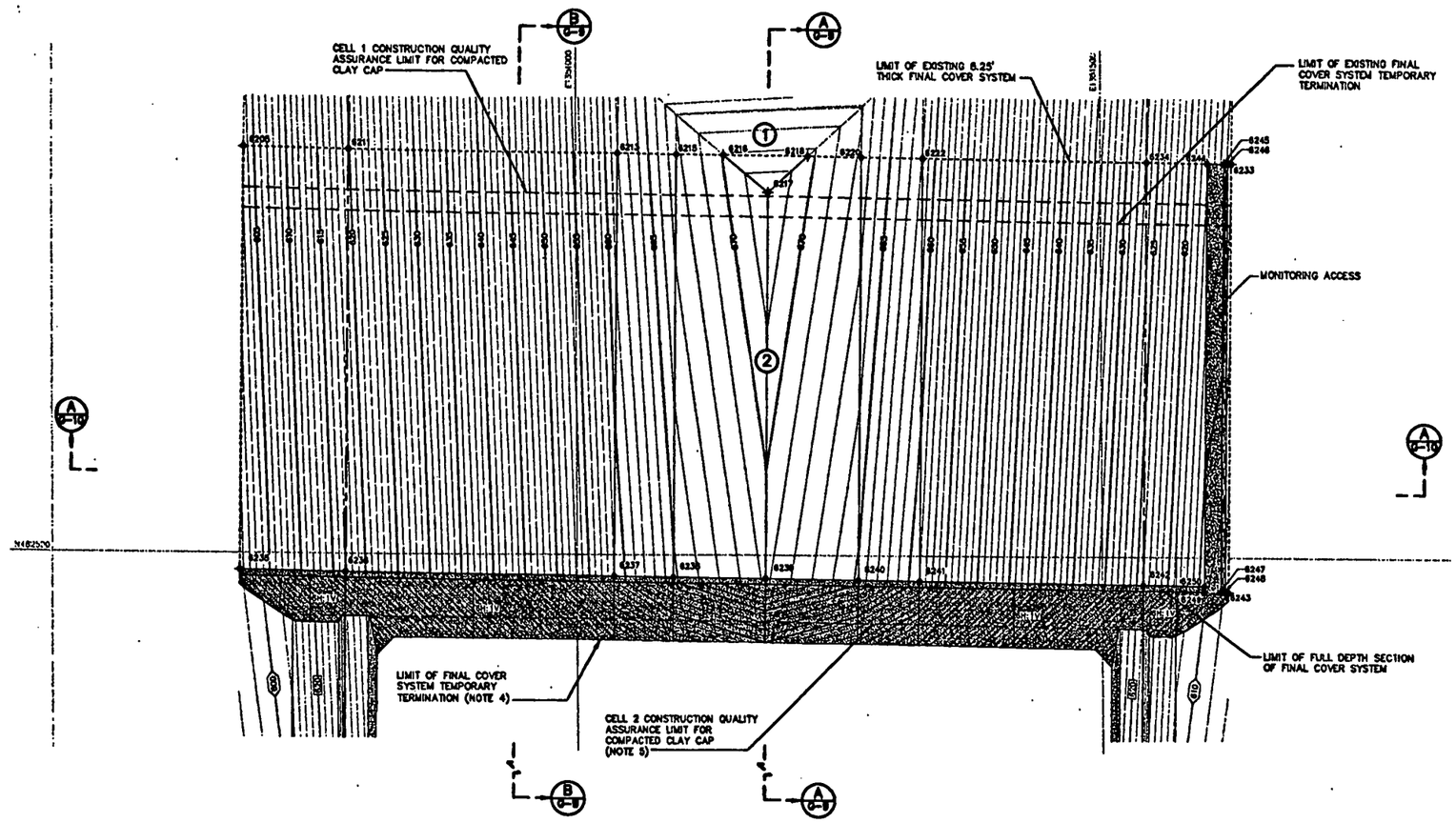


LEGEND

- 600 — SUBGRADE LAYER ELEVATION (FEET)
- 625 — PROTECTIVE CLAY ELEVATION (FEET) (NOTE 2)
- 645 — FINISHED GRADE ELEVATION (FEET) (NOTE 2)
- PERIMETER BERM BASELINE
- APPROXIMATE LIMIT OF FINAL COVER SYSTEM CONSTRUCTION
- 6205 — CONSTRUCTION CONTROL POINT
- 1 — CELL DESIGNATION
- FINAL COVER SYSTEM TEMPORARY TERMINATION AREA (NOTES 3, 4 AND 5)

