24
9/20/74 MZRO

I-17026

DR-0409-X

NOTICE

PORTIONS OF THIS REPORT ARE ILLEGIBLE. It has been reproduced from the best available copy to permit the broadest possible availability.

UC-20 20122
Vol. 2

SSI RESPONSE OF A TYPICAL SHEAR WALL STRUCTURE

Appendix B
In-Structure Response Spectra Comparisons

J. J. Johnson
E. C. Schewe
O. R. Maslenikov

April 1984

Lawrence
Livermore
National
Laboratory

This is an informal report intended primarily for internal or limited external distribution. The opinions and conclusions stated are those of the author and may or may not be those of the Laboratory.

This work was supported by the United States Nuclear Regulatory Commission under a Memorandum of Understanding with the United States Department of Energy.

DISSEMINATION OF INFORMATION

APPENDIX B

IN-STRUCTURE RESPONSE SPECTRA COMPARISONS

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

MASTER

DISTRIBUTION STATEMENT 1
UNCLASSIFIED

SUMMARY AND NUMERICAL RESULTS

The Seismic Safety Margins Research Program (SSMRP) is an U.S. Nuclear Regulatory Commission-funded multiyear research program conducted by Lawrence Livermore National Laboratory (LLNL). Its objective was to develop a complete, fully coupled analysis procedure (including methods and computer programs) for estimating the risk of earthquake-induced radioactive release from a commercial nuclear power plant. The full SSMRP analysis procedure is based on a state-of-the-art seismic and systems analysis process and explicitly includes the uncertainties inherent in such a process. It is readily apparent that the tools, codes, and data bases developed to-date by the SSMRP comprise a most complete and comprehensive seismic probabilistic risk assessment (PRA) methodology. However, application of the SSMRP methodology in its entirety on a routine basis for all commercial nuclear power plants is too time consuming and costly. The goal of the SSMRP Simplified Methods Project is to develop a simplified methodology for routine seismic PRA's of commercial nuclear power plants.

Estimating three aspects of seismic response of structures and components is essential to a seismic PRA: median-level response, variability of response, and correlation of response for each level of the seismic hazard. In the SSMRP to-date, these aspects were determined calculationaly using the computer program SMACS. To reduce the effort in a seismic PRA, it is proposed to use A-E and vendor developed seismic responses and/or models to the extent possible. Developing median level responses based on design information requires calibration, i.e. removing conservatism or non-conservatism from the design procedure. At least two procedures exist to do so: use generically developed calibration factors which quantify design procedures and parameters vs. best estimate; or perform limited re-analysis of the nuclear power plant for which the seismic PRA

is being performed using best estimate procedures and utilizing the results in the systems analysis and for calibration purposes. The seismic response of structures was the subject of this study.

The objectives of this study were two-fold:

- Develop building response calibration factors, i.e. factors which relate best estimate or median level response to responses calculated by selected design procedures. Soil-structure interaction was the phenomenon of interest because significant simplifications are frequently introduced in its treatment. This objective may be viewed as addressing the question: How much conservatism is introduced by ignoring SSI or by approximating SSI effects by a simplified procedure?
- The second objective can similarly be viewed in the context of a question: What effect does placing an identical structure on different sites and with different foundation conditions have on structure response?

The structure selected for this study is a part of the Zion AFT complex. Only the auxiliary, fuel-handling, and diesel generator buildings were studied. This structure is a connected group of shear-wall buildings constructed of reinforced concrete, typical of nuclear power plant structures. The bases of comparison for this study were structure responses: peak in-structure accelerations (27 components), and peak wall forces and moments (111 components). In-structure response spectra were also considered. Reference 1 details the study and presents results for peak in-structure accelerations, peak wall forces and moments, and a limited number of in-structure

response spectra. The present report is a companion volume which contains in-structure response spectra comparisons in detail.

