Insert 3.7.2.4-1

This subsection of the Referenced DCD, including associated Appendix 3A in its entirety, is incorporated by reference with the following supplement for the Fermi 3 site-specific soil-structure interaction (SSI) analyses for the RB/FB and CB. The SSI analysis approach, model setup, and calibration of the structural models are as presented in Appendix 3A of the Referenced DCD.

The FWSC is essentially a surface founded structure in the Referenced DCD, Subsection 3.7.1.1 and there are no embedded walls for the FWSC. Therefore, the Referenced DCD backfill requirements surrounding Seismic Category I structures are not applicable to FWSC embedded basemat (embedded 2.35 m (7.7 feet)). The FWSC is founded on fill concrete which meets the Referenced DCD requirements for backfill underneath Seismic Category I structures. Therefore, there is no site-specific SSI analysis performed for the FWSC.

Add the following subsections following Subsection 3.7.2.4.

3.7.2.4.1 Fermi 3 Site-Specific Soil-Structure Interaction Analysis

This subsection presents the Fermi 3 site-specific SSI analyses performed in accordance with SRP 3.7.2 for the Seismic Category I RB/FB and CB. The Fermi 3 site-specific foundation input response spectra (FIRS) developed in Subsection 2.5.2 is in accordance with Regulatory Guide 1.208. The Fermi 3 site-specific FIRS developed in Subsection 3.7.1 is in accordance with Regulatory Guide 1.208 and NRC Interim Staff Guidance (DC/COL-ISG-017) for ensuring hazard-consistent seismic input for site response and soil structure interaction analyses. The Fermi 3 site-specific FIRS developed in Subsection 2.5.2 and Subsection 3.7.1 are fully enveloped, in all cases, by the ESBWR CSDRS as presented in Subsections 2.5.2.6.4 and Subsection 3.7.1.1.4.5, respectively. Therefore, the Fermi 3 site-specific SSI analyses were not performed to address an exceedance of the CSDRS by the FIRS, rather the Fermi 3 site-specific SSI analyses were performed to address the following Fermi 3 site-specific conditions:

- Partial embedment in the Bass Islands Group bedrock of the RB/FB and CB Seismic Category I structures, as shown on Figures 2.5.4-202 and 2.5.4-203, to confirm that the Referenced DCD design is applicable for this case.
- To demonstrate that the Referenced DCD requirements for the backfill surrounding Seismic Category I structures can be neglected for RB/FB and CB with the RB/FB and CB partially embedded in the bedrock at the Fermi 3 site.

The Fermi 3 site-specific SSI analyses follow the same methodology used in the Referenced DCD for SSI analyses for the ESBWR Standard Plant using the SASSI2000 computer program. The SASSI2000 structural models are developed from the Referenced DCD lumped-mass stick models coupled with the Fermi 3 site-specific strain compatible dynamic subsurface properties developed in Subsection 3.7.1. In the SASSI2000 model for the Fermi 3 site-specific SSI analyses, the RB/FB and CB are modeled as partially embedded into the Bass Islands Group bedrock. The backfill above the top of the Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88 surrounding the RB/FB and CB was not included in the model. Therefore, the Fermi 3 site-specific SSI analyses do not take credit for the benefits provided by the backfill surrounding the RB/FB and CB. Fill concrete is used to backfill the gap between the RB/FB and CB and excavated bedrock up to the top of Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88. The gap between the RB/FB and the CB up to the top of the Bass Islands Group bedrock is also filled with fill concrete as shown on Figures 2.5.4-202 and 2.5.4-203.

The site-specific SSI analyses results are presented and compared with the Referenced DCD seismic responses in the following subsections to confirm the applicability of the ESBWR Standard Plant for the

RB/FB and CB. In addition, the foundation stability and the dynamic bearing pressure demands are evaluated in Subsection 3.8.5 for the RB/FB and CB based on the Fermi 3 site-specific SSI analyses results.

3.7.2.4.1.1 Strain Compatible Dynamic Subsurface Material Properties

The geology of the Fermi 3 site is discussed in detail in Subsection 2.5.1. The subsurface materials encountered and the engineering properties of subsurface materials at Fermi 3 site are discussed in detail in Subsection 2.5.4.

In accordance with SRP 3.7.2, three subsurface material profiles, a best estimate (BE) profile, a lower bound (LB) profile, and an upper bound (UB) profile, were developed and used in the SSI analyses to account for variability in the subsurface materials properties at the Fermi 3 site,. The development of the Fermi 3 site-specific strain compatible dynamic subsurface material properties associated with the BE, LB, and UB profiles is discussed in Subsection 3.7.1.3. The strain compatible dynamic subsurface material properties of the BE, LB, and UB subsurface profiles used in the Fermi 3 site-specific SSI analyses are provided in Tables 3.7.1-215 through 3.7.1-217. To demonstrate that the backfill surrounding the Seismic Category I RB/FB and CB above the top of the Bass Islands Group bedrock can be neglected, the BE, LB, and UB subsurface profiles used for the Fermi 3 SSI analyses do not include backfill that will be placed during construction above the Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88 to finished ground level grade at Elevation 179.6 m (589.3 ft) NAVD 88.

3.7.2.4.1.2 FIRS Compatible Ground Motion Time History

Subsection 3.7.1.1.5 describes development of the Fermi 3 site-specific ground motion time histories used in the SSI analyses. The Fermi 3 site-specific SSI analyses used three orthogonal components (two horizontal and one vertical) of a single ground motion time history that were developed to be in-column motions at the bottom of RB/FB and CB basemat levels. The site-specific ground motion time histories are compatible with the SSI FIRS developed in Subsection 3.7.1 and are used as input motions applied at the bottom of RB/FB and CB basemat levels in the Fermi 3 site-specific SSI analyses.

3.7.2.4.1.3 Soil-Structure Interaction Analysis Method

The analysis method follows Referenced DCD Subsection 3A.5.2 for SSI analysis using the SASSI2000 computer program. The SASSI2000 RB/FB and CB structural models are described in Subsection 3.7.2.4.1.4.

3.7.2.4.1.4 Soil-Structure Interaction Analysis Structural Models

The Fermi 3 site-specific SSI SASSI2000 structural models for the RB/FB and CB are constructed from the building stick models coupled with the foundation finite element model in the manner described in Referenced DCD Subsection 3A.7.3. The RB/FB and CB seismic models are shown in Referenced DCD Figures 3A.7-4 and 3A.7-6, respectively. The overall Fermi 3 site-specific SSI SASSI2000 models are shown on Figures 3.7.2-201 through 3.7.2-203 for the RB/FB, and on Figures 3.7.2-204 through 3.7.2-206 for the CB. The Fermi 3 site-specific SSI SASSI2000 structural model configurations are the same as those shown on Referenced DCD Figures 3A.7-8 through 3A.7-10 for the RB/FB and Figures 3A.7-11 through 3A.7-13 for the CB, except that the vertical spacing of the wall nodes between the top of the Bass Islands Group bedrock (Elevation –6770 mm in Figures 3.7.2-202 and 3.7.2-205) and the foundation basemat, (i.e. the embedded portion of the RB/FB and CB), are adjusted for a closer match with the Fermi 3 site-specific subsurface profile layers.

The subsurface layer thicknesses used in the RB/FB and CB Fermi 3 site-specific SSI analyses satisfy the SASSI2000 requirement that the subsurface layer thicknesses be limited to less than 20 percent of the shear wave length of the subsurface material the wave is passing through at the highest frequency of interest in the analysis (f_n). For the Fermi 3 site-specific SSI analyses, f_n is 50 Hz.

The SASSI2000 model X-direction and Y-direction represent plant north-south (NS) and east-west (EW) directions, respectively, at the Fermi 3 site. The SASSI2000 model Z-direction represents the vertical direction.

3.7.2.4.1.5 Soil-Structure Interaction Analysis Cases

The Fermi 3 site-specific SSI analyses cases are summarized in Tables 3.7.2-201 and 3.7.2-202 for the RB/FB and CB, respectively. To account for variability in the subsurface material properties at the Fermi 3 site, the BE, LB, and UB profiles were used in the site-specific SSI analyses. Each analysis case consists of three directions of excitation (two horizontal and one vertical) applied separately to the Fermi 3 site-specific SSI SASSI2000 model. The calculated resulting co-directional floor response spectra in the X-, Y-, and Z-directions are combined using the SRSS method. The resulting co-directional structural loads responses from each direction of excitation for each case are combined using algebraic sums in the time domain to obtain the total response.

3.7.2.4.1.6 Soil-Structure Interaction Analysis Results

In the following subsections, the results of the Fermi 3 site-specific SSI analyses for the BE, LB and UB subsurface profiles are presented and compared at key locations with the seismic design envelopes specified in Referenced DCD Subsection 3A.9 for maximum seismic structural loads and floor response spectra.

3.7.2.4.1.6.1 SSI Enveloping Maximum Structural Loads

For the RB/FB model, the enveloping seismic loads from the Fermi 3 site-specific SSI analyses based on the BE, LB and UB subsurface profiles (herein called Fermi 3 site-specific SSI enveloping seismic loads) are presented in Tables 3.7.2-203a through 3.7.2-203e.

The Fermi 3 site-specific SSI enveloping seismic loads for the RB/FB stick model are presented in Table 3.7.2-203a. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD enveloping seismic loads provided in Referenced DCD Table 3A.9-1a for the RB/FB stick model. Table 3.7.2-203a also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping seismic loads to the Referenced DCD enveloping seismic loads for the RB/FB stick model. Table 3.7.2-203a shows that the Fermi 3 site-specific SSI enveloping seismic loads for the RB/FB stick model are lower than the Referenced DCD enveloping seismic loads, with a maximum percentage ratio of approximately 55 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 55 percent of the enveloping seismic loads used in the ESBWR Standard Plant for the RB/FB.

The Fermi 3 site-specific SSI enveloping seismic loads for the Reinforced Concrete Containment Vessel (RCCV) stick model are presented in Table 3.7.2-203b. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD enveloping seismic loads provided in Referenced DCD Table 3A.9-1b for the RCCV stick model. Table 3.7.2-203b also presents the percentage ratio of the

Fermi 3 site-specific SSI enveloping seismic loads to the Referenced DCD enveloping seismic loads for the RCCV stick model. Table 3.7.2-203b shows that the Fermi 3 site-specific SSI enveloping seismic loads for the RCCV stick model are lower than the Referenced DCD enveloping seismic loads, with a maximum percentage ratio of approximately 45 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 45 percent of the enveloping seismic loads used in the ESBWR Standard Plant for the RCCV.

The Fermi 3 site-specific SSI enveloping seismic loads for the Vent Wall/Pedestal stick model are presented in Table 3.7.2-203c. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD enveloping seismic loads provided in Referenced DCD Table 3A.9-1c for the Vent Wall/Pedestal stick model. Table 3.7.2-203c also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping seismic loads to the Referenced DCD enveloping seismic loads for the Vent Wall/Pedestal stick model. Table 3.7.2-203c shows that the Fermi 3 site-specific SSI enveloping seismic loads for the Vent Wall/Pedestal stick model are lower than the Referenced DCD enveloping seismic loads, with a maximum percentage ratio of approximately 36 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 36 percent of the enveloping seismic loads used in the ESBWR Standard Plant for the Vent Wall/Pedestal.

The Fermi 3 site-specific SSI enveloping seismic loads for the Reactor Shield Wall (RSW) stick model are presented in Table 3.7.2-203d. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD enveloping seismic loads provided in Referenced DCD Table 3A.9-1d for the RSW stick model. Table 3.7.2-203d also presents the percentage ratio of the Fermi 3-site specific SSI enveloping seismic loads to the Referenced DCD enveloping seismic loads for the RSW stick model. Table 3.7.2-203d shows that the Fermi 3 site-specific SSI enveloping seismic loads for the RSW stick model are lower than the Referenced DCD enveloping seismic loads, with a maximum percentage ratio of approximately 40 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 40 percent of the enveloping seismic loads used in the ESBWR Standard Plant for the RSW.

The Fermi 3 site-specific SSI enveloping seismic loads for the Reactor Pressure Vessel (RPV) stick model are presented in Table 3.7.2-203e. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD SSI analysis enveloping seismic loads for the RPV stick model which are not presented in the Referenced DCD. Table 3.7.2-203e presents the percentage ratio of the Fermi 3 site-specific SSI enveloping seismic loads to the Referenced DCD SSI analysis enveloping seismic loads for the RPV stick model. Table 3.7.2-203e shows that the Fermi 3 site-specific SSI enveloping seismic loads for the RPV stick model are lower than the Referenced DCD SSI analysis enveloping seismic loads, with a maximum percentage ratio of approximately 60 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 60 percent of the enveloping seismic loads actually used in the ESBWR Standard Plant for the RPV.

For the CB model, the Fermi 3 site-specific SSI enveloping seismic loads for CB stick model are presented in Tables 3.7.2-204. The Fermi 3 site-specific SSI enveloping seismic loads are compared with the Referenced DCD enveloping seismic loads provided in Referenced DCD Table 3A.9-1f for the CB stick model. Table 3.7.2-204 also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping seismic loads to the Referenced DCD enveloping seismic loads for the CB stick model. Table 3.7.2-204 shows that the Fermi 3 site-specific SSI enveloping seismic loads for the CB stick model are lower than the Referenced DCD enveloping seismic loads, with a maximum percentage ratio of approximately 50 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping seismic load is approximately 50 percent of the enveloping seismic loads used in the ESBWR Standard Plant for the CB.

The vertical loads are expressed in terms of enveloping absolute acceleration. For the RB/FB model, the enveloping maximum vertical acceleration from Fermi 3 site-specific SSI analyses based on the BE, LB and UB subsurface profiles (herein called Fermi 3 site-specific SSI enveloping maximum vertical accelerations) are presented in Tables 3.7.2-205a through 3.7.2-205e.

The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RB/FB stick model are presented in Table 3.7.2-205a. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3a for the RB/FB stick model. Table 3.7.2-205a also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the RB/FB stick model. Table 3.7.2-205a shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RB/FB stick model are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 36 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 36 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the RB/FB.

The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RCCV stick model are presented in Table 3.7.2-205b. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3b for the RCCV stick model. Table 3.7.2-205b also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the RCCV stick model. Table 3.7.2-205b shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RCCV stick model are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 33 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 33 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the RCCV.

The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the Vent Wall/Pedestal stick model are presented in Table 3.7.2-205c. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3c for the Vent Wall/Pedestal stick model. Table 3.7.2-205c also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the Vent Wall/Pedestal stick model. Table 3.7.2-205c shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the Vent Wall/Pedestal stick model are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 34 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 34 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the Vent Wall/Pedestal.

The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RSW stick model are presented in Table 3.7.2-205d. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3d for the RSW stick model. Table 3.7.2-205d also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the RSW stick model. Table 3.7.2-205d shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RSW stick model are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 32 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 32 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the RSW.

The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RB/FB Flexible Slab Oscillators are presented in Table 3.7.2-205e. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3e for the RB/FB Flexible Slab Oscillators. Table 3.7.2-205e also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the RB/FB Flexible Slab Oscillators. Table 3.7.2-205e shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the RB/FB Flexible Slab Oscillators are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 42 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 42 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the RB/FB Flexible Slab Oscillators.

For the CB stick model, the Fermi 3 site-specific SSI enveloping maximum vertical accelerations are presented in Table 3.7.2-206. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the CB stick model are presented in Table 3.7.2-206. The SSI enveloping maximum vertical accelerations are compared with the Referenced DCD enveloping maximum vertical accelerations provided in Referenced DCD Table 3A.9-3g for the CB stick model. Table 3.7.2-206 also presents the percentage ratio of the Fermi 3 site-specific SSI enveloping maximum vertical accelerations to the Referenced DCD enveloping maximum vertical accelerations for the CB stick model. Table 3.7.2-206 shows that the Fermi 3 site-specific SSI enveloping maximum vertical accelerations for the CB stick model are lower than the Referenced DCD enveloping maximum vertical accelerations, with a maximum percentage ratio of approximately 50 percent. This indicates that the greatest Fermi 3 site-specific SSI enveloping maximum vertical acceleration is approximately 50 percent of the enveloping maximum vertical acceleration used in the ESBWR Standard Plant for the CB.

