

COMMITTENTE:



ALTA SORVEGLIANZA:



GENERAL CONTRACTOR:



**INFRASTRUTTURE FERROVIARIE STRATEGICHE DEFINITE DALLA  
LEGGE OBIETTIVO N. 443/01  
LINEA A.V. /A.C. TORINO – VENEZIA Tratta MILANO – VERONA  
Lotto Funzionale Brescia-Verona  
PROGETTO DEFINITIVO**

**PROGETTO DI COLTIVAZIONE E DI RICOMPOSIZIONE**

IL PROGETTISTA

IL PROGETTISTA INTEGRATORE

**AMBIENTALE DELLA CAVA DI GHIAIA "VR 01"**

**COMUNE DI CASTELNUOVO DEL GARDA (VR)**

**INDAGINI GEOTECNICHE ED ANALISI DI LABORATORIO**

G.T. ENGINEERING s.r.l.  
Via S. Rocco 20, 43012  
Castelnuovo del Garda (VR)  
Ordine degli Ingegneri della  
Provincia di Parma n° 631

saipem spa  
Tommaso Taranta  
Dottore in Ingegneria Civile iscritto all'albo  
degli Ingegneri della Provincia di Milano  
al n. A23468 - Sez. A. Settori:  
a) civile e ambientale b) industriale c) dell'informazione  
Tel. 02.52020557 - Fax 02.52020309  
C.F. e P.IVA 00825790157

ALTA SORVEGLIANZA



Verificato	Data	Approvato	Data

COMMESSA    LOTTO    FASE    ENTE    TIPO DOC.    OPERA/DISCIPLINA    PROGR.    REV.

I	N	0	5	0	0	D	E	2	R	O	C	A	0	0	0	0	2	6	3	0
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PROGETTAZIONE GENERAL CONTRACTOR									Autorizzato/Data
Rev.	Data	Descrizione	Redatto	Data	Verificato	Data	Approvato	Data	Consorzio <b>Cepav due</b> Project Director (Ing. F. Lombardi) Data: _____
0	31.03.14	Emissione per CdS		31.03.14		31.03.14		31.03.14	

SAIPEM S.p.a. COMM. 032121

Data: 31.03.14

Doc. N.: 49416\_02.doc



Progetto cofinanziato  
dalla Unione Europea

CUP: F81H91000000008

CAVA VR01 - CASTELNUOVO DEL GARDA (VR)

