RAS 5488 72-22-ISFSI APPLICANT EXHIBIT 238 - Rec'd 6/2/03

PRESENTATION OF CONE PENETRATION TESTING RESULTS

OF SOILS AT THE

PRIVATE FUEL STORAGE FACILITY
SKULL VALLEY, UTAH

Report No. 05996.02-G (P030) Rev. 1

Prepared for:

Stone & Webster Engineering Corporation

Prepared by:

ConeTec, Inc.
Salt Lake City, Utah

May 1999

Prepared by: _____ 5/27/99
ConeTec, Inc. Date

Reviewed by: _____ 5/27/99
ConeTec, Inc. Date

TEMPLATE - Seeg-028

Seeg-02

NUCLEAR REGULATORY COMMISSION

Docket No. 72-22

In the matter of PFS

Staff

Applicant ✓

Intervenor

Cont'g Off'r

Contractor

Other

Reporter

NUCLEAR REGULATORY COMMISSION

Official Exh. No. 238

Official Exh. No.

IDENTIFIED ✓

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DATE 6/21/02

DATE Witness Trudeau

Witness

Witness G. Bera

Soil stress calculations performed in the interpretations are based on a soil unit weight assigned to the specific soil behavior type zones. The soil unit weights used in the interpretations are based on laboratory tests performed by SWEC on borings CTB-N, CTB-S, CTB-5(OW) and CTB-4, which are located adjacent to CPT locations CPT-37 and CPT-38. The unit weights were determined by taking an average of the laboratory unit weights corresponding to the soil behavior type zone from the corresponding CPT test. Where soil behavior type zones do not correspond with laboratory data, unit weights were interpolated to correspond with the laboratory data, or are based on typical values published by Lunne, et al (1997). A summary of the values assigned to the soil behavior type zones is presented in Table 2.

Table 2 – SBT Assigned Values

Zone	SPT Qt/N	Unit Wt. (kN/m^3)	Unit Wt. (pcf)	K (cm/s)	Description
0	1.0	19.5	124.1	$1x10^{-15}$	Undefined
1	2.0	11.7	74.5	$1.7x10^{-7}$	Sensitive Fines
2	1.0	11.0	70.0	$5x10^{-6}$	Organic Soil
3	1.0	11.7	74.5	$5x10^{-8}$	Clay
4	1.5	12.5	79.6	$5x10^{-7}$	Silty Clay
5	2.0	13.4	85.3	$5x10^{-6}$	Clayey Silt
6	2.5	15.5	98.7	$5x10^{-5}$	Silt
7	3.0	15.5	98.7	$5x10^{-4}$	Sandy Silt
8	4.0	16.0	101.9	$5x10^{-3}$	Silty Sand/Sand
9	5.0	16.0	101.9	$5x10^{-2}$	Sand
10	6.0	20.0	127.3	5.0	Gravelly Sand
11	1.0	20.5	130.5	$1x10^{-6}$	Stiff Fine Grained
12	2.0	19.0	120.9	$1x10^{-5}$	Cemented Sand

The undrained shear strength calculations were determined based on an estimated N_{kt} value of 12.5. This N_{kt} factor was determined based on the average of the individual N_{kt} factors calculated from laboratory shear strength tests performed on samples from borings B-1, B-3, B-4, C-2, CTB-N and CTB-S , and corresponding Qt valued observed in the nearest CPT test. The laboratory shear strengths were determined from CU triaxial tests performed by SWEC. The N_{kt} factor is calculated using the following equation:

$$S_u = \frac{Q_t - \sigma_v}{N_{kt}}$$

where:

S_u = Undrained shear strength
Q_t = Corrected total cone resistance
σ_v = Total soil stress
N_{kt} = Correction Factor

