Figure 2.4-30 thru Figure 2.4-40 Are Not Used

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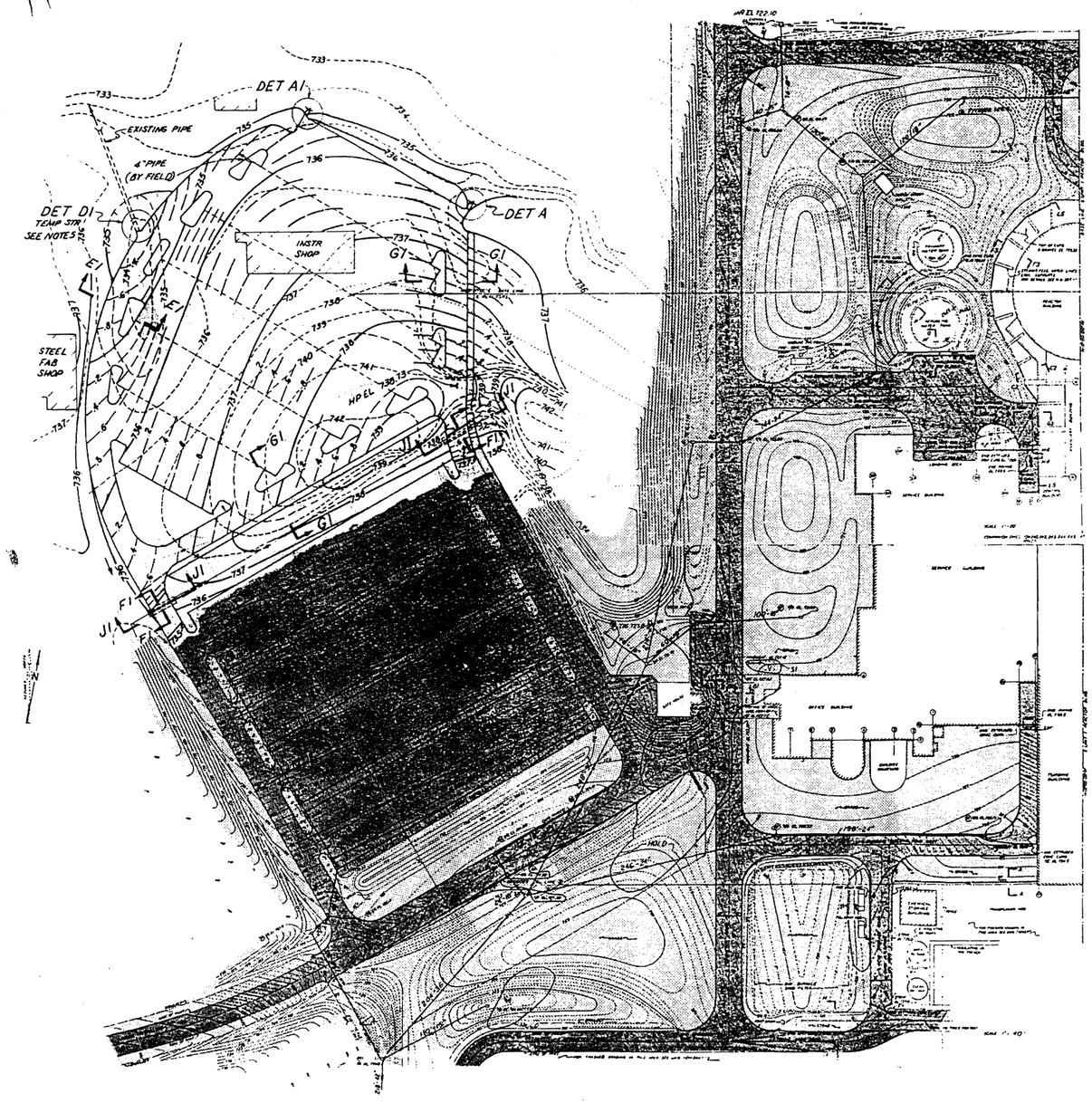
Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40a Main Plant Site Grading And Drainage System For Flood Studies Sheet 1

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40a Main Plant Site Grading and Drainage System For Flood Studies Sheet 2



Added by Amendment 50

LEGEND
PAVED AREAS
GRASSED AREAS

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

MAIN PLANT
SITE GRADING AND DRAINAGE
SYSTEM FOR FLOOD STUDIES
SHEET 3
FIGURE 2.4-40a

Figure 2.4-40a Main Plant Site Grading and Drainage System For Flood Studies Sheet 3

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40b Main Plant General Plan

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40c Yard Site Grading and Drainage System For Flood Studies

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40d-1 Main Plant Plant Perimeter Roads Plan and Profile Sheet 1

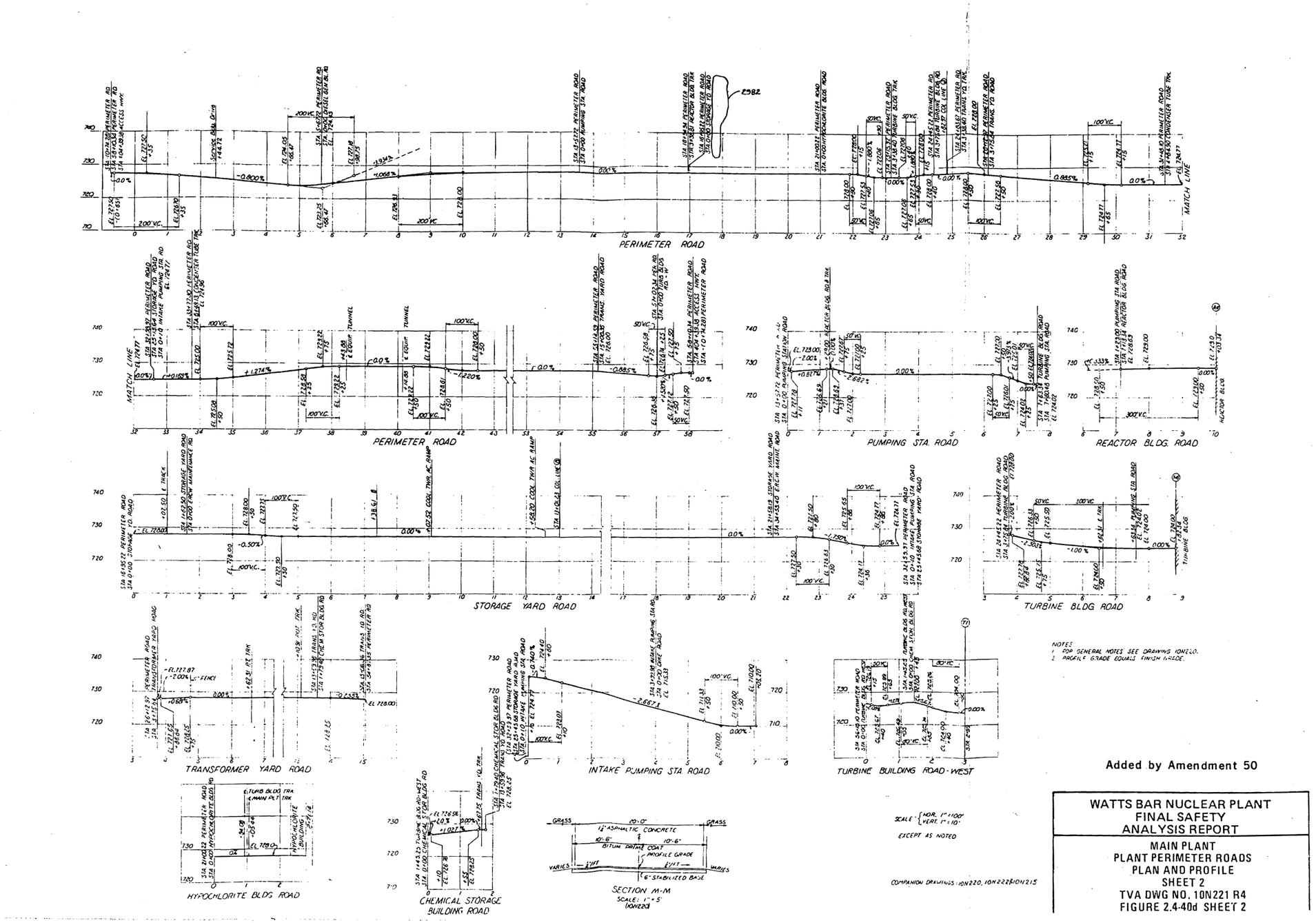
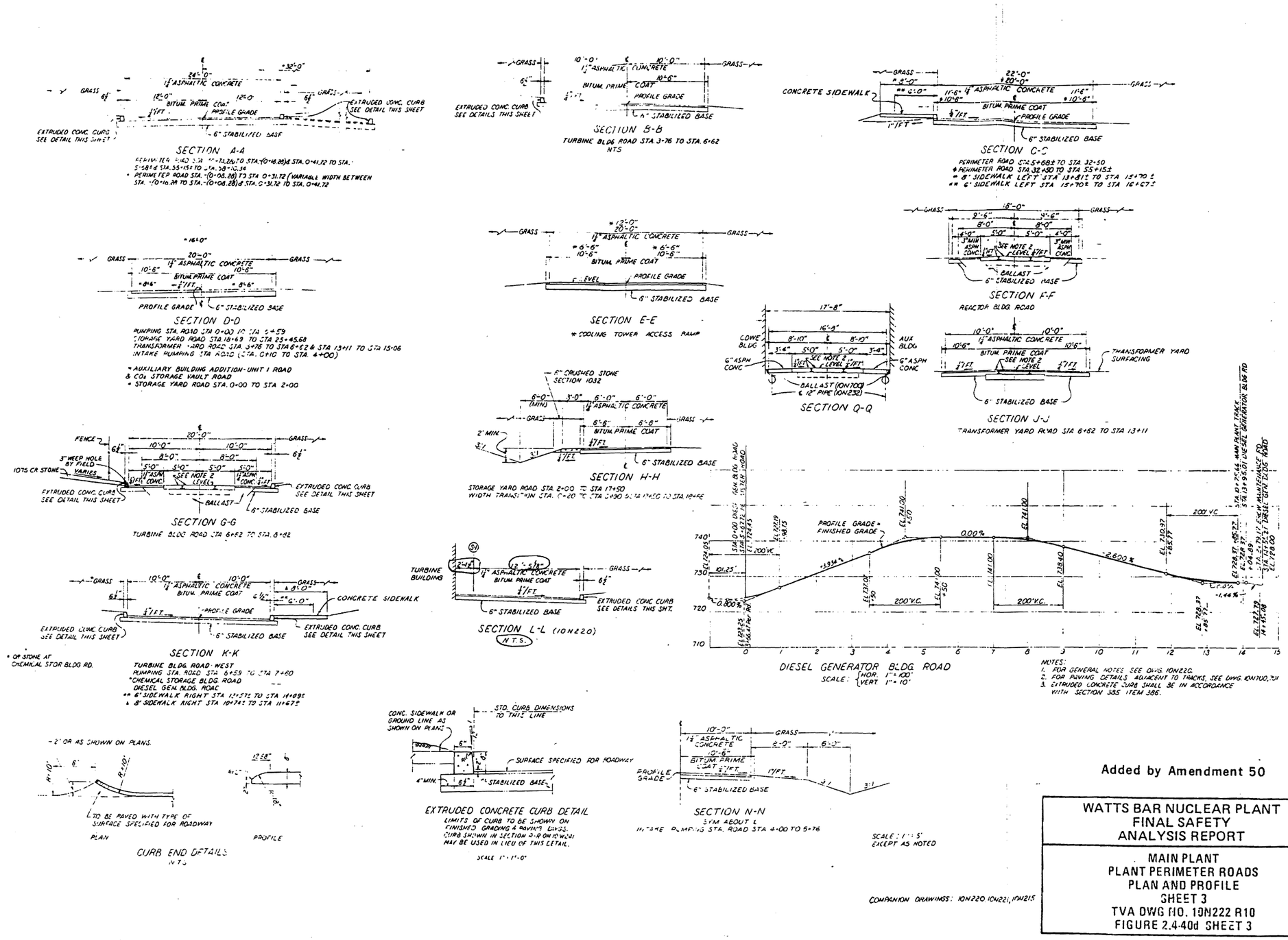


Figure 2.4-40d Main Plant Plant Perimeter Roads Plan and Profile - Sheet 2



Added by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
MAIN PLANT PLANT PERIMETER ROADS PLAN AND PROFILE SHEET 3 TVA DWG NO. 10N222 R10 FIGURE 2.4-40d SHEET 3

Figure 2.4-40d Main Plant Plant Perimeter Roads Plan and Profile - Sheet 3

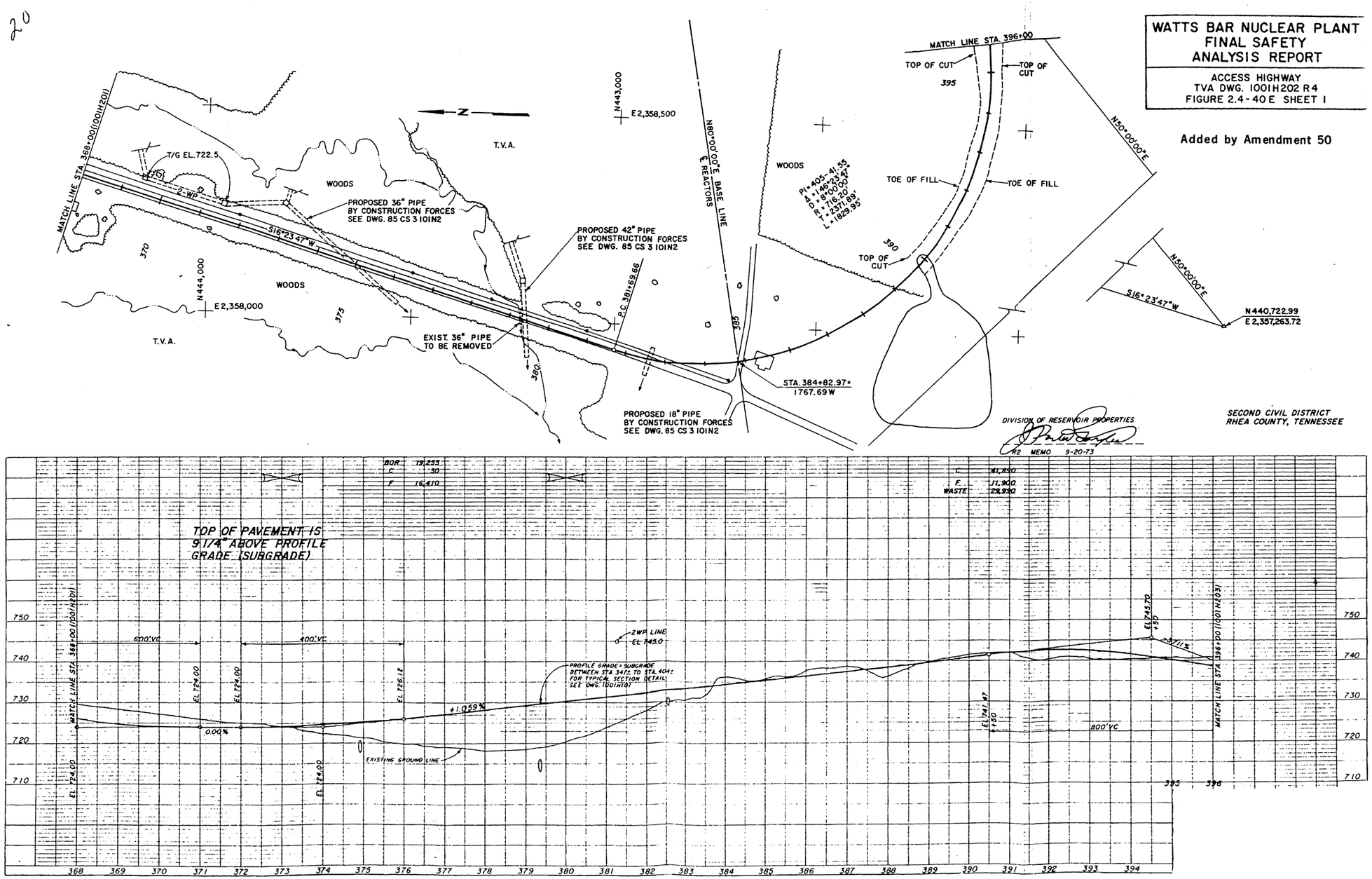


Figure 2.4-40e Access Highway TVA DWG 1001H202 R4 - Sheet 1

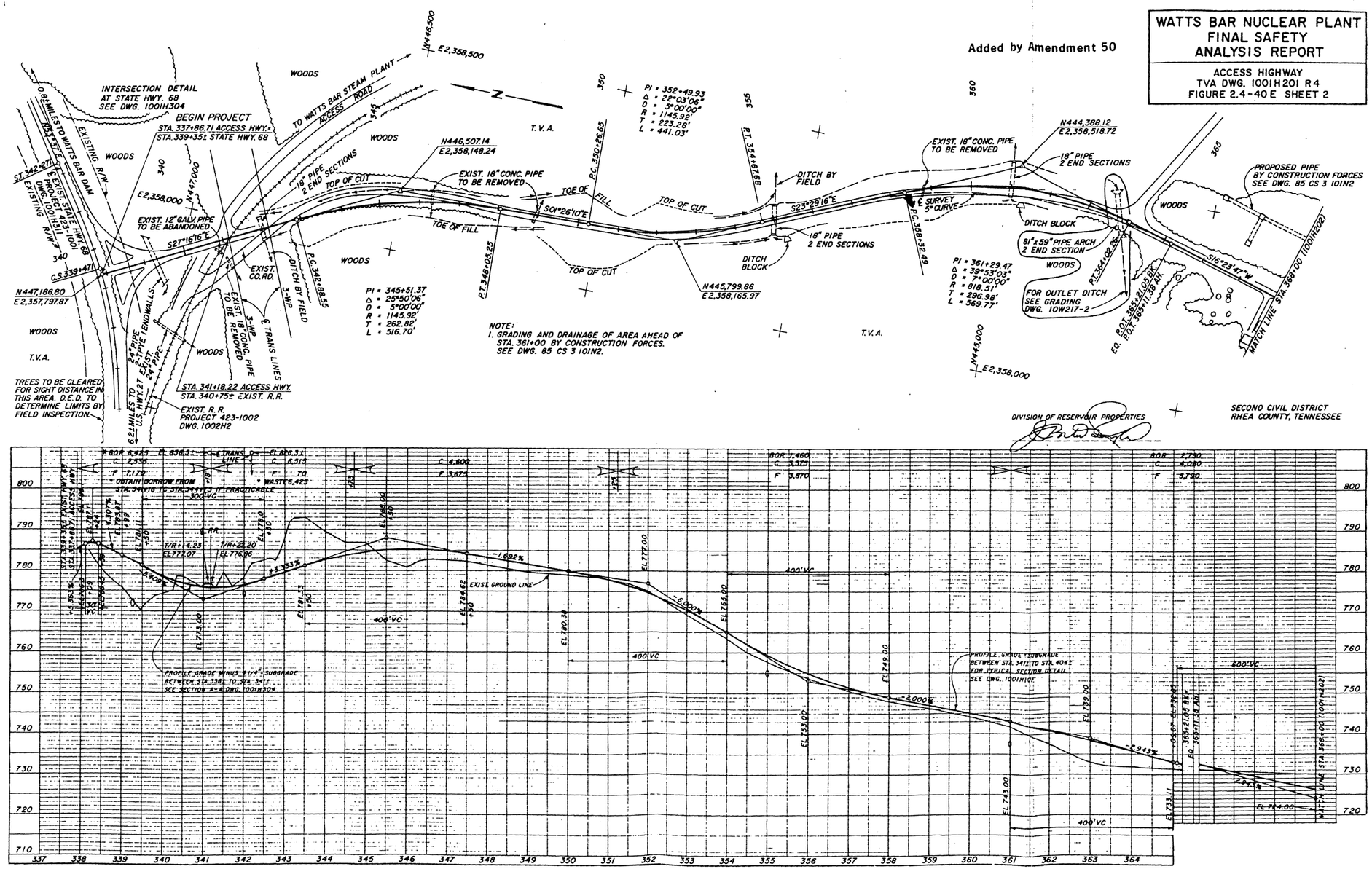
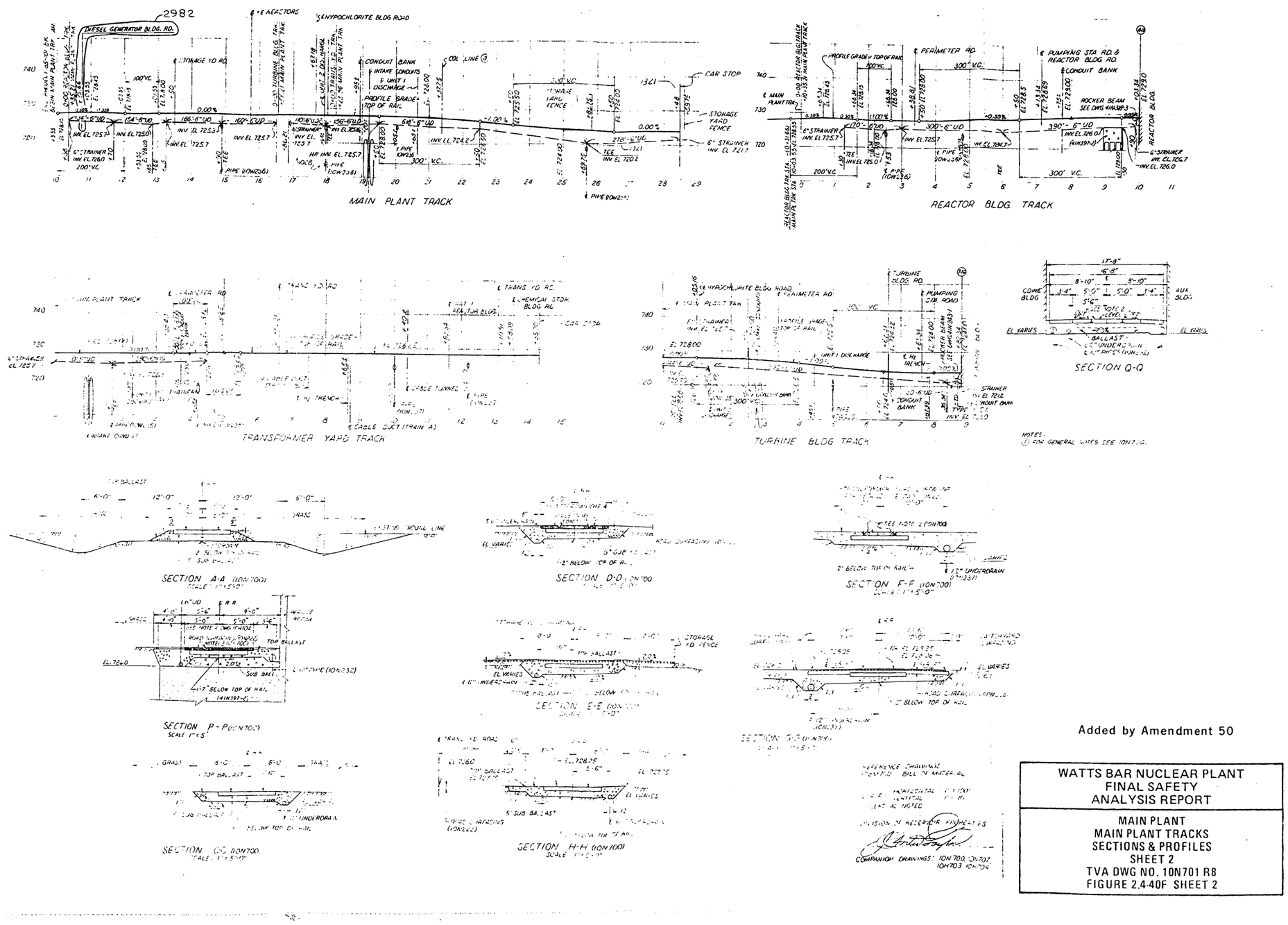


Figure 2.4-40e Access Highway TVA DWG. 1001H201 R4 - Sheet 2

Security-Related Information - Withheld Under 10CFR2.390

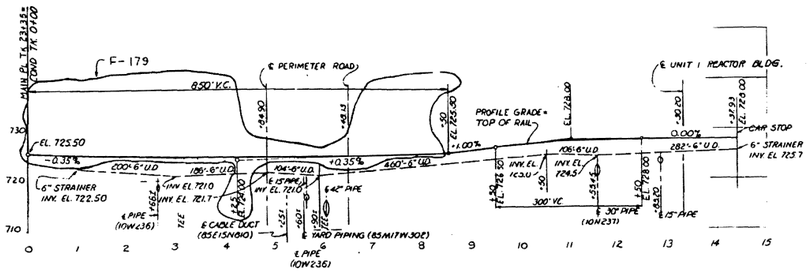
Figure 2.4-40f Main Plant Main Plant Tracks Plan - Sheet 1

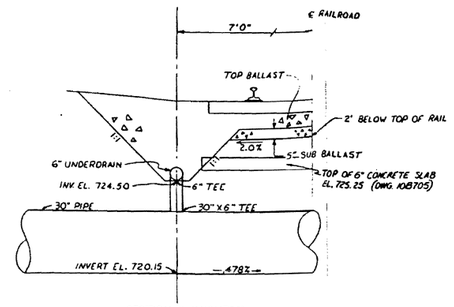


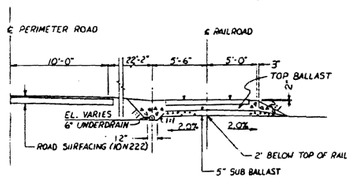
Added by Amendment 50

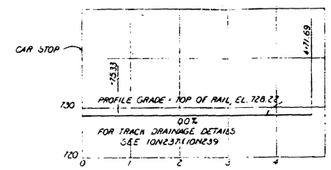
WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
MAIN PLANT MAIN PLANT TRACKS SECTIONS & PROFILES SHEET 2 TVA DWG NO. 10N701 R8 FIGURE 2.4-40F SHEET 2

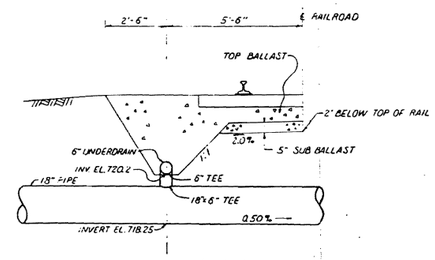
Figure 2.4-40f Main Plant Main Plant Tracks Sections & Profiles - Sheet 2

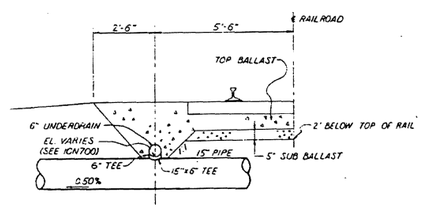


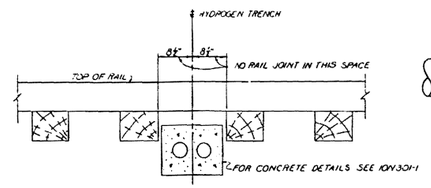




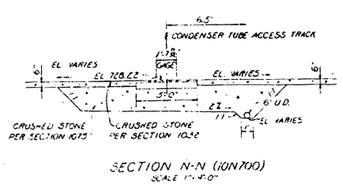








NOTES:
1. FOR GENERAL NOTES SEE 10N700.