DATESTAMP 06/11/2005

TIMESTAMP 23.52.45

3=METHOD 1792=NO. OF SLIP SURFACES 7=NO. OF RADII 2=SIDE FUNCTION TYPE  
 18.9500=X-COOR. 26.5550=Y-COOR. COMPUTED AXIS

SLIP NO.	X-COORD.	Y-COORD.	RADIUS	ITERATION NO.	LAMBDA	FACTOR OF SAFETY (MOMENT)	FACTOR OF SAFETY (FORCE)
1	7.190	16.670	7.797	1	0.0000	16.8925403	15.8731314
1	7.190	16.670	7.797	4	0.0000	17.9308423	16.9031055
1	7.190	16.670	7.797	3	-0.0450	17.9324719	17.9339946
2	7.190	16.670	8.089	1	0.0000	15.8808558	14.6839903
2	7.190	16.670	8.089	4	0.0000	17.1691663	16.0040470
2	7.190	16.670	8.089	3	-0.0435	17.1712973	17.1753875
3	7.190	16.670	8.382	1	0.0000	14.9566155	13.6198436
3	7.190	16.670	8.382	4	0.0000	16.4885875	15.2095404
3	7.190	16.670	8.382	3	-0.0424	16.4912448	16.5003324
4	7.190	16.670	8.674	1	0.0000	14.1962548	12.7439298
4	7.190	16.670	8.674	3	0.0000	15.9643115	14.5811240
4	7.190	16.670	8.674	3	-0.0412	15.9674723	15.9664741
5	7.190	16.670	8.966	1	0.0000	13.5736324	12.0235233
5	7.190	16.670	8.966	4	0.0000	15.5726163	14.0886060
5	7.190	16.670	8.966	3	-0.0405	15.5762982	15.5754873
6	7.190	16.670	9.259	1	0.0000	13.0586162	11.4238792
6	7.190	16.670	9.259	5	0.0000	15.2777502	13.6937874
6	7.190	16.670	9.259	3	-0.0400	15.2819495	15.2802077
7	7.190	16.670	9.551	1	0.0000	12.6258933	10.9173203
7	7.190	16.670	9.551	5	0.0000	15.0594235	13.3788508
7	7.190	16.670	9.551	3	-0.0396	15.0641306	15.0604291
8	8.702	16.720	7.707	1	0.0000	17.1404462	16.2351898
8	8.702	16.720	7.707	4	0.0000	18.0502820	17.1249761
8	8.702	16.720	7.707	3	-0.0457	18.0516889	18.0525001
9	8.702	16.720	8.001	1	0.0000	16.3591412	15.2481086
9	8.702	16.720	8.001	4	0.0000	17.5221189	16.4250855
9	8.702	16.720	8.001	3	-0.0442	17.5239952	17.5265473
10	8.702	16.720	8.295	1	0.0000	15.3617539	14.0954775
10	8.702	16.720	8.295	4	0.0000	16.7703417	15.5516793
10	8.702	16.720	8.295	3	-0.0429	16.7727344	16.7788743
11	8.702	16.720	8.588	1	0.0000	14.5223871	13.1305440
11	8.702	16.720	8.588	4	0.0000	16.1718905	14.8454187
11	8.702	16.720	8.588	3	-0.0416	16.1747901	16.1741573
12	8.702	16.720	8.882	1	0.0000	13.8378817	12.3402752
12	8.702	16.720	8.882	4	0.0000	15.7167301	14.2869595
12	8.702	16.720	8.882	3	-0.0409	15.7201518	15.7186723
13	8.702	16.720	9.176	1	0.0000	13.2745759	11.6867665
13	8.702	16.720	9.176	4	0.0000	15.3802894	13.8529753
13	8.702	16.720	9.176	3	-0.0402	15.3842302	15.3830461
14	8.702	16.720	9.469	1	0.0000	12.8053277	11.1389190
14	8.702	16.720	9.469	5	0.0000	15.1277940	13.5014187
14	8.702	16.720	9.469	3	-0.0398	15.1322473	15.1296458
15	10.214	16.770	7.618	1	0.0000	17.0124977	16.2351898
15	10.214	16.770	7.618	4	0.0000	17.7936577	17.0014214
15	10.214	16.770	7.618	3	-0.0459	17.7948699	17.7951356
16	10.214	16.770	7.913	1	0.0000	16.8293048	15.8133154
16	10.214	16.770	7.913	4	0.0000	17.8664465	16.8447606
16	10.214	16.770	7.913	3	-0.0450	17.8680795	17.8695858
17	10.214	16.770	8.208	1	0.0000	15.8033508	14.6133959
17	10.214	16.770	8.208	4	0.0000	17.0905965	15.9348206
17	10.214	16.770	8.208	3	-0.0434	17.0927306	17.0967703
18	10.214	16.770	8.503	1	0.0000	14.8820376	13.5540508
18	10.214	16.770	8.503	4	0.0000	16.4100280	15.1410015
18	10.214	16.770	8.503	3	-0.0424	16.4126884	16.4216072

