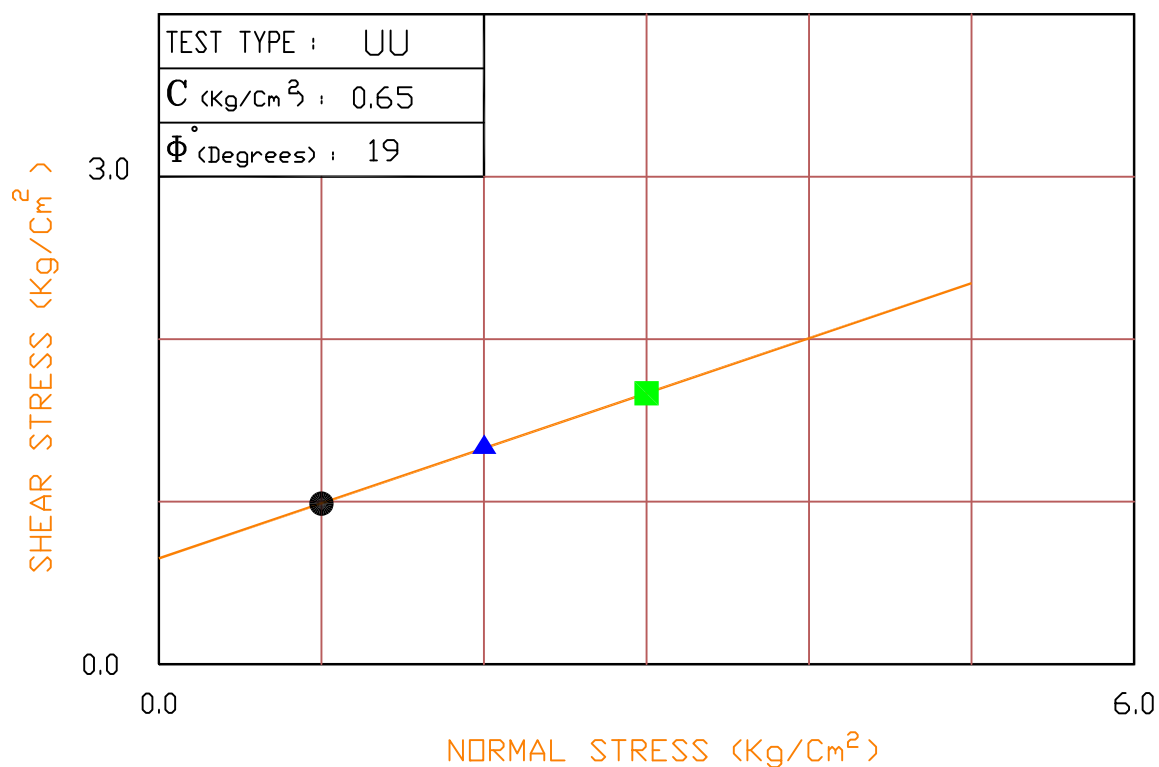
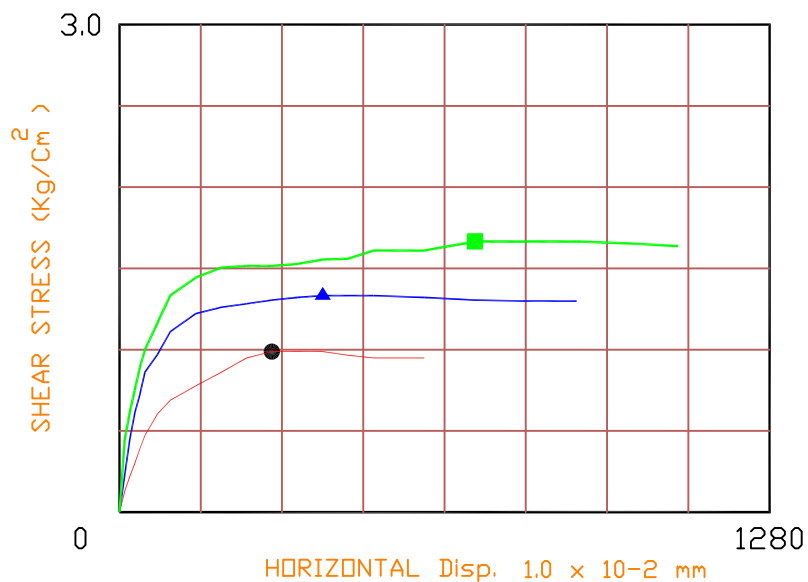


	SOIL ENGINEERING SERVICES (SES) خدمات مهندسی مکانیک خاک	
	PROJ NO: 1347-EE-PEP-GEO-001-B	REV: B
	SUBJECT: GEOTECHNICAL INVESTIGATION, PHASE I, FACTUAL REPORT, SOUTH ALUMINIUM SMELTER (SALCO) IRAN	

Enclosure T

Direct Shear Tests



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-002	U01	5.00-5.50	UNDISTURBED	CL/CH

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.58	26	1.00	0.99	
▲	1.59	25	2.00	1.33	
■	1.59	25	3.00	1.67	

DIRECT SHEAR TEST

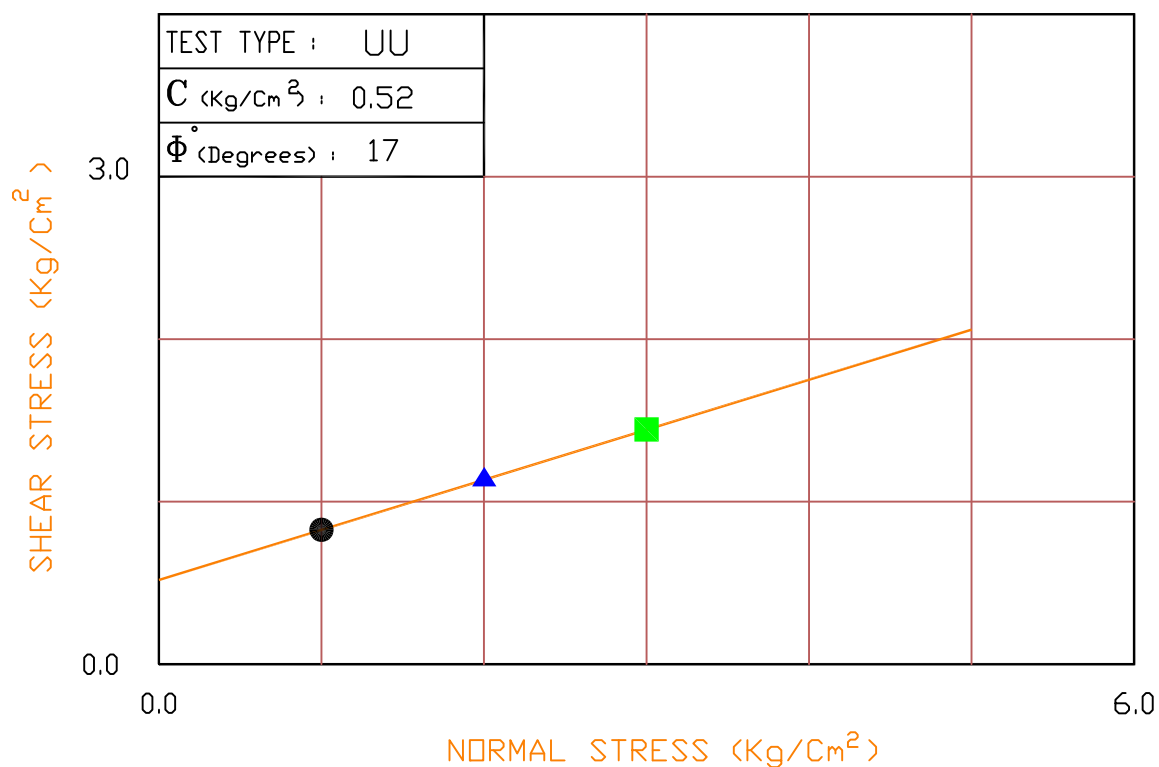
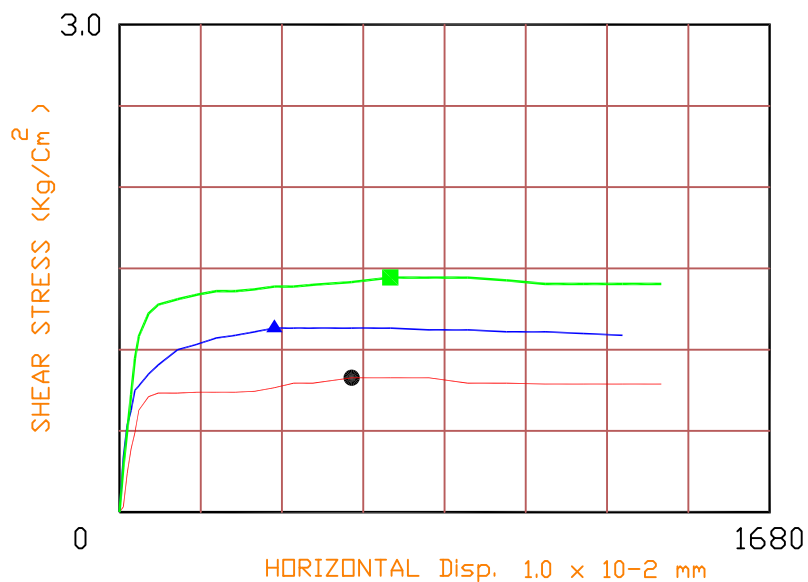


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
1

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-008	U01	6.00-6.50	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.53	26	1.00	0.83	
▲	1.54	27	2.00	1.13	
■	1.57	26	3.00	1.44	

DIRECT SHEAR TEST

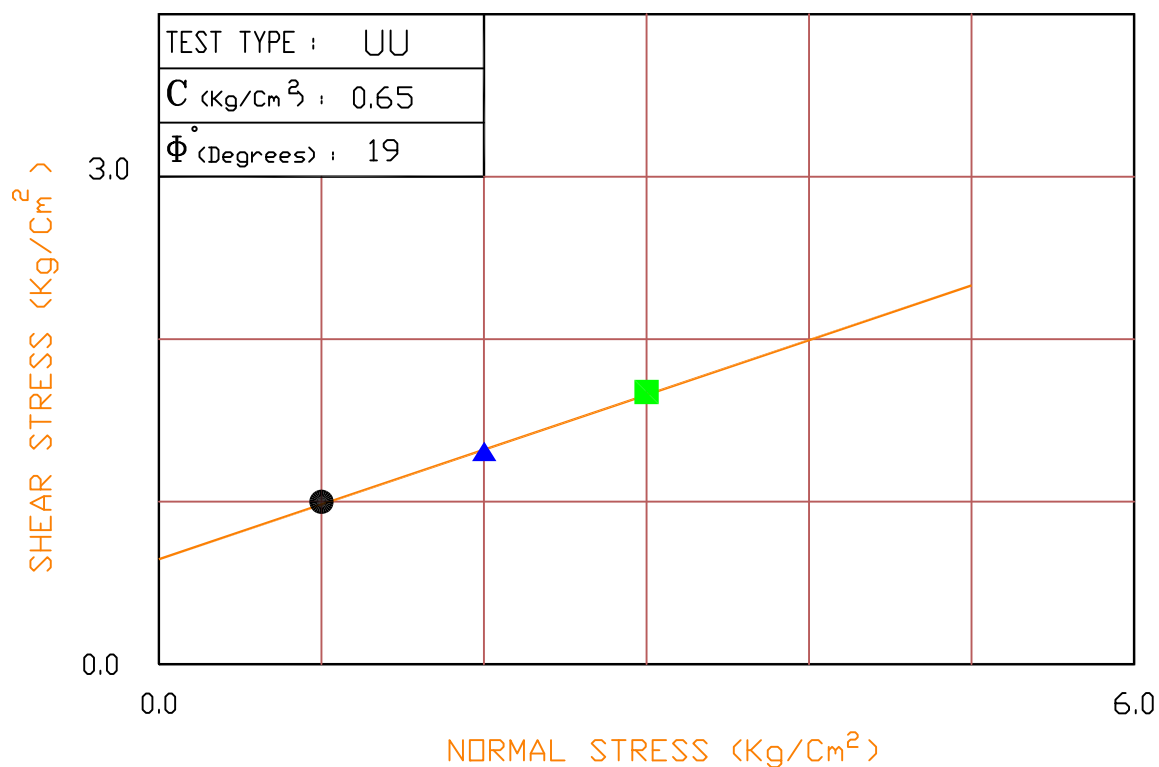
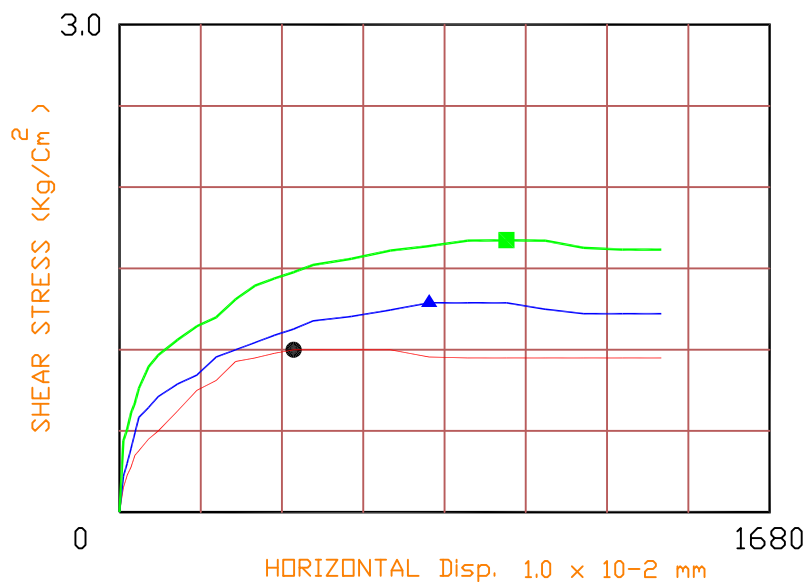


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
2

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-021	U01	4.00-4.50	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.44	35	1.00	1.00	
▲	1.42	36	2.00	1.29	
■	1.44	35	3.00	1.67	