FINAL COVER SYSTEM CONSTRUCTION CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION
6205	482883.87	1350688.42	603.37
6211	482882.76	1350787.45	619.88
6213	482878.87	1351039.88	661.85
6215	482878.96	1351098.32	667.79
6216	482878.40	1351144.04	670.08
6217	482843.05	1351186.41	671.96
6218	482877.42	1351224.34	670.34
6220	482876.79	1351275.48	667.79
6222	482876.08	1351333.79	661.95
6233	482872.51	1351825.78	613.28
6234	482873.51	1351544.07	626.80
6235	482484.00	1350883.53	800.82
6236	482482.79	1350762.58	816.88
6237	482476.70	1351035.00	858.85
6238	482478.98	1351083.33	864.80
6239	482477.83	1351161.85	869.21
6240	482476.82	1351270.57	864.78
6241	482476.11	1351328.90	856.95
6242	482473.84	1351539.18	823.90
6243	482467.06	1351820.82	810.24
6244	482872.79	1351602.54	817.18
6245	482872.80	1351616.52	816.52
6246	482872.55	1351622.57	813.82
6247	482467.15	1351613.58	813.48
6248	482467.10	1351617.61	810.78
6249	482467.34	1351597.59	814.13
6250	482472.82	1351597.65	814.18

NOTES:

1. PURPOSE OF THIS DRAWING IS TO PRESENT CONSTRUCTION CONTROL POINTS FOR FINAL COVER SYSTEM FOR CELL 2.
2. FINISHED GRADE ELEVATIONS CORRESPOND TO TOP OF TOPSOIL, RIPRAP AND ODOT 304.02 AGGREGATE BASE COMPONENTS OF FINAL COVER SYSTEM. PROTECTIVE CLAY LAYER ELEVATIONS CORRESPOND TO TOP OF PROTECTIVE CLAY LAYER.
3. SHADED AREA REPRESENTS EXTENT OF TEMPORARY TERMINATION OF FINAL COVER SYSTEM. TEMPORARY TERMINATION SHALL BE CONSTRUCTED ACCORDING TO DETAIL SHOWN ON DRAWING G-30.
4. CONSTRUCTION CONTROL POINTS FOR LIMIT OF FINAL COVER SYSTEM TEMPORARY TERMINATION FOR ARE PROVIDED ON DRAWING G-26.
5. CONSTRUCTION CONTROL POINTS FOR CONSTRUCTION QUALITY ASSURANCE LIMIT FOR COMPACTED CLAY CAP FOR CELL 2 ARE PROVIDED ON DRAWING G-27.

REV. NO	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
D	04.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	SLB	SJB	SI	JFB
B	05.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	"	JHS	SJB	DGP	JFB
C	"	NOT ISSUED	"	"	"	"	"
B	"	NOT ISSUED	"	"	"	"	"
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	"	JHS	SJB	DGP	JFB

50 25 0 50 100
SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
FINAL COVER SYSTEM GRADING PLAN – CELL 2

THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

REVIEWED 20 May 2004

STATE OF OHIO — JOHN BEECH — E-56248 — REGISTERED PROFESSIONAL ENGINEER — SEAL

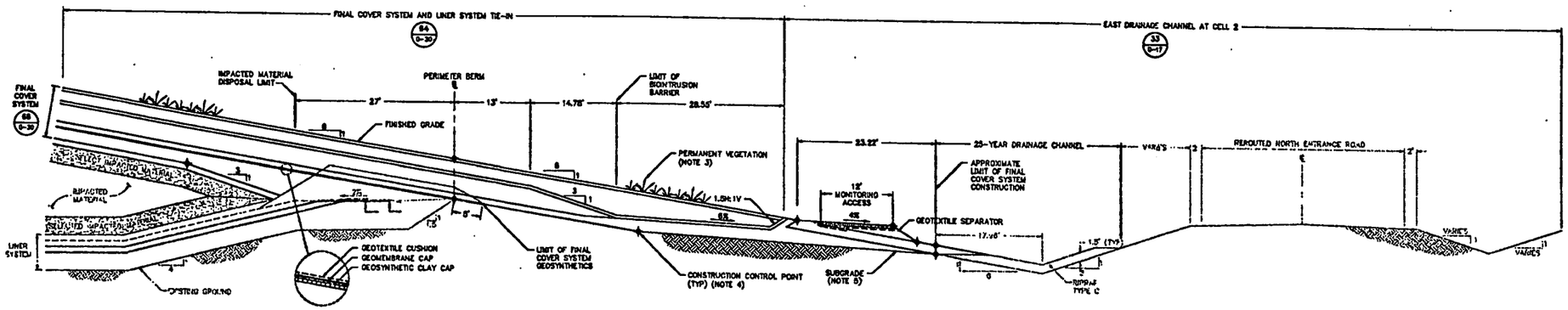
GEO SYNTEC CONSULTANTS

PROJECT NO.:	20194
CONTRACT NO.:	93PS005028
FDNP DRAWING NO.:	901-5000-C-00336
GEOSYNTEC PROJECT NO.:	GP1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0706
SHEET NO.:	G-26
REVISION NO.:	0

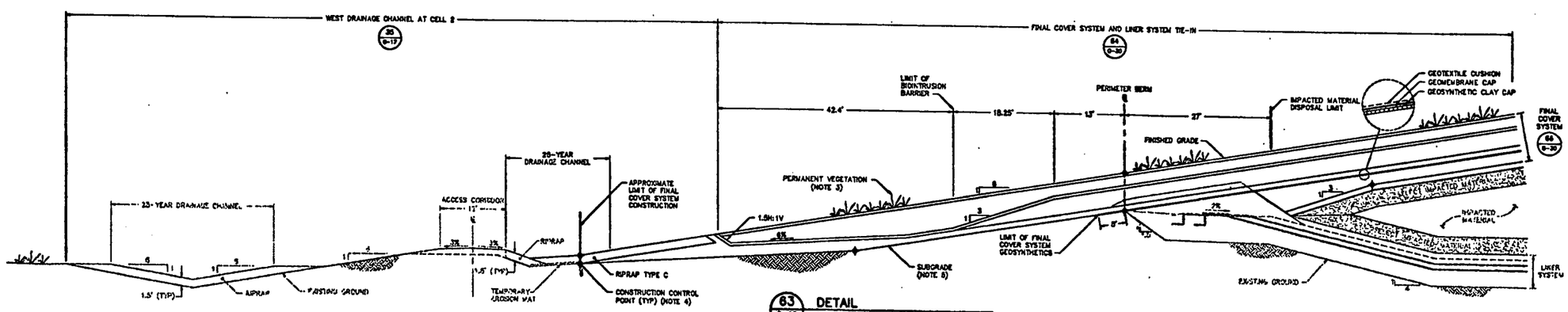
000031

CERTIFIED–FOR–CONSTRUCTION

4009



62 0-10 DETAIL
EAST PERIMETER AT CELL 2
SCALE: 1" = 5'



63 0-10 DETAIL
WEST PERIMETER AT CELL 2
SCALE: 1" = 5'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
3. PERMANENT VEGETATION SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02930.
4. CONSTRUCTION CONTROL POINTS FOR CONTOURING LAYER, COMPACTED CLAY CAP AND FINAL COVER SYSTEM ARE PROVIDED ON DRAWINGS 0-26, 0-27 AND 0-28 RESPECTIVELY.
5. CONTRACTOR SHALL RE-ESTABLISH SUBGRADE ELEVATIONS OUTSIDE PERIMETER BERM BASELINE PRIOR TO FINAL COVER SYSTEM CONSTRUCTION. CONSTRUCTION CONTROL POINTS FOR SUBGRADE ARE PROVIDED ON DRAWING 0-23.
6. GEOTEXTILE SEPARATOR SHALL BE IN ACCORDANCE WITH SPECIFICATION 02223G.