1783	29.198	36.390	26.655	1	0.0000	2.7401755	2.8270357
1783	29.198	36.390	26.655	4	0.0000	2.8937084	2.7092790
1783	29.198	36.390	26.655	3	-0.3974	2.8854094	2.8925567
1784	29.198	36.390	26.968	1	0.0000	2.6722717	2.7585560
1784	29.198	36.390	26.968	4	0.0000	2.8286900	2.6439260
1784	29.198	36.390	26.968	3	-0.3985	2.8187362	2.8263270
1785	29.198	36.390	27.281	1	0.0000	2.6277716	2.7154428
1785	29.198	36.390	27.281	4	0.0000	2.7882615	2.6007295
1785	29.198	36.390	27.281	3	-0.3986	2.7782355	2.7863907
1786	30.710	36.440	25.313	1	0.0000	3.2112541	3.3019412
1786	30.710	36.440	25.313	4	0.0000	3.3672692	3.1662492
1786	30.710	36.440	25.313	3	-0.3645	3.3674725	3.3744535
1787	30.710	36.440	25.628	1	0.0000	3.2042934	3.3003518
1787	30.710	36.440	25.628	4	0.0000	3.3683029	3.1578582
1787	30.710	36.440	25.628	3	-0.3642	3.3685236	3.3761813
1788	30.710	36.440	25.942	1	0.0000	3.1986169	3.3000079
1788	30.710	36.440	25.942	4	0.0000	3.3705518	3.1507538
1788	30.710	36.440	25.942	3	-0.3639	3.3707883	3.3791461
1789	30.710	36.440	26.256	1	0.0000	3.1940548	3.3007375
1789	30.710	36.440	26.256	4	0.0000	3.3738445	3.1447660
1789	30.710	36.440	26.256	3	-0.3636	3.3740953	3.3831755
1790	30.710	36.440	26.571	1	0.0000	3.0667337	3.1683010
1790	30.710	36.440	26.571	4	0.0000	3.2485117	3.0248033
1790	30.710	36.440	26.571	3	-0.3653	3.2421313	3.2513122
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000

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SUMMARY OF MINIMUM FACTORS OF SAFETY

MOMENT EQUILIBRIUM: FELLENIUS OR ORDINARY METHOD

22.4780=X-COOR. 20.9740=Y-COOR. 12.5082=RADIUS 1.4293070=F.S.

413=SLIP#

MOMENT EQUILIBRIUM: BISHOP SIMPLIFIED METHOD

21.1340=X-COOR. 24.7280=Y-COOR. 15.1447=RADIUS 1.5802895=F.S.

738=SLIP#

FORCE EQUILIBRIUM: JANBU SIMPLIFIED METHOD (NO  $f_0$  FACTOR)

22.4780=X-COOR. 20.9740=Y-COOR. 12.5082=RADIUS 1.4346840=F.S.

413=SLIP#

MOMENT AND FORCE EQUILIBRIUM: MORGENSTERN-PRICE METHOD

21.1340=X-COOR. 24.7280=Y-COOR. 15.1447=RADIUS 1.5708721=F.S.

738=SLIP#

NORMAL TERMINATION OF SLOPE

MOST\_CRITICAL # SLIP\_SURFACE #

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1	738
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SLIP\_SURFACE # AUTOTENSIONELEV

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CAVA VR01 - CASTELNUOVO DEL GARDA (VR)

