

ANEXO 19

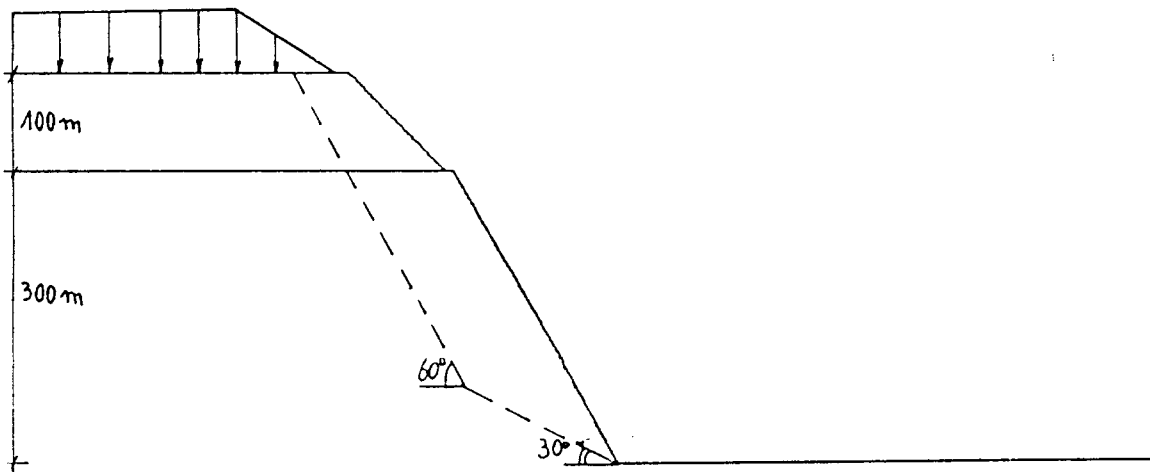
RESULTADO DE ANÁLISE DE ESTABILIDADE

TALUDES ROCHOSOS

TALUDE EM GNAISSE COM F1

CASO 3a

F.S. = 3,30



W L C B B - MACIÃO ROCHOSO, PESQUISA DE CUNHA, Coesão=C
 CHAISSÉ + Zona Cis. $\phi=180+360m$. ANISOTROPIA (30 a 60)

 * NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
 Parametros da zona de cisalhamento

Unit weight of material = .027
 CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
 Cohesion - - - - - 1.500
 Friction angle - - - - - 53.000 degrees

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
 Chairess e Zona de Cisalhamento (2)

Unit weight of material = .027
 ---- ANISOTROPIC SHEAR STRENGTHS ----

Failure Plane Orientation (degrees)	Cohesion	Friction Angle (degrees)
-99.000	3.000	40.00
-60.000	3.000	40.00
-30.000	4.260	52.96
.000	4.260	52.96

