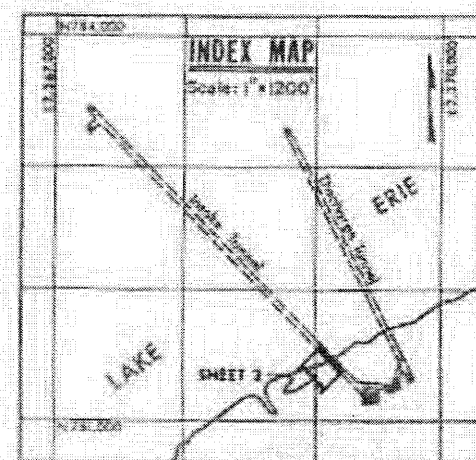


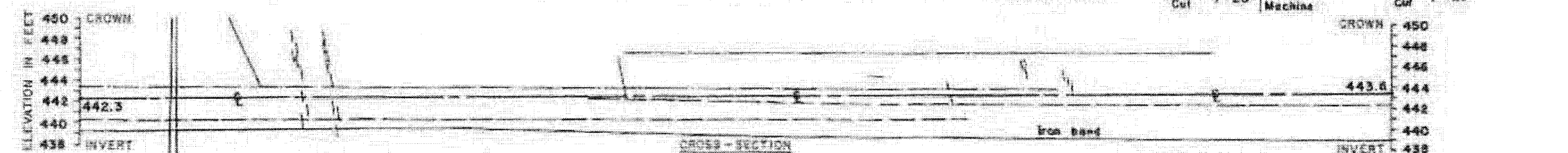
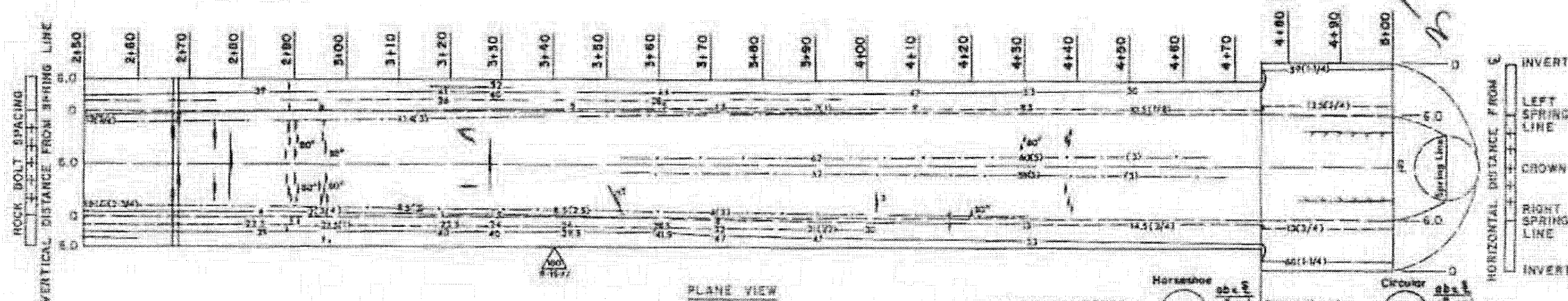
Location Map
Perry Nuclear Power Plant

Figure 2D-1



- SYMBOLS**
- 1/4" HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - 1/10" DISCONTINUOUS IRON BED
 - 1/1" HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - 1/100" DISCONTINUOUS IRON BED WITHIN GREY BED
 - 1/2" FRACTURE ZONE
 - 1/2" FAULT
 - 1/2" BEDDING PARTING
 - 1/2" VERTICAL JOINT
 - 1/2" INCLINED JOINT
 - 1/2" BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
 - SEEPAGE FROM FEATURE
 - OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 - METHANE GAS, MAXIMUM PERCENT I.E.L. WITH DATE OF OCCURRENCE
- *Note:*
Number(s) in parentheses indicates bed thickness
Number preceding parenthesis indicates inches above or below spring line of station of measurement

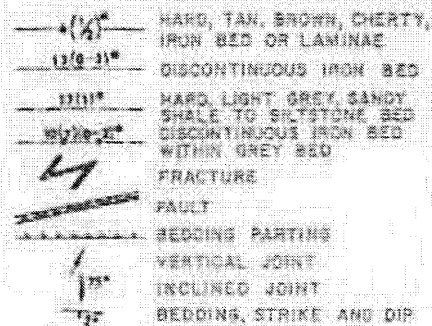






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1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"	1'-10"
Not pertinent																	
Not pertinent																	
Not pertinent																	
Not pertinent																	

EXCAVATION PROGRESS
ESTIMATED ROCK CONDITION (TERZAGHI NO.)
TEMPORARY SUPPORT SYSTEM
BEDDING SPACING
FRACTURE SPACING
WATER CONDITION
DEPTH OF COVER

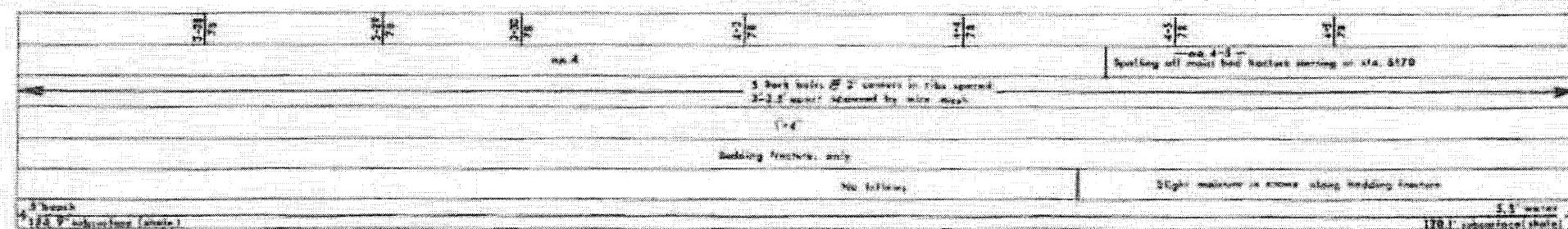
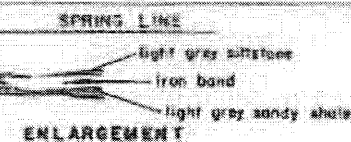
(Rev. 12 1/03)
PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations
Figure 20-2 (Sheet 2 of 24)



 MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT I.E.L. WITH DATE OF OCCURRENCE

*Note:
 Number(s) in parenthesis indicates bed thickness
 Number preceding parenthesis indicates inches
 above or below spring line at station of
 measurement.

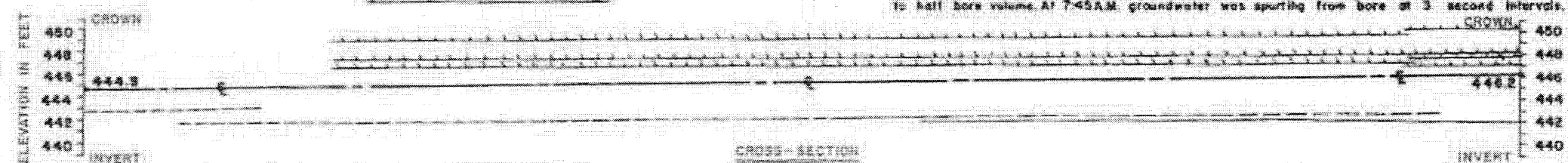
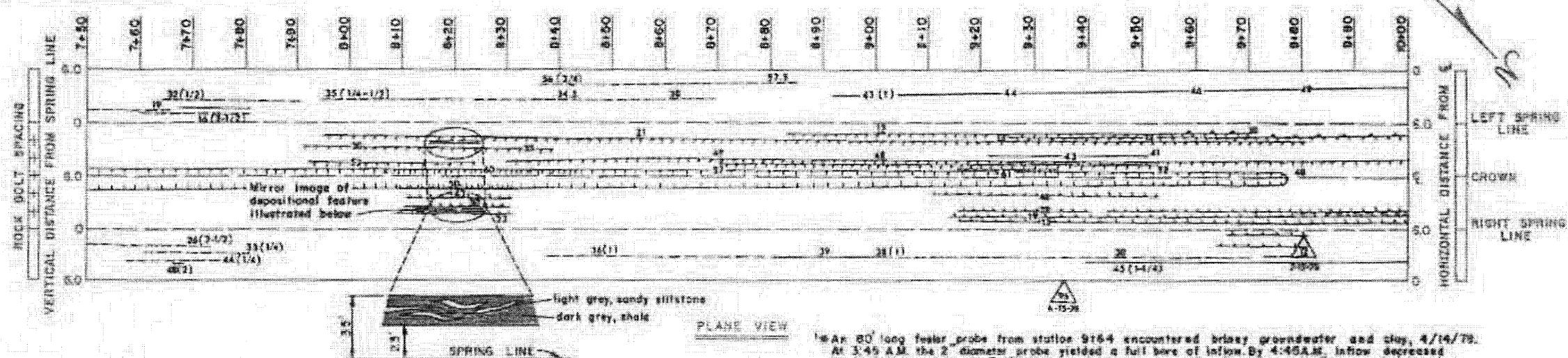
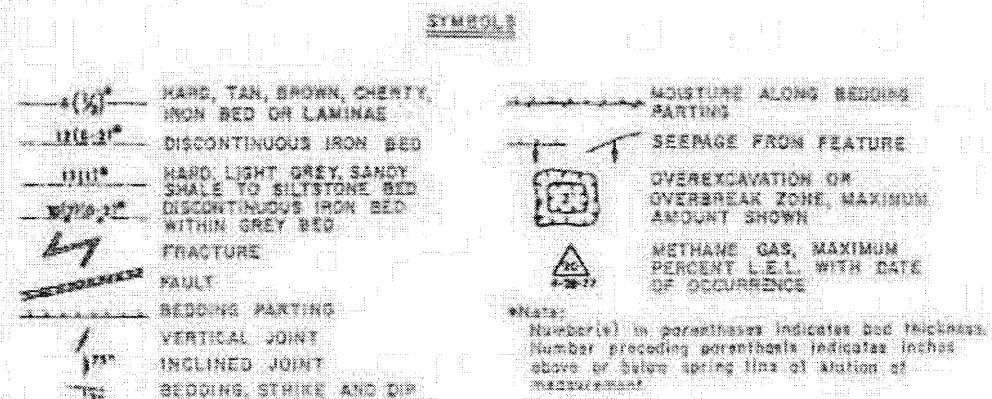
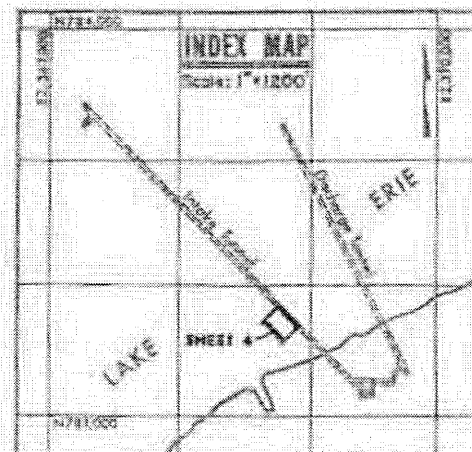


EXCAVATION PROGRESS	
ESTIMATED ROCK	
CONDITION (TERZAGHI NO.)	
TEMPORARY SUPPORT	
SYSTEM	
BEDDING SPACING	
FRACTURE SPACING	
WATER CONDITION	
DEPTH OF COVER	

PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

Figure 2B-7 (Sheet 3 of 24)



3'-0"	3'-0"	3'-0"	3'-0"	3'-0"	3'-0"
max 4'-8" Careless spalling along bedding fracture near crown					
3 rock bolts @ 8' spacing in ribs covered					
2-1.5' mesh spaced by wire mesh					
1'-4"	1'-2"	1'-8"	1'-10"	1'-10"	1'-10"
bedding fracture only					
Moisture along bedding fracture near crown			Moisture along bedding fracture near crown		
Seepage out of rock bolts w/ iron staining			Slight moisture along 20% of bedding fractures and rock bolts		
5.5' water			11.5' water		
ONLY subsurface (chairs)			ONLY subsurface (chairs)		

EXCAVATION PROGRESS

ESTIMATED ROCK CONDITION (TERZAGHI NO.)

TEMPORARY SUPPORT SYSTEM

BEDDING SPACING

FRACTURE SPACING

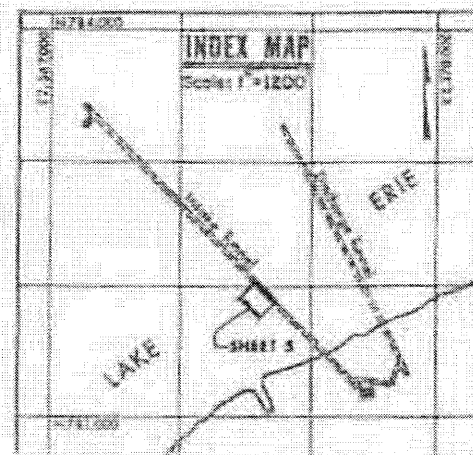
WATER CONDITION

DEPTH OF COVER



PERRY NUCLEAR POWER PLANT

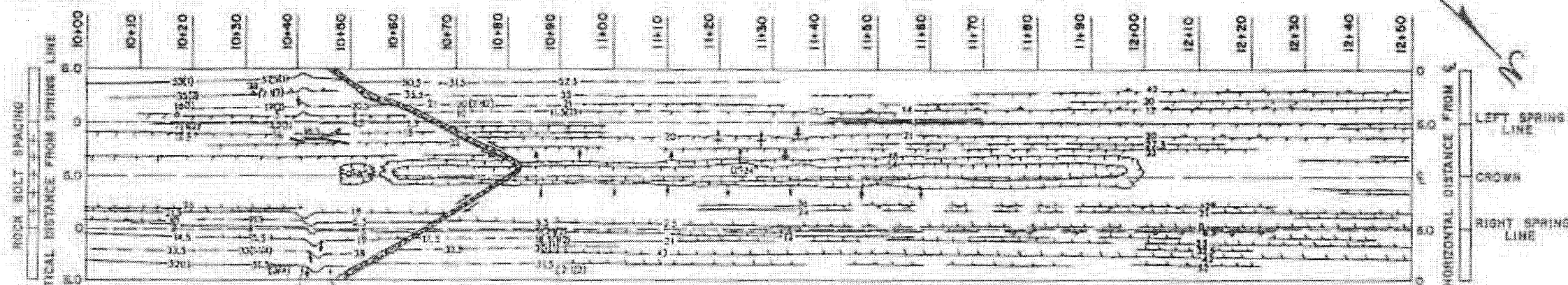
Geologic Map of
Tunnel Excavations
Figure 2D-2 (Sheet 4 of 24)



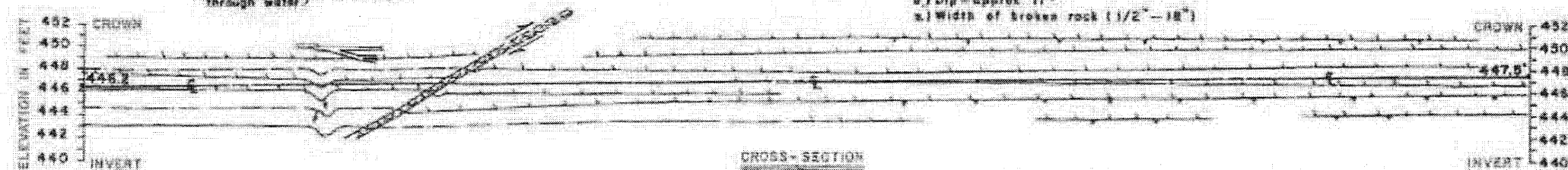
- SYMBOLS**
- 1 1/2" HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - 10-12" DISCONTINUOUS IRON BED
 - 12-14" HARD, LIGHT GREY SANDY SHALE TO SILTSTONE BED
 - 10-12" DISCONTINUOUS IRON BED WITHIN GREY BED
 - FRACTURE
 - FAULT (with sense of motion)
 - BEDDING PARTING
 - VERTICAL JOINT
 - INCLINED JOINT
 - BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
- SEEPAGE FROM FEATURE
- OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
- METHANE GAS, MAXIMUM PERCENT I.E.L. WITH DATE OF OCCURRENCE

* Note:
Number(s) in parentheses indicates bed thickness.
Number preceding parenthesis indicates inches above or below spring line at station of measurement.