The basic approach was to analyze the structure for a series of site and foundation conditions. Best estimate and design procedures were used. Comparisons between best estimate results allows one to quantify the effects of placing the identical structure on different sites and founding it in different manners. Comparisons between responses calculated by simplified SSI design procedures and those calculated by best estimate procedures, allows one to develop calibration factors. These factors can be used to estimate median level responses from design values accounting for SSI analysis procedures.

Two soil profiles were considered: a uniform half-space of varying stiffness characteristics ($V_g = 500$ fps, 1000 fps, 2000 fps, and 3500 fps); and a single soil layer overlying a stiff bedrock -- two thicknesses (71 ft. and 110 ft.) and two layer stiffnesses ($V_g = 1000$ fps and 2000 fps) were treated. Also, a fixed-base condition served as an additional case. One set of analyses treated the structure as being surface-founded; a second set assumed it to be embedded an average depth of 39 ft. which corresponds to an equivalent e/r ratio of 0.35.

Nineteen basic cases were analyzed. Cases 1-15 represent best estimate scenarios provided the analysis scenario matches the physical characteristics of the soil, structure, and foundation. Cases 16-19 represent scenarios with simplifications in the SSI analysis procedure -- namely, constant, frequency independent soil springs representing the behavior of the soil and no treatment of radiation damping. In these 19 cases, structure damping was a uniform 4% of critical for all structure modes. An additional sensitivity study on

structure damping was performed for three site conditions (fixed-base, uniform half-spaces of 1000 fps and 2000 fps). The effect of structure damping on in-structure response was assessed.

Each of the nineteen cases was analyzed for a series of ten earthquakes targeted to the NRC R.G. 1.60 design ground response spectra. In-structure response spectra comparisons presented here are comparisons of mean spectra over the ten earthquakes on a point-by-point basis.

The data is presented in the following order:

- 1.) Surface vs. Embedded Foundations, Half-space Site; $V_s = 3500, 2000, 1000, 500$ fps.
- 2.) Fixed-Base Case vs. Surface Foundation, Half-Space Site; $V_s = 3500, 2000, 1000, 500$ fps.
- 3.) Fixed-Base Case vs. Embedded Foundation, Half-Space Site; $V_s = 3500, 2000, 1000, 500$ fps.
- 4.) Soil Springs Case vs. Surface Foundation, Half-Space Site; $V_s = 3500, 2000, 1000, 500$ fps.
- 5.) Soil Springs Case vs. Embedded Foundation, Half-Space Site; $V_s = 3500, 2000, 1000, 500$ fps.
- 6.) Surface vs. Embedded Foundations, 110 ft. Layered Site; $V_s = 2000, 1000$ fps.
- 7.) Fixed-Base Case vs. Surface Foundation, 110 ft. Layered Site; $V_s = 2000, 1000$ fps.
- 8.) Fixed-Base Case vs. Embedded Foundation, 110 ft. Layered Site; $V_s = 2000, 1000$ fps.

- 9.) Surface vs. Embedded Foundations, 71 ft. Layered Site
Surface/110 ft. Layered Site Embedded; $V_s = 2000, 1000$
fps.
- 10.) Fixed-Base vs. Surface Foundation, 71 ft. Layered Site;
 $V_s = 2000, 1000$ fps.

References

- 1.) Johnson, J. J., Schewe, E. C., and Maslenikov, O. R., "SSI Response of a Typical Shear Wall Structure," SMA 12209.23.01, April 1984.