No (or zero) pore water pressures

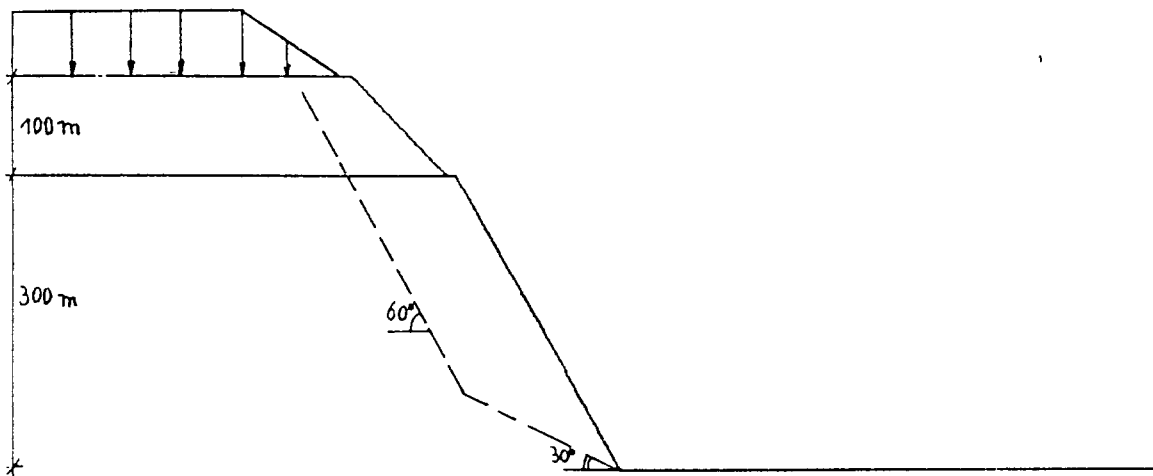
 * FINAL CRITICAL SHEAR SURFACE (FOUND AFTER 37 TRIAL POSITIONS) *

X	Y
136.50	900.00
489.90	534.18
590.00	500.00

Factor of Safety = 3.305

CASO 3b

F.S. = 1,48



E A L O B O - SANCIO ROCHOSO, PESQUISA DE CUNHA
 SNAISSE + ZONA CIS, H=100+300m, ALFA=45, ANISOTROPIA

 * NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
 Parametros da zona de cisalhamento

Unit weight of material = .027

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS

Cohesion - - - - - .252
 Friction angle - - - - - 51.000 degrees

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
 Graisse com zona de cis.

Unit weight of material = .027

--- ANISOTROPIC SHEAR STRENGTHS ---

Failure Plane Orientation (degrees)	Cohesion	Friction Angle (degrees)
-99.000	.550	42.00
-50.000	.550	42.00
-39.000	.050	52.96
.000	.050	52.96

No (or zero) pore water pressures

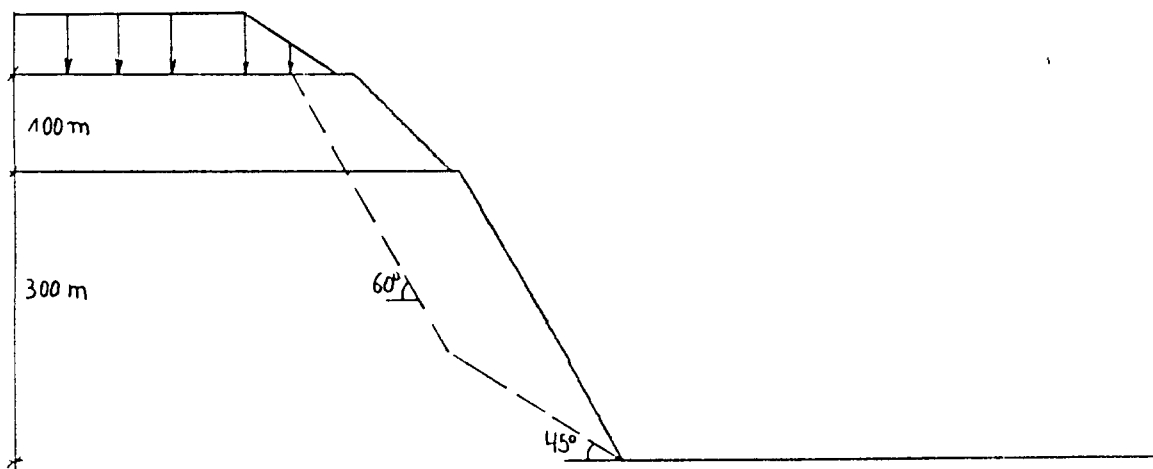
 * FINAL CRITICAL SHEAR SURFACE (FOUND AFTER 6 TRIAL POSITIONS) *

X	Y
257.09	900.00
501.02	570.96
570.00	500.00

Factor of Safety = 1.474

CASO 3c

F.S. = 1,75



PROJ. 016 - LÍMICO RICHOSO, PESQUISA DE CUNHA, Voçao=C/5
GRANDE + ZONA CIS, H=100+300m, ANISOTROPIA (45 a 60)

* NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
Parametros da zona de cisalhamento (C/5)

Unit weight of material = .027

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS
Cohesion - - - - - .300
Friction angle - - - - - 53.000 degrees