DIRECT SHEAR TEST

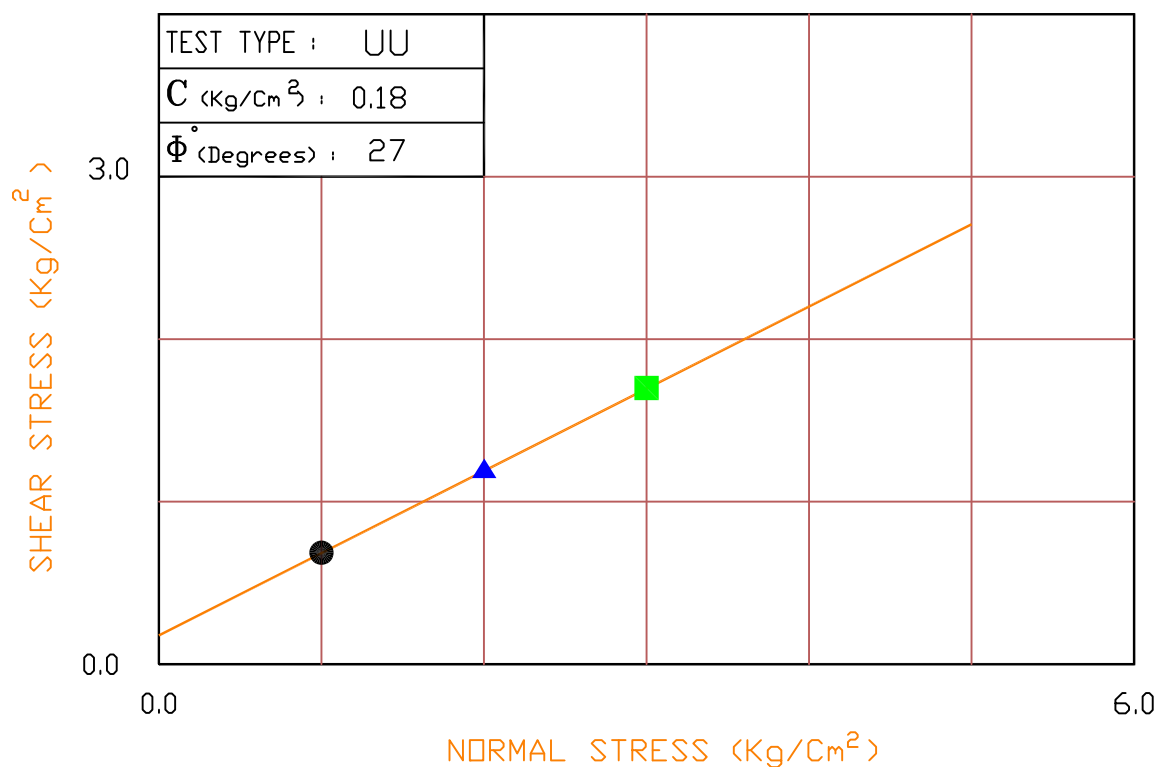
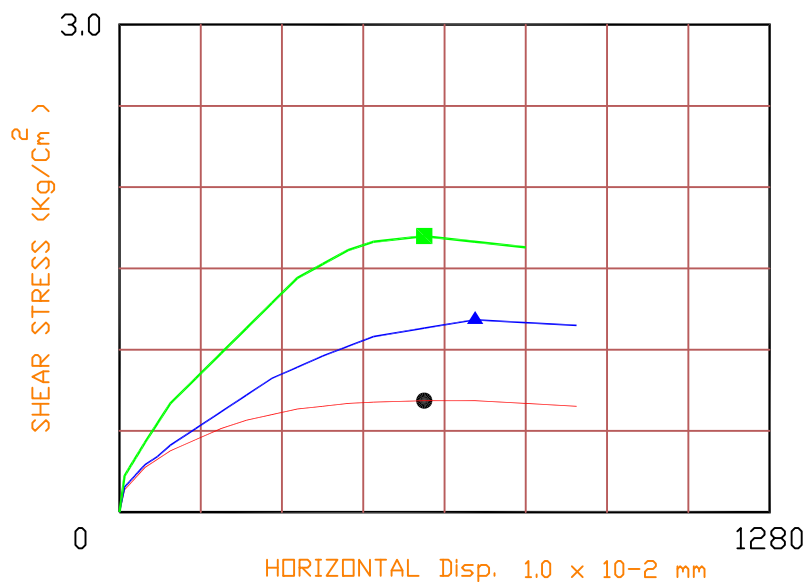


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
3

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-044	U04	12.00-12.50	UNDISTURBED	<ML/CL>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.60	26	1.00	0.69	
▲	1.60	26	2.00	1.18	
■	1.60	26	3.00	1.70	

DIRECT SHEAR TEST

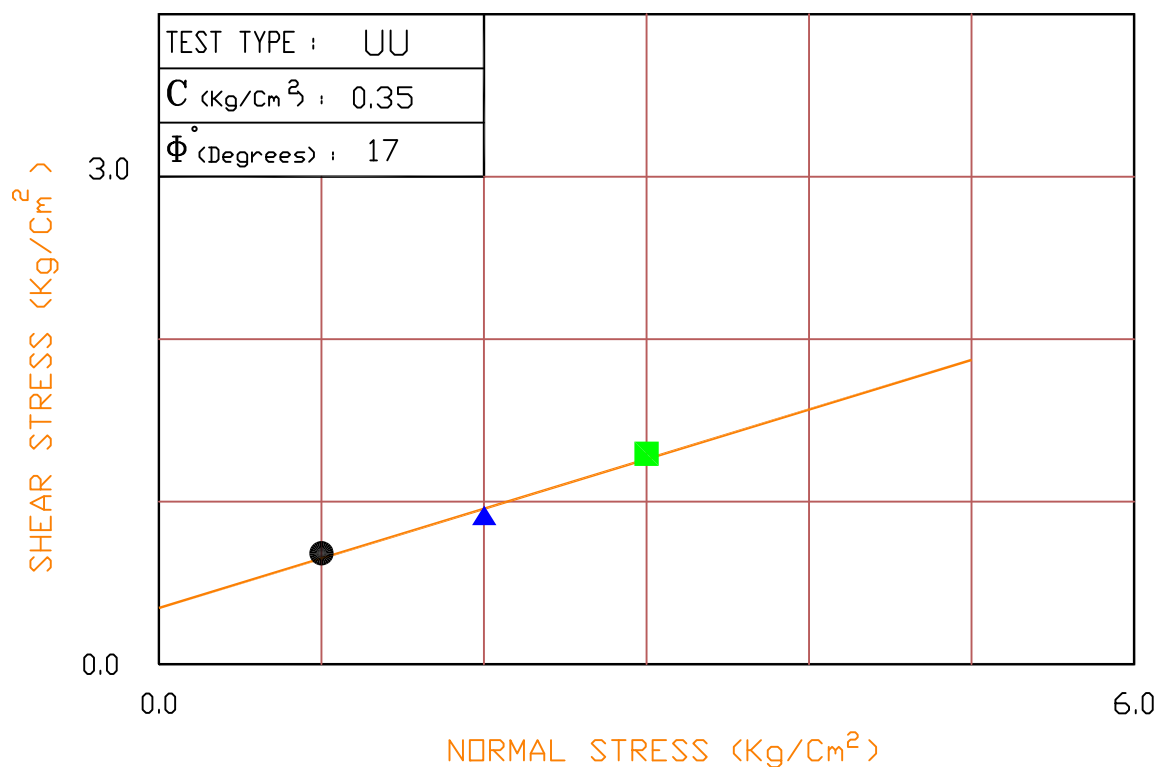
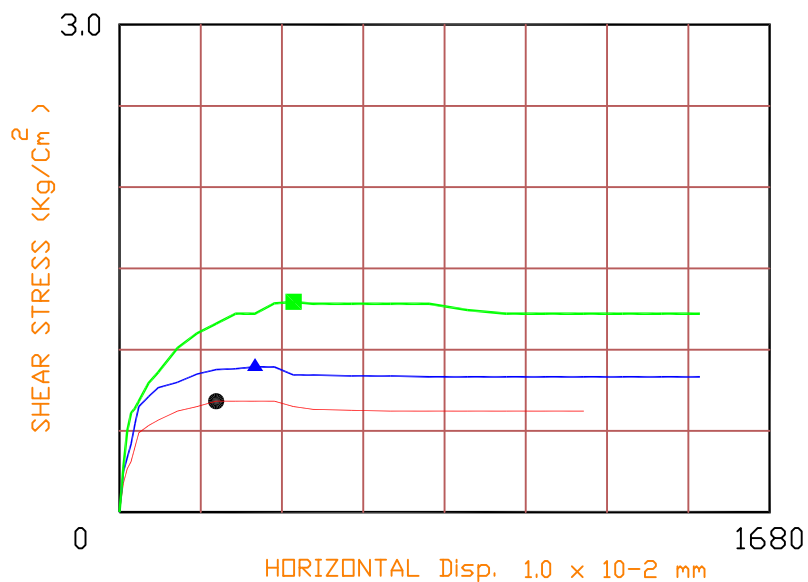


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
4

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-053	U01	5.50-6.00	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.65	21	1.00	0.68	
▲	1.63	23	2.00	0.89	
■	1.66	21	3.00	1.29	

DIRECT SHEAR TEST

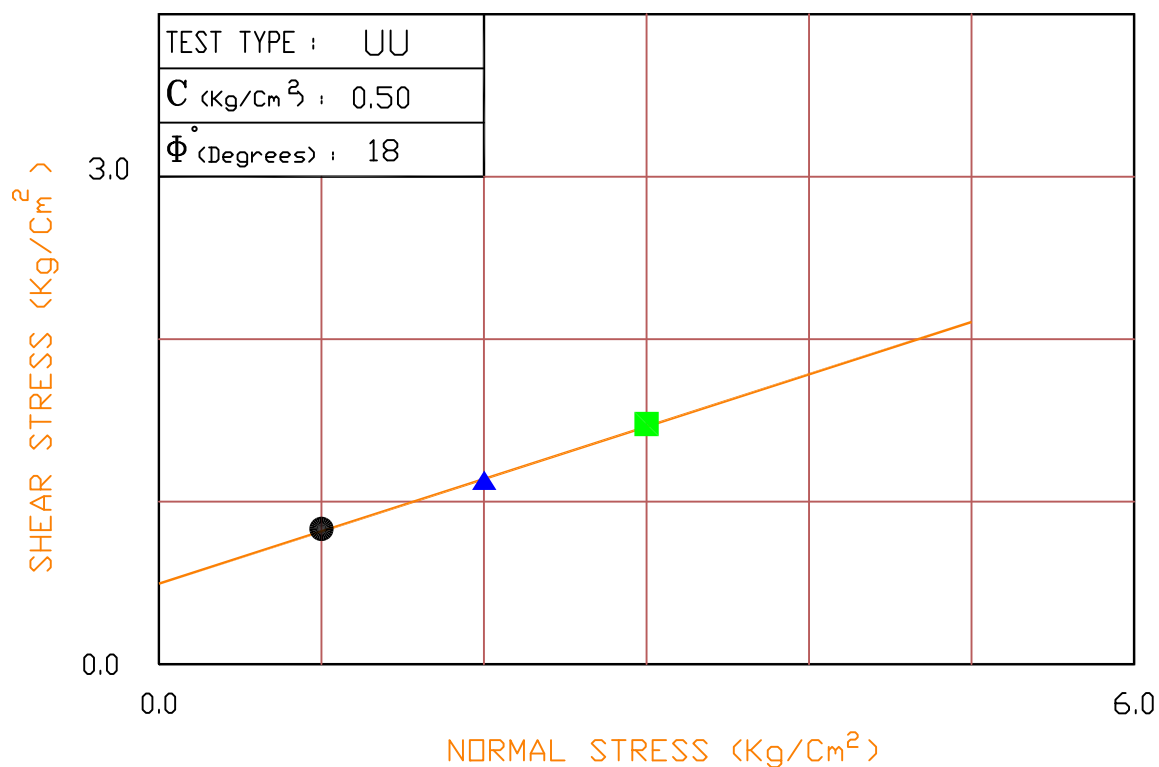
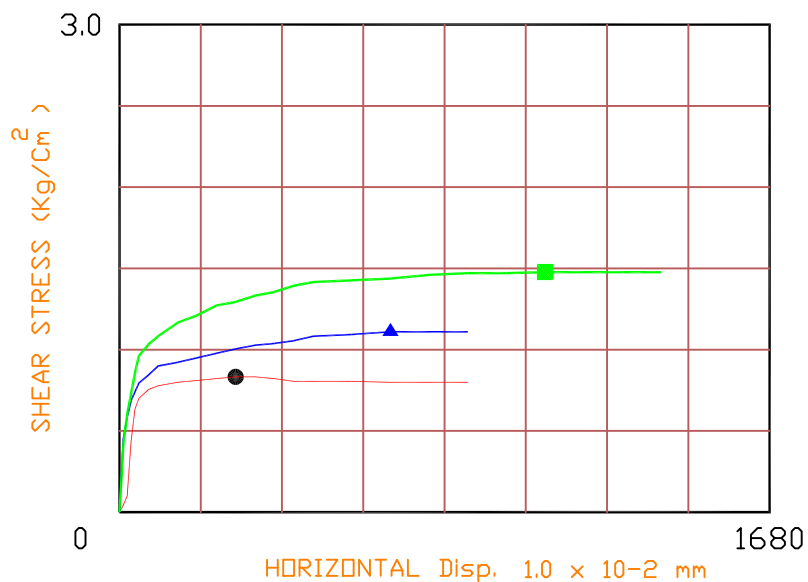


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
5

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-058	U01	5.50-6.00	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.57	26	1.00	0.83	
▲	1.60	24	2.00	1.11	
■	1.56	25	3.00	1.48	

