Appendix D

Drawing No.	Drawing Title
10W425-81	Existing Conditions 2004, Drawing Index, Legend & General Notes
10W425-82	Dredge Cell Lateral Expansion Site Location Plan
10W425-83	Dredge Cell Dike Restoration Plan Sheet 1
10W425-84	Dredge Cell Dike Restoration Plan Sheet 2
10W425-85	Dredge Cell Dike Restoration Plan Sheet 3
10W425-86	Dredge Cell Dike Restoration Plan Sheet 4
10W425-87	Dredge Cell Dike Restoration Partial Plan Sheet 5
10W425-88	Dredge Cell Dike Restoration Cross Section Sheet 1
10W425-89	Dredge Cell Dike Restoration Cross Section Sheet 2
10W425-90	Dredge Cell Dike Restoration Cross Section & Details Sheet 3
10W425-91	Dredge Cell Dike Restoration Details Sheet 1
10W425-92	Borrow Area Plan

KINGSTON FOSSIL PLANT

DREDGE CELL RESTORATION

STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
KNOXVILLE ENVIRONMENTAL FIELD OFFICE
2700 MIDDLEBROOK PIKE, SUITE 220
KNOXVILLE, TENNESSEE 37921-5602
PHONE (865) 594-6035 STATEWIDE 1-888-891-8332 FAX (865) 594-6105

April 29, 2005

Mr. Gordon Park
Manager of Permitted Programs
Tennessee Valley Authority
1101 Market Street
Chattanooga, Tennessee 37402-2801

RE: Proposed modification to approved construction and operation plans - New leachate breakout remediation, collection, and transfer system for the lower west and south slopes of the Kingston Power Plant Coal Ash Fill, IDL 73-0094

Dear Mr. Park:

The revised plan for TVA Kingston Power Plant Coal Ash Fill, submitted to our office by TVA Fossil Engineering Services on April 27, 2005, has been reviewed in accordance with Rule Chapter 1200-1-7, Solid Waste Processing and Disposal. This modification consists of leachate collection trench drains at the 775, 781, and 595 elevation bench levels around the west and south sides; a toe drain and improved drainage ditch around the toe of the fill on the west side; and a new collection/retention pond with force main to a channel leading to the ash pond. The plan also calls for geonet to be installed at the toe in the vicinity of the original breakout. We find that the revised plan meets the regulatory requirements, and this design is an improvement over the temporary collection/transfer system that was installed to correct the existing problem. We agree that this revision should be considered a minor modification, and we are therefore approving the plan as submitted. In all aspects of construction and operation affected by the modification, this plan will replace and supercede the original plan.

Work may begin to install the features included with this modification at any time when the weather is suitable and the necessary equipment and materials can be mobilized to the site, but work must begin no later than June 1, 2005, in accordance with your suggested schedule. Installation of the system shall be completed not later than August 31, 2005.

An approved copy of the modified plan is enclosed for your use. If you have any questions concerning this matter, do not hesitate to contact me.

Yours truly,

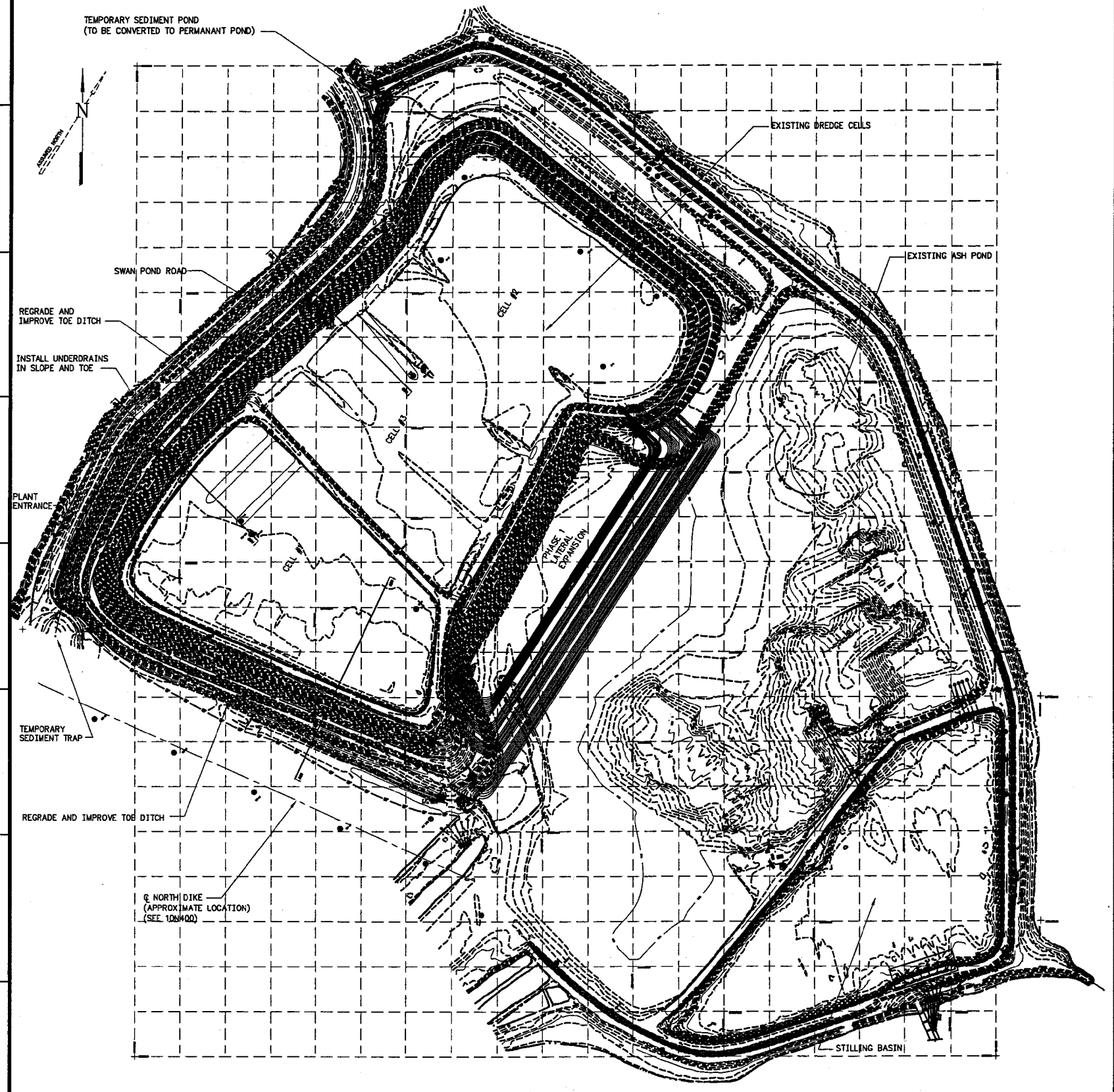
Rick Brown
Environmental Engineer
Division of Solid Waste Management

Larry F. Cook
Knoxville Field Office Manager

cc: DSWM, Nashville Central Office

RSB /tvaknglcsmda.doc minrmod

DRAWING CHANGE AUTHORIZATION



DRAWING INDEX

DRAWING NO.	DRAWING TITLE
10W425-81	EXISTING CONDITIONS, DRAWING INDEX, LEGEND & GENERAL NOTES
10W425-82	DREDGE CELL LATERAL EXPANSION SITE LOCATION PLAN
10W425-83	DREDGE CELL DIKE RESTORATION PLAN SHEET 1
10W425-84	DREDGE CELL DIKE RESTORATION PLAN SHEET 2
10W425-85	DREDGE CELL DIKE RESTORATION PLAN SHEET 3
10W425-86	DREDGE CELL DIKE RESTORATION PLAN SHEET 4
10W425-87	DREDGE CELL DIKE RESTORATION PLAN & SECTION SHEET 5
10W425-88	DREDGE CELL DIKE RESTORATION SECTION & DETAIL SHEET 1
10W425-89	DREDGE CELL DIKE RESTORATION SECTION SHEET 2
10W425-90	DREDGE CELL DIKE RESTORATION SECTION & DETAILS SHEET 3
10W425-91	DREDGE CELL DIKE RESTORATION DETAILS SHEET 1
10W425-92	DREDGE CELL DIKE RESTORATION DITCH PROFILES
10W425-93	DREDGE CELL DIKE RESTORATION BORROW AREA

LEGEND

EXISTING		NEW
⊕	BENCH MARK	NA
580	GRADE CONTOUR	580
	ASPHALT ROAD	
	GRAVEL ROAD	
	RAILROAD TRACK	NA
SD-15"	STORM SEWER	SD-15"
UD-6"	UNDER DRAIN	UD-8"
NA	FORCE MAIN	FM-6"
	OVERHEAD ELECTRICAL UTILITY POLE	
•	LIGHT POLE	•
⊠	OVERHEAD ELECTRICAL UTILITY TOWER	NA
OE	OVERHEAD UTILITY LINES	OE
NA	ACCESS ROUTE	→
NA	℄ DITCH	
NA	TERRACE DITCH	
NA	LET DOWN CHANNEL	
NA	METAL SPILLWAY	
NA	POND DISCHARGE WEIR W/SKIMMER	
NA	SURFACE WATER COMPLIANCE MONITORING POINT	
NA	SILT FENCE	SF SF
× 430.5	SPOT ELEVATION	430.5
	PIEZOMETER	
	SOIL BORING	
	MONITORING WELL	
NA	MANHOLE	⊡MH
NA	EARTH	
NA	ASH	
NA	GYPSUM	
NA	RANDOM SOIL	
NA	SELECT SOIL	
NA	CLAY	
NA	RIP RAP	
NA	FINAL COVER/ VEGATATIVE LAYER	

NOTES:

1. FOR LATERAL EXPANSION DRAWING INDEX AND LEGEND, SEE DRAWING 10W425-20.
2. DRAWINGS 10W425-22 AND -23 DEPICT PHASING OF EXPANSION CONSTRUCTION. CONSTRUCTION DRAWINGS BEGIN WITH 10W425-26.
3. DCA DRAWINGS 10W425-81 THRU -94 ARE FOR A MINOR MODIFICATION TO THE PERMIT.

COMPANION DRAWINGS:

15W807, 15W808

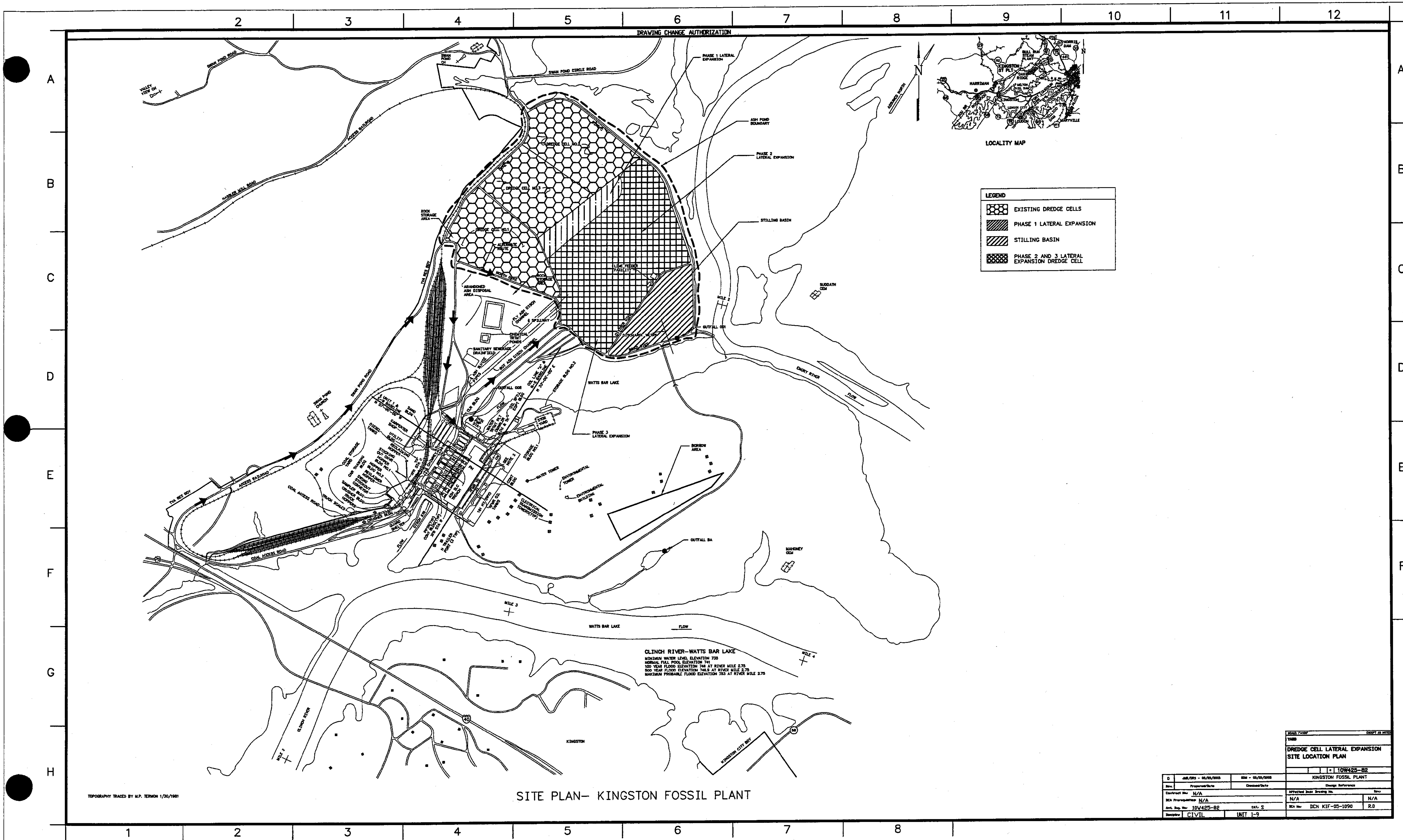
SCALE 1"=200' EXCEPT AS NOTED
YARD

EXISTING CONDITIONS
GENERAL NOTES, LEGEND &
DRAWING INDEX

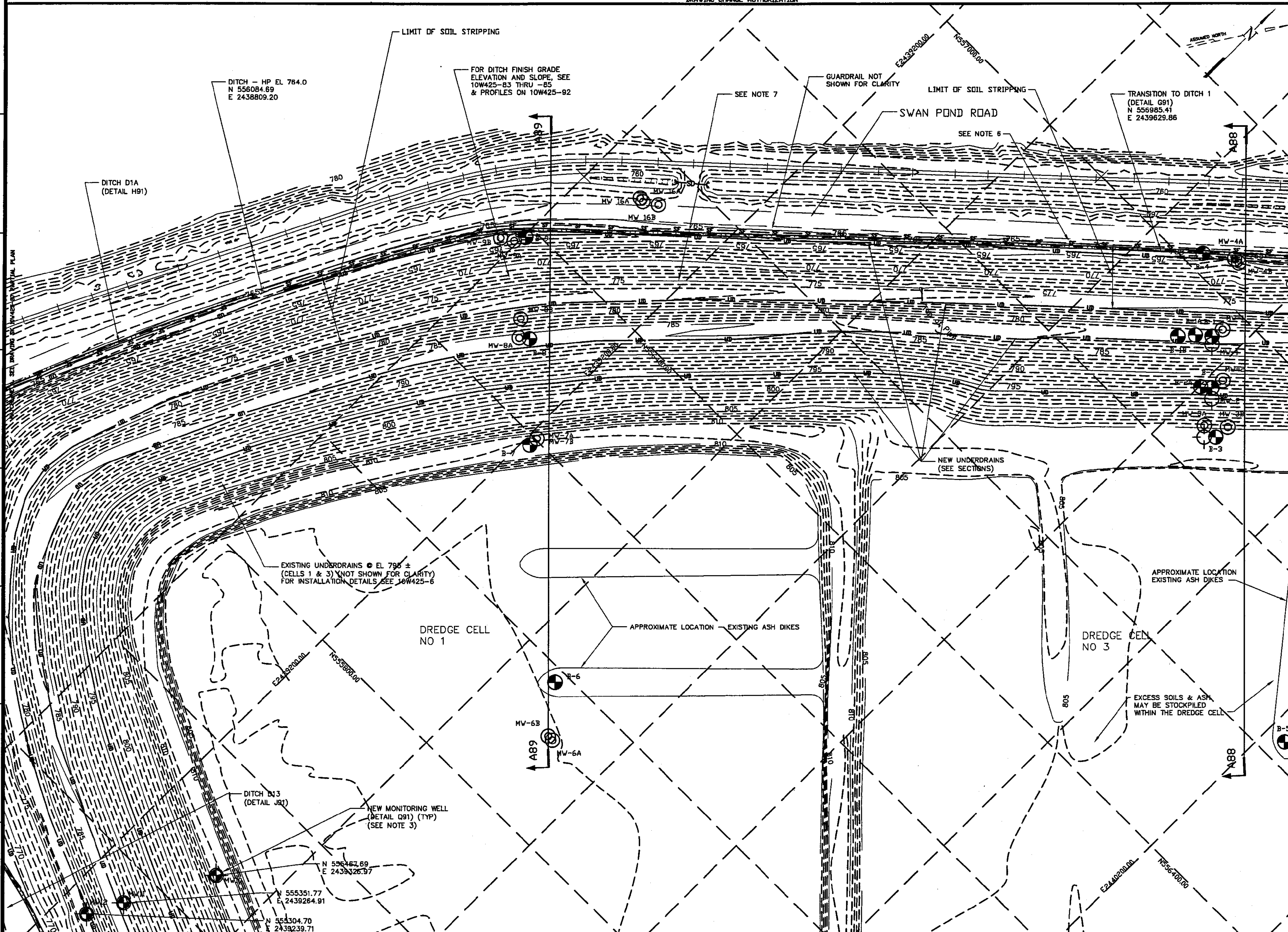
	10W425-81
KINGSTON FOSSIL PLANT	
Change Reference	
Affected Down Drawing No.	Rev.
N/A	N/A
DCN KIF-05-1090	R.0

0	JAN/2005 - 05/25/2005	DCN - 06/25/2005
Rev.	Prepared/Date	Checked/Date
Contract No. N/A		
DCA Preparation N/A		
Ant. Dwg. No. 10W425-81		DRT. S
Discipline CIVIL		UNIT 1-9

TVA-00002832

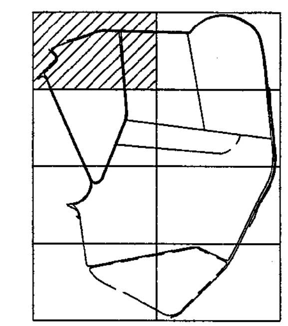

DRAWING CHANGE AUTHORIZATION
LOCALITY MAP
LEGEND
EXISTING DREDGE CELLS
PHASE 1 LATERAL EXPANSION
STILLING BASIN
PHASE 2 AND 3 LATERAL EXPANSION DREDGE CELL
PHASE 1 LATERAL EXPANSION
ASH POND BOUNDARY
PHASE 2 LATERAL EXPANSION
STILLING BASIN
PHASE 3 LATERAL EXPANSION
DREDGE CELL NO.2
DREDGE CELL NO.3
DREDGE CELL NO.1
ROCK STORAGE AREA
ABANDONED ASH DISPOSAL AREA
SANITARY SEWAGE DRAINFIELD
LIME FEEDER FACILITY
BORROW AREA
OUTFALL 001
OUTFALL BA
SWAN POND CIRCLE ROAD
SWAN POND ROAD
ACCESS RAILROAD
COAL ACCESS ROAD
TVA RES BDY
EMORY RIVER
WATTS BAR LAKE
FLOW
SUDDATH CEM
MAHONEY CEM
KINGSTON
KINGSTON CITY BDY
CLINCH RIVER
CLINCH RIVER—WATTS BAR LAKE
MINIMUM WATER LEVEL ELEVATION 735
NORMAL FULL POOL ELEVATION 741
100 YEAR FLOOD ELEVATION 746 AT RIVER MILE 2.75
500 YEAR FLOOD ELEVATION 746.9 AT RIVER MILE 2.75
MAXIMUM PROBABLE FLOOD ELEVATION 753 AT RIVER MILE 2.75
TOPOGRAPHY TRACED BY M.P. TERMON 1/30/1981
SITE PLAN— KINGSTON FOSSIL PLANT
YARD
DREDGE CELL LATERAL EXPANSION
SITE LOCATION PLAN
10W425-82
KINGSTON FOSSIL PLANT
Contract No. N/A
DCA Prerequisites N/A
Arch. Dwg. No. 10V425-82 CAT. S
Discipline CIVIL UNIT 1-9
Affected Base Drawing No. N/A
Rev. N/A
DCA No. DCN KIF-05-1090 R.0

DRAWING CHANGE AUTHORIZATION



NOTES:

1. FOR PERMIT MINOR MODIFICATION DRAWING INDEX AND LEGEND, SEE DRAWING 10W425-81. FOR GENERAL NOTES, SEE 10W425-20.
2. ALL WORK SHALL COMPLY WITH THE APPROVED STORMWATER POLLUTION PREVENTION PLAN & CONSTRUCTION STORMWATER PERMIT.
3. WELLS SHALL BE INSTALLED AFTER UNDERDRAINS, AND PRIOR TO RESUMPTION OF DREDGING ACTIVITIES. VERIFY THAT WELL LOCATIONS DO NOT INTERFERE WITH UNDERDRAINS AND LATERALS.
4. NOT USED.
5. REPORT IMMEDIATELY TO TVA FES ANY SIGNS OF SEEPAGE THRU THE DIKE, OR IF SATURATED GROUND CONDITIONS SUDDENLY EXIST.
6. NOTIFY TENNESSE ONE CALL (800) 351-1111 PRIOR TO PREFORMING ANY EXCAVATION ADJACENT TO SWAN POND ROAD.
7. EXISTING CONTOURS ON SLOPE OF EXISTING DREDGE CELL (BELOW EL 810) HAVE AN EXISTING 1' SOIL COVER LAYER.
8. USE CAUTION DURING DITCH CONSTRUCTION AROUND MONITORING WELLS 4A, 4B, 9A AND 9B.


KEY PLAN

SCALE 1"=50'			EXCEPT AS NOTED
YARD			
DREDGE CELL DIKE RESTORATION PLAN SHEET 1			
C	10W425-83		
KINGSTON FOSSIL PLANT			
Change Reference			
Affected Base Drawing No.			Rev.
N/A			N/A
DCA No.	DCN KIF-05-1090		R.0

0	JMB/DRS – 05/25/2005	GDM – 05/25/2005
Rev.	Prepared/Date	Checked/Date
Contract No. N/A		
DCA Prerequisites N/A		
Arch. Dwg. No. 10W425-83	CAT. S	
Discipline CIVIL	UNIT 1-9	

DRAWING CHANGE AUTHORIZATION
DETAIL 1: SEE DRAWING SK 10W425-87

LIMITS OF SOIL STRIPPING
NEW POND (SEE NOTE 5)
GUARDRAIL NOT SHOWN FOR CLARITY
FOR DITCH FINISHED GRADE ELEVATION AND SLOPE, SEE 10W425-83 THRU 85 & PROFILES ON 10W425-92
SEE NOTE 6 10W425-83
DITCH D1 (DETAIL G91)
PRECAST LIFT STATION (DETAIL A61)
EXISTING CONCRETE SUMP (ABANDON OR REMOVE) REMOVE EXISTING HDPE SD (SEE NOTE 6)
SEE NOTE 4
LIMIT OF COMPOSITE GEONET
EXISTING UNDERDRAINS (SEE 10W425-2 & 4 FOR ORIGINAL CONSTRUCTION)
NEW UNDERDRAINS (SEE SECTIONS)
DO NOT STRIP SOIL ON DIKES FOR CELL 2
EXISTING UNDERDRAINS @ EL 795 ± (CELLS 1 & 3) (NOT SHOWN FOR CLARITY) FOR INSTALLATION DETAILS SEE 10W425-6
NEW MONITORING WELL (DETAIL Q91) (TYP) (SEE NOTE 3, 10W425-83)
N 557351.46 E 2441046.81
N 557393.15 E 2441086.21
N 557299.07 E 2440997.32
SWAN POND EMBAYMENT
DREDGE CELL NO 3
DREDGE CELL NO 2
ASSUMED NORTH
KEY PLAN

GRADING NOTES:

1. FOR PERMIT MINOR MODIFICATION DRAWING INDEX AND LEGEND, SEE DRAWING 10W425-81. FOR CONSTRUCTION NOTES, SEE 10W425-83.
2. INSTALL SILT FENCE IMMEDIATELY BEHIND GUARDRAILS ON SWAN POND ROAD.
3. PRECAST LIFT STATION TO BE INSTALLED DURING POND CONSTRUCTION. RELOCATE EXISTING SUBMERSIBLE PUMPS TO THE PERMANENT LIFT STATION. (INCLUDING TEMPORARY AND PERMANENT STRUCTURES).
4. PROVIDE RIPRAP AT END OF FORCE MAIN FOR EROSION PROTECTION. SIZE: D_{50} = 6 INCHES. THICKNESS = 1FT.
5. CONSTRUCT THE NEW POND PRIOR TO DISTURBING OR REMOVING VEGETATION. RELOCATE EXISTING PUMPS & ELECTRICAL EQUIPMENT JUST PRIOR TO PLACING POND INTO SERVICE. THE POND SHALL FUNCTION AS A TEMPORARY SEDIMENT BASIN DURING CONSTRUCTION, AND WILL BE CONVERTED TO A PERMANENT POND AT THE COMPLETION OF CONSTRUCTION.
6. THE EXISTING CONCRETE SUMP SHALL BE REMOVED.

HATCHLINE A, SEE DRAWING 10W425-85

			DREDGE CELL DIKE RESTORATION PLAN SHEET 2
			10W425-84
0	AB/SRS - 10/20/2005	BDN - 10/20/2005	KINGSTON FOSSIL PLANT
Rev.	Prepared/Date	Checked/Date	Change Reference
Contract No: N/A			
EDMS Prerequisites: N/A			Affected Dwgs Drawing No. / Rev: N/A / N/A
Dwg. Seq. No: 10W425-84	CAT: S		EDMS No: DCN KIF-05-1090 / R.0
Discipline: CIVIL	UNIT 1-9		

TVA-00002835

DRAWING CHANGE AUTHORIZATION

MATCHLINE A, SEE DRAWING SK 10W425-83

DITCH 10H31 (DETAIL K91)

DITCH — HP EL 768.0
N = 555164.71
E = 2439388.95

LIMITS OF SOIL STRIPPING

REMOVE 16" HDPE SD

FOR DITCH FINISHED GRADE ELEVATION AND SLOPE, SEE PARTIAL PLANS ON 10W425-83 THRU -85 & -92

DREDGE CELL NO 1

DREDGE CELL NO 3

PHASE 1 LATERAL EXPANSION

DITCH D17 (DETAIL K91)