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
Gravies e Z. Cisalhamento (2)

Unit weight of material = .027

---- ANISOTROPIC SHEAR STRENGTHS ----
Failure Plane Friction
Orientation Cohesion Angle
(degrees) (degrees)

-70.000	.600	43.00
-50.000	.600	43.00
-45.000	.850	52.96
.000	.850	52.96

No (or zero) pore water pressures

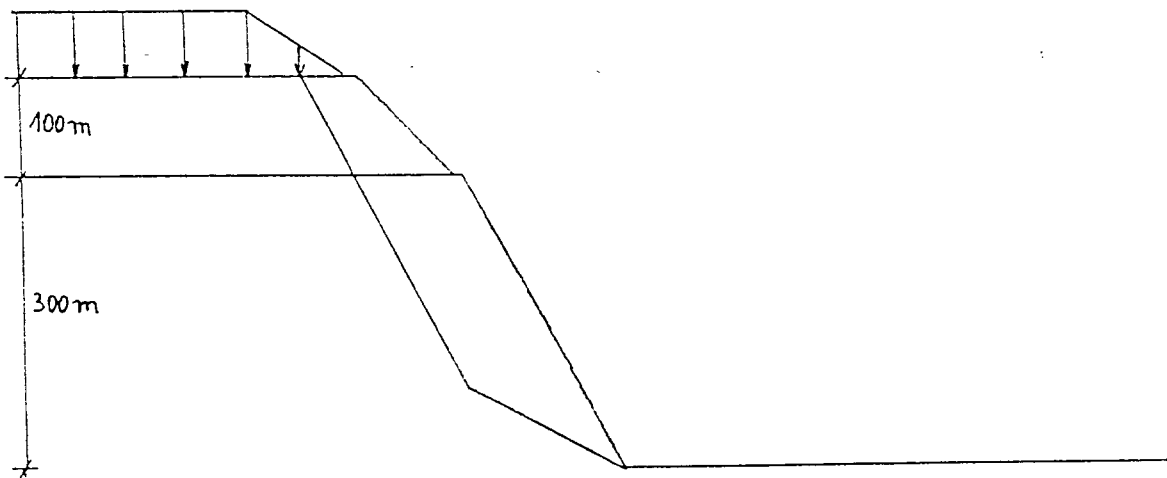
* FINAL CRITICAL SHEAR SURFACE (FOUND AFTER 14 TRIAL POSITIONS) *

X	Y
252.29	960.00
464.70	653.24
570.00	500.00

Factor of Safety = 1.745

CASO 3e

F.S. = 1,36



PROBLEMA - MACIÇO ROCHOSO, PESQUISA DE CURVA
 $\beta=100+300\alpha$, $\alpha=45$, ZL, CISCALHAMENTO, ENV. NÃO LINEAR

 * NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
 Zona de cisalhamento III/IV

Unit weight of material = .027

---- NONLINEAR SHEAR STRENGTH ENVELOPE ----

Point	Normal Stress	Shear Stress
1	.000	.250
2	1.000	1.950
3	2.750	3.170
4	4.100	4.100
5	5.500	5.090

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
 Zona de cisalhamento III

Unit weight of material = .027

---- NONLINEAR SHEAR STRENGTH ENVELOPE ----

Point	Normal Stress	Shear Stress
1	.000	.310
2	1.300	2.100
3	2.750	3.420
4	4.100	4.530
5	5.500	5.510
6	6.800	6.420
7	8.250	7.250
8	9.600	8.040
9	11.000	8.790
10	12.300	9.400
11	13.750	10.160
12	15.100	10.810
13	16.500	11.430
14	17.800	12.030
15	19.250	12.620