Added by Amendment 50

SCALE AS SHOWN

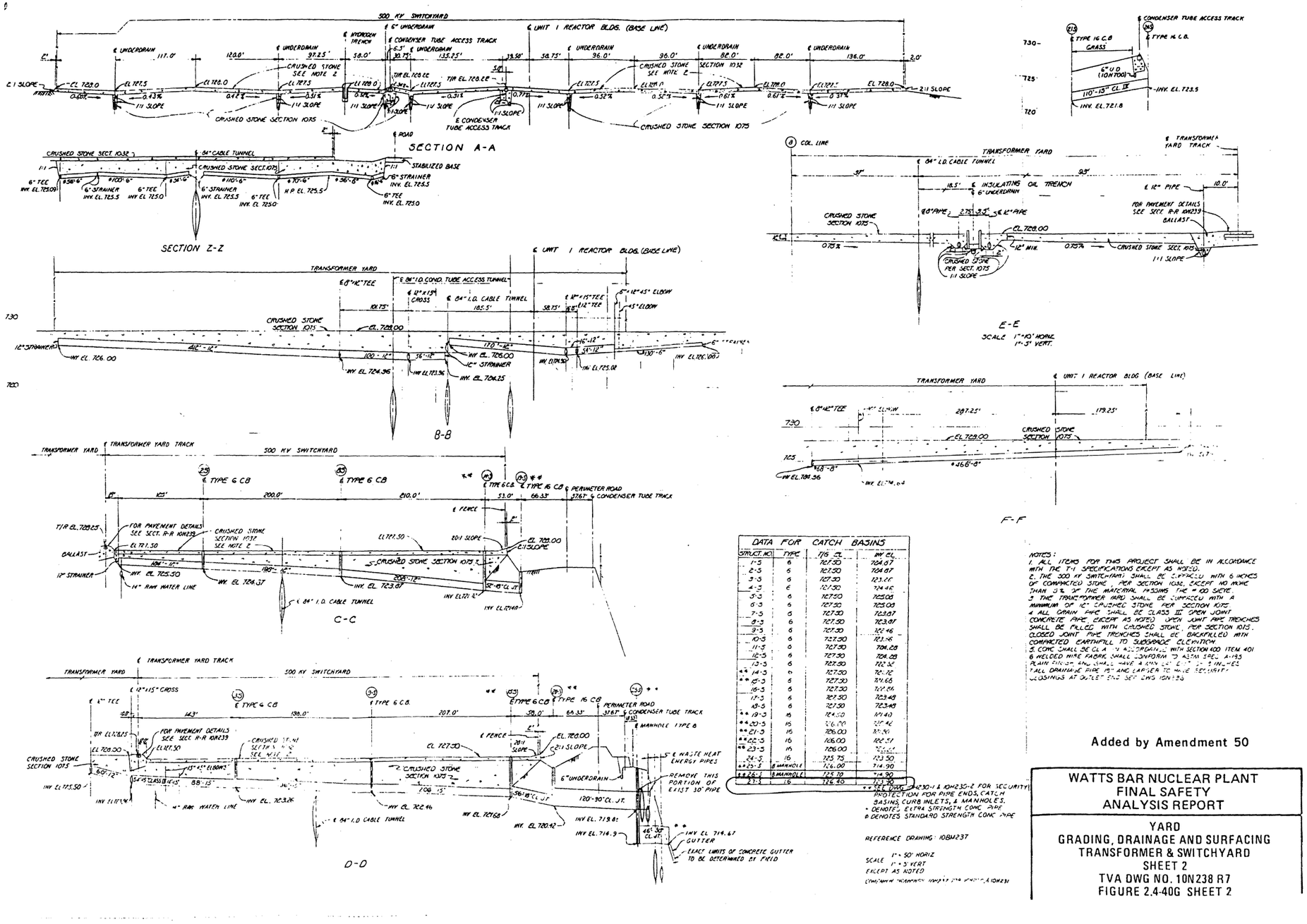
COMPANION DRAWINGS: 10N700, 10N701, 10N237, 10N239, 10H703, 10H704, 10B705.

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
MAIN PLANT MAIN PLANT TRACKS SECTIONS & PROFILES SHEET 3 TVA DWG NO. 10N702 R3 FIGURE 2.4-40F SHEET 3

Figure 2.4-40f Main Plant Main Plant Tracks Sections & Profiles - Sheet 3

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 1



DATA FOR CATCH BASINS			
STRUCT. NO.	TYPE	T/G EL.	INV EL.
1-3	6	727.50	724.07
2-3	6	727.50	724.07
3-3	6	727.50	723.07
4-3	6	727.50	724.46
5-3	6	727.50	725.03
6-3	6	727.50	725.03
7-3	6	727.50	723.07
8-3	6	727.50	723.07
9-3	6	727.50	722.46
10-3	6	727.50	723.56
11-3	6	727.50	724.28
12-3	6	727.50	724.28
13-3	6	727.50	722.32
* 14-3	6	727.50	721.12
* * 15-3	6	727.50	719.66
16-3	6	727.50	724.46
17-3	6	727.50	723.49
18-3	6	727.50	723.49
* * 19-3	16	724.50	719.40
* * 20-3	16	726.00	719.42
* * 21-3	16	726.00	719.90
* * 22-3	16	726.00	722.51
* * 23-3	16	726.00	[illegible]
24-3	16	725.75	723.50
* * 25-3	8 MANHOLE	726.00	714.90
* * 26-1	8 MANHOLE	725.10	714.90
27-3	16	726.40	723.50

* SEE DWG. 10N230-1 & 10N230-2 FOR SECURITY PROTECTION FOR PIPE ENDS, CATCH BASINS, CURB INLETS, & MANHOLES.
* DENOTES EXTRA STRENGTH CONC. PIPE
* DENOTES STANDARD STRENGTH CONC. PIPE

REFERENCE DRAWING: 10BM237

SCALE 1" = 50' HORIZ.
1" = 5' VERT.
EXCEPT AS NOTED

NOTES:
1. ALL ITEMS FOR THIS PROJECT SHALL BE IN ACCORDANCE WITH THE T-1 SPECIFICATIONS EXCEPT AS NOTED.
2. THE 500 KV SWITCHYARD SHALL BE SURFACED WITH 6 INCHES OF COMPACTED STONE, PER SECTION 1038, EXCEPT NO MORE THAN 3% OF THE MATERIAL PASSING THE #40 SIEVE.
3. THE TRANSFORMER YARD SHALL BE SURFACED WITH A MINIMUM OF 12" CRUSHED STONE PER SECTION 1075.
4. ALL DRAIN PIPE SHALL BE CLASS II OPEN JOINT CONCRETE PIPE EXCEPT AS NOTED. OPEN JOINT PIPE TRENCHES SHALL BE FILLED WITH CRUSHED STONE, PER SECTION 1015. CLOSED JOINT PIPE TRENCHES SHALL BE BACKFILLED WITH COMPACTED EARTHFILL TO SUBGRADE ELEVATION.
5. CONC. SHALL BE CLASS A AS SPECIFIED WITH SECTION 400 ITEM 401
6. WELDED WIRE FABRIC SHALL CONFORM TO ASTM SPEC. A-185 PLAIN DIRECTION AND SHALL HAVE A MIN. [illegible] INCHES TALL. DRAINAGE PIPE 18" AND LARGER TO HAVE SECURITY GRATINGS AT OUTLET END. SEE DWG 10N239

Added by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

YARD
GRADING, DRAINAGE AND SURFACING
TRANSFORMER & SWITCHYARD
SHEET 2
TVA DWG NO. 10N238 R7
FIGURE 2.4-40G SHEET 2

Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 2

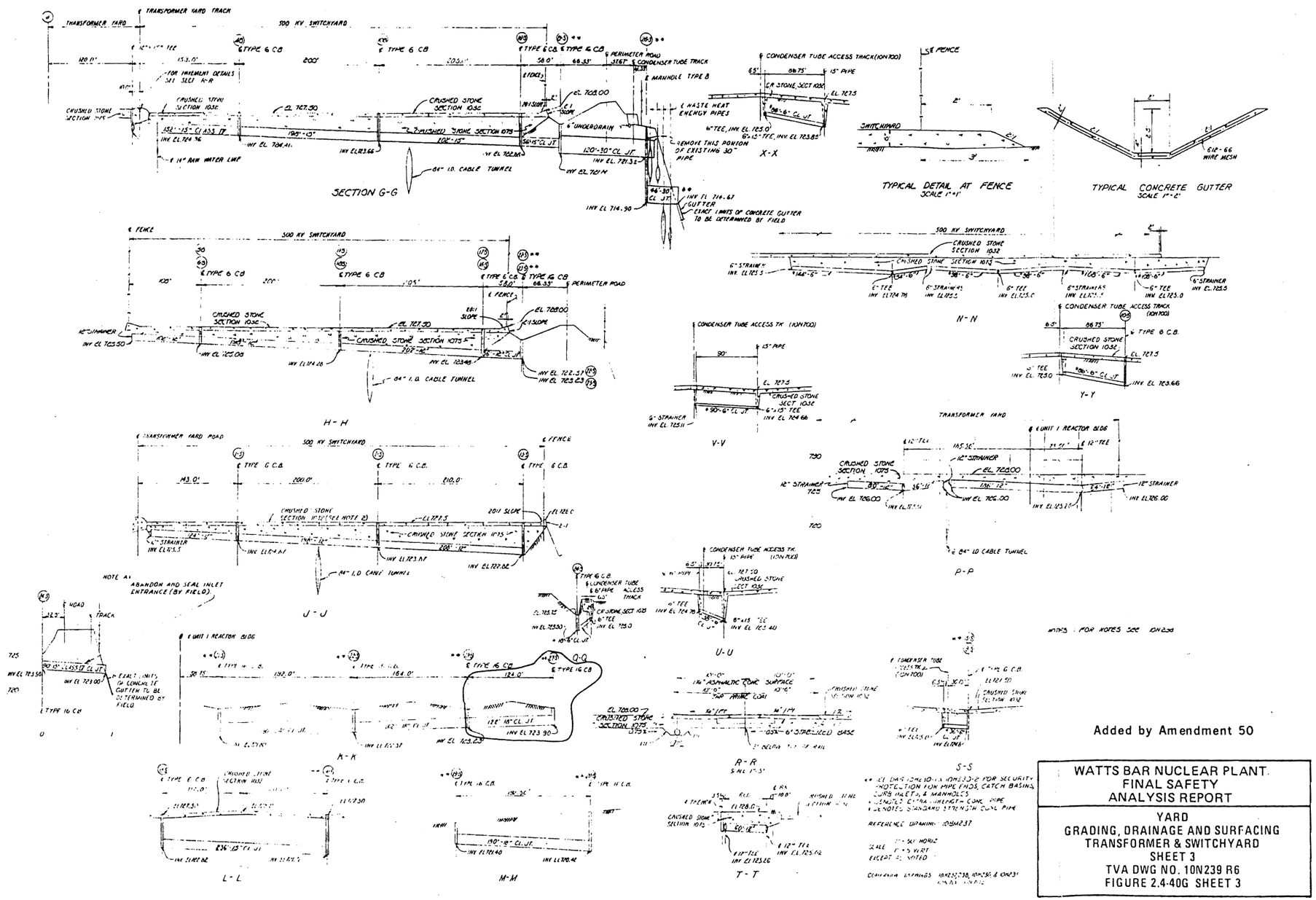
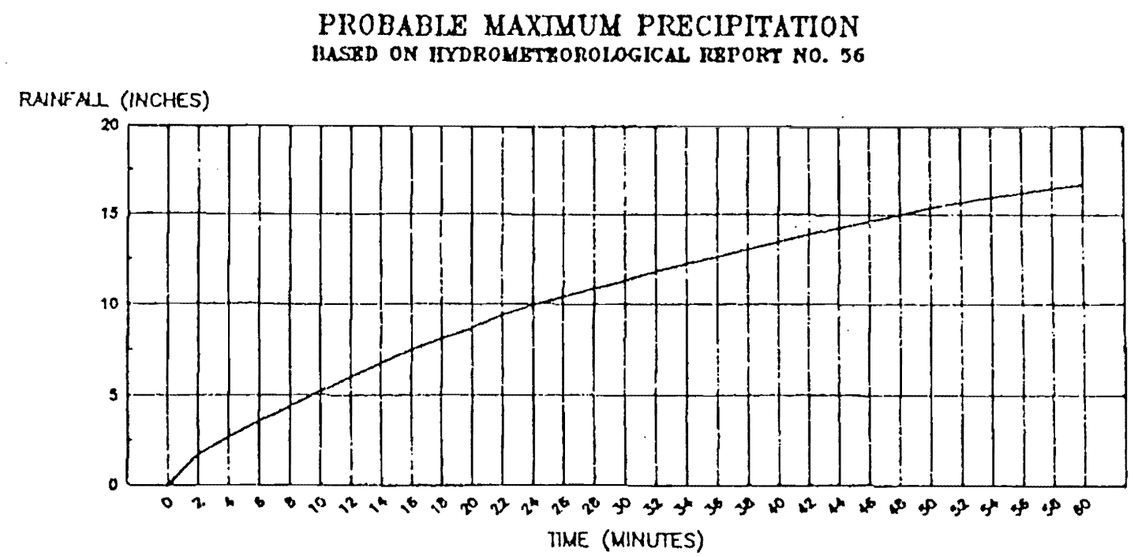


Figure 2.4-40g Yard, Grading Drainage and Surfacing Transformer & Switchyard - Sheet 3



SCANNED DOCUMENT
THIS IS A SCANNED DOCUMENT MAINTAINED ON THE LBNP OPTIGRAPHICS SCANNER DATABASE

AMENDMENT 83

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

PROBABLE MAXIMUM PRECIPITATION
POINT RAINFALL
FIGURE 2.4-40h

Figure 2.4-40h Probable Maximum Precipation Point Rainfall

Figure 2.4-40i Deleted by Amendment 83

Figure 2.4-40j Deleted by Amendment 83

Figure 2.4-40k Deleted by Amendment 83

Figure 2.4-40L Deleted by Amendment 83

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Figure 2.4-41 thru Figure 2.4-60 Are Not Used

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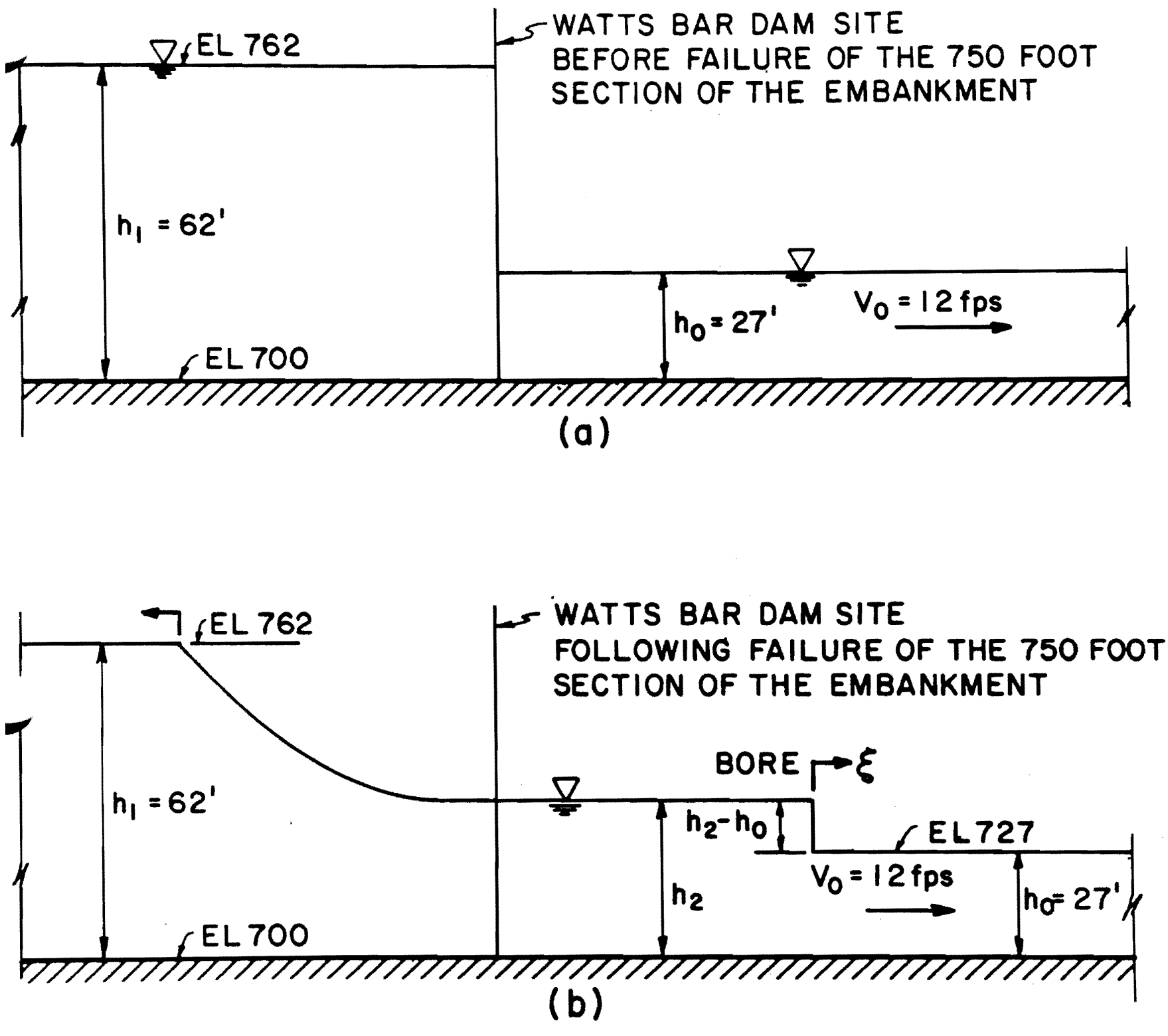
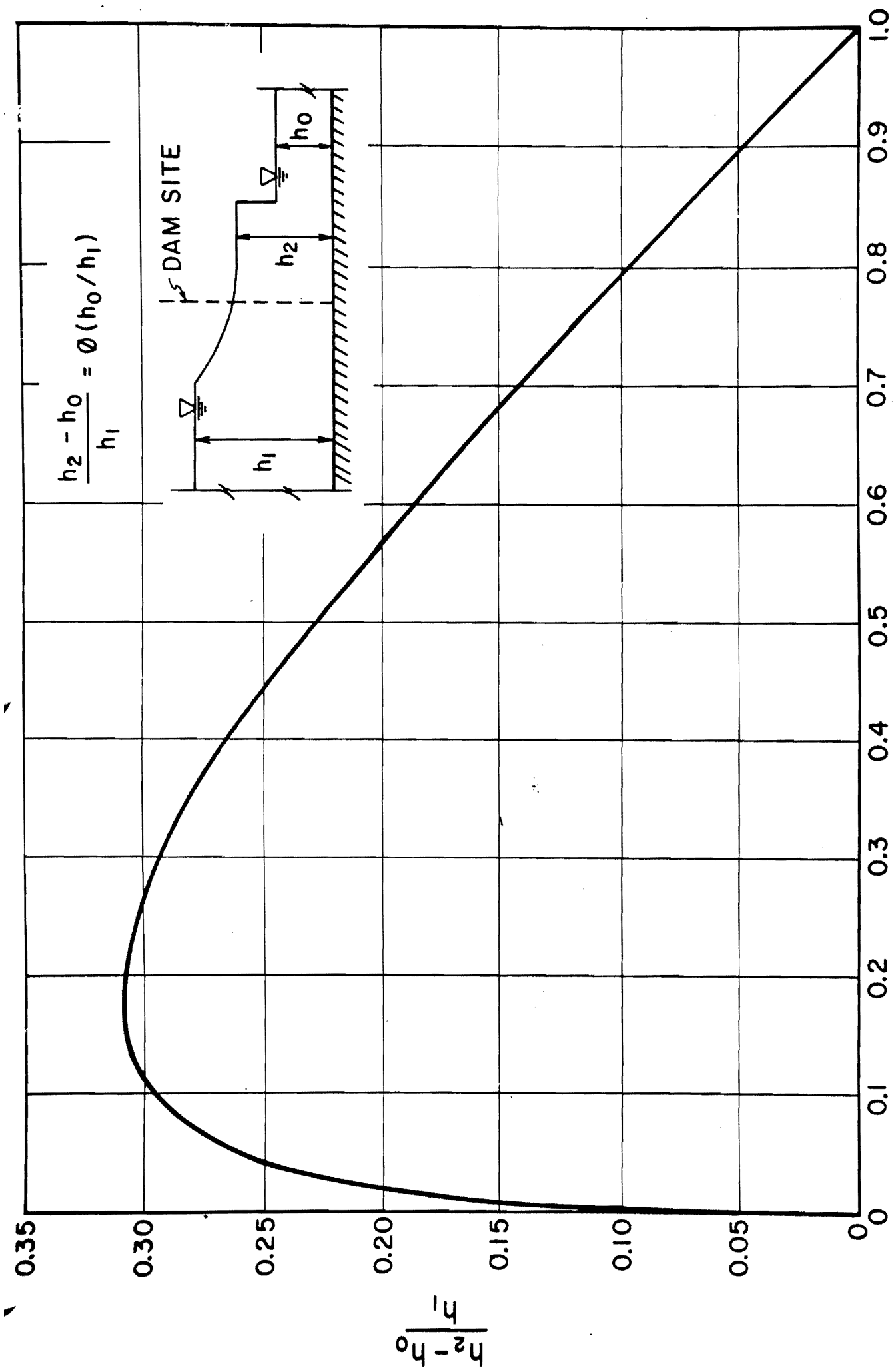