LIMITS OF SOIL STRIPPING

E2439800.00

N556600.00

E2440200.00

N556600.00

ASH-10

ASH-30

B-6

B-5A

B-5

SS-13

MW 13B

2'-9" CMP INV EL 762.41

MATCHLINE A, SEE DRAWING SK 10W425-86

GENERAL NOTES

1. FOR PERMIT MINOR MODIFICATION DRAWING INDEX AND LEGEND, SEE DRAWING 10W425-81. FOR CONSTRUCTION NOTES, SEE 10W425-83.

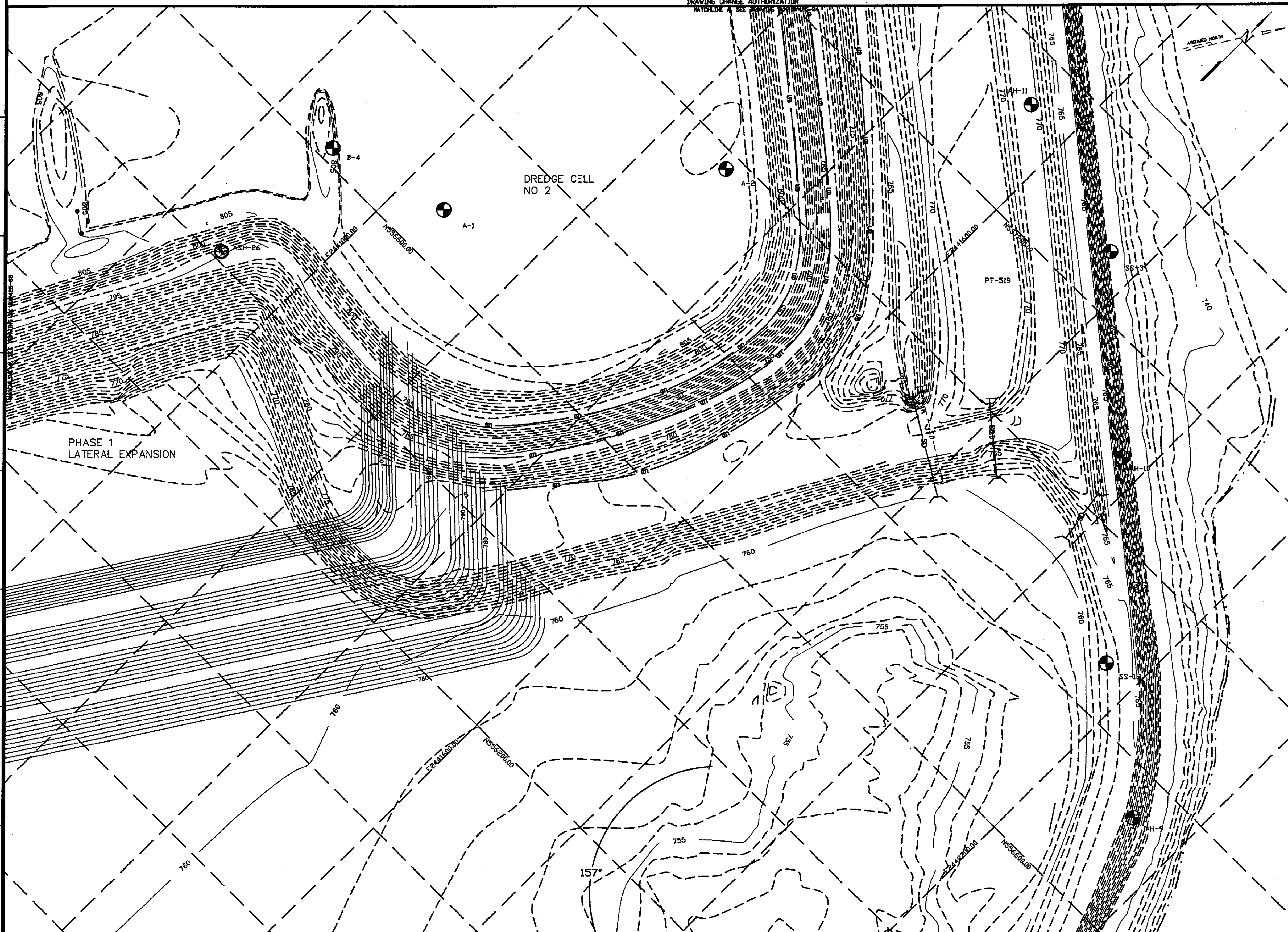
KEY PLAN

DREDGE CELL DIKE RESTORATION
PLAN SHEET 3

10W425-85

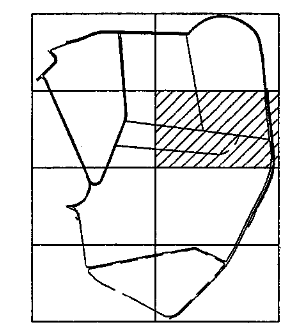
KINGSTON FOSSIL PLANT

Contract No: N/A	
EDA Prerequisites: N/A	
Invt. Dwg. No: 10W425-85	CAT: S
Discipline: CIVIL	UNIT 1-9
EDA No: DCN KIF-05-1090	R.0



GENERAL NOTES

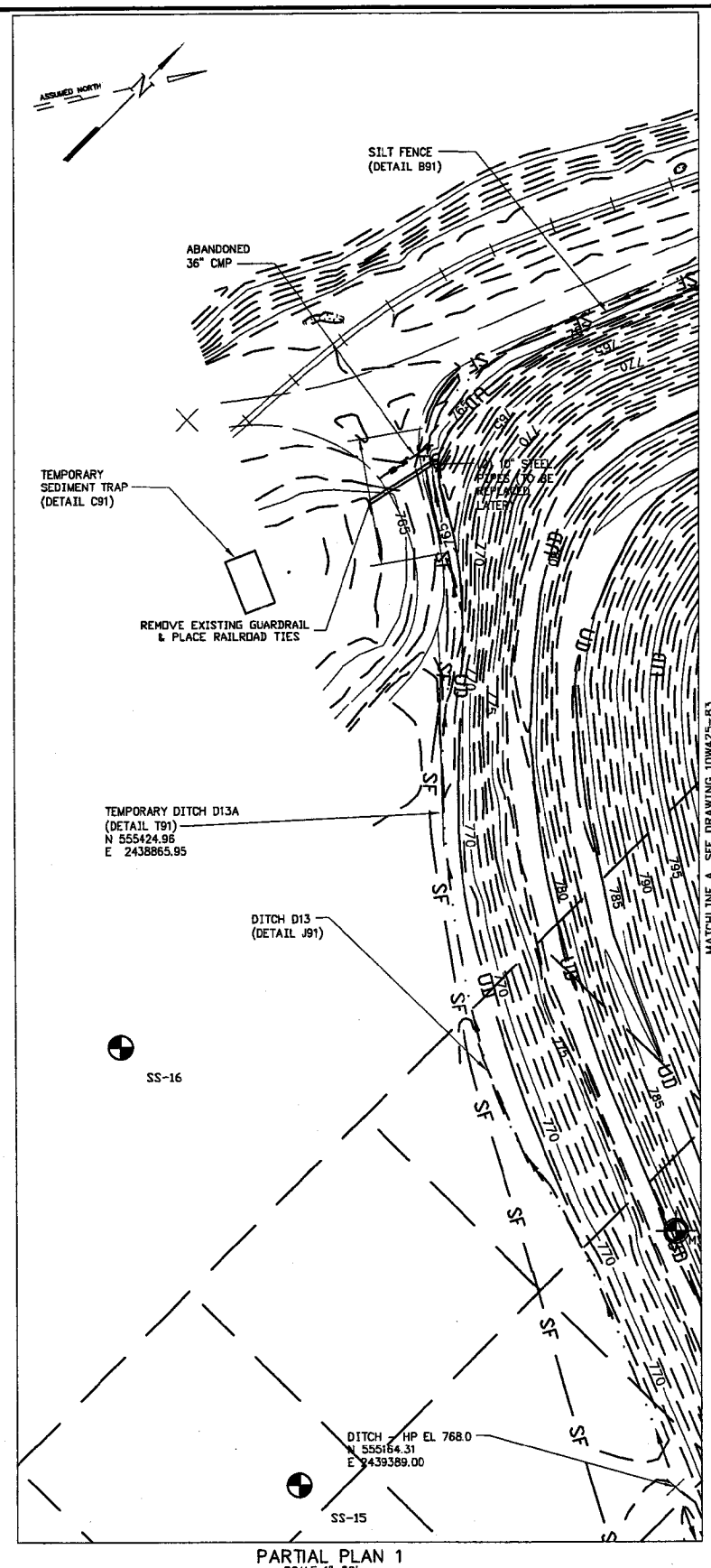
1. FOR PERMIT MINOR MODIFICATION DRAWING INDEX AND LEGEND, SEE DRAWING 10W425-81. FOR CONSTRUCTION NOTES, SEE 10W425-83.


KEY PLAN

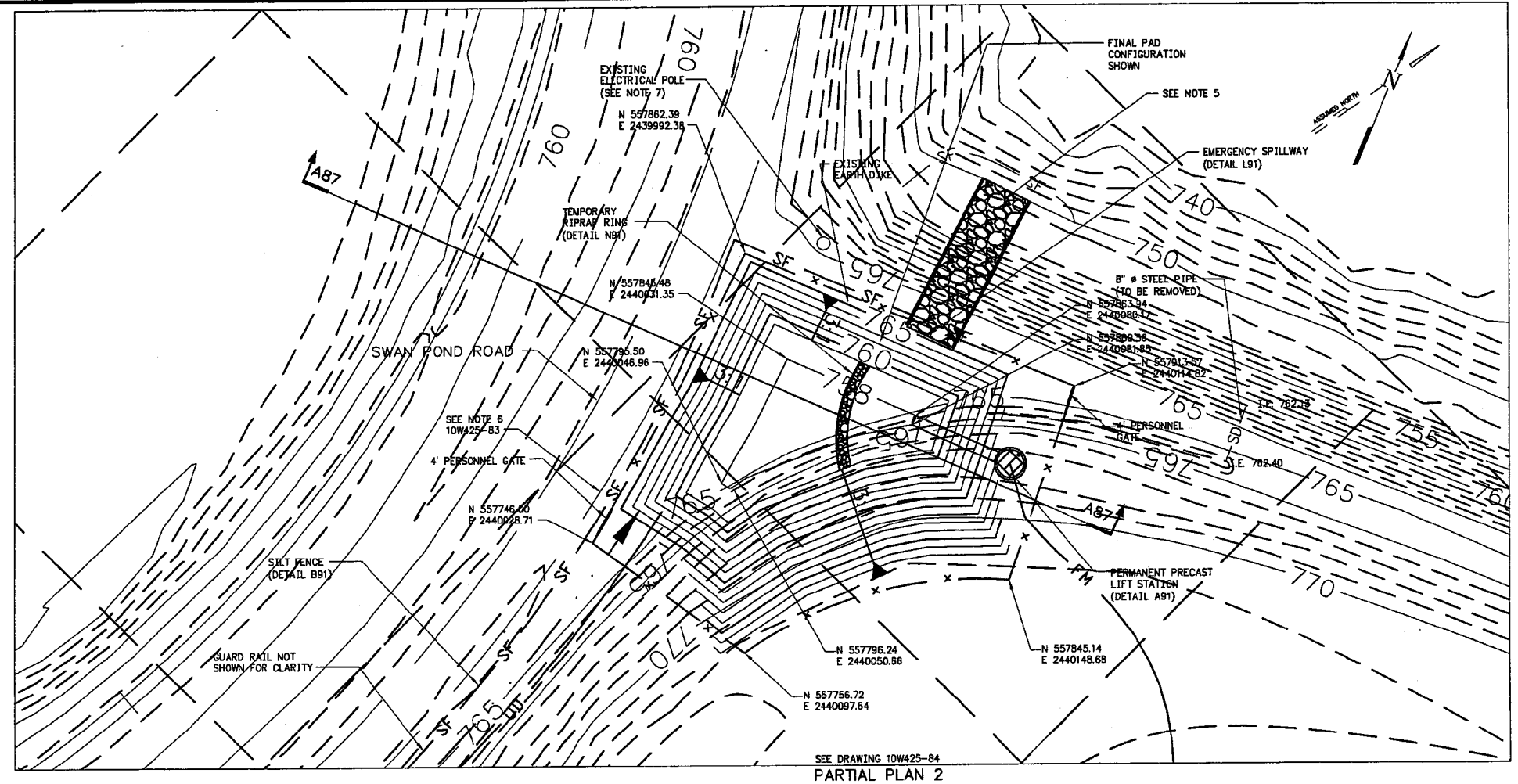
SCALE: 1"=50'		EXCEPT AS NOTED
YARD		
DREDGE CELL DIKE RESTORATION PLAN SHEET 4		
0	10W425-86	
KINGSTON FOSSIL PLANT		
Change Reference		
Affected Base Drawing No.		Rev.
N/A		N/A
DCA No.	DCN KIF-05-1090	R.0

0	JMB/DRS - 05/25/2005	GDM - 05/25/2005
Rev.	Prepared/Date	Checked/Date
Contract No.	N/A	
DCA Prerequisites	N/A	
Arr. Dwg. No.	10W425-86	CAT. S
Discipline	CIVIL	UNIT 1-9

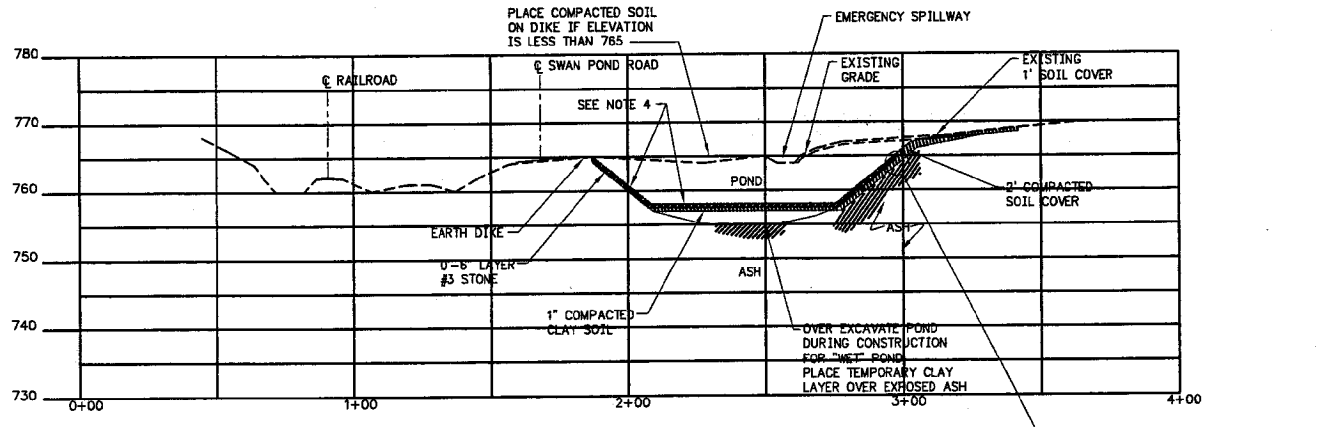
DRAWING CHANGE AUTHORIZATION



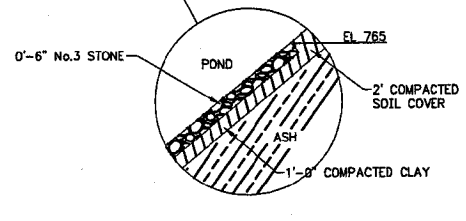
PARTIAL PLAN 1
SCALE 1"=50'



PARTIAL PLAN 2
SCALE 1"=20'



SECTION A87
SCALE: HORIZONTAL: 1"=5'
VERTICAL: 1"=10'