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REV. NO.	DATE	DESCRIPTION	DES. BY	DR. BY	CHK. BY	RVW. BY	APP. BY
G	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DGP	JAS	DJS	SI	JFS
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SI	JAS	DJS	DGP	JFS
C	--	NOT ISSUED	--	--	--	--	--
B	--	NOT ISSUED	--	--	--	--	--
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SI	JAS	DJS	DGP	JFS

SCALE IN FEET

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
CELL PERIMETER DETAILS

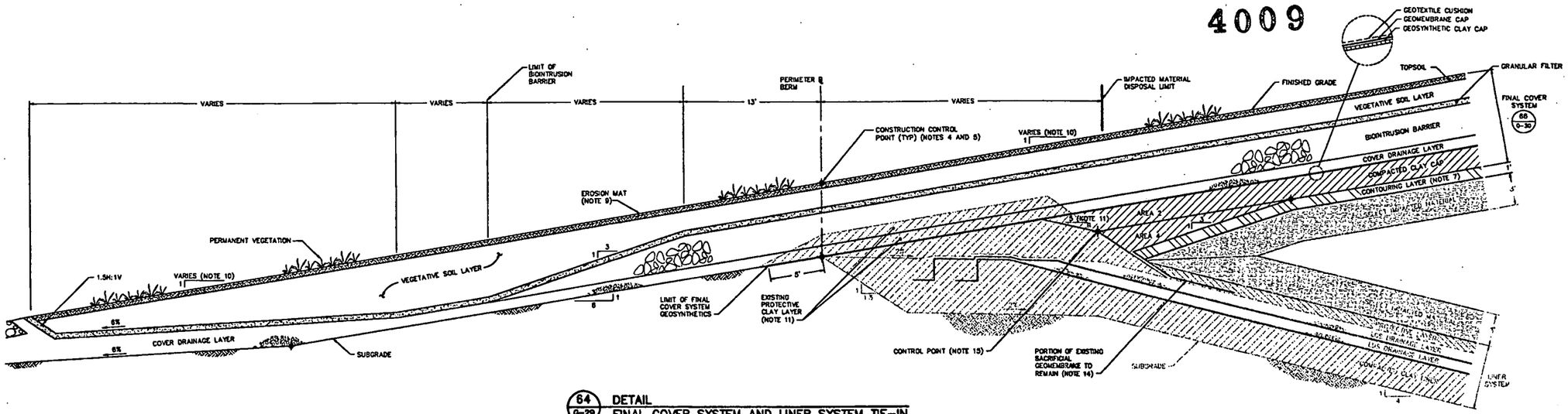
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

STATE OF OHIO — JOHN T. BECCH — E-84248 — REGISTERED PROFESSIONAL ENGINEER

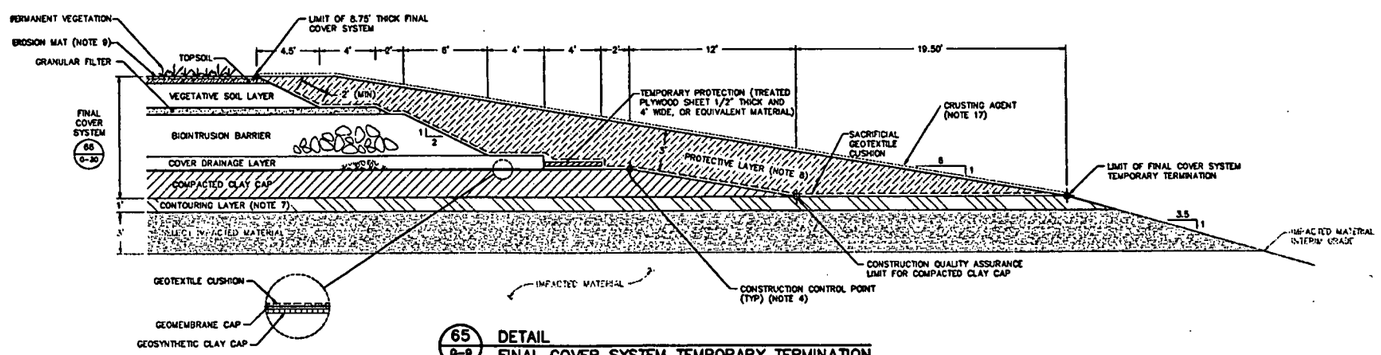
GEOSYNTEC CONSULTANTS

PROJECT NO.:	20104
CONTRACT NO.:	95PS005028
FDMP DRAWING NO.:	BOX-8000-G-00357
GEOSYNTEC PROJECT NO.:	GC1342-18.3
GEOSYNTEC DOCUMENT NO.:	F01-0707
SHEET NO.:	G-29
REVISION NO.:	0