ConeTec Inc. - CPT Interpretation Page: 1a
Interpretation Output - Release 1.00.18
Job No: 99-0525-1349-4199
Job No: 99-315
Client: Stone & Webster Engineering
Project: Private Fuel Storage Facility
Site: CPT-10
Location: PFSF (05996.02)
Cone: 20 TON A 070
CPT Date: 99/27/04
CPT Time: 08:58
CPT File: 315CP10.COR
Northing (m): 0.000
Easting (m): 0.000
Elevation (m): 0.000

Water Table (m): 38.10 (ft): 125.0
Su Nkt used: 12.50
Averaging Increment (m): 0.0 (Every Data Point)
Phi Method : Robertson and Campanella, 1983
Dr Method : Jamiolkowski - All Sands
State Parameter M: 1.20
Used Unit Weights Assigned to Soil Zones
Values of 1.0E9 or UnDef are printed for parameters that are not valid for the material type (SBT)

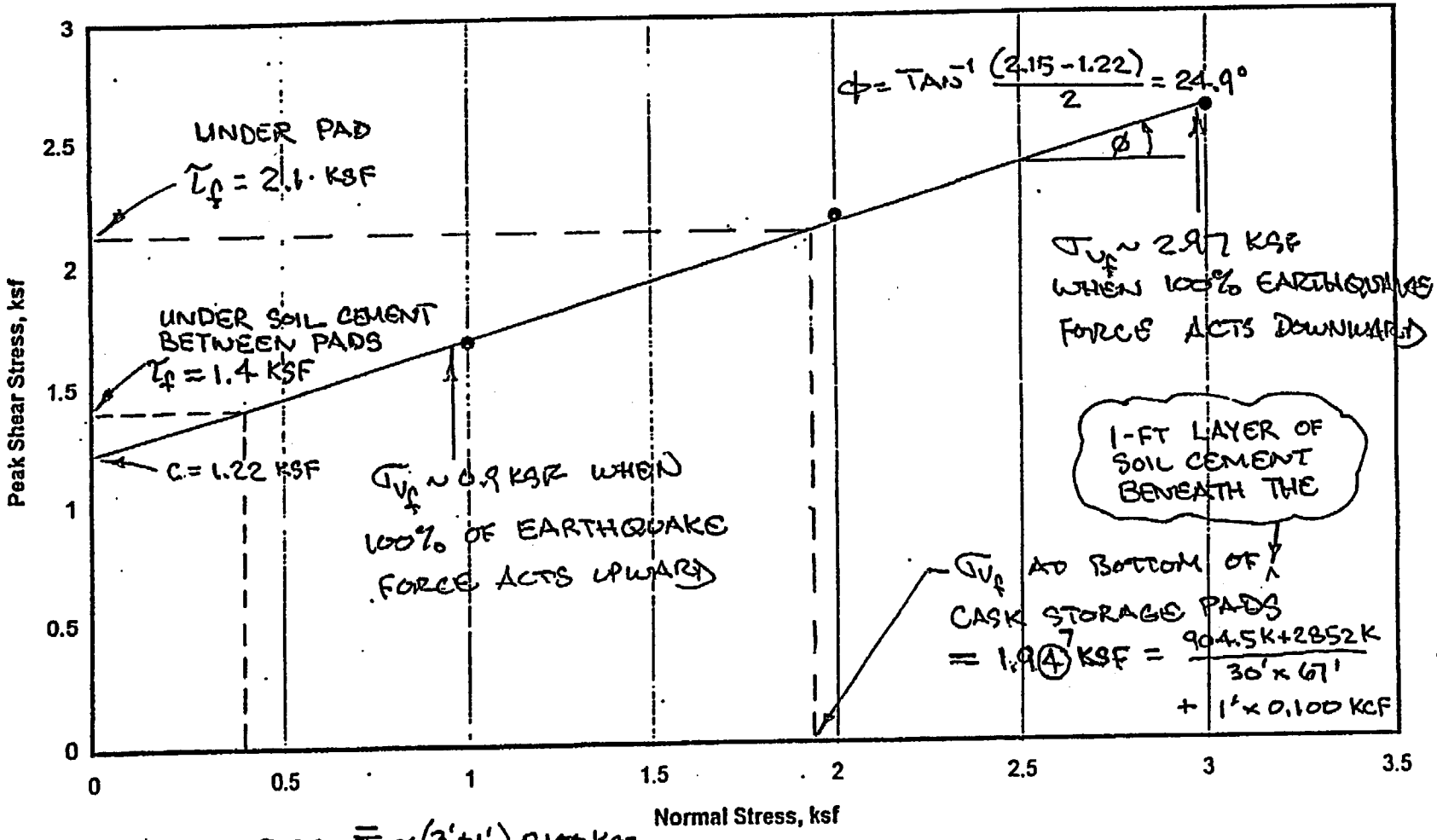
Depth (ft)	AvgQt (tsf)	AvgFs (tsf)	AvgRf (%)	AvgUd (ft)	SBT	U.Wt. pcf	TStress (tsf)	EStress (tsf)	Ueq (tsf)	Cn	N60 (blows/ft)	(N1)60	Su (tsf)	CRR
0.16	2.0	0.02	1.00	0.2	1	74.5	0.01	0.01	0.00	2.00	1.0	1.9	0.16	0.00
0.33	4.6	0.02	0.44	0.2	1	74.5	0.01	0.01	0.00	2.00	2.2	4.4	0.37	0.00
0.49	9.5	0.02	0.21	-0.3	6	98.7	0.02	0.02	0.00	2.00	3.6	7.3	0.76	0.00
0.66	14.4	0.02	0.14	-0.4	6	98.7	0.03	0.03	0.00	2.00	5.5	11.1	1.15	0.00
0.82	13.5	0.02	0.15	-0.2	6	98.7	0.04	0.04	0.00	2.00	5.2	10.3	1.08	0.00
0.98	12.4	0.02	0.16	-0.3	6	98.7	0.04	0.04	0.00	2.00	4.7	9.5	0.99	0.00
.15	12.8	0.02	0.16	-0.3	6	98.7	0.05	0.05	0.00	2.00	4.9	9.8	1.02	0.00
