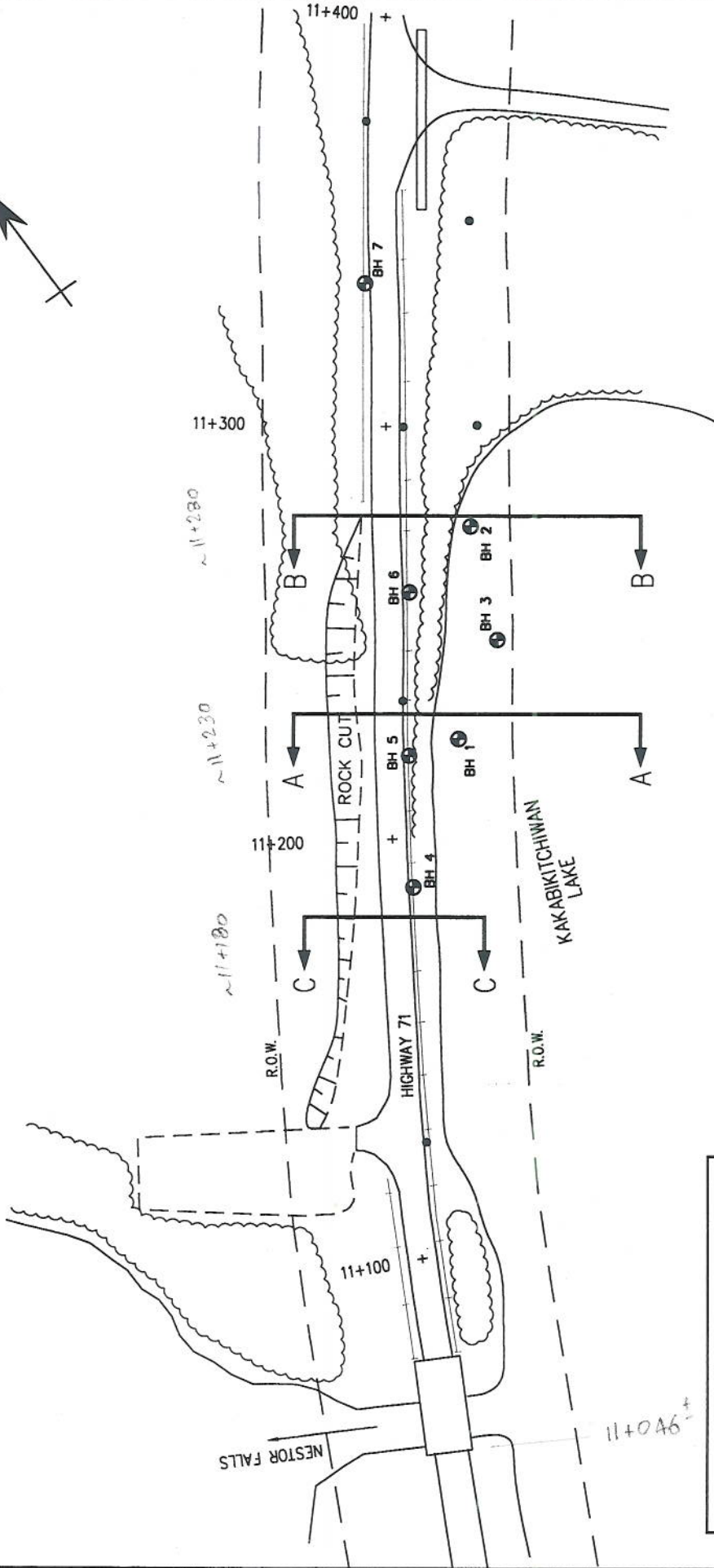


ENCLOSURES

DST CONSULTING ENGINEERS INC.