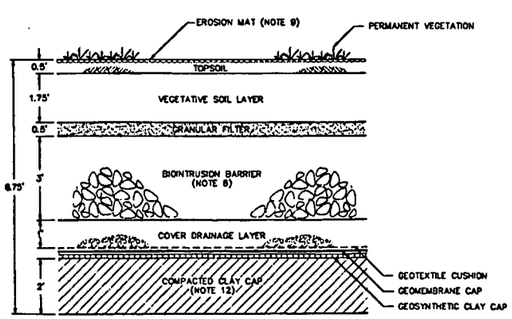
4009



64 / 0-29 DETAIL
FINAL COVER SYSTEM AND LINER SYSTEM TIE-IN
SCALE: 1" = 4'



65 / 0-9 DETAIL
FINAL COVER SYSTEM TEMPORARY TERMINATION
SCALE: 1" = 4'



66 / 0-10 DETAIL
FINAL COVER SYSTEM
SCALE: 1" = 2'

NOTES:

1. DETAILS ARE SHOWN TO SCALE AS NOTED EXCEPT FOR GEOSYNTHETICS WHICH ARE SHOWN AT AN EXAGGERATED SCALE FOR CLARITY. MATERIAL TOLERANCES SHALL BE WITHIN LIMITS GIVEN IN SPECIFICATIONS.
2. RIPRAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02271.
3. FINAL COVER SYSTEM COMPONENT SUMMARY IS PROVIDED FOR INFORMATION PURPOSES ONLY. SPECIFICATION SECTIONS SHALL BE REFERENCED FOR DETAILED MINIMUM REQUIREMENTS FOR EACH MATERIAL.
4. CONSTRUCTION CONTROL POINTS FOR CONTOURING LAYER, COMPACTED CLAY CAP AND FINAL COVER SYSTEM ARE PROVIDED ON DRAWINGS G-26, G-27 AND G-28, RESPECTIVELY.
5. CONTRACTOR SHALL RE-ESTABLISH SUBGRADE ELEVATIONS OUTSIDE PERIMETER BERM BASELINE PRIOR TO COMPLETION OF COMPACTED CLAY CAP. CONSTRUCTION CONTROL POINTS FOR SUBGRADE ARE PROVIDED ON DRAWING G-25.
6. CHOKE STONE LAYER SHALL BE PLACED INTO TOP OF BIOINTRUSION BARRIER IN ACCORDANCE WITH SPECIFICATION SECTION 02280.
7. CONTOURING LAYER SHALL CONSIST OF NON-IMPACTED MATERIAL IN ACCORDANCE WITH SPECIFICATION SECTION 02240. RUNOFF FROM NON-IMPACTED CONTOURING LAYER SHALL BE DIVERTED TO IMPACTED RUNOFF CATCHMENT AREA UNTIL COMPACTION OF SECOND LIFT OF COMPACTED CLAY CAP IS COMPLETED. CONTRACTOR SHALL CONTAIN AND CONTROL WATER GENERATED DURING CONSTRUCTION AND FILLING OF OSDF IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
8. PROTECTIVE LAYER IN FINAL COVER SYSTEM TEMPORARY TERMINATION SHALL BE NON-IMPACTED NON-GRANULAR MATERIAL. NON-IMPACTED PROTECTIVE LAYER SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02240.
9. EROSION MAT SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.
10. SLOPE OF LOWER PORTION OF FINAL COVER SYSTEM IS 6H:1V FOR EAST AND WEST PERIMETERS OF OSDF.
11. EXISTING PROTECTIVE CLAY LAYER PLACED ABOVE FINAL COVER SYSTEM GRADES SHALL BE CUT BACK JUST PRIOR TO COMPLETION OF COMPACTED CLAY CAP. TRANSITION FROM PROTECTIVE CLAY LAYER TO COMPACTED CLAY CAP SHALL BE CUT BACK AT A 5H:1V SLOPE OR FLATTER IN ACCORDANCE WITH SPECIFICATION SECTION 02225.
12. COMPACTED CLAY CAP SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02225.
13. GEOSYNTHETICS WILL BE SUPPLIED BY FLUOR FERNALD, INC.
14. CONTRACTOR SHALL REMOVE EXPOSED PORTION OF EXISTING SACRIFICIAL GEOMEMBRANE BY CUTTING PRIOR TO CONSTRUCTION OF COMPACTED CLAY CAP IN TEMPORARY DRAINAGE CHANNEL.