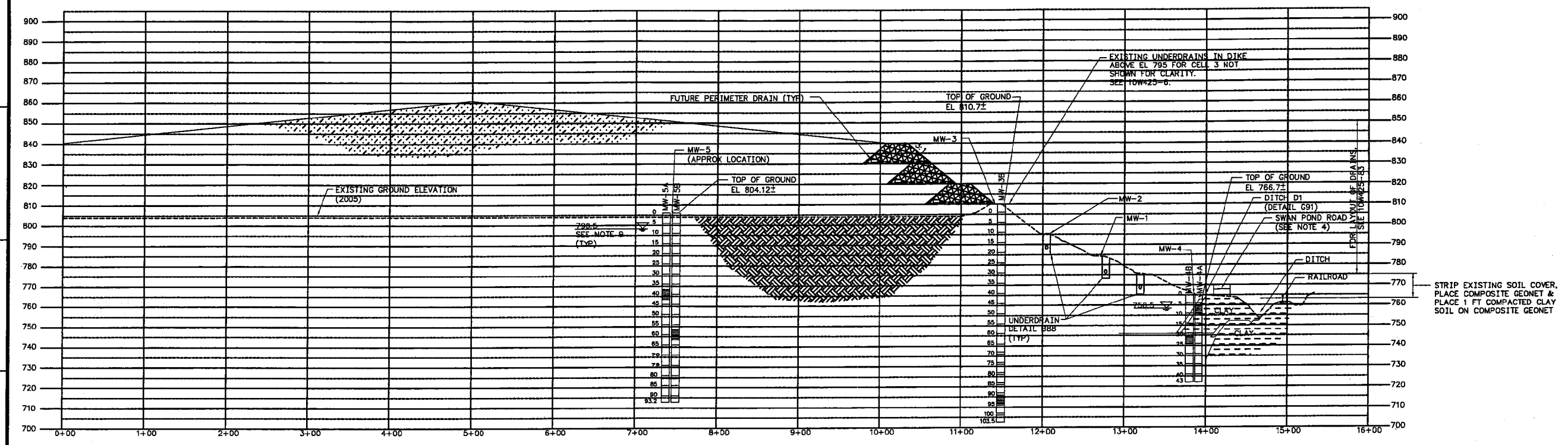
NOTES:

1. AT THE END OF CONSTRUCTION, REMOVE RIPRAP RING.
2. REMOVE ACCUMMULATED SEDIMENT WHEN LEVEL EXCEEDS THE SEDIMENT CLEANOUT LEVEL SHOWN ON DETAIL E91.
3. REMOVE ACCUMULATED SEDIMENT IN POND AT THE END OF CONSTRUCTION.
4. PLACE CLAY LINER AND RIPRAP LINING IN POND AT THE END OF CONSTRUCTION.
5. RIPRAP PLACED ON SLOPE SHALL BE UNDERLAIN WITH GEOTEXTILE, AND HAND PLACED, TO PREVENT ROCK FROM BEING PLACED INTO SWAN POND EMBAYMENT.
6. STRIP OR CUT VEGETATION PRIOR TO INSTALLING EMERGENCY SPILLWAY.
7. EXISTING UNDERGROUND UTILITIES ARE NOT SHOWN. CONSTRUCTOR SHALL TEMPORARILY REROUTE UNDERGROUND UTILITIES TO THE EXISTING SUMP AND PERMANENTLY REROUTE UTILITY TO NEXTEL TOWER (IF REQUIRED) TO CONSTRUCT POND. FOLLOW PROPER LOCKOUT/TAGOUT PROCEDURES.

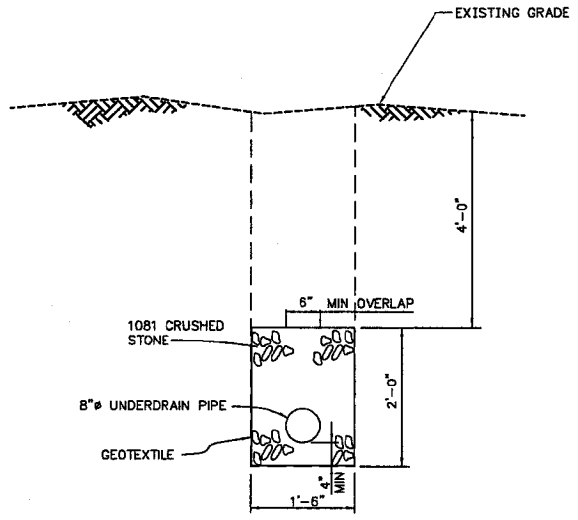
Scale: As Noted		EXCEPT AS NOTED
YARD		
DREDGE CELL DIKE RESTORATION PLAN & SECTION SHEET 5		
		10W425-87
KINGSTON FOSSIL PLANT		
0	AUS/DRS - 05/25/2005	KDH - 05/25/2005
Rev.	Prepared/Date	Checked/Date
Change Reference		
Contract No: N/A		Affected State Drawing No. / Rev: N/A / N/A
DCA Prerequisites: N/A		DCA No: DCN KIF-05-1090 / R.0
Aux. Dwg. No: 10W425-87	Encl.: 5	
Discipline: CIVIL	UNIT 1-9	

TVA-00002838

DRAWING CHANGE AUTHORIZATION



SECTION A88
SCALE: HORIZONTAL: 1" = 30'
VERTICAL: 1" = 20'



DETAIL B88
PERIMETER UNDERDRAIN
SCALE: 1" = 1'-0"

NOTES:

1. FOR DRAWINGS LIST AND LEGEND SEE 10W425-81.
2. FOR GENERAL NOTES SEE 10W425-26. FOR CONSTRUCTION NOTES, SEE 10W425-83.
3. BETWEEN EL 760 & 775, STRIP EXISTING 1'-0" SOIL COVER WITHIN THE LIMITS SHOWN ON DRAWINGS 10W425-83 THRU 10W425-86. PRIOR TO INSTALLING FINAL COVER. STOCK PILE SOIL AND REUSE AS RANDOM FILL VEGETATIVE LAYER FOR FINAL COVER.
4. DETAIL DEPICTS SECTION THROUGH EXISTING DREDGE CELLS ADJACENT TO SWAN POND ROAD. BASE ELEVATION OF DREDGE CELL VARIES.
5. UNDERDRAINS ARE NOT REQUIRED FOR EXISTING DIKE CONSTRUCTED FOR DREDGE CELL 2.
6. LATERAL OUTLET PIPE SHALL BE NON-PERFORATED POLYETHYLENE CORRUGATED TUBING AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS, INC., COLUMBUS, OHIO (614) 457-3051 OR EQUAL.
7. LATERAL OUTLET PIPES SHALL BE PLACED EVERY 200 FEET ON CENTER, AT LOW POINTS. FOR PROFILE OF DRAINS, SEE 10W425-94.
8. GEOTEXTILE USED FOR UNDERDRAIN SHALL BE A WOVEN MONOFILAMENT WITH AN APPARENT OPENING SIZE (AOS) SELECTED BY TVA FES (US STANDARD SIEVE SIZE) WHEN TESTED IN ACCORDANCE WITH ASTM D 4751. THE GEOTEXTILE SHALL BE GEOTEX 104F AS MANUFACTURED BY SYNTHETIC INDUSTRIES OR APPROVED EQUAL.
9. WATER LEVELS SHOWN ARE THOSE EXISTING AFTER MW DEVELOPMENT.

– SCREENING FOR BORE HOLE CONVERTED TO MIN.

SCALE: FULL — EXCEPT AS NOTED
YARD

DREDGE CELL DIKE RESTORATION
SECTION & DETAIL SHEET 1

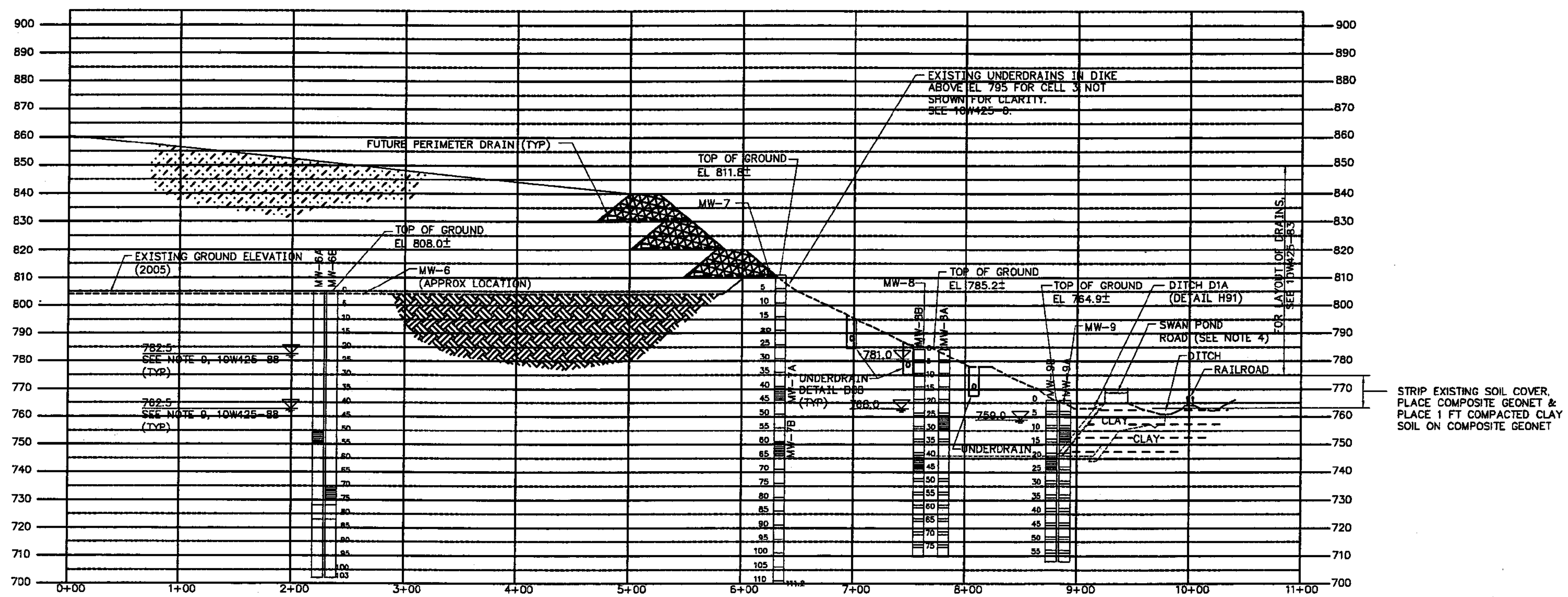
C 10W425-88

KINGSTON FOSSIL PLANT

0	JAB/GRS – 10/25/2005	GDH – 10/27/2005	
Rev.	Prepared/Date	Checked/Date	Change Reference
Contract No.	N/A		
SCA Prerequisite	N/A		
Asst. Dwg. No.	10W425-88	CAT. S	
Discipline	CIVIL	UNIT 1-9	

Affected Dwgs Drawing No.	Rev
N/A	N/A
SCA No. DCN KIF-05-1090	R.0

DRAWING CHANGE AUTHORIZATION



SECTION A89
SCALE: HORIZONTAL: 1" = 30'
VERTICAL: 1" = 20'

NOTES:

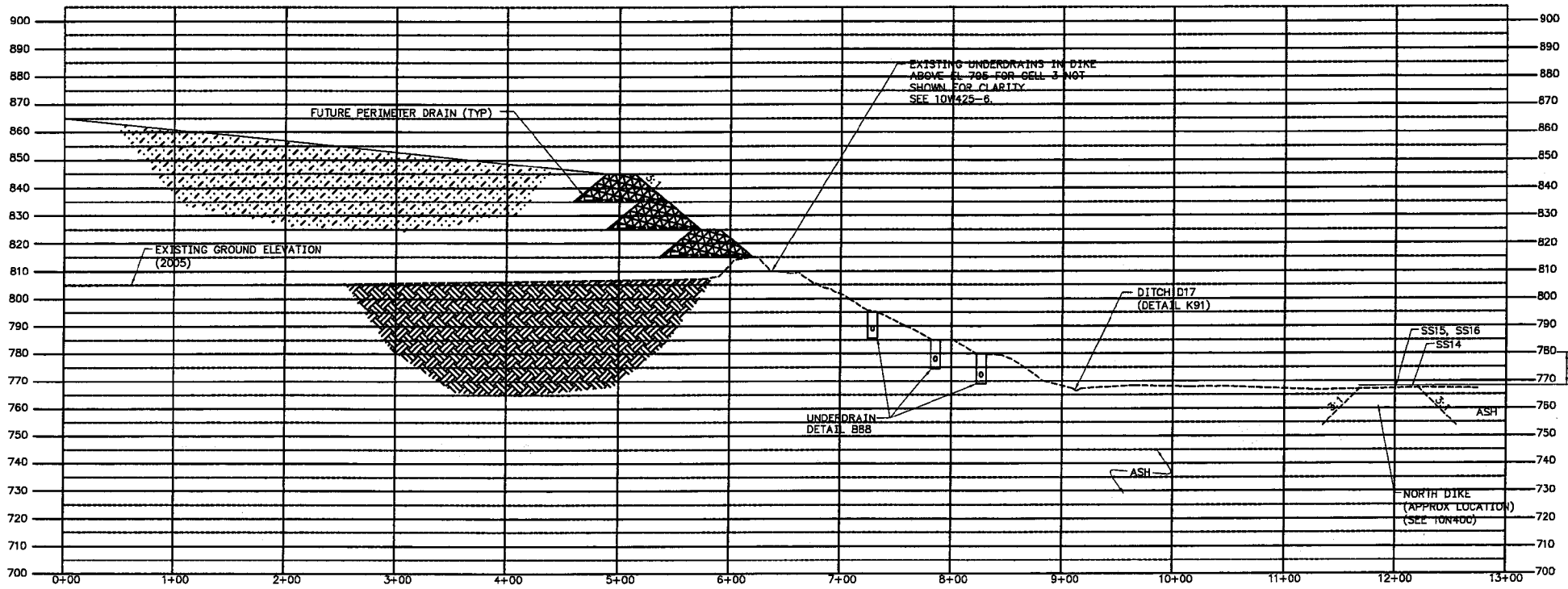
1. FOR DRAWINGS LIST AND LEGEND SEE 10W425-81.
2. FOR NOTES SEE 10W425-88.

▥ – SCREENING FOR BORE HOLE CONVERTED TO MIN.