WATTS BAR PROBABLE MAXIMUM FLOOD
WATER LEVELS BEFORE & AFTER EMBANKMENT FAILURE
FIGURE 2.4-61

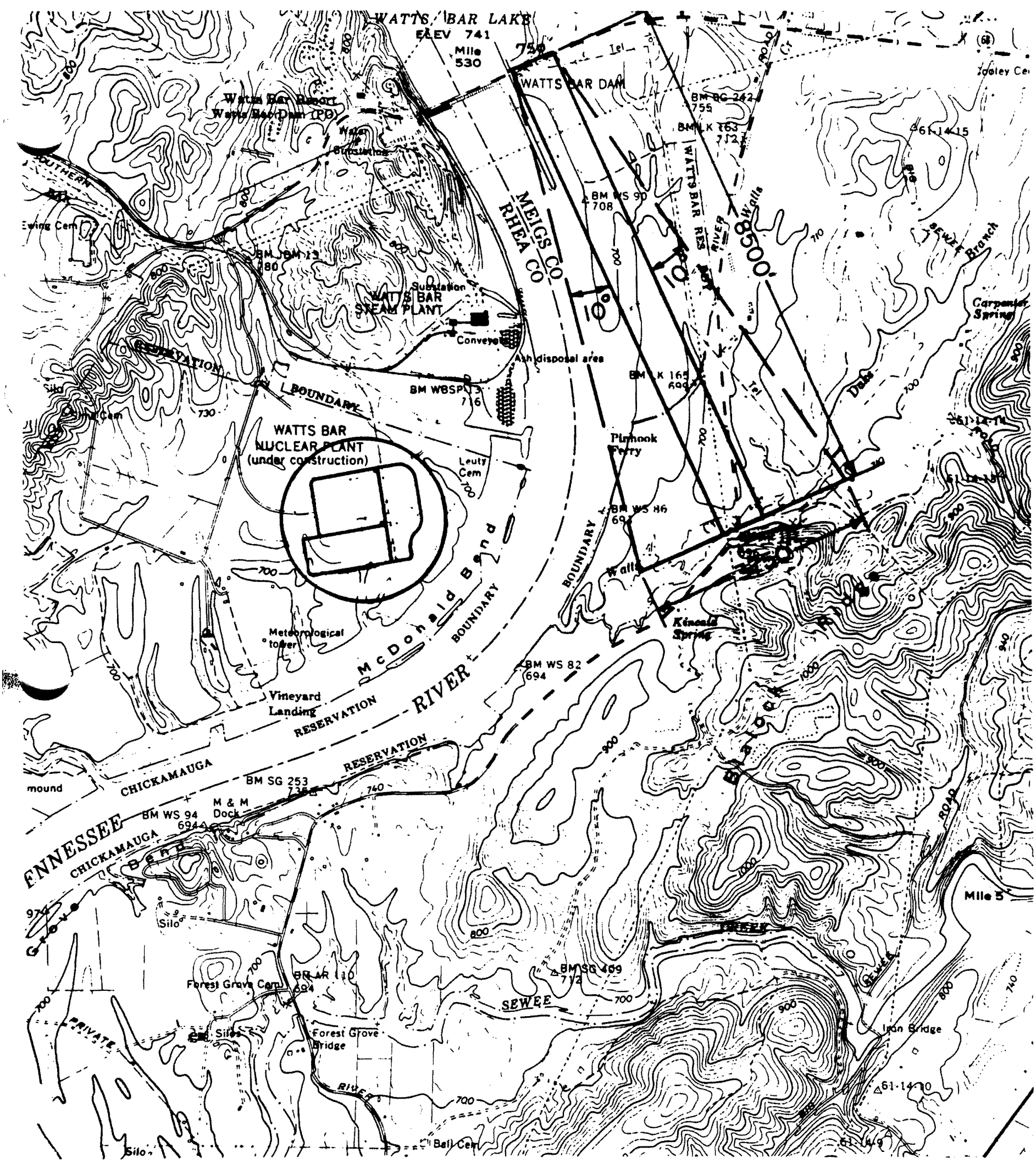
Revised by Amendment 39

Figure 2.4-61 Watts Bar Probable Maximum Flood Water Levels Before and After Embankment Failure



RELATIVE BORE HEIGHT (AFTER J.J. STROKER, REF. 31)
FIGURE 2.4-62
Revised by Amendment 39

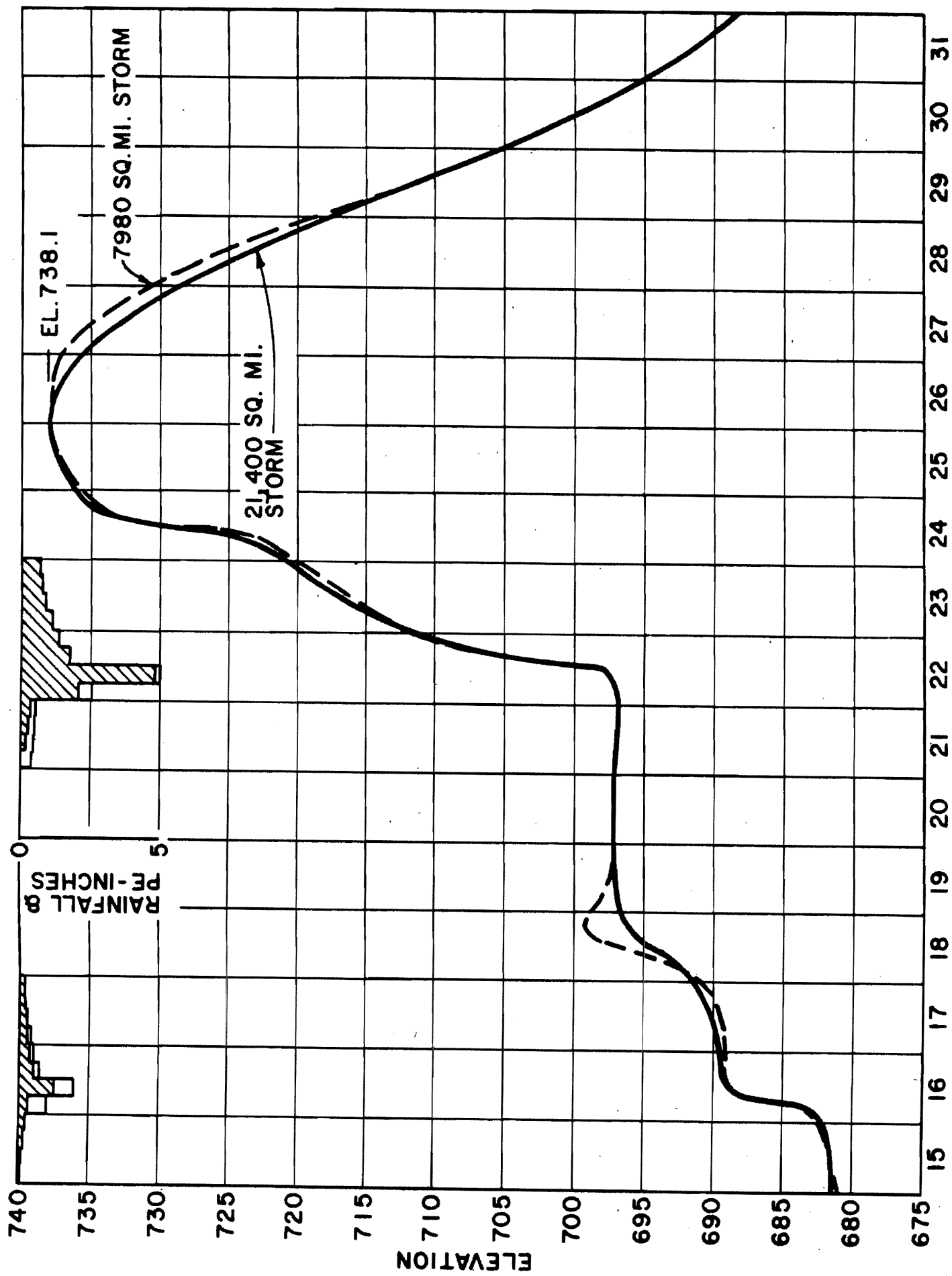
Figure 2.4-62 Relative Bore Height (After J. J. Stroker, REF. 31)



ASSUMED LIMITS OF EMBANKMENT FAILURE
WAVE EXPANSION
FIGURE 2.4-63

Revised by Amendment 39

Figure 2.4-63 Assumed Limits of Embankment Failure Wave Expansion



WATTS BAR NUCLEAR PLANT PROBABLE MAXIMUM FLOOD ELEVATION
FIGURE 2.4-64

Revised by Amendment 32

Figure 2.4-64 Watts Bar Nuclear Plant Probable Maximum Flood Elevation

Figure 2.4-65 thru Figure 2.4-67 Are Not Used

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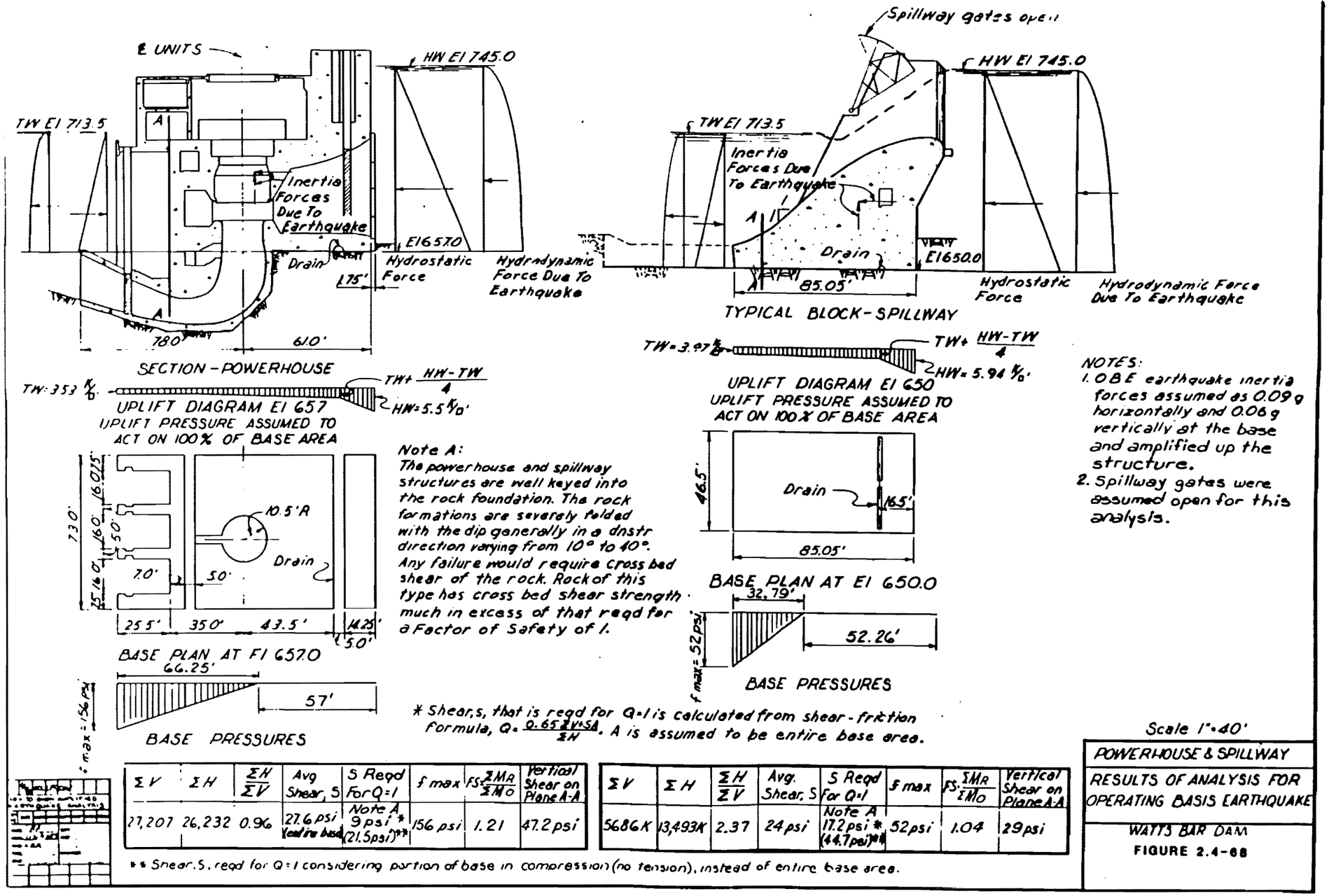


Note A:
The powerhouse and spillway structures are well keyed into the rock foundation. The rock formations are severely folded with the dip generally in a dnstr direction varying from 10° to 40°. Any failure would require cross bed shear of the rock. Rock of this type has cross bed shear strength much in excess of that reqd for a Factor of Safety of 1.

NOTES:
1. OBE earthquake inertia forces assumed as 0.09 g horizontally and 0.06 g vertically at the base and amplified up the structure.
2. Spillway gates were assumed open for this analysis.

* Shear, S, that is reqd for Q=1 is calculated from shear-friction formula, $Q = \frac{0.65\,\Sigma V + SA}{\Sigma H}$. A is assumed to be entire base area.

ΣV	ΣH	ΣH/ΣV	Avg Shear, S	S Reqd For Q=1	f max	FS: ΣMR/ΣMO	Vertical Shear on Plane A-A
27,207	26,232	0.96	27.6 psi (cut fire base)	Note A 9 psi * (21.5 psi)**	156 psi	1.21	47.2 psi

ΣV	ΣH	ΣH/ΣV	Avg. Shear, S	S Reqd for Q=1	f max	FS: ΣMR/ΣMO	Vertical Shear on Plane A-A
5686K	13,493K	2.37	24 psi	Note A 17.2 psi * (44.7 psi)**	52 psi	1.04	29 psi

** Shear, S, reqd for Q=1 considering portion of base in compression (no tension), instead of entire base area.

Scale 1" = 40'

POWERHOUSE & SPILLWAY
RESULTS OF ANALYSIS FOR OPERATING BASIS EARTHQUAKE
WATTS BAR DAM
FIGURE 2.4-68

Amendment 63

Figure 2.4-68 Powerhouse & Spillway Results of Analysis For Operating Basis Earthquake - Watts Bar Dam

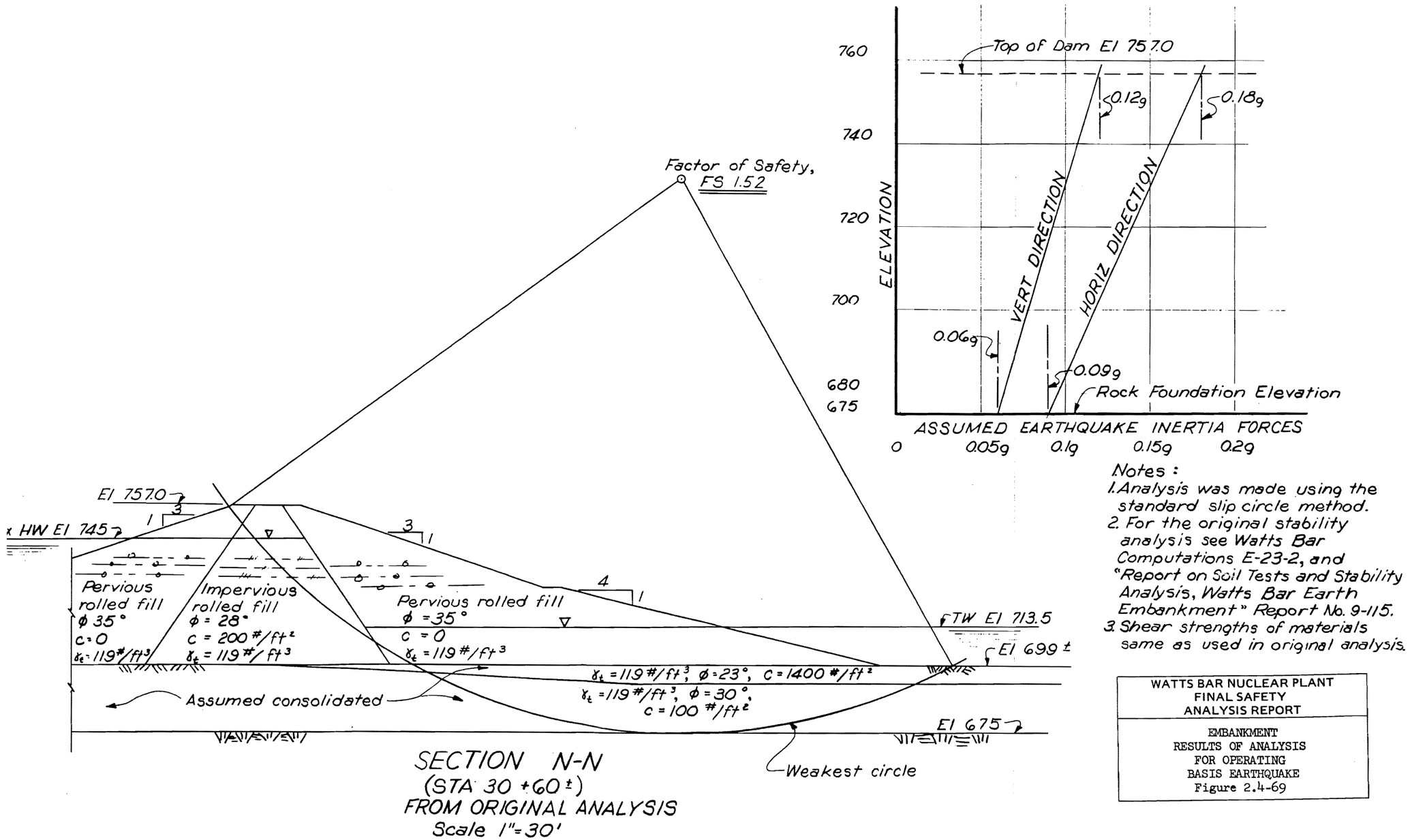
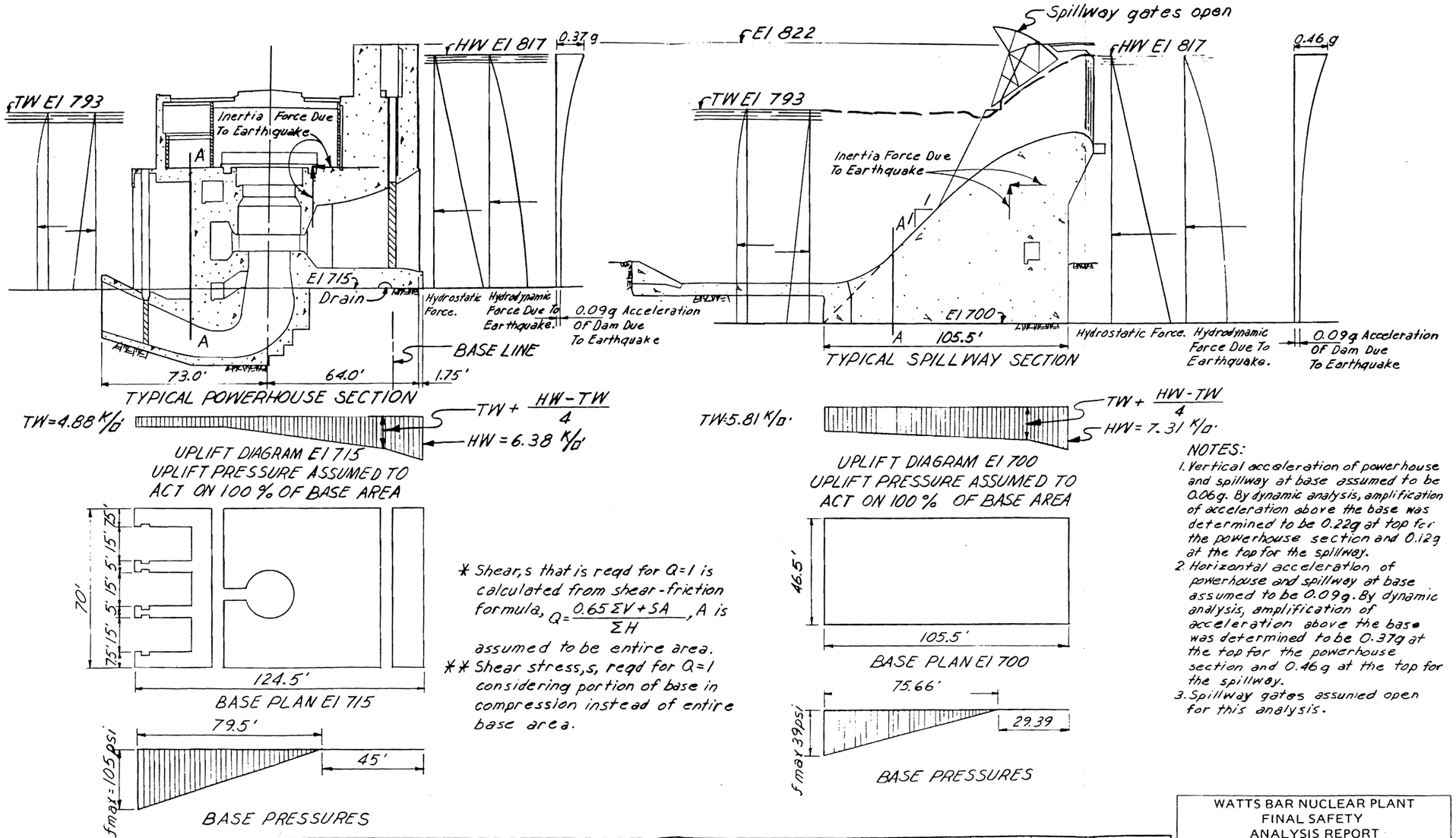


Figure 2.4-69 Embankment Results of Analysis For Operating Basis Earthquake

Figure 2.4-70 Deleted by Amendment 83



* Shear, s that is reqd for Q=1 is calculated from shear-friction formula, $Q = \frac{0.65\Sigma V + SA}{\Sigma H}$, A is assumed to be entire area.

** Shear stress, s, reqd for Q=1 considering portion of base in compression instead of entire base area.

NOTES:

1. Vertical acceleration of powerhouse and spillway at base assumed to be 0.06g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.22g at top for the powerhouse section and 0.12g at the top for the spillway.
2. Horizontal acceleration of powerhouse and spillway at base assumed to be 0.09g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.37g at the top for the powerhouse section and 0.46g at the top for the spillway.
3. Spillway gates assumed open for this analysis.