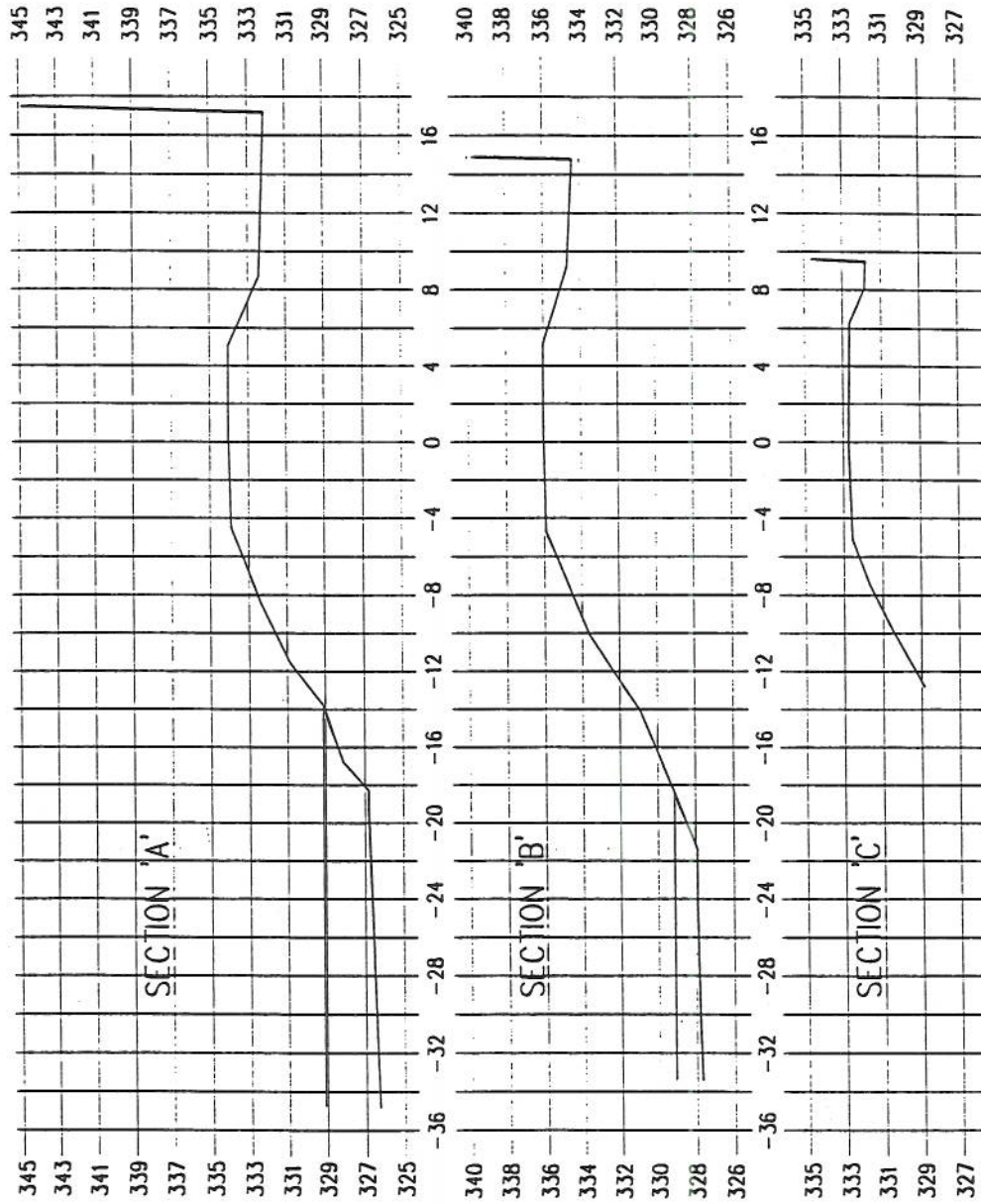


LEGEND

- ⊕ DST BOREHOLE LOCATIONS
- MTO BOREHOLE LOCATIONS

MTD Geocres No. 52F-26


	CLIENT:	DWG TITLE:		DATE:	PROJECT NO.
	COOK ENGINEERING	BOREHOLE LOCATION PLAN		FEB 99	TC98146
	CAD REF. NO.: BH-LOCA.DWG	PROJECT:		SCALE:	ENCLOSURE
TWP OF GODSON		HIGHWAY 71		1:1500	1
		ONTARIO			



11+230

11+280

11+180

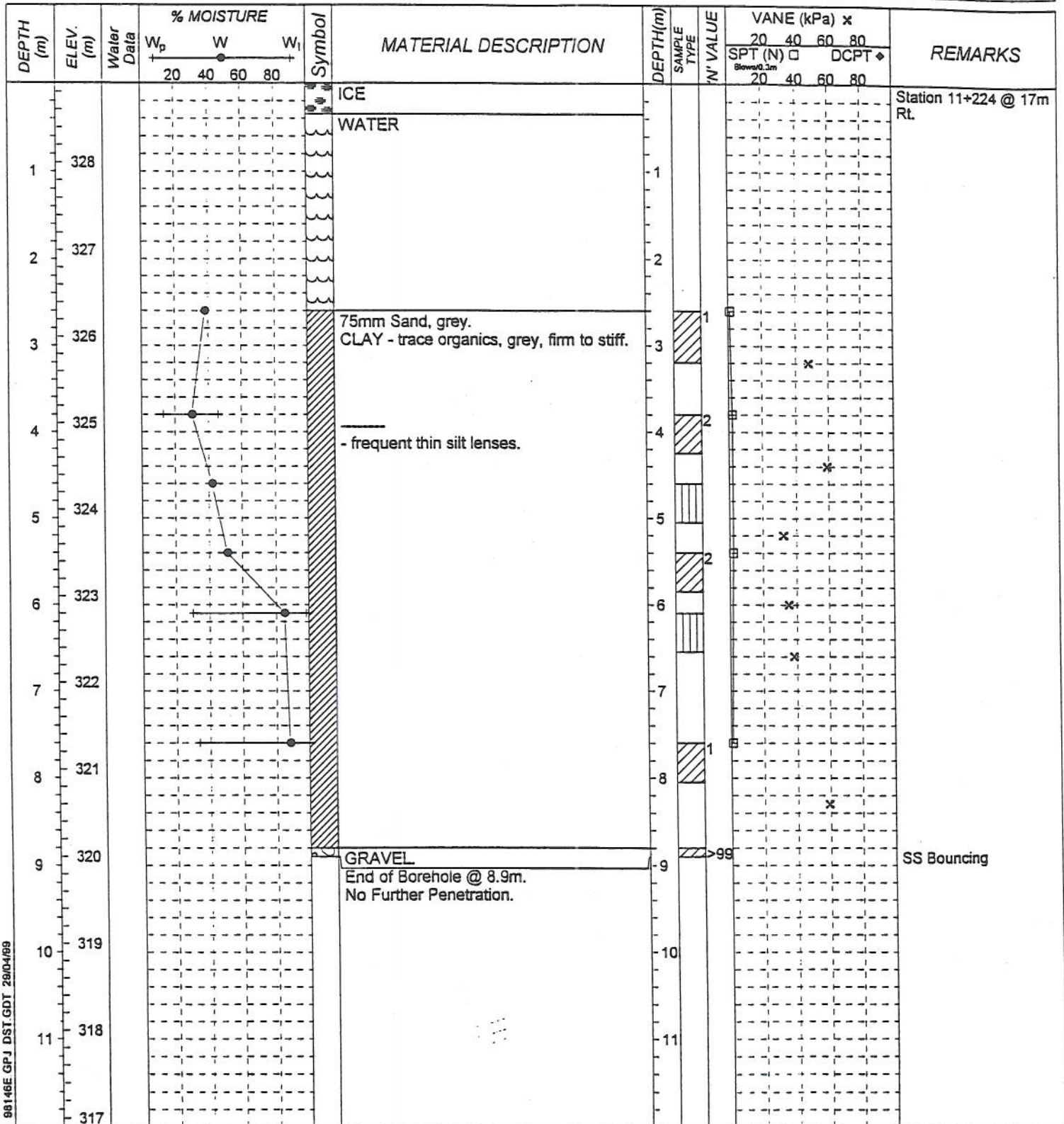
	CLIENT: COOK ENGINEERING	DWG TITLE:	CROSS SECTIONS		PROJECT NO. TG98146F
	CAD REF. NO.: BH-LOCA.DWG	PROJECT: FOUNDATION INVESTIGATION HIGHWAY 71	DATE: MAR 99	SCALE: 1:400	ENCLOSURE 2
	TWP OF GODSON ONTARIO				

LOG OF BOREHOLE 1

DST REF. No.: TG98146F
 CLIENT: Cook Engineering
 PROJECT: Foundation Investigation
 LOCATION: Nestor Falls, Ontario
 SURFACE ELEV.: 328.9 metres

Drilling Data
 METHOD: Washbore
 DIAMETER: 80mm ID

DATE: February 15 1999

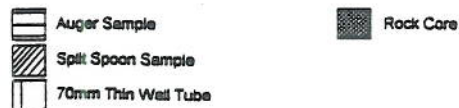


BOREHOLE (STANDARD) 98146E GPJ DST GDT 29/04/99



DST Consulting Engineers Inc.
 605 Hewitson Street
 Thunder Bay, Ontario P7B 2M8
 PH: (807) 623-2929
 FX: (807) 623-1792
 Email: dst@dst-engineers.on.ca
 Web: www.dst-engineers.on.ca