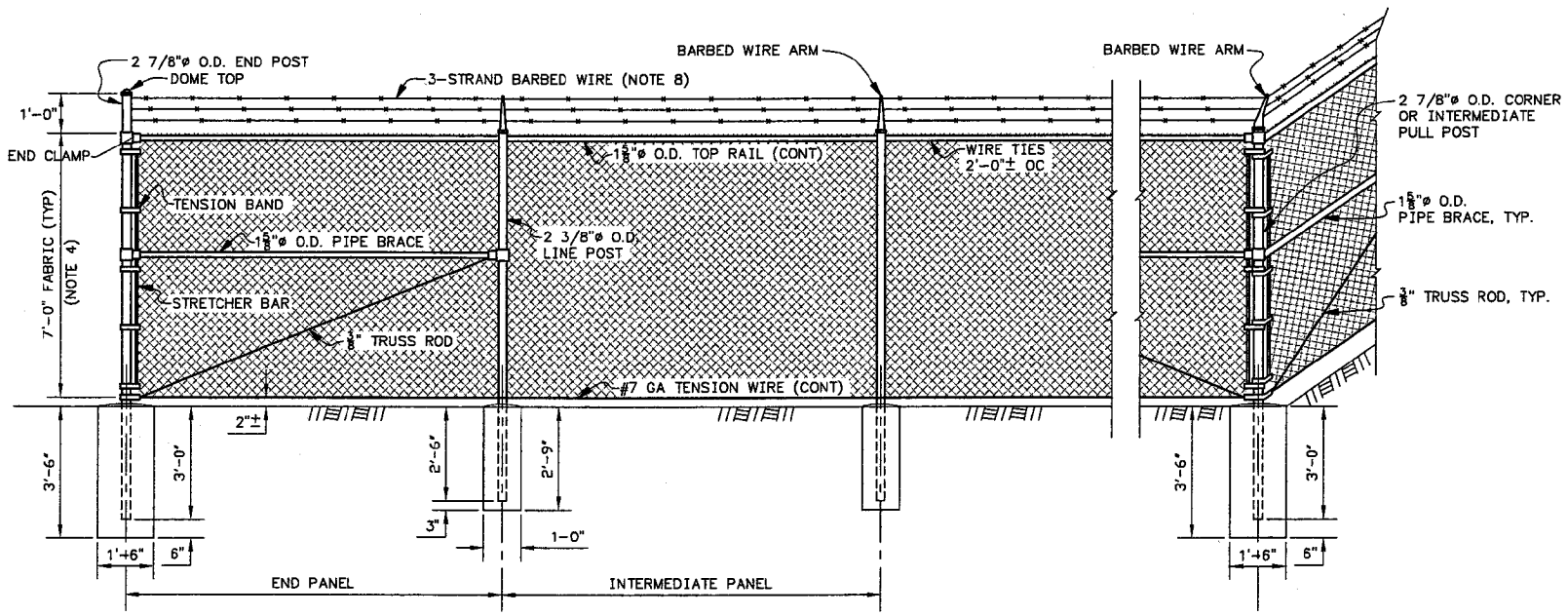
SCALE: 1"=50'		EXCEPT AS NOTED
YARD		
DREDGE CELL DIKE RESTORATION SECTION SHEET 2		
C	10W425-89	
KINGSTON FOSSIL PLANT		
Change Reference		
Affected Base Drawing No.		Rev.
N/A		N/A
DCA No.	DCN KIF-05-1090	R.D

D	JMB/DRS - 05/25/2005	GDM - 05/25/2005
Rev.	Prepared/Date	Checked/Date
Contract No. N/A		
DCA Prerequisites N/A		
Arch. Dwg. No. 10W425-89	CAT. S	
Discipline CIVIL	UNIT 1-9	

DRAWING CHANGE AUTHORIZATION



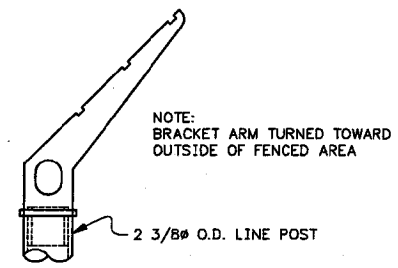
SECTION A90
SCALE: HORIZONTAL: 1" = 30'
VERTICAL: 1" = 20'



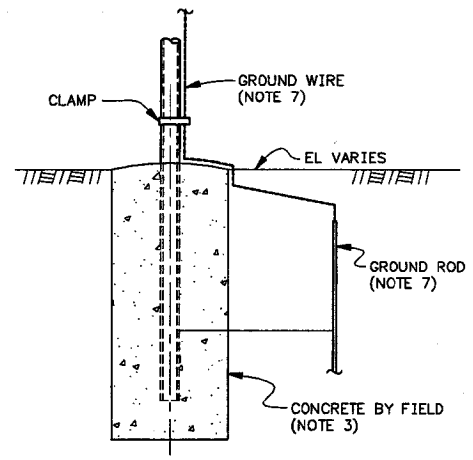
DETAIL B90 – CHAIN LINK FENCE
TYPICAL PANELS
N.T.S.

CHAIN LINK NOTES:
1. ALL FENCING WORK SHALL BE DONE IN ACCORDANCE WITH STANDARD INDUSTRY PRACTICE.
2. STRUCTURAL STEEL SHAPES SHALL BE ASTM A 36.
3. CONCRETE SHALL BE CLASS "B" PER SECTION 400 OF THE GENERAL CONSTRUCTION SPECIFICATION NO. T1.
4. FENCING TO BE 7-FEET #9 ZINC COATED TYPE 2 CHAIN LINK FENCE FABRIC WITH THREE STRANDS (1-FEET) BARBED WIRE TOPPING 8-FEET HIGH WITH #7 ZINC COATED BOTTOM TAUGHT WIRE. MATERIAL AND INSTALLATION SHALL BE IN ACCORDANCE WITH CHAIN LINK FENCE MANUFACTURERS INSTITUTE. INDUSTRIAL FENCE FRAMING SHALL COMPLY WITH ASTM F1043, DESIGN GROUP 1CF AND INCLUDE POSTS, BRACING, TOP RAILS, STRETCHER BARS, TRUSS RODS, AND TENSION WIRE.
5. ALL POSTS AND OTHER APPURTENANCES SHALL BE HOT DIP GALVANIZED.
6. ALL DAMAGED GALVANIZING SHALL BE REPAIRED BY USE OF ZINC PAINT.
7. FIELD WORK FOR ELECTRICAL GROUNDING: GROUND FENCE AT APPROXIMATELY 125 FEET INTERVALS BY CLAMPING 2/0 GROUND CABLE TO FENCE POSTS AND TERMINATE CABLE TO 5/8"ø 8'-0" GROUND ROD LOCATED APPROXIMATELY2'-0" INSIDE FENCE, DRIVEN SO THAT THE TOP OF GROUND ROD IS 8" BELOW GRADE SURFACE; SIMILARLY, GROUND ALL CORNER AND END POSTS.
8. BARBED WIRE TO BE ALUMINUM COATED STEEL.

NOTES:
1. FOR DRAWINGS LIST AND LEGEND SEE 10W425-81.
2. FOR NOTES SEE 10W425-88.



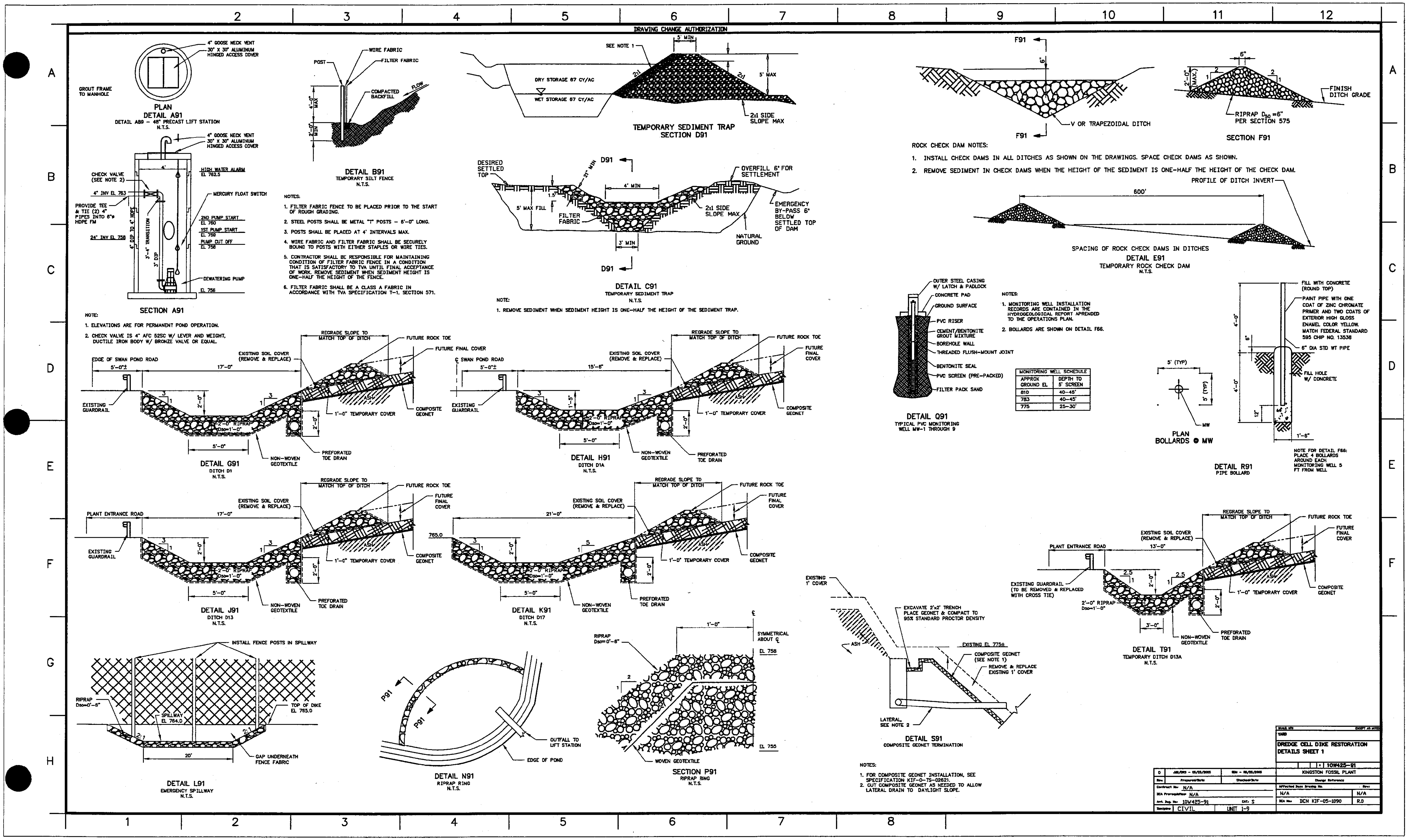
BARBED WIRE ARM
N.T.S.



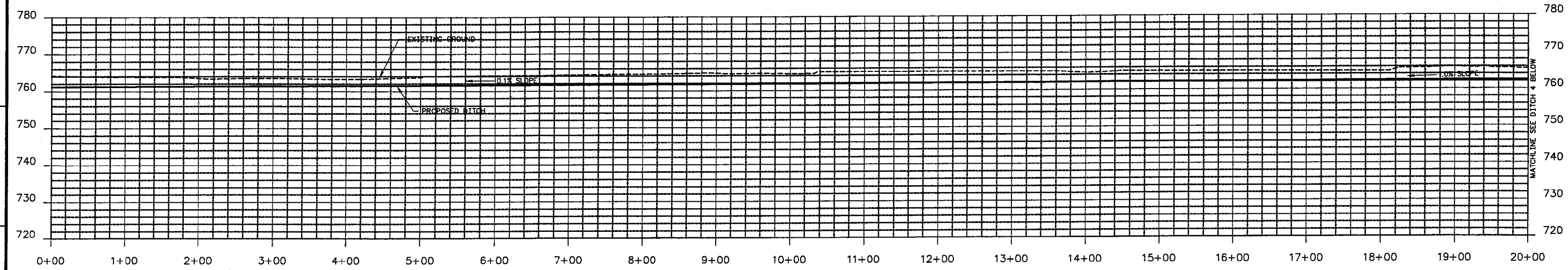
BASE DETAIL
N.T.S.

YARD			EXCEPT AS NOTED
DREDGE CELL DIKE RESTORATION SECTION & DETAILS SHEET 3			
		=	10W425-90
0	AB/DRS - 05/25/2005	DSM - 05/25/2005	KINGSTON FOSSIL PLANT
Rev.	Prepared/Date	Checked/Date	Change Reference
Contract No. N/A			Affected Tech Spec Sect. No. / Rev
ECA Prerequisites N/A			N/A / N/A
Asst. Dwg. No. 10W425-90	Est. $		ECN No. DCN KIF-05-1090 / R.0
Discipline CIVIL	UNIT 1-9		