In-Structure Response Spectra for Surface vs. Embedded
Foundations, Half Space Site; $V_s = 3500, 2000, 1000,$
500 fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec^2 , Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE: $V_S=3500$ FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; $V_S=2000$ FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION — — — — —

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

—————

EMBEDDED FOUNDATION

- - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 UNIFORM HALF SPACE; $V_S=500$ FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; $V_s=3500$ FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

—————

EMBEDDED FOUNDATION

- - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; $V_S=1000$ FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION XX ROTATION
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE, VS=1000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX B: DG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Z (VERT); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE: VS=2000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION —————

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 317
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W): FUEL HANDLING BLDG. EL 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S) : FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE: VS=3500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Y (N-S): FUEL HANDLING BLDG. E: F17

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y (N-S): FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE: VS=1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NOOE 7B, Y (N-S); FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
EMBEDDED FOUNDATION _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION — — — — —

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 183, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=50G FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 542
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS≈1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W): AUX BLDG. EL. 666
UNIFORM HALF SPACE: VS=2000 FPS
SURFACE FOUNDATION
EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, X (E-W); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLOG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX B.DG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Y (N-S); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION ———
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
EMBEDDED FOUNDATION _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
EMBEDDED FOUNDATION _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION —————

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT): DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 EMBEDDED FOUNDATION —————
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672. Y (N-S); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Z (VERT); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

In-Structure Response Spectra for Fixed-Base Case vs.
Surface Foundation, Half-Space Site; $V_s = 3500, 2000,$
1000, 500 fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION X TRANSLATION (E-W)
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; $V_S=1000$ FPS

SURFACE FOUNDATION

FIXED BASE

—————
 - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; $V_S=3500$ FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE: VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE: VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; $V_S=3500$ FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE: VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE
SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

UNIFORM HALF SPACE; $V_5=500$ FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, 2 (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE
SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA ~ 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL: 617
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S): FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S) : FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 7B, Y (N-S) ; FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION
 FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. ELL. 617

UNIFORM HALF SPACE; VS=500 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE
 SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 61'
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 817

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE: $V_S \approx 2000$ FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION —————
FIXED BASE ————

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION —————
 FIXED BASE ——— ——— ———

MEAN RESPONSE SPECTRA - 2% DAMPING

MODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=1000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE —————
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BL...
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; $V_S = 3500$ FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE —————
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (IN-S); FUEL HANDLING BLDG. ELL. 842
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=3500 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. LVL. 542
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION —————
 FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 255, X (E-W); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Y (N-S); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 66S
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; V5=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 656
 UNIFORM HALF SPACE: VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, 2 (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLOG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FFS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672. X (E-W); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE
SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE
SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Y (N-S); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Z (VERT); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE
SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE —————
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

In-Structure Response Spectra for Fixed-Base Case vs.
Embedded Foundation, Half-Space Site; $V_s = 3500, 2000,$
1000, 500 fps.

Half Section of the Model Illustrating Node Points at which
In-Structure Response Spectra are Generated (Accelerations in
Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=3500 FPS.

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; $V_S=3500$ FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; $V_S=2000$ FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; $V_S=1000$ FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

UNIFORM HALF SPACE; $V_S \approx 500$ FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 7B, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA -- 2% DAMPING
 NODE 78, Y (E-W); FUEL HANDLING BLDG. EL. 6 7
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y (N-S); FUEL HANDLING BLDG. EL 617
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=1000 FPS

EMBEDDED FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 7B, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 61"

UNIFORM HALF SPACE: $V_S=3500$ FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DI_SEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLOC. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=3500 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 842
 UNIFORM HALF SPACE; VS=2000 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=1000 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, X (E-W); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA ~ 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; $V_S=3500$ FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL 666
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, X (E-W); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672. X (E-W); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Y (N-S); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Y (N-S); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Z (VERT); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Z (VERT); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=500 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

In-Structure Response Spectra for Soil Springs Case vs.
Surface Foundation, Half-Space Site; $V_s = 3500, 2000,$
1000, 500 fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec^2 , Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=2000 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (IN-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS _____

SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NOTE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 7B, Y (N-S); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 7B, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 7B, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 SURFACE FOUNDATION _____
 SOIL SPRINGS - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SURFACE FOUNDATION _____
 SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
SOIL SPRINGS - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SURFACE FOUNDATION _____
SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. E. 807
 UNIFORM HALF SPACE: VS=1000 CM/S
 SOIL STRAIN: _____
 SURFACE FOUNDATION: _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 542
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=2000 FPS