SAMPLE TYPE LEGEND



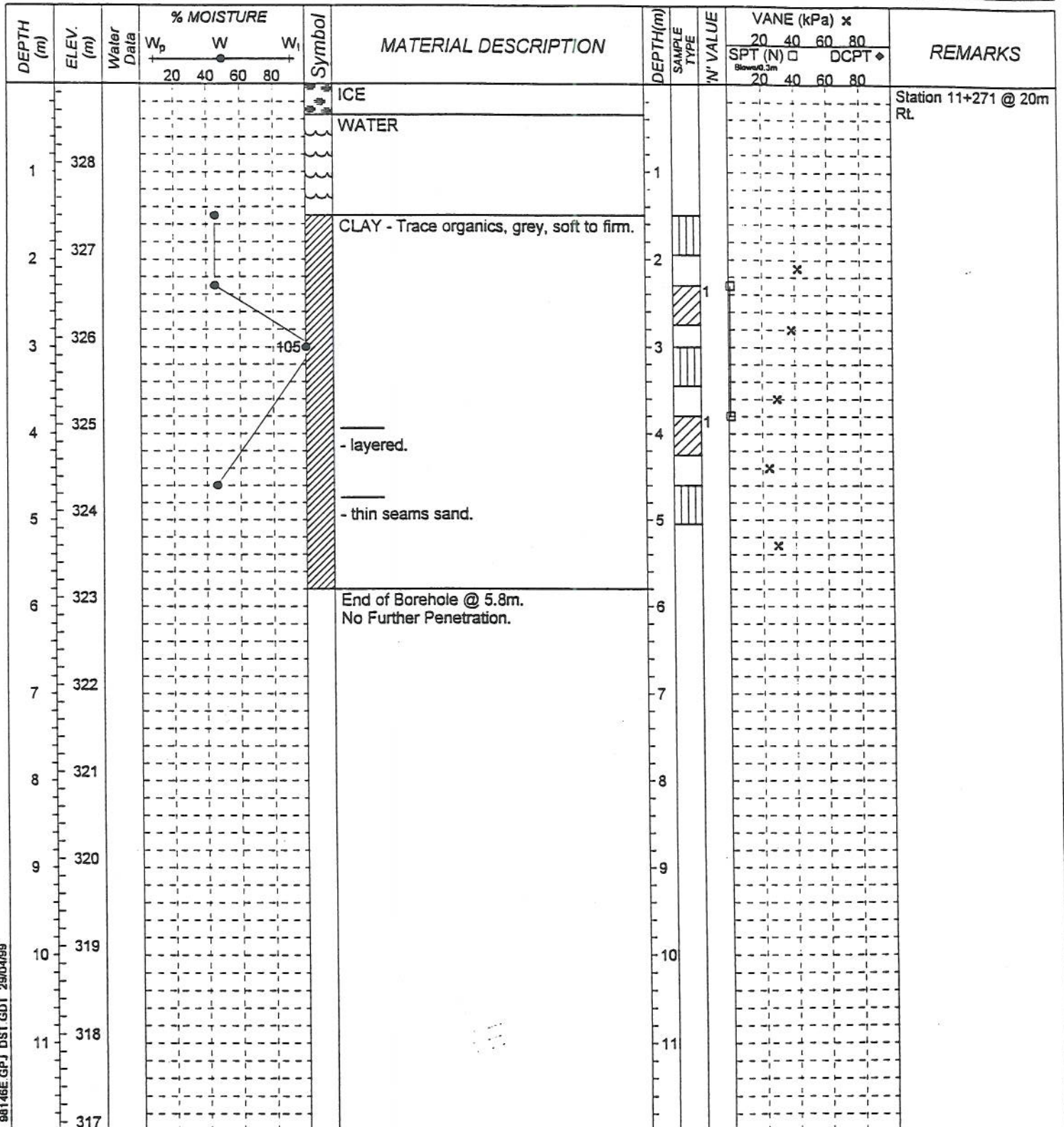
ENCLOSURE 3

LOG OF BOREHOLE 2

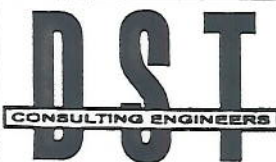
DST REF. No.: TG98146F
 CLIENT: Cook Engineering
 PROJECT: Foundation Investigation
 LOCATION: Nestor Falls, Ontario
 SURFACE ELEV.: 328.9 metres

Drilling Data
 METHOD: Washbore
 DIAMETER: 80mm ID

DATE: February 15 1999



BOREHOLE (STANDARD) 98146E.GPJ DST GDT 290499



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 Web: www.dst-engineers.on.ca