ΣV	ΣH	ΣH/ΣV	Avg shear	S reqd for Q=1	f max	F.S. = ΣMR/ΣMo	Vertical shear on plane A-A
22,762K	22,541K	0.99	24.2psi (entire base)	8.3psi * (14.6psi)**	105psi	1.18	26 psi

ΣV	ΣH	ΣH/ΣV	Avg shear	S reqd for Q=1	f max	F.S. = ΣMR/ΣMo	Vertical shear on plane A-A
19,488K	14,382K	0.75	20psi (entire base)	2.38psi * (3.30psi)**	39psi	1.26	17psi

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

POWERHOUSE & SPILLWAY
RESULTS OF ANALYSIS FOR
OPERATING BASIS EARTHQUAKE
Fort Loudoun Dam
Figure 2.4-71

Figure 2.4-71 Powerhouse & Spillway Results of Analysis For Operating Basis Earthquake - Fort Loudoun Dam

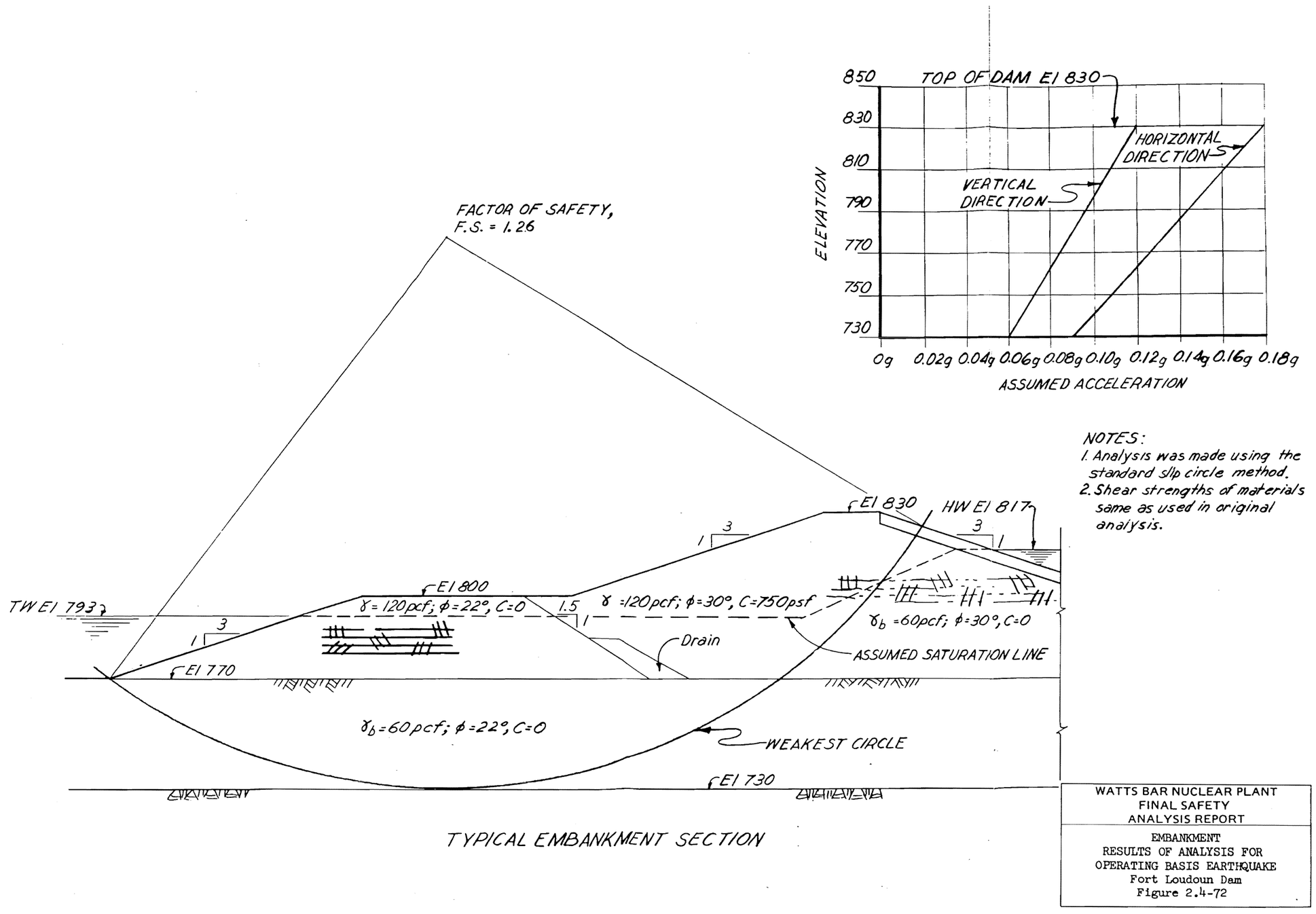
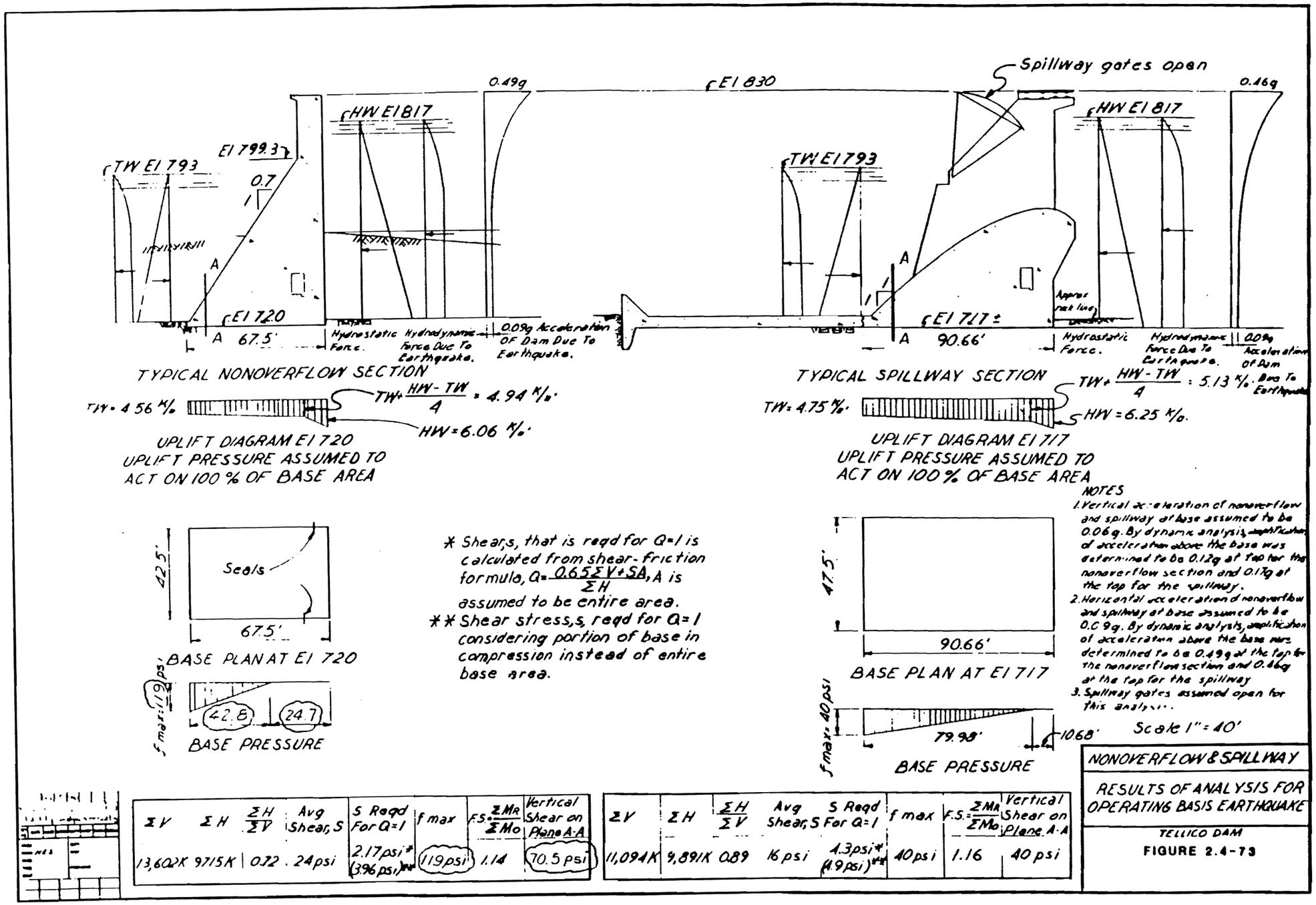


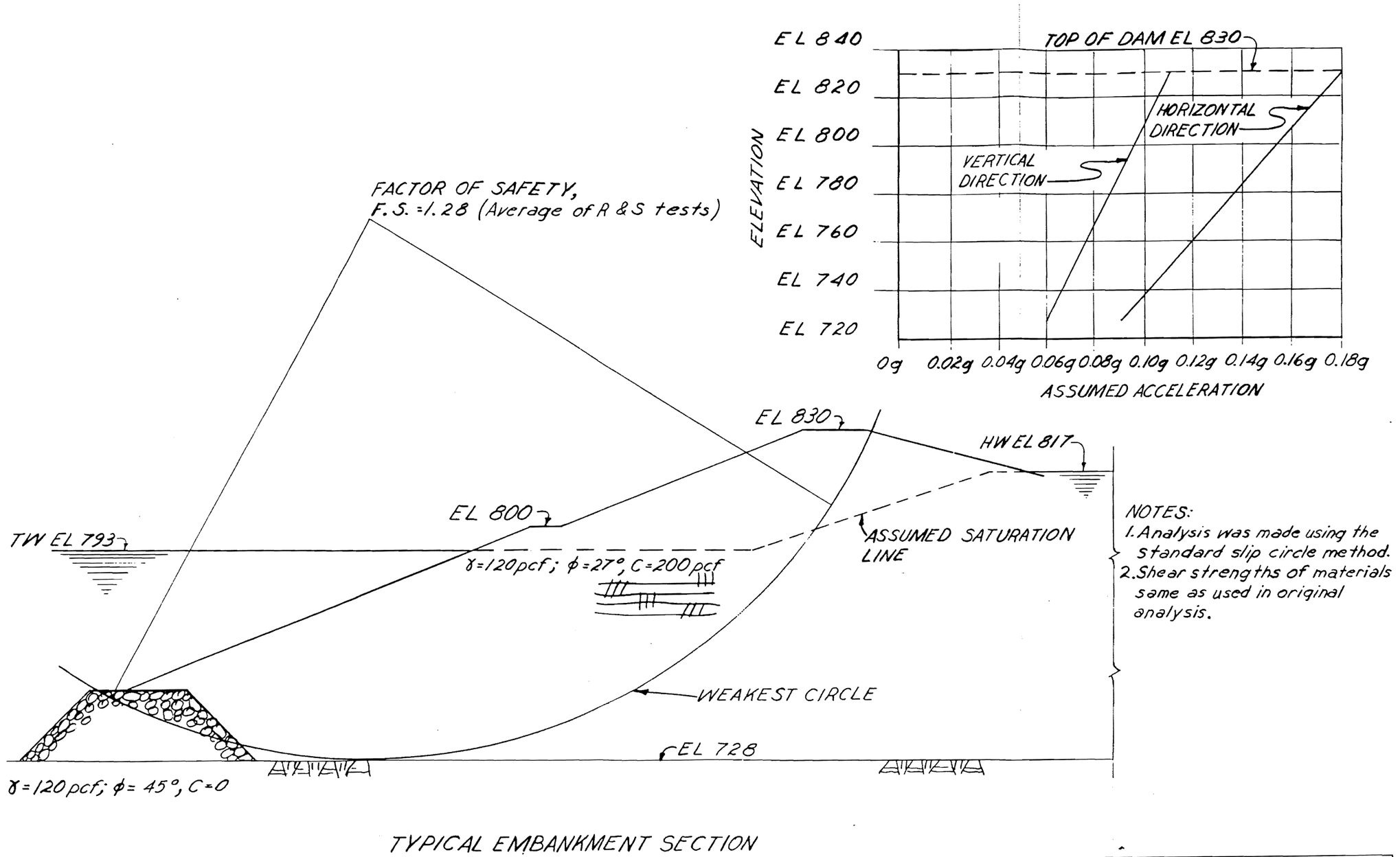
Figure 2.4-72 Embankment Results Of Analysis For Operating Basis Earthquake - Fort Loudoun Dam



ΣV	ΣH	ΣH/ΣV	Avg Shear, S	S Reqd For Q=1	f max	F.S. = ΣMR/ΣMo	Vertical Shear on Plane A-A
13,602K	9715K	0.72	24psi	2.17psi* (3.96psi)**	119psi	1.14	70.5 psi

ΣV	ΣH	ΣH/ΣV	Avg Shear, S	S Reqd For Q=1	f max	F.S. = ΣMR/ΣMo	Vertical Shear on Plane A-A
11,094K	9,891K	0.89	16 psi	4.3psi* (4.9psi)**	40psi	1.16	40 psi

Figure 2.4-73 Nonoverflow & Spillway Results of Analysis For Operating Basis Earthquake - Tellico Dam

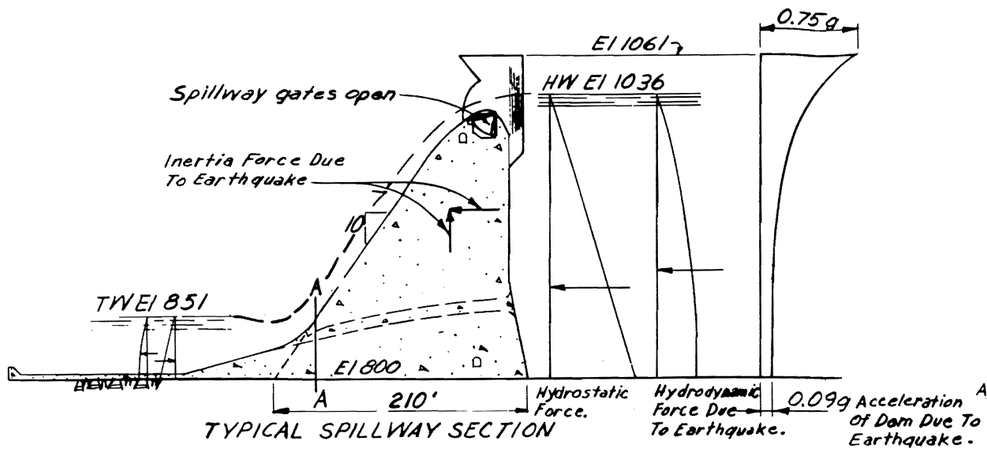


TYPICAL EMBANKMENT SECTION

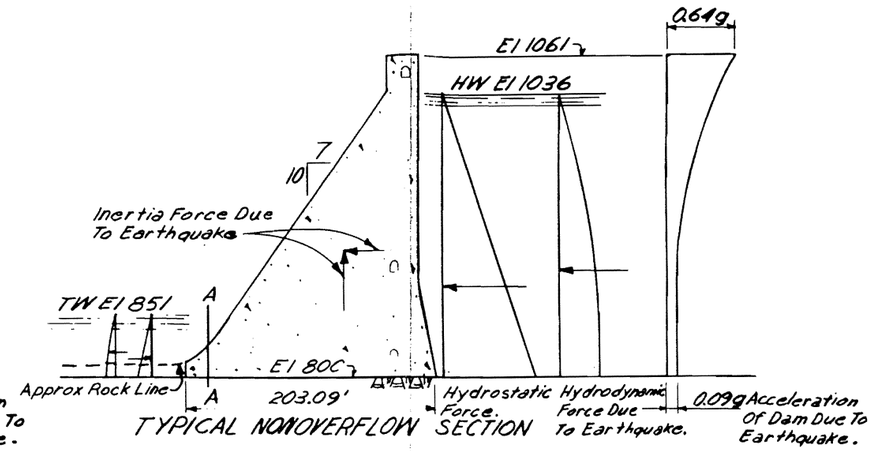
WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

EMBANKMENT
RESULTS FOR ANALYSIS FOR
OPERATING BASIS EARTHQUAKE
Tellico Dam
Figure 2.4-74

Figure 2.4-74 Embankment Results For Analysis For Operating Basis Earthquake - Tellico Dam

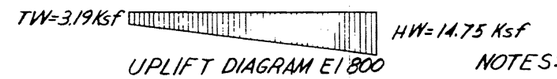


TYPICAL SPILLWAY SECTION



TYPICAL NONOVERFLOW SECTION

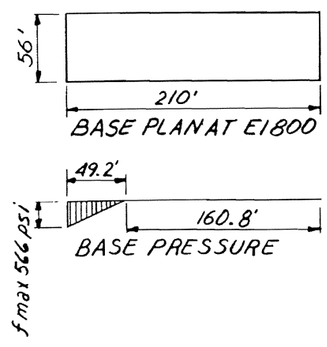
UPLIFT DIAGRAM El 800
UPLIFT PRESSURE ASSUMED
TO ACT ON 100 % OF BASE AREA



UPLIFT DIAGRAM El 800
UPLIFT PRESSURE ASSUMED
TO ACT ON 100 % OF BASE AREA

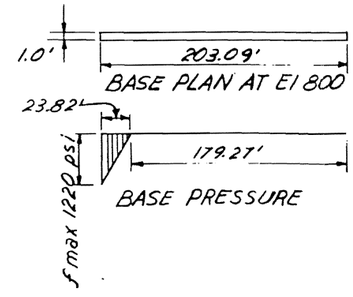
NOTES:

1. Vertical acceleration of nonoverflow and spillway at base assumed to be 0.06g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.14g at the top for the nonoverflow section and 0.14g at the top for the spillway.
2. Horizontal acceleration of nonoverflow and spillway at base assumed to be 0.09g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.64g at the top for the nonoverflow section and 0.75g at the top for the spillway.
3. Spillway gates assumed open for this analysis.



BASE PLAN AT El 800

BASE PRESSURE



BASE PLAN AT El 800

BASE PRESSURE

*Shear, s, that is reqd for Q=1 is calculated from shear-friction formula, $Q = \frac{0.65\Sigma V + SA}{\Sigma H}$, A is assumed to be entire area.

** Shear, s, reqd for Q=1 considering portion of base in compression (no tension), instead of entire base area.

ΣV	ΣH	$\frac{\Sigma H}{\Sigma V}$	Avg Shear, s	S Reqd For Q=1	f max	$FS = \frac{\Sigma M_R}{\Sigma M_O}$	Vertical Shear on plane A-A
112,616 K	143,587 K	1.28	85 psi (entire base)	42 psi* (177 psi)**	566 psi	1.25	247 psi

ΣV	ΣH	$\frac{\Sigma H}{\Sigma V}$	Avg Shear, s	S Reqd For Q=1	f max	$FS = \frac{\Sigma M_R}{\Sigma M_O}$	Vertical Shear on plane A-A
2101 K	2786 K	1.33	95 psi (entire base)	49 psi* (415 psi)**	1220 psi	1.03	535 psi

WATTS BAR NUCLEAR PLANT
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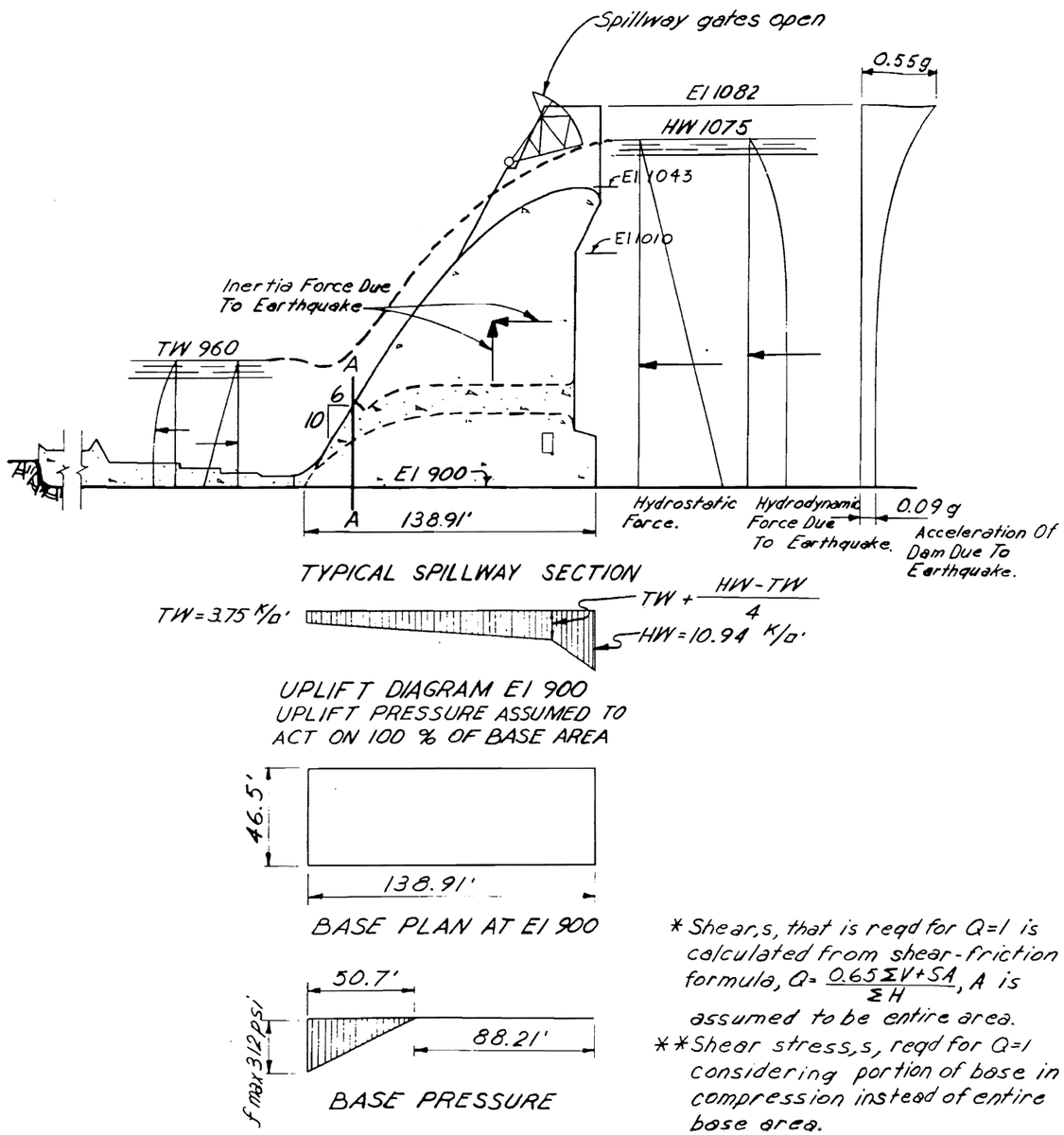
SPILLWAY & NONOVERFLOW
RESULTS OF ANALYSIS FOR
OBE + ½ PMF
Norris Dam
Figure 2.4-75

Figure 2.4-75 Spillway & Nonoverflow Results of Analysis For OBE & 1/2 PMF-Norris Dam

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-76 Analysis For OBE & 1/2 PMF Assumed Condition of Dam After Failure Norris Dam



* Shear, s, that is reqd for Q=1 is calculated from shear-friction formula, $Q = \frac{0.65\Sigma V + SA}{\Sigma H}$, A is assumed to be entire area.

** Shear stress, s, reqd for Q=1 considering portion of base in compression instead of entire base area.

ΣV	ΣH	$\frac{\Sigma H}{\Sigma V}$	Avg Shear, S	S Reqd For Q=1	f max	F.S. $\frac{\Sigma M_R}{\Sigma M_O}$	Vertical Shear on Plane A-A
53,007K	57,276K	1.08	61 psi (entire base)	25 psi * (67 psi)**	312 psi	1.13	173 psi

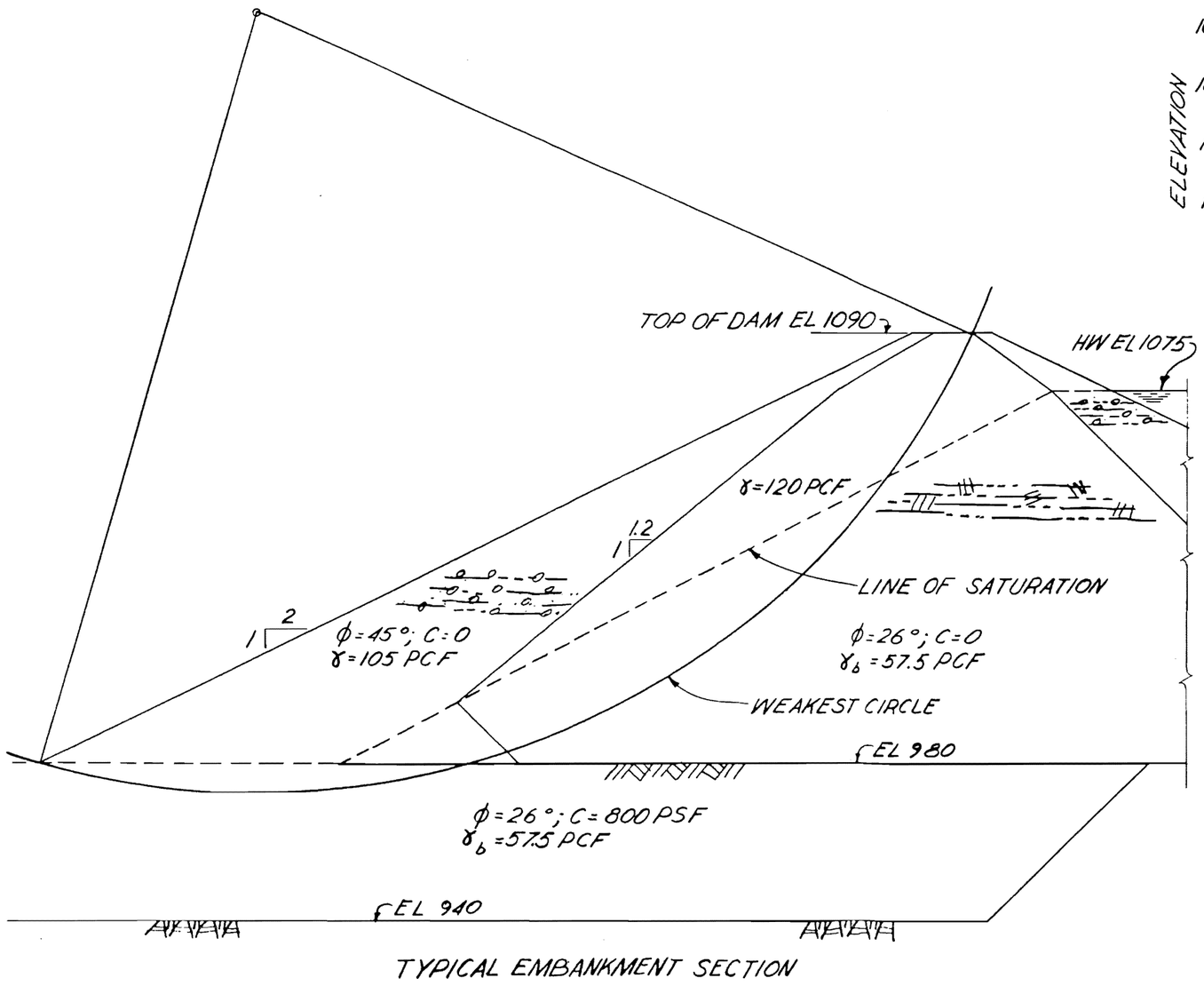
NOTES:

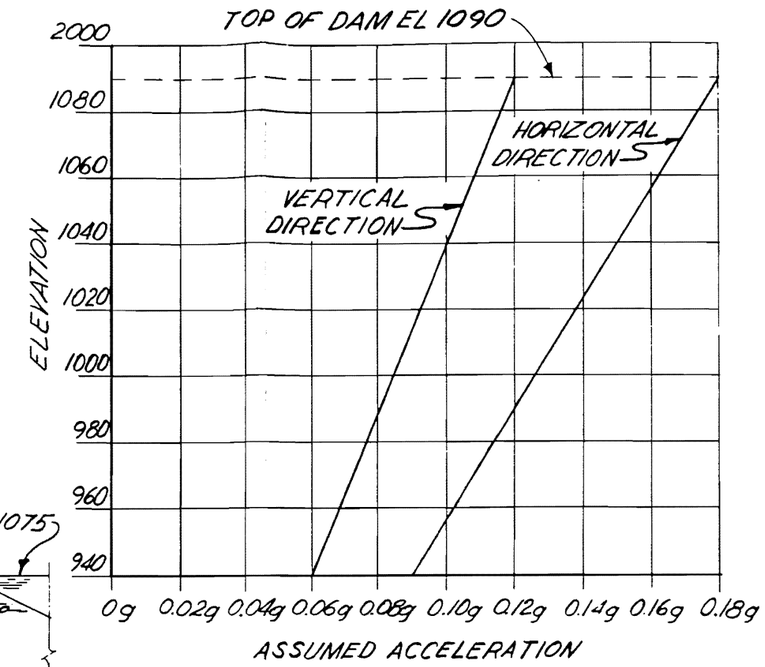
1. Vertical acceleration of the spillway at the base assumed to be 0.06 g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.11 g at the top.
2. Horizontal acceleration of the spillway at the base assumed to be 0.09 g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.55 g at the top.
3. Spillway gates assumed open for this analysis.