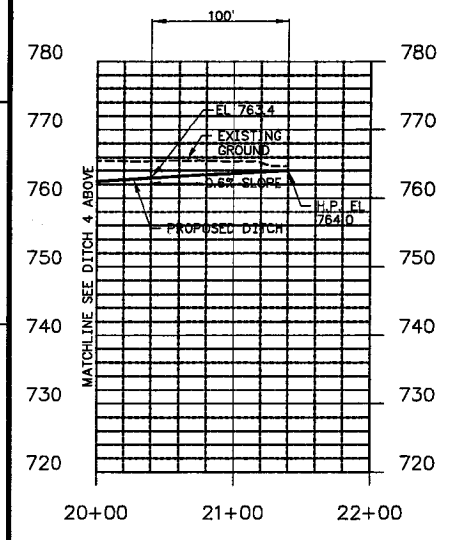
TVA-00002841


DRAWING CHANGE AUTHORIZATION
PLAN
DETAIL A91
DETAIL A89 - 48" PRECAST LIFT STATION
N.T.S.
4" GOOSE NECK VENT
30" X 30" ALUMINUM HINGED ACCESS COVER
GROUT FRAME TO MANHOLE
CHECK VALVE (SEE NOTE 2)
4" INV EL 763
PROVIDE TEE & TIE (2) 4" PIPES INTO 6"ø HDPE FM
24" INV EL 758
HIGH WATER ALARM EL 762.5
MERCURY FLOAT SWITCH
2ND PUMP START EL 760
1ST PUMP START EL 759
PUMP CUT OFF EL 758
DEWATERING PUMP
EL 756
SECTION A91
NOTE:
1. ELEVATIONS ARE FOR PERMANENT POND OPERATION.
2. CHECK VALVE IS 4" AFC 52SC W/ LEVER AND WEIGHT, DUCTILE IRON BODY W/ BRONZE VALVE OR EQUAL.
POST
WIRE FABRIC
FILTER FABRIC
COMPACTED BACKFILL
FLOW
DETAIL B91
TEMPORARY SILT FENCE
N.T.S.
NOTES:
1. FILTER FABRIC FENCE TO BE PLACED PRIOR TO THE START OF ROUGH GRADING.
2. STEEL POSTS SHALL BE METAL "T" POSTS - 6'-0" LONG.
3. POSTS SHALL BE PLACED AT 4' INTERVALS MAX.
4. WIRE FABRIC AND FILTER FABRIC SHALL BE SECURELY BOUND TO POSTS WITH EITHER STAPLES OR WIRE TIES.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONDITION OF FILTER FABRIC FENCE IN A CONDITION THAT IS SATISFACTORY TO TVA UNTIL FINAL ACCEPTANCE OF WORK. REMOVE SEDIMENT WHEN SEDIMENT HEIGHT IS ONE-HALF THE HEIGHT OF THE FENCE.
6. FILTER FABRIC SHALL BE A CLASS A FABRIC IN ACCORDANCE WITH TVA SPECIFICATION T-1, SECTION 571.
SEE NOTE 1
DRY STORAGE 67 CY/AC
WET STORAGE 67 CY/AC
5' MIN
5' MAX
2:1 SIDE SLOPE MAX
TEMPORARY SEDIMENT TRAP
SECTION D91
DESIRED SETTLED TOP
OVERFILL 6" FOR SETTLEMENT
4' MIN
5' MAX FILL
FILTER FABRIC
2:1 SIDE SLOPE MAX
EMERGENCY BY-PASS 6" BELOW SETTLED TOP OF DAM
NATURAL GROUND
3' MIN
DETAIL C91
TEMPORARY SEDIMENT TRAP
N.T.S.
NOTE:
1. REMOVE SEDIMENT WHEN SEDIMENT HEIGHT IS ONE-HALF THE HEIGHT OF THE SEDIMENT TRAP.
V OR TRAPEZOIDAL DITCH
FINISH DITCH GRADE
RIPRAP D50 =6" PER SECTION 575
SECTION F91
ROCK CHECK DAM NOTES:
1. INSTALL CHECK DAMS IN ALL DITCHES AS SHOWN ON THE DRAWINGS. SPACE CHECK DAMS AS SHOWN.
2. REMOVE SEDIMENT IN CHECK DAMS WHEN THE HEIGHT OF THE SEDIMENT IS ONE-HALF THE HEIGHT OF THE CHECK DAM.
PROFILE OF DITCH INVERT
600'
SPACING OF ROCK CHECK DAMS IN DITCHES
DETAIL E91
TEMPORARY ROCK CHECK DAM
N.T.S.
EDGE OF SWAN POND ROAD
EXISTING GUARDRAIL
EXISTING SOIL COVER (REMOVE & REPLACE)
REGRADE SLOPE TO MATCH TOP OF DITCH
FUTURE ROCK TOE
FUTURE FINAL COVER
1'-0" TEMPORARY COVER
COMPOSITE GEONET
2'-0" RIPRAP D50=1'-0"
NON-WOVEN GEOTEXTILE
PREFORATED TOE DRAIN
DETAIL G91
DITCH D1
N.T.S.
℄ SWAN POND ROAD
DETAIL H91
DITCH D1A
N.T.S.
PLANT ENTRANCE ROAD
DETAIL J91
DITCH D13
N.T.S.
765.0
DETAIL K91
DITCH D17
N.T.S.
OUTER STEEL CASING W/ LATCH & PADLOCK
CONCRETE PAD
GROUND SURFACE
PVC RISER
CEMENT/BENTONITE GROUT MIXTURE
BOREHOLE WALL
THREADED FLUSH-MOUNT JOINT
BENTONITE SEAL
PVC SCREEN (PRE-PACKED)
FILTER PACK SAND
DETAIL Q91
TYPICAL PVC MONITORING WELL MW-1 THROUGH 9
NOTES:
1. MONITORING WELL INSTALLATION RECORDS ARE CONTAINED IN THE HYDROGEOLOGICAL REPORT APPENDED TO THE OPERATIONS PLAN.
2. BOLLARDS ARE SHOWN ON DETAIL F66.
MONITORING WELL SCHEDULE
APPROX GROUND EL | DEPTH TO 5' SCREEN
810 | 40-45'
783 | 40-45'
775 | 25-30'
5' (TYP)
MW
PLAN
BOLLARDS @ MW
FILL WITH CONCRETE (ROUND TOP)
PAINT PIPE WITH ONE COAT OF ZINC CHROMATE PRIMER AND TWO COATS OF EXTERIOR HIGH GLOSS ENAMEL COLOR YELLOW. MATCH FEDERAL STANDARD 595 CHIP NO. 13538
6" DIA STD WT PIPE
FILL HOLE W/ CONCRETE
DETAIL R91
PIPE BOLLARD
NOTE FOR DETAIL F66: PLACE 4 BOLLARDS AROUND EACH MONITORING WELL 5 FT FROM WELL
EXISTING GUARDRAIL (TO BE REMOVED & REPLACED WITH CROSS TIE)
DETAIL T91
TEMPORARY DITCH D13A
N.T.S.
INSTALL FENCE POSTS IN SPILLWAY
RIPRAP D50=0'-6"
SPILLWAY EL 764.0
TOP OF DIKE EL 765.0
GAP UNDERNEATH FENCE FABRIC
DETAIL L91
EMERGENCY SPILLWAY
N.T.S.
OUTFALL TO LIFT STATION
EDGE OF POND
DETAIL N91
RIPRAP RING
N.T.S.
SYMMETRICAL ABOUT ℄
EL 758
EL 755
WOVEN GEOTEXTILE
SECTION P91
RIPRAP RING
N.T.S.
EXISTING 1' COVER
ASH
EXCAVATE 2'x2' TRENCH PLACE GEONET & COMPACT TO 95% STANDARD PROCTOR DENSITY
EXISTING EL 775±
COMPOSITE GEONET (SEE NOTE 1)
REMOVE & REPLACE EXISTING 1' COVER
LATERAL, SEE NOTE 2
DETAIL S91
COMPOSITE GEONET TERMINATION
NOTES:
1. FOR COMPOSITE GEONET INSTALLATION, SEE SPECIFICATION KIF-0-TS-02621.
2. CUT COMPOSITE GEONET AS NEEDED TO ALLOW LATERAL DRAIN TO DAYLIGHT SLOPE.
DREDGE CELL DIKE RESTORATION
DETAILS SHEET 1
10W425-91
KINGSTON FOSSIL PLANT
DCN KIF-05-1090
CIVIL
UNIT 1-9