- FAULT SEOMETRY**
- a.) Apparent displacement - 22"
 - b.) Actual vertical displacement - 12"
 - c.) Strike - N 47° E
 - d.) Dip - approx 17°
 - e.) Width of broken rock (1 1/2" - 18")



No. 5-6		No. 7-8		No. 9-10		No. 11-12		No. 13-14		No. 15-16	
5 rock bolts at 2' centers in steel ribs at 3-3.5 centers		0-24" of overbreak between rock bolt no 2-4		5 rock bolts at 2' centers in steel ribs at 3-3.5 centers		5 rock bolts at 2' centers in steel ribs at 3-3.5 centers		5 rock bolts at 2' centers in steel ribs at 3-3.5 centers		5 rock bolts at 2' centers in steel ribs at 3-3.5 centers	
Full chauling		Full chauling		Full chauling		Full chauling		Full chauling		Full chauling	
No inflow		No inflow		No inflow		No inflow		No inflow		No inflow	
11.7 water (photo)		11.7 water (photo)		11.7 water (photo)		11.7 water (photo)		11.7 water (photo)		11.7 water (photo)	

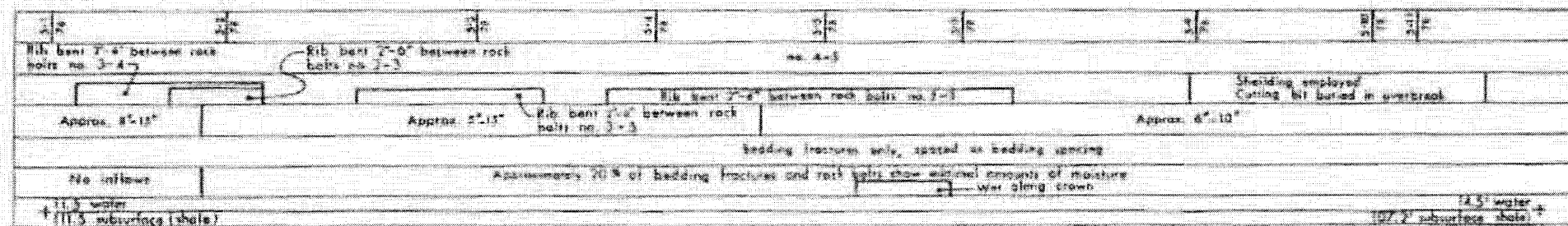
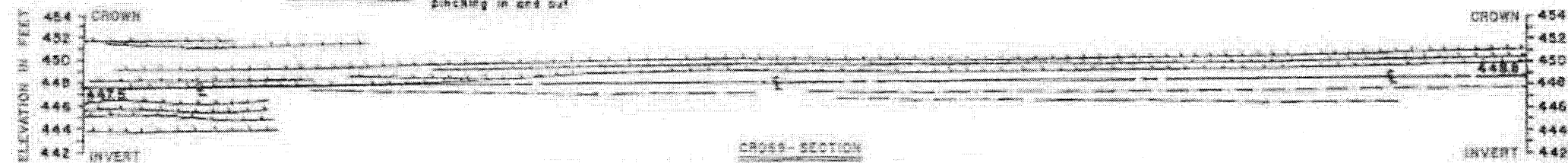
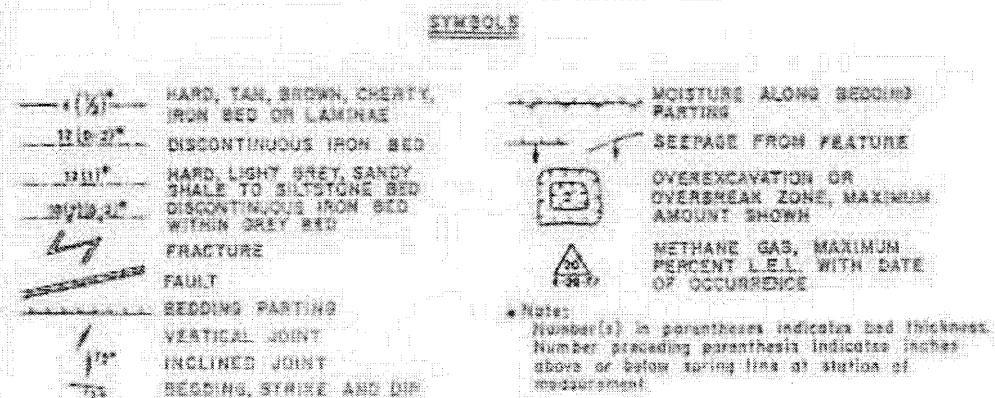
EXCAVATION PROGRESS
ESTIMATED ROCK CONDITION (TERZAGHI NO.)
TEMPORARY SUPPORT SYSTEM
BEDDING SPACING
FRACTURE SPACING
WATER CONDITION
DEPTH OF COVER

(Rev. 12/1/03)

PERRY NUCLEAR POWER PLANT

Geologic Map of Tunnel Excavations

Figure 20-2 (Sheet 5 of 24)



EXCAVATION PROGRESS	
ESTIMATED ROCK	
CONDITION (TERZAGHI NO.)	
TEMPORARY SUPPORT	
SYSTEM	
NEEDING SPACING	
FRACTURE SPACING	
WATER CONDITION	
DEPTH OF COVER	

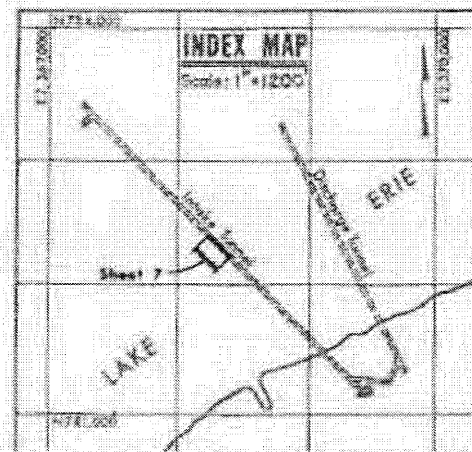
REV. 12-1-83



PERRY NUCLEAR POWER PLANT

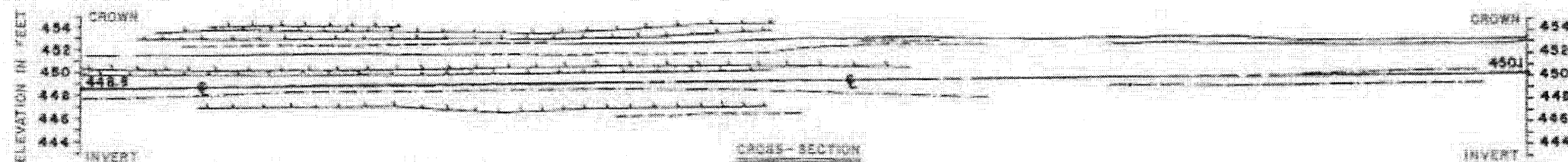
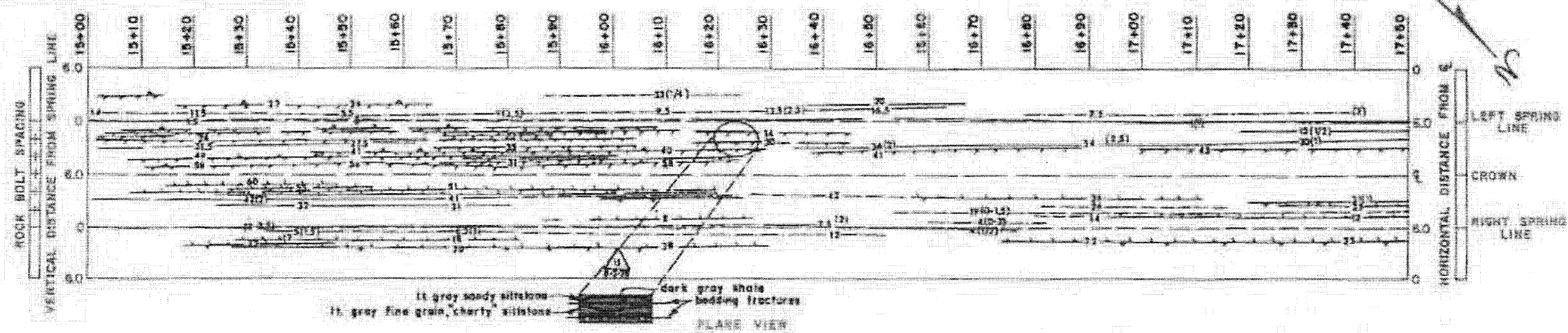
Geologic Map of Tunnel Excavations

Figure 2D-2 (Sheet 6 of 24)



- SYMBOLS**
- $\frac{1}{2}$ " HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - 12(2-3)" DISCONTINUOUS IRON BED
 - 17(1)" HARD, LIGHT GRAY, SANDY SHALE TO SILTSTONE BED
 - 25(12-2)" DISCONTINUOUS IRON BED WITHIN GRAY BED
 - FR FRACTURE
 - FA FAULT
 - BD BEDDING PARTING
 - VJ VERTICAL JOINT
 - IJ INCLINED JOINT
 - BD, S, D, I BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
 - SEEPAGE FROM FEATURE
 - OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 - METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE
- Note:**
 Number(s) in parentheses indicates bed thickness.
 Number preceding parenthesis indicates inches above or below spring line at station of measurement.



0+00	0+10	0+20	0+30	0+40
NO. 4-5	NO. 4-5	NO. 4-5	NO. 4-5	NO. 4-5
Slight scaling from crown along entire length of excavation (0'-2' overbreak)				
2 rock bolts at 7' centers in steel ribs or 3.5' to 4.0' centers, spaced by wire mesh				
Approx. 6"-10"	8"-9"		6"-10"	
Bedding fractures only				
Approx. 20% of bedding fractures show minimal moisture				
Approx. 10% of bedding fractures show moisture				
14.5' water				
107.2' subsurface (shale)				
10.3' water				
103.9' subsurface (shale)				

EXCAVATION PROGRESS
 ESTIMATED ROCK
 CONDITION (TERZAGHI NO. 1)
 TEMPORARY SUPPORT
 SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

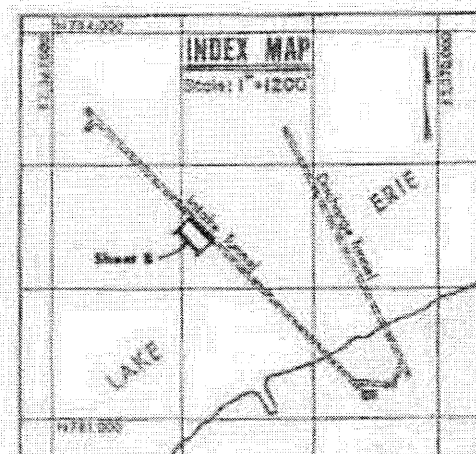
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Geologic Map of
 Tunnel Excavations

Figure 2D-2 (Sheet 7 of 24)

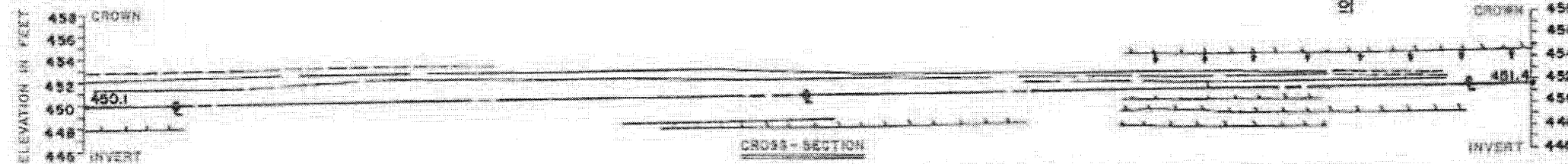
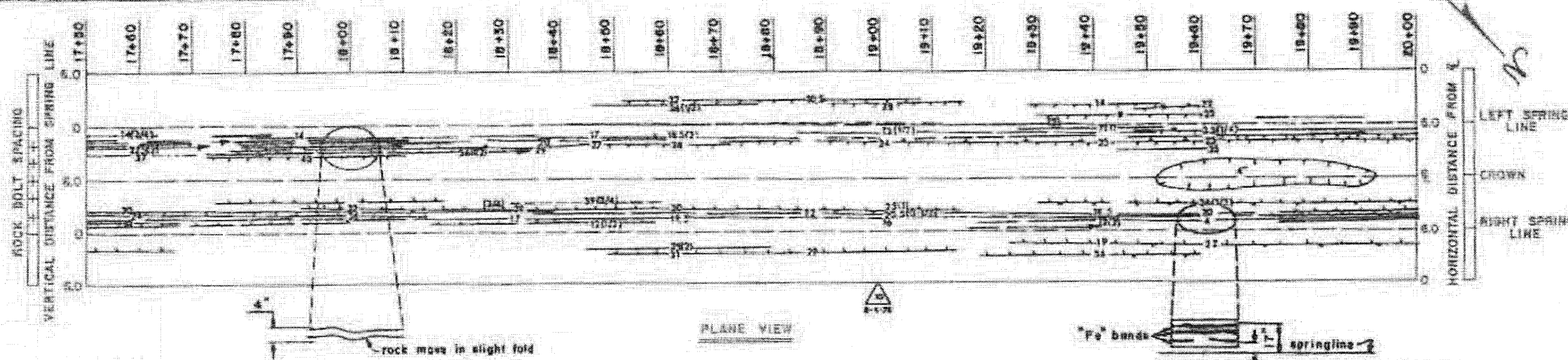


SYMBOLS

(X) HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 12 10 37 DISCONTINUOUS IRON BED
 12 11 HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 12 12 20 DISCONTINUOUS IRON BED WITHIN GREY BED
 12 13 FRACTURE
 12 14 FAULT
 12 15 BEDDING PARTING
 12 16 VERTICAL JOINT
 12 17 INCLINED JOINT
 12 18 BEDDING, STRIKE AND DIP

MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

*Note:
 Number(s) in parenthesis indicates bed thickness
 Number preceding parenthesis indicates inches above or below spring line of station of measurement.