SOIL SPRINGS _____

SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE :88, Y (N-S); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=1000 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=3500 FPS

SURFACE FOUNDATION _____

SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
SURFACE FOUNDATION _____
SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=1000 FPS
SURFACE FOUNDATION _____
SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=500 FPS
 SURFACE FOUNDATION _____
 SOIL SPRINGS - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, X (E-W); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 566
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Y (N-S); AUX BLDG. EL. 666

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS —————
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA ~ 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX SLNG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256. Z (VERT); AUX BLDG. EL. 665
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666

UNIFORM HALF SPACE; VS=1000 FPS

SOIL SPRINGS _____

SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303. Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, X (E-W); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, X (E-W); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=2000 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; $V_S=1000$ FPS
SOIL SPRINGS _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S): AUX BLDG, EL. 579
UNIFORM HALF SPACE: VS=2000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Z (VERT); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=2000 FPS

SOIL SPRINGS

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Z (VERT); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
SURFACE FOUNDATION _____

In-Structure Response Spectra for Soil Springs Case vs.
Embedded Foundation, Half-Space Site; $V_s = 3500, 2000,$
 $1000, 500$ fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10. Y (N-S); AUX BLDG. EL. 592

UNIFORM HALF SPACE; VS=1000 FPS

SOIL SPRINGS _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA ~ 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE: VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=3500 FPS
 EMBEDDED FOUNDATION _____
 SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 EMBEDDED FOUNDATION _____
 SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=1000 FPS

EMBEDDED FOUNDATION _____

SCIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617

UNIFORM HALF SPACE; VS=500 FPS

EMBEDDED FOUNDATION _____

SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDC. EL. 617
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL.
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 MBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=3500 FPS

SOIL SPRINGS

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL 617
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

UNIFORM HALF SPACE; VS=500 FPS

SOIL SPRINGS

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 647
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=2000 FPS

SOIL SPRINGS _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE: VS-1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; $V_S=500$ FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (IN-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE: VE=100 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION: _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=3500 FPS
EMBEDDED FOUNDATION _____
SOIL SPRINGS - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
UNIFORM HALF SPACE; VS=2000 FPS
EMBEDDED FOUNDATION _____
SOIL SPRINGS - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

UNIFORM HALF SPACE; VS=1000 FPS

EMBEDDED FOUNDATION _____

SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 64
UNIFORM HALF SPACE; VS=500 FPS
EMBEDDED FOUNDATION _____
SOIL SPRINGS _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, X (E-W); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS —————
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=3500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (IN-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT): AUX BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303. X (E-W); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA ~ 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT): DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE: VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, X (E-W); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, X (E-W); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=500 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 572, Y (N-S); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=2000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (IN-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=1000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=3500 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
UNIFORM HALF SPACE; VS=2000 FPS
SOIL SPRINGS _____
EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Z (VERT); AUX BLDG. EL. 579
 UNIFORM HALF SPACE; VS=1000 FPS
 SOIL SPRINGS _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Z (VERT); AUX BLDG. EL. 579

UNIFORM HALF SPACE; VS=500 FPS

SOIL SPRINGS

EMBEDDED FOUNDATION

In-Structure Response Spectra for Surface vs. Embedded
Foundations, 110 ft. Layered Site; $V_s = 2000, 1000,$
fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION Y TRANSLATION (N-S)
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SUPFACE FOUNDATION —————

EMBEDDED FOUNDATION —————

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Z TRANSLATION (VERT)
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION Z TRANSLATION (VERT)
110 FT. SOIL LAYER OVER BEDROCK; $V_S=1000$ FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION XX ROTATION
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

110 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS

EMBEDDED FOUNDATION

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION ZZ ROTATION
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, X (E-W); AUX BLDG. EL. 592

110 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 7B, X (E-W); FUEL HANDLING BLDG. EL. 517
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 EMBEDDED FOUNDATION _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER F-ROCK; VS=2000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION —————