SAMPLE TYPE LEGEND



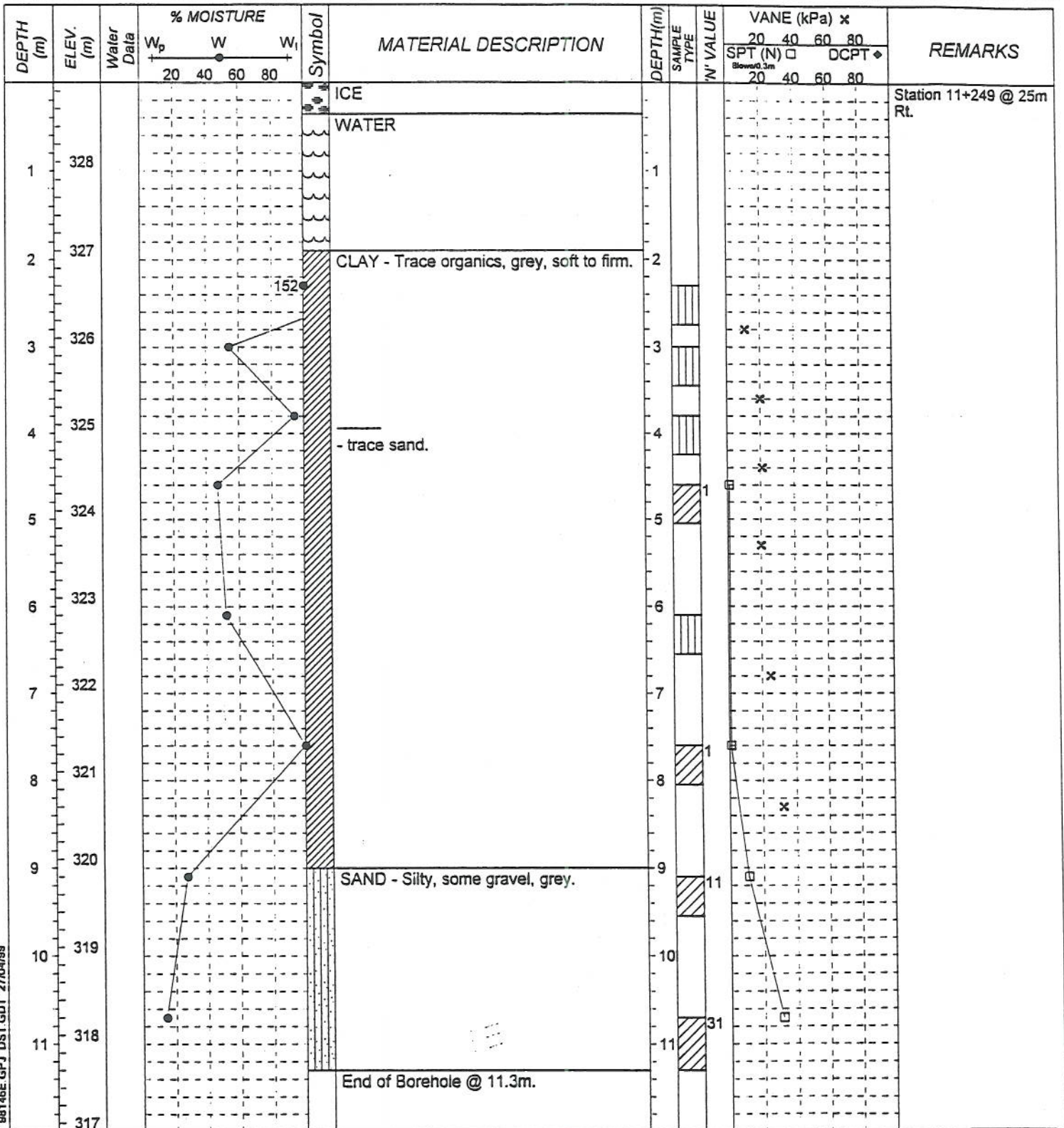
ENCLOSURE 4

LOG OF BOREHOLE 3

DST REF. No.: TG98146F
 CLIENT: Cook Engineering
 PROJECT: Foundation Investigation
 LOCATION: Nestor Falls, Ontario
 SURFACE ELEV.: 328.9 metres

Drilling Data
 METHOD: Washbore
 DIAMETER: 80mm ID

DATE: February 15 1999



BOREHOLE (STANDARD) 98146E.GPJ DST.GDT 27/04/99



DST Consulting Engineers Inc.
 605 Hewitson Street
 Thunder Bay, Ontario P7B 2M8
 PH: (807) 623-2929
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 Email: dst@dst-engineers.on.ca
 Web: www.dst-engineers.on.ca

SAMPLE TYPE LEGEND



ENCLOSURE 5

Township of Godson

Borehole 4

Station 11+190 4.8 Rt

0	- 50	Asph
50	- 300	Cr Sa & Gr
300	- 700	Br F-M Sa some Gr Tr RF
700	- 900	Br F-M Sa with Si Tr Gr RF (wet @ 800)
900		NFP RF

Borehole 5

Station 11+220 4.8 Rt

0	- 50	Asph
50	- 700	Cr Sa & Gr
700	- 800	RF
800		NFP RF

Borehole 6

Station 11+260 4.8 Rt

0	- 50	Asph
50	- 700	Cr Sa & Gr
700	- 2.4	Br F-M Sa with Gr Tr RF
2.4		NFP RF

Borehole 7

Station 11+335 4.9 Lt

0	- 50	Asph
50	- 410	Cr Sa & Gr
410	- 1.1	Br F-M Sa some Gr Tr Si
1.1		NFP RF

MTO Boreholes
Highway 71 - Township of Godson
W.P. 307-85-00
DST Reference No.: TG98146

Station 11+125 3.6 Rt

0	- 95	Asph
95	- 260	Cr Gr
260	- 900	Br F Gr
900	- 1.2	RF & Si(y) Sa
	1.2	NFP RF

Station 11+233 3.4 Rt

0	- 130	Asph
130	- 270	Cr Gr
270	- 370	Asph
370	- 520	Cr Gr (dirty)
520	- 1.8	Br F-M Sa with Gr, Tr Si
1.8	- 2.0	RF

Station 11+300 20 Rt (D-7.5)

0	- 200	Tps
200	- 1.10	Gry F-M Sa Si(y) Occ Gr (wet)
	1.10	NFP Bld

Station 11+325 20 Rt (D-7.9)

0	- 200	Tps
200	- 600	Br Lt Cl (soft & wet) (Fr Wat @ 0.2)
600	- 1.25	Br Si(y) Sa, Tr Cobs
	1.25	NFP Cobs or Blds

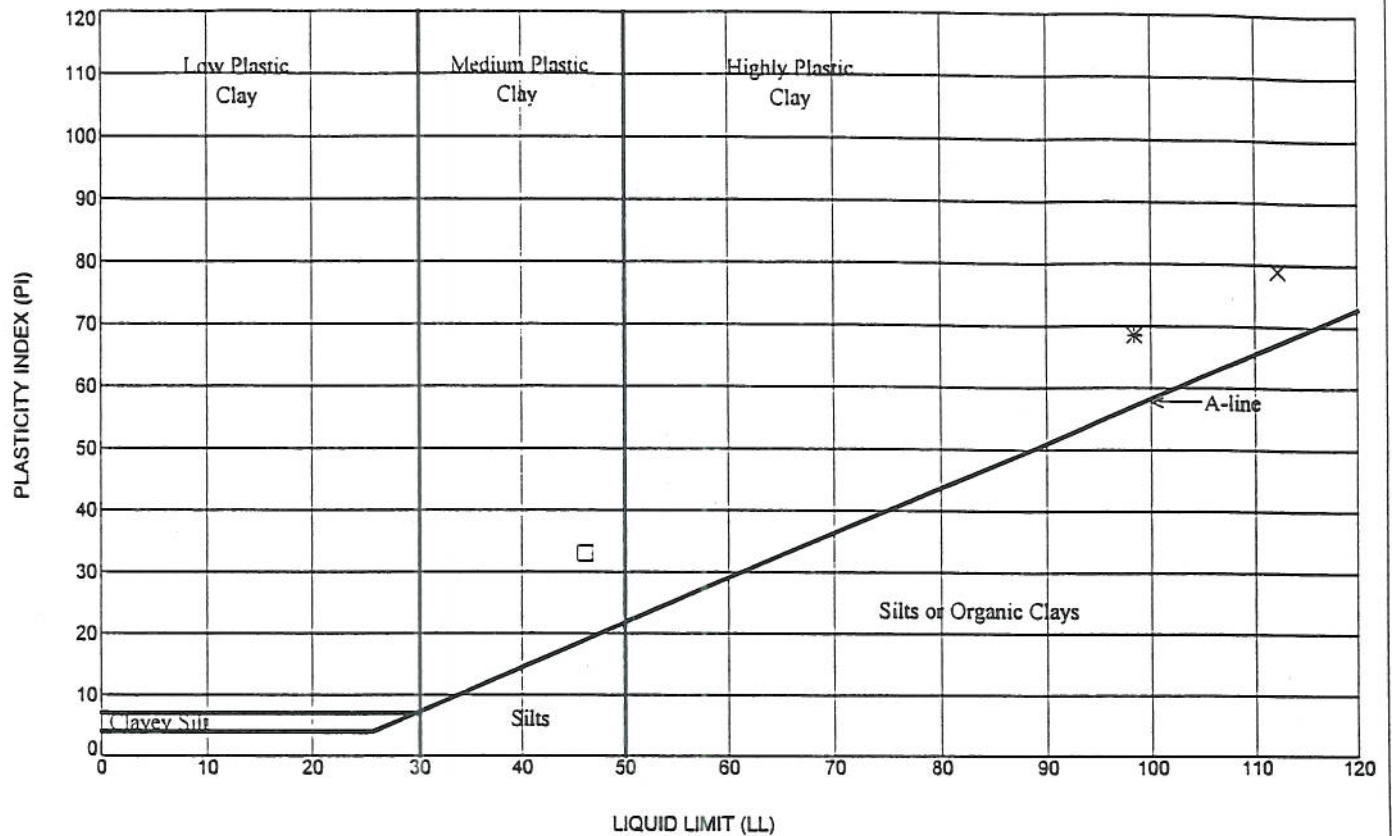
Station 11+350 19 Rt (D-7.5)