DIRECT SHEAR TEST

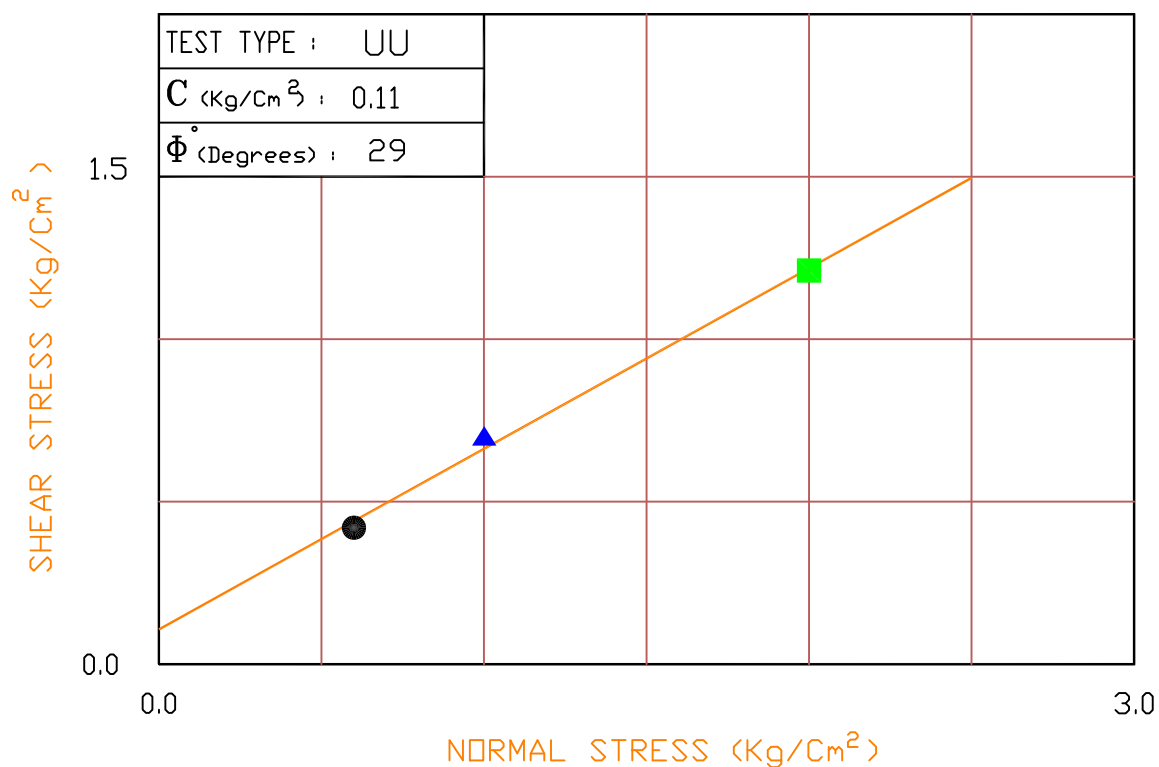
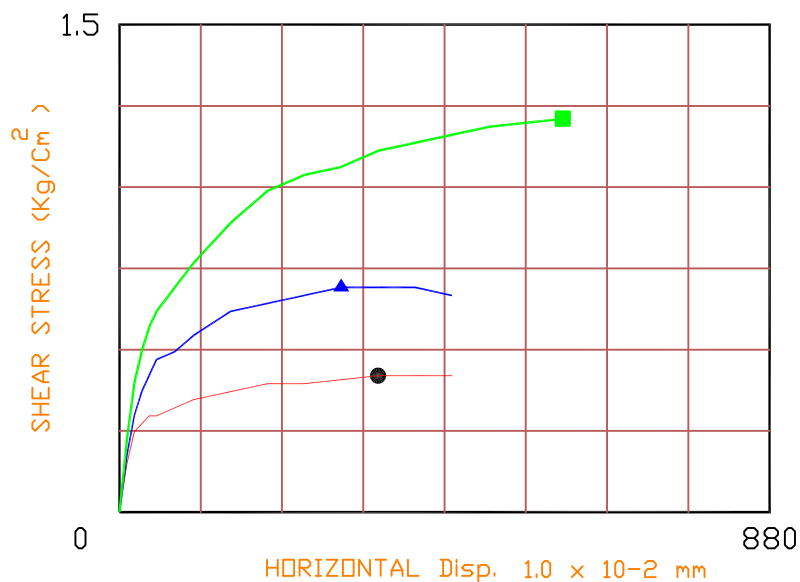


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
6

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-100	U01	6.00-6.50	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.63	27	0.60	0.42	
▲	1.63	27	1.00	0.69	
■	1.64	27	2.00	1.21	

DIRECT SHEAR TEST

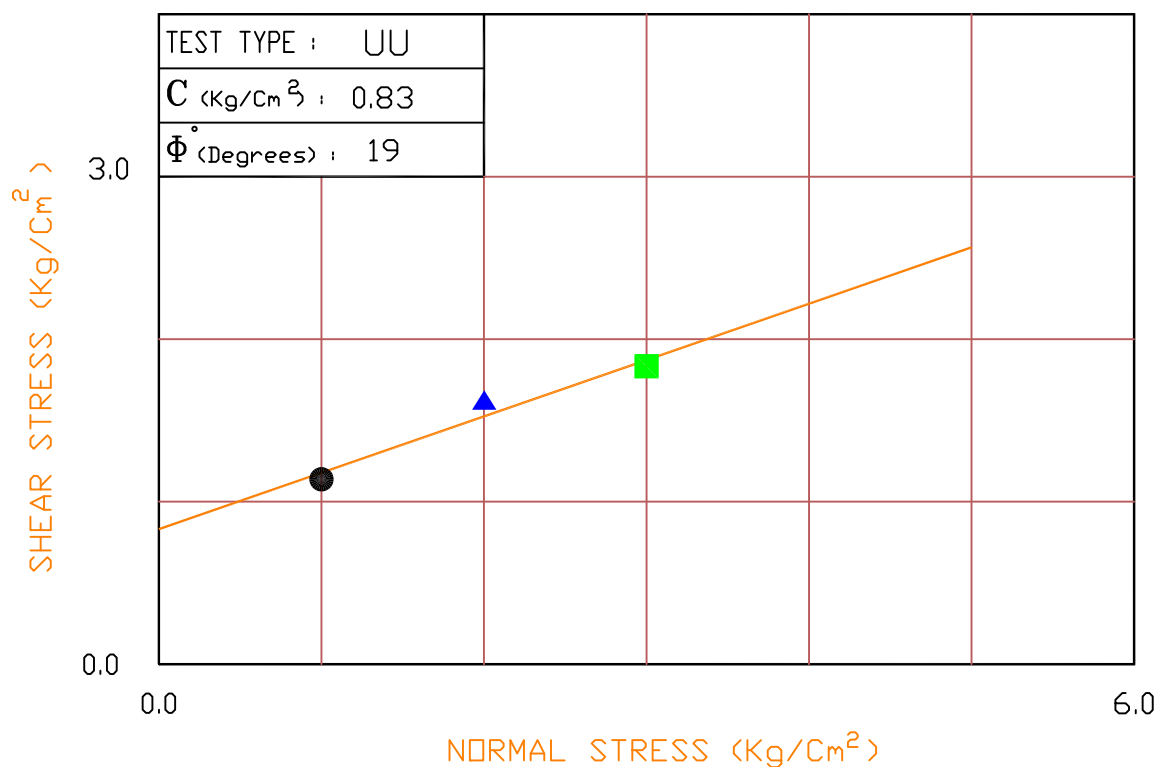
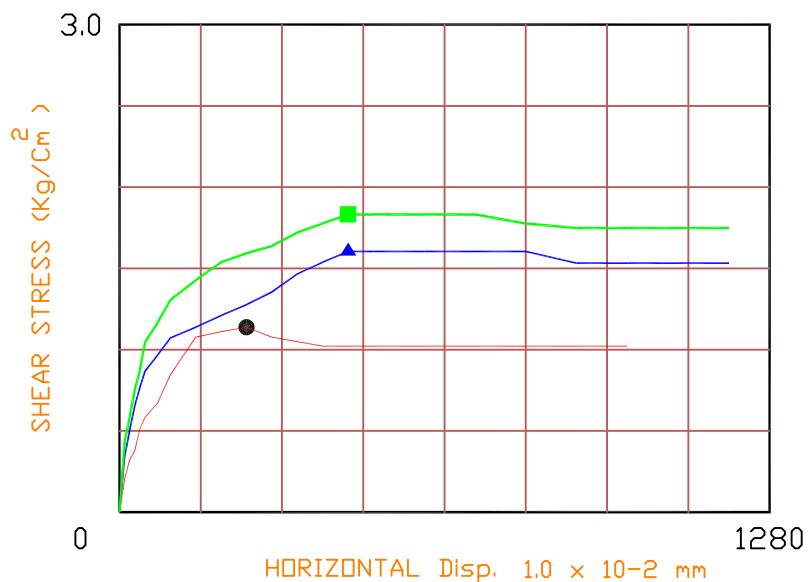


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
7

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-107	U02	6.50-7.00	UNDISTURBED	CL

SYM-BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.61	23	1.00	1.14	
▲	1.57	23	2.00	1.60	
■	1.57	24	3.00	1.83	

DIRECT SHEAR TEST

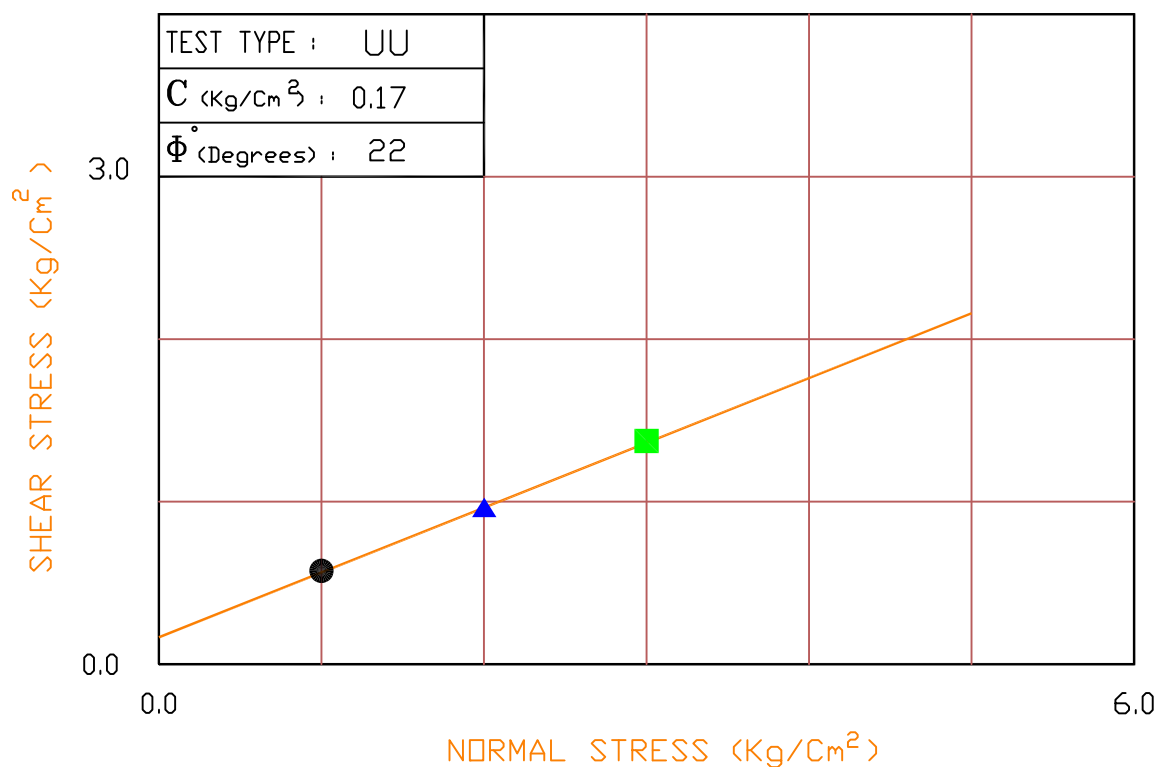
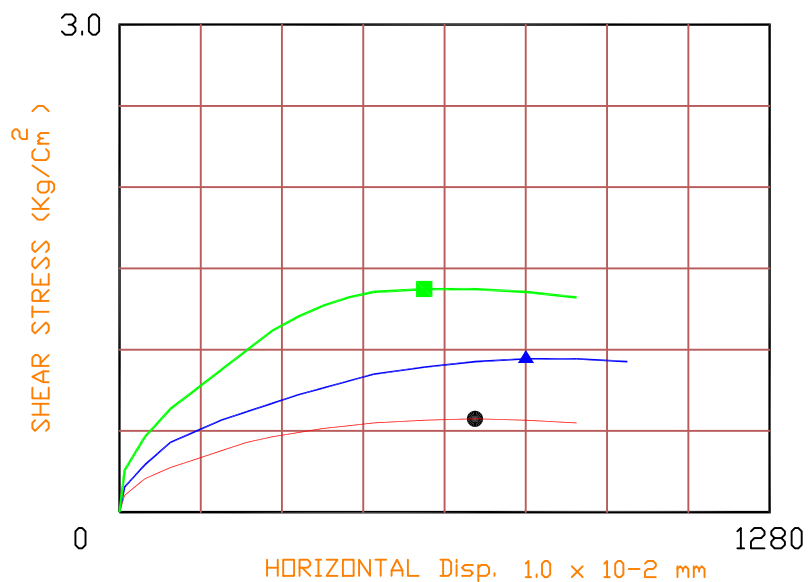


PROJECT SOUTH ALUMINUM SMELTER PLANT
 CLIENT NFC

Figure No.
 8

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-107	U05	14.00-14.50	UNDISTURBED	<ML>

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.59	26	1.00	0.57	
▲	1.59	26	2.00	0.94	
■	1.59	26	3.00	1.37	