3.7.2.4.1.6.2 Comparison of the Site-Specific SSI Floor Response Spectra

The site-specific floor response spectra for the BE, LB, and UB subsurface profiles are compared with the enveloping floor response spectra at 5 percent damping in Referenced DCD Subsection 3A.9.2.

For the RB/FB model, the floor response spectra at 5 percent damping obtained from Fermi 3 site-specific SSI analyses for the BE, LB, and UB subsurface profiles (herein called Fermi 3 site-specific SSI floor response spectra at 5 percent damping) are shown on Figures 3.7.2-207a through 3.7.2-207f for the X direction, on Figures 3.7.2-208a through 3.7.2-208f for the Y direction, and on Figures 3.7.2-209a through 3.7.2-209f for the vertical direction. The Fermi 3 site-specific SSI floor response spectra at 5 percent damping are compared with the Referenced DCD Subsection 3A.9.2 enveloping floor response spectra at 5 percent damping on Figures 3.7.2-207 through 3.7.2-209 (solid black lines). The Fermi 3 site-specific SSI floor response spectra at 5 percent damping at the locations presented in the Referenced DCD, Subsection 3A.9.2 for the RB/FB model are considerably lower than the DCD enveloping floor response spectra at 5 percent damping, indicating that the ESBWR Standard Plant for the RB/FB is acceptable at the Fermi 3 site.

For the CB model, Fermi 3 site-specific SSI floor response spectra at 5 percent damping are shown on Figures 3.7.2-210a and 3.7.2-210b for the X-direction, on Figures 3.7.2-211a and 3.7.2-211b for the Y-direction, and on Figures 3.7.2-212a and 3.7.2-212b for the vertical direction. The Fermi 3 site-specific SSI floor response spectra at 5 percent damping are compared with the Referenced DCD Subsection 3A.9.2 enveloping floor response spectra at 5 percent damping as shown on Figures 3.7.2-210 through 3.7.2-212 (solid black lines). The Fermi 3 site-specific SSI floor response spectra at 5 percent damping at the locations presented in the Referenced DCD, Subsection 3A.9.2 in the CB model are considerably lower than the DCD enveloping floor response spectra at 5 percent damping, indicating that the ESBWR Standard Plant design for the CB is acceptable at the Fermi 3 site.

3.7.2.4.1.7 Conclusions

The results of the Fermi 3 site-specific SSI analyses for the RB/FB and CB performed to consider partial embedment into the Bass Islands Group bedrock, without taking credit for the lateral support of the backfill located above the top of Bass Islands Group bedrock (Elevation 168.2 m [552.0 ft] NAVD 88, Table 2.5.4-201) shows the following:

- That seismic forces, floor response spectra, and accelerations are significantly less than for the Referenced DCD design values for the ESBWR Standard Plant based on the CSDRS.
- That the factors of safety for sliding and overturning are significantly greater than the required factor of safety of 1.1 in SRP 3.8.5.
- That the dynamic bearing demands are much smaller than the allowable dynamic bearing capacity on the Bass Islands Group dolomite presented in Table 2.5.4-227.

The results from the Fermi 3 site-specific SSI analyses using the BE, LB, and UB subsurface profiles show that the seismic forces in members, floor response spectra, and acceleration are bounded by values presented in the Referenced DCD for both the RB/FB and CB. In addition, Subsection 3.8.5 demonstrates that the actual factors of safety for overturning and sliding are greater than the required factors of safety.

The Fermi 3 site-specific SSI soil dynamic bearing demands for the RB/FB and CB are greater than the Referenced DCD maximum dynamic bearing demands for the material properties consistent with the BE, LB, and UB subsurface profiles (Subsection 3.8.5). However, the Fermi 3 site-specific SSI dynamic bearing demands for the RB/FB and CB are less than the allowable dynamic bearing capacity in Subsection 2.5.4.10, Table 2.5.4-227.

Based on the Fermi 3 site-specific SSI analyses, the following conclusions apply to the Fermi 3 site:

- The Referenced DCD standard plant design (ESBWR Standard Plant) is applicable to the RB/FB and CB Seismic Category I structures at the Fermi 3 site with partial embedment into bedrock and neglecting the contribution of the surrounding backfill.
- The DCD backfill requirements for the backfill above the top of the Bass Islands Group bedrock (Elevation168.2 m [552 ft] NAVD 88) that surrounds the embedded walls of the Fermi 3 Seismic Category I structures are shown to be unnecessary. Therefore, the backfill above the top of the Bass Islands Group bedrock is not Seismic Category I backfill.

- The following Fermi 3 site-specific SSI dynamic responses using the SSI FIRS and the BE, LB and UB subsurface profiles are less than the corresponding dynamic responses in the referenced DCD using the CSDRS:
  - Fermi 3 site-specific SSI enveloping seismic loads are less than the Referenced DCD enveloping seismic loads. The Fermi 3 site-specific SSI enveloping seismic loads are a maximum of 60 and 50 percent of the Referenced DCD values for the RB/FB and CB, respectively.
  - Fermi 3 site-specific SSI enveloping maximum vertical accelerations are less than the Referenced DCD enveloping maximum vertical accelerations. The Fermi 3 site-specific SSI enveloping maximum vertical accelerations are a maximum of 42 and 50 percent of the Referenced DCD values for the RB/FB and CB, respectively.
  - Fermi 3 site-specific SSI floor response spectra are considerably less than the Referenced DCD enveloping floor response spectra at the same locations.
- The Fermi 3 site-specific foundation stability (sliding and overturning) evaluation was performed without taking credit for the backfill located above the top of the Bass Islands Group bedrock that surrounds the embedded walls of the RB/FB and CB, and by neglecting the side frictional resistance along the sides of the basemats and the shear keys beneath the basemats. The Fermi 3 site-specific foundation stability evaluation demonstrated that the minimum Fermi 3 site-specific factors of safety for sliding and overturning for the RB/FB and CB are 3.09 for sliding and 1,029 for overturning (presented in Subsection 3.8.5).
- The Fermi 3 RB/FB and CB are stable against floatation with a minimum factor of safety of 1.85 (presented in Subsection 3.8.5).
- The dynamic bearing demands from the Fermi 3 site-specific SSI analyses are considerably below the allowable dynamic bearing capacities for the Bass Islands Group bedrock at the Fermi 3 site (presented in Subsection 3.8.5).

Insert 3.7.2.8-1

For the Seismic Category II structures and Radwaste Building, Fermi 3 site-specific analyses will be performed if the Referenced DCD backfill requirements are not met.

Insert 3.7.2.14-1

3.7.2.14 Determination of Seismic Category I Structure Overturning Moments

Add the following at the end of the Subsection 3.7.2.14.

The Fermi 3 site-specific stability evaluation against overturning is presented in Subsection 3.8.5.

Table 3.7.2-201 RB/FB Soil-Structure Interaction Analysis Cases

Building	Case ID No.	Model * (DCD)	Input Motion	Subsurface Profile BE	Subsurface Profile LB	Subsurface Profile UB
	RFI-1			✓	--	--
RB/FB	RFI-2	Base	FIRS	--	✓	--
	RFI-3			--	--	✓

Note *: As shown in the DCD Table 3A.6-1, there are some models with minor modifications to evaluate the modeling effects. For this Fermi 3 SSI analyses, the most basic model, "Base" is applied.

BE = Best estimate

LB = Lower bound

UB = Upper bound

Table 3.7.2-202 CB Soil-Structure Interaction Analysis Cases

Building	Case ID No.	Model * (DCD)	Input Motion	Subsurface Profile		
				BE	LB	UB
CB	CFI-1	Base	FIRS	✓	--	--
	CFI-2			--	✓	--
	CFI-3			--	--	✓

Note *: As shown in the DCD Table 3A.6-1, there are some models with minor modifications to evaluate the modeling effects. For this Fermi 3 SSI analyses, the most basic model, "Base" is applied.

BE = Best estimate

LB = Lower bound

UB = Upper bound

Table 3.7.2-203a Ratio with DCD Enveloping Seismic Loads: RB/FB Stick model

Elev. (m)	Elem No.	Node No.	Fermi 3 SSI Enveloping Seismic Loads: Shear X-Dir. (MN)	Shear Y-Dir. (MN)	Moment X-Dir. (MN-m)	Moment Y-Dir. (MN-m)	Torsion (MN-m)	Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads): Shear X-Dir.	Shear Y-Dir.	Moment X-Dir.	Moment Y-Dir.	Torsion
52.40 *	1110	110			904.0	915.4				55%	51%	
		109	60.8	70.2	1968.1	2035.5	552.8	40%	44%	46%	46%	40%
34.00	1109	109			2683.6	2694.0				48%	49%	
		108	67.7	61.1	2938.7	2956.9	812.3	35%	40%	45%	47%	34%
27.00	1108	108			3223.2	3354.1				42%	47%	
		107	155.0	143.7	3430.6	3807.8	1257.6	36%	36%	38%	44%	38%
22.50	1107	107			3722.4	4062.0				38%	44%	
		106	173.3	164.1	4407.7	4600.7	2267.1	36%	35%	38%	41%	37%
17.50	1106	106			4832.7	4846.0				39%	41%	
		105	185.9	192.1	5422.2	5302.2	1973.9	35%	35%	39%	38%	39%
13.57	1105	105			5640.4	5494.9				39%	38%	
		104	196.0	203.3	6320.8	6026.5	2135.1	34%	34%	38%	36%	41%
9.06	1104	104			6485.3	6186.0				38%	36%	
		103	211.6	213.4	7135.0	6737.9	2387.5	35%	33%	37%	34%	40%
4.65	1103	103			4685.8	3955.3				25%	20%	
		102	253.4	213.7	5608.5	4661.0	2872.2	30%	25%	24%	19%	25%
-1.00	1102	102			5720.4	4941.8				24%	20%	
		101	279.3	239.5	7017.3	5735.0	3184.9	32%	26%	25%	20%	28%
-6.40	1101	101			5137.1	4489.2				18%	15%	
-11.50		2	133.3	113.8	5338.8	4541.8	1957.5	14%	11%	17%	13%	17%

Note: Total torsional moments are obtained by the absolute sum of the accidental torsional moments and the values of the geometric torsional moments shown. The accidental torsional moment is the product of the horizontal force component and an eccentricity of 5% of the larger horizontal dimension at various elevations.

* : The difference between the modeled elevation 52.4 m and the actual elevation 52.7 m at the RB roof is negligibly small.

MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-203b Ratio with DCD Enveloping Seismic Loads: RCCV Stick model

			Fermi 3 SSI Enveloping Seismic Loads					Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)				
			Shear		Moment			Shear		Moment		
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	Torsion (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.	Torsion
34.00	1209	209			76.6	194.4				39%	33%	
		208	58.5	74.9	431.3	648.8	12.2	43%	41%	41%	43%	34%
27.00	1208	208			741.6	1139.5				43%	45%	
		206	65.3	80.7	1133.0	1658.8	703.3	40%	32%	38%	38%	39%
17.50	1206	206			1235.3	1948.9				37%	41%	
		205	85.8	88.6	1495.5	2140.0	781.3	37%	31%	36%	37%	39%
13.57	1205	205			1545.1	2290.9				36%	39%	
		204	94.5	99.7	1853.1	2512.3	893.5	36%	31%	34%	35%	41%
9.06	1204	204			1918.7	2703.5				34%	36%	
		203	102.9	109.8	2248.1	2923.5	1048.9	34%	30%	33%	33%	40%
4.65	1203	203			2322.9	3101.6				33%	34%	
		202	58.6	68.1	2600.8	3255.7	773.8	26%	24%	33%	31%	27%
-1.00	1202	202			2667.8	3382.1				33%	31%	
		201	80.0	81.7	3024.4	3698.8	806.6	29%	25%	32%	30%	28%
-6.40	1201	201			3071.9	3751.2				32%	30%	
-11.50		2	32.5	31.3	3205.1	3810.9	324.6	12%	10%	30%	27%	17%

Note: Total torsional moments are obtained by the absolute sum of the accidental torsional moments and the values of the geometric torsional moments shown. The accidental torsional moment is the product of the horizontal force component and an eccentricity of 5% of the larger horizontal dimension at various elevations.

MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-203c Ratio with DCD Enveloping Seismic Loads: Vent Wall/Pedestal Stick model

Elev. (m)	Elem No.	Node No.	Fermi 3 SSI Enveloping Seismic Loads: Shear X-Dir. (MN)	Shear Y-Dir. (MN)	Moment X-Dir. (MN-m)	Moment Y-Dir. (MN-m)	Torsion (MN-m)	Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads): Shear X-Dir.	Shear Y-Dir.	Moment X-Dir.	Moment Y-Dir.	Torsion
17.50	701	701			22.9	19.4				30%	23%	
		702	6.5	7.0	27.7	27.1	11.8	19%	19%	24%	20%	10%
14.50	702	702			30.4	32.5				26%	22%	
		703	6.4	7.1	38.0	47.7	12.7	18%	18%	17%	18%	11%
11.50	703	703			39.3	48.0				17%	18%	
		704	7.4	9.1	50.2	64.7	13.9	20%	22%	15%	17%	12%
8.50	704	704			51.5	65.5				15%	17%	
		705	8.2	9.6	56.1	71.3	14.7	22%	21%	15%	16%	12%
7.4625	705	705			70.8	75.3				20%	17%	
		706,303	4.9	5.5	77.9	86.7	7.6	12%	14%	17%	16%	8%
4.65	1303	303			187.7	192.6				32%	31%	
		377	11.1	13.8	184.2	204.8	38.1	34%	31%	31%	31%	27%
2.4165	1377	377			226.6	252.1				31%	31%	
		302	16.5	20.5	229.2	277.4	46.4	34%	31%	29%	30%	27%
-1.00	1302	302			207.5	241.4				25%	25%	
		376	23.5	22.9	236.6	271.6	40.3	36%	28%	25%	26%	28%
-2.75	1376	376			236.7	271.7				25%	26%	
		301	23.7	23.1	304.7	331.4	40.3	36%	28%	27%	25%	28%
-6.40	1301	301			287.5	327.2				25%	24%	
-11.50		2	12.4	11.4	334.8	355.7	19.5	12%	9%	20%	18%	17%

Note: Total torsional moments are obtained by the absolute sum of the accidental torsional moments and the values of the geometric torsional moments shown. The accidental torsional moment is the product of the horizontal force component and an eccentricity of 5% of the larger horizontal dimension at various elevations.

MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-203d Ratio with DCD Enveloping Seismic Loads: RSW Stick model

			Fermi 3 SSI Enveloping Seismic Loads					Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)				
			Shear		Moment			Shear		Moment		
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	Torsion (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.	Torsion
24.18	707	707			0.81	0.61				39%	36%	
			0.93	0.75	4.32	3.39	0.13	31%	28%	33%	27%	34%
20.20	708	708			6.88	4.96				37%	29%	
			4.95	4.38	25.85	24.33	0.47	34%	36%	33%	36%	34%
15.775	709	709			26.70	25.40				33%	36%	
			5.63	5.07	51.08	47.92	0.66	33%	35%	32%	36%	35%
11.35	710	710			51.29	48.14				32%	35%	
			6.23	5.58	75.47	69.93	0.68	31%	34%	32%	35%	29%
7.4625	711	711			68.34	72.73				35%	40%	
			12.65	14.14	88.84	100.69	8.05	31%	40%	30%	40%	34%
4.65	712	712			41.81	40.90				33%	31%	
			4.84	5.94	41.43	46.23	8.13	34%	31%	31%	31%	27%
2.4165	713	713			1.26	1.09				35%	34%	
			0.45	0.44	1.07	0.88	0.06	30%	35%	37%	33%	27%
1.96	714	714			0.95	0.85				35%	36%	
-0.80		715	0.29	0.27	0.17	0.16	0.04	33%	36%	33%	30%	28%

Note: Total torsional moments are obtained by the absolute sum of the accidental torsional moments and the values of the geometric torsional moments shown. The accidental torsional moment is the product of the horizontal force component and an eccentricity of 5% of the larger horizontal dimension at various elevations.

MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model

			Fermi 3 SSI Enveloping Seismic Loads				Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)			
			Shear		Moment		Shear		Moment	
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.
27.64	801	801			0.0	0.0				
26.792		802	0.2	0.2	0.2	0.1	39%	32%	39%	32%
26.792	802	802			0.2	0.1			39%	32%
25.944		803	0.7	0.5	0.8	0.6	40%	32%	40%	32%
25.944	803	803			0.8	0.6			40%	32%
25.03		804	1.3	1.0	1.9	1.5	40%	32%	40%	32%
25.03	804	804			1.9	1.5			40%	32%
24.3188		805	1.8	1.5	3.2	2.5	40%	35%	40%	33%
24.3188	805	805			3.2	2.5			40%	33%
22.276		806	2.4	2.0	8.2	6.7	40%	34%	40%	34%
22.276	806	806			8.2	6.7			40%	34%
21.8247		807	3.3	2.7	9.7	7.9	41%	34%	40%	34%
21.8247	807	807			9.7	7.9			40%	34%
20.2		808	3.7	3.0	15.6	12.7	41%	34%	40%	34%
20.2	808	808			15.6	12.7			40%	34%
19.5278		809	1.1	1.1	16.3	13.3	30%	35%	40%	35%
19.5278	809	809			16.3	13.3			40%	35%
17.2677		810	1.8	1.7	20.4	17.0	35%	41%	40%	37%
17.2677	810	810			20.4	17.0			40%	37%
16.365		811	2.4	2.2	22.6	18.8	39%	41%	40%	37%
16.365	811	811			22.6	18.8			40%	37%
14.51		812	4.1	3.2	29.0	23.4	46%	40%	43%	37%
14.51	812	812			29.0	23.4			43%	37%
12.491		813	3.7	2.9	36.4	29.0	39%	37%	43%	37%

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model (Continued)

			Fermi 3 SSI Enveloping Seismic Loads				Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)			
			Shear		Moment		Shear		Moment	
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.
12.491	813	813			36.4	29.0			43%	37%
10.472		814	3.5	2.7	42.5	34.0	35%	35%	41%	37%
10.472	814	814			42.5	34.0			41%	37%
8.453		815	3.7	3.4	47.4	38.1	37%	38%	38%	36%
8.453	815	815			28.0	21.3			39%	35%
7.8071		816	5.2	4.2	24.8	19.2	41%	37%	39%	35%
7.8071	816	816			24.8	19.2			39%	35%
7.111		817	5.1	3.9	21.3	17.1	41%	35%	38%	36%
7.111	817	817			21.3	17.1			38%	36%
6.401		818	5.0	3.6	17.9	16.5	41%	33%	38%	41%
6.401	818	818			17.9	16.5			38%	41%
5.691		819	5.3	3.4	15.3	12.8	45%	32%	37%	38%
5.691	819	819			15.3	12.8			37%	38%
4.981		820	4.7	3.1	13.5	11.3	41%	30%	37%	41%
4.981	820	820			13.5	11.3			37%	41%
4.2713		821	4.5	3.0	11.6	9.5	43%	30%	36%	43%
4.2713	821	821			11.6	9.5			36%	43%
3.7593		822	4.5	2.9	11.2	8.6	45%	31%	37%	41%
3.7593	822	822			11.2	8.6			37%	41%
3.215		823	4.5	2.9	11.4	8.8	48%	31%	41%	44%
3.215	823	823			11.4	8.8			41%	44%
2.365		824	4.4	2.8	11.9	9.4	49%	31%	48%	45%
2.365	824	824			3.3	2.8			38%	44%
1.785		825	2.2	1.9	2.0	1.7	38%	44%	39%	44%
1.785	825	825			2.0	1.7			39%	44%
1.2		826	2.0	1.8	0.8	0.7	39%	46%	38%	37%

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model (Continued)

Elev. (m)	Elem No.	Node No.	Fermi 3 SSI Enveloping Seismic Loads: Shear X-Dir. (MN)	Fermi 3 SSI Enveloping Seismic Loads: Shear Y-Dir. (MN)	Fermi 3 SSI Enveloping Seismic Loads: Moment X-Dir. (MN-m)	Fermi 3 SSI Enveloping Seismic Loads: Moment Y-Dir. (MN-m)	Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads): Shear X-Dir.	Ratio: Shear Y-Dir.	Ratio: Moment X-Dir.	Ratio: Moment Y-Dir.
1.2	826	826			0.8	0.7			38%	37%
0.7657		827	1.7	1.6	0.2	0.2	40%	47%	39%	30%
0.7657	827	827			0.2	0.2			35%	32%
-0.1315		828	1.2	1.1	1.2	1.1	38%	48%	38%	50%
8.453	871	815			54.8	53.5			38%	39%
7.4625		711	9.0	6.6	55.7	56.9	48%	37%	39%	42%
21.8247	828	829			0.0	0.0				
20.2		830	0.1	0.1	0.1	0.2	23%	25%	23%	25%
20.2	829	830			0.1	0.2			23%	25%
19.5278		831	0.3	0.6	0.7	0.9	36%	64%	53%	60%
19.5278	830	831			0.7	0.9			53%	60%
17.2677		832	0.4	0.4	1.2	1.2	29%	26%	30%	27%
17.2677	831	832			1.2	1.2			30%	27%
16.365		833	0.6	0.5	1.7	1.6	46%	31%	33%	28%
16.365	832	833			1.7	1.6			33%	28%
14.51		834	2.1	1.3	4.1	3.7	42%	26%	44%	38%
14.51	833	834			4.1	3.7			44%	38%
12.491		835	1.4	0.7	7.1	4.7	45%	23%	48%	32%
12.491	834	835			7.1	4.7			48%	32%
10.472		836	0.6	0.5	7.2	5.2	36%	25%	44%	31%
10.472	835	836			7.2	5.2			44%	31%
8.453		837	1.1	0.9	5.7	3.3	41%	40%	39%	22%
8.453	836	837			5.7	3.3			39%	22%
7.8071		838	1.5	1.1	4.8	2.9	42%	35%	36%	20%

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model (Continued)

			Fermi 3 SSI Enveloping Seismic Loads				Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)			
			Shear		Moment		Shear		Moment	
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.
7.8071	837	838			4.8	2.9			36%	20%
7.111		839	1.9	1.4	3.9	2.6	46%	33%	34%	20%
7.111	838	839			3.9	2.6			34%	20%
6.401		840	2.2	1.5	3.0	2.5	48%	34%	28%	22%
6.401	839	840			3.0	2.5			28%	22%
5.691		841	2.8	1.7	2.6	2.4	54%	34%	25%	23%
5.691	840	841			2.6	2.4			25%	23%
4.981		842	3.2	2.0	3.8	2.9	55%	35%	42%	27%
4.981	841	842			3.8	2.9			42%	27%
4.2713		843	3.4	2.1	5.3	3.6	54%	36%	48%	33%
4.2713	842	843			5.3	3.6			48%	33%
3.7593		844	3.6	2.2	6.6	4.4	55%	37%	48%	36%
3.7593	843	844			6.6	4.4			48%	36%
3.215		845	3.0	1.8	7.6	5.7	43%	28%	47%	40%
3.215	844	845			7.6	5.7			47%	40%
2.365		846	3.2	2.6	10.1	7.3	44%	37%	47%	42%
0.7657	859	827			0.0	0.0			25%	20%
-0.788		861	0.1	0.1	0.1	0.1	40%	32%	39%	38%
-0.788	861	861			0.1	0.1			39%	38%
-1.443		863	0.0	0.0	0.1	0.1	32%	32%	40%	43%
-1.443	863	863			0.1	0.1			40%	43%
-2.098		865	0.0	0.0	0.1	0.1	38%	28%	42%	40%
-2.098	865	865			0.1	0.1			42%	40%
-2.753		867	0.1	0.1	0.1	0.1	36%	32%	39%	37%

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model (Continued)

			Fermi 3 SSI Enveloping Seismic Loads				Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads)			
			Shear		Moment		Shear		Moment	
Elev. (m)	Elem No.	Node No.	X-Dir. (MN)	Y-Dir. (MN)	X-Dir. (MN-m)	Y-Dir. (MN-m)	X-Dir.	Y-Dir.	X-Dir.	Y-Dir.
-2.753	867	867			0.1	0.1			39%	37%
-3.4715		869	0.1	0.1	0.0	0.0	39%	37%	39%	37%
-3.4715	869	869			0.0	0.0			39%	37%
-4.2237		871	0.0	0.1	0.0	0.0	39%	37%	0%	0%
7.896	845	847			0.0	0.0				
7.8071		848	0.4	0.6	0.0	0.0	35%	51%	35%	51%
7.8071	846	848			0.0	0.0			35%	51%
7.111		849	0.4	0.5	0.3	0.4	35%	52%	35%	52%
7.111	847	849			0.3	0.4			35%	52%
6.401		850	0.3	0.3	0.5	0.7	45%	53%	37%	53%
6.401	848	850			0.5	0.7			37%	53%
5.691		851	0.1	0.1	0.5	0.7	38%	34%	40%	54%
5.691	849	851			0.5	0.7			40%	54%
4.981		852	0.3	0.3	0.3	0.5	46%	50%	42%	56%
4.981	850	852			0.3	0.5			42%	56%
4.2713		853	0.4	0.6	0.0	0.1	41%	55%	45%	54%
4.2713	851	853			0.0	0.1			45%	54%
4.1784		854	0.5	0.6	0.0	0.0	45%	54%	3%	4%
4.1784	852	854			0.0	0.0			1%	1%
4.065		855	0.4	0.4	0.1	0.0	40%	52%	40%	52%
4.065	853	855			0.1	0.0			40%	52%
3.215		856	0.4	0.4	0.4	0.3	39%	52%	39%	52%
3.215	854	856			0.4	0.3			39%	52%
2.365		857	0.1	0.1	0.5	0.4	38%	47%	38%	52%

Table 3.7.2-203e Ratio with DCD Enveloping Seismic Loads: RPV Stick model (Continued)

Elev. (m)	Elem No.	Node No.	Fermi 3 SSI Enveloping Seismic Loads: Shear X-Dir. (MN)	Fermi 3 SSI Enveloping Seismic Loads: Shear Y-Dir. (MN)	Fermi 3 SSI Enveloping Seismic Loads: Moment X-Dir. (MN-m)	Fermi 3 SSI Enveloping Seismic Loads: Moment Y-Dir. (MN-m)	Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads): Shear X-Dir.	Ratio: Shear Y-Dir.	Ratio: Moment X-Dir.	Ratio: Moment Y-Dir.
2.365	855	857			0.5	0.4			38%	52%
1.785		858	0.2	0.2	0.3	0.3	39%	52%	38%	51%
1.785	856	858			0.3	0.3			38%	51%
1.2		859	0.5	0.5	0.0	0.0	38%	51%	6%	17%
1.2	857	859			0.0	0.0			2%	5%
0.7657		860	0.7	0.7	0.3	0.3	38%	51%	38%	51%
0.7657	858	860			0.3	0.3			38%	51%
-0.1315		828	0.9	0.8	1.1	1.0	38%	52%	38%	52%
-0.1315	860	828			0.1	0.1			34%	33%
-0.788		862	0.1	0.1	0.1	0.1	36%	30%	39%	41%
-0.788	862	862			0.1	0.1			39%	41%
-1.443		864	0.0	0.0	0.1	0.1	36%	24%	38%	43%
-1.443	864	864			0.1	0.1			38%	43%
-2.098		866	0.0	0.0	0.1	0.1	32%	28%	40%	42%
-2.098	866	866			0.1	0.1			40%	42%
-2.753		868	0.1	0.1	0.1	0.1	37%	29%	40%	35%
-2.753	868	868			0.1	0.1			40%	35%
-3.4715		870	0.1	0.1	0.0	0.0	40%	36%	39%	35%
-3.4715	870	870			0.0	0.0			39%	35%
-4.2237		872	0.0	0.1	0.0	0.0	39%	35%	0%	0%

MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-204 Ratio with DCD Enveloping Seismic Loads: CB Stick model

Elev. (m)	Elem No.	Node No.	Fermi 3 SSI Enveloping Seismic Loads: Shear X-Dir. (MN)	Shear Y-Dir. (MN)	Moment X-Dir. (MN-m)	Moment Y-Dir. (MN-m)	Torsion (MN-m)	Ratio of (Fermi 3 SSI Enveloping Seismic Loads) to (DCD Enveloping Seismic Loads): Shear X-Dir.	Shear Y-Dir.	Moment X-Dir.	Moment Y-Dir.	Torsion
13.80	6	6			44.1	34.0				28%	27%	
			14.5	14.6	96.5	85.1	10.8	44%	50%	39%	43%	15%
9.06	5	5			128.4	104.1				36%	38%	
			26.0	25.7	233.1	211.7	21.3	49%	47%	41%	48%	17%
4.65	4	4			131.1	68.2				18%	13%	
			33.8	32.8	355.5	284.0	20.0	45%	41%	31%	29%	11%
-2.00	3	3			297.3	282.4				24%	27%	
-7.40		2	38.3	36.2	504.0	472.0	24.4	31%	36%	32%	31%	10%

Note: Total torsional moments are obtained by the absolute sum of the accidental torsional moments and the values of the geometric torsional moments shown. The accidental torsional moment is the product of the horizontal force component and an eccentricity of 5% of the larger horizontal dimension at various elevations.
MN = Mega Newton; MN-m = Mega Newton-meter; m = meter

Table 3.7.2-205a Ratio with DCD Enveloping Maximum Vertical Acceleration: RB/FB

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration)
			Max. Vertical Acceleration (g)	Max. Vertical Acceleration
52.40 *	110	RB/FB	0.34	27%
34.00	109	RB/FB	0.29	36%
27.00	108	RB/FB	0.25	34%
22.50	107	RB/FB	0.25	34%
17.50	106	RB/FB	0.21	29%
13.57	105	RB/FB	0.20	28%
9.06	104	RB/FB	0.19	27%
4.65	103	RB/FB	0.19	25%
-1.00	102	RB/FB	0.18	24%
-6.40	101	RB/FB	0.17	25%
-11.50	2	RB/FB	0.16	26%
-15.50	1	RB/FB	0.16	32%

Note: For structural design use only.

* : The difference between the modeled elevation 52.4 m and the actual elevation 52.7 m at the RB roof is negligibly small.

m = meter

Table 3.7.2-205b Ratio with DCD Enveloping Maximum Vertical Acceleration: RCCV

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration: Max. Vertical Acceleration (g)	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration): Max. Vertical Acceleration
34.00	209	RCCV	0.29	33%
27.00	208	RCCV	0.29	33%
17.50	206	RCCV	0.23	31%
13.57	205	RCCV	0.21	27%
9.06	204	RCCV	0.19	29%
4.65	203	RCCV	0.18	26%
-1.00	202	RCCV	0.17	29%
-6.40	201	RCCV	0.17	29%

Note: For structural design use only.
m = meter

Table 3.7.2-205c Ratio with DCD Enveloping Maximum Vertical Acceleration: VW/Pedestal

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration)
			Max. Vertical Acceleration (g)	Max. Vertical Acceleration
17.50	701	VW	0.23	21%
14.50	702	VW	0.22	21%
11.50	703	VW	0.23	24%
8.50	704	VW	0.22	29%
7.4625	705	VW	0.21	30%
4.65	706,303	Pedestal	0.21	32%
-1.00	302	Pedestal	0.18	31%
-6.40	301	Pedestal	0.17	34%

Note: For structural design use only.
m = meter

Table 3.7.2-205d Ratio with DCD Enveloping Maximum Vertical Acceleration: RSW

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration Max. Vertical Acceleration (g)	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration) Max. Vertical Acceleration
24.18	707	RSW	0.26	26%
20.20	708	RSW	0.26	27%
15.775	709	RSW	0.24	28%
11.35	710	RSW	0.22	29%
7.4625	711	RSW	0.21	30%
4.65	712	RSW	0.21	32%
2.4615	713	RSW	0.20	32%
1.96	714	RSW	0.20	32%
-0.80	715	RSW	0.20	32%

Note: For structural design use only.
m = meter

Table 3.7.2-205e Ratio with DCD Enveloping Maximum Vertical Acceleration: RB/FB Flexible Slab Oscillators

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration Max. Vertical Acceleration (g)	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration) Max. Vertical Acceleration
52.40 *	9101	Oscillator	0.20	17%
	9102	Oscillator	0.52	29%
	9103	Oscillator	0.80	25%
	9104	Oscillator	0.63	26%
	9105	Oscillator	0.59	26%
	9106	Oscillator	0.71	24%
	9107	Oscillator	0.71	25%
	9108	Oscillator	0.49	19%
34.00	9091	Oscillator	0.35	28%
	9092	Oscillator	0.33	30%
27.00	9081	Oscillator	0.35	30%
	9082	Oscillator	0.32	33%
	9083	Oscillator	0.28	26%
	9084	Oscillator	0.35	27%
	9085	Oscillator	0.31	32%
22.50	9071	Oscillator	0.50	31%
	9072	Oscillator	0.55	42%
	9073	Oscillator	0.62	31%
	9074	Oscillator	0.37	28%
	9075	Oscillator	0.34	29%
17.50	9061	Oscillator	0.48	27%
	9062	Oscillator	0.49	33%
	9063	Oscillator	0.27	32%
	9064	Oscillator	0.53	29%
	9065	Oscillator	0.30	21%

Table 3.7.2-205e Ratio with DCD Enveloping Maximum Vertical Acceleration: RB/FB Flexible Slab Oscillators (Continued)

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration)
			Max. Vertical Acceleration (g)	Max. Vertical Acceleration
13.57	9051	Oscillator	0.24	29%
	9052	Oscillator	0.29	20%
9.06	9041	Oscillator	0.26	29%
	9042	Oscillator	0.27	19%
4.65	9031	Oscillator	0.39	34%
	9032	Oscillator	0.27	28%
	9033	Oscillator	0.35	35%
	9034	Oscillator	0.39	26%
	9035	Oscillator	0.27	20%
-1.00	9021	Oscillator	0.32	29%
	9022	Oscillator	0.45	31%
	9023	Oscillator	0.29	29%
	9024	Oscillator	0.33	37%
	9025	Oscillator	0.31	23%
	9026	Oscillator	0.42	26%
	9027	Oscillator	0.27	31%
-6.40	9011	Oscillator	0.31	34%
	9012	Oscillator	0.35	38%
	9013	Oscillator	0.33	25%

Note: For structural design use only.