DATESTAMP 07/11/2005

TIMESTAMP 0.02.29

3=METHOD 1000=NO. OF SLIP SURFACES 1=NO. OF RADII 2=SIDE FUNCTION TYPE  
 18.7500=X-COOR. 20.0000=Y-COOR. COMPUTED AXIS

SLIP NO.	X-COOR.	Y-COOR.	RADIUS	ITERATION NO.	LAMBDA	FACTOR OF SAFETY (MOMENT)	FACTOR OF SAFETY (FORCE)
1	-11.501	172.796	163.201	1	0.0000	2.9607433	2.9598689
1	-11.501	172.796	163.201	4	0.0000	2.9616049	2.9592209
1	-11.501	172.796	163.201	3	-0.1879	2.9614914	2.9596351
2	5.463	64.923	55.194	1	0.0000	3.1826453	3.1965923
2	5.463	64.923	55.194	5	0.0000	3.1901855	3.1750229
2	5.463	64.923	55.194	3	-0.2500	3.1897652	3.1806921
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
4	10.468	33.094	25.356	1	0.0000	5.7364195	5.9954362
4	10.468	33.094	25.356	5	0.0000	6.1313462	5.7099578
4	10.468	33.094	25.356	3	-0.1546	6.1275780	6.1270065
5	11.364	27.397	20.780	1	0.0000	3.9757301	4.2768897
5	11.364	27.397	20.780	5	0.0000	4.5610126	4.0746429
5	11.364	27.397	20.780	3	-0.1646	4.5608999	4.5582213
6	11.968	23.558	18.085	1	0.0000	3.3542621	3.7198431
6	11.968	23.558	18.085	6	0.0000	4.1888201	3.5657949
6	11.968	23.558	18.085	3	-0.1672	4.1935113	4.1905754
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
11	-12.648	187.668	178.118	1	0.0000	3.0095668	3.0084489
11	-12.648	187.668	178.118	4	0.0000	3.0103927	3.0078839
11	-12.648	187.668	178.118	3	-0.1779	3.0103006	3.0082678
12	5.925	69.946	60.238	1	0.0000	2.1046380	2.1114563
12	5.925	69.946	60.238	4	0.0000	2.1125754	2.1016811
12	5.925	69.946	60.238	3	-0.2500	2.1117772	2.1057705
13	9.720	45.889	37.182	1	0.0000	1.8671803	1.8860310
13	9.720	45.889	37.182	4	0.0000	1.8854094	1.8615244
13	9.720	45.889	37.182	3	-0.6008	1.8832150	1.8808022
14	11.405	35.212	27.671	1	0.0000	2.8022339	3.0010301
14	11.405	35.212	27.671	4	0.0000	3.0852172	2.8466968
14	11.405	35.212	27.671	3	-0.2563	3.0805698	3.0903122
15	12.385	28.995	22.676	1	0.0000	2.4917328	2.7339113
15	12.385	28.995	22.676	5	0.0000	2.9308950	2.6106407
15	12.385	28.995	22.676	3	-0.2257	2.9326374	2.9296812
16	13.046	24.806	19.734	1	0.0000	2.3068593	2.6091021
16	13.046	24.806	19.734	6	0.0000	2.9500817	2.5144955
16	13.046	24.806	19.734	3	-0.2149	2.9584533	2.9564030
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000

989	34.048	19.687	13.616	0	0.0000	997.0000000	997.0000000
989	34.048	19.687	13.616	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
991	-2.926	184.554	174.761	1	0.0000	3.1153836	3.1138101
991	-2.926	184.554	174.761	4	0.0000	3.1183353	3.1116132
991	-2.926	184.554	174.761	3	-0.1522	3.1182885	3.1130881
992	23.524	70.712	58.988	1	0.0000	3.1368573	3.1475943
992	23.524	70.712	58.988	4	0.0000	3.1669924	3.1228302
992	23.524	70.712	58.988	3	-0.4178	3.1670732	3.1674892
993	28.914	47.515	36.273	1	0.0000	3.2187112	3.2641529
993	28.914	47.515	36.273	4	0.0000	3.3071101	3.1894029
993	28.914	47.515	36.273	3	-0.3718	3.3073217	3.3098403
994	31.295	37.267	26.853	1	0.0000	3.3515964	3.4558013
994	31.295	37.267	26.853	4	0.0000	3.5320327	3.2992122
994	31.295	37.267	26.853	3	-0.3508	3.5322535	3.5411926
995	32.673	31.335	21.864	1	0.0000	3.2700320	3.4308076
995	32.673	31.335	21.864	4	0.0000	3.5673540	3.2118240
995	32.673	31.335	21.864	3	-0.3160	3.5574746	3.5556040
996	33.596	27.365	18.890	1	0.0000	3.3072127	3.5471795
996	33.596	27.365	18.890	5	0.0000	3.7572699	3.2358327
996	33.596	27.365	18.890	3	-0.2974	3.7472152	3.7439605
997	34.272	24.452	17.000	1	0.0000	3.3645012	3.6901130
997	34.272	24.452	17.000	5	0.0000	4.0032234	3.2834873
997	34.272	24.452	17.000	3	-0.2826	3.9953236	3.9969447
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000

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SUMMARY OF MINIMUM FACTORS OF SAFETY

MOMENT EQUILIBRIUM: FELLENIUS OR ORDINARY METHOD

22.7176=X-COOR. 18.9585=Y-COOR. 12.7585=RADIUS 1.3878371=F.S.  
538=SLIP#

MOMENT EQUILIBRIUM: BISHOP SIMPLIFIED METHOD

21.4886=X-COOR. 23.6298=Y-COOR. 13.9139=RADIUS 1.5946782=F.S.  
625=SLIP#

FORCE EQUILIBRIUM: JANBU SIMPLIFIED METHOD (NO  $f_0$  FACTOR)