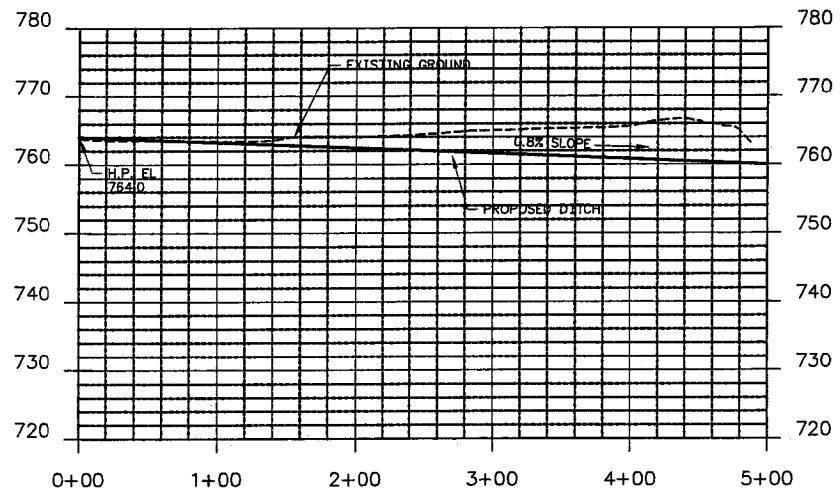
DRAWING CHANGE AUTHORIZATION



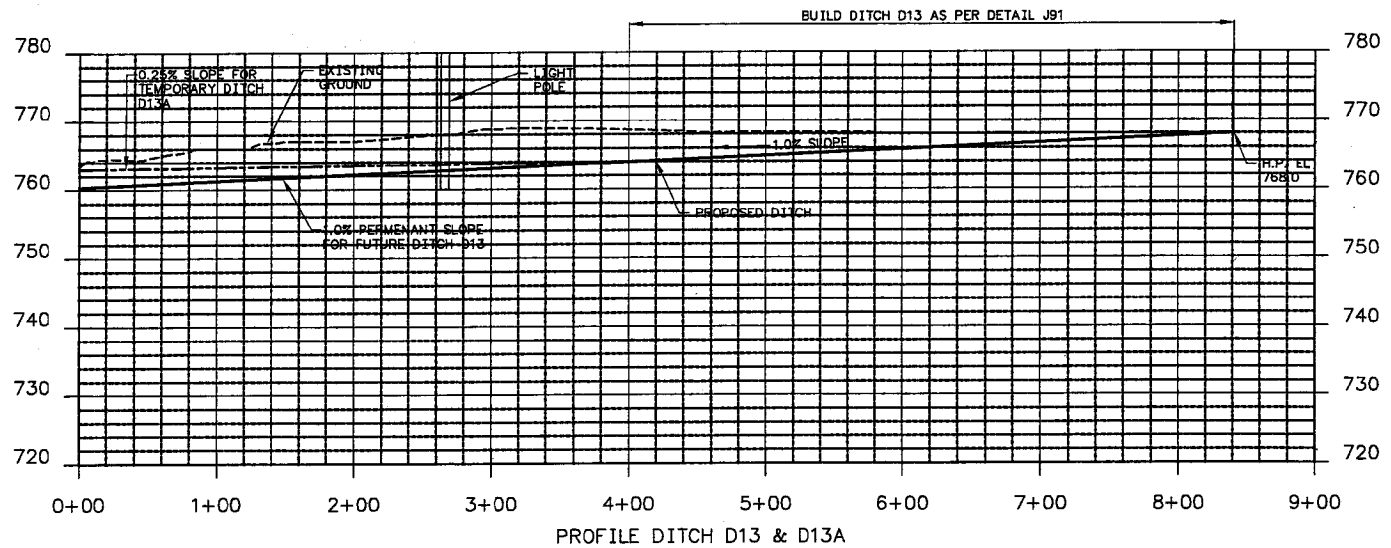
PROFILE DITCH D1 & D1A



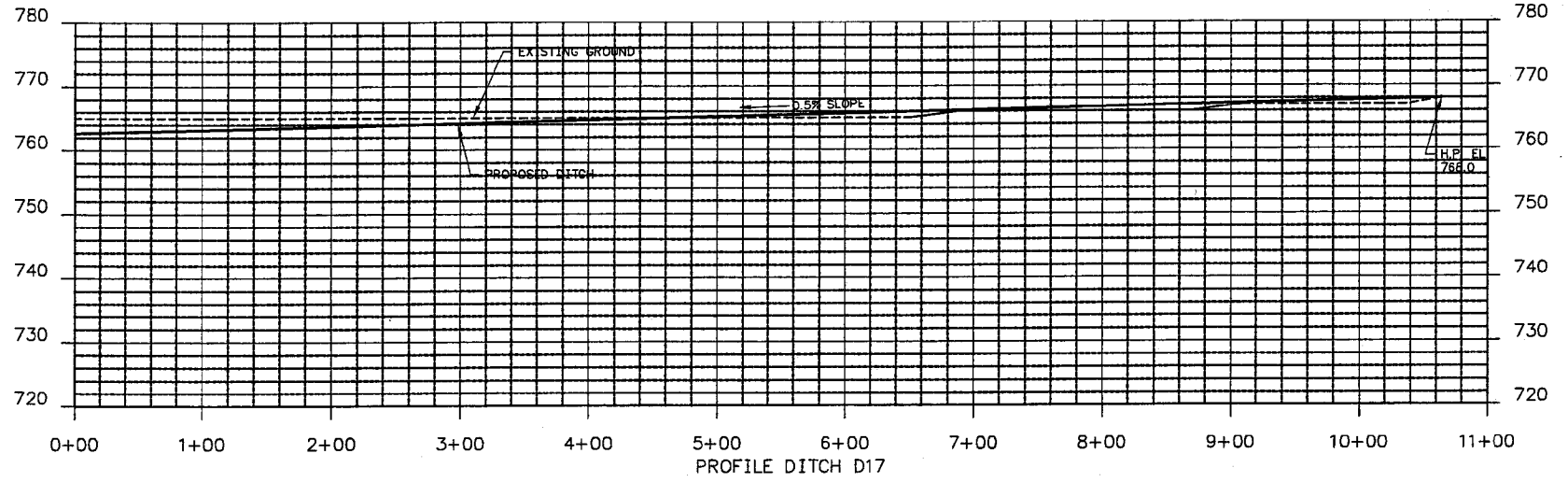
PROFILE DITCH D1 & D1A



PROFILE DITCH D1A



PROFILE DITCH D13 & D13A



PROFILE DITCH D17

YARD

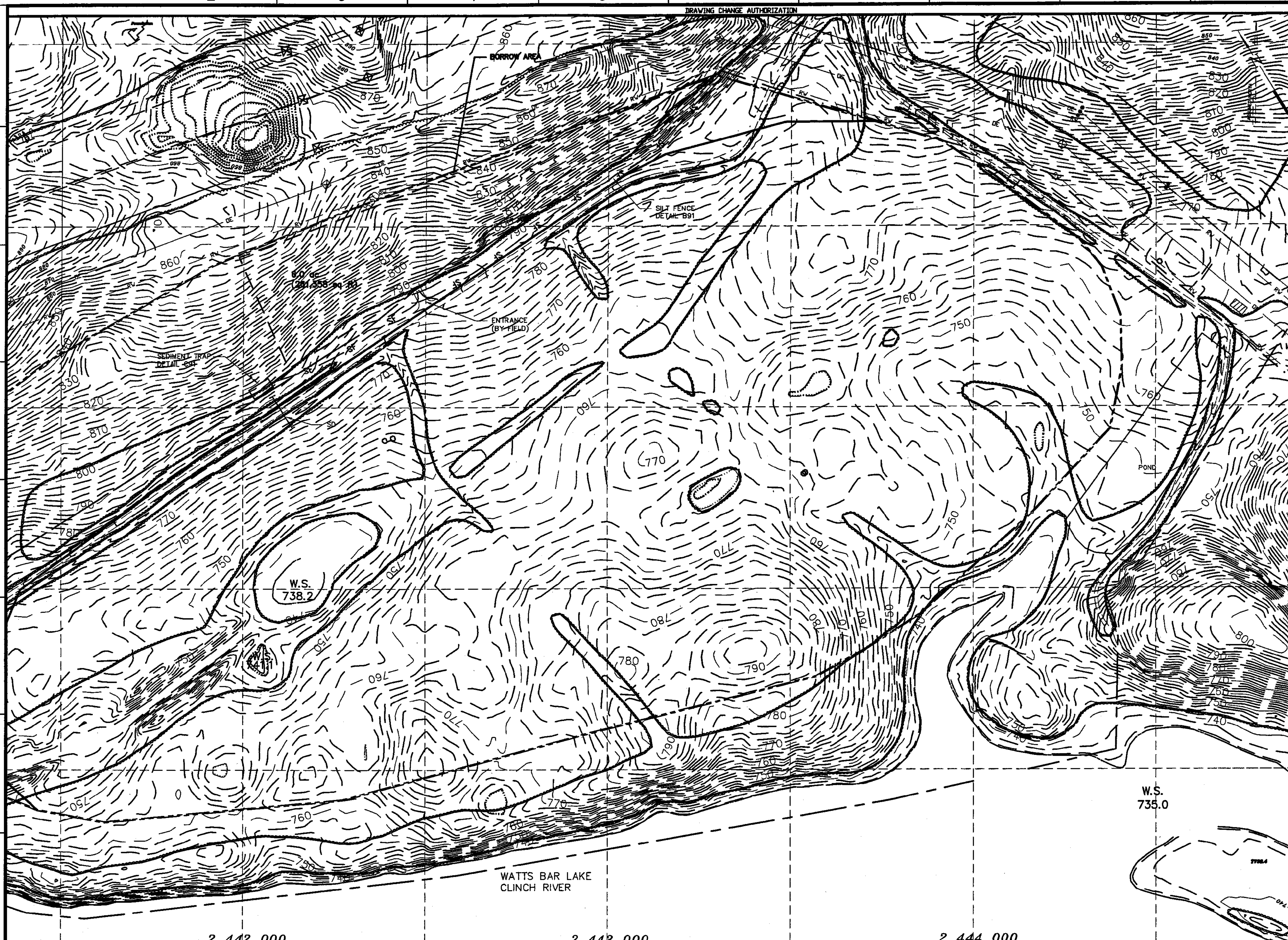
DREDGE CELL DIKE RESTORATION
DITCH PROFILES

10W425-92

KINGSTON FOSSIL PLANT

0	ISSUED FOR CONSTRUCTION	05/23/2008	BSM
Rev.	Preparer/Date		Checker/Date
Contract No: N/A		Change Reference	
DCA Prerequisites: N/A		Affected Unit Drawing No.	Rev
Aux. Dwg. No: 10W425-92	DAT: S	N/A	N/A
Discipline: CIVIL	UNIT 1-9	DCN No: DCN KIF-05-1090	R.0

TVA-00002843



SCALE: 1"=60'			EXCEPT AS NOTED
YARD			
DREDGE CELL DIKE RESTORATION BORROW AREA			
		C	10W425-93
0	Prepared/Date	Checked/Date	KINGSTON FOSSIL PLANT
Rev.	Prepared/Date	Checked/Date	Change Reference
Contract No: N/A		Affected Base Drawing No.	Rev:
DCA Prerequisites: N/A		N/A	N/A
Ant. Dwg. No: 10W425-93	CAT: S	DCA No: DCN KIF-05-1090	R.0
Discipline: CIVIL	UNIT 1-9		

TVA/COO	FORM A – DESIGN CHANGE NOTICE				Page 1 of 2
1. a. DCN Type ☐ Base DCN ☒ PIC for Base/ Parent DCN No.: KIF-05-1090	b. Class Routine Design Change ☐ Documentation Only ☐ Material Equivalency ☐ c. Advance Authorization ☒ Yes ☐ No	2.	DCN No.	KIF-05-~~1090~~ 1099	Rev. 0
		3.	Plant/TL/SUB/ Facility	KIF	
			Unit/TL/SUB No.	1-9	
		4.	System(s)	14,114	

PART I - REQUESTED CHANGE

5.	Authorizing Documents	KIF530
6.	Requested Change or Problem Statement	Due to unanticipated design and construction issues, design changes within the PIC criteria is anticipated to track configuration control of the plant. This PIC is initiated as a mechanism for releasing the changes

7.	Gary Melton	Parsons E&C	757-9974	8.	William M. Lytle	6/3/05
	Initiator's Name (Print)	Organization	Phone		Supervisor/Principal Engr	Date

PART II - INITIATION APPROVAL
(Skip blocks 9 and 10 for Advance Authorization Approval)

9.			10.		
	Reviewed INITIATOR'S DEPARTMENT MANAGER	Date		Approved ENGRG/OPERATIONS MANAGER	Date

PART III - APPROVED CHANGE/DETAILED DESIGN

11.	Approved Change Description	☐ Planned at Initiation	☐ As Issued (If different than planned, line through below and update on continuation sheet.)		
	The changes included in this DCN involve various field and design changes. See individual AA's for field changes.				
12.	Advanced Authorization Approval (If applicable, otherwise mark N/A.)	RE or Manager [signature] FOR ROP		Date	6-7-05
13.	Does this change contain any assumptions or constraints that require confirmation before RTO?			☐ Yes ☒ No	
14.	Does this change address the full scope of the authorizing document?			☐ Yes ☒ No	

15.	[signature]	751-2783	6/2/05	16.	[signature]		6/7/05
	RE	Phone	Date		Civil Lead		Date
17.	N/A			18.	N/A		
	Electrical/I&C Lead		Date		Mechanical Lead		Date
19.	N/A			20.	N/A		
	Operations		Date		Maintenance		Date
21.	N/A			22.	N/A		
	System Engineer		Date		Implementing Organization		Date
23.	N/A			25.	N/A		
	Telecommunications		Date		Plant/Site Manager		Date
24.	N/A			26.	**ISSUE EDMS #**		
	Engrg or Site Engrg Manager		Date				

PART IV - DCN CLOSURE

27			29	**CLOSURE EDMS #**
	Facility Manager or Engrg Manager	Date		
28	[signature]	6/7/05		
	RE Signature for DCN Closure	Date		

Mark "N/A" in any blocks not applicable.

TVA/COO	FORM A - DESIGN CHANGE NOTICE	Page 2 of 2

DCN REVISION LOG

Revision Number	Effective Date	Pages Affected	Description of Revision

DCN CONTINUATION SHEET

6. Cont'd Requested Change or Problem Statement	See Block 6.
11. Cont'd Approved Change Description	See Block 11.

RELATED DCNS REQUIRED TO COMPLETE THIS MODIFICATION

N/A

TVA Kingston Fossil - KIF

Initiation Date: 6/3/05

Page 1 of 1

ADVANCE AUTHORIZATION FORM

AA-01	Parent DCN: KIF - 05 - 1090	FTS:
	Parent PIC: KIF - 05 - 1099	Responsible Design Engineer/ORG/Phone: Dan Smith /(423)757-8088

Requested Change or Problem:

1. Surveyors requested additional points to locate centerline of ditches at toe of existing ash dike.
2. Revise specification KIF-0-TS-02621 to clarify bottom woven (calendared) geotextile in lieu of non-woven geotextile. The specification was originally written for the permit application and portions of the cover can utilize non-woven on top and bottom of geonet. The specification addressed the calendared geotextile (where shown on drawings). While this statement is applicable for the permit application, the composite geonet for this installation should address only the calendared geotextile on the bottom of the composite geonet.

Suggested Solution (not required):

1. See revised DCA sketches to this AA.
2. See revised specification KIF-0-TS-2621 R1.

Approved Change

See suggested solution.

Resp. Engineer:	Signature: Daniel R Smith	Date: 6/3/05	Supv.	Signature	Date: 6/7/05

TVA Kingston Fossil - KIF

Initiation Date: 7/27/05

Page 1 of 1

ADVANCE AUTHORIZATION FORM

AA-02	Parent DCN: KIF - 05 - 1090	FTS:
	Parent PIC: KIF - 05 - 1099	Responsible Design Engineer/ORG/Phone: Dan Smith /(423)757-8088

Requested Change or Problem:

1. Revise spillway as shown. Due to a difference in topography (pre construction vs. post construction), the spillway needs to be lowered to ensure the upstream ditch does not overtop. The pond will not discharge a 25-yr storm event with the pumps running.

Suggested Solution (not required):

1. See revised DCA sketches to this AA.

Approved Change

See suggested solution.

Resp. Engineer:	Signature	Date	Supv.	Signature	Date
		7/27/05			7/27/05

FORM G – ADVANCE AUTHORIZED TRACKING SHEET

AA- 02 PIC# KIF - 05 - 1099 Page _____ of _____

Block 6 - Requested Change

Revise spillway as shown. Due to a difference in topography (pre construction vs. post construction), the spillway needs to be lowered to ensure the upstream ditch does not overtop. The pond will not discharge a 25-yr storm event with the pumps running.

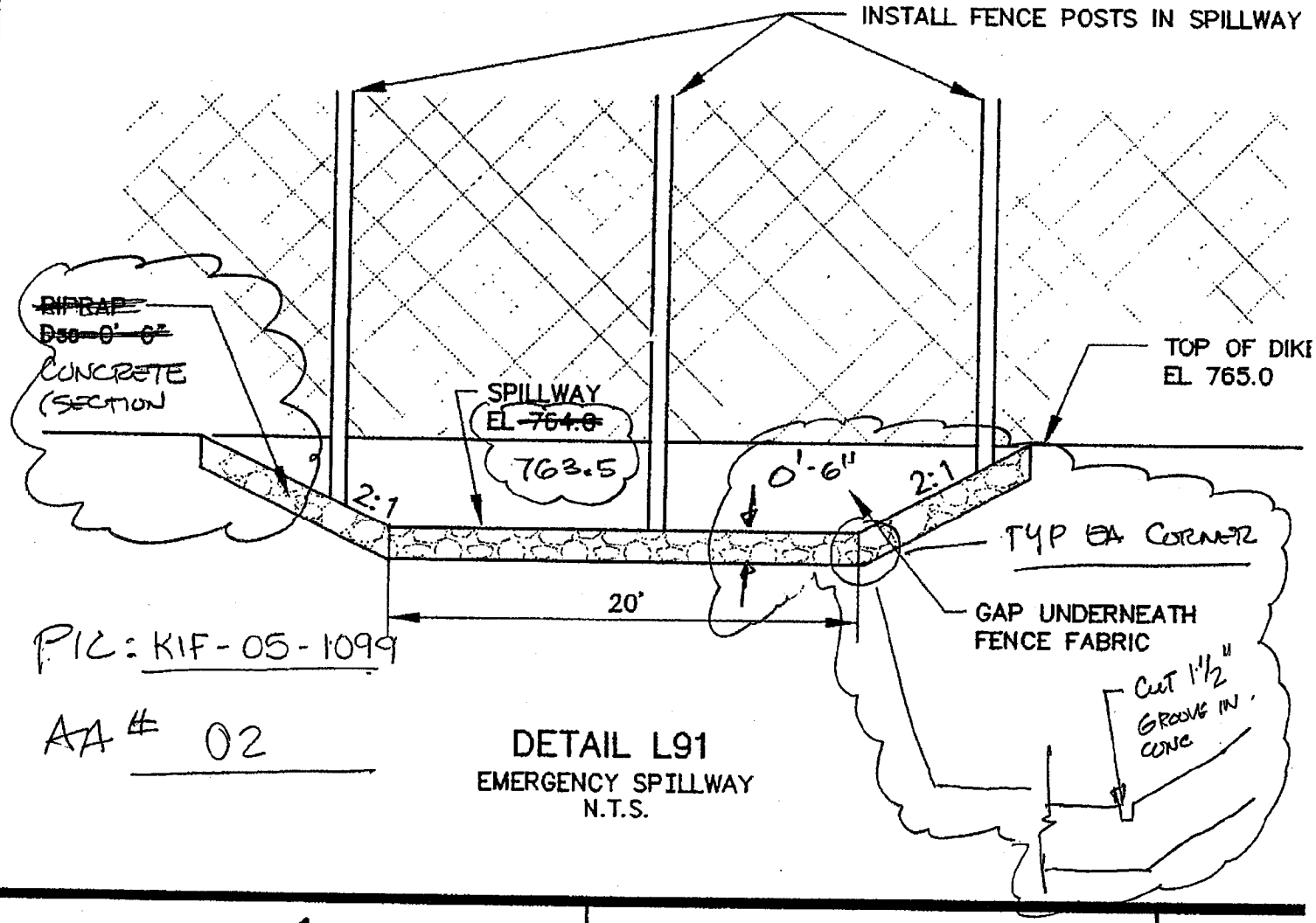
Block 11 - Approved Change

See revised DCA sketches to this AA

Supv/Prin Egnr: _____ Signature _____ Date RE: _____ Signature 7/27/05 Date

DETAIL J91
DITCH D13
N.T.S.

NON-WOVEN
GEOTEXTILE



PIC: KIF-05-1099

AA # 02

DETAIL L91
EMERGENCY SPILLWAY
N.T.S.

KIF 0201 PIC - KIF-05-1099 TO DCN 1090

TVA Kingston Fossil - KIF

Initiation Date: 9/15/05

Page 1 of 1

ADVANCE AUTHORIZATION FORM

AA-03	Parent DCN: KIF - 05 - 1090	FTS:
	Parent PIC: KIF - 05 - 1099	Responsible Design Engineer/ORG/Phone: Dan Smith /(423)757-8088

Requested Change or Problem:

1. Revise specification KIF-0-TS-02621 to clarify bottom non-woven geotextile.

Suggested Solution (not required):

1. See revised specification KIF-0-TS-2621 R2.

Approved Change

See suggested solution.

Resp. Engineer:	Signature	9/7/05 Date	Supv.	Signature	9/8/05 Date

APPENDIX 2 TO FORM C DCN KIF-05-1090
KINGSTON FOSSIL PLANT DREDGE CELL RESTORATION

SPECIFICATION KIF-0-TS-02621

REVISION 2

FOR

GEOCOMPOSITE DRAINAGE LAYER

SECTION KIF-0-TS-02621

GEOCOMPOSITE DRAINAGE LAYER

TABLE OF CONTENTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. This Section covers technical requirements for furnishing and installing the geocomposite drainage layer.