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

Cherokee Dam
Figure 2.4-77

Figure 2.4-77 Spillway & Nonoverflow Results of Analysis For Operating Basis Earthquake -Cherokee Dam





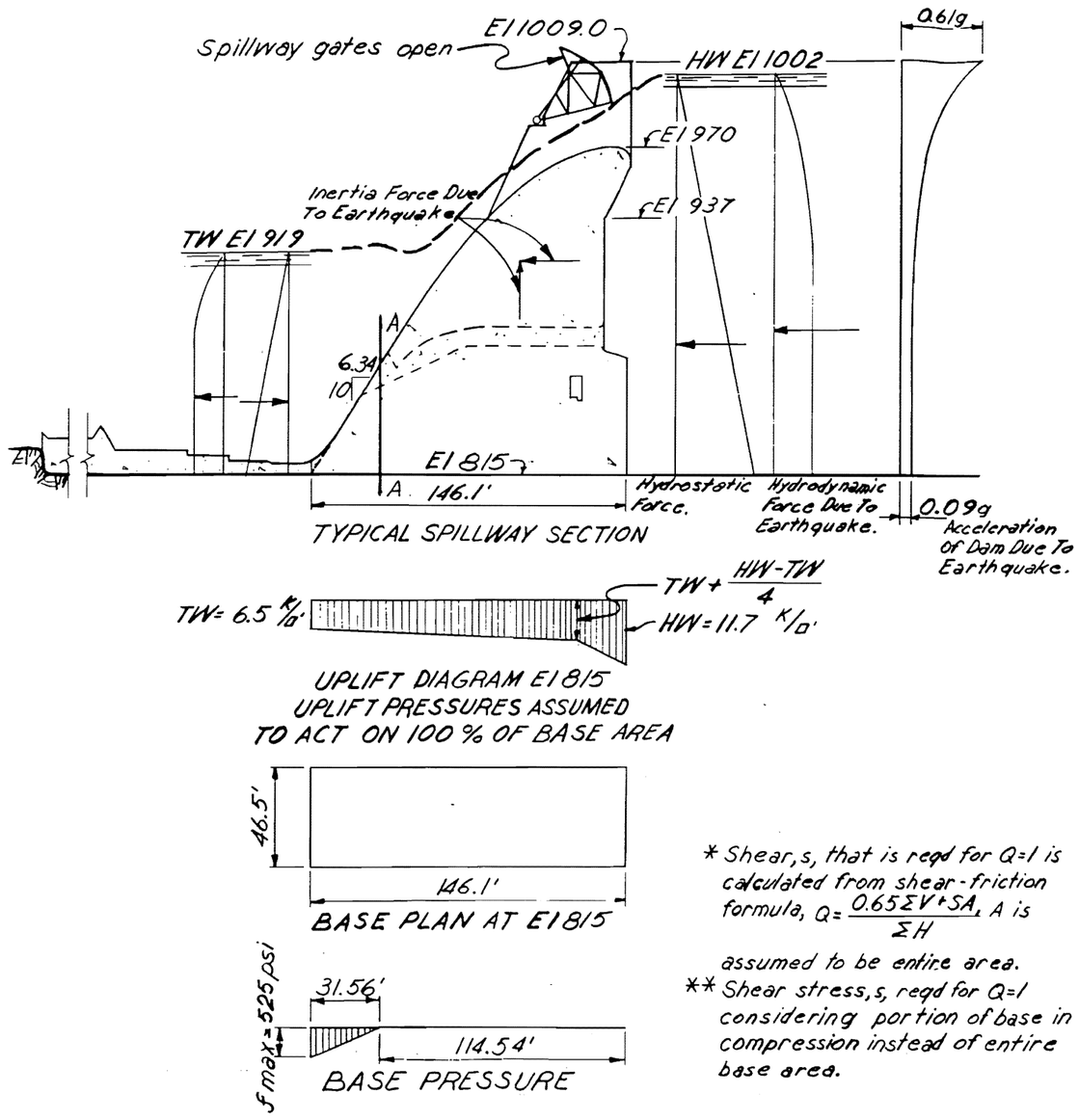
NOTES:
1. Analysis was made using the standard slip circle method.
2. Shear strengths of materials same as used in original analysis.

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
EMBANKMENT RESULTS OF ANALYSIS FOR OPERATING BASIS EARTHQUAKE Cherokee Dam Figure 2.4-78

Figure 2.4-78 Embankment Results of Analysis For Operating Basis Earthquake - Cherokee Dam

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-79 Assumed Condition of Dam After Failure PBE And 1/2 Probable Max Flood - Cherokee Dam



NOTES:

1. Vertical acceleration of the spillway at the base assumed to be 0.06 g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.13 g at the top.
2. Horizontal acceleration of the spillway at the base assumed to be 0.09g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.61 g at the top.
3. Spillway gates assumed open for this analysis.

* Shear, s, that is reqd for Q=1 is calculated from shear-friction formula, $Q = \frac{0.65\Sigma V + SA}{\Sigma H}$, A is assumed to be entire area.

** Shear stress, s, reqd for Q=1 considering portion of base in compression instead of entire base area.

ΣV	ΣH	$\frac{\Sigma H}{\Sigma V}$	Avg Shear, S	S Reqd For Q=1	f max	$F.S. = \frac{\Sigma MR}{\Sigma Mo}$	Vertical Shear on Plane A-A
55,483 K	60,245 K	1.09	61.6 psi (entire base)	25 psi * (170 psi) **	525 psi	1.06	156 psi

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
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SPILLWAY & NONOVERFLOW
RESULTS OF ANALYSIS FOR
OPERATING BASIS EARTHQUAKE
Douglas Dam
Figure 2.4-80

Figure 2.4-80 Spillway & Nonoverflow Results of Analysis For Operating Basis Earthquake - Douglas Dam

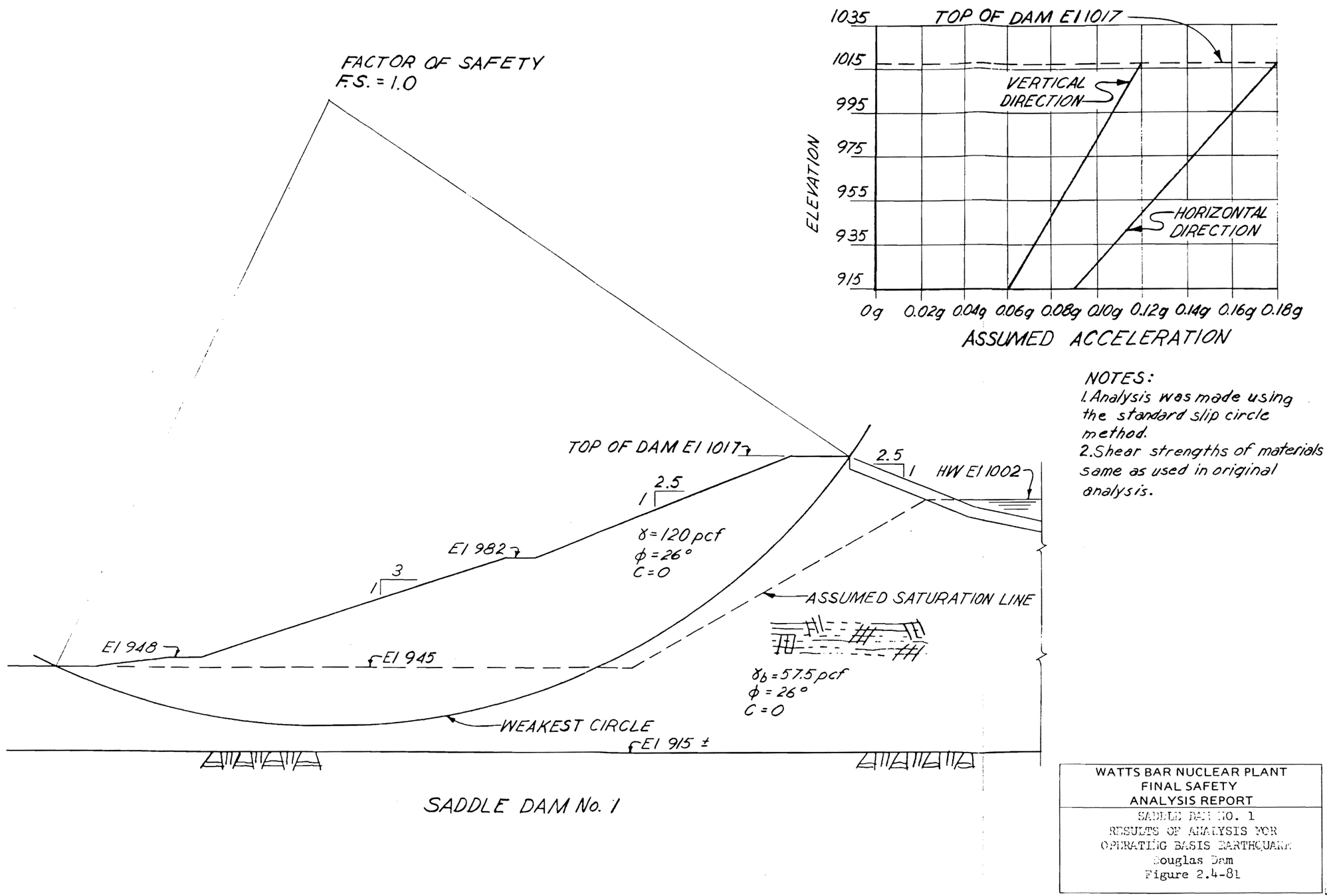


Figure 2.4-81 Saddle Dam No. 1 Results of Analysis For Operating Basis Earthquake - Douglas Dam

Security-Related Information - Withheld Under 10CFR2.390

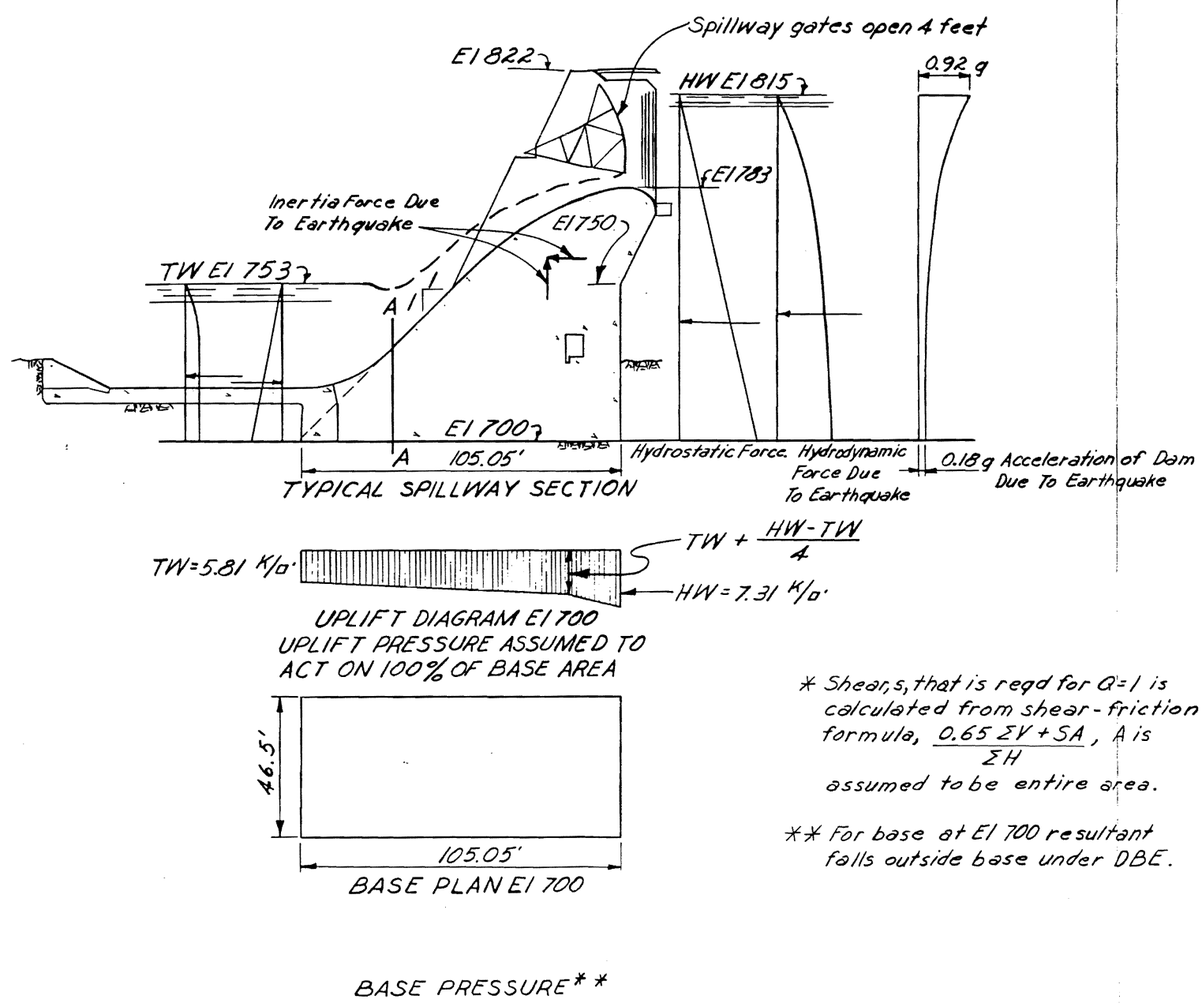
Figure 2.4-82 Douglas Dam Assumed Condition of Dam After Failure aBE And 1/2 Probable Maximum Flood - Douglas Project

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-83 Fontana Dam Assumed Condition of Dam after Failure aBE And 1/2 Probable Maximum Flood - Fontana Dam

Figure 2.4-84 Deleted by Amendment 63

Figure 2.4-85 Deleted by Amendment 63



NOTES:

1. Vertical acceleration of spillw at base assumed to be 0.12g By dynamic analysis, amplification of acceleration above the base was determined to be 0.24g at to
2. Horizontal acceleration of spillway at base assumed to b 0.18g. By dynamic analysis, amplification of acceleration above the base was determined to be 0.92g at to
3. Spillway gates assumed ope 4 feet for this analysis.

* Shears, that is reqd for Q=1 is calculated from shear-friction formula, $\frac{0.65\,\Sigma V + SA}{\Sigma H}$, A is assumed to be entire area.

** For base at El 700 resultant falls outside base under DBE.

ΣV	ΣH	$\frac{\Sigma H}{\Sigma V}$	Avg shear	S reqd for Q=1	f max	$FS \frac{\Sigma M_R}{\Sigma M_O}$
18,254 K	29,534 K	1.62	42 psi (entire base)	25 psi*	* *	0.9

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

SPILLWAY
RESULTS OF ANALYSIS FOR
SSE EARTHQUAKE
Fort Loudoun Dam
Figure 2.4-86

Figure 2.4-86 Spillway Results of Analysis For SSE Earthquake Fort Loudoun Dam

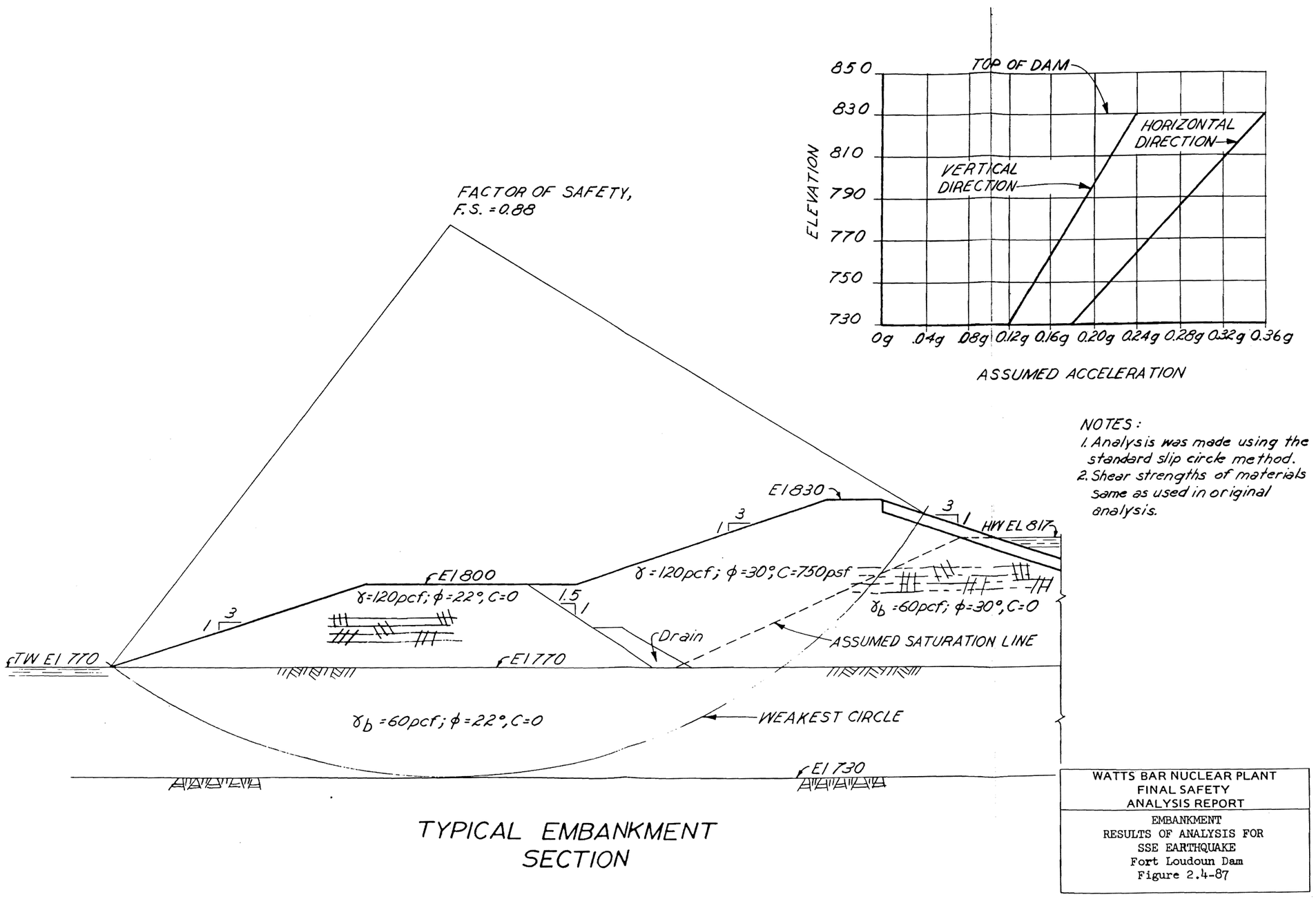


Figure 2.4-87 Embankment Results of Analysis For SSE Earthquake Fort Loudoun Dam

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-88 Fort Loudoun Dam Assumed Condition of Dam After Failure SSE Combined With a 25 Year Flood - Fort Loudoun Dam

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-89 Tellico Dam Assumed Condition of Dam After Failure SSE Combined With a 25 Year Flood Tellico Project

Security-Related Information - Withheld Under 10CFR2.390

Figure 2.4-90 Norris Dam SSE + 25 Year Flood Judged Condition of Dam After Failure - Norris Dam

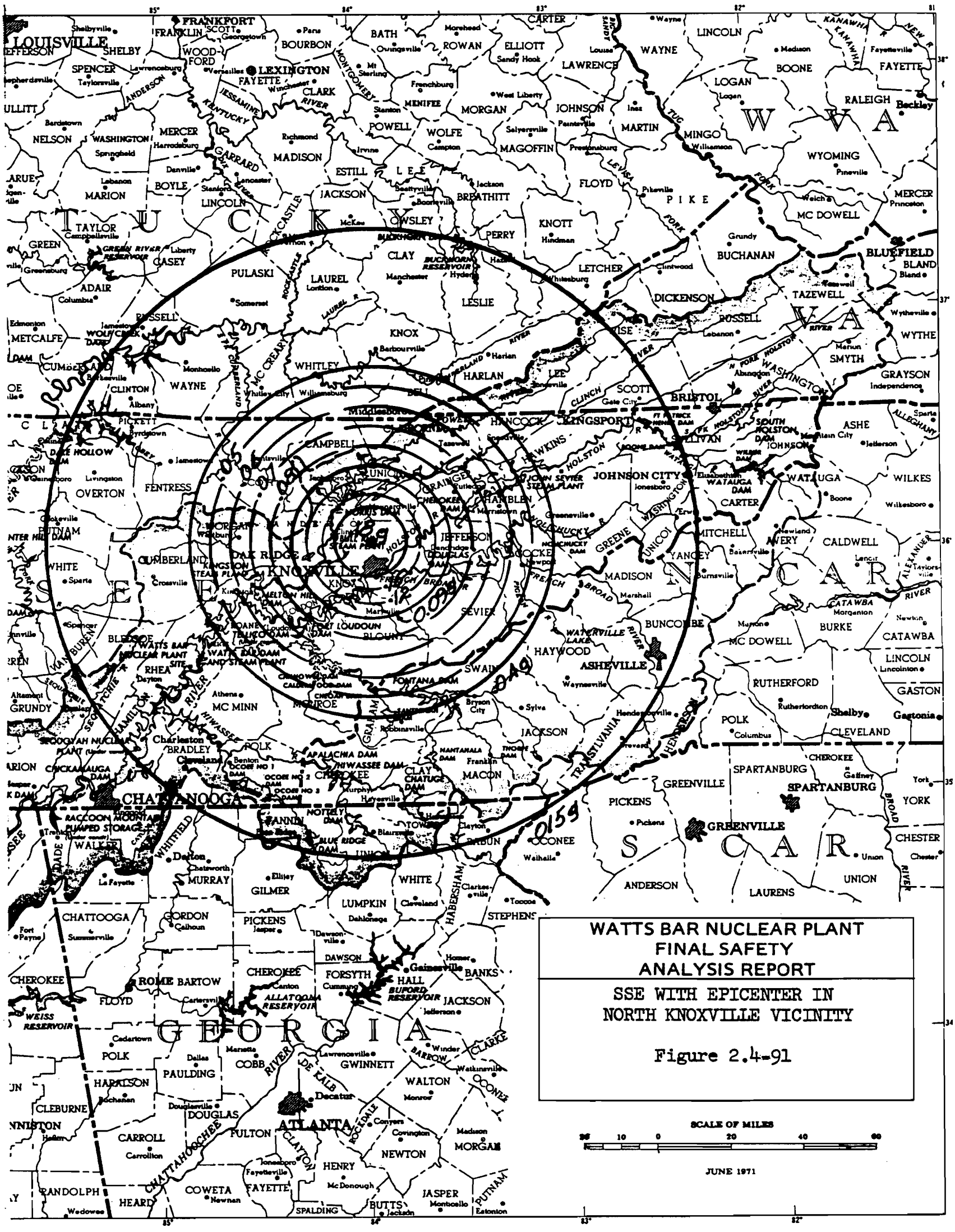
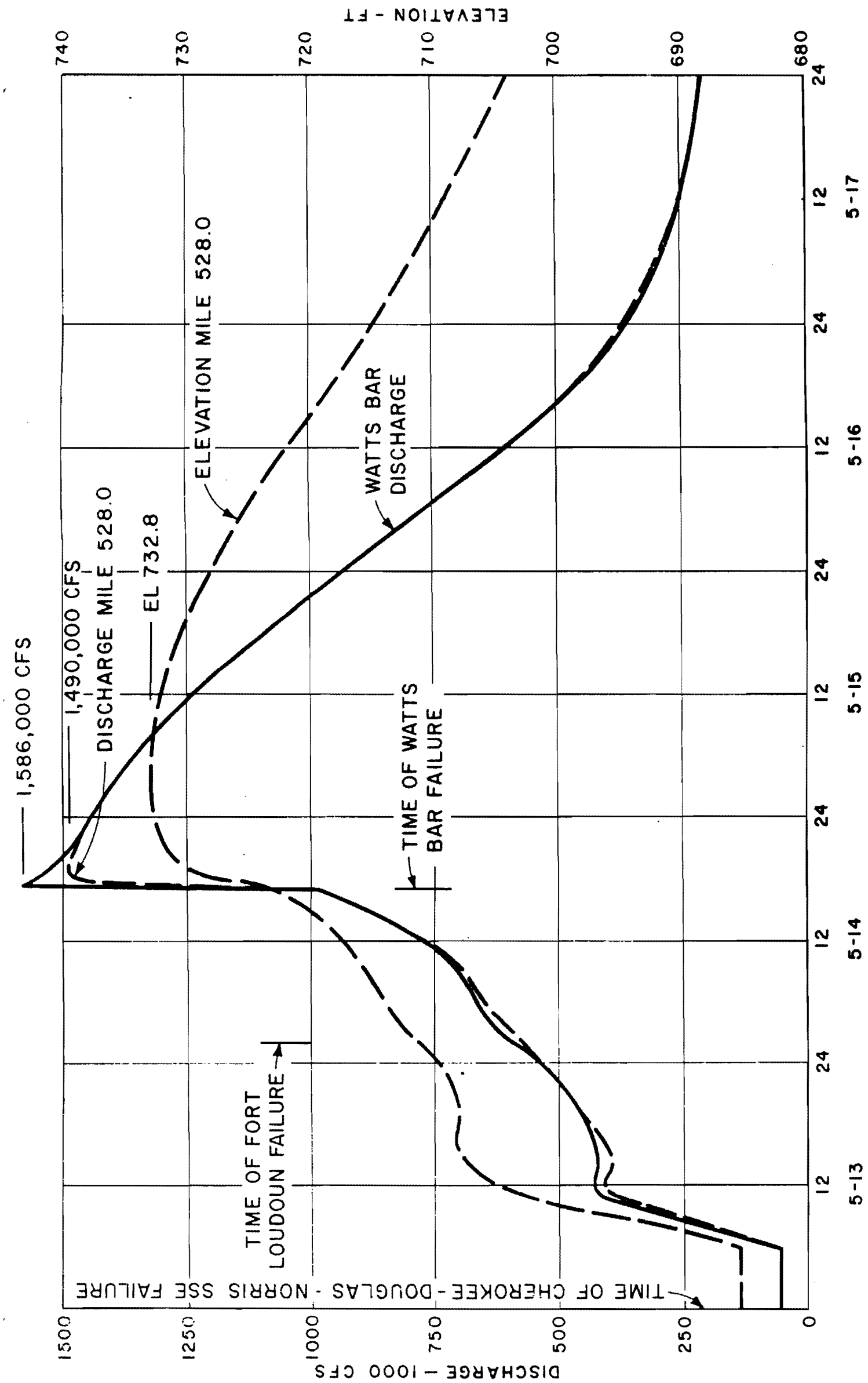