DIRECT SHEAR TEST

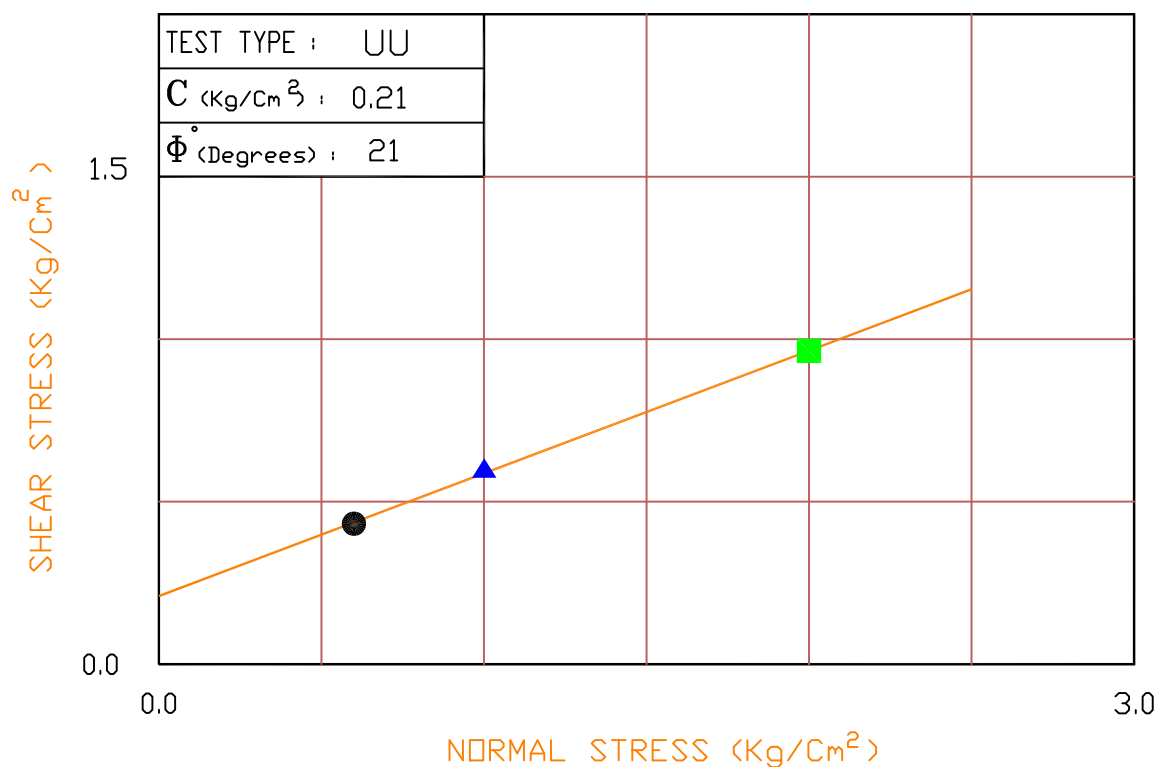
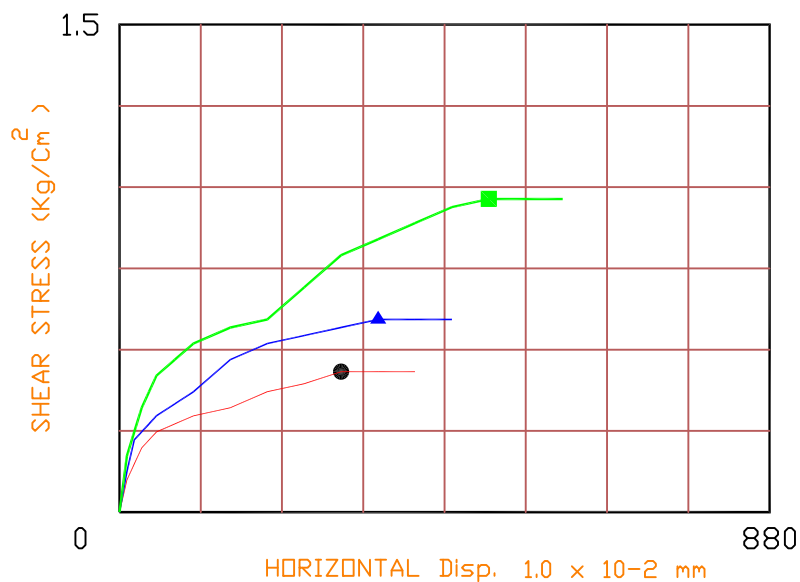


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
9

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-111	U01	6.50-6.95	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.71	24	0.60	0.43	
▲	1.70	24	1.00	0.59	
■	1.70	24	2.00	0.96	

DIRECT SHEAR TEST

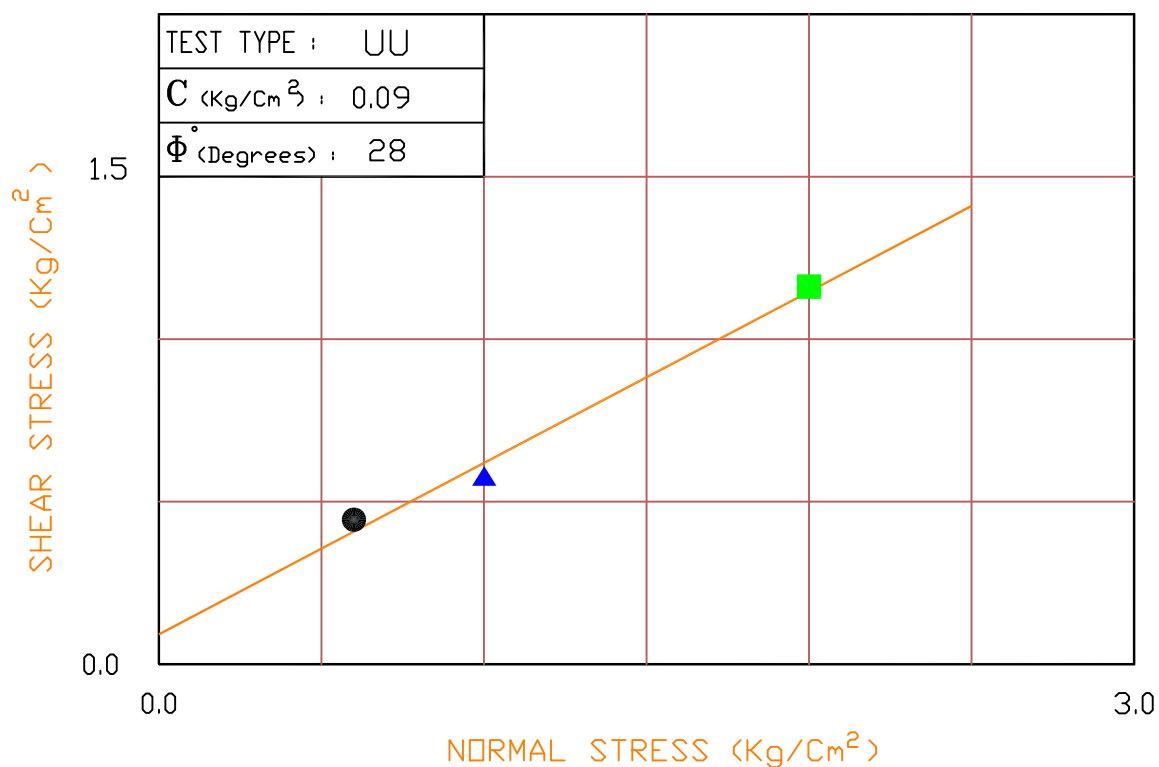
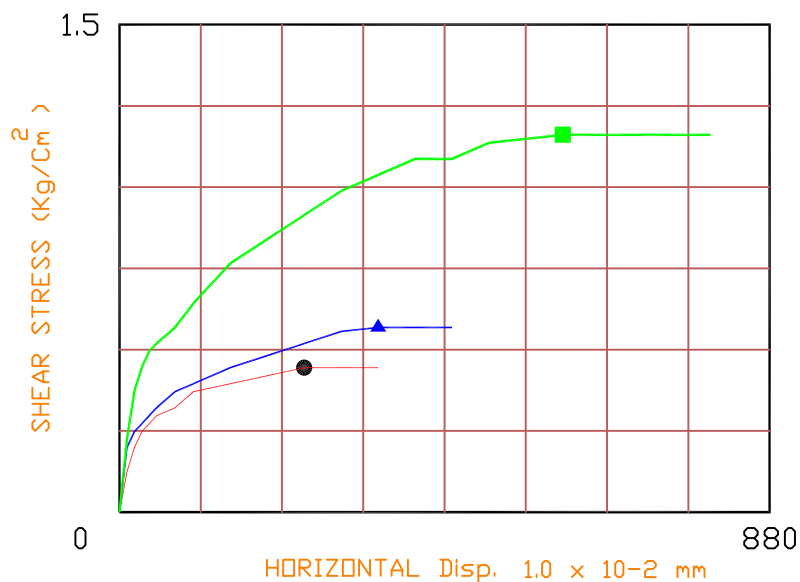


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
10

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-130	U01	4.00-4.50	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.68	25	0.60	0.44	
▲	1.68	25	1.00	0.57	
■	1.68	25	2.00	1.16	

DIRECT SHEAR TEST

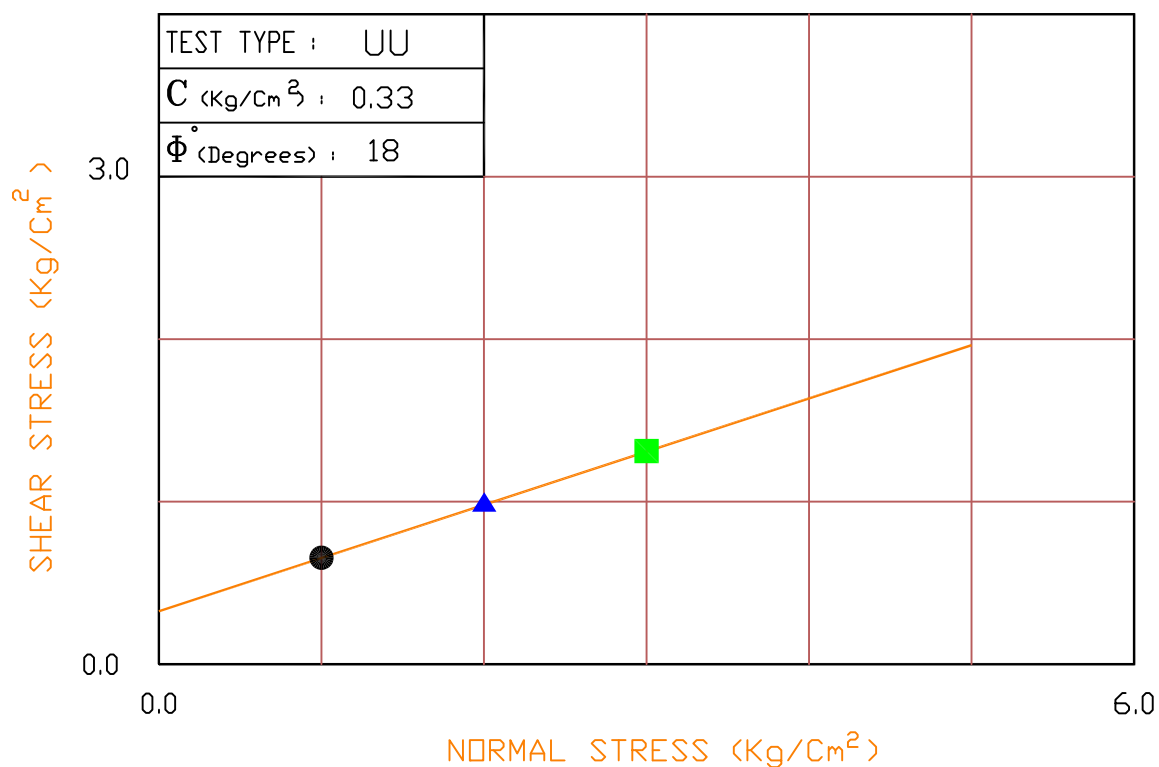
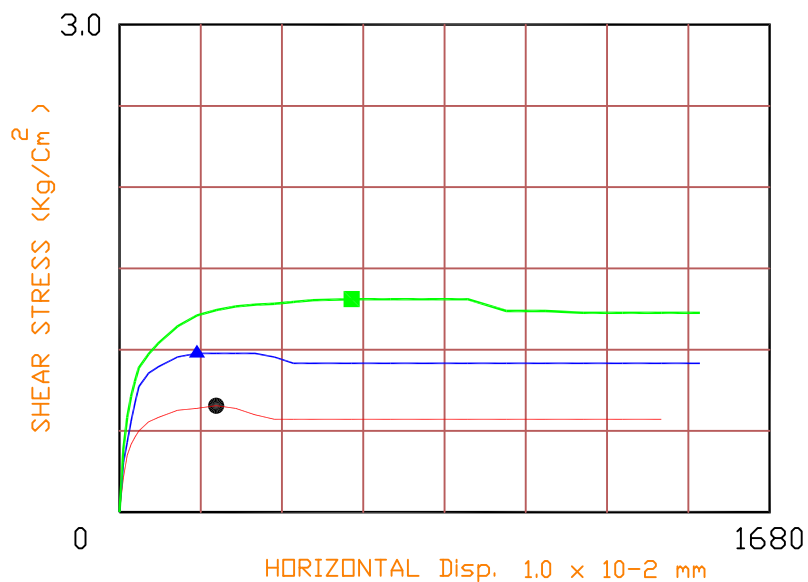


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
11

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-133	U01	5.00-5.50	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.63	19	1.00	0.66	
▲	1.64	20	2.00	0.98	
■	1.63	21	3.00	1.31	

DIRECT SHEAR TEST

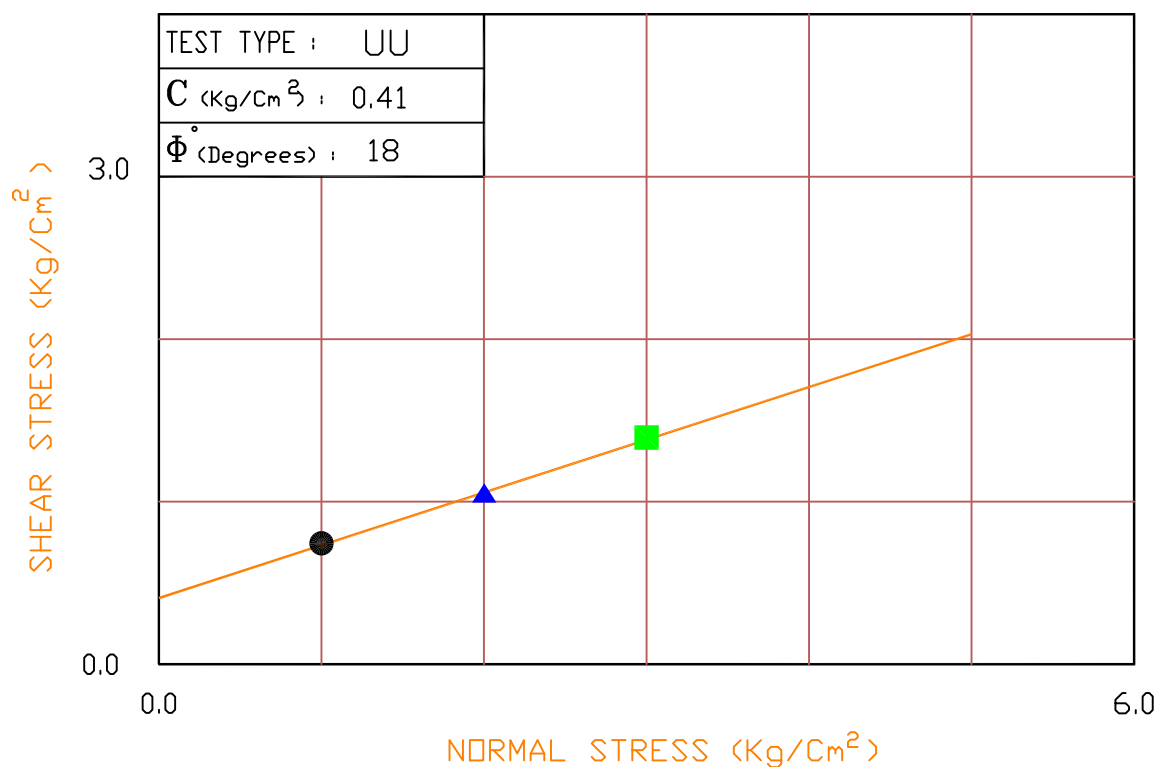
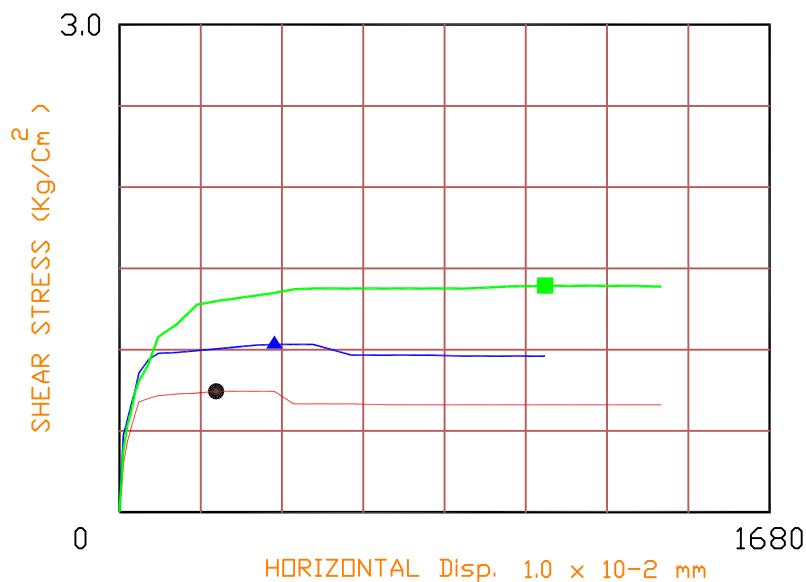