* : The difference between the modeled elevation 52.4 m and the actual elevation 52.7 m at the RB roof is negligibly small.

m = meter

Table 3.7.2-206 Ratio with DCD Enveloping Maximum Vertical Acceleration: CB

Elev. (m)	Node No.	Stick Model	Fermi 3 SSI Enveloping Maximum Vertical Acceleration: X-dir. (g)	Fermi 3 SSI Enveloping Maximum Vertical Acceleration: Y-dir. (g)	Fermi 3 SSI Enveloping Maximum Vertical Acceleration: Max. Vertical Acceleration (g)	Ratio of (Fermi 3 SSI Enveloping Maximum Vertical Acceleration) to (DCD Enveloping Maximum Vertical Acceleration): X-dir.	Ratio: Y-dir.	Ratio: Max. Vertical Acceleration
13.80	6	CB	0.56	0.56	0.30	45%	50%	30%
9.06	5	CB	0.42	0.43	0.29	48%	48%	34%
4.65	4	CB	0.39	0.31	0.25	45%	38%	34%
-2.00	3	CB	0.25	0.27	0.18	32%	38%	32%
-7.40	2	CB	0.21	0.21	0.18	39%	39%	36%
-10.40	1	CB	0.21	0.21	0.18	39%	40%	36%
13.80	9001	Oscillator	---	---	0.85	---	---	39%
	9002	Oscillator	---	---	0.63	---	---	47%
	9003	Oscillator	---	---	0.55	---	---	39%
9.06	9101	Oscillator	---	---	0.75	---	---	38%
	9102	Oscillator	---	---	0.52	---	---	41%
	9103	Oscillator	---	---	0.56	---	---	39%
4.65	9201	Oscillator	---	---	0.44	---	---	34%
	9202	Oscillator	---	---	0.46	---	---	32%
-2.00	9301	Oscillator	---	---	0.46	---	---	33%