22.0756=X-COOR. 21.1036=Y-COOR. 12.0209=RADIUS 1.4454887=F.S.  
626=SLIP#

MOMENT AND FORCE EQUILIBRIUM: MORGENSTERN-PRICE METHOD

21.4886=X-COOR. 23.6298=Y-COOR. 13.9139=RADIUS 1.5031420=F.S.  
625=SLIP#

NORMAL TERMINATION OF SLOPE

MOST\_CRITICAL # SLIP\_SURFACE #

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1	625
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SLIP\_SURFACE # AUTOTENSIONELEV

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CAVA VR01 - CASTELNUOVO DEL GARDA (VR)

DATESTAMP 07/11/2005

TIMESTAMP 0.12.30

3=METHOD 1792=NO. OF SLIP SURFACES 7=NO. OF RADII 2=SIDE FUNCTION TYPE  
 18.9500=X-COOR. 26.5550=Y-COOR. COMPUTED AXIS

SLIP NO.	X-COORD.	Y-COORD.	RADIUS	ITERATION NO.	LAMBDA	FACTOR OF SAFETY (MOMENT)	FACTOR OF SAFETY (FORCE)
1	7.190	16.670	7.797	1	0.0000	25.6882309	23.9108219
1	7.190	16.670	7.797	5	0.0000	26.8633278	25.5557303
1	7.190	16.670	7.797	3	-0.0381	26.8644095	26.8661861
2	7.190	16.670	8.089	1	0.0000	22.4473013	20.5433120
2	7.190	16.670	8.089	5	0.0000	23.9497005	22.5548197
2	7.190	16.670	8.089	3	-0.0368	23.9514170	23.9555429
3	7.190	16.670	8.382	1	0.0000	20.4750961	18.4558619
3	7.190	16.670	8.382	4	0.0000	22.2966418	20.7820377
3	7.190	16.670	8.382	3	-0.0363	22.2990280	22.3081015
4	7.190	16.670	8.674	1	0.0000	19.0791894	16.9574962
4	7.190	16.670	8.674	4	0.0000	21.2065940	19.5696266
4	7.190	16.670	8.674	3	-0.0358	21.2096180	21.2093605
5	7.190	16.670	8.966	1	0.0000	18.0214847	15.8093032
5	7.190	16.670	8.966	5	0.0000	20.4445323	18.6849614
5	7.190	16.670	8.966	3	-0.0356	20.4481926	20.4474349
6	7.190	16.670	9.259	1	0.0000	17.1862551	14.8929720
6	7.190	16.670	9.259	5	0.0000	19.8887824	18.0071039
6	7.190	16.670	9.259	3	-0.0355	19.8930689	19.8910955
7	7.190	16.670	9.551	1	0.0000	16.5055621	14.1402041
7	7.190	16.670	9.551	6	0.0000	19.4780167	17.4787274
7	7.190	16.670	9.551	3	-0.0355	19.4829151	19.4786963
8	8.702	16.720	7.707	1	0.0000	29.2690975	27.5402609
8	8.702	16.720	7.707	5	0.0000	30.2867459	28.9137821
8	8.702	16.720	7.707	3	-0.0404	30.2877919	30.2888799
9	8.702	16.720	8.001	1	0.0000	23.7189335	21.8872308
9	8.702	16.720	8.001	5	0.0000	25.0577713	23.7221488
9	8.702	16.720	8.001	3	-0.0372	25.0591637	25.0621338
10	8.702	16.720	8.295	1	0.0000	21.2922221	19.3387740
10	8.702	16.720	8.295	5	0.0000	22.9538520	21.5071407
10	8.702	16.720	8.295	3	-0.0365	22.9559103	22.9620873
11	8.702	16.720	8.588	1	0.0000	19.6624158	17.6010783
11	8.702	16.720	8.588	4	0.0000	21.6375835	20.0686876
11	8.702	16.720	8.588	3	-0.0359	21.6402874	21.6391326
12	8.702	16.720	8.882	1	0.0000	18.4637869	16.3056248
12	8.702	16.720	8.882	4	0.0000	20.7345159	19.0428974
12	8.702	16.720	8.882	3	-0.0358	20.7378656	20.7374014
13	8.702	16.720	9.176	1	0.0000	17.5331914	15.2899682
13	8.702	16.720	9.176	5	0.0000	20.0927851	18.2786531
13	8.702	16.720	9.176	3	-0.0356	20.0967639	20.0954848
14	8.702	16.720	9.469	1	0.0000	16.7859417	14.4664530
14	8.702	16.720	9.469	5	0.0000	19.6193858	17.6845984
14	8.702	16.720	9.469	3	-0.0355	19.6239832	19.6211134
15	10.214	16.770	7.618	1	0.0000	30.6153585	29.0355279
15	10.214	16.770	7.618	5	0.0000	31.4890432	30.2648266
15	10.214	16.770	7.618	3	-0.0401	31.4899001	31.4904197
16	10.214	16.770	7.913	1	0.0000	25.4222265	23.6632656
16	10.214	16.770	7.913	5	0.0000	26.5981205	25.3069612
16	10.214	16.770	7.913	3	-0.0380	26.5992136	26.6009644
17	10.214	16.770	8.208	1	0.0000	22.2726381	20.3880749
17	10.214	16.770	8.208	5	0.0000	23.7760099	22.3939314
17	10.214	16.770	8.208	3	-0.0367	23.7777430	23.7818246
18	10.214	16.770	8.503	1	0.0000	20.3355575	18.3359312
18	10.214	16.770	8.503	4	0.0000	22.1542613	20.6517912
18	10.214	16.770	8.503	3	-0.0363	22.1566625	22.1655909