0	- 150	Tps
150	- 550	Br Si with Sa & Bld (wet)
	550	NFP Bld

Station 11+375 4.6 Lt

0	- 65	Asph (C & G)
65	- 200	Cr Gr
200	- 1.20	Br F-M Sa, Tr Si & Gr
1.2	- 1.5	RF & Si(y) Sa

ATTERBERG LIMIT TEST RESULTS



LEGEND:

- BOREHOLE 1 DEPTH 3.80
- * BOREHOLE 1 DEPTH 6.10
- X BOREHOLE 1 DEPTH 7.60

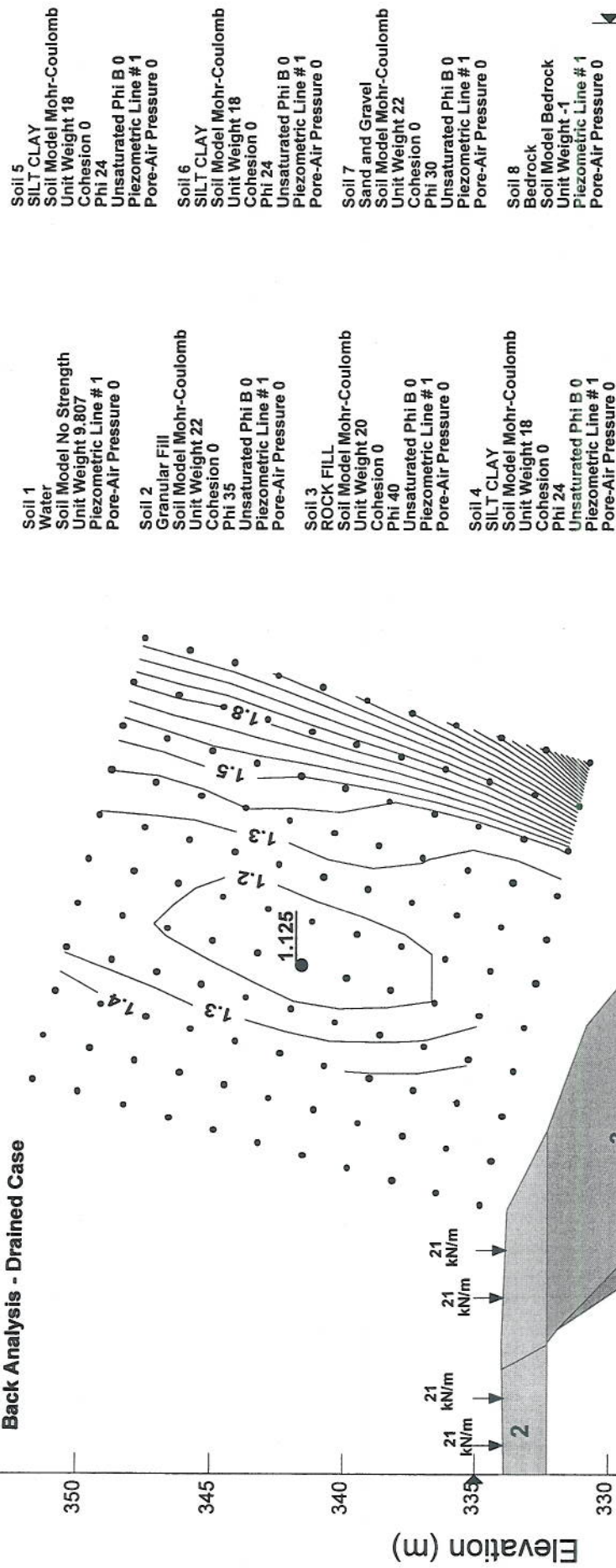
W_L	W_P	PI	W
46	13	33	30
98	30	69	85
112	33	79	88