12 17	12 18	12 19	12 20	12 21
as 4	Slight scaling along crown for series length (between rock bolt 2 & 4)		Slight scaling from roof (0'-4')	as 4
	3 rock bolts at 2.0' centers in steel ribs at 2.5' to 4.0' centers, spanned by wire mesh		Some ribs at 4.0' centers	
	Approx. 8"	Approx. 4" to 10"	4" to 8"	
	Bedding fractures only		Slight moisture on approx. 60% of the excavation	
	Traces of moisture along a couple bedding fractures		12.3 water 101.3 methane (shale)	
12 22	12 23	12 24	12 25	12 26

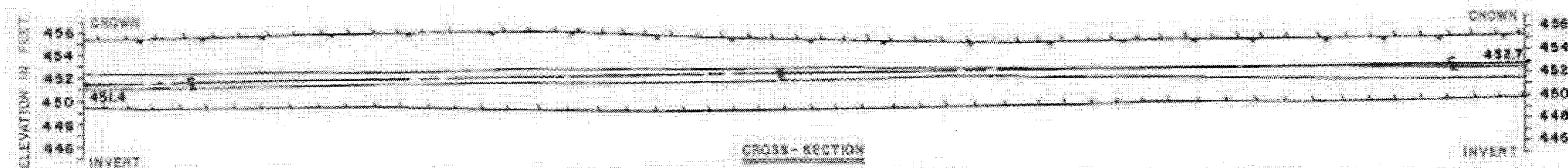
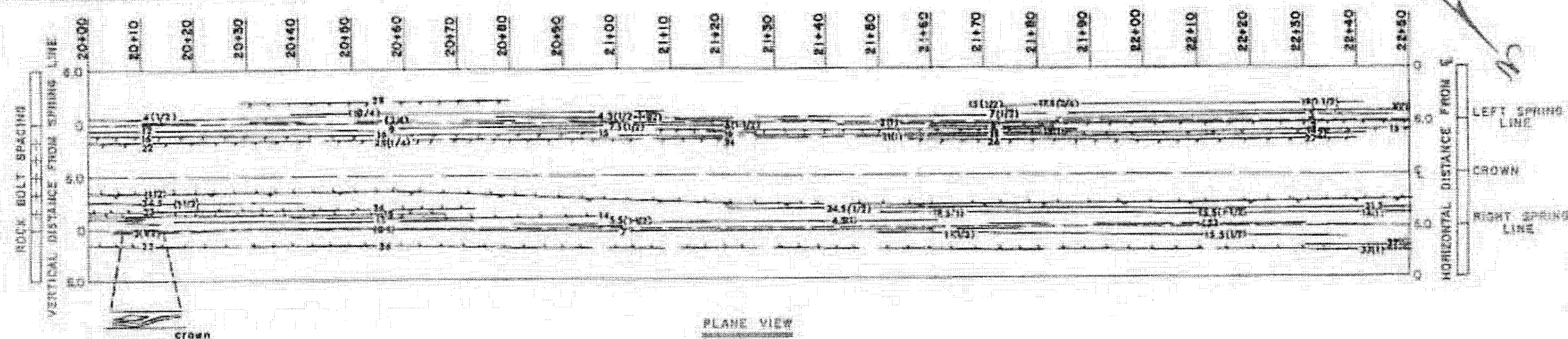
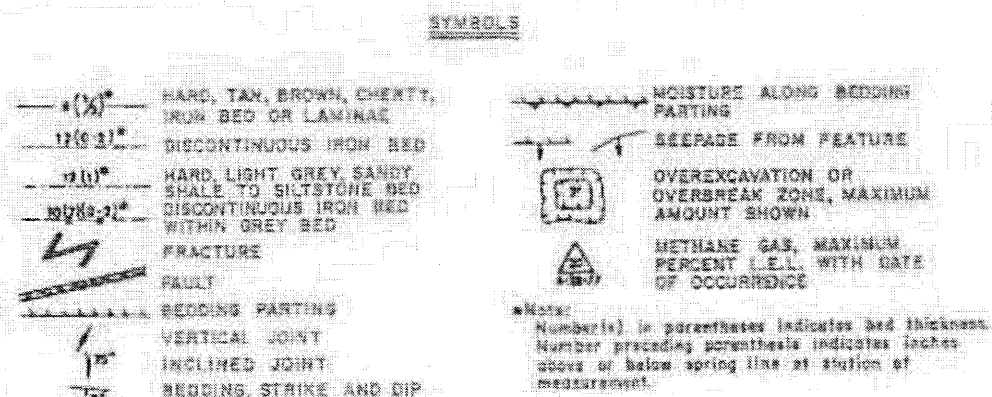
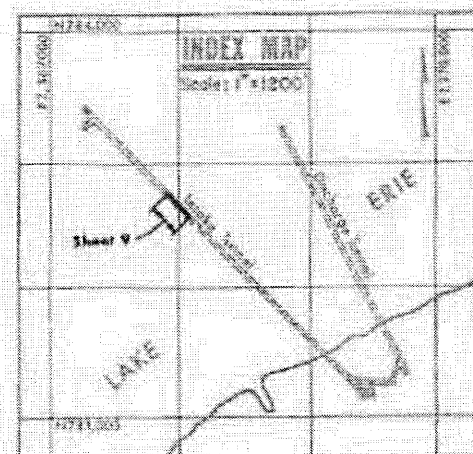
EXCAVATION PROGRESS
 ESTIMATED ROCK CONDITION (TERZAGHI NO.)
 TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

Geologic Map of Tunnel Excavations

Figure 2D-2 (Sheet 8 of 24)



2-30 31	1-2 76	4-1 76	4-2 76	4-2 76
No. 8				
3 rock bolts at 2' centers in steel ribs at 4' centers supported by wire mesh			3 rock bolts at 2' centers in steel ribs at 2.5'-4.0' centers supported by wire mesh	
5'-8'			8'-8'	
Bedding fractures only				
Slight moisture from open parting along east wall for entire length				
17.5 water 191.8 subsurface (shale)			17.5 water 186.5' subsurface (shale)	

EXCAVATION PROGRESS
ESTIMATED ROCK
CONDITION (TERZAGHI NO.)
TEMPORARY SUPPORT
SYSTEM
BEDDING SPACING
FRACTURE SPACING
WATER CONDITION
DEPTH OF COVER

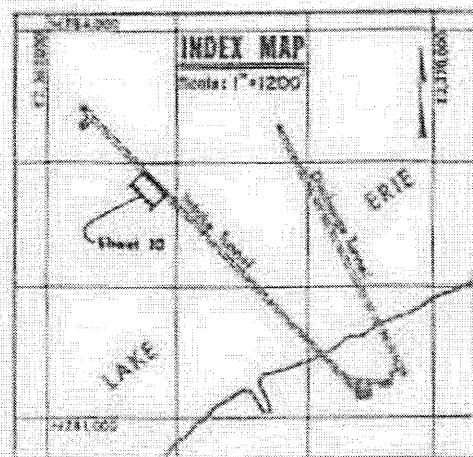
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

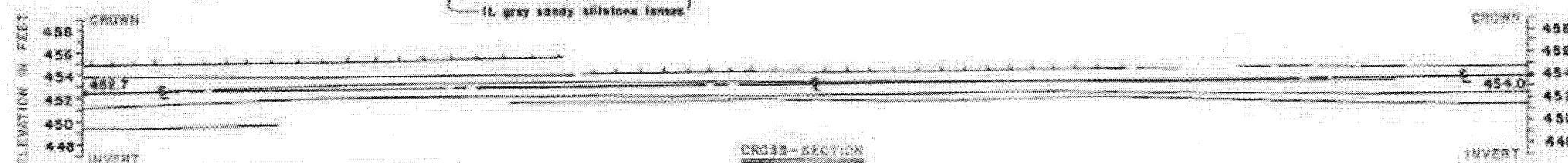
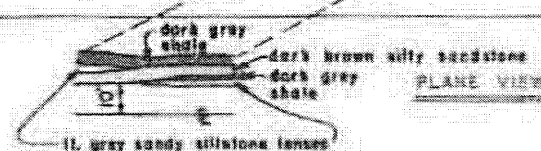
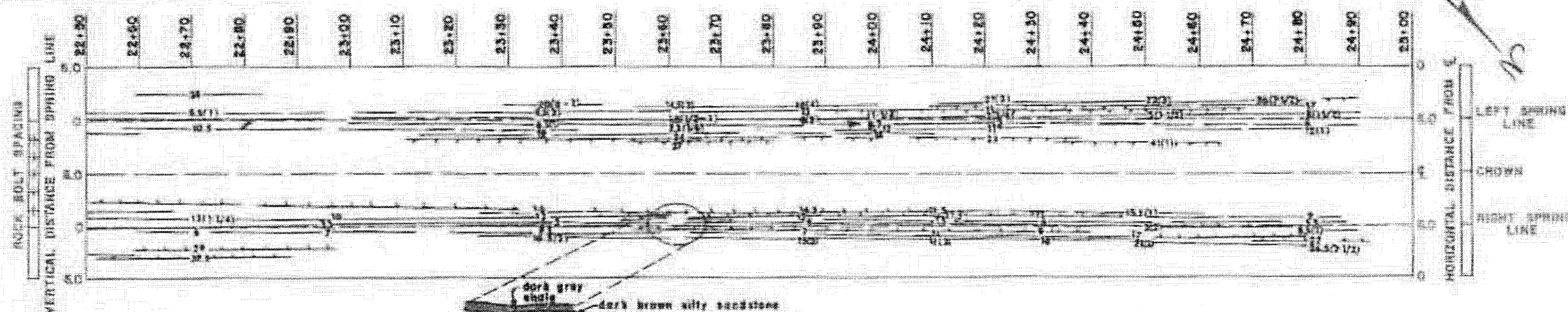
Geologic Map of
Tunnel Excavations

Figure 20-2 (Sheet 9 of 24)



- SYMBOLS**
- (1/2)— HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - (12/2-21)— DISCONTINUOUS IRON BED
 - (12/1)— HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - (10/20,2)— DISCONTINUOUS IRON BED WITHIN GREY BED
 - (1/2)— FRACTURE
 - (1/2)— FAULT
 - (1/2)— BEDDING PARTING
 - (1/2)— VERTICAL JOINT
 - (1/2)— INCLINED JOINT
 - (1/2)— BEDDING, STRIKE AND DIP

- (1/2)— MOISTURE ALONG BEDDING PARTING
 - (1/2)— SEEPAGE FROM FEATURE
 - (1/2)— OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 - (1/2)— METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE
- Note:**
Number(s) in parentheses indicates bed thickness.
Number preceding parenthesis indicates inches above or below spring line at station of measurement.



No. 4		No. 4	
Slight overbreak between rail bolt nos. 7 & 8, 10'-0" deep (max 24")		Slight overbreak between rail bolt nos. 7 & 8, 10'-0" deep (max 24")	
Track bolts in 7' centers in steel ribs at 1.5' to 4.0' centers, supported by wire mesh		Track bolts in 7' centers in steel ribs at 1.5' to 4.0' centers, supported by wire mesh	
3'-7"		1'-8"	
Bedding fractures only, located as above		No seepage	
Most bedding fractures, above springline along east wall		No seepage	
1.5' water		1.5' water	
K&S Substation (shown)		K&S Substation (shown)	

EXCAVATION PROGRESS
ESTIMATED ROCK
CONDITION (TERZAGHI NO. 1)
TEMPORARY SUPPORT
SYSTEM
BEDDING SPACING
FRACTURE SPACING
WATER CONDITION
DEPTH OF COVER

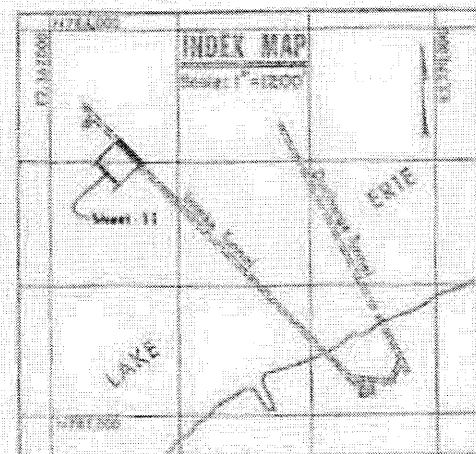
(Rev. 12-1/83)



PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

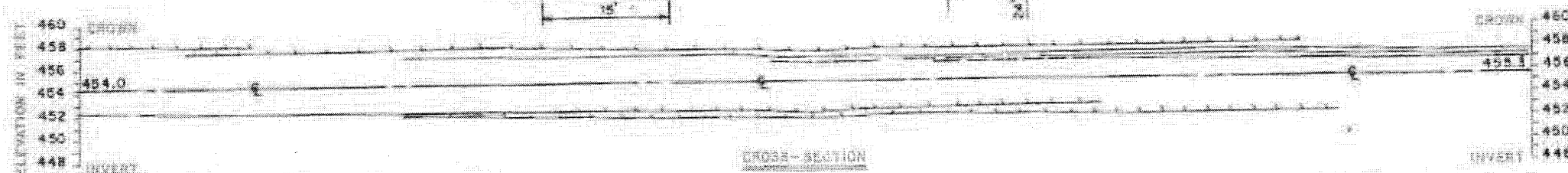
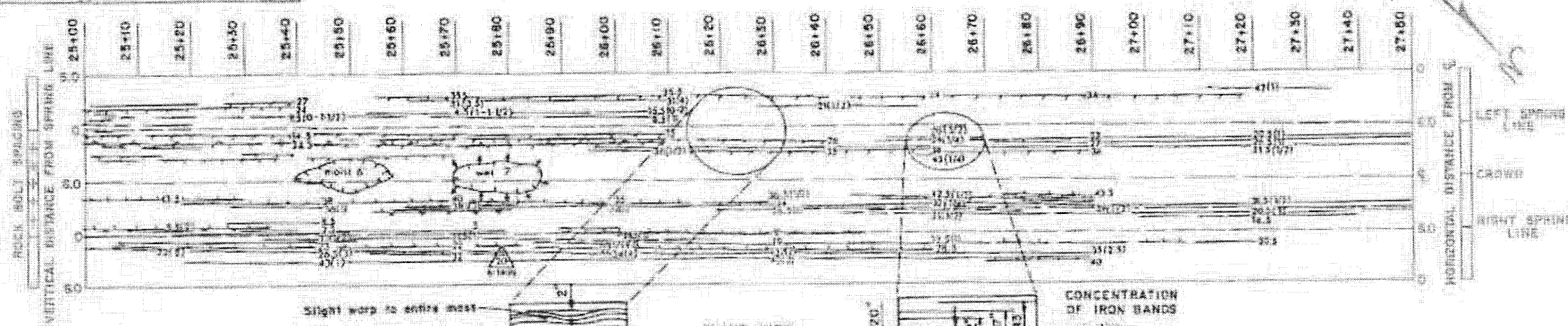
Figure 2D-2 (Sheet 13 of 24)



- SYMBOLS**
- $\frac{1}{2}$ HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - $\frac{1}{2}$ DISCONTINUOUS IRON BED
 - $\frac{1}{2}$ HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - $\frac{1}{2}$ DISCONTINUOUS IRON BED WITHIN GREY BED
 - $\frac{1}{2}$ FRACTURE
 - $\frac{1}{2}$ FAULT
 - $\frac{1}{2}$ BEDDING PARTING
 - $\frac{1}{2}$ VERTICAL JOINT
 - $\frac{1}{2}$ INCLINED JOINT
 - $\frac{1}{2}$ BEDDING, STRIKE AND DIP

- $\frac{1}{2}$ MOISTURE ALONG BEDDING PARTING
- $\frac{1}{2}$ BEARING FROM FEATURE
- $\frac{1}{2}$ OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
- $\frac{1}{2}$ METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

* Note:
Numerals in parentheses indicates bed thickness
Number preceding parenthesis indicates inches above or below spring line at station of measurement



Slight overbreak along entire section 0' - 6' deep max 2'		Slight overbreak along entire section 0' - 6'		Slight overbreak along entire section 0' - 6'	
16' - 6' overbreak in crown max 2'	1' - 7'	1' - 7'	1' - 7'	1' - 7'	1' - 7'
Additional rock bolts and ribs added to prohibit additional overbreaks		Additional rock bolts and ribs added to prohibit additional overbreaks		Additional rock bolts and ribs added to prohibit additional overbreaks	
Slight dip from overbreak in crown		Slight moisture along bedding fractures		No seepage	
3' - 5' water		3' - 5' water		3' - 5' water	
140' surface (thole)		140' surface (thole)		140' surface (thole)	

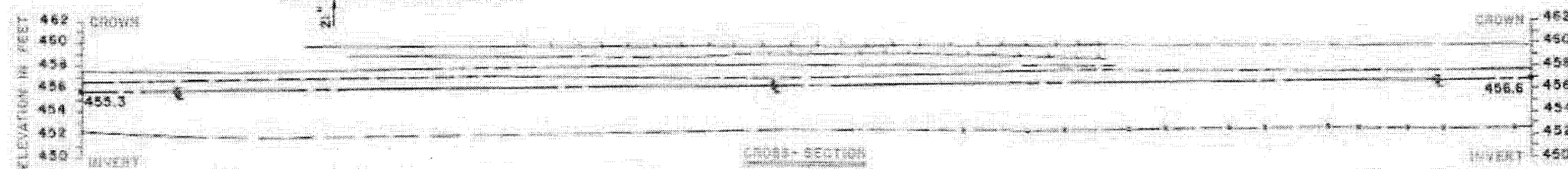
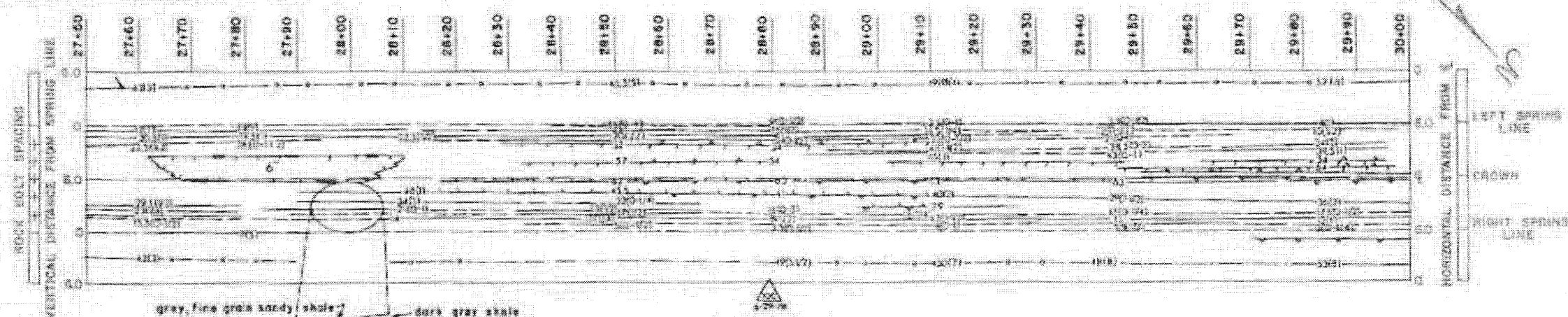
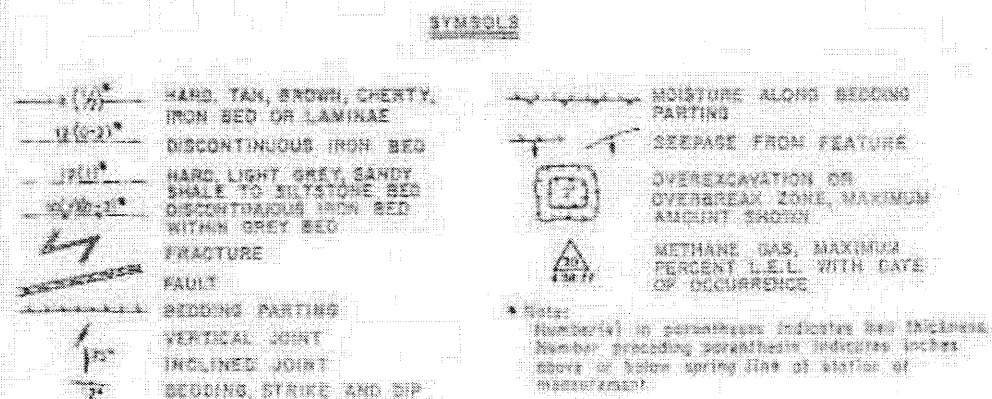
EXCAVATION PROGRESS
ESTIMATED ROCK CONDITION (VERTICAL RD.)
TEMPORARY SUPPORT SYSTEM
BEDDING SHADING
FRACTURE SHADING
WATER CONDITION
DEPTH OF COVER

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

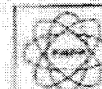
Geologic Map of
Tunnel Excavations

Figure 2D-2 (Sheet 11 of 24)

[illegible]

EXCAVATION PROGRESS
ESTIMATED ROCK
CONDITION (TERMINAL AND)
TEMPERATURE SURVEILLANCE
SYSTEM
RECORDING BRANCH
FRACTURE SPACING
WATER CONTENT
DEPTH OF COVER

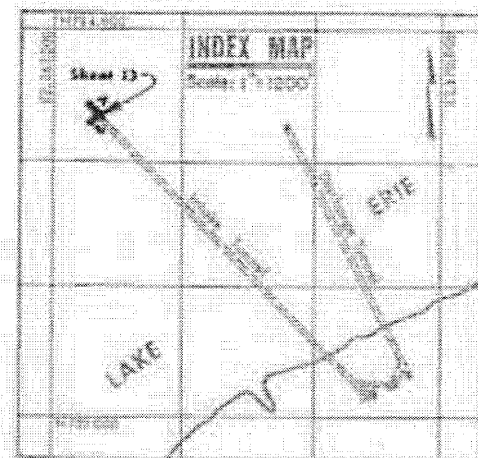
Rev. 12-1-03



PERRY NUCLEAR POWER PLANT

Geologic Map of Tunnel Excavations

Figure 3D-2 (Sheet 12 of 24)

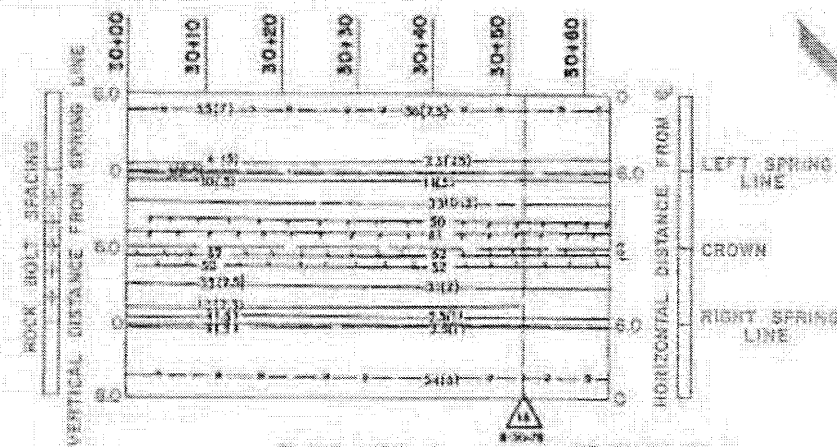


SYMBOLS

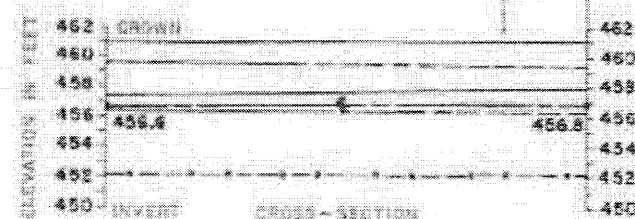
1/2" = 1' HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 1/2" = 1' DISCONTINUOUS IRON BED
 1/2" = 1' HARD, LIGHT GREY, SANDY SHALE TO SLTSTONE BED
 1/2" = 1' DISCONTINUOUS IRON BED WITHIN GREY BED
 1/2" = 1' FRACTURE
 1/2" = 1' FAULT
 1/2" = 1' BEDDING PARTING
 1/2" = 1' VERTICAL JOINT
 1/2" = 1' INCLINED JOINT
 1/2" = 1' BEDDING, STRIKE AND DIP

MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

*Note: Numbers in parentheses indicate bed thickness. Number preceding parenthesis indicates inches above or below spring line at station of measurement.



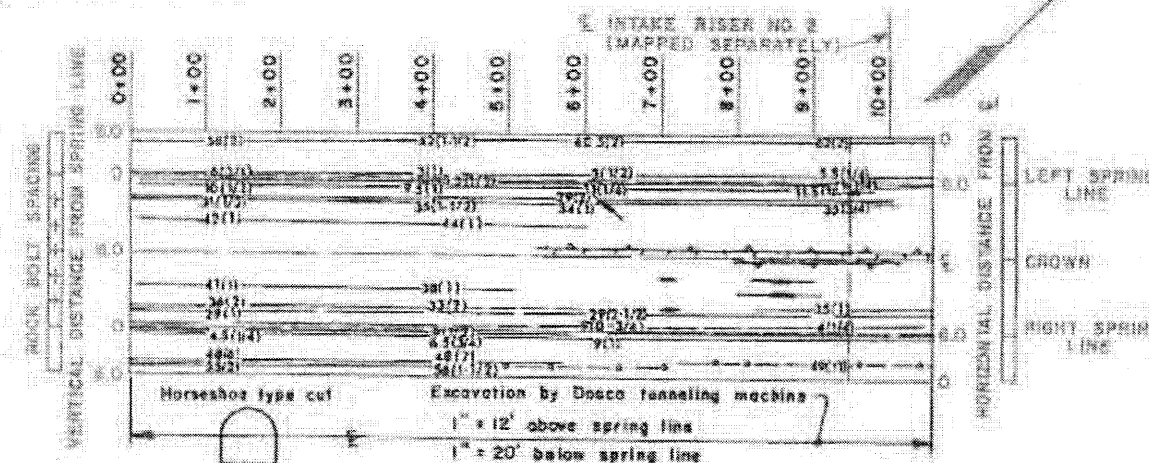
PLANE VIEW A



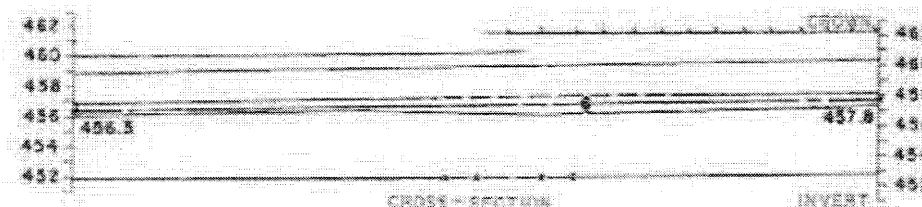
CROSS-SECTION A

EXCAVATION PROGRESS	ESTIMATED ROCK CONDITION (TERZAGHI NO.)
1-4	1-4
Slight overbreak along entire section	1-4
3 rock bolts at 2' centers in steel ribs at 4' centers spaced by wire mesh	1-4
4'-6"	1-4
Bedding fractures only, spaced as above	1-4
Slight moisture along all bedding fractures	1-4
22.5' water	22.5'
91.5' subsurface (scale)	91.5'

TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER



PLANE VIEW B

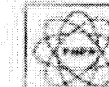


CROSS-SECTION B

EXCAVATION PROGRESS	ESTIMATED ROCK CONDITION (TERZAGHI NO.)
1-4	1-4
3 rock bolts at 2' centers in steel ribs at 4'-6.5' centers, spaced by wire mesh	1-4
3'-8"	1-4
Bedding fractures only, spaced as above	1-4
Bedding fractures only	1-4
22.5' water	22.5'
91.5' subsurface (scale)	91.5'

TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

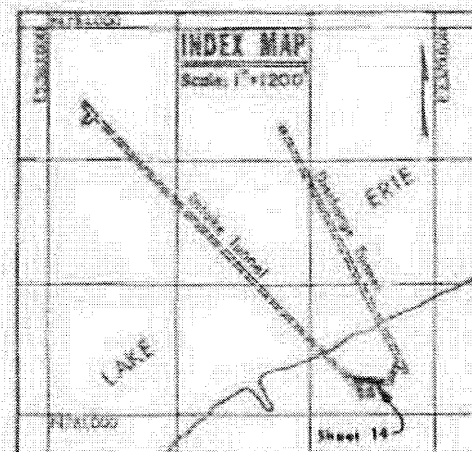
(Rev. 12 1/83)



PERRY NUCLEAR POWER PLANT

Geologic Map of
 Tunnel Excavations

Figure 20-2 (Sheet 13 of 24)

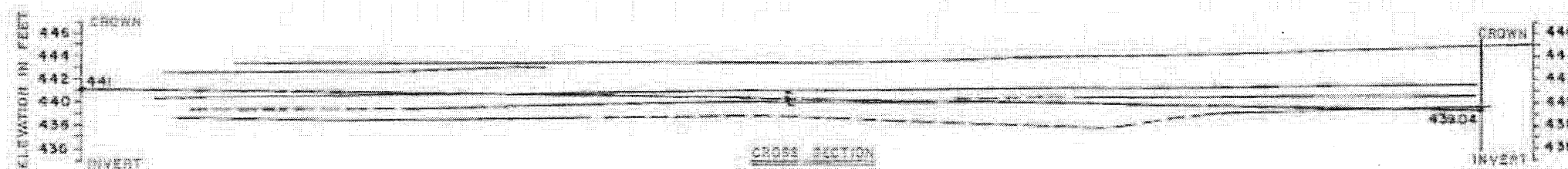
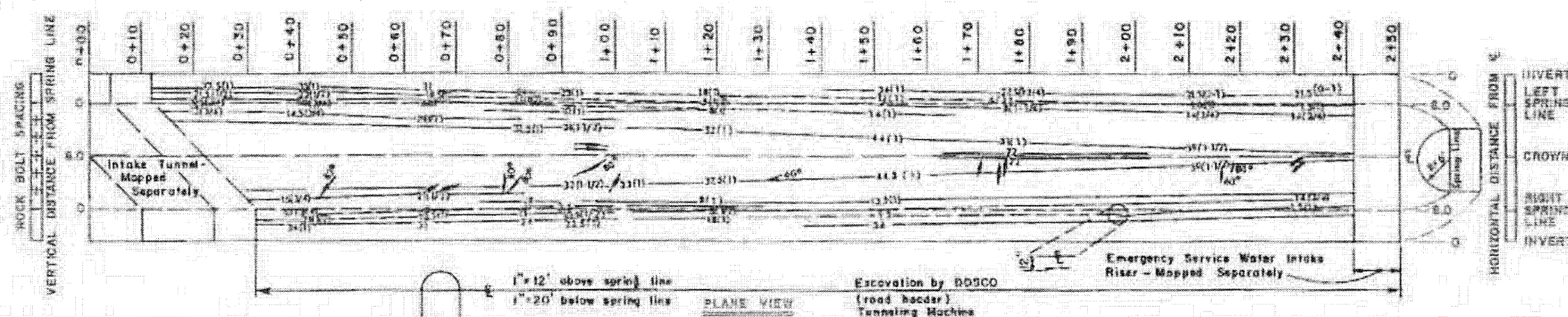


SYMBOLS

(X) HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 2/5-2 DISCONTINUOUS IRON BED
 13(1) HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 10(7X2-2) DISCONTINUOUS IRON BED WITHIN GREY BED
 FRACTURE
 FAULT
 BEDDING PARTING
 VERTICAL JOINT
 INCLINED JOINT
 BEDDING, STRIKE AND DIP

MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

* Note: Number in parentheses indicates bed thickness. Number preceding parentheses indicates inches above or below spring line at station of measurement.



STATION	0+00	0+10	0+20	0+30	0+40	0+50	0+60	0+70	0+80	0+90	1+00	1+10	1+20	1+30	1+40	1+50	1+60	1+70	1+80	1+90	2+00	2+10	2+20	2+30	2+40	2+50
ESTIMATED ROCK CONDITION (VERBAGE NO.)	1-4	3	1/2-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4	1-4
TEMPORARY SUPPORT SYSTEM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
BEDDING SPACING	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
FRACTURE SPACING	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
WATER CONDITION	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
DEPTH OF COVER	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

EXCAVATION PROGRESS
 ESTIMATED ROCK CONDITION (VERBAGE NO.)
 TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

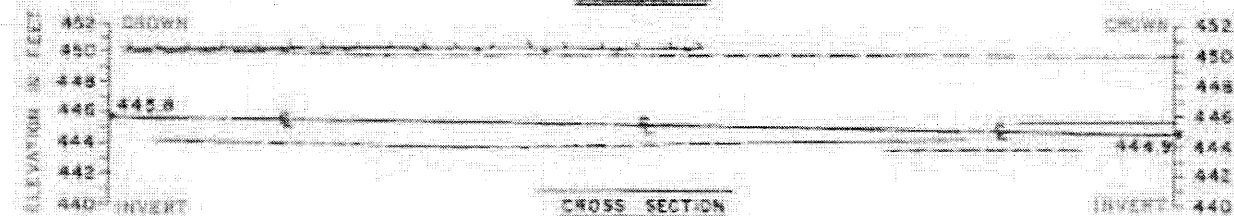
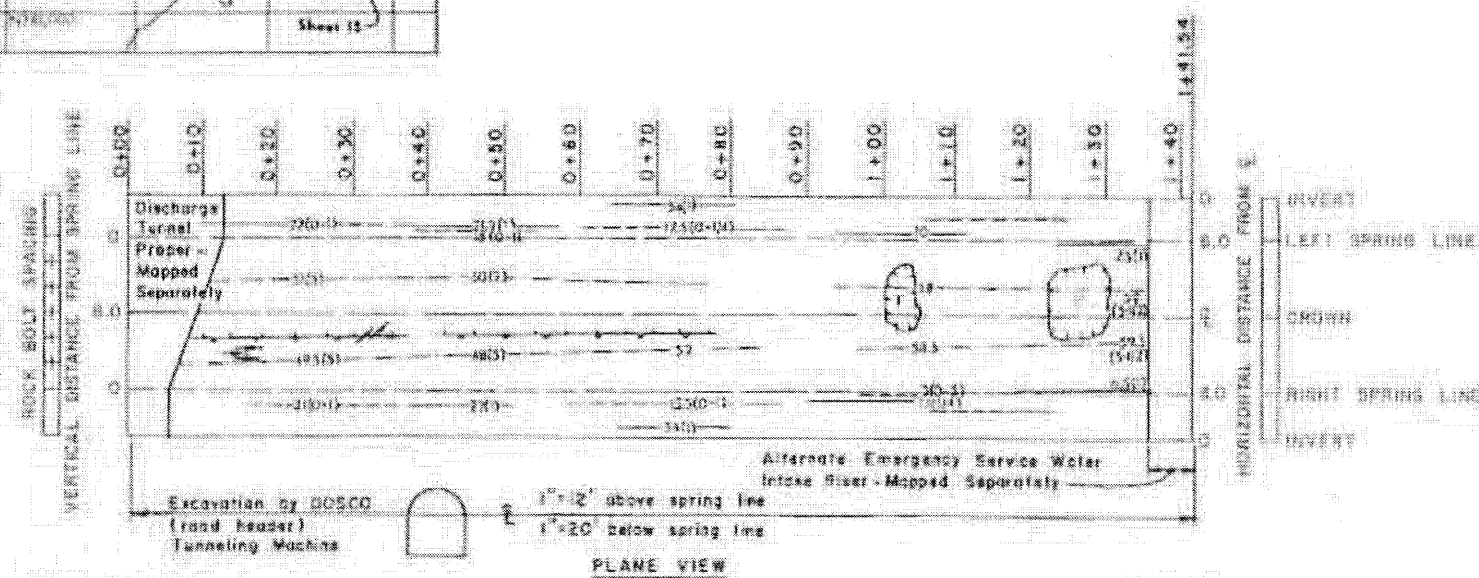
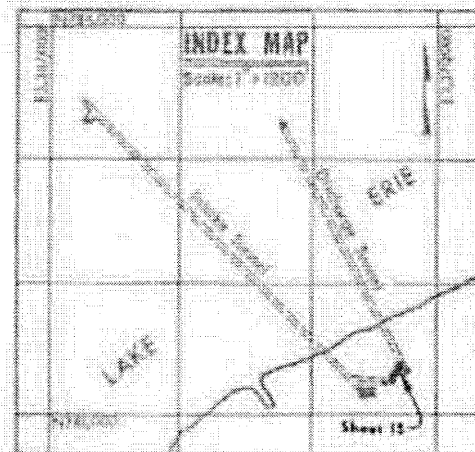
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

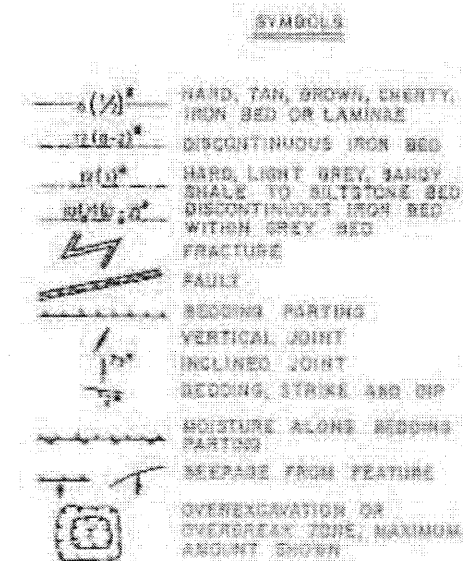
Geologic Map of
 Tunnel Excavations

Figure 2D-2 (Sheet 14 of 24)



Excavation Progress	Estimated Rock Condition (Terzaghi No.)	Temporary Support System
1/2" x 1/2"	2	1/2" x 1/2" rock bolts at 3' centers in steel ribs at 10'-11' centers, spanned by wire mesh
3" x 2"	3	3" x 2" rock bolts at 3' centers in steel ribs at 10'-11' centers, spanned by wire mesh
4" x 2"	4	4" x 2" rock bolts at 3' centers in steel ribs at 10'-11' centers, spanned by wire mesh
Approx. 1/2" x 1/2" rock bolts	5	Approx. 1/2" x 1/2" rock bolts at 3' centers in steel ribs at 10'-11' centers, spanned by wire mesh

Excavation Progress
Estimated Rock Condition (Terzaghi No.)
Temporary Support System
Bedding Spacing
Fracture Spacing
Water Condition
Depth of Cover



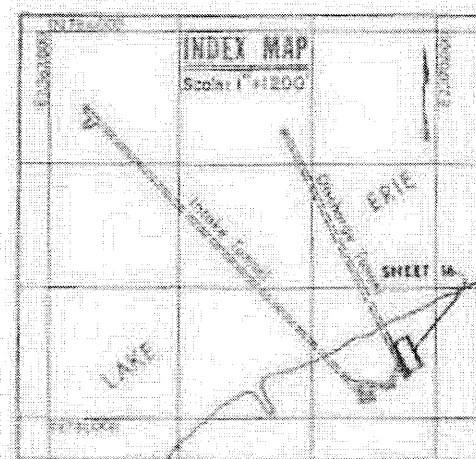
Notes:
Number(s) in parentheses indicate bed thickness.
Number preceding parentheses indicates inches above or below spring line at station of measurement.

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

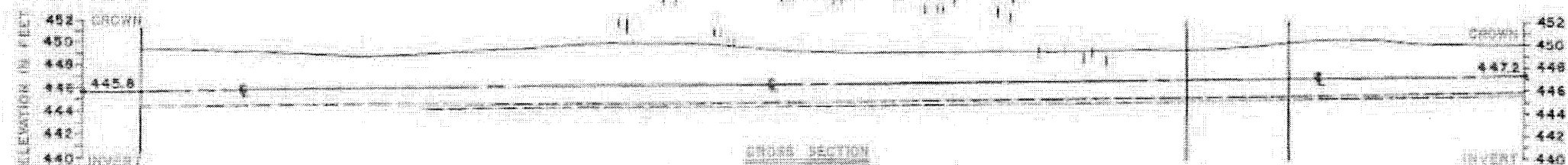
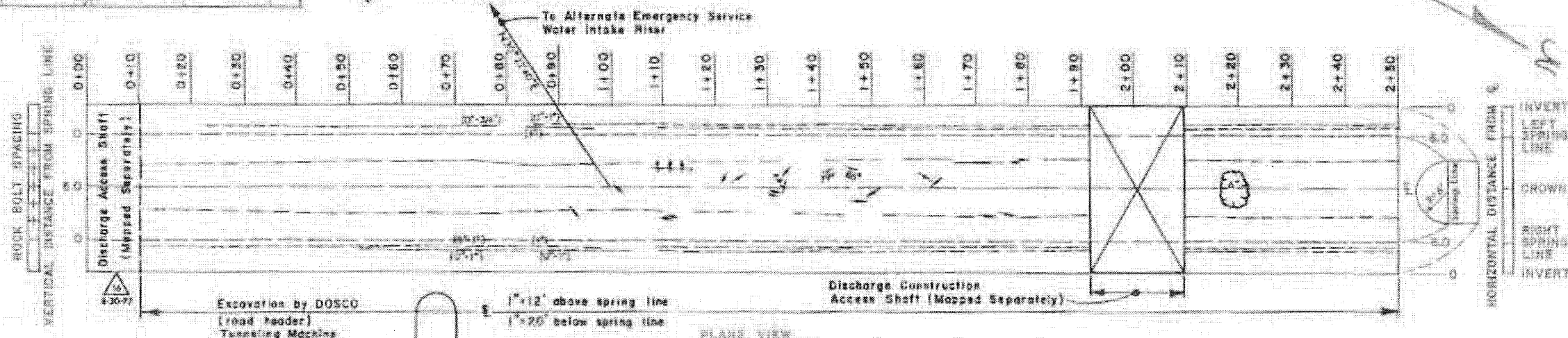
Figure 2D-2 (Sheet 15 of 24)



SYMBOLS

- 1/2" (1/2)" HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
- 1/2" (1/2)" DISCONTINUOUS IRON BED
- 1/2" (1/2)" HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
- 1/2" (1/2)" DISCONTINUOUS IRON BED WITHIN GREY BED
- 1/2" (1/2)" FRACTURE
- 1/2" (1/2)" FAULT
- 1/2" (1/2)" BEDDING PARTING
- 1/2" (1/2)" VERTICAL JOINT
- 1/2" (1/2)" INCLINED JOINT
- 1/2" (1/2)" BEDDING, STRIKE AND DIP
- 1/2" (1/2)" MOISTURE ALONG BEDDING PARTING
- 1/2" (1/2)" SEEPAGE FROM FEATURE
- 1/2" (1/2)" OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
- 1/2" (1/2)" METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

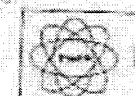
* NOTE:
Number(s) in parentheses indicates bed thickness.
Number preceding parentheses indicates inches above or below spring line at station of measurement.