Note: For structural design use only.
m = meter

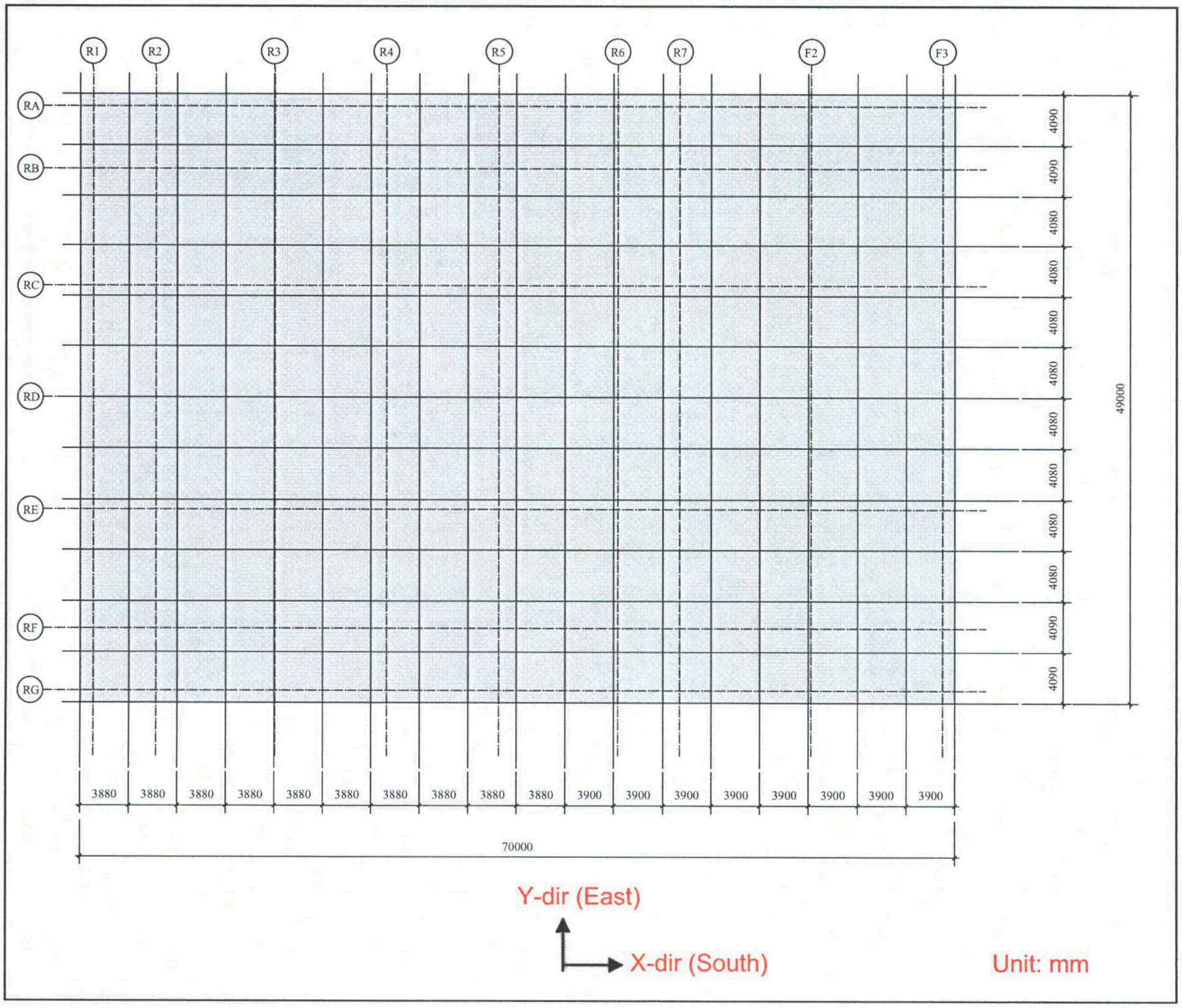

Figure 3.7.2-201 SASSI2000 Plate Elements for RB/FB Basemat

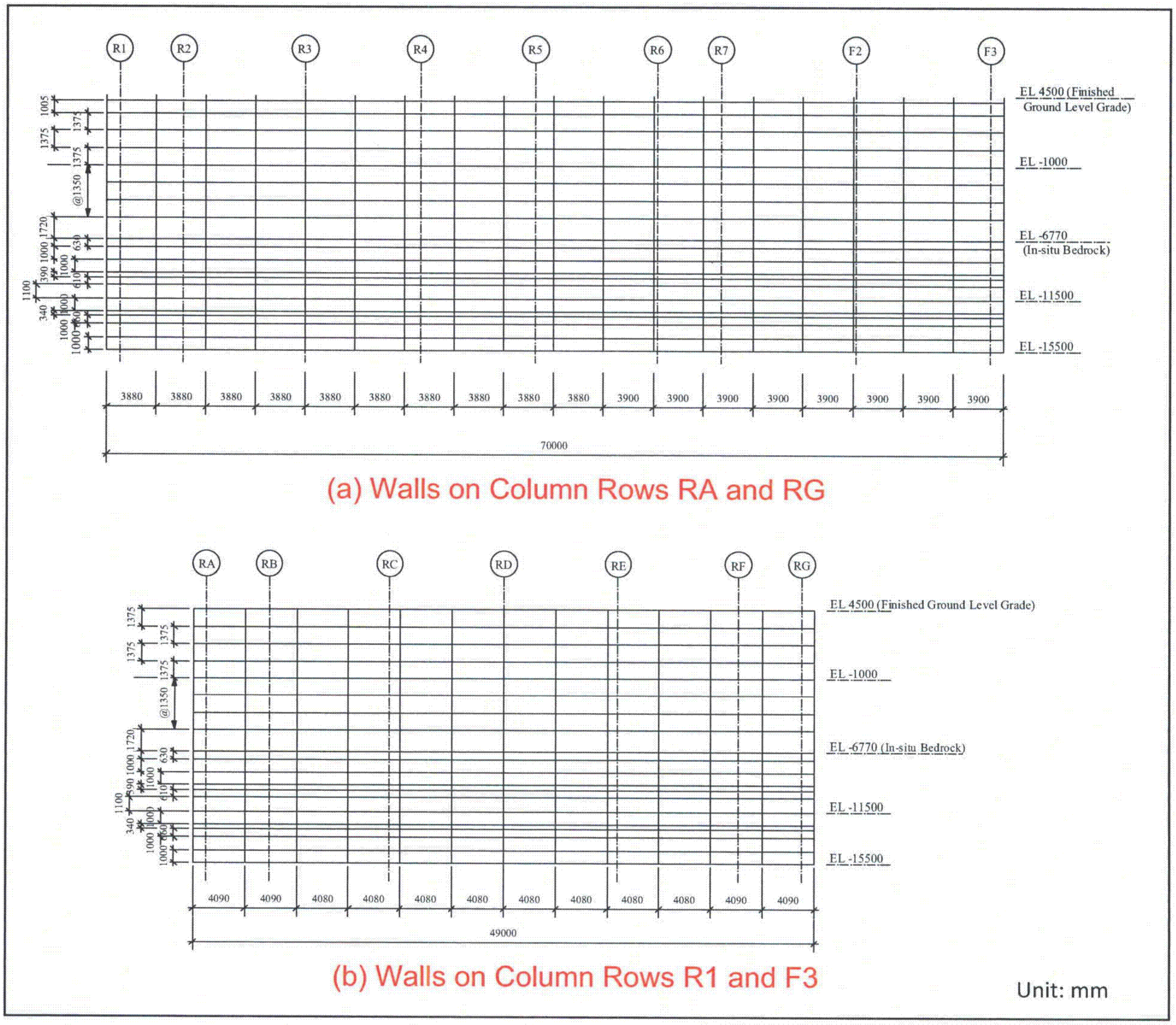

Figure 3.7.2-202 SASSI2000 Plate Elements for RB/FB Exterior Walls

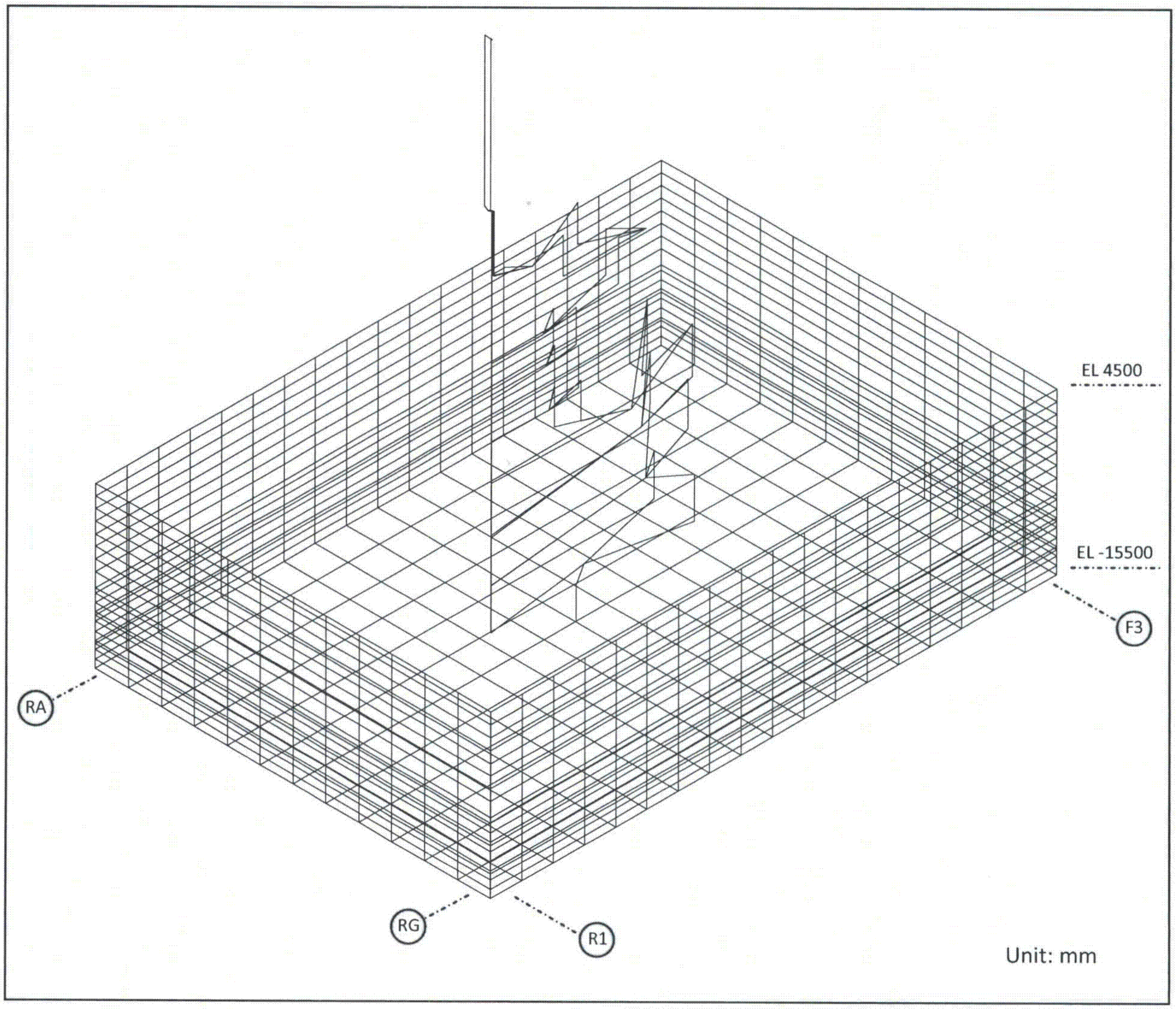

Figure 3.7.2-203 Overview of SASSI2000 SSI RB/FB Model

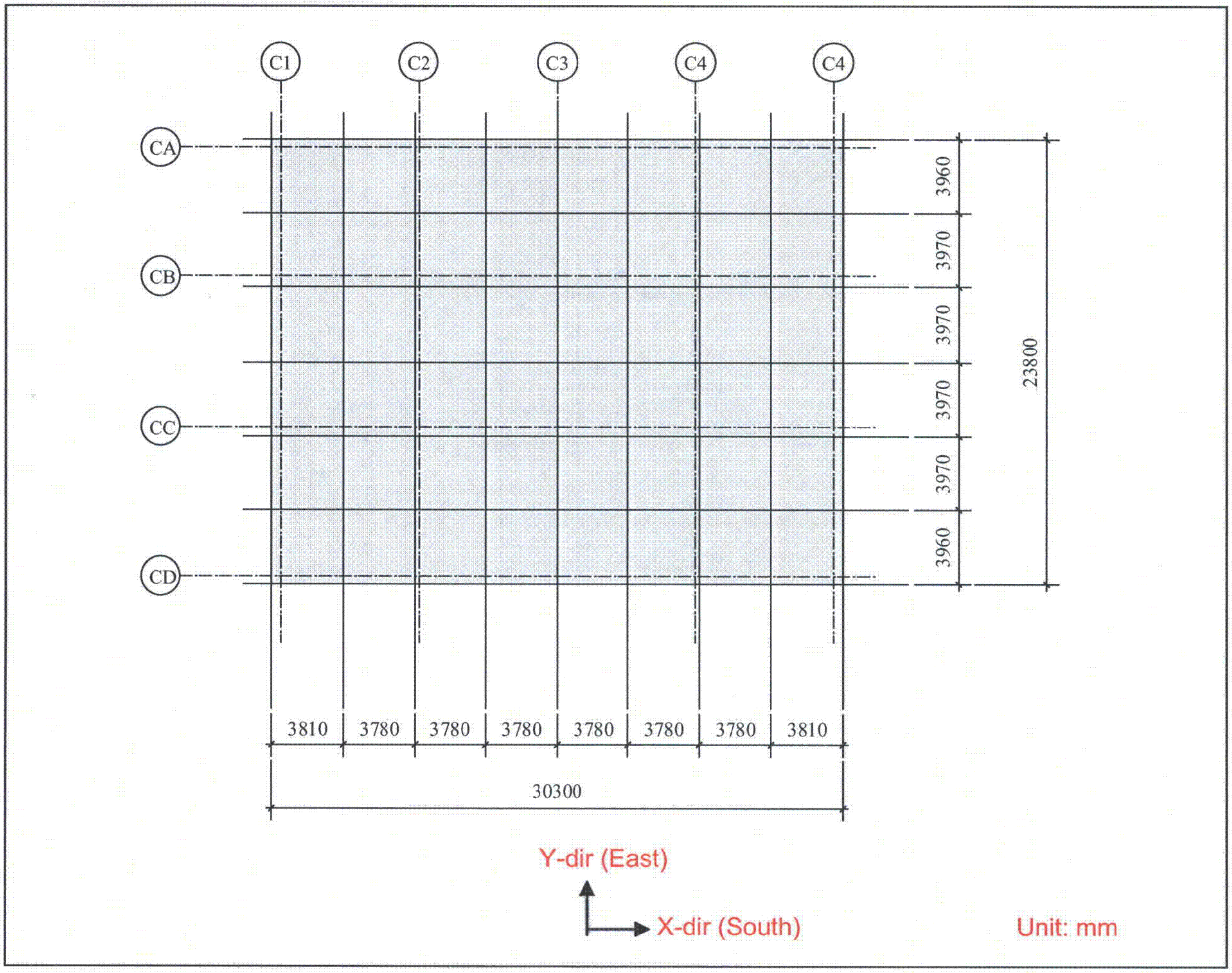

Figure 3.7.2-204 SASSI2000 Plate Elements for CB Basemat

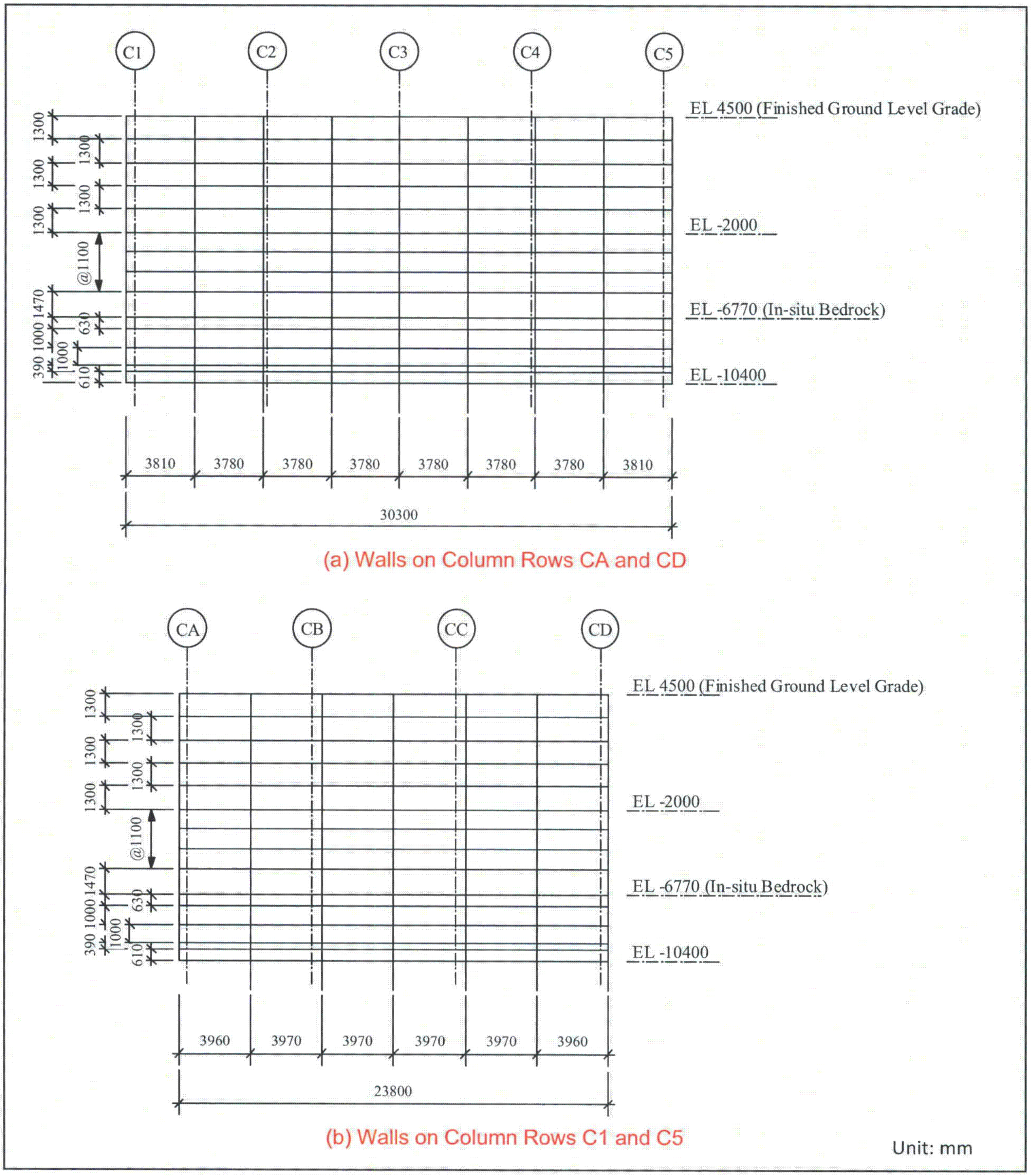

Figure 3.7.2-205 SASSI2000 Plate Elements for CB Exterior Walls

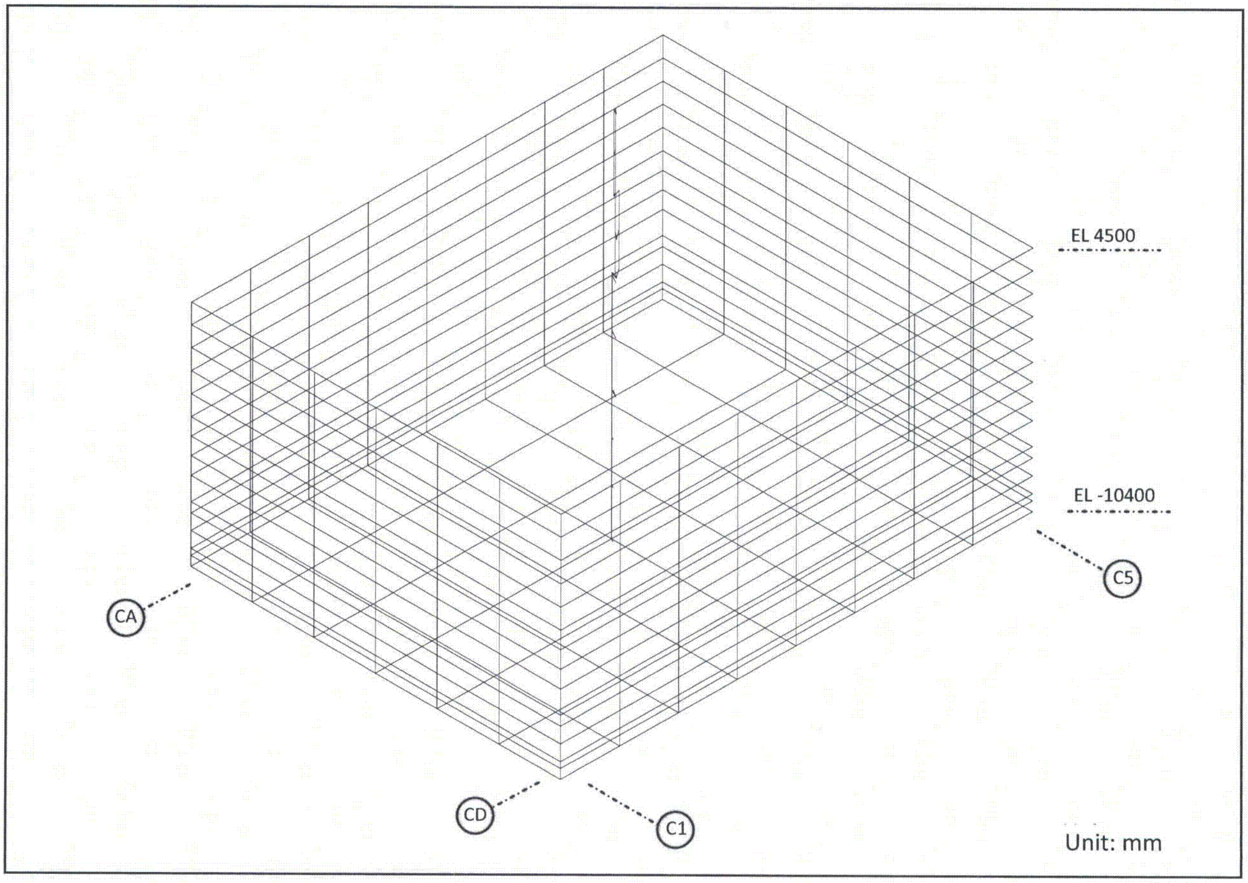

Figure 3.7.2-206 Overview of CB SASSI2000 SSI Model

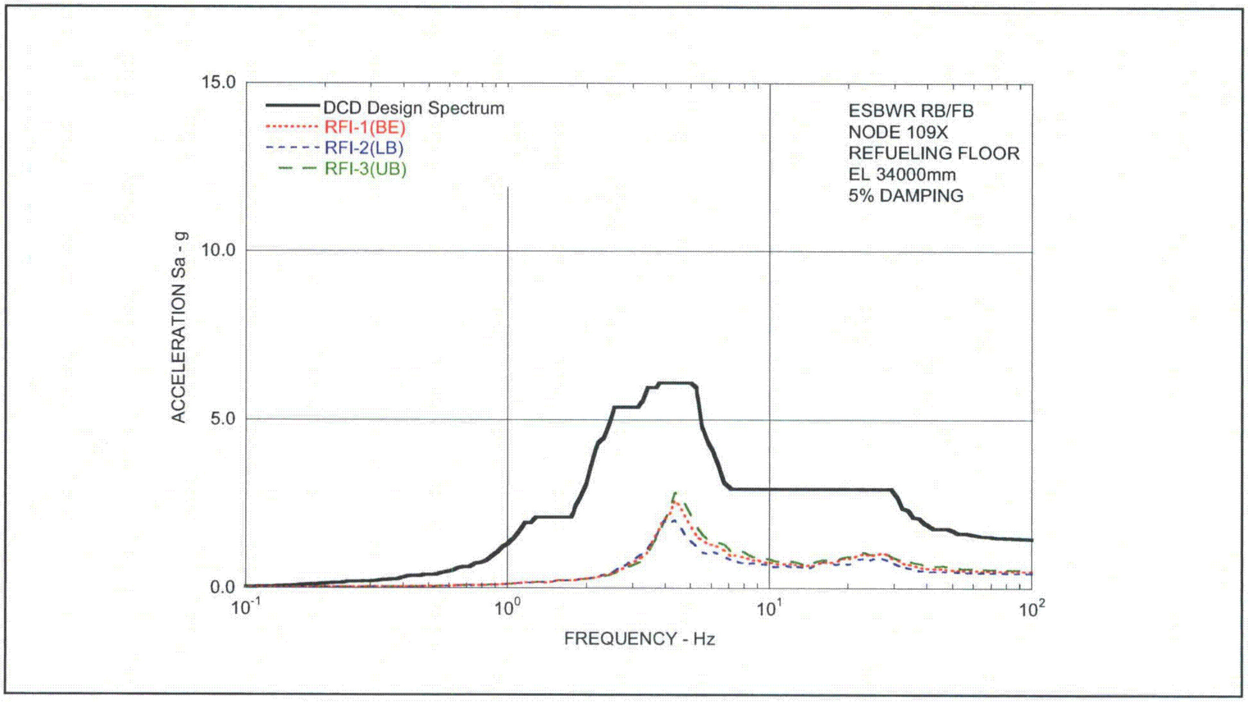

Figure 3.7.2-207a Comparison of Floor Response Spectra - RB/FB Refueling Floor in X-Direction

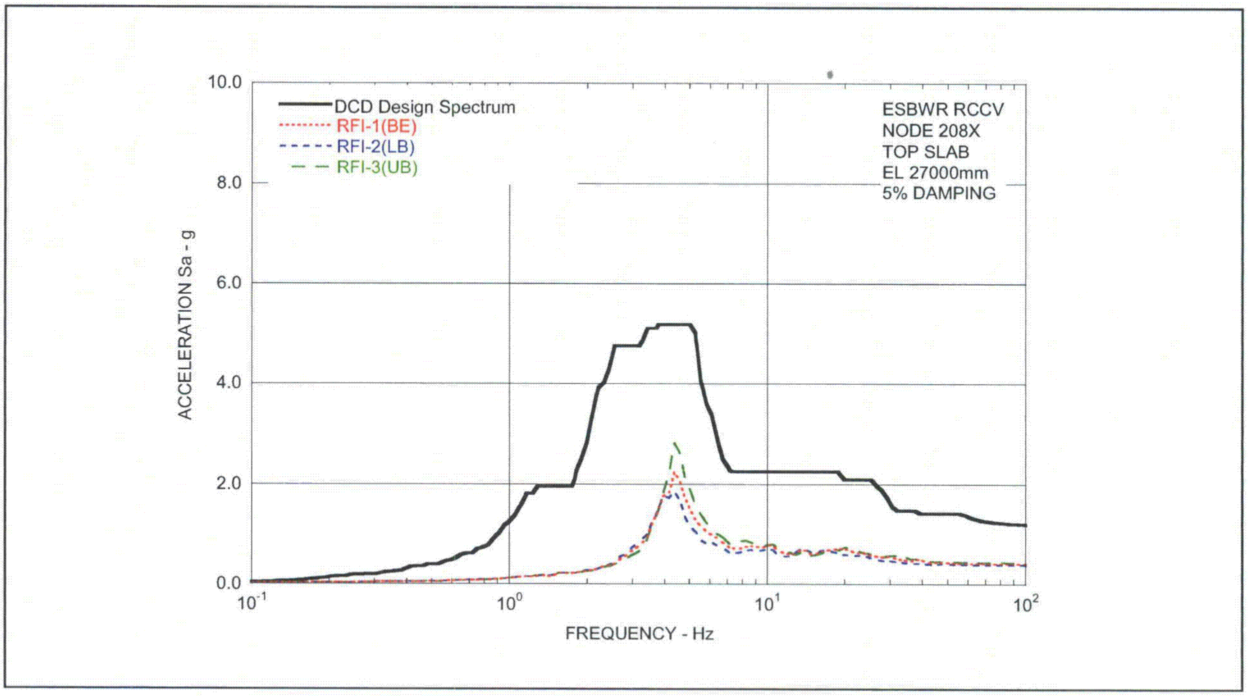

Figure 3.7.2-207b Comparison of Floor Response Spectra - RCCV Top Slab in X-Direction