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION -----

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
EMBEDDED FOUNDATION _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK, VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; $V_S \approx 1000$ FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 665
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 505, Z (VERT): DIESEL GEN. BLDG. EL. 688
 110 FT. SOIL LAYER OVER BEDROCK: VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672. X (E-W); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

In-Structure Response Spectra for Fixed-Base Case vs.
Surface Foundation, 110 ft. Layered Site; $V_s = 2000$,
1000 fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec^2 , Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION —————

FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN: RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Y TRANSLATION (N-S)

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION Z TRANSLATION (VERT)
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

11 FT. SOIL LAYER OVER BEDROCK; $V_S=1000$ FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE _____

SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION YY ROTATION
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION ZZ ROTATION
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Y (N-S); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 7B, X (E-W); FUEL HANDLING BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE —————
 SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION —————
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL: 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 665
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 . FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, X (E-W); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Z (VERT); AUX BLDG. EL. 579

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION

FIXED BASE

In-Structure Response Spectra for Fixed-Base Case vs.
Embedded Foundation, 110 ft. Layered Site; $V_s = 2000$,
1000 fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION X TRANSLATION (E-W)

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 110 FT. SOIL LAYER OVER BEDROCK; $V_S=2000$ FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Z TRANSLATION (VERT)
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

110 FT. SOIL LAYER OVER BEDROCK; $V_S=1000$ FPS

EMBEDDED FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

110 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS

1000000 LB. WEIGHT

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION YY ROTATION
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION YY ROTATION
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION ZZ ROTATION

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION ZZ ROTATION
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE. _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (IN-S); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Y (N-S) ; FUEL HANDLING BLDG. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; V5-2000 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NOCE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BL'G. EL. 617

110 FT. SOIL LAYER OVER BEDROCK; S=2000 FPS

EMBEDDED FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
1.0 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
EMBEDDED FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (IN-S); FUEL HANDLING BLDG. EL. 642
110 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 186, Z (OVER): FUEL HANDLING BLDG. EL. C-2

100 FT OIL LAYER OVER BEDROCK: VS=2000 FPS

EMBEDDED FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

EMBEDDED FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 MODE 256, Y (IN-S); AUX BLDG. EL. 656
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED MASS
 EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. EL. 666

110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. EL. 666

110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 303, X (E-W); DIESEL GEN. BLDG. EL. E66

113 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

FIXED BASE

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 665
 110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

EMBEDDED FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, X (E-W); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=2030 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 672, Y (N-S); AUX BLDG. EL. 579
 110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 FIXED BASE _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
110 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
EMBEDDED FOUNDATION _____

In-Structure Response Spectra for Surface vs. Embedded
Foundations, 71 ft. Layered Site Surface/110 ft. Layered
Site Embedded; $V_s = 2000, 1000$ fps.

Half Section of the Model Illustrating Node Points at which
In-Structure Response Spectra are Generated (Accelerations in
Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION X TRANSLATION (E-W)
71 FT. SOIL LAYER OVER BEDROCK; $V_S=1000$ FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION Y TRANSLATION (N-S)
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION Z TRANSLATION (VERT)
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Z TRANSLATION (VERT)
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION XX ROTATION
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION XX ROTATION
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION YY ROTATION

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION ZZ ROTATION
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION ZZ ROTATION
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FT/SEC
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, X (E-W); AUX BLDG. EL. 592
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION —————
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. FL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLOC. EL. 592
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Y (N-S); FUEL HANDLING BLDG. EL. 617

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Y (N-S) FUEL HANDLING BLDG. EL.
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 F
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 61
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 61'
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FP
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION —————

EMBEDDED FOUNDATION ——— ——— ———

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EI
71 FT. SOIL LAYER OVER BEDROCK; VS=2000
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 71 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Y (N-S); AUX BLDG. EL. 666
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 256, Z (VERT); AUX BLDG. EL. 666
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 256, Z (VERT); AUX BLDG. FL. 666

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION

EMBEDDED FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W) - DIESEL GEN. BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 656
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 66F
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FT
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 EMBEDDED FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; $V_S=2000$ FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
EMBEDDED FOUNDATION _____

In-Structure Response Spectra for Fixed-Base Case vs.
Surface Foundation, 71 ft. Layered Site; $V_s = 2000, 1000,$
fps.