EXCAVATION PROGRESS									
ESTIMATED ROCK CONDITION (INTERMEDIATE NO.)									
TEMPORARY SUPPORT SYSTEM									
BEDDING SPACING									
FRACTURE SPACING									
WATER CONDITION									
DEPTH OF COVER									
Station 0+00 to 0+50	Station 0+50 to 1+00	Station 1+00 to 1+50	Station 1+50 to 2+00	Station 2+00 to 2+50	Station 2+50 to 3+00				
2-5"	1/2"-6"	1/2"-1"	1"-5"	1"-5"	1/2"-6"				
No seepage	No seepage	No seepage	No seepage	No seepage	No seepage				
Approx. 35% moisture	Approx. 35% moisture	Approx. 35% moisture	Approx. 35% moisture	Approx. 35% moisture	Approx. 35% moisture				
2.5' steel L & 1.5' steel	2.5' steel L & 1.5' steel	2.5' steel L & 1.5' steel	2.5' steel L & 1.5' steel	2.5' steel L & 1.5' steel	2.5' steel L & 1.5' steel				

EXCAVATION PROGRESS
ESTIMATED ROCK
CONDITION (INTERMEDIATE NO.)
TEMPORARY SUPPORT
SYSTEM
BEDDING SPACING
FRACTURE SPACING
WATER CONDITION
DEPTH OF COVER

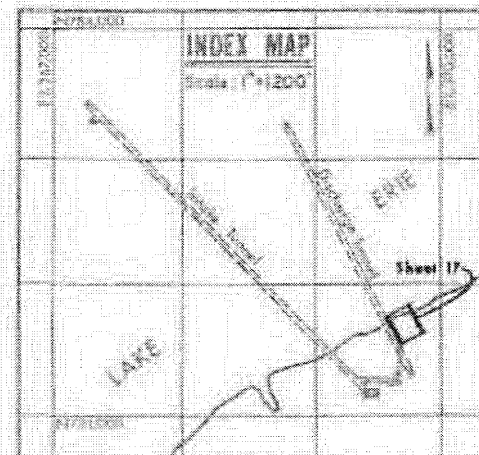
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

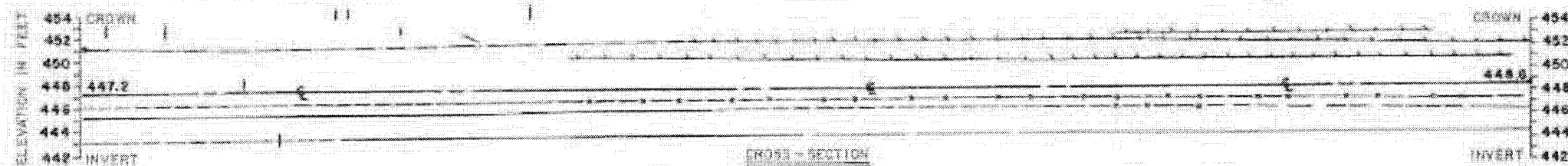
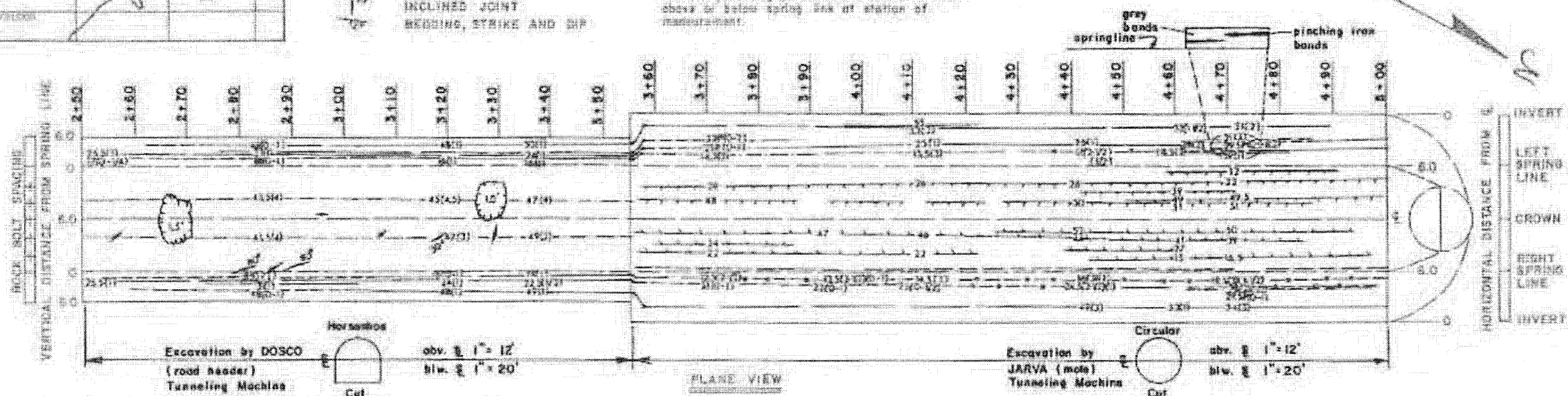
Figure 20-2 (Sheet 15 of 24)



- SYMBOLS**
- 14' HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - 12(5-2)' DISCONTINUOUS IRON BED
 - 12(1)' HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - 15(1/2-2)' DISCONTINUOUS IRON BED WITHIN GREY BED
 - 15' FRACTURE
 - FAULT
 - BEDDING PARTING
 - VERTICAL JOINT
 - INCLINED JOINT
 - BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
- SEEPAGE FROM FEATURE
- OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN

* Note: Number(s) in parentheses indicates bed thickness. Number preceding parentheses indicates inches above or below spring line of station of measurement.



1'-0"	1'-2"	1'-4"	1'-6"	1'-8"	1'-10"	1'-12"	1'-14"	1'-16"
No. 4								
3 inch bolts at 2' centers in steel ribs at 30'-33' centers, spanned by wire mesh								
1'-4"	1'-5"	1'-6"	1'-7"	1'-8"	1'-9"	1'-10"	1'-11"	1'-12"
Approx. 5'±0'	Approx. 6'	Approx. 11'	Jointing less apparent in smooth circular bore excavation			Bedding fractures only, spaced as above		
No inflow								
Approx. 24' limestone & 14' glacial till						Approx. 2' of bench 11±8' shale		

- EXCAVATION PROGRESS
- ESTIMATED ROCK CONDITION (TERZAGHI NO.)
- TEMPORARY SUPPORT SYSTEM
- BEDDING SPACING
- FRACTURE SPACING
- WATER CONDITION
- DEPTH OF COVER

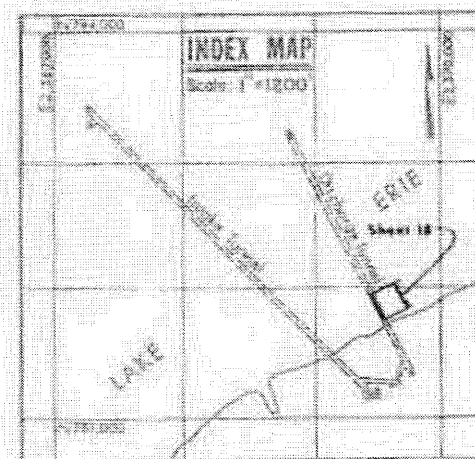
(Rev. 12-1-03)



PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

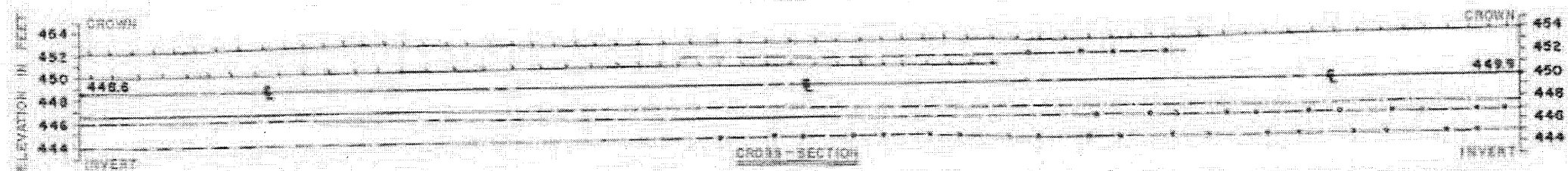
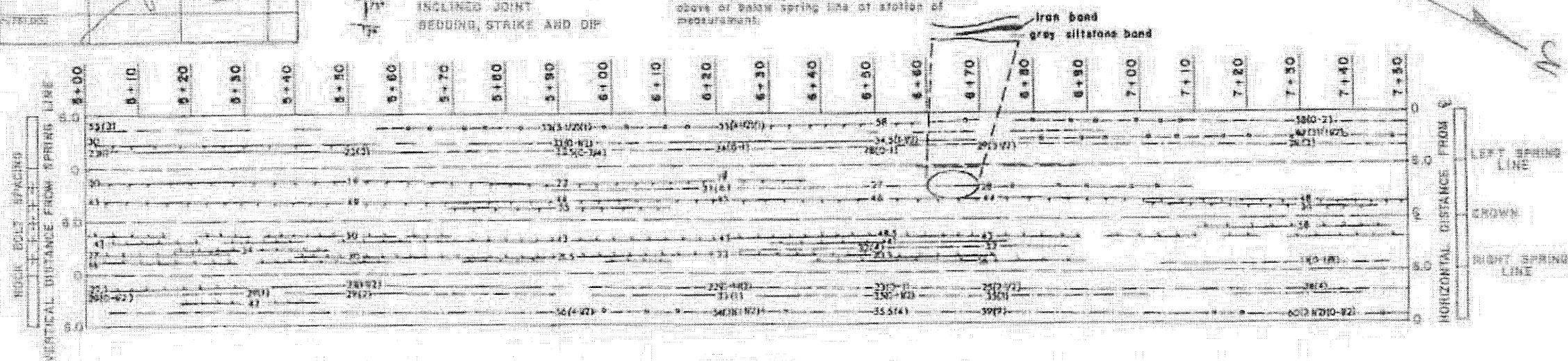
Figure 2D-2 (Sheet 17 of 24)



- SYMBOLS**
- $\frac{1}{2}$ " HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 - $\frac{1}{2}$ "-2" DISCONTINUOUS IRON BED
 - 1"10" HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - $\frac{1}{2}$ "-2" DISCONTINUOUS IRON BED WITHIN GREY BED
 - $\frac{1}{2}$ " FRACTURE
 - $\frac{1}{2}$ " FAULT
 - $\frac{1}{2}$ " BEDDING PARTING
 - $\frac{1}{2}$ " VERTICAL JOINT
 - $\frac{1}{2}$ " INCLINED JOINT
 - $\frac{1}{2}$ " BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
- SEEPAGE FROM FEATURE
- OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
- METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

Note: Numerical in parentheses indicates bed thickness. Number preceding parentheses indicates inches above or below spring line at station of measurement.



CROWN		INVERT	
454		444	
452		446	
450		448	
448		450	
446		452	
444		454	
INVERT		CROWN	
444		454	
446		452	
448		450	
450		448	
452		446	
454		444	
CROWN		INVERT	
454		444	
452		446	
450		448	
448		450	
446		452	
444		454	

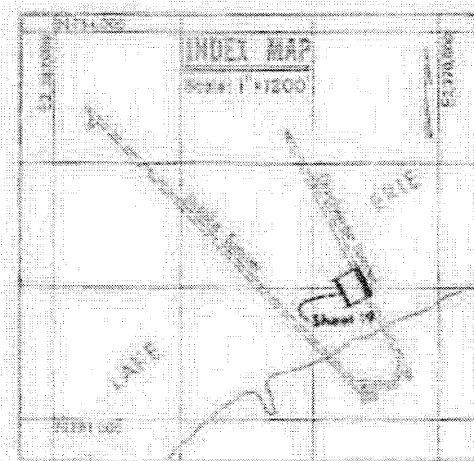
- EXCAVATION PROGRESS
- ESTIMATED ROCK CONDITION (TERZAGHI NO.)
- TEMPORARY SUPPORT SYSTEM
- BEDDING SPACING
- FRACTURE SPACING
- WATER CONDITION
- DEPTH OF COVER

(Rev. 12 1/03)