March 1999

Reference No.: TG98146F

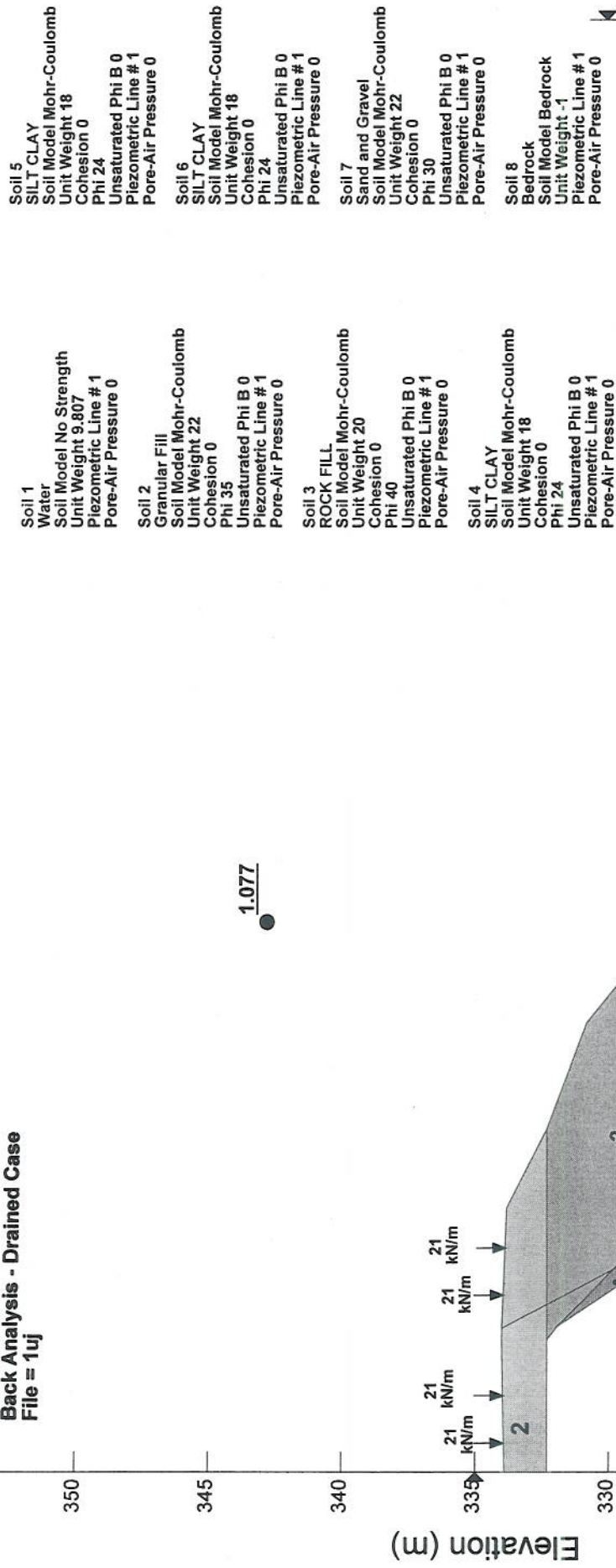
Foundation Investigation - Nestor Falls

**EXISTING CONDITIONS
ROTATION FAILURE
Station 11 + 230
Nestor Falls
Back Analysis - Drained Case**



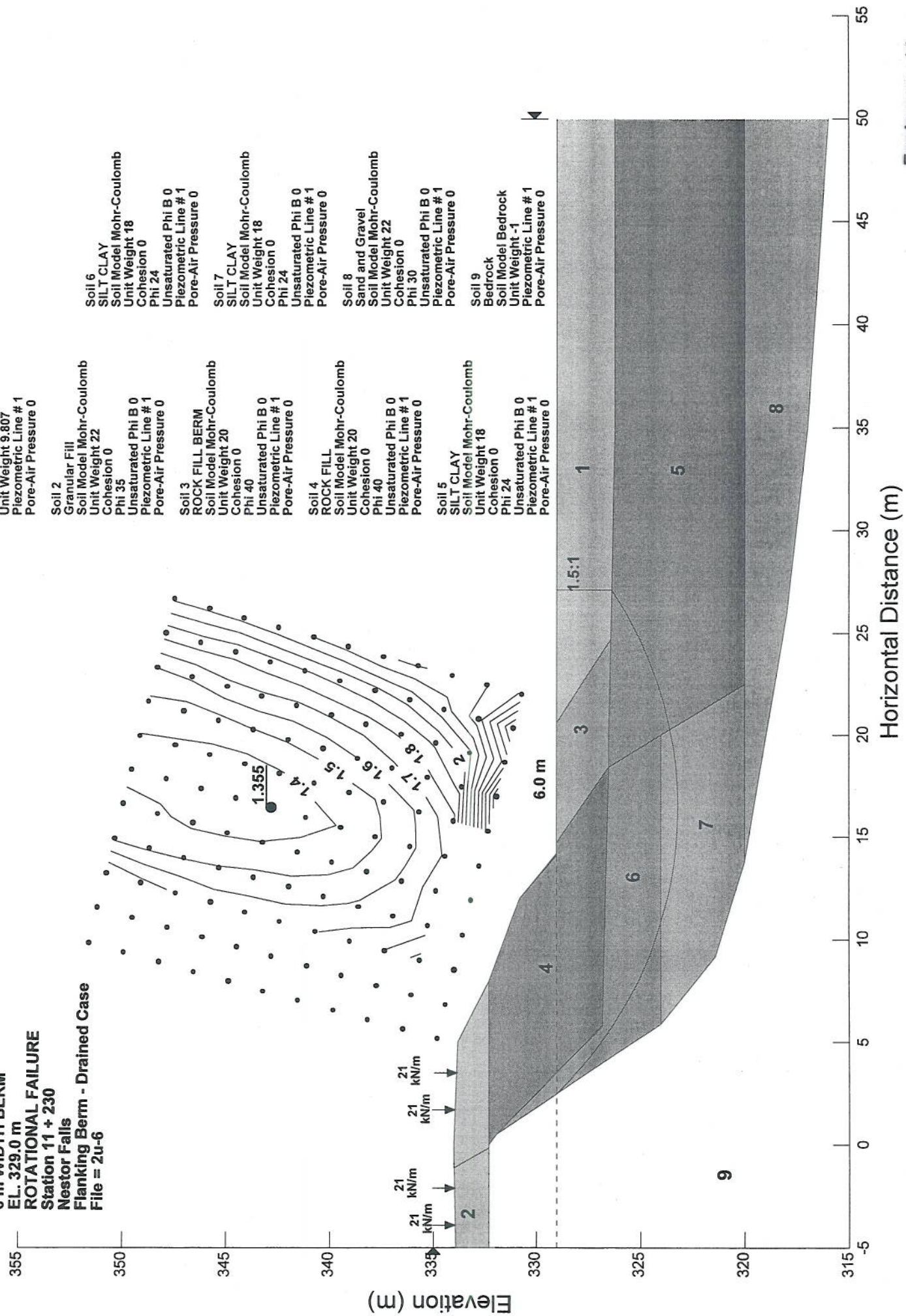
Horizontal Distance (m)

**EXISTING CONDITIONS
BLOCK FAILURE
Station 11 + 230
Nestor Falls
Back Analysis - Drained Case
File = 1uj**



Horizontal Distance (m)

6 m WIDTH BERM
 EL. 329.0 m
 ROTATIONAL FAILURE
 Station 11 + 230
 Nestor Falls
 Flanking Berm - Drained Case
 File = 2u-6



- | | |
|---|--|
| Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | |

6 m WIDTH BERM
EL 329.0 m
BLOCK FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2uj-6

- | | | | | | | | | |
|---|--|---|--|--|--|--|--|--|
| Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0 |
|---|--|---|--|--|--|--|--|--|