Half Section of the Model Illustrating Node Points at which In-Structure Response Spectra are Generated (Accelerations in Ft/sec², Frequencies in Hz.)

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION X TRANSLATION (E-W)
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION X TRANSLATION (E-W)
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Y TRANSLATION (N-S)
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION Z TRANSLATION (VERT)
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION —————
 FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION Z TRANSLATION (VERT)

71 FT. SOIL LAYER OVER BEDROCK; $V_S=1000$ FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

FOUNDATION XX ROTATION

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION YY ROTATION
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION YY ROTATION
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 FOUNDATION ZZ ROTATION
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
FOUNDATION ZZ ROTATION
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 59F
71 FT. SOIL LAYER OVER BEDROCK; VS-2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, X (E-W); AUX BLDG. EL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 10, Y (N-S); AUX BLDG. EL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION —————
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 10, Y (N-S); AUX BLDG. EL. 592

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN. RESPONSE SPECTRA - 2% DAMPING
NODE 10, Z (VERT); AUX BLDG. EL. 592
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 10, Z (VERT); AUX BLDG. EL. 592
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION _____
 FIXED BAS. _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617

71 FT. SOIL LAYER OVER BEDROCK: VS=2000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, X (E-W); FUEL HANDLING BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA ~ 2% DAMPING
 NOSE 78, Y (N-S) ; FUEL HANDLING BLDG EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION: _____
 FIXED BASE: _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 78, Y(N-S) : FUEL HANDLING BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 78, Z (VERT); FUEL HANDLING BLDG. EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION —————
 FIXED BASE —————

MEAN RESPONSE SPECTRA ~ 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; $V_S=2000$ FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, X (E-W); DIESEL GEN. BLDG. EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
 SURFACE FOUNDATION —————
 FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Y (N-S); DIESEL GEN. BLDG. EL. 617
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 147, Z (VERT); DIESEL GEN. BLOC. EL. 617
 71 FT SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 147, Z (VERT); DIESEL GEN. BLDG. EL. 61'
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, X (E-W); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE —————
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Y (N-S); FUEL HANDLING BLDG. EL. 642

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

FIXED BASE

SURFACE FOUNDATION

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 188, Z (VERT); FUEL HANDLING BLDG. EL. 642

71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS

SURFACE FOUNDATION _____

FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, X (E-W); AUX BLOG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE —————
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (IN-S); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Y (N-S); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 256, Z (VERT); AUX BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
 SURFACE FOUNDATION _____
 FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, X (E-W); DIESEL GEN. BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
 NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 66F
 71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FP'
 FIXED BASE _____
 SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Y (N-S); DIESEL GEN. BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
FIXED BASE _____
SURFACE FOUNDATION _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION —————
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 303, Z (VERT); DIESEL GEN. BLDG. EL. 666
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION —————
FIXED BASE - - - - -

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, X (E-W); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING

NODE 672, Y (N-S); AUX BLDG. EL. 579

71 FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS

SURFACE FOUNDATION

FIXED BASE

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Y (N-S); AUX BLDG. EL 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
7) FT. SOIL LAYER OVER BEDROCK; VS=2000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____

MEAN RESPONSE SPECTRA - 2% DAMPING
NODE 672, Z (VERT); AUX BLDG. EL. 579
71 FT. SOIL LAYER OVER BEDROCK; VS=1000 FPS
SURFACE FOUNDATION _____
FIXED BASE _____