Note: Sa = Spectral Acceleration

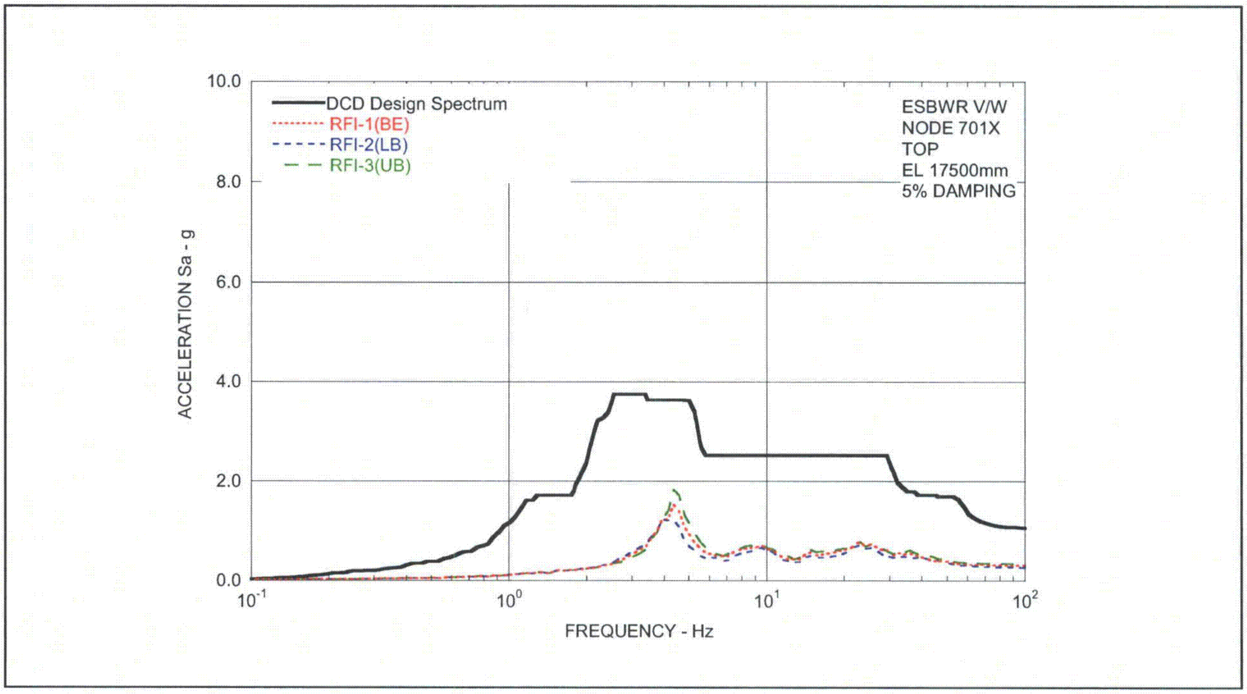

Figure 3.7.2-207c Comparison of Floor Response Spectra - Vent Wall Top in X-Direction

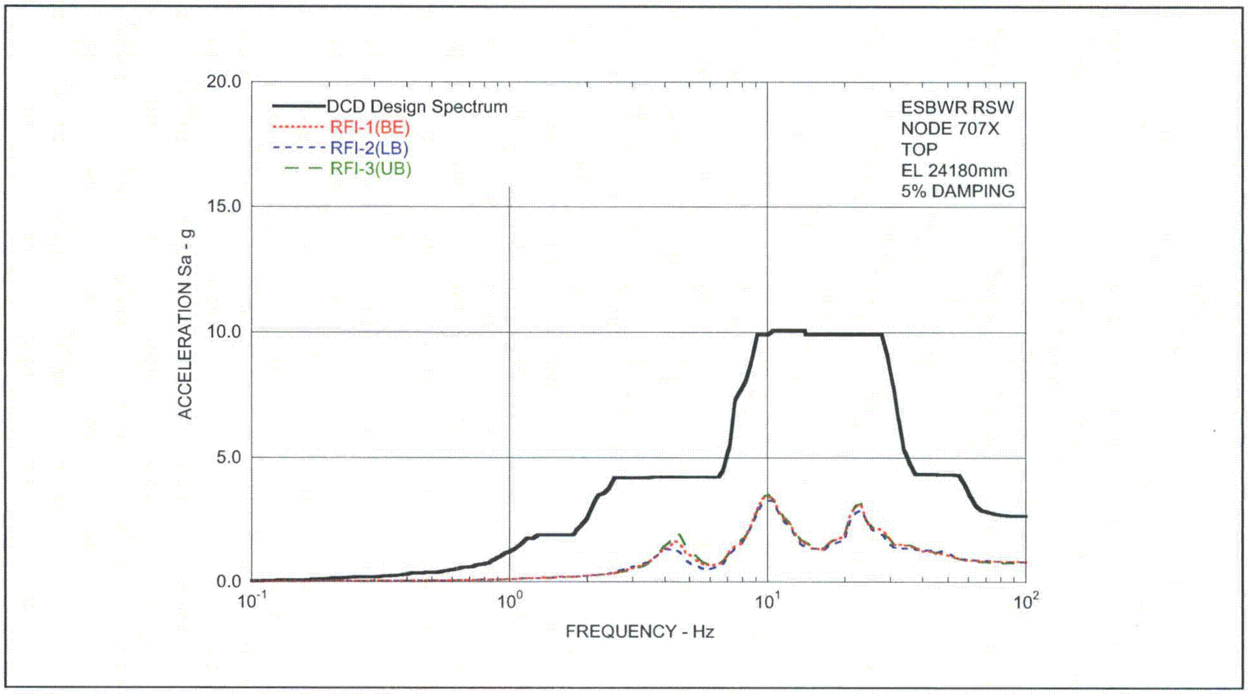

Figure 3.7.2-207d Comparison of Floor Response Spectra - RSW Top in X-Direction

Note: Sa = Spectral Acceleration

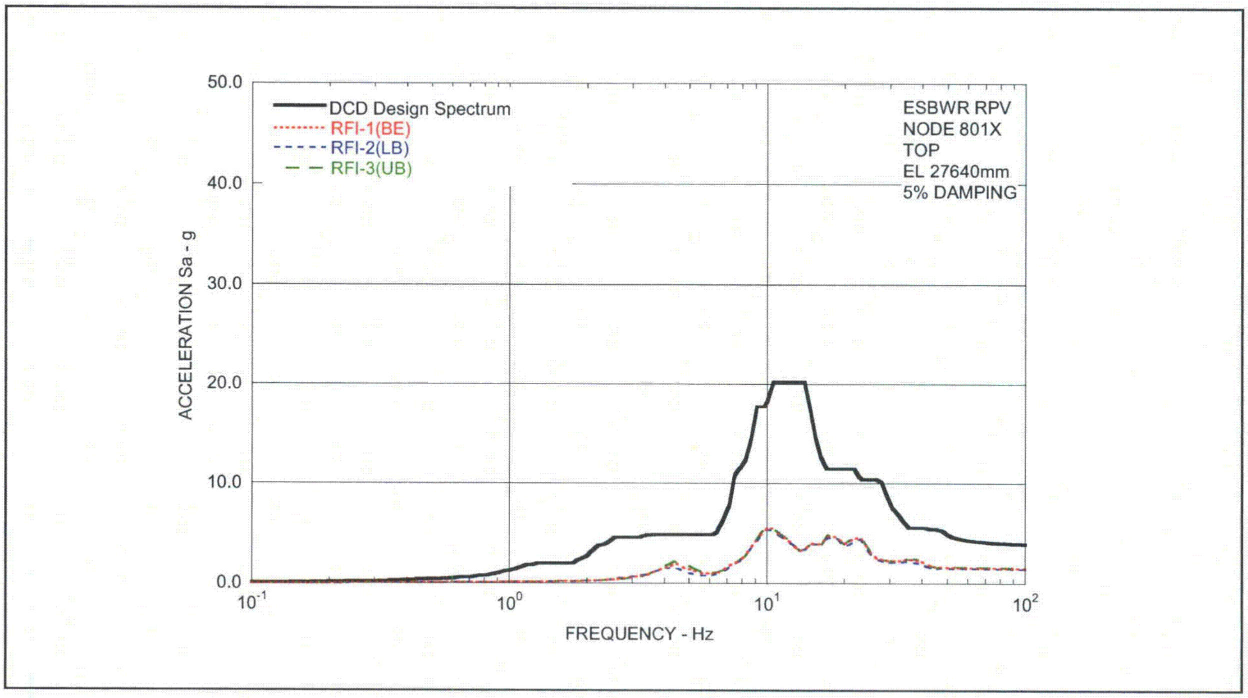

Figure 3.7.2-207e Comparison of Floor Response Spectra - RPV Top in X-Direction

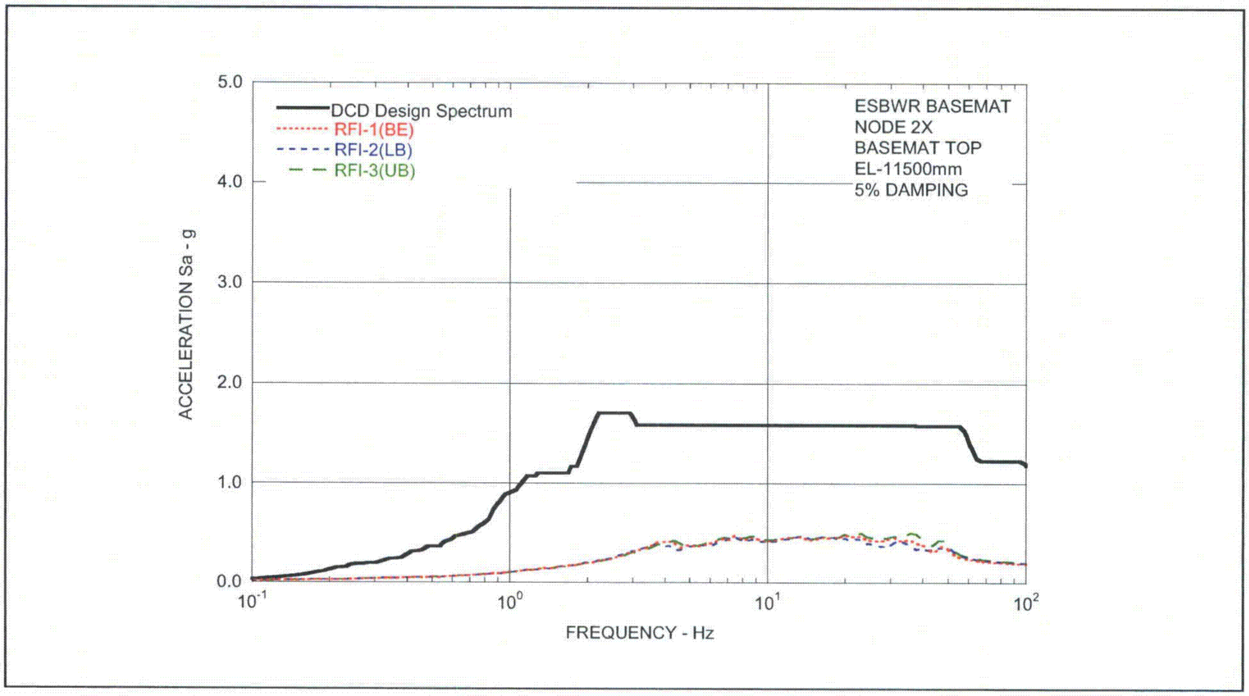

Figure 3.7.2-207f Comparison of Floor Response Spectra - RB/FB Basemat in X-Direction

Note: Sa = Spectral Acceleration

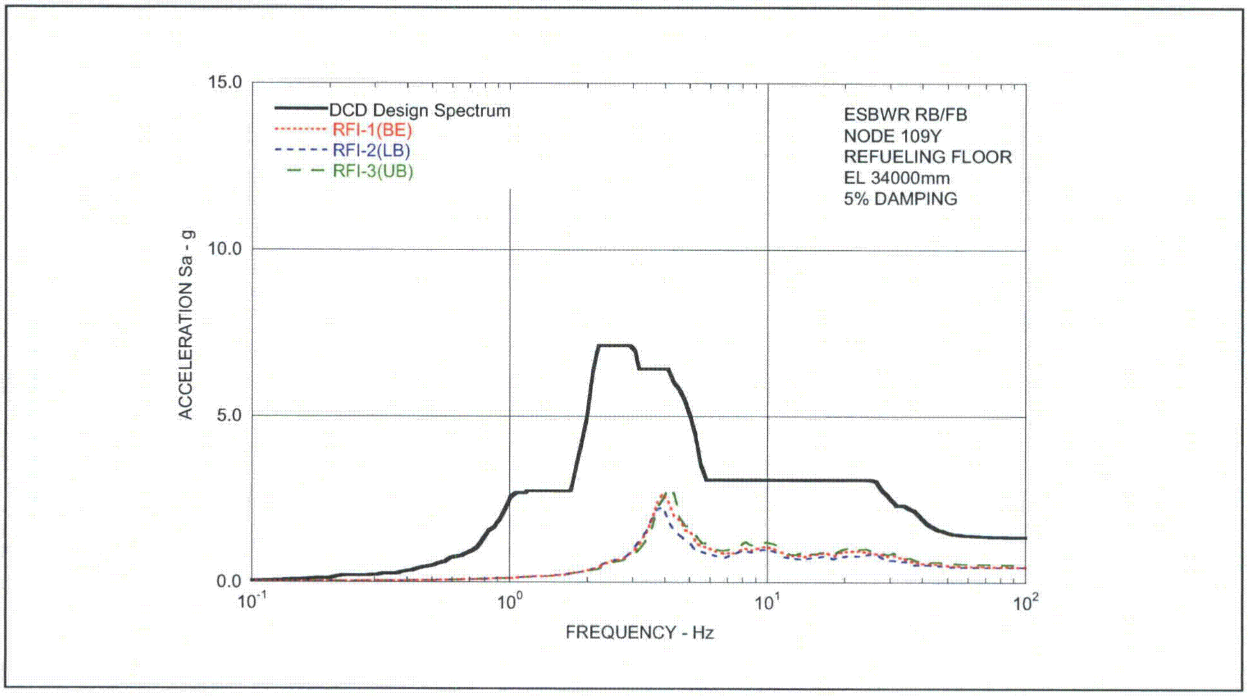

Figure 3.7.2-208a Comparison of Floor Response Spectra - RB/FB Refueling Floor in Y-Direction

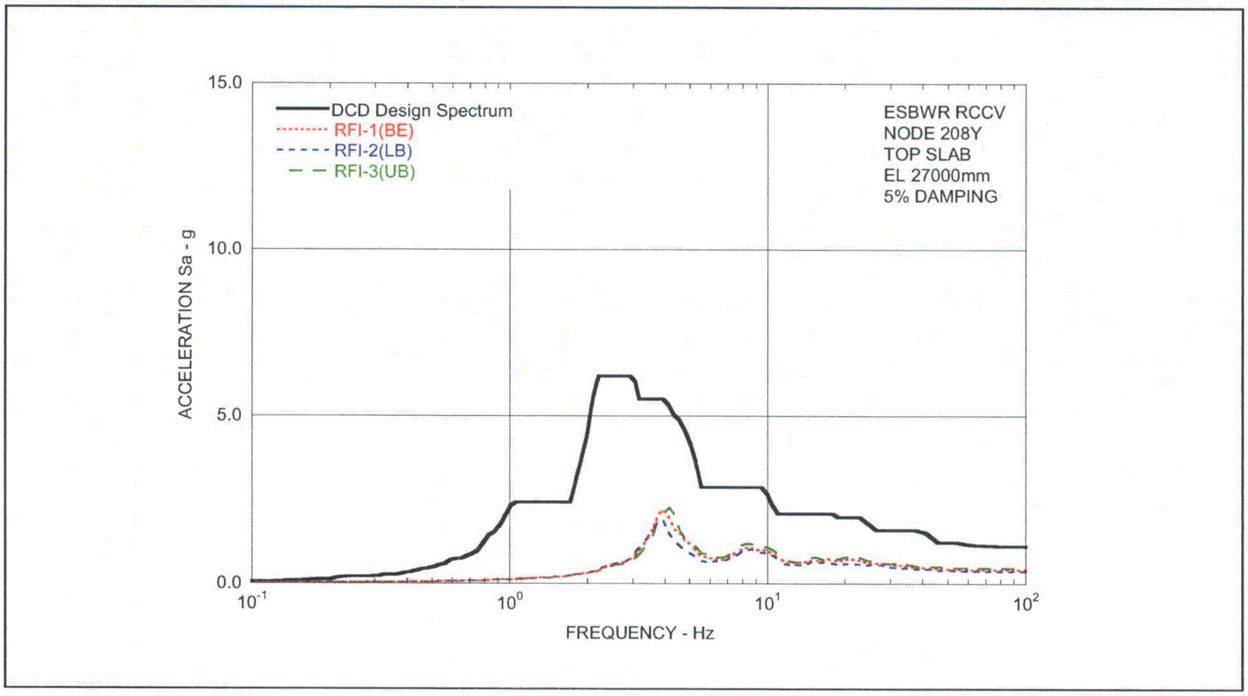

Figure 3.7.2-208b Comparison of Floor Response Spectra - RCCV Top Slab in Y-Direction