1.349



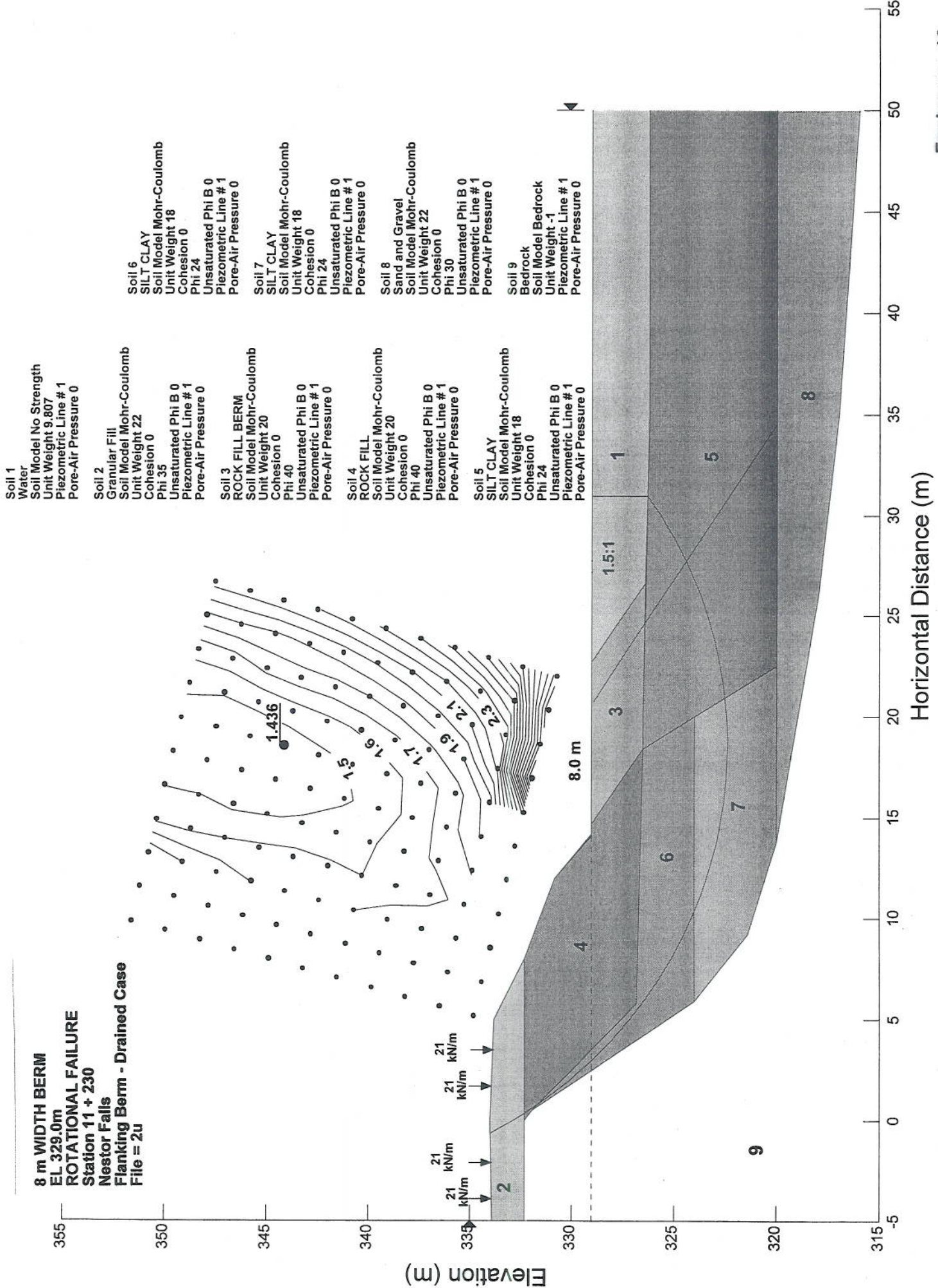
Elevation (m)

21 kN/m
21 kN/m
21 kN/m
21 kN/m

6.0 m

1.5:1

Horizontal Distance (m)



8m WIDTH BERM
EL 329.0 m
BLOCK FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2uj

1.419



Elevation (m)

21 kN/m
21 kN/m
21 kN/m
21 kN/m

8.0 m

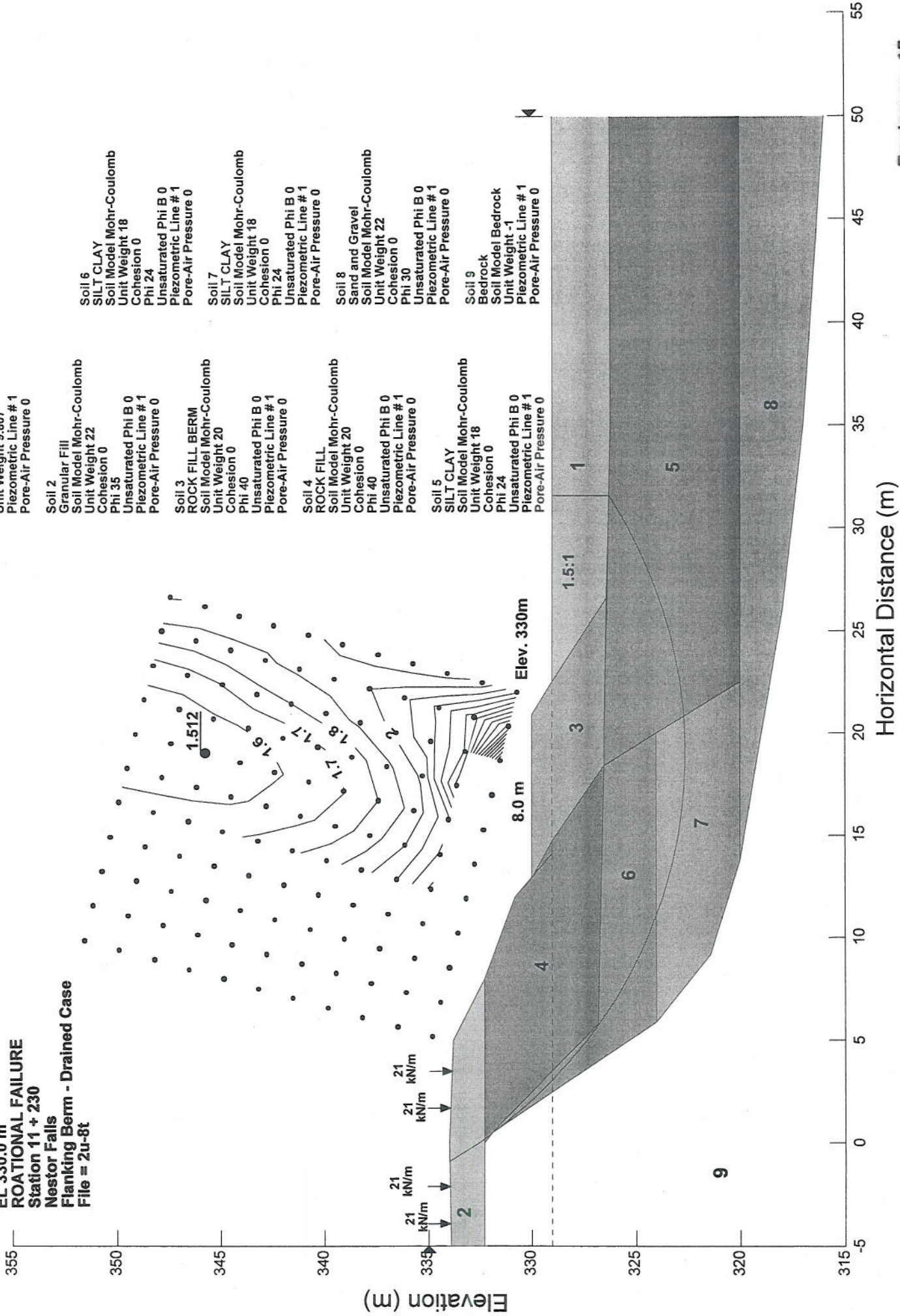
1.5:1

Horizontal Distance (m)

- Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0

8m WIDTH BERM
EL 330.0 m
ROTATIONAL FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2u-8t

- | | | | | | | | | |
|---|--|---|--|--|--|--|--|--|
| Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0 |
|---|--|---|--|--|--|--|--|--|



8m WIDTH BERM
EL 330.0 m
BLOCK FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2uj-8t

- | | | | | | |
|--------|-----------------|-------------------------|-------------------|----------------------|---------------------|
| Soil 1 | Water | Soil Model No Strength | Unit Weight 9.807 | Piezometric Line # 1 | Pore-Air Pressure 0 |
| Soil 2 | Granular Fill | Soil Model Mohr-Coulomb | Unit Weight 22 | Cohesion 0 | Phi 35 |
| Soil 3 | ROCK FILL BERM | Soil Model Mohr-Coulomb | Unit Weight 20 | Cohesion 0 | Phi 40 |
| Soil 4 | ROCK FILL | Soil Model Mohr-Coulomb | Unit Weight 20 | Cohesion 0 | Phi 40 |
| Soil 5 | SILT CLAY | Soil Model Mohr-Coulomb | Unit Weight 18 | Cohesion 0 | Phi 24 |
| Soil 6 | SILT CLAY | Soil Model Mohr-Coulomb | Unit Weight 18 | Cohesion 0 | Phi 24 |
| Soil 7 | SILT CLAY | Soil Model Mohr-Coulomb | Unit Weight 18 | Cohesion 0 | Phi 24 |
| Soil 8 | Sand and Gravel | Soil Model Mohr-Coulomb | Unit Weight 22 | Cohesion 0 | Phi 30 |
| Soil 9 | Bedrock | Soil Model Bedrock | Unit Weight -1 | Piezometric Line # 1 | Pore-Air Pressure 0 |

1.462

Elevation (m)

Elev. 330m

8.0 m

1

5

3

4

6

7

8

9

1.5:1

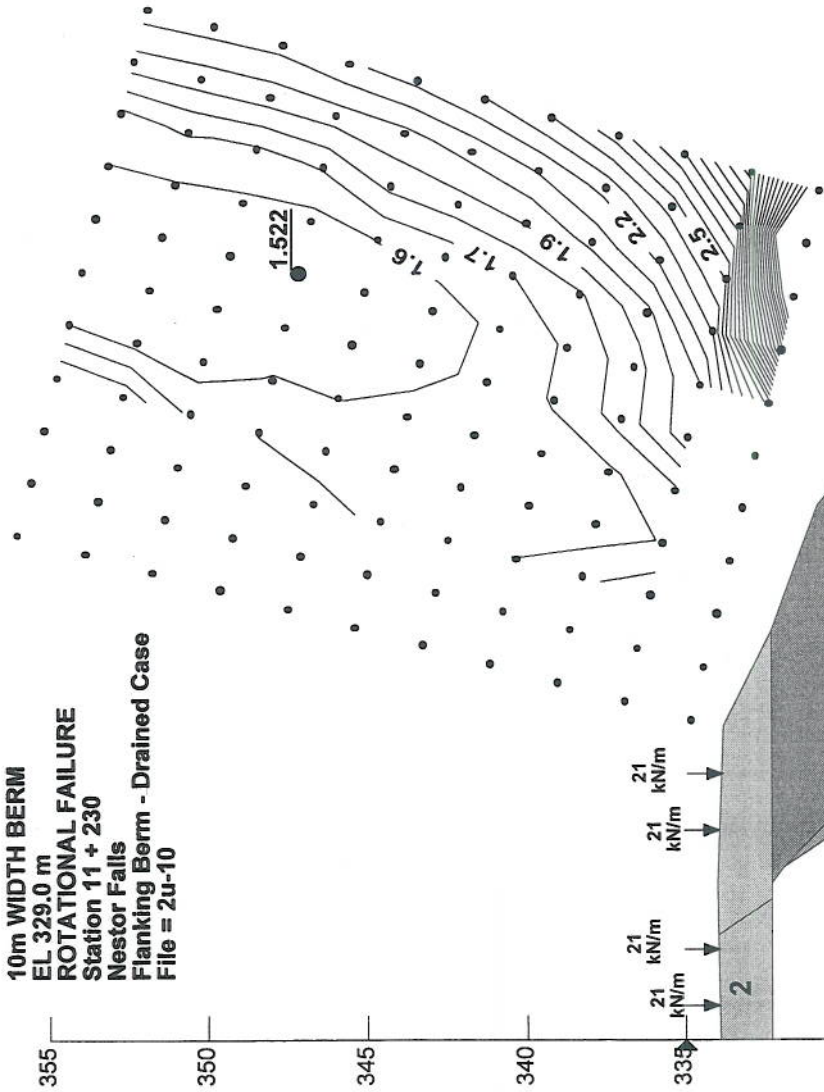
Horizontal Distance (m)

10m WIDTH BERM
EL 329.0 m
ROTATIONAL FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2u-10

Elevation (m)

Horizontal Distance (m)

- Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0
- Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0



10m WIDTH BERM
EL 329.0 m
BLOCK FAILURE
Station 11 + 230
Nestor Falls
Flanking Berm - Drained Case
File = 2uj-10

Elevation (m)

Horizontal Distance (m)

- | | |
|---|--|
| Soil 1
Water
Soil Model No Strength
Unit Weight 9.807
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 6
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 2
Granular Fill
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 35
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 7
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 3
ROCK FILL BERM
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 8
Sand and Gravel
Soil Model Mohr-Coulomb
Unit Weight 22
Cohesion 0
Phi 30
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 4
ROCK FILL
Soil Model Mohr-Coulomb
Unit Weight 20
Cohesion 0
Phi 40
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | Soil 9
Bedrock
Soil Model Bedrock
Unit Weight -1
Piezometric Line # 1
Pore-Air Pressure 0 |
| Soil 5
SILT CLAY
Soil Model Mohr-Coulomb
Unit Weight 18
Cohesion 0
Phi 24
Unsaturated Phi B 0
Piezometric Line # 1
Pore-Air Pressure 0 | |

1.486



10.0 m

1

1.5:1

3

4

9

6

21 kN/m

21 kN/m

21 kN/m

21 kN/m

7

5

21 kN/m

21 kN/m

21 kN/m

21 kN/m

8