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
12

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-139	D02	4.00-4.50	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.62	21	1.00	0.74	This is an undisturbed sample, designated as D by mistake.
▲	1.64	20	2.00	1.03	
■	1.60	21	3.00	1.39	

DIRECT SHEAR TEST

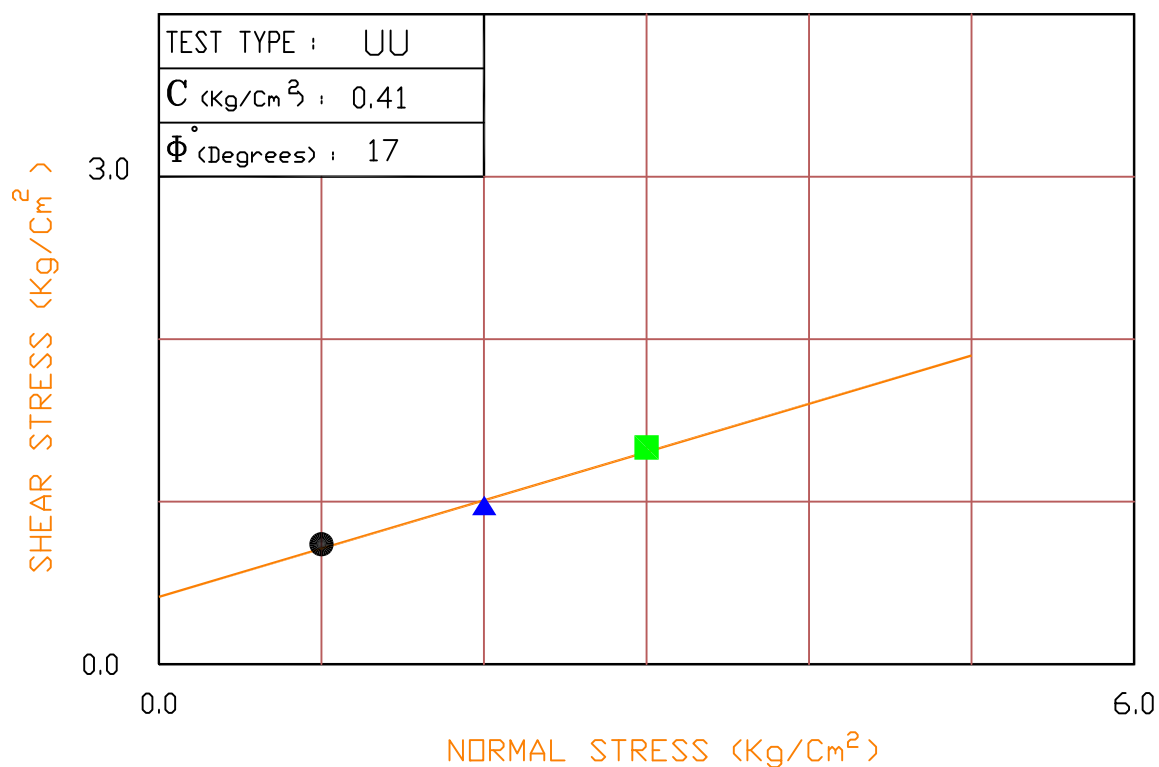
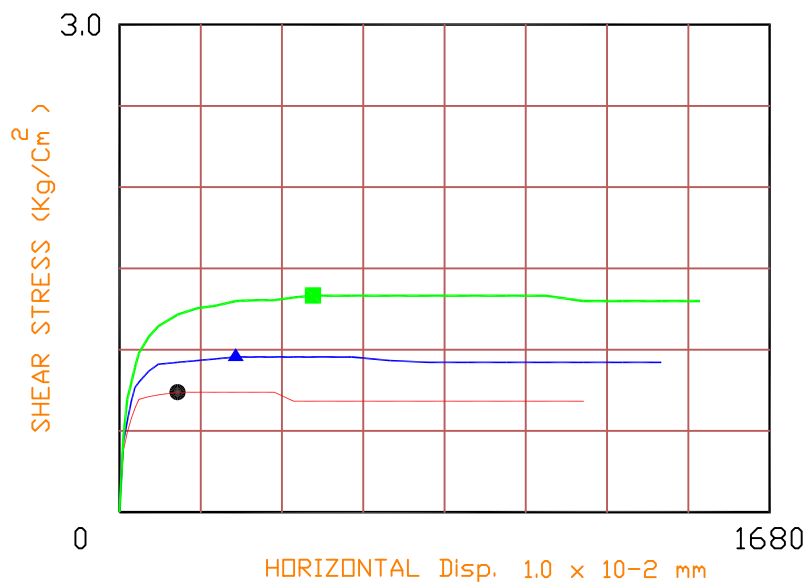


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
13

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-148	U01	3.50-4.00	UNDISTURBED	<CL>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.58	27	1.00	0.74	
▲	1.57	27	2.00	0.95	
■	1.55	28	3.00	1.33	

DIRECT SHEAR TEST

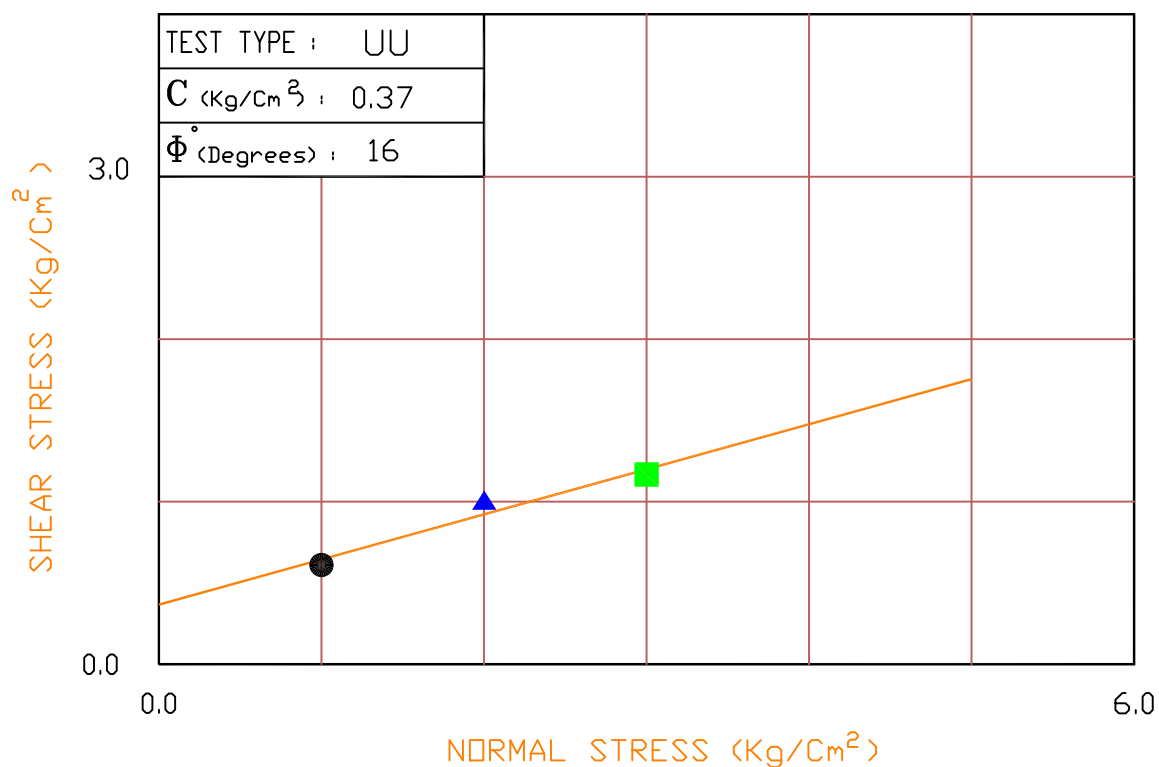
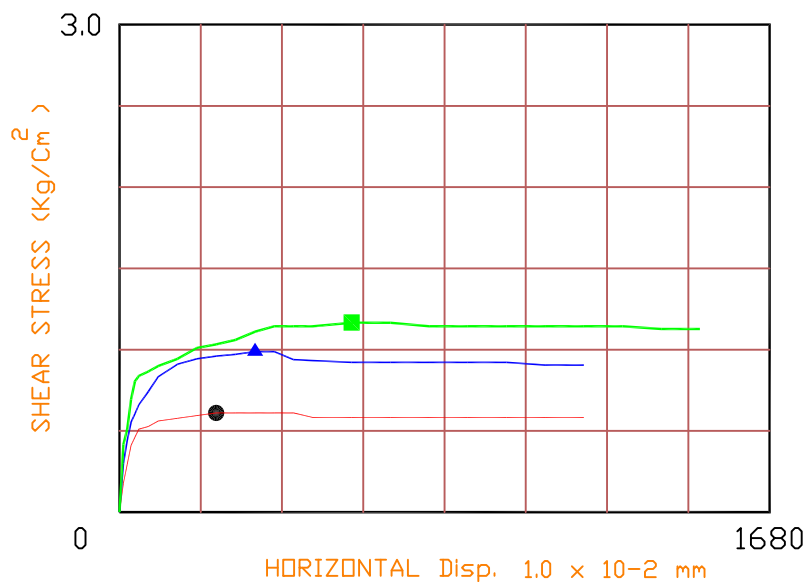


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
14

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-156	U01	3.50-4.00	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.63	22	1.00	0.61	
▲	1.63	20	2.00	0.99	
■	1.63	21	3.00	1.17	

DIRECT SHEAR TEST

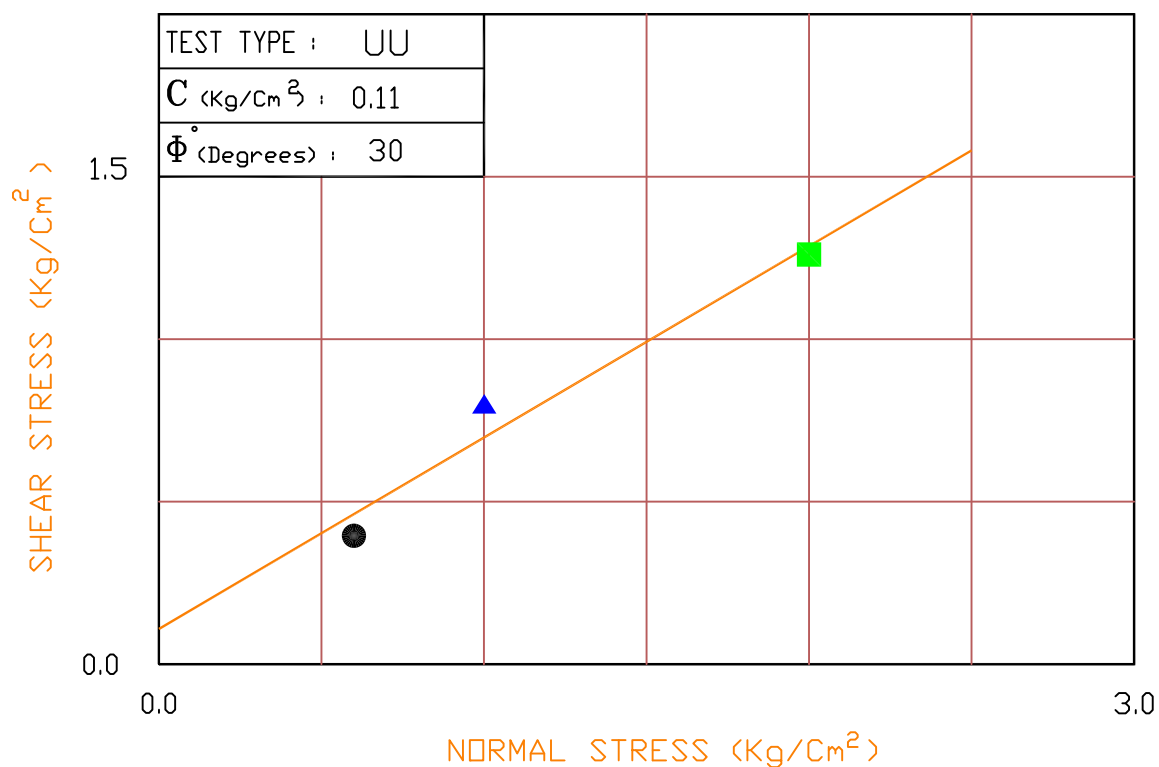
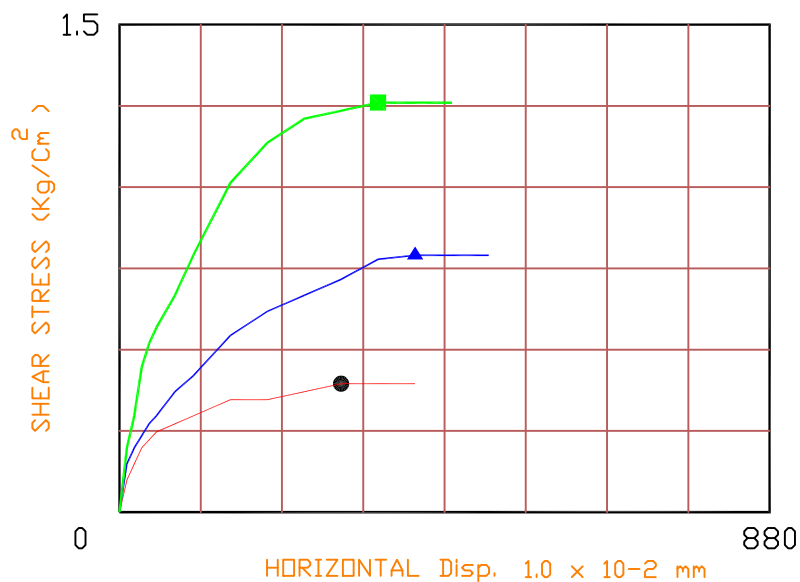