No (or zero) pore water pressures

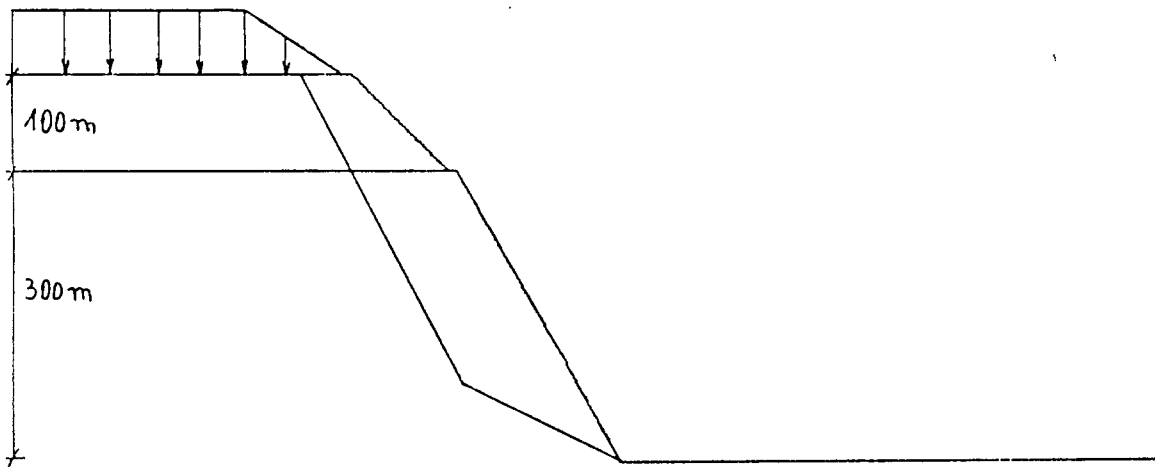
 * FINAL CRITICAL SHEAR SURFACE (FOUND AFTER 11 TRIAL POSITIONS) *

X	Y
274.74	900.00
503.64	573.31
590.00	500.00

Factor of Safety = 1.362

CASO 3f

F.S. = 1,25



PROBLEMA - MACICO ROCHOSO, PESQUISA DE CUNHA
H=120+300m, ALFA=45, SOMENTE ZONA DE CISCALHAMENTO

* NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1

Parametros da zona de cisalhamento

Unit weight of material = .027

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS

Cohesion - - - - - .250

Friction angle - - - - - 51.000 degrees

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2

SOMENTE ZONA DE CISCALHAMENTO

Unit weight of material = .027

CONVENTIONAL (ISOTROPIC) SHEAR STRENGTHS

Cohesion - - - - - .550

Friction angle - - - - - 42.000 degrees

No (or zero) pore water pressures

* FINAL CRITICAL SHEAR SURFACE (FOUND AFTER 20 TRIAL POSITIONS) *

X	Y
212.50	900.00
492.92	560.25
590.00	500.00

Factor of Safety = 1.253

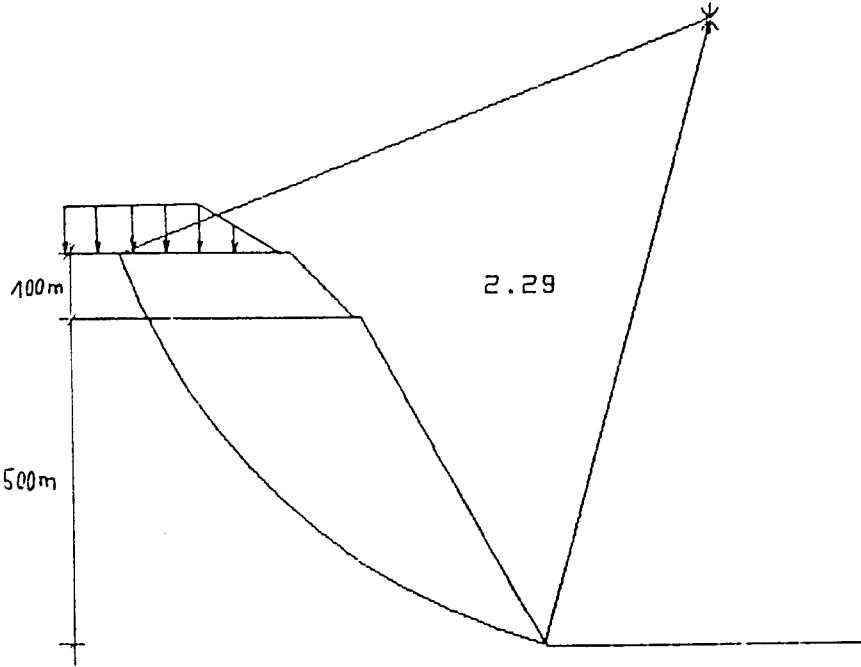
ANEXO 18

RESULTADOS DE ANÁLISE DE ESTABILIDADE

TALUDE ROCHOSO

TALUDE EM XISTO E GNAISSE

CASO 2a



PROBLEMA - ANALISE DO CIRCULO CRITICO e TRINCA
 DADO: (DIF. H = 100 + 300m, ALFA = 45, ENV. AMO LINEAR)

 * NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
 Apto (500h<700)