1783	29.198	36.390	26.655	1	0.0000	2.8964185	2.9965514
1783	29.198	36.390	26.655	4	0.0000	3.0590362	2.8565691
1783	29.198	36.390	26.655	3	-0.3911	3.0593817	3.0672825
1784	29.198	36.390	26.968	1	0.0000	2.8989906	3.0040363
1784	29.198	36.390	26.968	4	0.0000	3.0688733	2.8578638
1784	29.198	36.390	26.968	3	-0.3902	3.0692366	3.0777930
1785	29.198	36.390	27.281	1	0.0000	2.9020253	3.0119519
1785	29.198	36.390	27.281	4	0.0000	3.0791199	2.8596187
1785	29.198	36.390	27.281	3	-0.3893	3.0794995	3.0887306
1786	30.710	36.440	25.313	1	0.0000	3.2112541	3.3019412
1786	30.710	36.440	25.313	4	0.0000	3.3672692	3.1662492
1786	30.710	36.440	25.313	3	-0.3645	3.3674725	3.3744535
1787	30.710	36.440	25.628	1	0.0000	3.2042934	3.3003518
1787	30.710	36.440	25.628	4	0.0000	3.3683029	3.1578582
1787	30.710	36.440	25.628	3	-0.3642	3.3685236	3.3761813
1788	30.710	36.440	25.942	1	0.0000	3.1986169	3.3000079
1788	30.710	36.440	25.942	4	0.0000	3.3705518	3.1507538
1788	30.710	36.440	25.942	3	-0.3639	3.3707883	3.3791461
1789	30.710	36.440	26.256	1	0.0000	3.1940548	3.3007375
1789	30.710	36.440	26.256	4	0.0000	3.3738445	3.1447660
1789	30.710	36.440	26.256	3	-0.3636	3.3740953	3.3831755
1790	30.710	36.440	26.571	1	0.0000	3.1904645	3.3023960
1790	30.710	36.440	26.571	4	0.0000	3.3780371	3.1397518
1790	30.710	36.440	26.571	3	-0.3633	3.3783006	3.3881245
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1791	30.710	36.440	26.885	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000
1792	30.710	36.440	27.199	0	0.0000	992.0000000	992.0000000

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SUMMARY OF MINIMUM FACTORS OF SAFETY

MOMENT EQUILIBRIUM: FELLENIUS OR ORDINARY METHOD

19.7900=X-COOR.      28.4820=Y-COOR.      18.3964=RADIUS      1.5773879=F.S.