B. This Section includes the following:

1. Geocomposite panel layout.

2. Furnishing and installing geocomposite.

3. Supervision of geocomposite installation by liner manufacturer's representative.

4. Construction of fill to be placed on geocomposite.

5. Submittal of data per Table 02621-1.

1.2 CODES AND STANDARDS

A. The latest edition and published addenda of the following publications in effect on the date of Contract Award are a part of this Section and, where referred to by title or by basic designation only, are applicable to the extent indicated by the specific reference:

1. American Society for Testing and Materials (ASTM):

a. D 1505, "Standard Test Method for Density of Plastics by the Density-Gradient Technique."

b. D 1603, "Standard Test Method for Carbon Black in Olefin Plastics."

c. D 4355, "Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc Type Apparatus."

d. D 4491, "Standard Test Method for Water Permeability of Geotextiles by Permittivity."

e. D 4716, "Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head."

f. D 4751, "Standard Test Method for Determining Apparent Opening Size of a Geotextile."

g. D 4833, "Standard Test Method for Index Puncture Resistance of Geotextiles, Geomembranes and Related Products."

h. D 5035, "Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)."

i. D 5199, "Standard Test Method for Measuring Nominal Thickness of Geotextiles and Geomembranes."

j. D 5261, "Standard Test Method for Measuring the Mass per Unit Area of Geotextiles."

k. D 5321, "Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method."

2. Geosynthetic Research Institute (GRI), GC-7, "Determination of Adhesion and Bond Strength of Geocomposites."

B. Where the above referenced codes and standards contain recommendations in addition to requirements, the recommendations shall be considered requirements and shall be followed unless stated otherwise by this technical specification Section.

C. In the event of any conflict between codes, or Technical Specifications and codes, the more stringent regulation shall apply.

1.3 SUBMITTALS

Submittals shall be as required in Table 02621-1.

1.4 PACKAGING AND DELIVERY

All geocomposites shall be covered during shipment. The geocomposite shall be supplied in rolls, labeled with at least the following information:

Manufacturer's Name

Product Identification

Roll Number

Roll Weight

Roll Dimensions

Date of Manufacture

Geotextile Types

Geotextile Bonding

1.5 HANDLING, STORAGE, AND PROTECTION

A. The geocomposite rolls shall be stored on pallets in a secured area, away from dirt, dust, water, and extreme heat. The storage space shall be protected from theft, vandalism, animals, passage of vehicles, and be adjacent to the area to be lined. Stack geocomposite drainage layer material to a height not exceeding four (4) rolls high. The Contractor shall

be responsible for unloading and storing the geocomposite in accordance with the manufacturer's recommendations.

B. Upon arrival at the jobsite, the installer shall conduct a surface inspection of all rolls for defects and damage. This inspection shall be conducted without unrolling or unpacking unless defects or damages are found or suspected. The Contractor shall notify the Owner of any defects or damages.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Manufacturer Requirements

1. The manufacturer of the geocomposite materials shall have had at least 10,000,000 square feet of its material installed for drainage and shall be approved by the Owner.

2. The geocomposite installation shall be performed under the supervision of the manufacturer's field representative or an installer approved by the manufacturer. The method of installation shall be approved by the manufacturer and authorized in writing, and submitted for approval before work begins to ensure that all warranties remain valid.

B. General Requirements

1. Geonet shall be manufactured by extruding two sets of polyethylene strands to form a three dimensional structure to provide planer water flow.

2. The geonet shall contain stabilizers to prevent ultraviolet light degradation.

R1

3. The drainage layer shall be provided as a geocomposite manufactured by heat bonding 6 oz/yd^2 nonwoven geotextile on the top of the geonet. For bottom geotextile, see paragraph 4 below. The bond shall be continuous with no unbonded areas. No burn through the geotextiles will be permitted. Glue and adhesives shall not be used.Geocomposite shall be FabriNet as manufactured by GSE Lining Technology, Inc. or approved equivalent. The geocomposite shall meet the following properties:

Characteristics	Test Method	Units	Criteria (MARV)
Resin			
Polymer Density	ASTM D 1505	g/cm^3	0.94
Melt Flow Index	ASTM D 1238	g/10 min	≤1.0
Geonet Test			
Carbon Black	ASTM D 1603	%	2.0
Tensile Strength, MD	ASTM D 5035	lbs/ ft	45
Density	ASTM D 1505	g/cm^3	0.94
Thickness	ASTM D 5199	mil	200
Non-Woven Geotextile Tests (Upper Geotextile)			
Mass per Unit Area	ASTM D 5261	oz/yd^2	6.0
Grab Tensile	ASTM D 4632	lbs.	170
Puncture	ASTM D 4833	lbs.	90
AOS, US Sieve	ASTM D 4751	mm	70
Water Flow Rate	ASTM D 4491	gpm/ft^2	110
UV Resistance	ASTM D 4355 (after 500 hours)	% retained	70
Woven Geotextile Tests (Lower Geotextile)**			
Mass per Unit Area	ASTM D 5261	oz/yd^2	10
Grab Tensile	ASTM D 4632	lbs.	250
Puncture	ASTM D 4833	lbs.	150
AOS, US Sieve	ASTM D 4751	mm	100
Water Flow Rate	ASTM D 4491	gpm/ft^2	85
Geocomposite Tests			
Ply Adhesion	GRI GC-7	lbs/ in.	1.0
Transmissivity*	ASTM D 4716-00	m^2/sec	1×10^{-4}
Interface-Friction Tests			
Geocomposite/ Cover Soil	ASTM D 5321	degrees	22 (Residual)
Geocomposite/Geomemeb.	ASTM D 5321	degrees	24 (Residual)

*Water at 20° C with a gradient of 0.1 and a load of 10,000 psf between two steel plates for 15 min.
**Non-Woven needlepunched geotextile shall be Carthage Mills FX-100HS or equivalent. R2

4. The geocomposite drainage layer beneath the compacted soil layer shall consist of the following components placed in order from ash surface upward:
   a. a non-woven needlepunched geotextile with AOS equal to 100; R2
   b. the non-woven needlepunched geotextile shall be heat bonded to the geonet; R2
   c. the upper geotextile shall be a non-woven needlepunched geotextile heat bonded to the geonet.

Manufacturing Quality Control

1. The geocomposite shall be manufactured in accordance with the Manufacturer's Quality Control Plan submitted to and approved by the Owner.

2. The geocomposite shall be tested according to the test methods and frequencies listed below:

Manufacturing Quality Control Test Frequencies			
Characteristics	**Test Method**		**FREQUENCY**
Resin			
Polymer Density	ASTM D 1505		Once Per Lot
Melt Flow Index	ASTM D 1238		Once Per Lot
Geonet Test			
Carbon Black	ASTM D 1603		1/50,000 ft^2
Tensile Strength, MD	ASTM D 5035		1/50,000 ft^2
Density	ASTM D 1505		1/50,000 ft^2
Thickness	ASTM D 5199		1/50,000 ft^2
Geotextile Tests			
Mass per Unit Area	ASTM D 5261		1/90,000 ft^2
Grab Tensile	ASTM D 4632		1/90,000 ft^2
Puncture	ASTM D 4833		1/90,000 ft^2
AOS, US Sieve	ASTM D 4751		1/540,000 ft^2
Water Flow Rate	ASTM D 4491		1/540,000 ft^2
UV Resistance	ASTM D 4355 (after 500 hours)		Once per resin formulation
Geocomposite Tests			
Ply Adhesion	GRI GC-7		1/50,000 ft^2
Transmissivity	ASTM D 4716-00		1/540,000 ft^2
Interface-Friction Tests*			
Geocomposite/ Cover Soil	ASTM D 5321		two tests
Geocomposite/Geomemb.	ASTM D 5321		two tests

* See NOTE under Table 02621-1 herein.

PART 3 – EXECUTION

3.1 INSTALLER REQUIREMENTS

A. An installer that has previously installed a minimum of 2,000,000 square feet of geocomposite shall perform the installation.

B. The installer's or manufacturer's field representative shall be in attendance full time during the GCL installation.

C. The GCL installer's or manufacturer's field representative shall certify in writing that all materials and shop drawings regarding panel placement, and construction techniques are

in compliance with the manufacturer's recommendations and other accepted QA/QC procedures.

3.2 GEOCOMPOSITE DRAINAGE LAYER INSTALLATION

A. General Requirements:

1. The Contractor shall be responsible for the design of the geocomposite panel layout. Panels shall be placed with seams running up and down slopes, not horizontally.

2. The fabricator of the geocomposite panels used in the work shall prepare shop drawings with a proposed panel layout to cover the area shown on the Drawings. These drawings shall be submitted for approval prior to fabrication of the geocomposite. The drawings shall be provided in a reproducible hard copy or electronic format.

3. Written specifications for the manufacture, fabrication, installation, and quality assurance/quality control for the geocomposite shall be approved by the Owner prior to start of liner fabrication.

B. Installation Requirements:

1. The geocomposite shall be placed with the long dimension parallel with the slope direction (up and down the slope, not sideways).

2. For long, steep slopes, special care shall be taken so that only full-length rolls are used at the top of the slope.

3. Adjacent roll edges of geocomposite shall be overlapped a minimum of 3-inches. The roll ends of geonets shall be overlapped a minimum of 6-inches.

4. All overlaps shall be joined by tying with plastic fasteners or polymeric braid. Metallic ties or fasteners are not allowed.

5. Tying devices shall be white or yellow, as contrasted to the black geonet, for ease of visual inspection.

6. Tie intervals along the roll edges shall be every 5-feet. Tie intervals along the roll ends shall be every 6-inches.

7. The geocomposite edges shall be seamed in accordance with the above requirements and sewn together. Roll ends shall be seamed in accordance with the above requirements and a geotextile cap shall be heat-bonded over the completed seam. The geotextile cap shall cover the open end of the geonet, the ties, and at least 6 inches of geotextile beyond the ties or geonet end. Heat bonding shall be performed with the utmost of care to prevent damage to any portion of the liner system. No burn through the geotextiles will be permitted.

8. The geocomposite shall be protected at all times during construction from contamination resulting from surface runoff. Any geocomposite so contaminated or otherwise damaged shall be removed and replaced.

9. In the presence of wind, all geocomposites shall be weighted down with sandbags or the equivalent. Such sandbags shall be used during placement and remain until replaced with cover material.

10. The geocomposite shall be properly anchored in the anchor trench to resist sliding. Anchor trench compaction equipment shall not come into contact with the geocomposite.

11. Install anchor trench in accordance with Specification 02778, LLDPE Geomembrane Construction Quality Assurance (Attachment 2 to QA/QC Plan).

3.3 COVER PLACEMENT

A. Cover soils shall be free of angular stones or other foreign matter, which could damage the geocomposite. Cover soils shall be approved by the Owner with respect to particle size, uniformity and chemical compatibility.

B. Soil cover shall be placed over the geocomposite using construction equipment that minimizes stresses on the geocomposite. A minimum of 1 foot of cover shall be maintained between the equipment tires/tracks and the geocomposite at all times during the covering process. This thickness recommendation does not apply to frequently trafficked areas or roadways, for which a minimum thickness of 2 feet shall be required.

C. Soil cover shall be placed in a manner that prevents the soil from entering the geocomposite overlap zones. Cover soil shall be pushed up slopes, not down slopes, to minimize tensile forces on the geocomposite.

D. Although direct vehicular contact with the geocomposite is to be avoided, lightweight, low ground pressure vehicles (such as 4-wheel, all-terrain vehicles) may be used to facilitate the initial placement of cover soil. The geocomposite supplier shall be contacted with specific recommendations on the appropriate procedures in this situation.

3.4 REPAIR

A. Prior to covering the deployed geocomposite, each roll shall be inspected for damage resulting from construction.

B. Any rips, tears or damaged areas on the deployed geocomposite shall be removed and patched. The patch shall be secured to the original geonet by tying every 6 inches with the approved tying devices. If the area to be repaired is more than 50 percent of the width of the panel, the damaged area shall be cut out and the two portions of the geocomposite shall be cut out and the two portions of the geocomposite shall be joined together in accordance with Section 3.3.

3.5 INTERFACE-FRICTION TESTING

A. Laboratory interface friction testing on the geocomposite/cover-soil and geocomposite/geomembrane interfaces shall be performed in accordance with ASTM D5321. Testing shall be performed with representative samples of geocomposite, geomembrane and Random Fill soil that will be compacted to 90% standard Proctor maximum dry density and used for construction of the final cover. For the geocomposite/cover-soil test, the substratum shall be the top surface of the geocomposite and the superstratum shall be the cover soil. For the geocomposite/geomembrane test, the superstratum shall be the geocomposite bottom surface and the substratum shall be the geomembrane top surface. A normal-stress range 0.1 tsf to 1.0 tsf shall be used. The compacted soil sample shall be saturated with water and both the geocomposite and geomembrane surfaces shall be wetted prior to shearing during the test. Both peak and residual shear stresses under each normal stress shall be recorded and friction angle interpreted separately for both peak and residual shear strength.

B The report for the testing shall consist, at a minimum, of sample size, sample origin, sample lot number, illustration of equipment used, summary of test methods employed, strain rate used during shear, shear stress-versus-displacement, normal stress-versus-peak stress and residual stress, peak and residual strength envelope plots. All stress versus displacement tests and all calculations performed to determine the angles of friction shall be corrected for machine resistance.

TABLE 02621-1 - DATA REQUIREMENTS AND SUBMITTAL SCHEDULE

Paragraph - Submittal Requirements		With Proposal	For Approval		For Record	
			Date	Copies	Date	Copies
All	Alternative Materials or Procedures	Yes	-	-	-	-
2.1 A	Manufacturer & Specification Sheet	Yes	-	-	-	-
2.1 B	Material Certification	No	2 Weeks prior to delivery	3	-	-
2.1 C	Manufacturing QC Testing	No	-	-	With delivery of rolls	3
3.1 A	Geocomposite Manufacturer's Experience	Yes	-	-	-	-
3.2 A	Manufacturer's Representative and Installation Requirements	No	2 Weeks prior to delivery	3	-	-
3.2 A	Shop Drawings for Geocomposite Installation	No	2 Weeks prior to Work	3 Prints	-	-
3.1 C	Final Documentation	No	-	-	Within 2 weeks after Work	3 Prints
3.5	Interface Friction Testing	No	*	-	-	-

* NOTE: Interface-friction testing shall be performed by CQA Consultant and the results will be used for approval prior to procurement. Geocomposite and geomemebrane samples shall be provided by the manufacturer(s) and loose soil sample will be provided by TVA.

END