Note: Sa = Spectral Acceleration

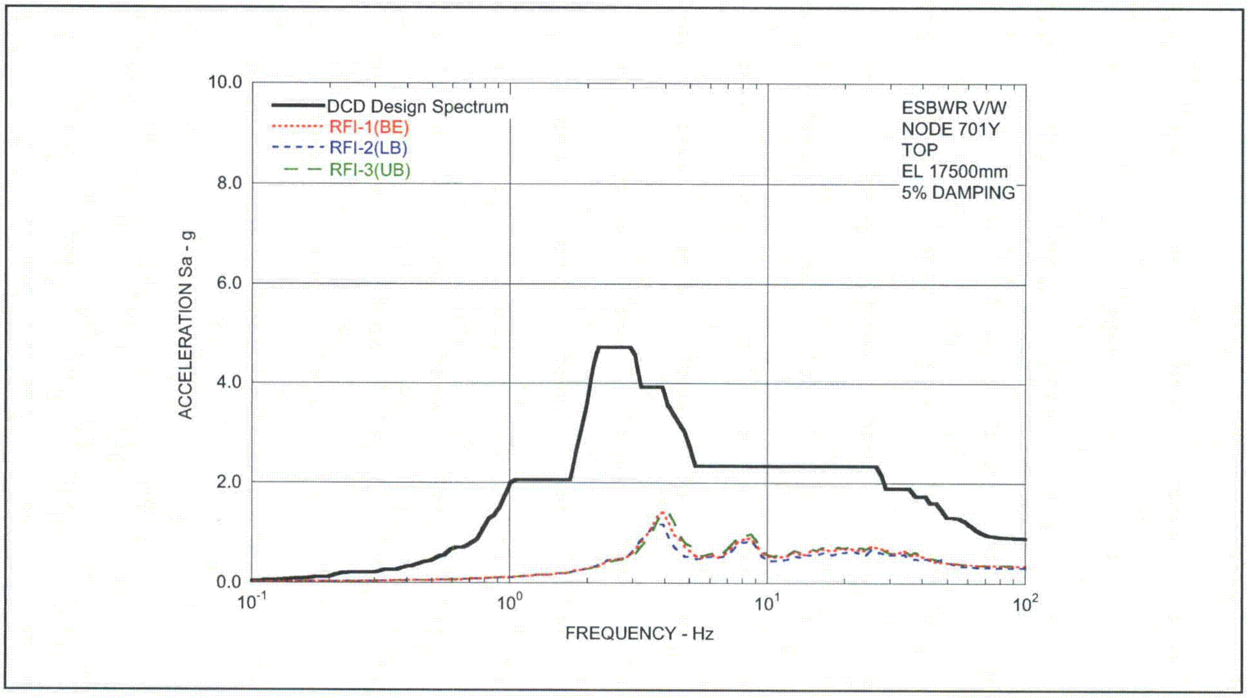

Figure 3.7.2-208c Comparison of Floor Response Spectra - Vent Wall Top in Y-Direction

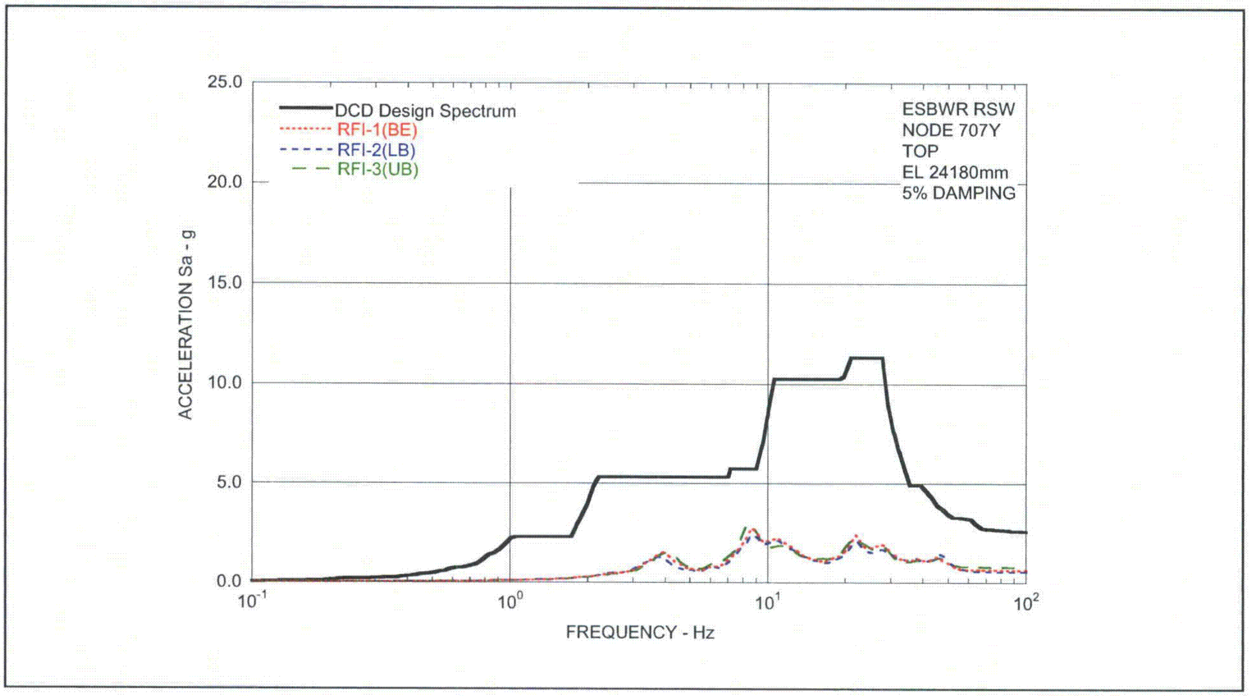

Figure 3.7.2-208d Comparison of Floor Response Spectra - RSW Top in Y-Direction

Note: Sa = Spectral Acceleration

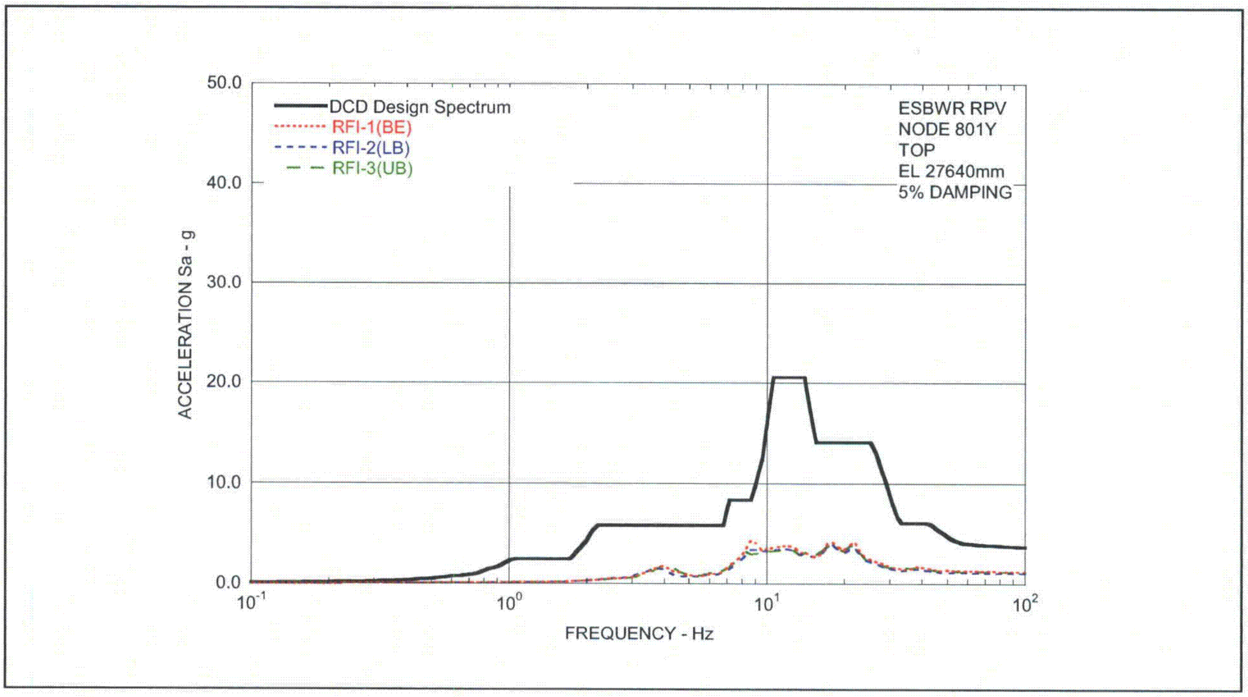

Figure 3.7.2-208e Comparison of Floor Response Spectra - RPV Top in Y-Direction

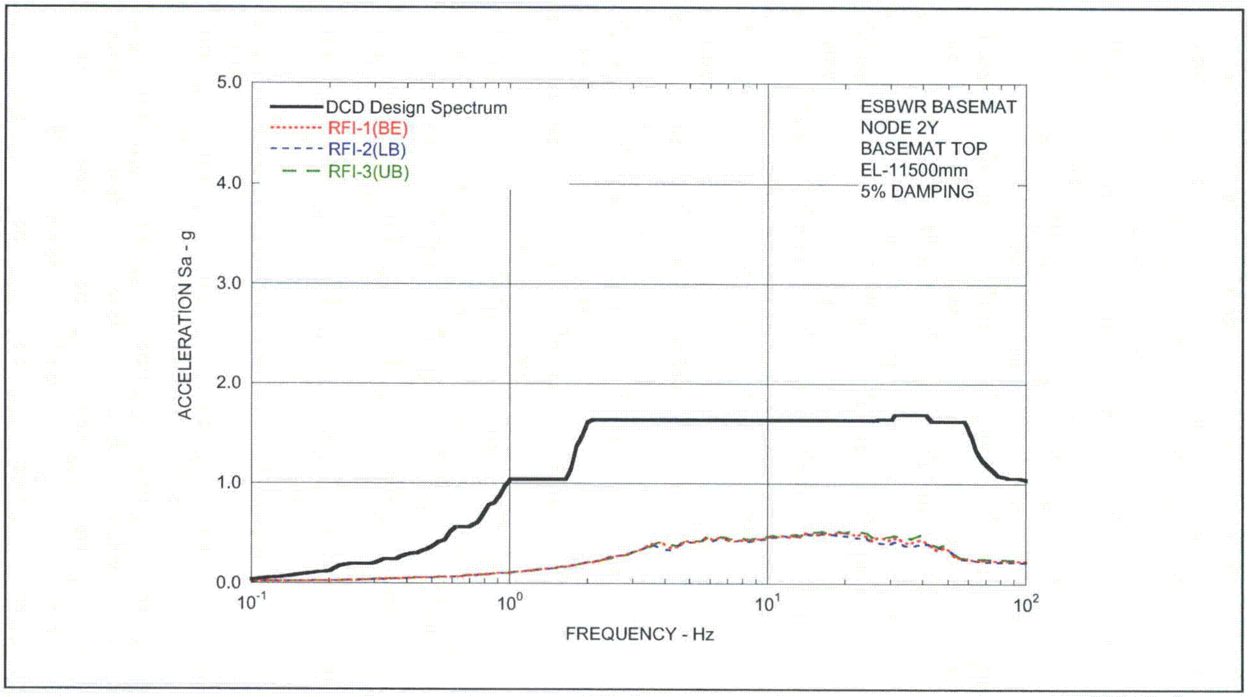

Figure 3.7.2-208f Comparison of Floor Response Spectra - RB/FB Basemat in Y-Direction

Note: Sa = Spectral Acceleration

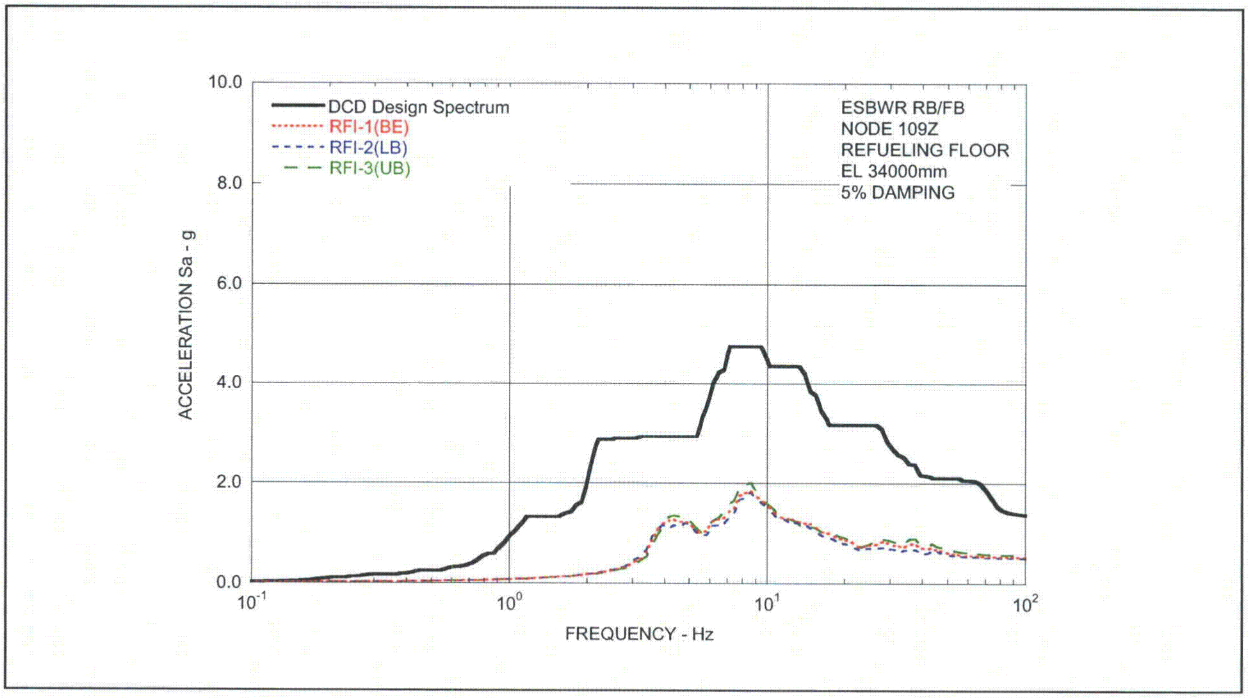

Figure 3.7.2-209a Comparison of Floor Response Spectra - RB/FB Refueling Floor in Z-Direction