1065=SLIP#

MOMENT EQUILIBRIUM: BISHOP SIMPLIFIED METHOD

18.3900=X-COOR.      30.9680=Y-COOR.      21.0010=RADIUS      1.6487918=F.S.

1282=SLIP#

FORCE EQUILIBRIUM: JANBU SIMPLIFIED METHOD (NO  $f_0$  FACTOR)

21.1900=X-COOR.      25.9960=Y-COOR.      15.7919=RADIUS      1.5649556=F.S.

848=SLIP#

MOMENT AND FORCE EQUILIBRIUM: MORGENSTERN-PRICE METHOD

18.3900=X-COOR.      30.9680=Y-COOR.      21.0010=RADIUS      1.6462469=F.S.

1282=SLIP#

NORMAL TERMINATION OF SLOPE

MOST\_CRITICAL #      SLIP\_SURFACE #

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1	1282
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SLIP\_SURFACE #      AUTOTENSIONELEV

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CAVA VR01 - CASTELNUOVO DEL GARDA (VR)

DATESTAMP 07/11/2005

TIMESTAMP 0.17.31

3=METHOD 1000=NO. OF SLIP SURFACES 1=NO. OF RADII 2=SIDE FUNCTION TYPE  
 18.7500=X-COOR. 20.0000=Y-COOR. COMPUTED AXIS

SLIP NO.	X-COOR.	Y-COOR.	RADIUS	ITERATION NO.	LAMBDA	FACTOR OF SAFETY (MOMENT)	FACTOR OF SAFETY (FORCE)
1	-11.501	172.796	163.201	1	0.0000	2.9607433	2.9598689
1	-11.501	172.796	163.201	4	0.0000	2.9616049	2.9592209
1	-11.501	172.796	163.201	3	-0.1879	2.9614914	2.9596351
2	5.463	64.923	55.194	1	0.0000	3.1826453	3.1965923
2	5.463	64.923	55.194	5	0.0000	3.1901855	3.1750229
2	5.463	64.923	55.194	3	-0.2500	3.1897652	3.1806921
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
3	8.930	42.878	34.069	0	0.0000	993.0000000	993.0000000
4	10.468	33.094	25.356	1	0.0000	7.4405848	7.7910016
4	10.468	33.094	25.356	5	0.0000	7.9142394	7.3421852
4	10.468	33.094	25.356	3	-0.1502	7.9176003	7.9169221
5	11.364	27.397	20.780	1	0.0000	5.0553501	5.4507785
5	11.364	27.397	20.780	5	0.0000	5.7592696	5.1209774
5	11.364	27.397	20.780	3	-0.1612	5.7659622	5.7645672
6	11.968	23.558	18.085	1	0.0000	4.2387831	4.7105306
6	11.968	23.558	18.085	6	0.0000	5.2466395	4.4421253
6	11.968	23.558	18.085	3	-0.1642	5.2573399	5.2535691
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
7	12.414	20.719	16.402	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
8	12.766	18.480	15.326	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
9	13.057	16.630	14.644	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
10	13.307	15.045	14.231	0	0.0000	997.0000000	997.0000000
11	-12.648	187.668	178.118	1	0.0000	3.0095668	3.0084489
11	-12.648	187.668	178.118	4	0.0000	3.0103927	3.0078839
11	-12.648	187.668	178.118	3	-0.1779	3.0103006	3.0082678
12	5.925	69.946	60.238	1	0.0000	2.1046380	2.1114563
12	5.925	69.946	60.238	4	0.0000	2.1125754	2.1016811
12	5.925	69.946	60.238	3	-0.2500	2.1117772	2.1057705
13	9.720	45.889	37.182	1	0.0000	1.8671803	1.8860310
13	9.720	45.889	37.182	4	0.0000	1.8854094	1.8615244
13	9.720	45.889	37.182	3	-0.6008	1.8832150	1.8808022
14	11.405	35.212	27.671	1	0.0000	3.4531653	3.7321743
14	11.405	35.212	27.671	5	0.0000	3.7959453	3.4717012
14	11.405	35.212	27.671	3	-0.2449	3.8041354	3.8027643
15	12.385	28.995	22.676	1	0.0000	3.0773263	3.4034101
15	12.385	28.995	22.676	5	0.0000	3.6050687	3.1837607
15	12.385	28.995	22.676	3	-0.2256	3.6170673	3.6155698
16	13.046	24.806	19.734	1	0.0000	2.8610229	3.2585463
16	13.046	24.806	19.734	6	0.0000	3.6350133	3.0713229
16	13.046	24.806	19.734	3	-0.2134	3.6519814	3.6456667
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
17	13.535	21.709	17.897	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000
18	13.920	19.266	16.722	0	0.0000	997.0000000	997.0000000