Figure 2.4-91 SSE With Epicenter In North Knoxville Vicinity



FLOOD HYDROGRAPHS

Figure 2.4-92

Revised by Amendment 35

Figure 2.4-92 Time and Date Flood Hydrographs

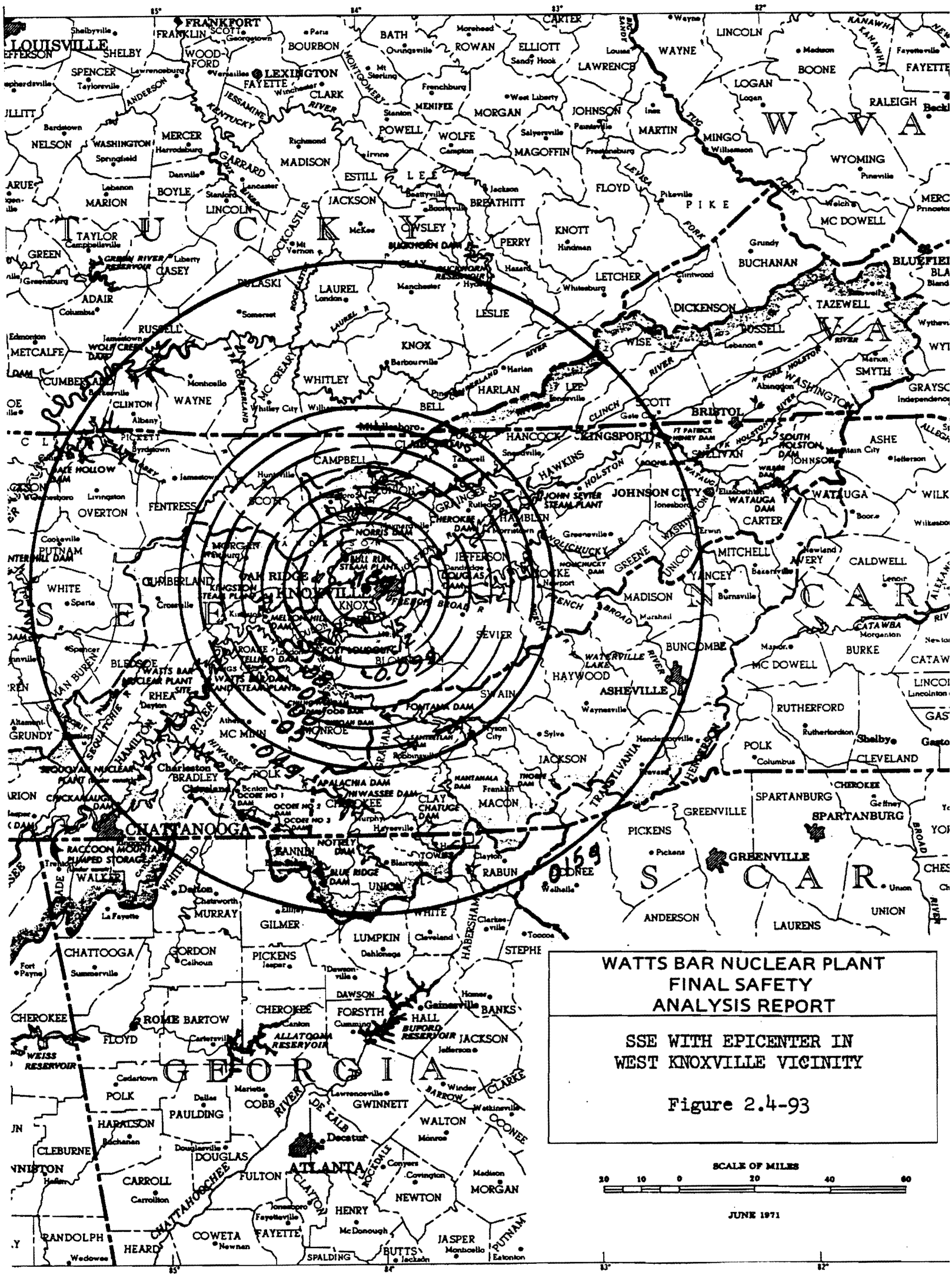


Figure 2.4-93 SSE With Epicenter In West Knoxville Vicinity

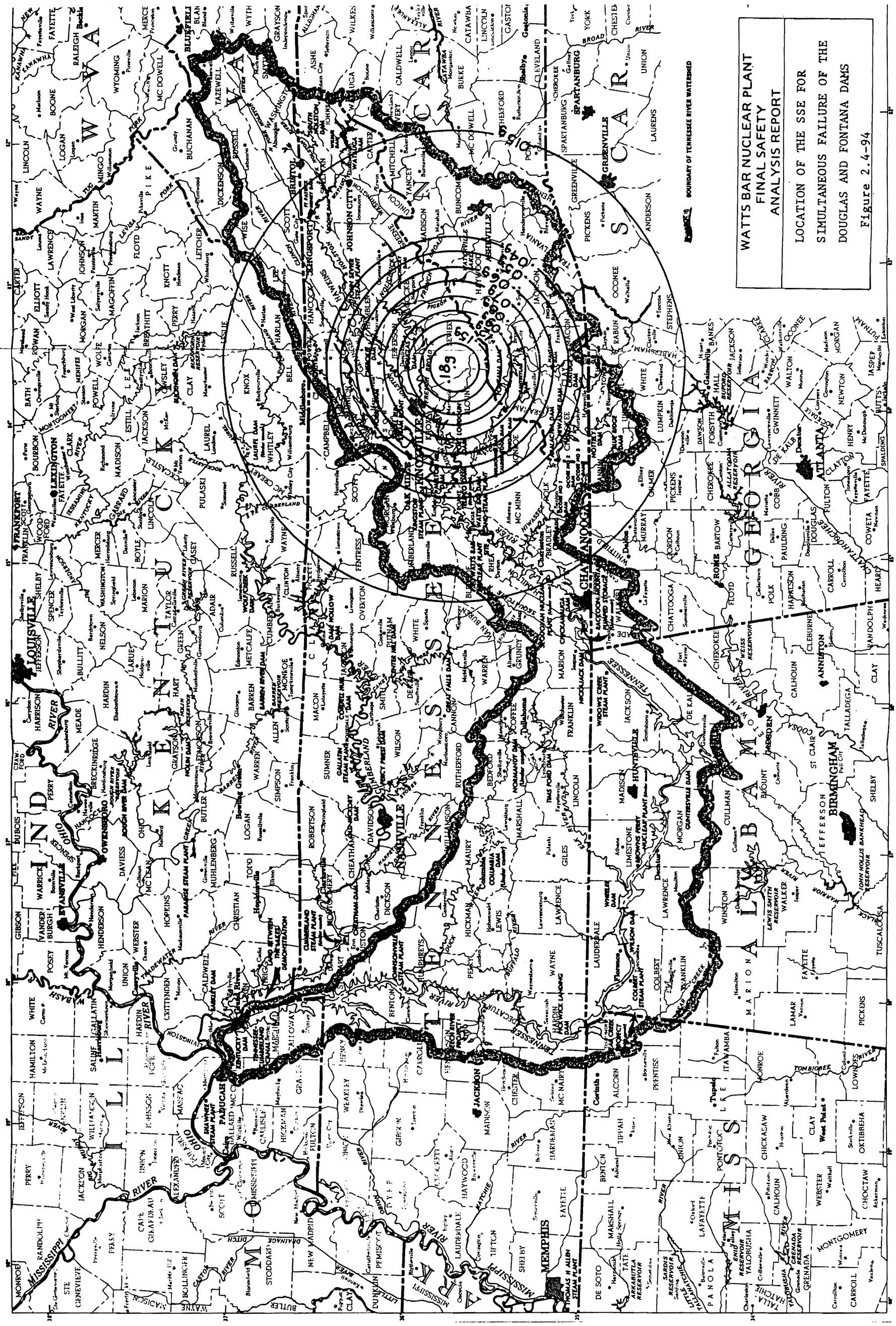


Figure 2.4-94 Location of SSE For Simultaneous Failure of The Douglas and Fontana Dams

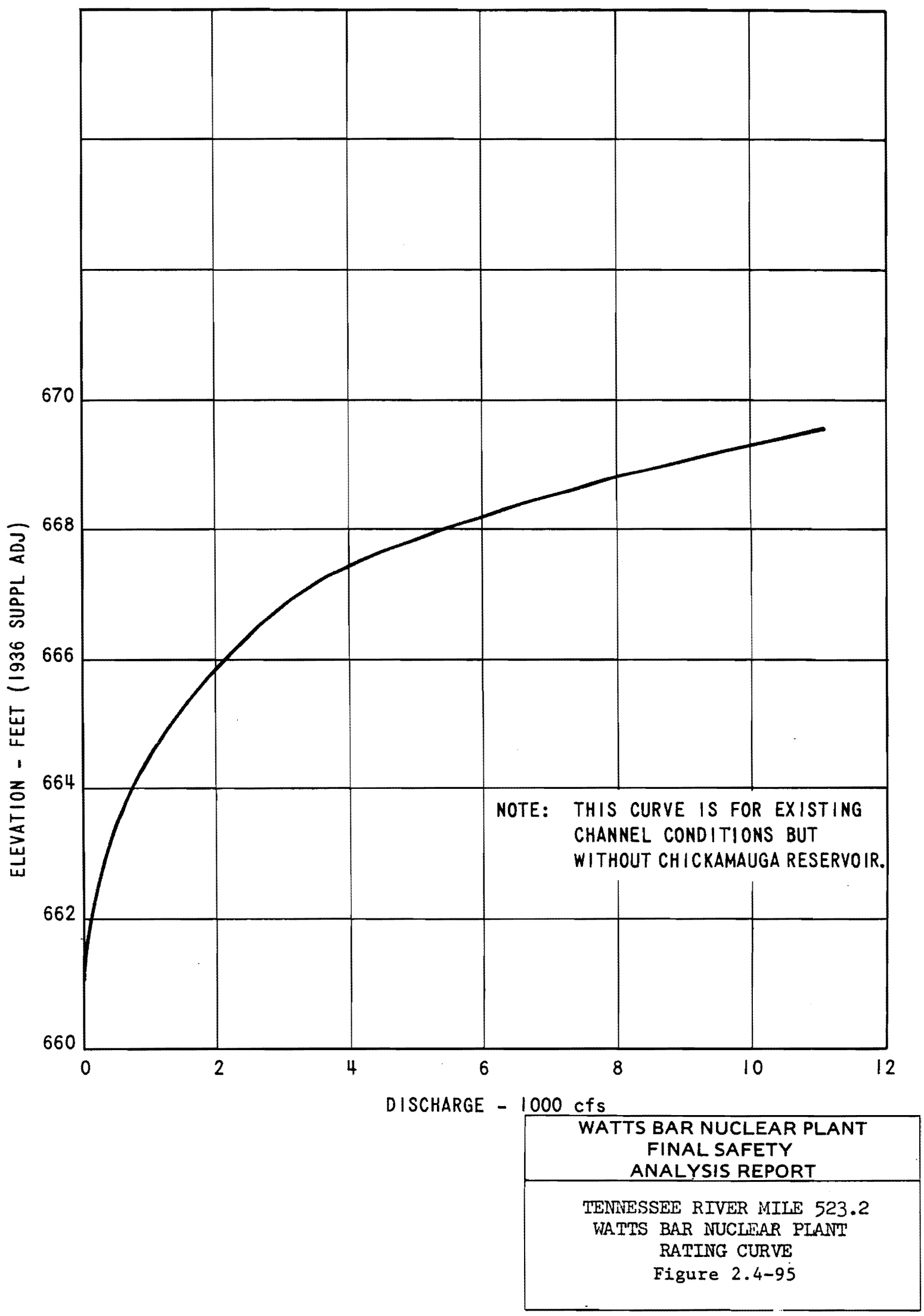


Figure 2.4-95 Tennessee River Mile 523.2 Watts Bar Nuclear Plant Rating Curve

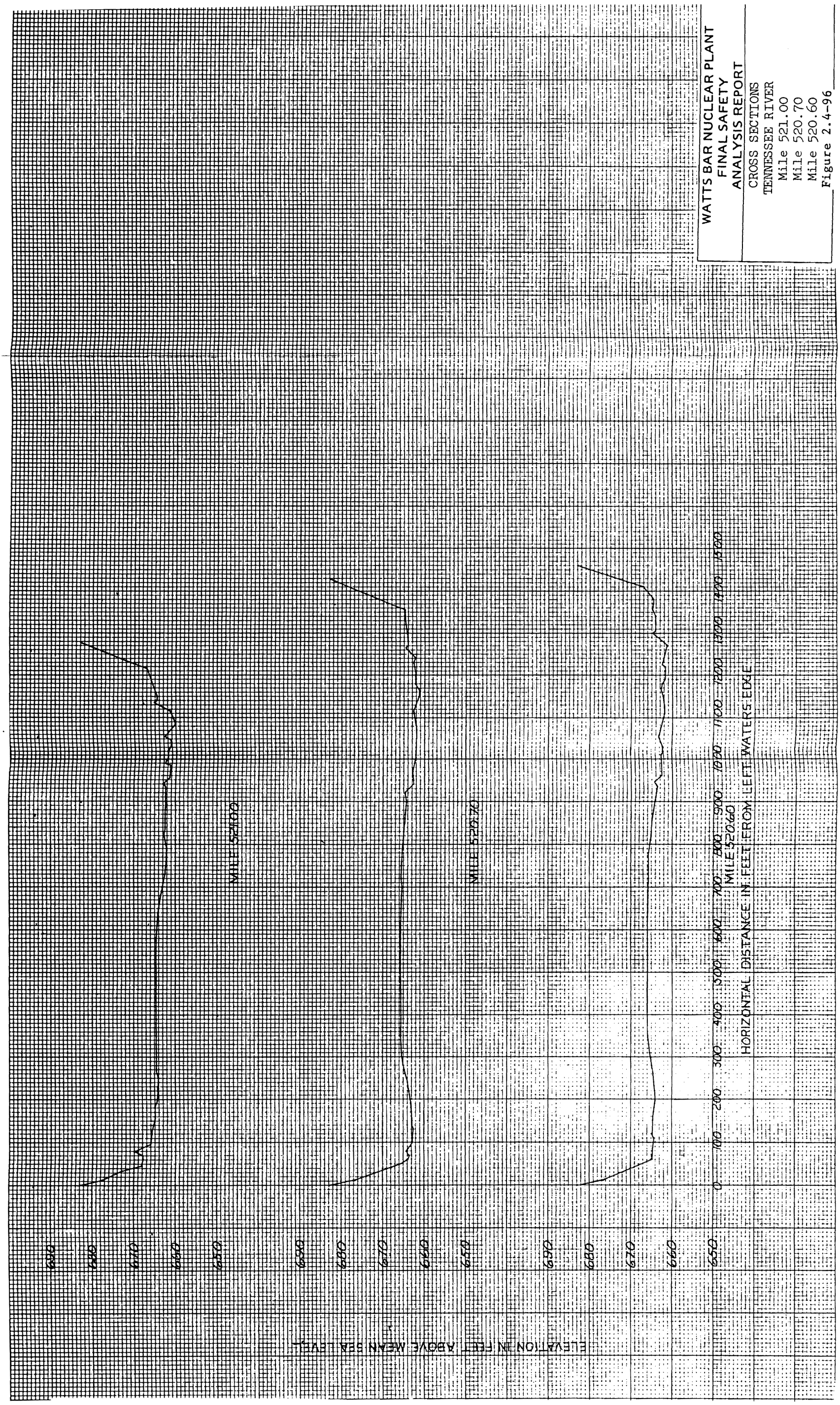


Figure 2.4-96 Cross Sections Tennessee River (mile 521.00) (mile 520.70) (mile 520.60)

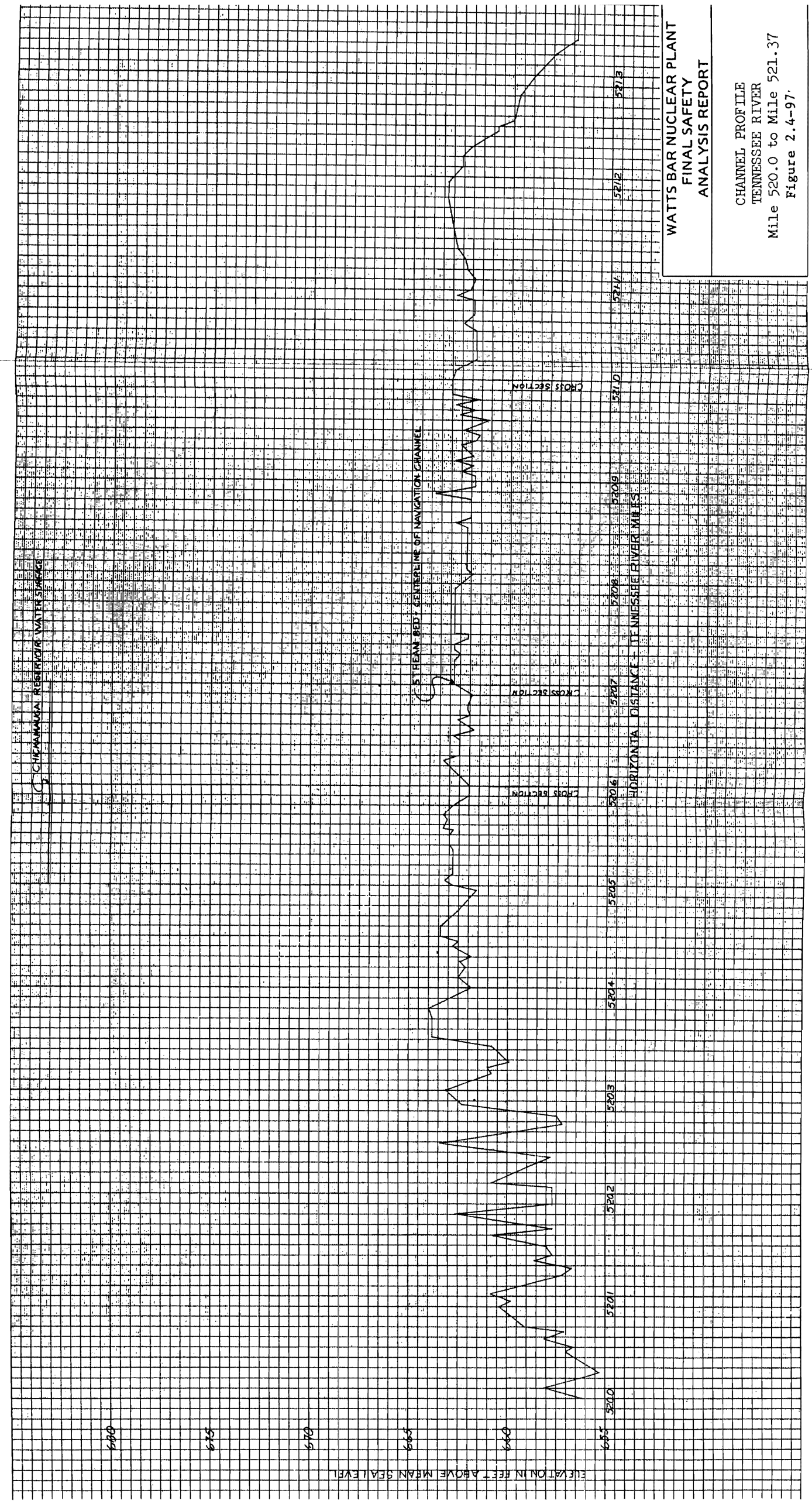
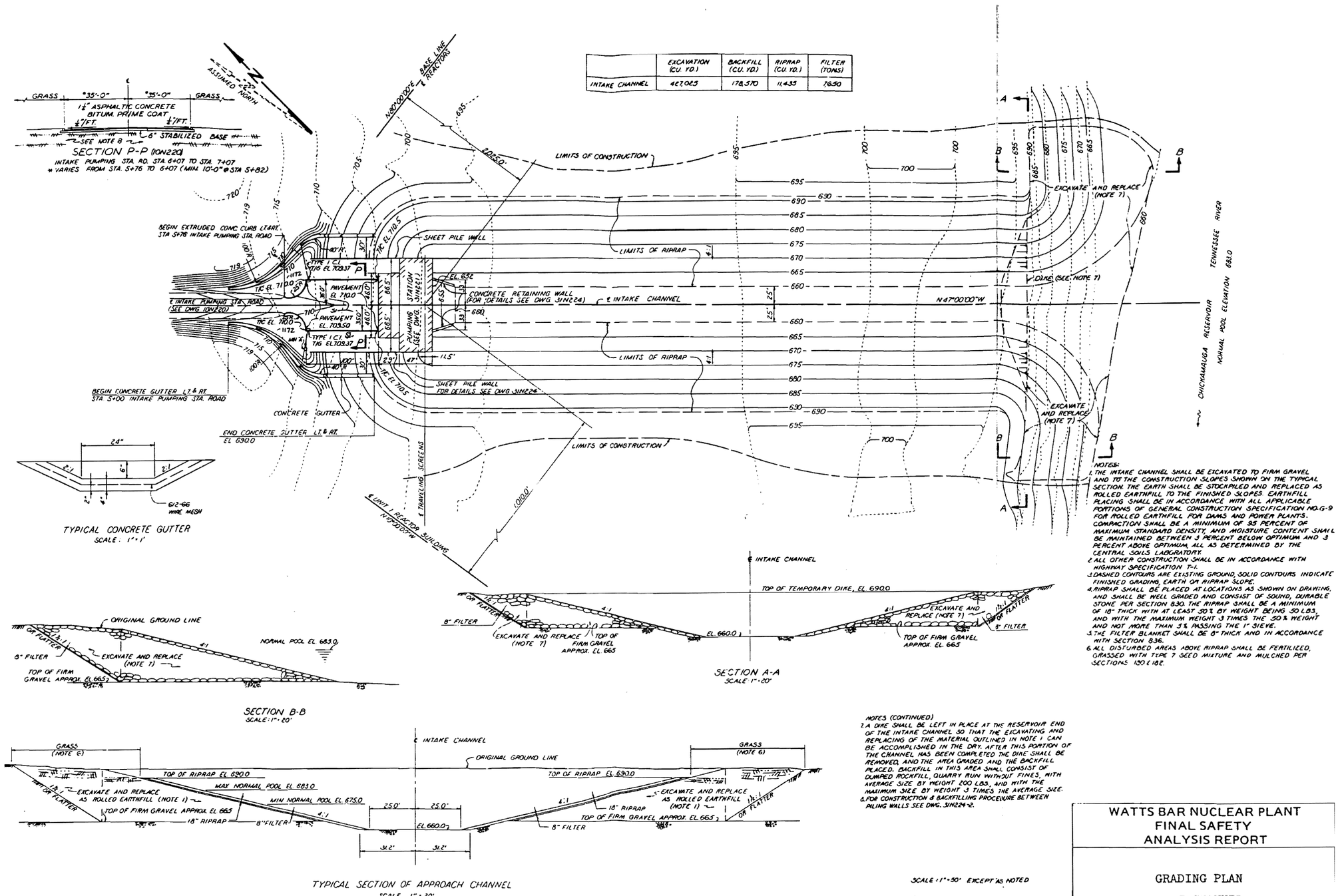