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
15

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-164	U01	5.50-6.00	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.71	24	0.60	0.40	
▲	1.72	24	1.00	0.79	
■	1.72	24	2.00	1.26	

DIRECT SHEAR TEST

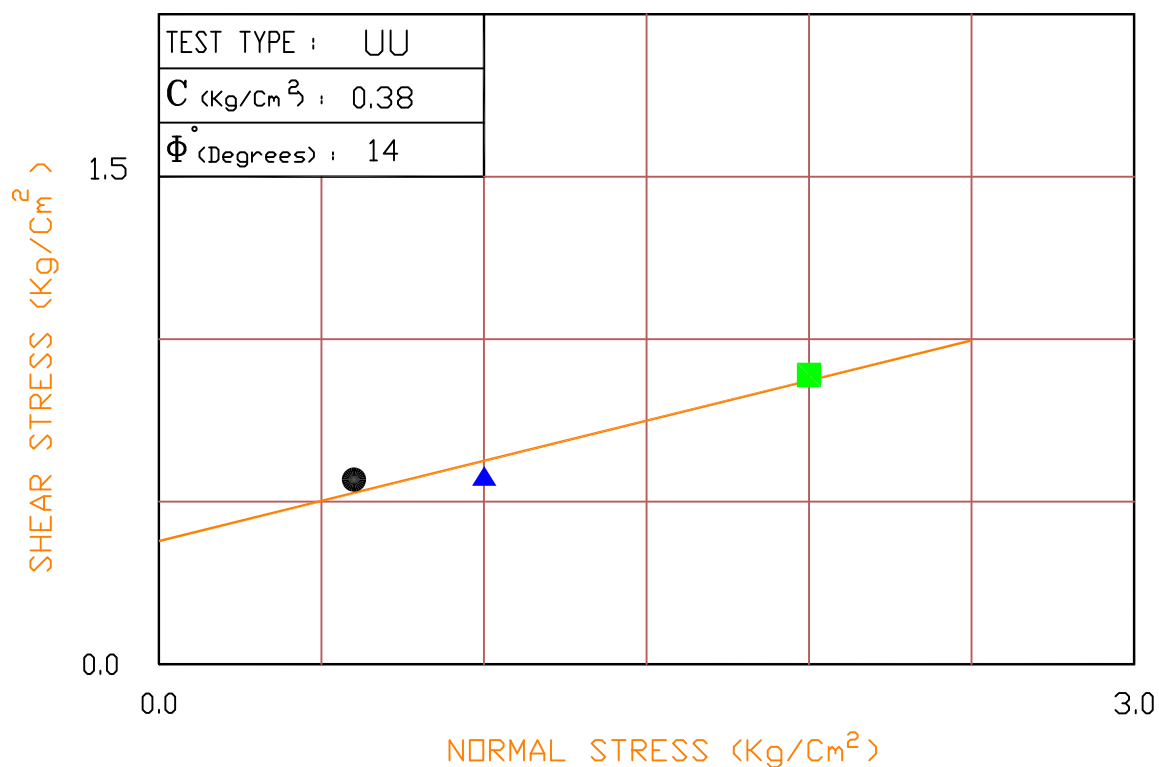
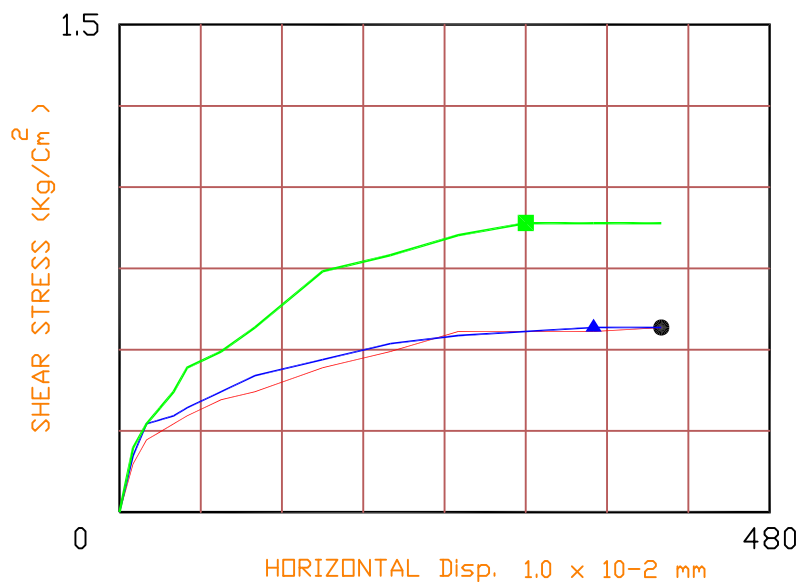


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
16

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-169	U01	5.50-6.00	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.66	24	0.60	0.57	
▲	1.67	24	1.00	0.57	
■	1.66	24	2.00	0.89	

DIRECT SHEAR TEST

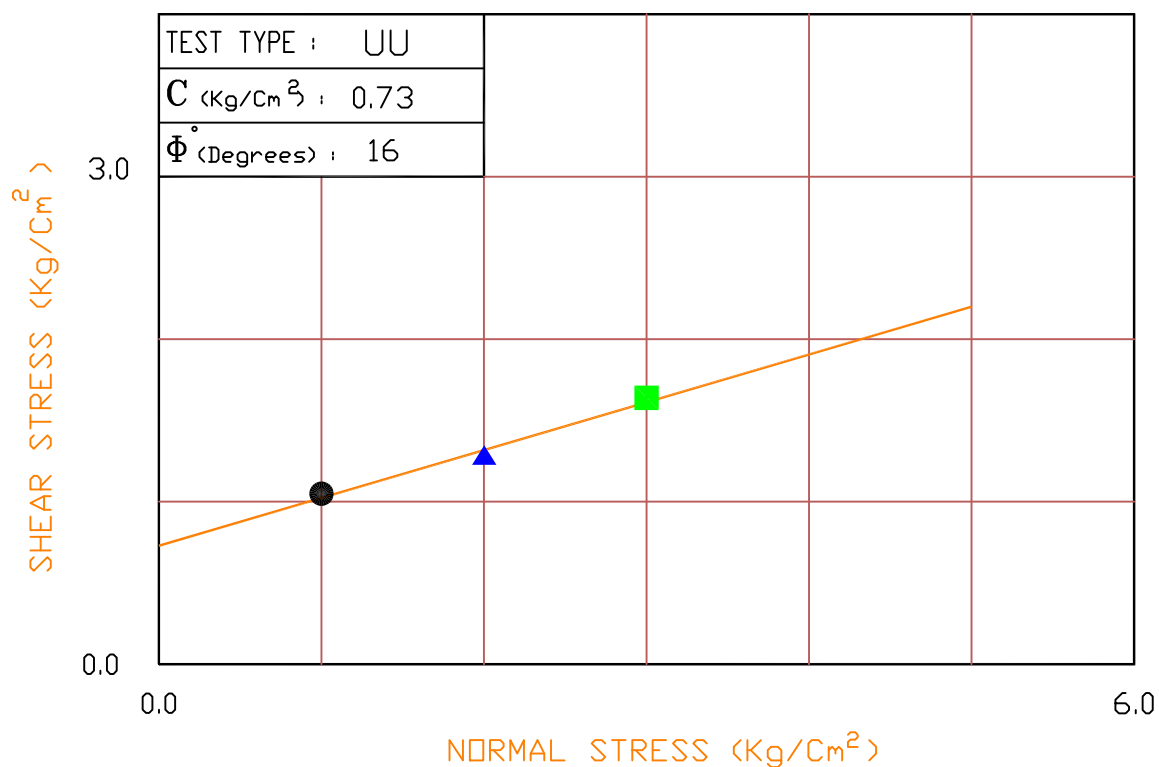
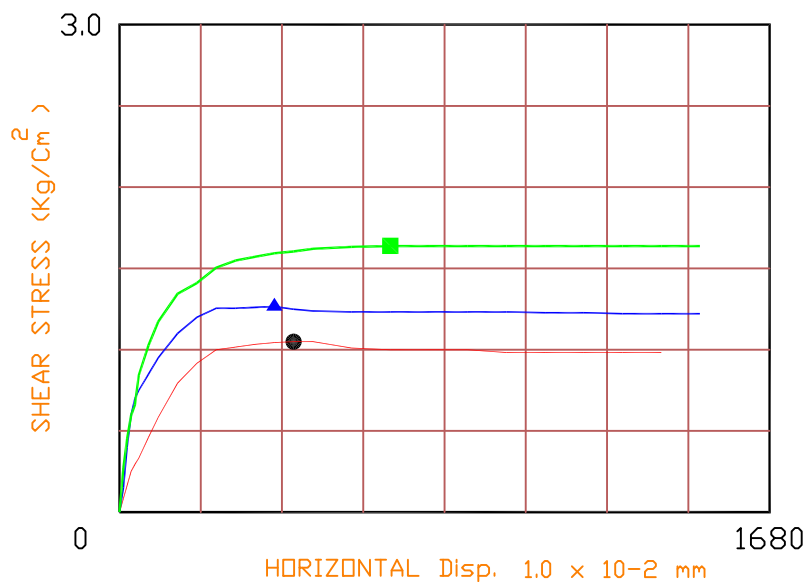


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
17

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-175	U01	6.00-6.50	UNDISTURBED	CL

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.66	24	1.00	1.05	
▲	1.64	25	2.00	1.27	
■	1.64	25	3.00	1.64	

DIRECT SHEAR TEST

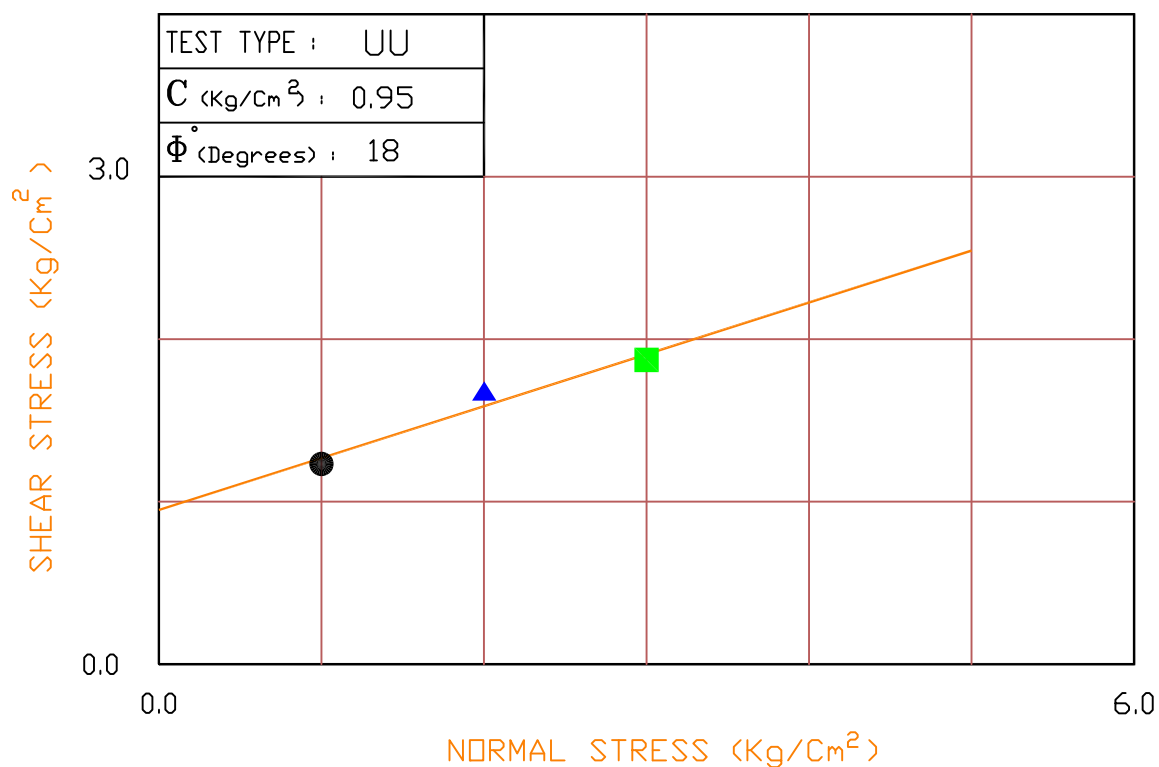
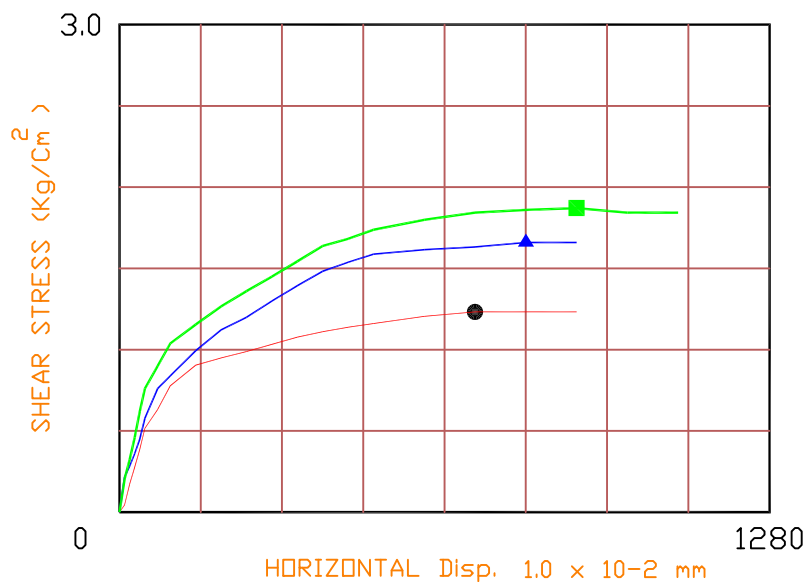