Unit weight of material = .035

--- LINEAR SHEAR STRENGTH ENVELOPE ---
 Point Normal Stress Shear Stress

1	.000	.776
2	1.750	3.070
3	3.500	6.290
4	5.250	9.390
5	7.000	10.290
6	8.750	12.050

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
 Apto (100h<700)

Unit weight of material = .035

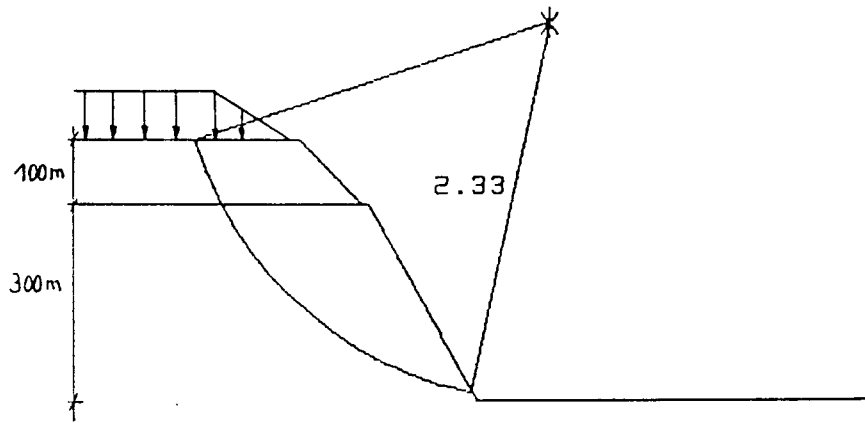
---- NONLINEAR SHEAR STRENGTH ENVELOPE ----
 Point Normal Stress Shear Stress

1	.000	1.282
2	1.750	4.490
3	3.500	7.150
4	5.250	9.500
5	7.000	11.650
6	8.750	13.640
7	10.500	15.520
8	12.250	17.210
9	14.000	19.020
10	15.750	20.660
11	17.500	22.250
12	19.250	23.780
13	21.000	25.270
14	22.750	26.720
15	24.500	28.130

No (or zero) pore water pressures

***** FINAL CRITICAL CIRCLE INFORMATION *****
 X Coordinate of Center - - - - - 940.000
 Y Coordinate of Center - - - - - 1250.000
 Radius - - - - - 980.000
 Factor of Safety - - - - - 2.292

CASO 2b



C O L U M B I A - MACICO ESCUDO, CIRCULO CRITICO e TRINCA
GRAISSE, H = 100 * 300m, ALFA = 45, ENV. NAO LINEAR

* NEW MATERIAL PROPERTY DATA *

DATA FOR MATERIAL TYPE 1
Graisse (1)

Unit weight of material = .027

---- NONLINEAR SHEAR STRENGTH ENVELOPE ----
Point Normal Stress Shear Stress

1	1.000	1.376
2	1.380	2.680
3	2.750	4.400
4	4.130	5.870
5	5.500	7.190

No (or zero) pore water pressures

DATA FOR MATERIAL TYPE 2
Graisse (2)