Figure 2.4-97 Channel Profile Tennessee River (mile 520.0 to mile 521.37)

Figure 2.4-98 Not Used



	EXCAVATION (CU. YD.)	BACKFILL (CU. YD.)	RIPRAP (CU. YD.)	FILTER (TONS)
INTAKE CHANNEL	427,063	178,570	11,435	7,650

NOTES:
1. THE INTAKE CHANNEL SHALL BE EXCAVATED TO FIRM GRAVEL AND TO THE CONSTRUCTION SLOPES SHOWN ON THE TYPICAL SECTION. THE EARTH SHALL BE STOCKPILED AND REPLACED AS ROLLED EARTHFILL TO THE FINISHED SLOPES. EARTHFILL PLACING SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PORTIONS OF GENERAL CONSTRUCTION SPECIFICATION NO.G-9 FOR ROLLED EARTHFILL FOR DAMS AND POWER PLANTS. COMPACTION SHALL BE A MINIMUM OF 95 PERCENT OF MAXIMUM STANDARD DENSITY, AND MOISTURE CONTENT SHALL BE MAINTAINED BETWEEN 3 PERCENT BELOW OPTIMUM AND 3 PERCENT ABOVE OPTIMUM, ALL AS DETERMINED BY THE CENTRAL SOILS LABORATORY.
2. ALL OTHER CONSTRUCTION SHALL BE IN ACCORDANCE WITH HIGHWAY SPECIFICATION T-1.
3. DASHED CONTOURS ARE EXISTING GROUND, SOLID CONTOURS INDICATE FINISHED GRADING, EARTH OR RIPRAP SLOPE.
4. RIPRAP SHALL BE PLACED AT LOCATIONS AS SHOWN ON DRAWING, AND SHALL BE WELL GRADED AND CONSIST OF SOUND, DURABLE STONE PER SECTION 830. THE RIPRAP SHALL BE A MINIMUM OF 18" THICK WITH AT LEAST 50% BY WEIGHT BEING 50 LBS, AND WITH THE MAXIMUM WEIGHT 3 TIMES THE 50% WEIGHT AND NOT MORE THAN 3% PASSING THE 1" SIEVE.
5. THE FILTER BLANKET SHALL BE 8" THICK AND IN ACCORDANCE WITH SECTION 836.
6. ALL DISTURBED AREAS ABOVE RIPRAP SHALL BE FERTILIZED, GRASSED WITH TYPE 7 SEED MIXTURE AND MULCHED PER SECTIONS 120 & 182.

NOTES (CONTINUED)
7. A DIKE SHALL BE LEFT IN PLACE AT THE RESERVOIR END OF THE INTAKE CHANNEL SO THAT THE EXCAVATING AND REPLACING OF THE MATERIAL OUTLINED IN NOTE 1 CAN BE ACCOMPLISHED IN THE DRY. AFTER THIS PORTION OF THE CHANNEL HAS BEEN COMPLETED THE DIKE SHALL BE REMOVED, AND THE AREA GRADED AND THE BACKFILL PLACED. BACKFILL IN THIS AREA SHALL CONSIST OF DUMPED ROCKFILL, QUARRY RUN WITHOUT FINES, WITH AVERAGE SIZE BY WEIGHT 200 LBS, AND WITH THE MAXIMUM SIZE BY WEIGHT 3 TIMES THE AVERAGE SIZE.
8. FOR CONSTRUCTION & BACKFILLING PROCEDURE BETWEEN PILING WALLS SEE DWG. 3N224-2.

SCALE: 1"=50' EXCEPT AS NOTED

WATTS BAR NUCLEAR PLANT
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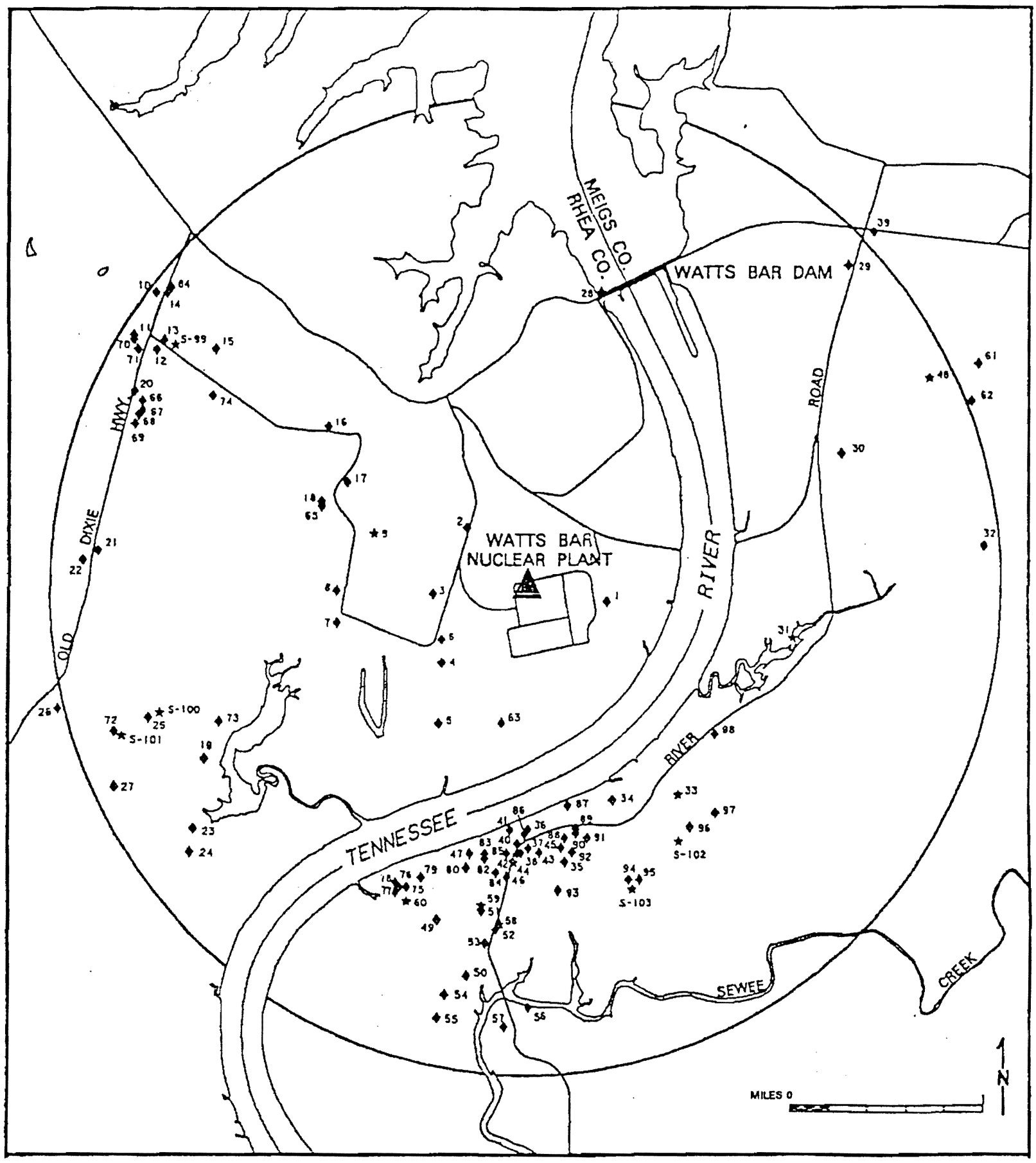
ANALYSIS REPORT

GRADING PLAN
INTAKE CHANNEL
Figure 2.4-99

Figure 2.4-99 Grading Plan Intake Channel

Figure 2.4-100 Deleted by Amendment 83

Figure 2.4-101 Deleted by Amendment 33



LEGEND

- ♦ WELL
- ★ SPRING
- — ROADS
- ○ 2 MILE RADIUS OF PLANT SITE

AMENDMENT 83

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

WELL AND SPRING INVENTORY
WITHIN 2 MILE RADIUS OF WATTS BAR
NUCLEAR PLANT SITE
FSAR FIG 2.4-102

SCANNED DOCUMENT
THIS IS A SCANNED DOCUMENT MAINTAINED ON
THE WBNP OPTICRAPHICS SCANNER DATABASE

Figure 2.4-102 Wells And Spring Inventory Within 2-Mile Radius of Watts Bar Nuclear Plant Site

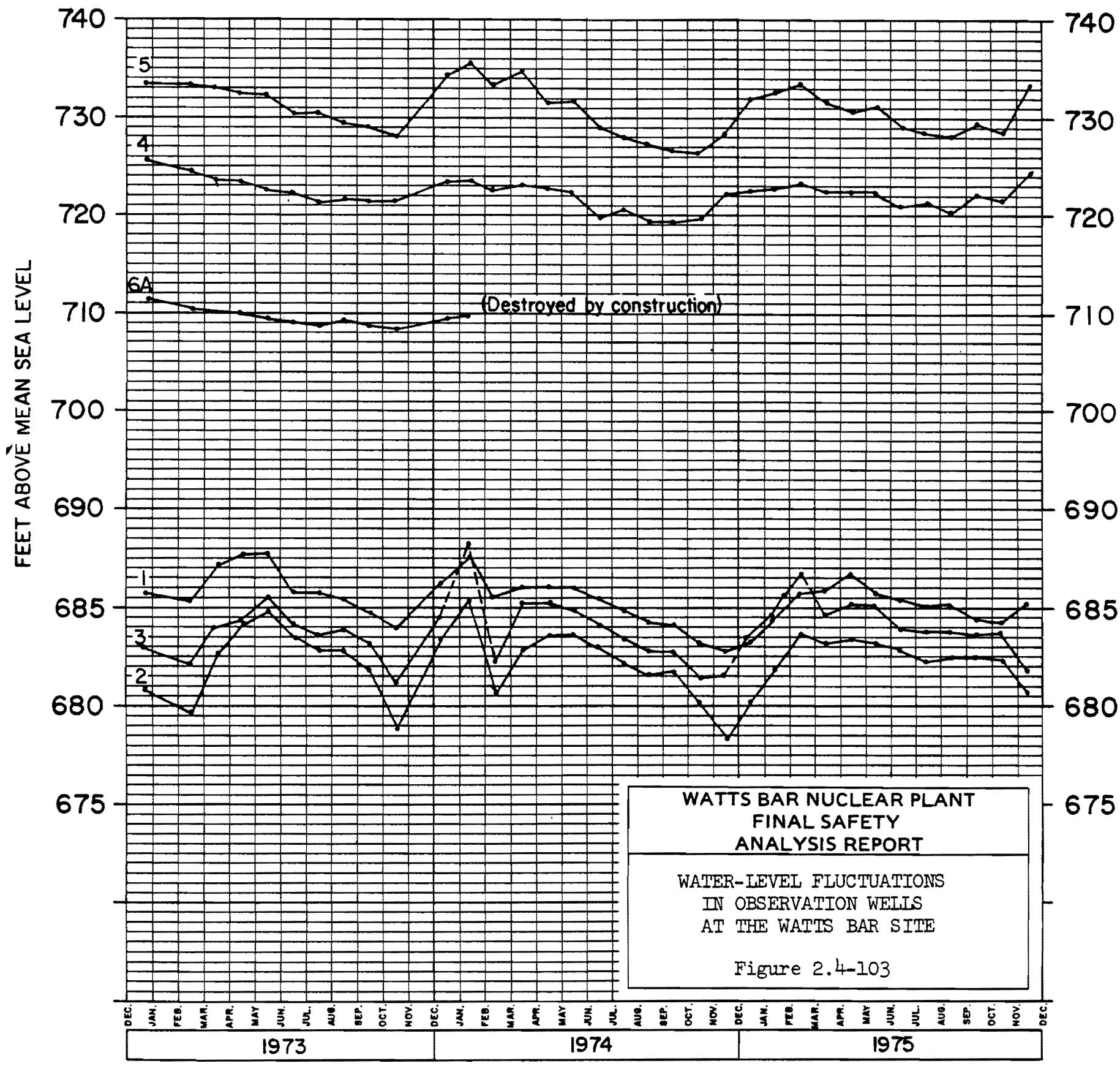
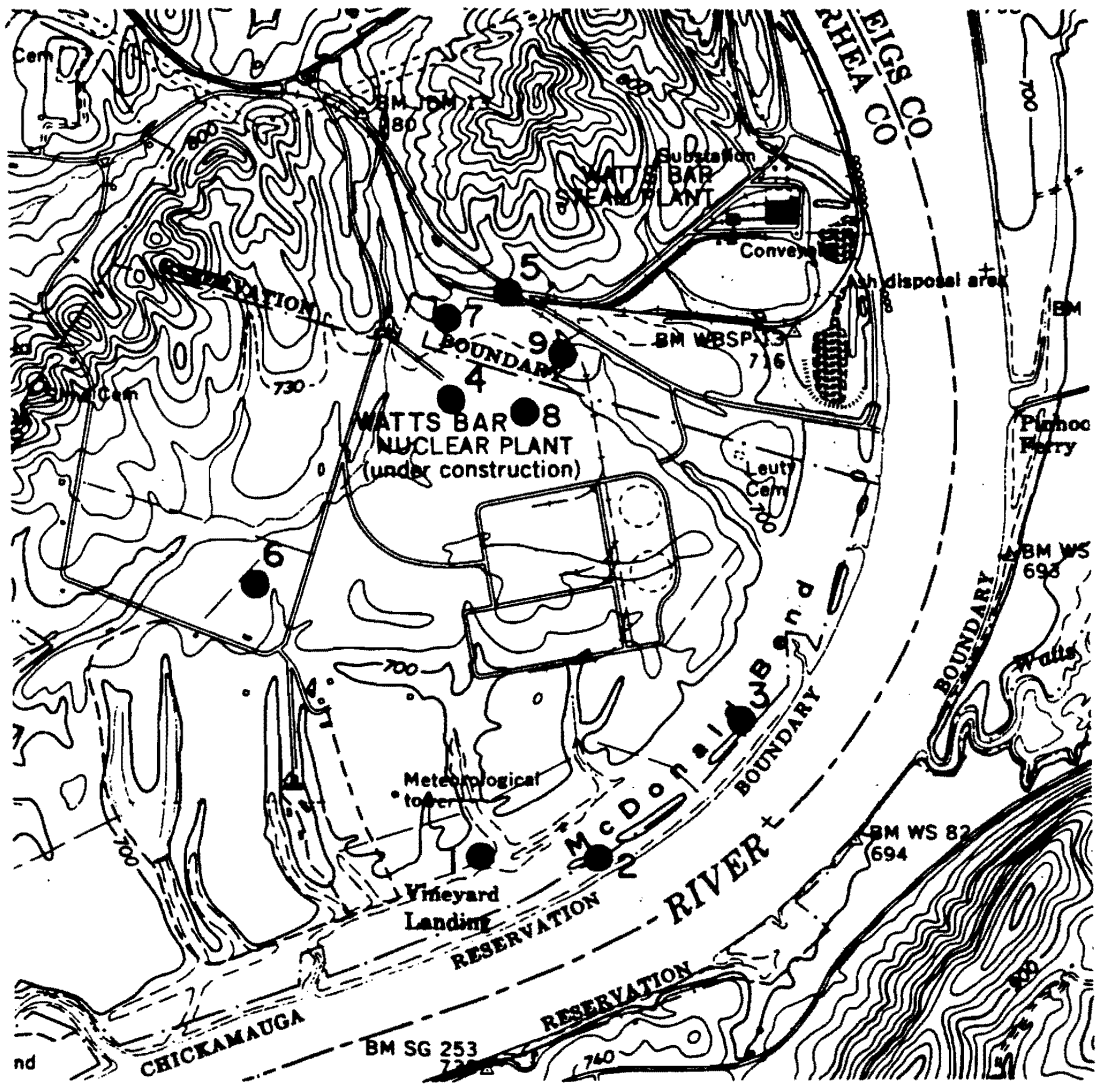


Figure 2.4-103 Water-Level Fluctuations In Observation Wells at The Watts Bar Site



NOTE:

Topographic base from U.S.G.S - T.V.A. 7.5 minute quadrangle, Decatur, Tenn., 118-SE, Contour interval 20 feet.

LEGEND:

●2 — Ground-water observation well showing number.

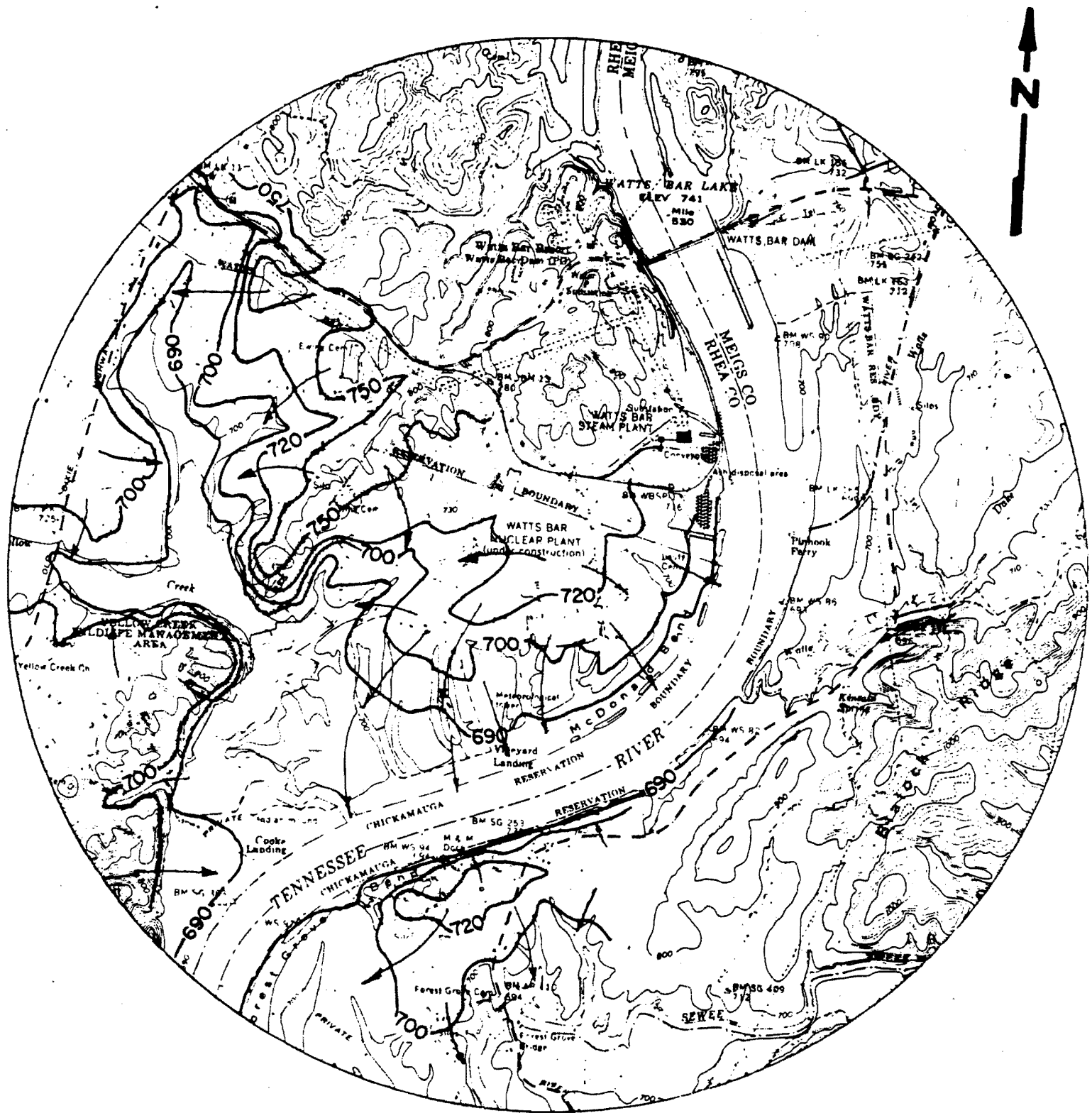
SCALE:

1000 0 1000 2000 Feet

Revised by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
LOCATIONS OF GROUND - WATER OBSERVATION WELLS FIGURE 2.4-104

Figure 2.4-104 Locations of Ground - Water Observation Wells



EXPLANATION:

700 — Water table contour, in feet above mean sea level.

— General direction of ground-water movement.