PERRY NUCLEAR POWER PLANT

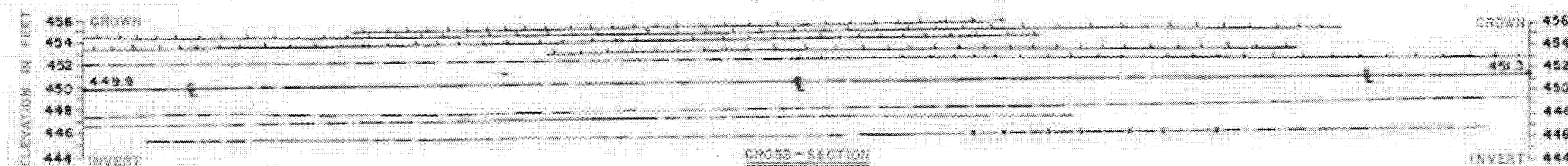
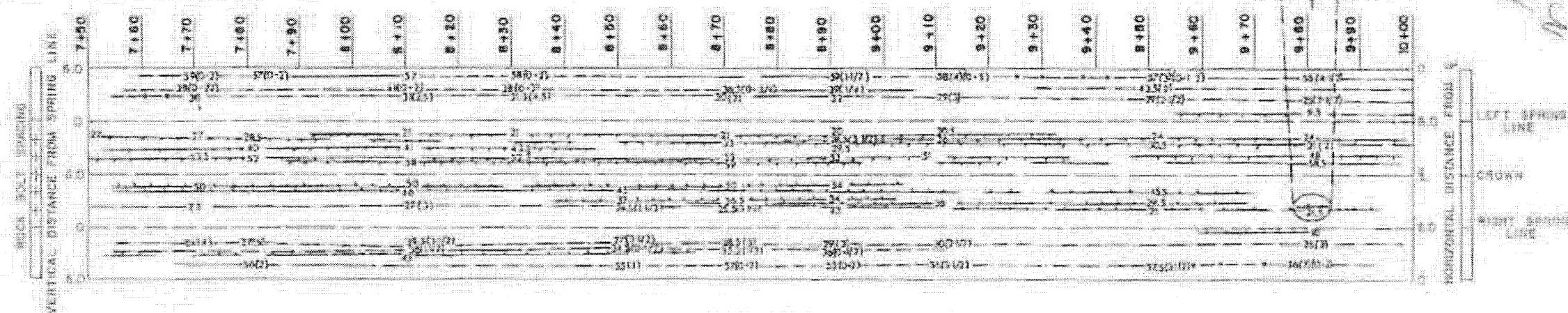
Geologic Map of
Tunnel Excavations

Figure 2D-2 (Sheet 18 of 24)



- SYMBOLS**
- 4(1/2)" HARD, TAN, BROWN, CHERTY IRON BED OR LAMINAE
 - 12(2-4)" DISCONTINUOUS IRON BED
 - 12(3)" HARD LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - 12(20-24)" DISCONTINUOUS IRON BED WITHIN GREY BED
 - 4" FRACTURE
 - FAULT
 - BEDDING PARTING
 - VERTICAL JOINT
 - INCLINED JOINT
 - BEDDING, STRIKE AND DIP

- MOISTURE ALONG BEDDING PARTING
 - SEEPAGE FROM FEATURE
 - OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 - METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE
- NOTES:**
 Numerical in parentheses indicates bed thickness.
 Number preceding parentheses indicates inches above or below spring line at station of measurement.



456	CROWN	456
454		454
452		452
450		450
448		448
446		446
444	INVERT	444
No. 4		
Stack bolts at 2' centers in steel ribs at 1'-6" centers, covered by wire mesh		
4" x 12"		
Bedding fractures only, spaced as above		
No inflow		
4.5' deep water		7.5' deep water
116.1' subsurface (hole)		111.7' subsurface (hole)

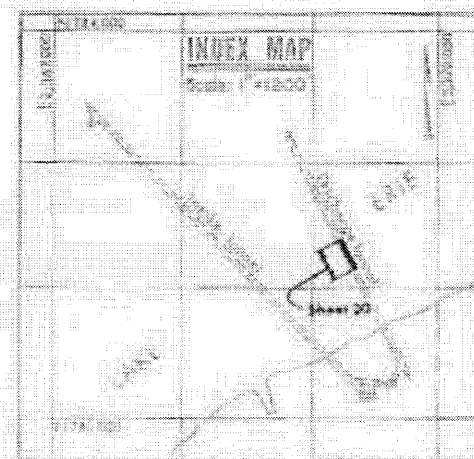
EXCAVATION PROGRESS
 ESTIMATED ROCK
 CONDITION (TERZAGHI NO.)
 TEMPORARY SUPPORT
 SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

(Rev. 12 1/63)

PERRY NUCLEAR POWER PLANT

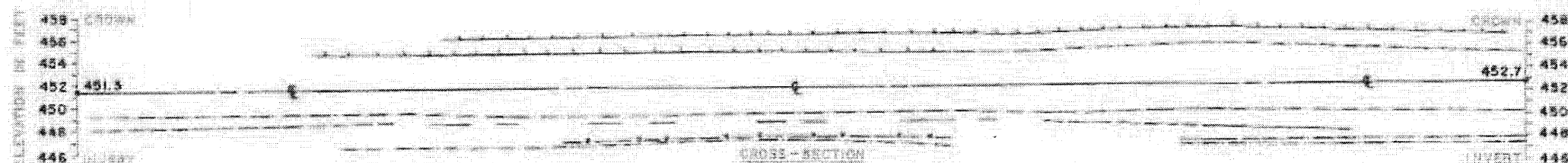
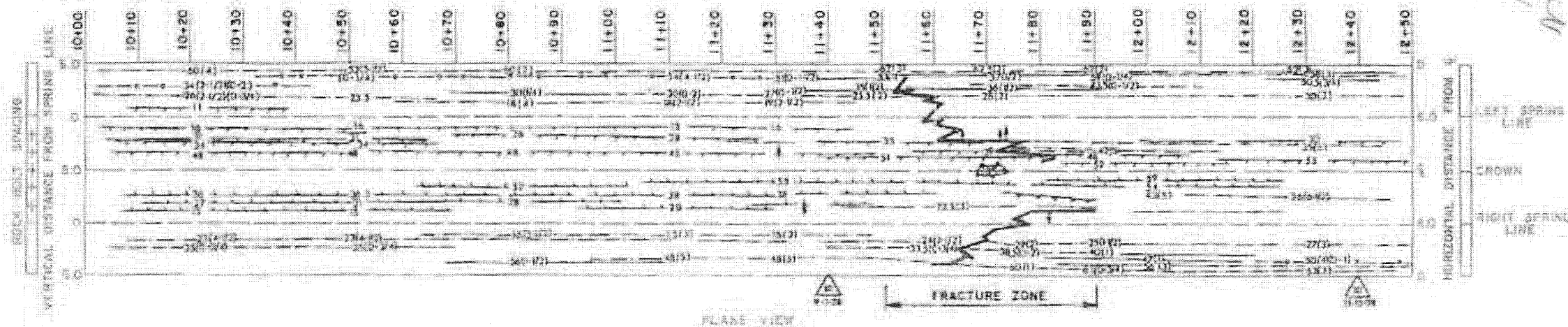
Geologic Map of
 Tunnel Excavations

Figure 20-2 (Sheet 19 of 24)



- SYMBOLS**
- $1/2$ " HARD, TAN, BROWN, CHESTY, IRON BED OR LAMINAE
 - $1/4$ " DISCONTINUOUS IRON BED
 - $1/8$ " HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 - $1/16$ " DISCONTINUOUS IRON BED WITHIN GREY BED
 - FRACTURE
 - POINT
 - BEDDING PARTING
 - VERTICAL JOINT
 - INCLINED JOINT
 - BEDDING STRIKE AND DIP

- MISTURE ALONG BEDDING PARTING
 - SEEPAGE FROM FEATURES
 - OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 - METHANE GAS, MAXIMUM PERCENT L.B.L. WITH DEPTH OF OCCURRENCE
- Notes:
 Numbers in parentheses indicate bed thickness.
 Numbers preceding parentheses indicate inches above or below spring line at station of excavation.



No. 4 0" x 4" at overbreak, starting from crown			
3 rock bolts at 2' centers in steel ribs at 4.0' x 4.5' centers, spanned by wire mesh			
3" x 10"	6" x 6"		3" x 9"
Bedding fractures only, spaced as above		Bedding fractures only, spaced as above	
No inflows		Zone of fractures in chamber pattern cutting excavation at low angle	No inflows
Seepage from rock bolts		Seepage from bedding partings in fracture zone	
7.5' water (111.7' substructure (photo))		8.5' water (107.7' substructure (photo))	

EXCAVATION PROGRESS
 ESTIMATED ROCK CONDITION (TERZAGHI NO.)
 TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

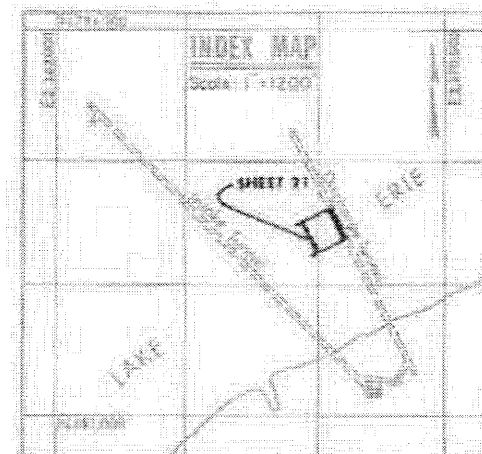
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Geologic Map of
 Tunnel Excavations

Figure 2D-2 (Sheet 20 of 24)

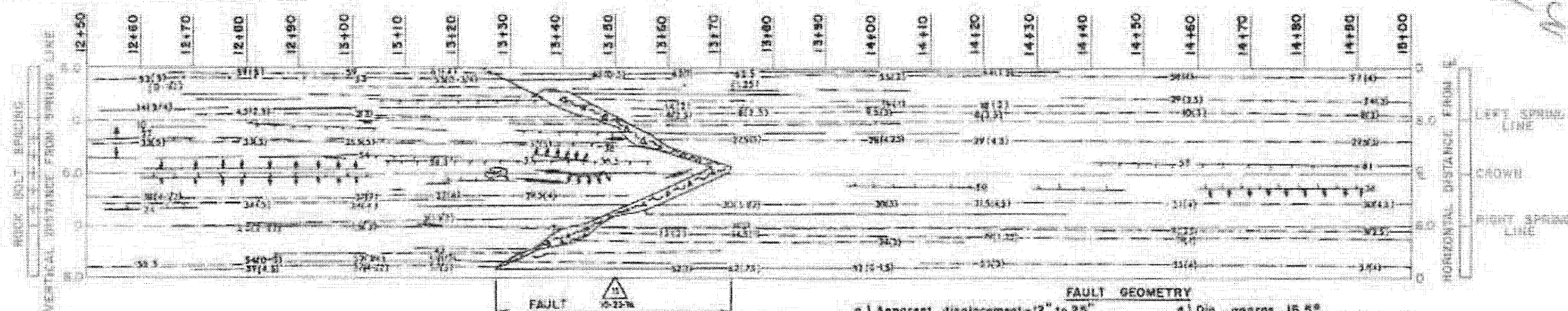


1/2" HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 12 1/2" DISCONTINUOUS IRON BED
 12 1/2" HARD LIGHT GREY SANDY SHALE TO SILTYSTONE BED
 12 1/2" DISCONTINUOUS IRON BED WITHIN GREY BED
 FRACTURE
 FAULT (with sense of motion)
 BEDDING PARTING
 VERTICAL JOINT
 INCLINED JOINT
 BEDDING STRIKE AND DIP

SYMBOLS

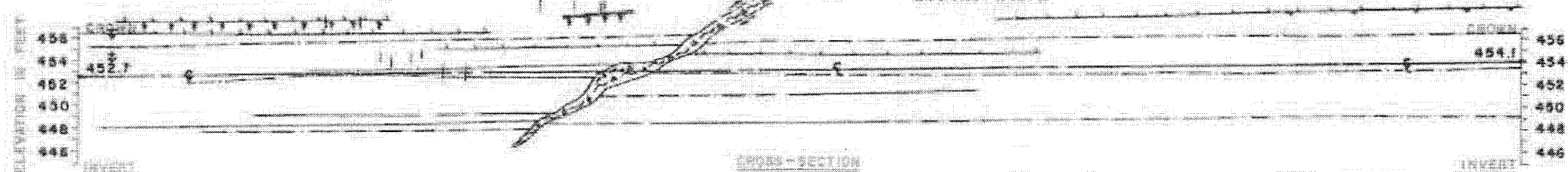
MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE

*Note:
 Number(s) in parentheses indicates bed thickness.
 Number preceding parenthesis indicates inches above or below spring line of station of measurement.



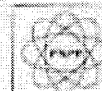
FAULT GEOMETRY

- a.) Apparent displacement - 12" to 25"
- b.) Actual vertical displacement - 8 1/2" to 11 1/2"
- c.) Strike - N 66° E
- d.) Dip - approx. 15.5°
- e.) Width of broken rock (1 1/2" to 24")



no. 4		no. 4-a		no. 5	
5 rock bolts at 2' centers in steel ribs at 3.5' - 4' centers, spanned by wire mesh		Full shielding employed		5 rock bolts at 2' centers in steel ribs at 3.5' - 4' centers spanned by wire mesh	
Bedding fractures spaced as above, joints widely spaced		Ribs at 2' centers		Bedding fractures only, spaced as above	
Most bedding fractures where indicated		Several minor inflows in fractured areas		Several dripping flows along shielding	
8.5' water		101.9' subsurface (shale)		14.5' water	