    CONTROL POINT WILL BE PROVIDED BY CONTRACTOR IN ACCORDANCE TO SPECIFICATION SECTION 02100.
16. INSTALL SILT FENCE 10 FEET (MEASURE HORIZONTALLY) UPSLOPE FROM LIMIT OF FINAL COVER SYSTEM TEMPORARY TERMINATION. SILT FENCE SHALL BE IN ACCORDANCE WITH SPECIFICATION SECTION 02270.

FINAL COVER SYSTEM COMPONENT SUMMARY (NOTE 3)

GEOSYNTHETICS (NOTE 13)

SYMBOL	COMPONENT	MATERIAL	SPECIFICATION SECTION
	GEOMEMBRANE CAP	TEXTURED 80-mil HDPE	02770
	GEOSYNTHETIC CLAY CAP	INTERNALLY-REINFORCED SODIUM MONTMORILLONITE CORE WITH WOVEN GEOTEXTILE SIDE AGAINST OVERLYING GEOMEMBRANE AND NONWOVEN SIDE AGAINST UNDERLYING SOIL	02772
	GEOTEXTILE CUSHION	POLYPROPYLENE OR POLYESTER NEEDLE-PUNCHED NONWOVEN GEOTEXTILE	02714
	EROSION MAT	EXCELSIOR MATTING COVERED WITH PLASTIC NETTING ON BOTH SIDES	02270

SOILS

SYMBOL	COMPONENT	MATERIAL	SPECIFICATION SECTION
	COMPACTED CLAY CAP	ON-SITE BORROW	02225
	COVER DRAINAGE LAYER	OFF-SITE BORROW	02710
	BIOINTRUSION BARRIER	OFF-SITE BORROW	02280
	GRANULAR FILTER	OFF-SITE BORROW	02712
	VEGETATIVE SOIL LAYER	ON-SITE BORROW	02250
	TOPSOIL	ON-SITE	02920
	PROTECTIVE LAYER (NON-IMPACTED NON-GRANULAR)	ON-SITE BORROW	02240
	CONTOURING LAYER (NON-IMPACTED)	ON-SITE BORROW	02240

VEGETATION

SYMBOL	COMPONENT	MATERIAL	SPECIFICATION SECTION
	PERMANENT VEGETATION	SEED MIX	02930

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D	01.30.08	CFC SUBMITTAL TO FLUOR FERNALD, INC./DOE/EPA	DCP	JKS	DJB	SI	JFB
D	01.10.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SI	JKS	DJB	DCP	JFB
C	-	NOT ISSUED	-	-	-	-	-
B	-	NOT ISSUED	-	-	-	-	-
A	01.07.08	PRE-FINAL SUBMITTAL TO FLUOR FERNALD, INC./DOE	SI	JKS	DJB	DCP	JFB

SCALE AS SHOWN

OWNER/FACILITY:
UNITED STATES DEPARTMENT OF ENERGY
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

CLIENT:
FLUOR FERNALD, INC.

PROJECT:
ON-SITE DISPOSAL FACILITY – PHASE IV

TITLE:
FINAL COVER SYSTEM DETAILS

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SIGNATURE
20 Jan 2009
DATE

STATE OF OHIO
JOHN F. BEECH
E-58246
REGISTERED PROFESSIONAL ENGINEER
SEAL

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ATLANTA, GEORGIA 30043 USA

PROJECT NO.:	20104
CONTRACT NO.:	DE-AC05-06OR23177
FEMP DRAWING NO.:	90X-5000-G-00358
GEOSYNTEC PROJECT NO.:	GC01342-16.3
GEOSYNTEC DOCUMENT NO.:	F01-0708
SHEET NO.:	G-30
REVISION NO.:	0