SCALE:

2000 0 4000 Feet

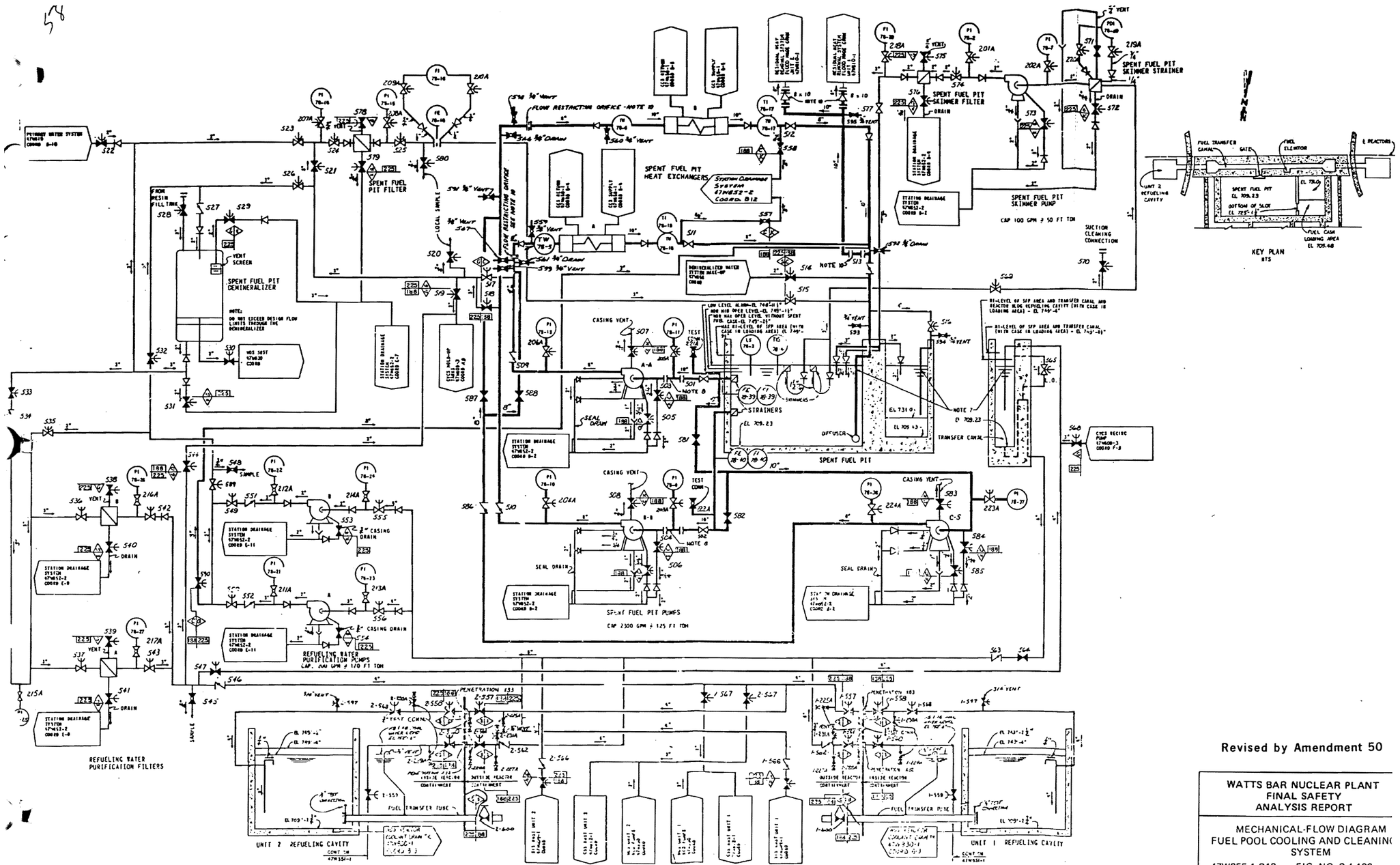
Revised by Amendment 50

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

GENERALIZED WATER-TABLE
CONTOUR MAP

Figure 2.4-105

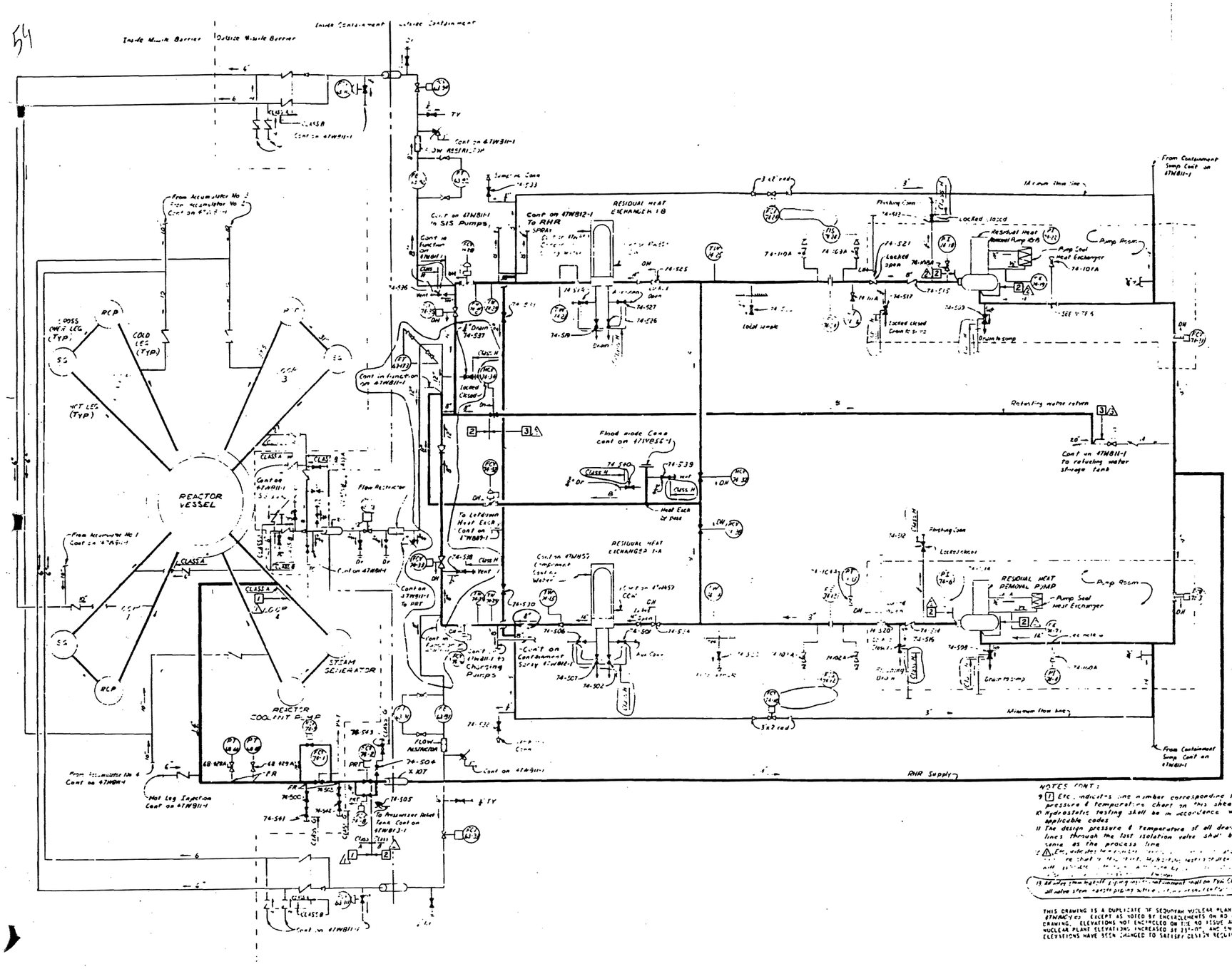
Figure 2.4-105 Generalized Water-Table Contour Map January 1972



Revised by Amendment 50

WATTS BAR NUCLEAR PLANT FINAL SAFETY ANALYSIS REPORT
MECHANICAL-FLOW DIAGRAM FUEL POOL COOLING AND CLEANING SYSTEM
47W855-1 R13 FIG. NO. 2.4-106

Figure 2.4-106 Mechanical - Flow Diagram Fuel Pool Cooling and Cleaning System



DESIGN PRESSURE & TEMPERATURE DATA		
Line No	Design Pressure (PSIG)	Design Temperature (°F)
1	2485	650
2	600	400
3	100	100

NOTES CONT:

9 [7] Etc. indicates line number corresponding to design pressure & temperature chart on this sheet.

10 Hydrostatic testing shall be in accordance with the applicable codes

11 The design pressure & temperature of all drain & vent lines through the first isolation valve shall be the same as the process line

12 [illegible]

13 [illegible] all valve stem packing [illegible] shall be TYP. Class 5 and all valve stem packing [illegible] shall be TYP. Class 3 and [illegible]

THIS DRAWING IS A DUPLICATE OF SEQUOYAH NUCLEAR PLANT DRAWING 47W867-1 EXCEPT AS NOTED BY ENCIRCLEMENTS ON RO OF THIS DRAWING. ELEVATIONS NOT ENCIRCLED ON THIS RO ISSUE ARE SEQUOYAH NUCLEAR PLANT ELEVATIONS INCREASED BY 237'-0", AND ENCIRCLED ELEVATIONS HAVE BEEN CHANGED TO SATISFY DESIGN REQUIREMENTS.

NOTES:

1 ALL VALVES ARE THE SAME SIZE AS THE PIPING IN WHICH THEY ARE
2 ALL PRESSURE GAGE VALVES ARE 1/2" GAGE VALVES UNLESS NOTED
3 ALL VALVE NUMBERS ARE [illegible]
4 ALL [illegible]
5 [illegible]
6 TEMPORARY STRAINER IS PLACED IN SPOOL PIECE DURING THE OPERATIONS. STRAINER MUST BE REMOVED BEFORE SHORT SHUTDOWN. USE PRESSURE GAGE DURING FLUSHING.
7 ALL DRAINS WILL BE RUN TO TRIFLUSH DRAINS
8 "FR" DENOTES 1/2 I.D. FLOW RESTRICTOR FOR TRANSIT CLASS A TO CLASS B.

REFERENCE DRAWINGS

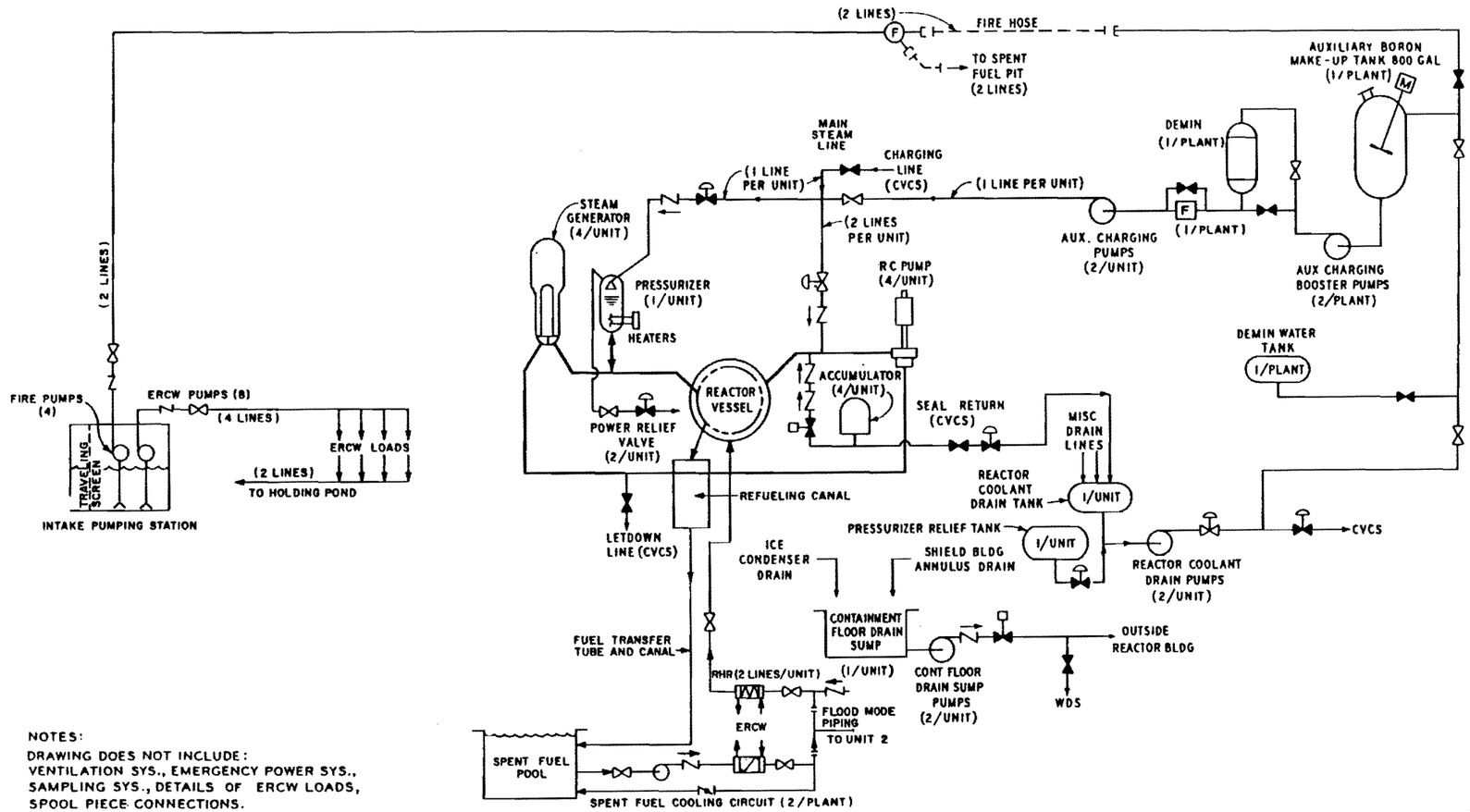
47B610-74 - - - - CONTROL DIAGRAM
47W800-1 - - - - - FLOW DIAGRAM GENERAL PLANT
47E601-74-SERIES-INSTRUMENT TABULATION
47W611-74 1-2 - - - - LOGIC DIAGRAM
47B211-1 - - - - - - PIPING SYSTEM CLASSIFICATION
47W832 SERIES- RHR SYSTEM PIPING
WESTINGHOUSE Specifications SD-WAT/WBT RESIDUAL HEAT REMOVAL SYSTEM.

Revised by Amendment

WATTS BAR NUCLEAR PLA
FINAL SAFETY ANALYSIS REPORT

POWERHOUSE UNITS 1 & 2
FLOW DIAGRAM
RESIDUAL HEAT REMOVAL SYSTEM
TVA DWG NO. 47W810-1 R16
FIGURE 2.4-107

Figure 2.4-107 Powerhouse Units 1 & 2 Flow Diagram - Residual Heat Removal System



NOTES:
DRAWING DOES NOT INCLUDE:
VENTILATION SYS., EMERGENCY POWER SYS., SAMPLING SYS., DETAILS OF ERCW LOADS, SPOOL PIECE CONNECTIONS.

WATTS BAR NUCLEAR PLANT
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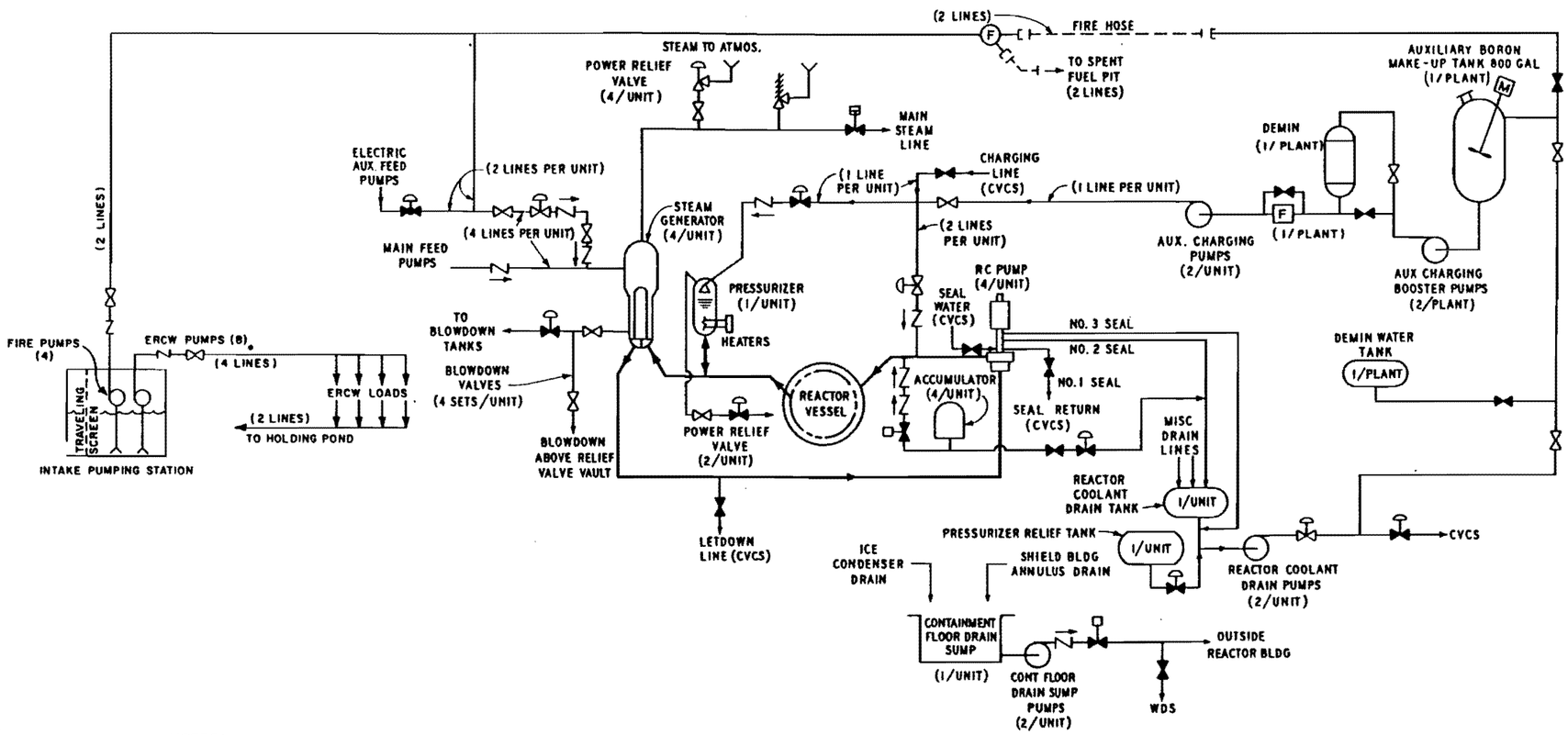
SCHEMATIC FLOW DIAGRAM
FLOOD PROTECTION PROVISIONS
OPEN REACTOR COOLING
(unit 1 shown, unit 2 similar)
Figure 2.4-108

Figure 2.4-108 Schematic Flow Diagram Flood Protection Provisions Open Reactor Cooling (Unit 1 Shown, Unit 2 Similar)

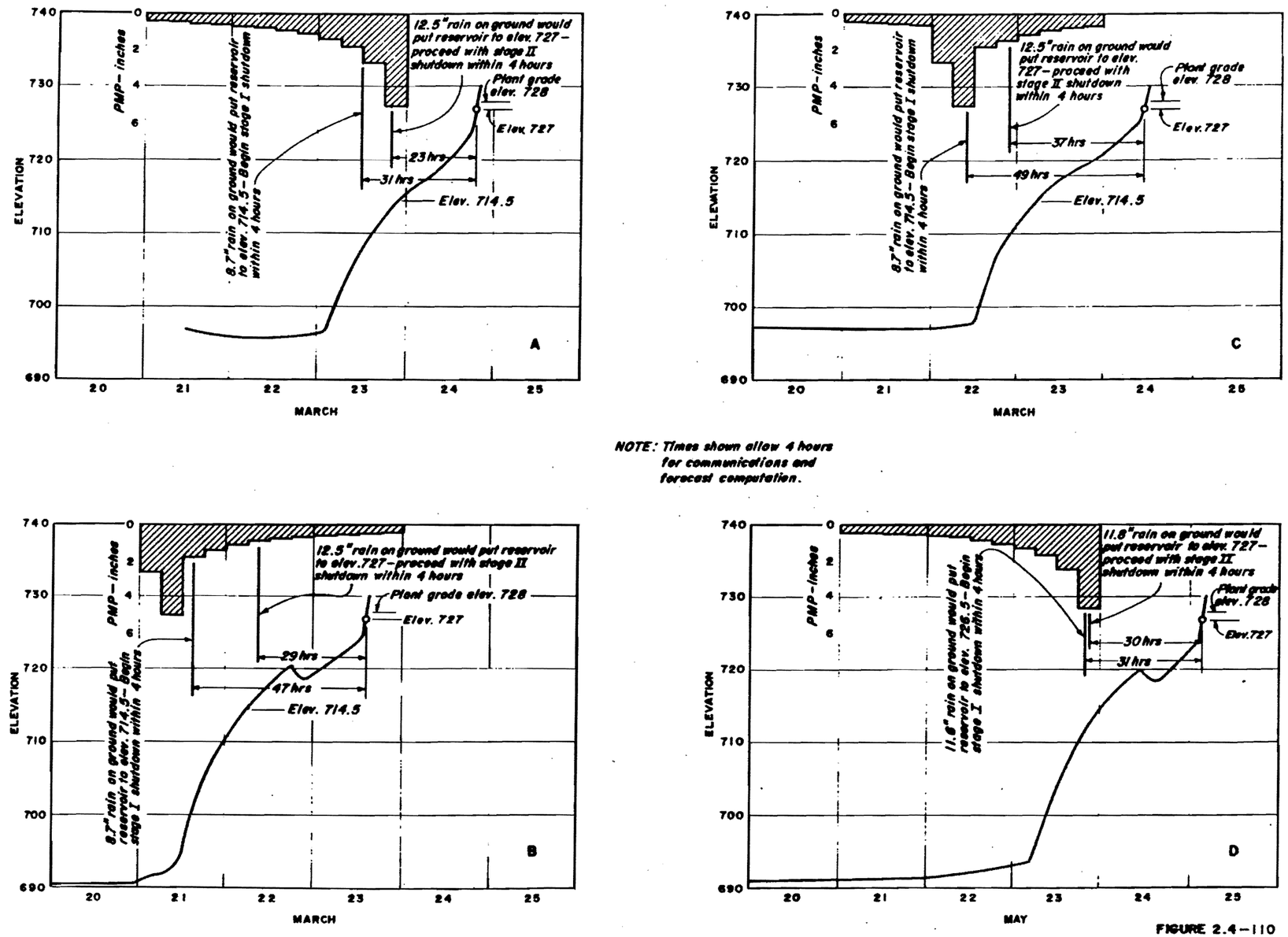


NOTES:
DRAWING DOES NOT INCLUDE:
VENTILATION SYS., EMERGENCY POWER SYS., SAMPLING SYS., DETAILS OF ERCW LOADS, SPOOL PIECE CONNECTIONS.

WATTS BAR NUCLEAR PLANT
FINAL SAFETY
ANALYSIS REPORT

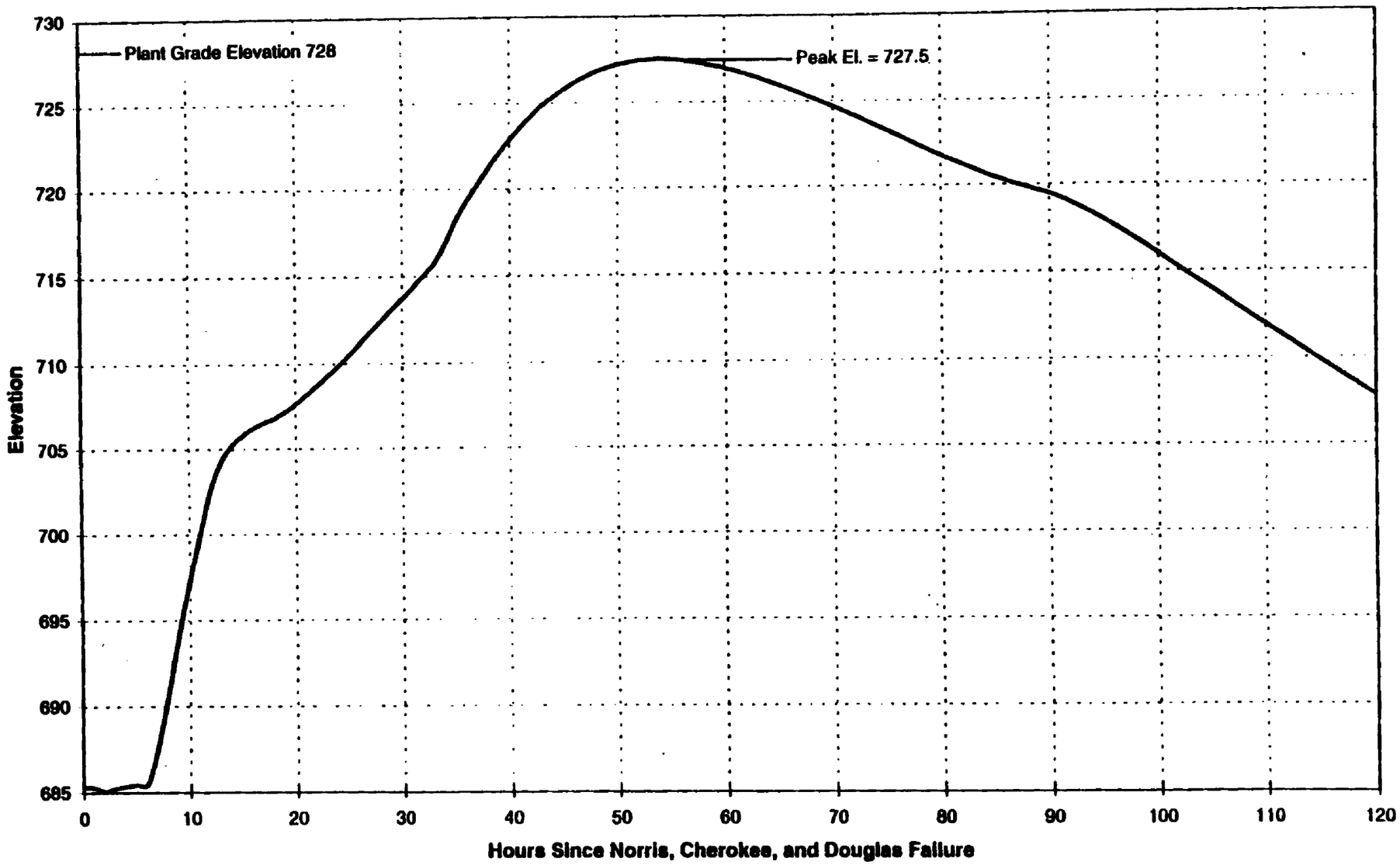
SCHEMATIC FLOW DIAGRAM
FLOOD PROTECTION PROVISIONS
NATURAL CONVECTION COOLING
(unit 1 shown, unit 2 similar)
Figure 2.4-109

Figure 2.4-109 Schematic Flow Diagram Flood Protection Provisions Natural Convection Cooling (Unit 1 Shown, Unit 2 Similar)



Added by Amendment 32

Figure 2.4-110 Watts Bar Nuclear Plant Rainfall Flood Protection Plan Basis For Safe Shutdown For Plant Flooding



Seismic Flood Analysis - Norris, Cherokee and Douglas SSE with 25-year Flood
Watts Bar Plant
Figure 2.4 - 111

FSAR - Amendment 92

Figure 2.4-111 Douglas PMF Failure Wave at Watts Bar Plant