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
18

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-198	U06	15.50-16.00	UNDISTURBED	

SYM-BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.60	24	1.00	1.23	
▲	1.62	23	2.00	1.66	
■	1.63	23	3.00	1.87	

DIRECT SHEAR TEST

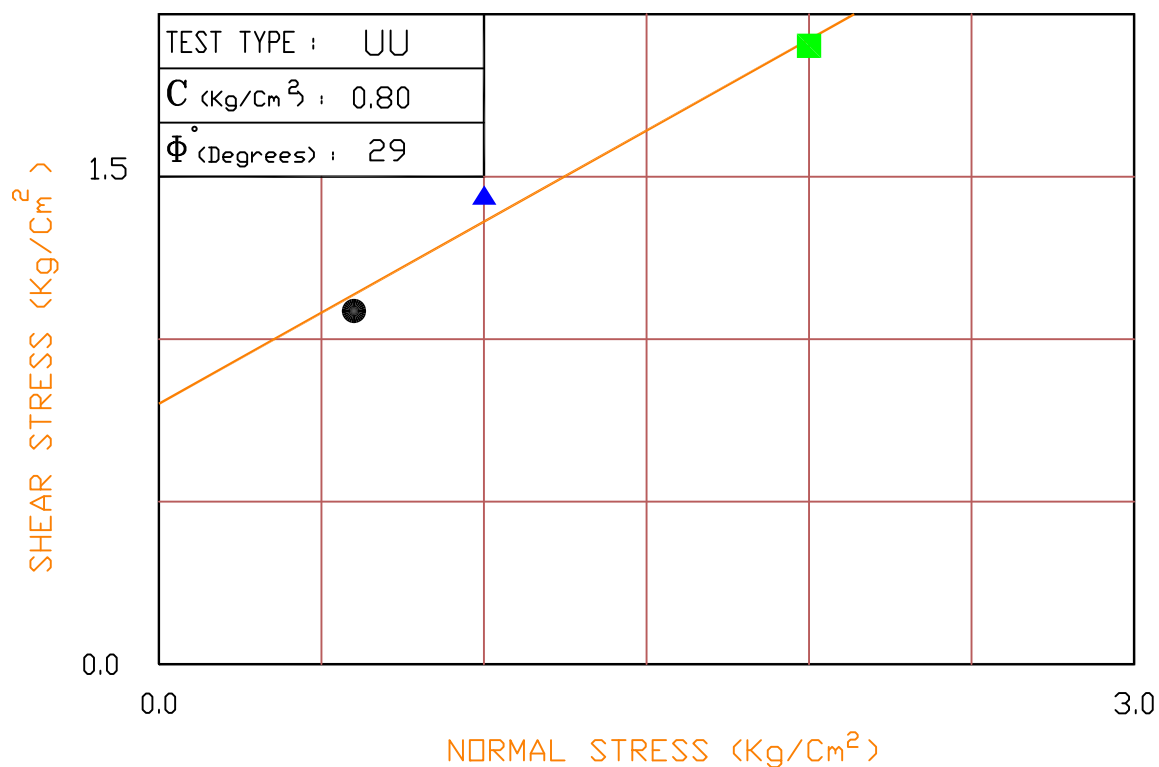
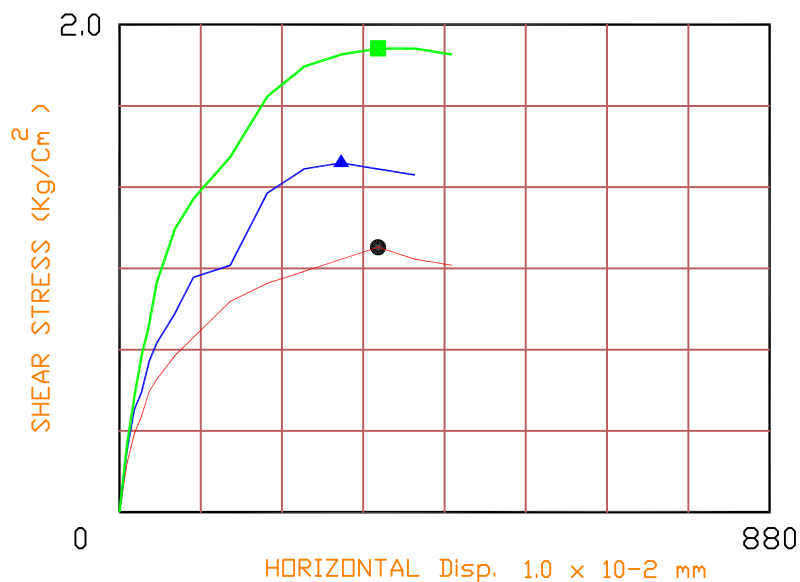


PROJECT SOUTH ALUMINUM SMELTER PLANT
 CLIENT NFC

Figure No.
 19

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-249	U01	4.00-4.50	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.70	23	0.60	1.09	
▲	1.70	23	1.00	1.43	
■	1.70	23	2.00	1.90	

DIRECT SHEAR TEST

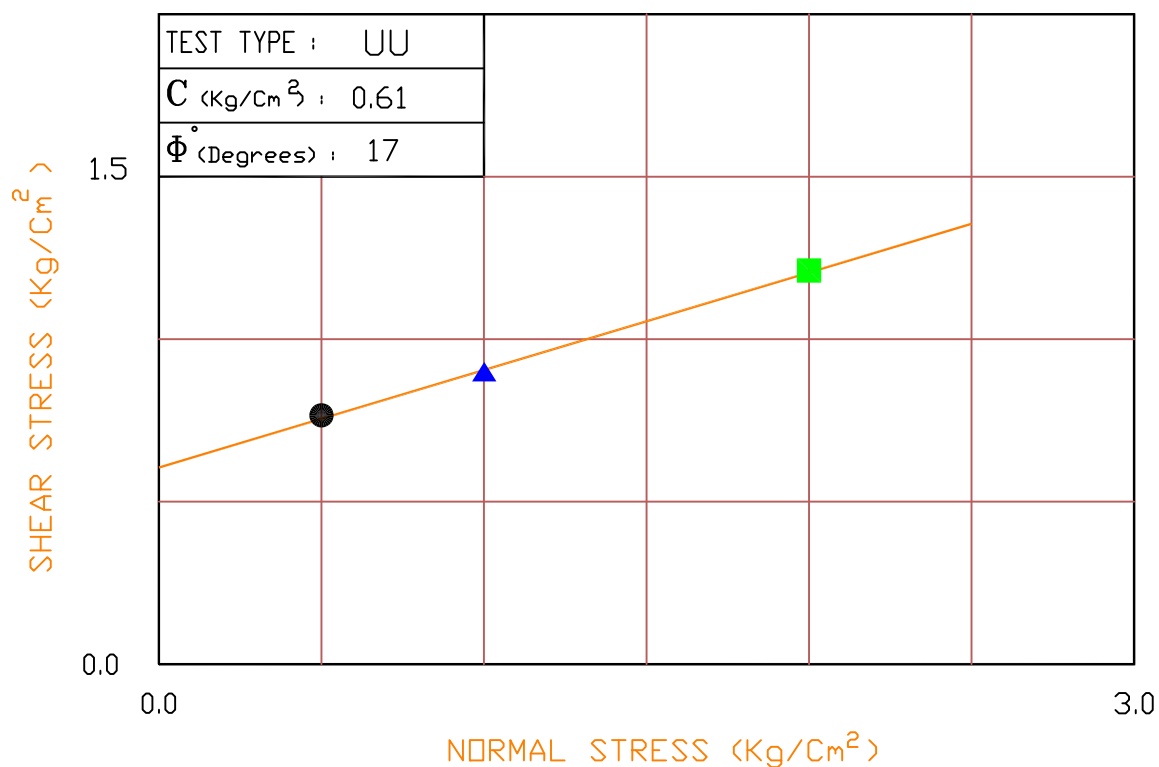
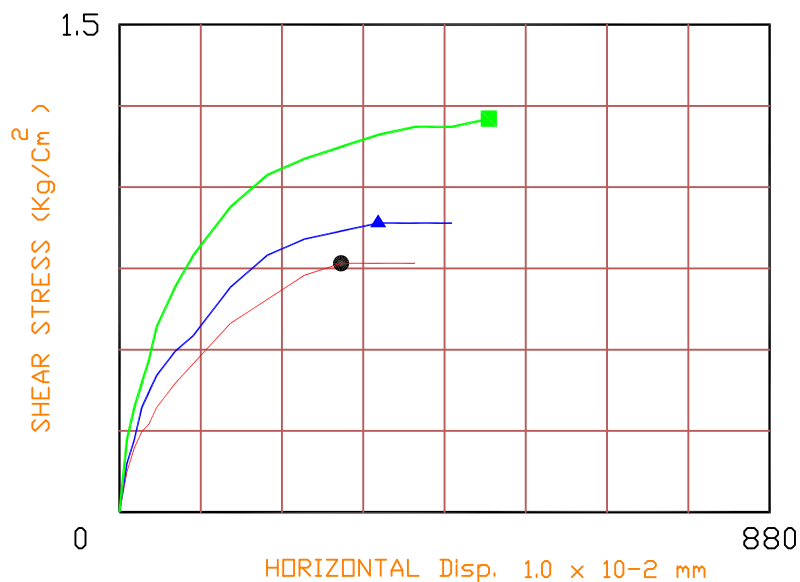


PROJECT SOUTH ALUMINUM SMELTER PLANT
 CLIENT NFC

Figure No.
 20

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-254	U01	4.00-4.50	UNDISTURBED	<CL/ML>

SYM- BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.68	24	0.50	0.77	
▲	1.68	24	1.00	0.89	
■	1.69	24	2.00	1.21	

DIRECT SHEAR TEST

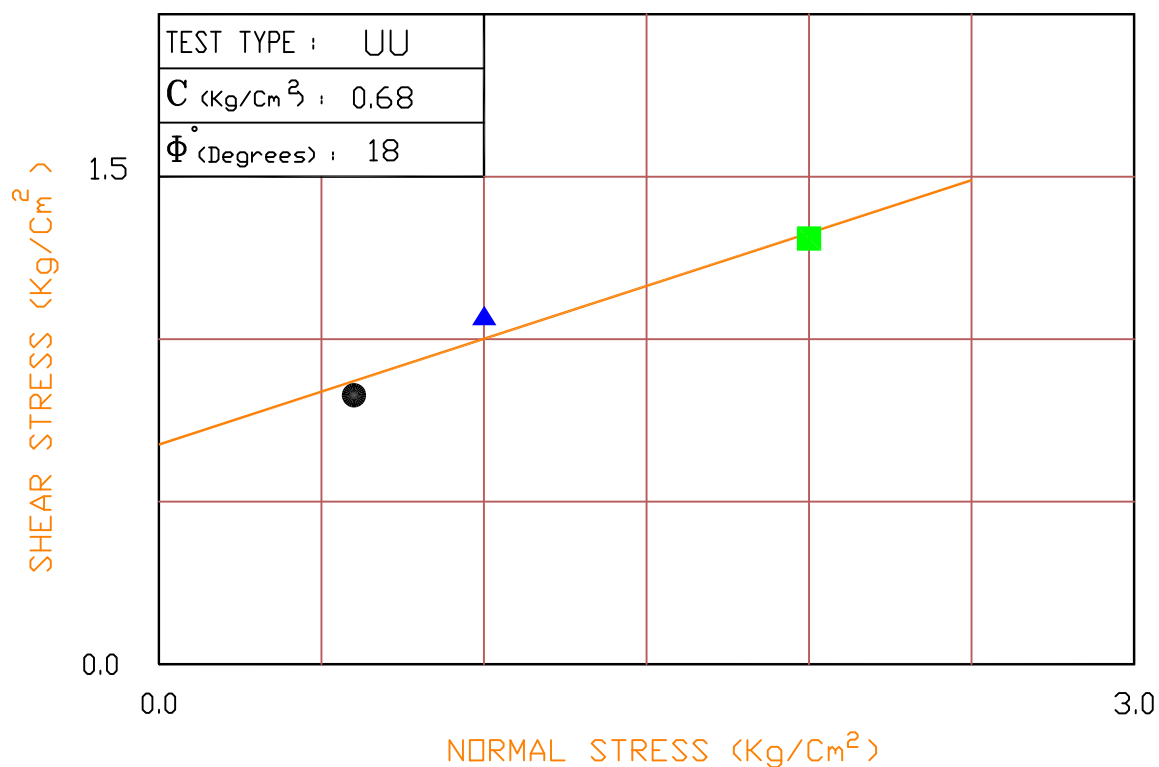
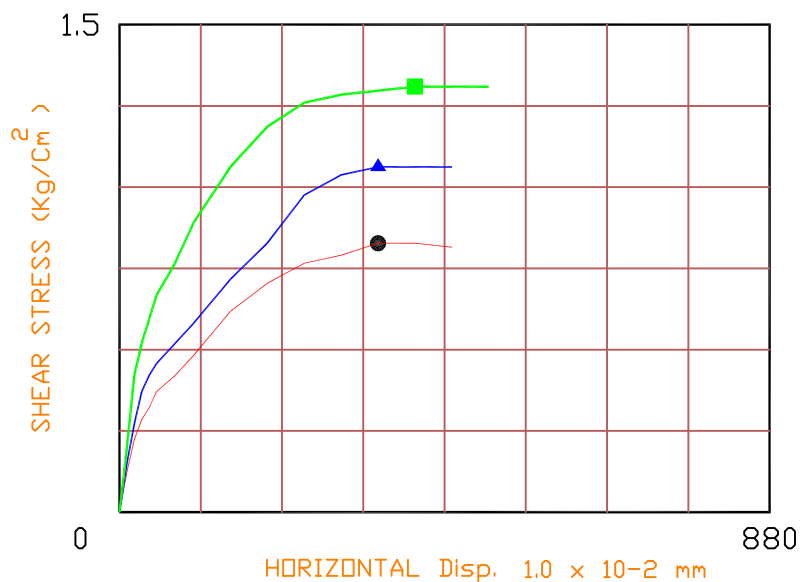


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
21

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-262	U01	6.00-6.50	UNDISTURBED	<ML/CL>

SYM-BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.67	22	0.60	0.83	
▲	1.66	22	1.00	1.06	
■	1.66	22	2.00	1.31	