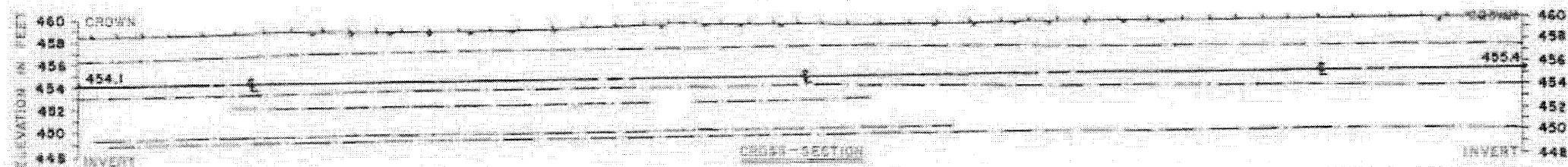
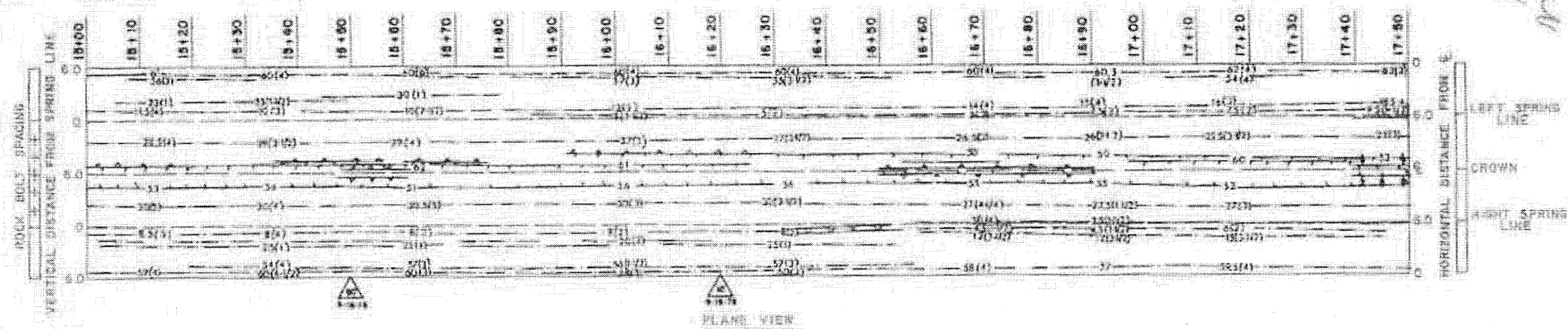
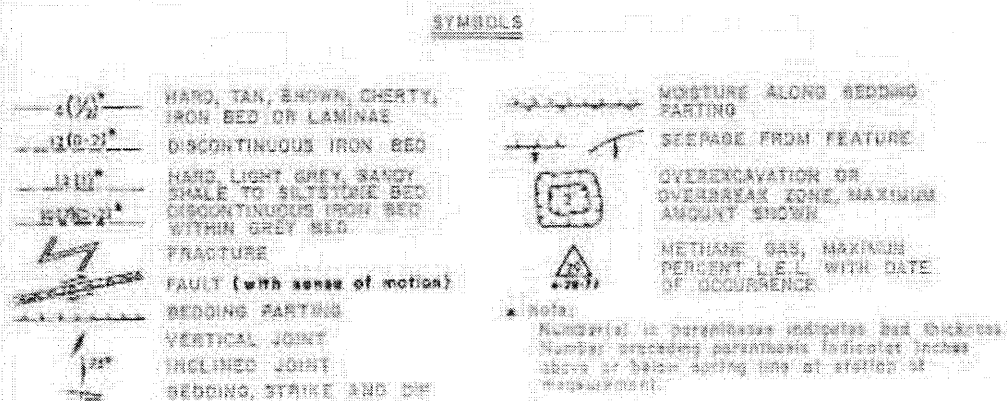
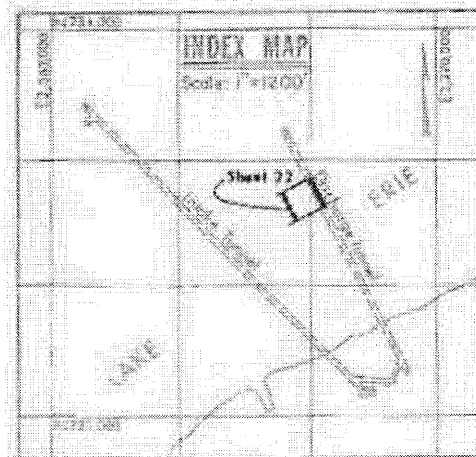
EXCAVATION PROGRESS
 ESTIMATED ROCK CONDITION (TERZAGHI NO.)
 TEMPORARY SUPPORT SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER



PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

Figure 20-2 (Sheet 21 of 24)



Slight overbreak along entire excavation (0"-6")				ea. 4
3 rock bolts at 2' centers in steel ribs or 40'-42" centers spanned by wire mesh				
3'-9"	4'-2"		1'-10"	
Bedding fractures only, spaced at above				
Moisture from bedding parting	Moisture from bedding parting	Moisture from bedding parting	Moisture from bedding parting	Moisture from bedding parting
12(1) water	12(1) water	12(1) water	12(1) water	12(1) water
12(1) water	12(1) water	12(1) water	12(1) water	12(1) water

EXCAVATION PROGRESS
 ESTIMATED ROCK
 CONDITION (TERZAGHI NO.)
 TEMPORARY SUPPORT
 SYSTEM
 BEDDING SPACING
 FRACTURE SPACING
 WATER CONDITION
 DEPTH OF COVER

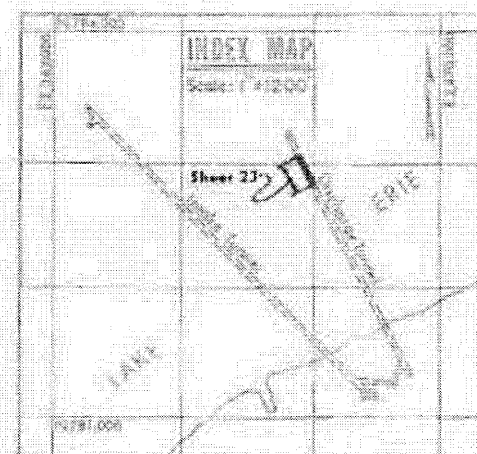
(Rev. 12 1/03)



PERRY NUCLEAR POWER PLANT

Geologic Map of
 Tunnel Excavations

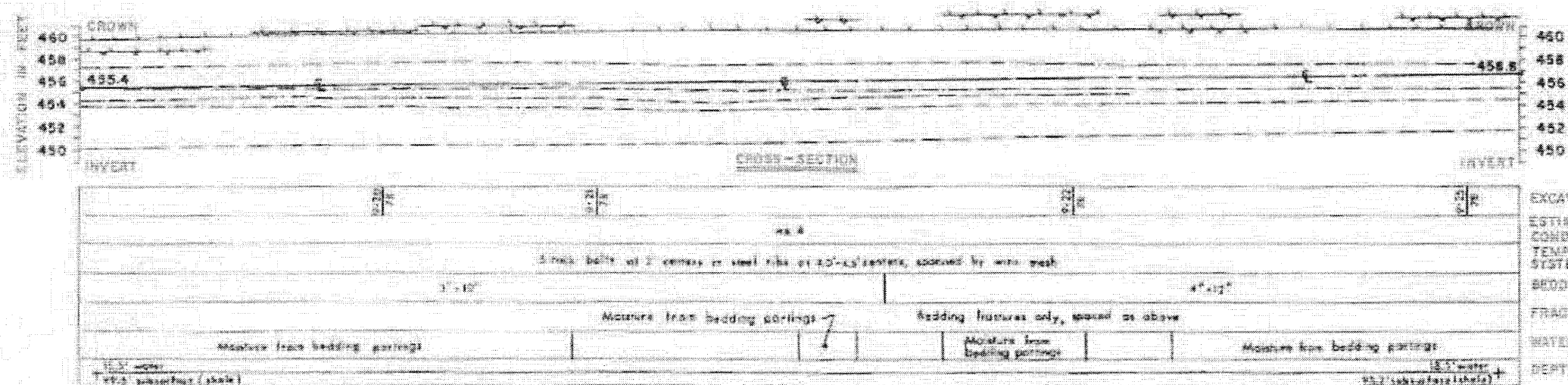
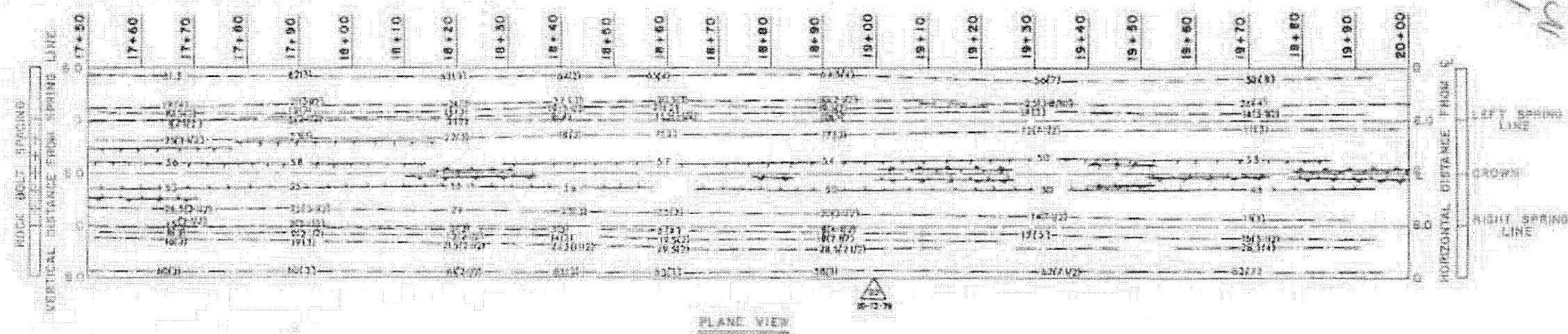
Figure 2D-2 (Sheet 22 of 24)



1/2" HARD, TAN, BROWN, CHERTY, IRON BED OR LAMINAE
 1/8" DISCONTINUOUS IRON BED
 1/4" HARD, LIGHT GREY, SANDY SHALE TO SILTSTONE BED
 3/4" DISCONTINUOUS IRON BED WITHIN GREY BED
 FRACTURE
 FAULT
 BEDDING PARTING
 VERTICAL JOINT
 INCLINED JOINT
 BEDDING STAIRS AND DIP

SYMBOLS

MOISTURE ALONG BEDDING PARTING
 SEEPAGE FROM FEATURE
 OVEREXCAVATION OR OVERBREAK ZONE, MAXIMUM AMOUNT SHOWN
 METHANE GAS, MAXIMUM PERCENT L.E.L. WITH DATE OF OCCURRENCE
 Notes:
 Numbers in parentheses indicates bed thickness.
 Number preceding parenthesis indicates inches above or below spring line at station of measurement.

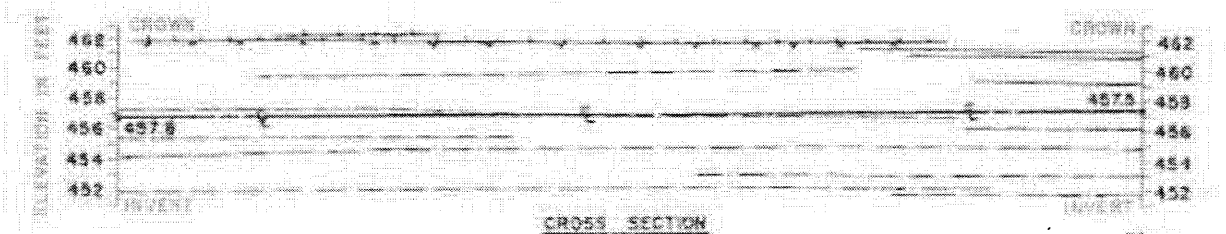
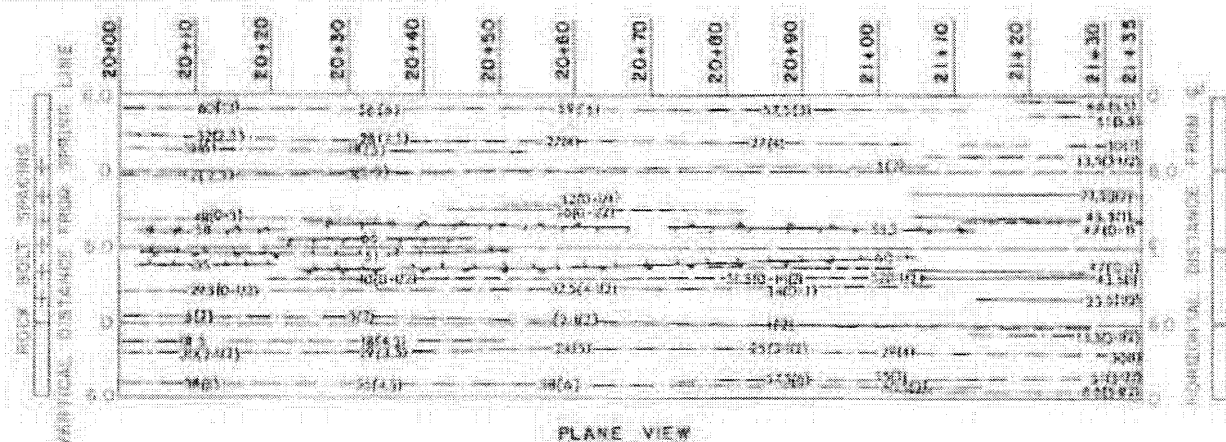
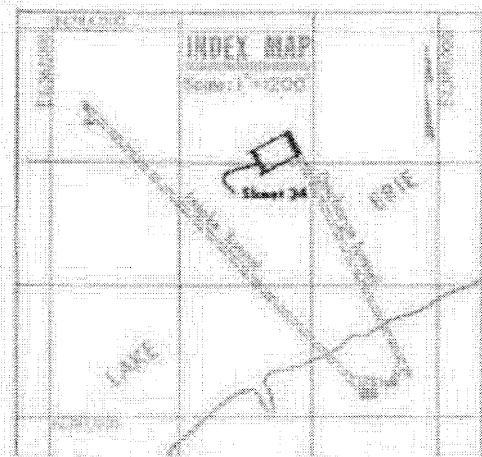


(Rev. 12 1/03)

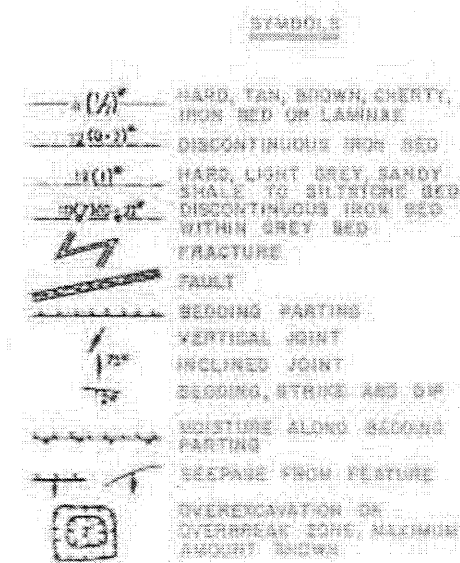
PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

Figure 2D-2 (Sheet 23 of 24)



Excavation Progress	
ESTIMATED ROCK CONDITION (TERMINAL AND)	
TEMPORARY SUPPORT SYSTEM	
BEDDING SPACING	
FRACTURE SPACING	
WATER CONDITION	
DEPTH OF COVER	
<p>as 1: Slight overbreak along entire excavation (8'-1')</p> <p>1/2" rock bolts at 2' centers, in steel ribs at 4'-25' centers, spaced by wire mesh</p> <p>2'-10"</p> <p>Bedding partings only, spaced as above</p> <p>Slight moisture along bedding partings, where indicated</p> <p>18.5' water + 2.5' subsurface (shale)</p> <p>2.5' water + 2.5' subsurface (shale)</p>	



Note:
Number(s) in parentheses indicates feet (inches).
Number preceding parentheses indicates inches.
above or below spring line at station of measurement.

(Rev. 12 1/83)

PERRY NUCLEAR POWER PLANT

Geologic Map of
Tunnel Excavations

Figure 20-2 (Sheet 24 of 24)