31	17.2	0.02	0.12	-0.1	7	98.7	0.06	0.06	0.00	2.00	5.5	11.0	UnDef	0.08
..48	24.1	0.02	0.08	-0.1	7	98.7	0.07	0.07	0.00	2.00	7.7	15.4	UnDef	0.09
1.64	29.0	0.02	0.07	-0.3	7	98.7	0.08	0.08	0.00	2.00	9.3	18.5	UnDef	0.10
1.80	29.3	0.02	0.07	-0.3	7	98.7	0.08	0.08	0.00	2.00	9.4	18.7	UnDef	0.10
1.97	25.9	0.02	0.08	-0.4	7	98.7	0.09	0.09	0.00	2.00	8.3	16.5	UnDef	0.09
2.13	22.6	0.02	0.09	-0.3	7	98.7	0.10	0.10	0.00	2.00	7.2	14.4	UnDef	0.09
2.30	22.1	0.02	0.09	-0.3	7	98.7	0.11	0.11	0.00	2.00	7.1	14.1	UnDef	0.09
2.46	21.8	0.02	0.09	-0.1	7	98.7	0.12	0.12	0.00	2.00	7.0	13.9	UnDef	0.09
2.62	18.1	0.02	0.11	0.1	7	98.7	0.12	0.12	0.00	2.00	5.8	11.6	UnDef	0.08
2.79	16.8	0.02	0.12	0.0	7	98.7	0.13	0.13	0.00	2.00	5.4	10.7	UnDef	0.08
2.95	18.6	0.02	0.11	0.2	7	98.7	0.14	0.14	0.00	2.00	5.9	11.9	UnDef	0.08
3.12	26.7	0.05	0.19	0.3	7	98.7	0.15	0.15	0.00	2.00	8.5	17.1	UnDef	0.09
3.28	29.1	0.24	0.83	-0.1	7	98.7	0.16	0.16	0.00	2.00	9.3	18.6	UnDef	0.10
3.44	25.2	0.35	1.39	0.1	6	98.7	0.16	0.16	0.00	2.00	9.7	19.3	2.01	0.10
3.61	21.5	0.42	1.96	0.0	6	98.7	0.17	0.17	0.00	2.00	8.2	16.4	1.70	0.10
3.77	17.6	0.24	1.36	-0.9	6	98.7	0.18	0.18	0.00	2.00	6.8	13.5	1.40	0.09
3.94	12.3	0.09	0.73	-0.6	6	98.7	0.19	0.19	0.00	2.00	4.7	9.4	0.97	0.00
4.10	10.5	0.02	0.19	-0.6	6	98.7	0.20	0.20	0.00	2.00	4.0	8.0	0.82	0.00
4.27	8.7	0.02	0.23	-0.1	1	74.5	0.20	0.20	0.00	2.00	4.2	8.3	0.68	0.00