DIRECT SHEAR TEST

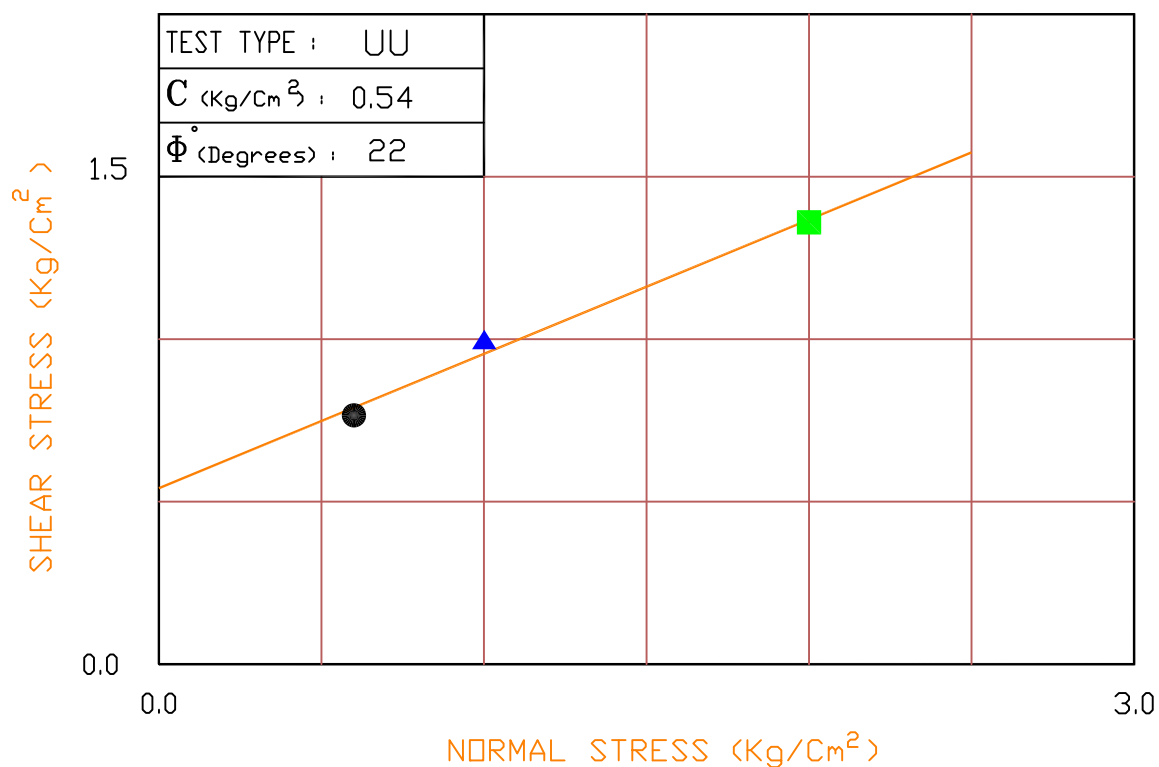
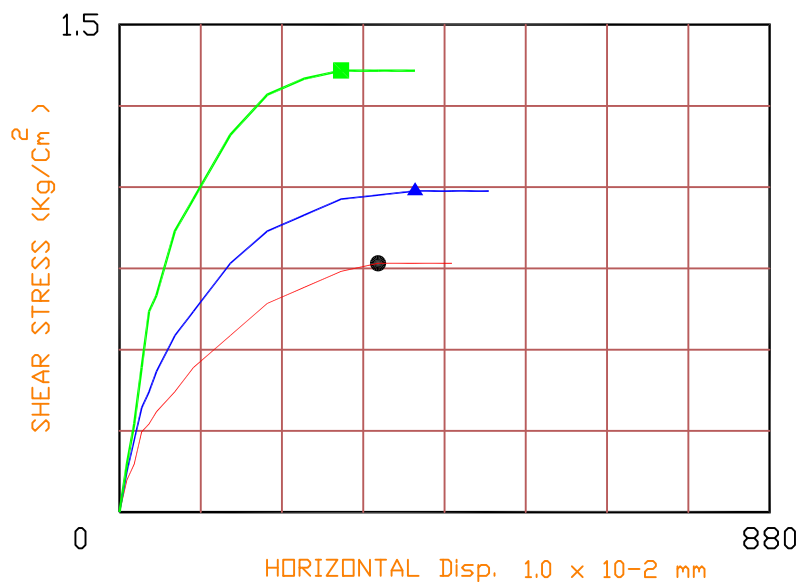


PROJECT SOUTH ALUMINUM SMELTER PLANT
 CLIENT NFC

Figure No.
 22

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-279	U01	3.50-4.00	UNDISTURBED	<CL/ML>

SYM-BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.72	24	0.60	0.77	
▲	1.71	24	1.00	0.99	
■	1.71	24	2.00	1.36	

DIRECT SHEAR TEST

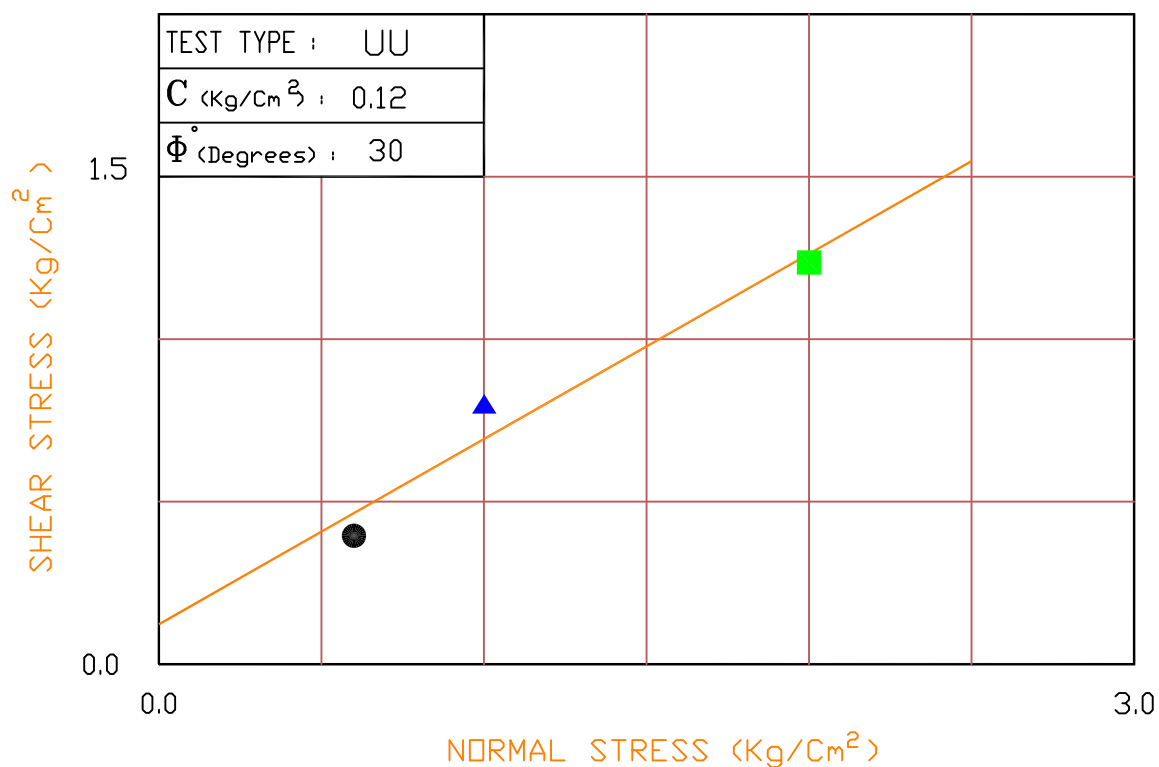
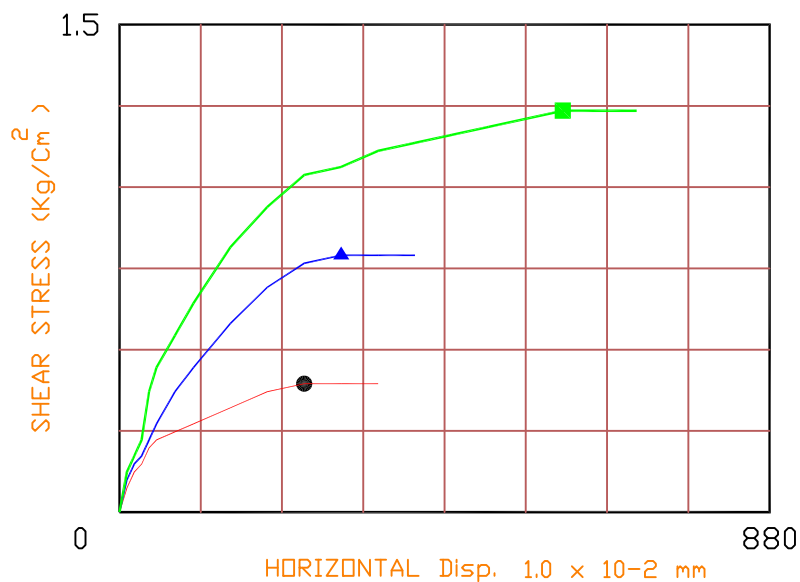


PROJECT SOUTH ALUMINUM SMELTER PLANT
 CLIENT NFC

Figure No.
 23

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-284	U01	6.00-6.50	UNDISTURBED	<ML/CL>

SYM- BOL	DRY DENSITY (gr/Cm ³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm ²)	SHEAR STRESS (Kg/Cm ²)	REMARKS :
●	1.68	25	0.60	0.40	
▲	1.69	25	1.00	0.79	
■	1.69	25	2.00	1.24	

DIRECT SHEAR TEST

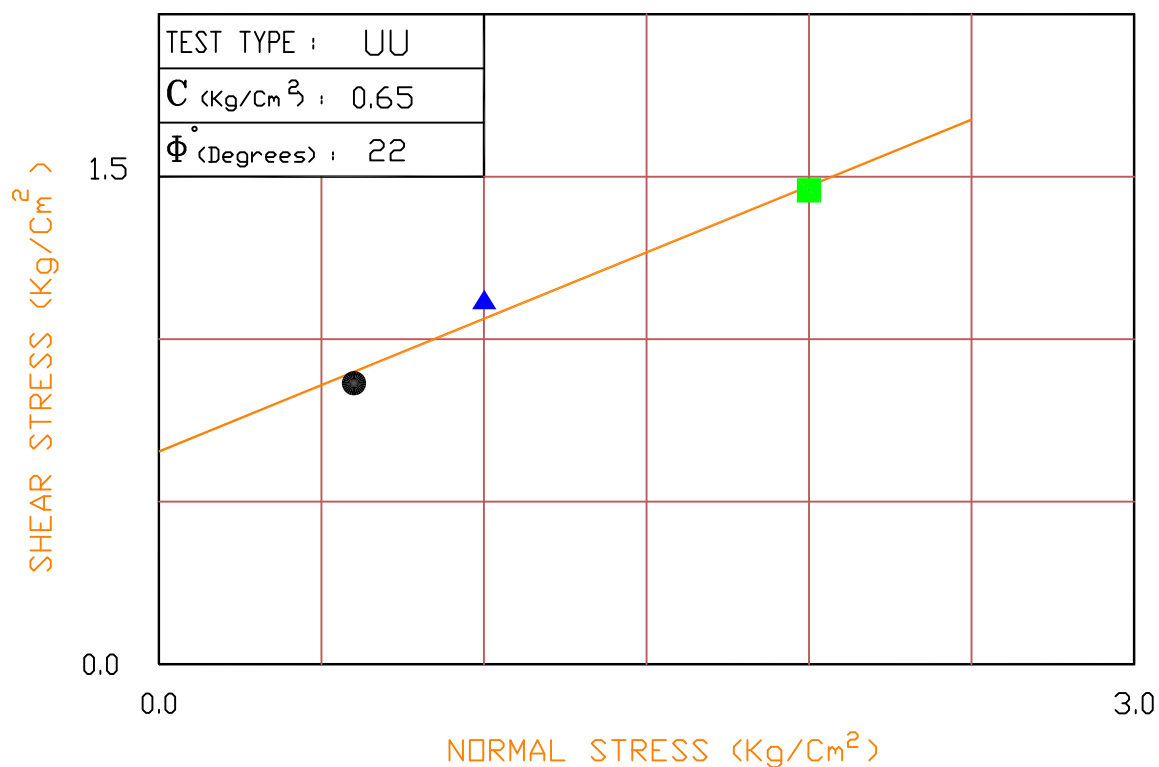
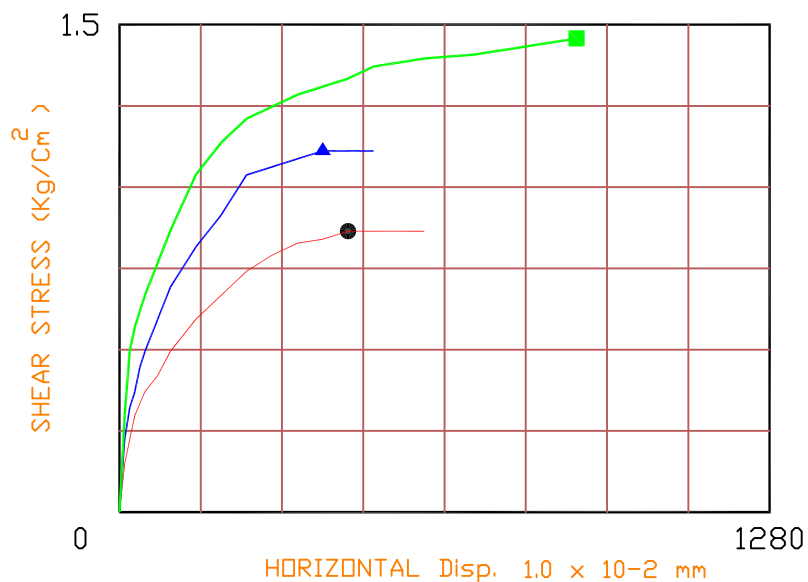


PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
24

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347



BORING / TEST PIT No	SAMPLE No.	DEPTH (m)	SAMPLE TYPE	SOIL TYPE
BH-329	U01	4.00-4.50	UNDISTURBED	<ML>

SYM-BOL	DRY DENSITY (gr/Cm³)	MOISTURE CONTENT %	NORMAL STRESS (Kg/Cm²)	SHEAR STRESS (Kg/Cm²)	REMARKS :
●	1.65	25	0.60	0.86	
▲	1.66	25	1.00	1.11	
■	1.65	25	2.00	1.46	

DIRECT SHEAR TEST



PROJECT SOUTH ALUMINUM SMELTER PLANT
CLIENT NFC

Figure No.
25

SOIL ENGINEERING SERVICES CONSULTING ENGINEERS

PROJ. No.: 1347