

STONE & WEBSTER ENGINEERING CORPORATION

CALCULATION TITLE PAGE

*SEE INSTRUCTIONS ON REVERSE SIDE

DRAFT

A 5010 64 (FRONT)

CLIENT & PROJECT <i>Private Fuel Storage, LLC / PFSF at Skull Valley</i>				PAGE 1 OF 65 <i>Plus 16 Attachment Pgs.</i>	
CALCULATION TITLE (Indicative of the Objective): <i>FINITE ELEMENT ANALYSIS OF CANISTER TRANSFER BUILDING</i>				QA CATEGORY (✓) <input checked="" type="checkbox"/> I - NUCLEAR SAFETY RELATED <input type="checkbox"/> II <input type="checkbox"/> III <input type="checkbox"/> OTHER	
CALCULATION IDENTIFICATION NUMBER					
J.O. OR W.O NO	DIVISION & GROUP	CURRENT CALC. NO.	OPTIONAL TASK CODE	OPTIONAL WORK PACKAGE NO.	
<i>05996.02</i>	<i>Structural</i>	<i>SC-6</i>	<i>-</i>	<i>-</i>	
* APPROVALS - SIGNATURE & DATE			REV. NO OR NEW CALC NO	SUPERSEDES * CALC. NO OR REV. NO.	CONFIRMATION * REQUIRED (✓) YES NO
PREPARER(S)/DATE(S)	REVIEWER(S)/DATE(S)	INDEPENDENT REVIEWER(S)/DATE(S)			
<i>T.M. Snyder 11/25/98</i>	<i>William Dykstra 12/4/98</i>	<i>Sean Chen 12/4/98</i>	<i>0</i>	<i>NA</i>	<i>✓ See Pg. 7</i>
<i>T.M. Snyder</i>	DRAFT	DRAFT	<i>1</i>	<i>0</i>	
DISTRIBUTION*					
GROUP	NAME & LOCATION	COPY SENT (✓)	GROUP	NAME & LOCATION	COPY SENT (✓)
RECORDS MGT. FILES (OR FIRE FILE IF NONE)	<i>Job Book (R4.2) orig. Fire File</i>	<i>✓</i>	<i>10</i>	DOCKETED USNRC 2003 JAN 13 AM 10:26 OFFICE OF THE SECRETARY RULEMAKINGS AND ADJUDICATIONS STAFF	

NUCLEAR REGULATORY COMMISSION

Subject No. _____ Official Exh. No. YY
in the matter of PCS
Staff _____ IDENTIFIED ✓
Applicant ✓ RECEIVED ✓
Intervenor _____ REJECTED _____
Other _____ WITHDRAWN _____
DATE 5-2-02 Witness _____

Amg

CALCULATION ATTACHMENT

J.O.W.O./CALCULATION NO. 05996.02-SC-6		REVISION 1	ATTACH 6 PAGE 1
PREPARER/DATE B. E. Ebbeson 4/01/02	REVIEWER/CHECKER/DATE T.M.Snyder 4/01/2002	INDEPENDENT REVIEWER Pares Datta 4/01/2002	
SUBJECT/TITLE PFSF / Skull Valley / Finite Element Analysis of Canister Transfer Building		QA CATEGORY/CODE CLASS I	

ATTACHMENT No. 6

The purpose of this Attachment is to find the differential vertical displacement of the CTB base mat caused by vertical earthquake loads. Results will be used in the testimony of Bruce E. Ebbeson on Section D of Unified Contention L/QQ before the Atomic Safety and Licensing Board.

The load combination with the full vertical earthquake is LC 1. This combination also includes 40% of the maximum N-S and E-W seismic loads, as well as dead and live loads. Displacement along the building centerline in the N-S direction (along column line D), and in the E-W direction along column line 6 will be plotted, and difference between the maximum and minimum displacements calculated. See pages 6-2 and 6-3 for these plots.

N-S Direction:

Maximum vertical displacement = .033094 feet

Minimum vertical displacement = .019479 feet

Differential vertical displacement = $(0.033094 - 0.019479)(12 \text{ in/ft}) = 0.163 \text{ inches}$

E-W Direction:

Maximum vertical displacement = .035367 feet

Minimum vertical displacement = .007579 feet

Differential vertical displacement = $(0.035367 - 0.007579)(12 \text{ in/ft}) = 0.333 \text{ inches}$.

It should be noted that these values are conservative because:

- They contain contribution from the dead and live loads
- They contain rigid body rotations caused by the horizontal seismic loads.

CALCULATION ATTACHMENT

J.O.W.O./CALCULATION NO.