4.43	8.6	0.02	0.23	0.1	1	74.5	0.21	0.21	0.00	2.00	4.1	8.2	0.67	0.00
4.59	9.6	0.02	0.21	0.0	6	98.7	0.22	0.22	0.00	2.00	3.7	7.4	0.75	0.00
4.76	10.8	0.02	0.19	0.1	6	98.7	0.23	0.23	0.00	2.00	4.1	8.3	0.85	0.00
4.92	11.4	0.02	0.18	-0.2	6	98.7	0.23	0.23	0.00	2.00	4.4	8.8	0.90	0.00
5.09	12.7	0.02	0.16	-0.1	6	98.7	0.24	0.24	0.00	2.00	4.8	9.7	0.99	0.00
5.25	13.3	0.02	0.15	-2.2	6	98.7	0.25	0.25	0.00	2.00	5.1	10.2	1.04	0.00
5.41	12.8	0.02	0.16	-2.5	6	98.7	0.26	0.26	0.00	1.97	4.9	9.7	1.01	0.00
5.58	13.2	0.02	0.15	-0.2	6	98.7	0.27	0.27	0.00	1.94	5.0	9.8	1.03	0.00
5.74	11.6	0.02	0.17	-0.2	6	98.7	0.27	0.27	0.00	1.91	4.4	8.5	0.90	0.00
5.91	12.6	0.02	0.16	-0.4	6	98.7	0.28	0.28	0.00	1.88	4.8	9.1	0.98	0.00
6.07	13.2	0.02	0.15	-0.4	6	98.7	0.29	0.29	0.00	1.86	5.1	9.4	1.03	0.00
6.23	12.8	0.02	0.16	-0.3	6	98.7	0.30	0.30	0.00	1.83	4.9	9.0	1.00	0.00
40	13.2	0.02	0.15	-1.7	6	98.7	0.31	0.31	0.00	1.81	5.1	9.1	1.03	0.00
.6	13.2	0.04	0.30	-0.2	6	98.7	0.31	0.31	0.00	1.78	5.1	9.0	1.03	0.00
..73	13.0	0.06	0.46	0.2	6	98.7	0.32	0.32	0.00	1.76	5.0	8.7	1.01	0.00
6.89	13.1	0.06	0.46	-3.8	6	98.7	0.33	0.33	0.00	1.74	5.0	8.7	1.02	0.00

FIGURE 7

DIRECT SHEAR TEST

Boring C-2, Sample U-1C

PAD EMPLACEMENT AREA



BETWEEN PADS $\bar{\sigma}_V$ ~ (3'+1') 0.100 KCF
= 0.4 KSF

REF SAR APP 2A ATT 7

ATTACHMENT C p C2
CALC 05996.02-G(B)-04-9

CALC 05996.02-G(B)-05-1 p 32