Unit weight of material = .027

---- NONLINEAR SHEAR STRENGTH ENVELOPE ----
Point Normal Stress Shear Stress

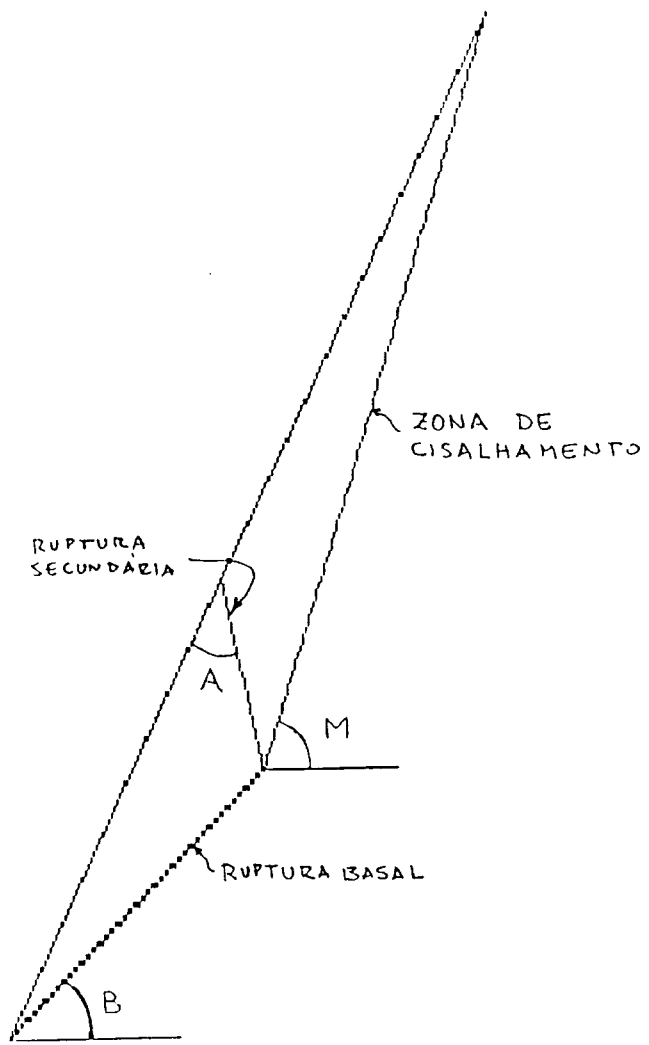
1	1.000	1.568
2	1.380	3.040
3	2.750	4.970
4	4.130	6.630
5	5.500	8.140
6	6.880	9.530
7	8.250	10.840
8	9.630	12.090
9	11.000	13.260

No (or zero) pore water pressures

**** FINAL CRITICAL CIRCLE INFORMATION ****
X Coordinate of Center - - - - - 700.000
Y Coordinate of Center - - - - - 1000.000
Radius - - - - - 530.000
Factor of Safety - - - - - 2.331

ANEXO 20

RESULTADOS ANÁLISE SARMA/HOEK



ESBOÇO DO TALUDE PARA ANÁLISE SARMA-HOEK

TABELA 24

RESULTADOS DA ANÁLISE COM O SARMA/HOEK

CASO	I (M GRAUS	B)	A (E m)	Cs (MPa)	φ_s (°)	Cc (MPa)	φ_c (°)	Cr (MPa)	φ_r (°)	H (m)	FS
1	60	70	30	90	10	0	0	.25	51	.80	60	64	5.20
2					20							128	3.15
3					50							321	2.10
4				75									1.72
5				60									1.63
6				45									1.61
7				40									1.62
8				30									1.67
9			35	45								338	1.60
10			40									364	1.59
11			45									407	1.61
12		80	40									238	1.90
13		75										281	1.75
14		65										614	1.40
15					20							246	1.98
16					10							123	3.17
17		70			50				45			364	1.51
18									40				1.45
19								.20					1.40
20										.20	40		0.92
21								.50		.50			1.38
22						.50	40						1.47
23						.15	36	.15	36			50	1.30
24												55	1.40
25												45	1.22
26					20							146	1.80
27					10							73	2.72

NOTA: na tabela só são indicados os parâmetros que foram mudados em cada linha.