05996.02-SC-6

REVISION

1

ATTACH 6

PAGE 2

PREPARER/DATE

B. E. Ebbeson 4/01/02

REVIEWER/CHECKER/DATE

T.M.Snyder 4/01/2002

INDEPENDENT REVIEWER

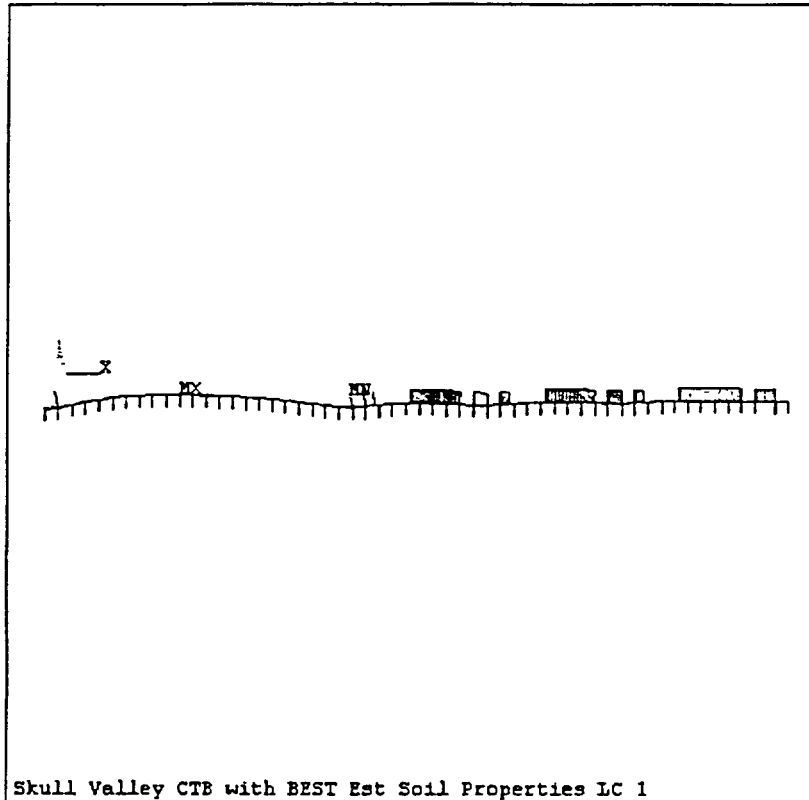
Pares Datta 4/01/2002

SUBJECT/TITLE

PFSF / Skull Valley / Finite Element Analysis of Canister Transfer Building

QA CATEGORY/CODE CLASS

I

ATTACHMENT No. 6SECTION CUT OF BASE MAT ALONG D-LINE

VIEW FACING WEST

(99' < Z < 103')

(-6' < Y < 6')

CALCULATION ATTACHMENT

J.O.W.O./CALCULATION NO.

05996.02-SC-6

REVISION

1

ATTACH 6

PAGE 3

PREPARER/DATE

B. E. Ebbeson 4/01/02

REVIEWER/CHECKER/DATE

T.M.Snyder 4/01/2002

INDEPENDENT REVIEWER

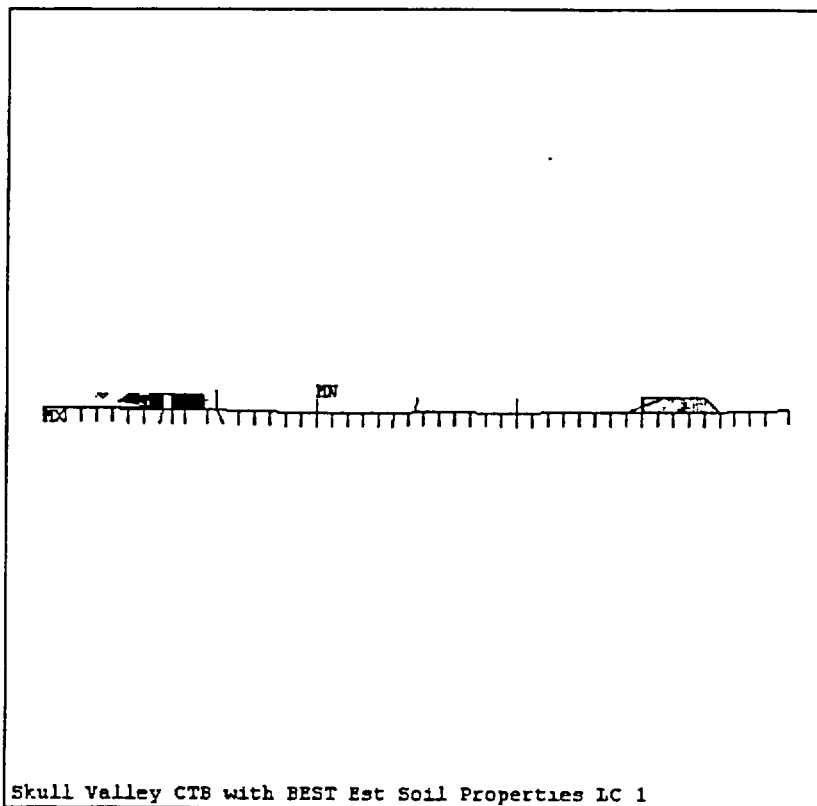
Pares Datta 4/01/2002

SUBJECT/TITLE

PFSF / Skull Valley / Finite Element Analysis of Canister Transfer Building

QA CATEGORY/CODE CLASS

I

ATTACHMENT No. 6

ANSYS 5.4
 APR 1 2002
 14:10:52
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 STEP=1
 SUB =1
 TIME=1
 UY
 TOP
 RSYS=0
 DMX =.209417
 SEPC=69.636
 SMN =-.035367
 SMX =-.007579
 -.035367
 -.032279
 -.029191
 -.026104
 -.023016
 -.019929
 -.016841
 -.013754
 -.010666
 -.007579

SECTION CUT OF BASE MAT ALONG 6-LINE

VIEW FACING NORTH

(-6' < Y < 6')

(X = 135')