989	34.048	19.687	13.616	0	0.0000	997.0000000	997.0000000
989	34.048	19.687	13.616	0	0.0000	997.0000000	997.0000000
989	34.048	19.687	13.616	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
990	34.394	18.242	13.125	0	0.0000	997.0000000	997.0000000
991	-2.926	184.554	174.761	1	0.0000	3.1153836	3.1138101
991	-2.926	184.554	174.761	4	0.0000	3.1183353	3.1116132
991	-2.926	184.554	174.761	3	-0.1522	3.1182885	3.1130881
992	23.524	70.712	58.988	1	0.0000	3.1368573	3.1475943
992	23.524	70.712	58.988	4	0.0000	3.1669924	3.1228302
992	23.524	70.712	58.988	3	-0.4178	3.1670732	3.1674892
993	28.914	47.515	36.273	1	0.0000	3.2187112	3.2641529
993	28.914	47.515	36.273	4	0.0000	3.3071101	3.1894029
993	28.914	47.515	36.273	3	-0.3718	3.3073217	3.3098403
994	31.295	37.267	26.853	1	0.0000	3.3515964	3.4558013
994	31.295	37.267	26.853	4	0.0000	3.5320327	3.2992122
994	31.295	37.267	26.853	3	-0.3508	3.5322535	3.5411926
995	32.673	31.335	21.864	1	0.0000	3.5339821	3.7219790
995	32.673	31.335	21.864	4	0.0000	3.8432420	3.4467077
995	32.673	31.335	21.864	3	-0.3185	3.8431592	3.8409647
996	33.596	27.365	18.890	1	0.0000	3.7854176	4.0849312
996	33.596	27.365	18.890	5	0.0000	4.2666270	3.6471099
996	33.596	27.365	18.890	3	-0.3029	4.2743285	4.2700776
997	34.272	24.452	17.000	1	0.0000	3.9510463	4.3610023
997	34.272	24.452	17.000	5	0.0000	4.6506876	3.7777268
997	34.272	24.452	17.000	3	-0.2879	4.6597506	4.6589017
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
998	34.802	22.173	15.761	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
999	35.236	20.304	14.942	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000
1000	35.605	18.715	14.412	0	0.0000	997.0000000	997.0000000

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SUMMARY OF MINIMUM FACTORS OF SAFETY

MOMENT EQUILIBRIUM: FELLENIUS OR ORDINARY METHOD

20.6114=X-COOR. 27.4046=Y-COOR. 17.0887=RADIUS 1.5843126=F.S.

624=SLIP#

MOMENT EQUILIBRIUM: BISHOP SIMPLIFIED METHOD

20.6114=X-COOR. 27.4046=Y-COOR. 17.0887=RADIUS 1.6704983=F.S.

624=SLIP#

FORCE EQUILIBRIUM: JANBU SIMPLIFIED METHOD (NO  $f_0$  FACTOR)

20.6114=X-COOR. 27.4046=Y-COOR. 17.0887=RADIUS 1.5713429=F.S.

624=SLIP#

MOMENT AND FORCE EQUILIBRIUM: MORGENSTERN-PRICE METHOD

20.6114=X-COOR. 27.4046=Y-COOR. 17.0887=RADIUS 1.6327752=F.S.

624=SLIP#

NORMAL TERMINATION OF SLOPE

MOST\_CRITICAL # SLIP\_SURFACE #

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1 624

SLIP\_SURFACE # AUTOTENSIONELEV

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