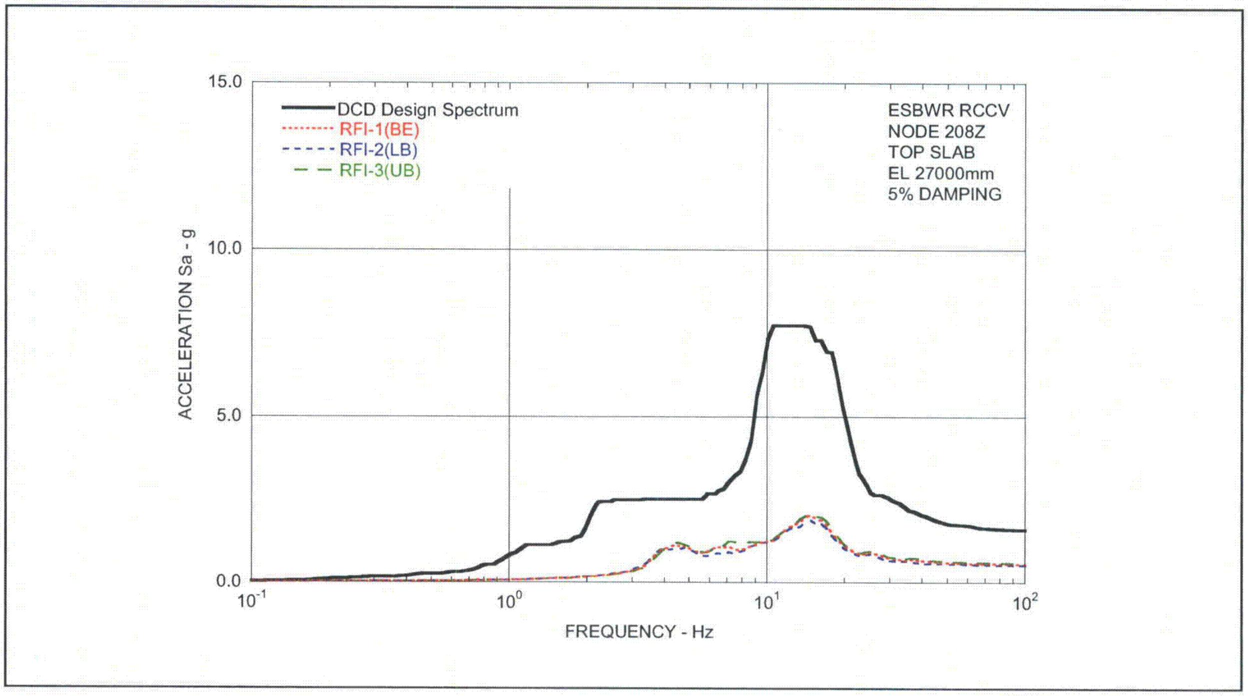

Figure 3.7.2-209b Comparison of Floor Response Spectra - RCCV Top Slab in Z-Direction

Note: Sa = Spectral Acceleration

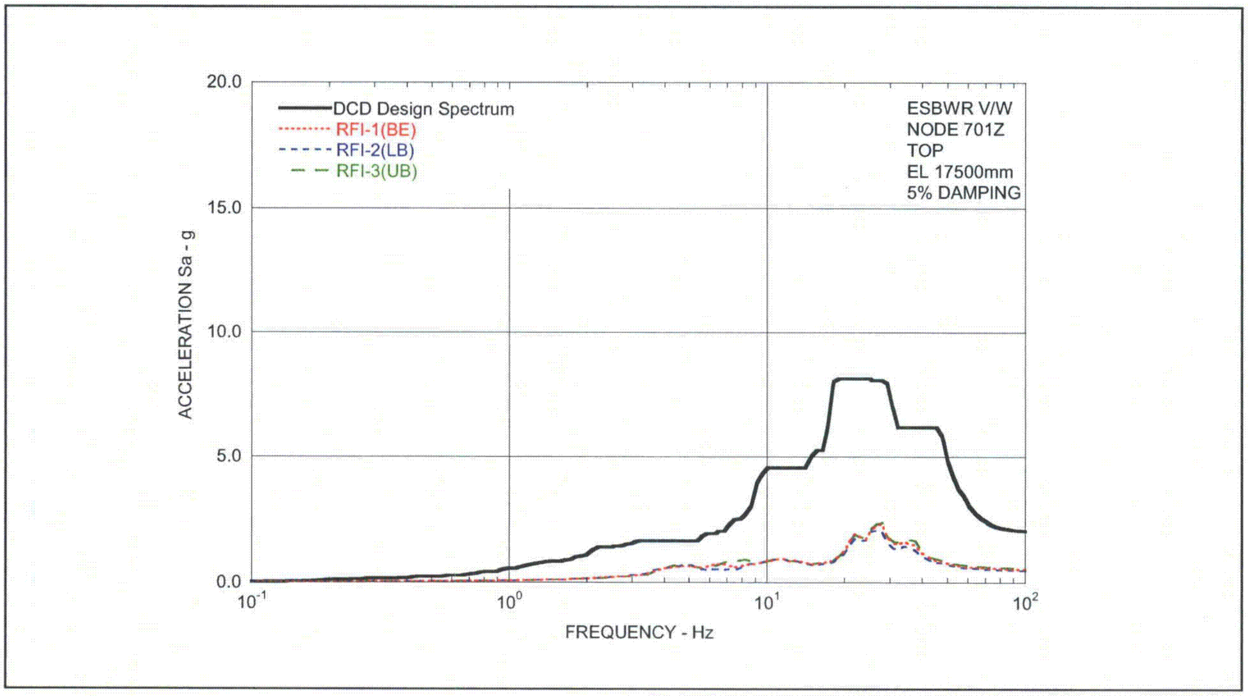

Figure 3.7.2-209c Comparison of Floor Response Spectra - Vent Wall Top in Z-Direction

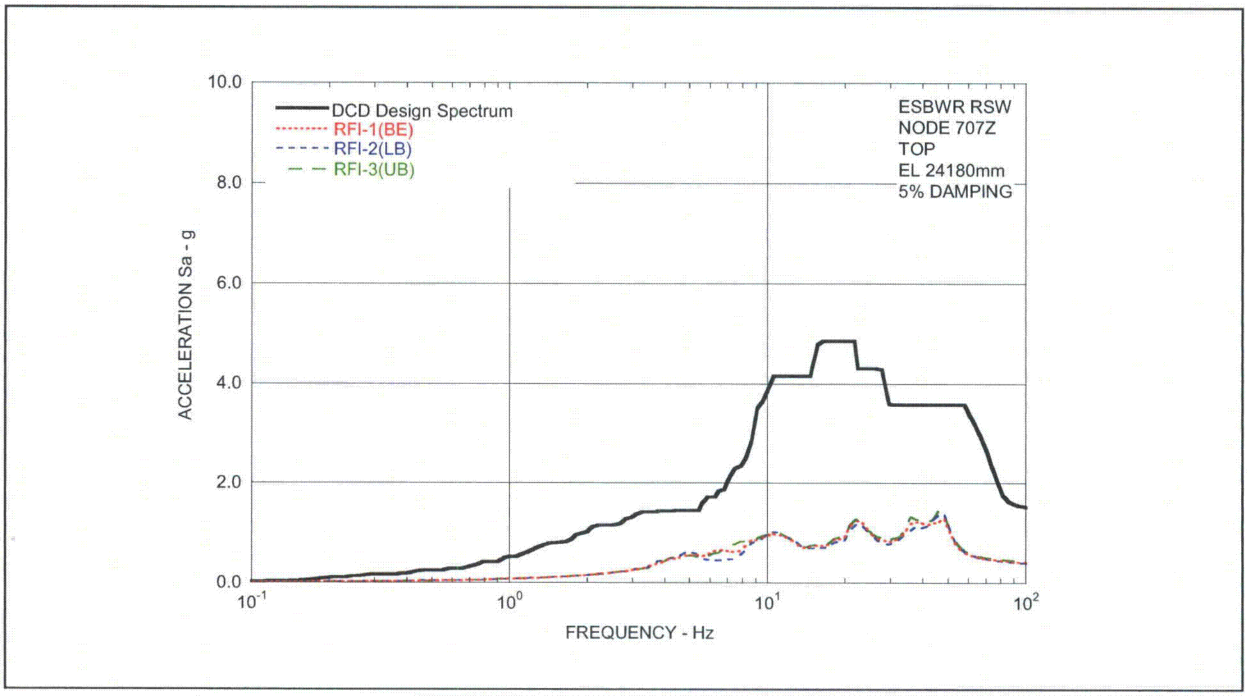

Figure 3.7.2-209d Comparison of Floor Response Spectra - RSW Top in Z-Direction

Note: Sa = Spectral Acceleration

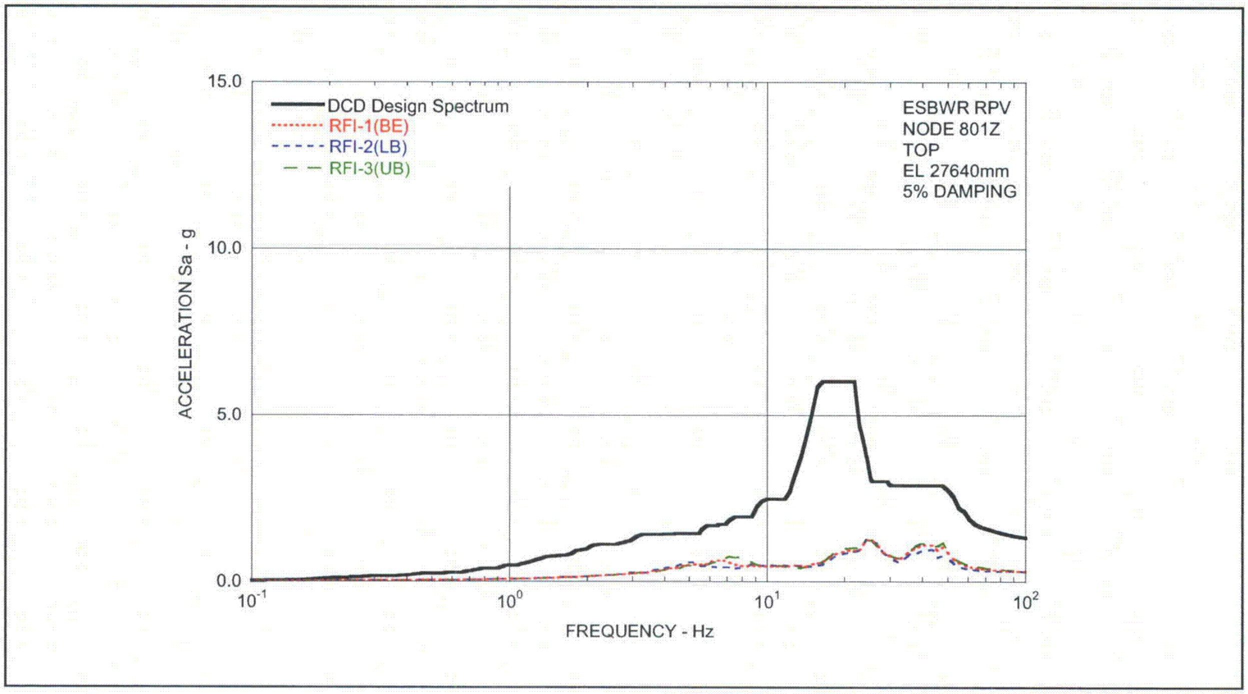

Figure 3.7.2-209e Comparison of Floor Response Spectra - RPV Top in Z-Direction

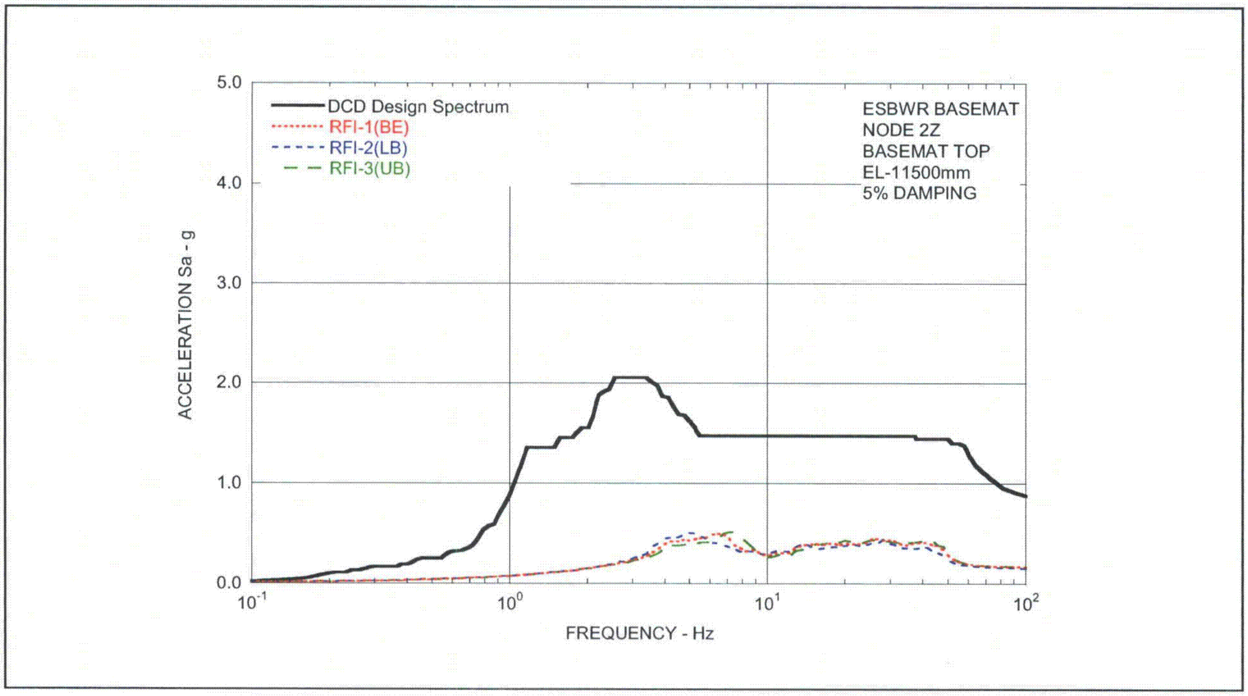

Figure 3.7.2-209f Comparison of Floor Response Spectra - RB/FB Basemat in Z-Direction

Note: Sa = Spectral Acceleration

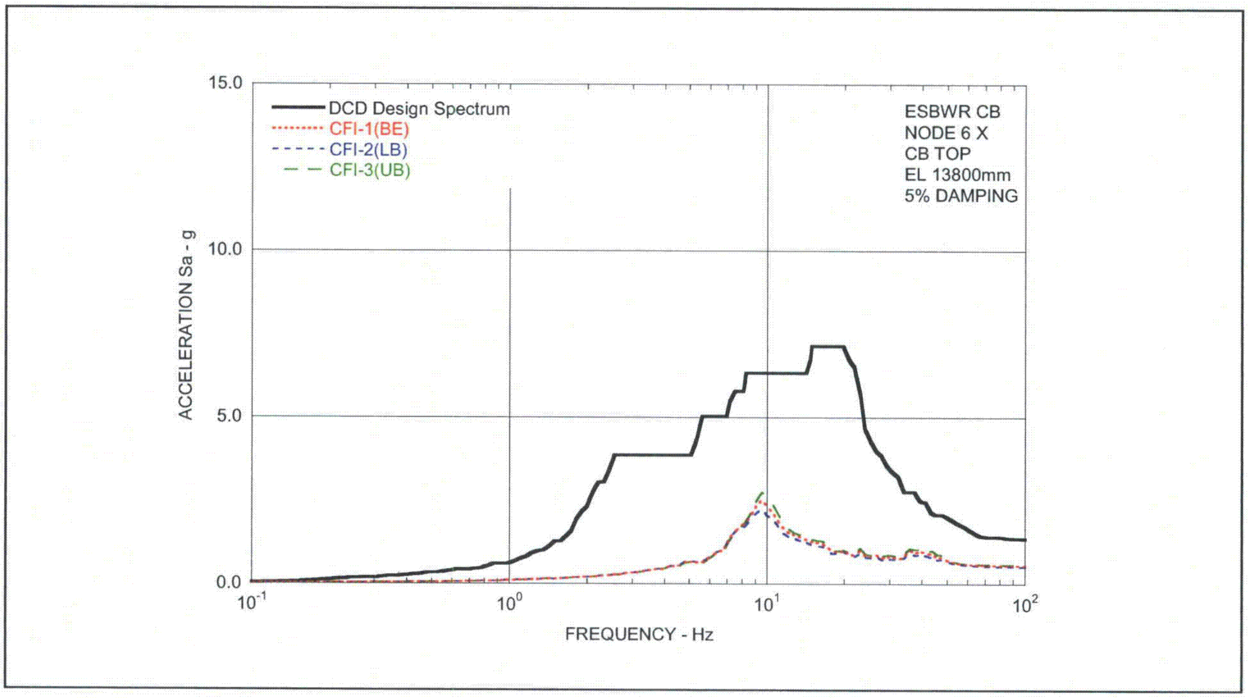

Figure 3.7.2-210a Comparison of Floor Response Spectra - CB Top in X-Direction

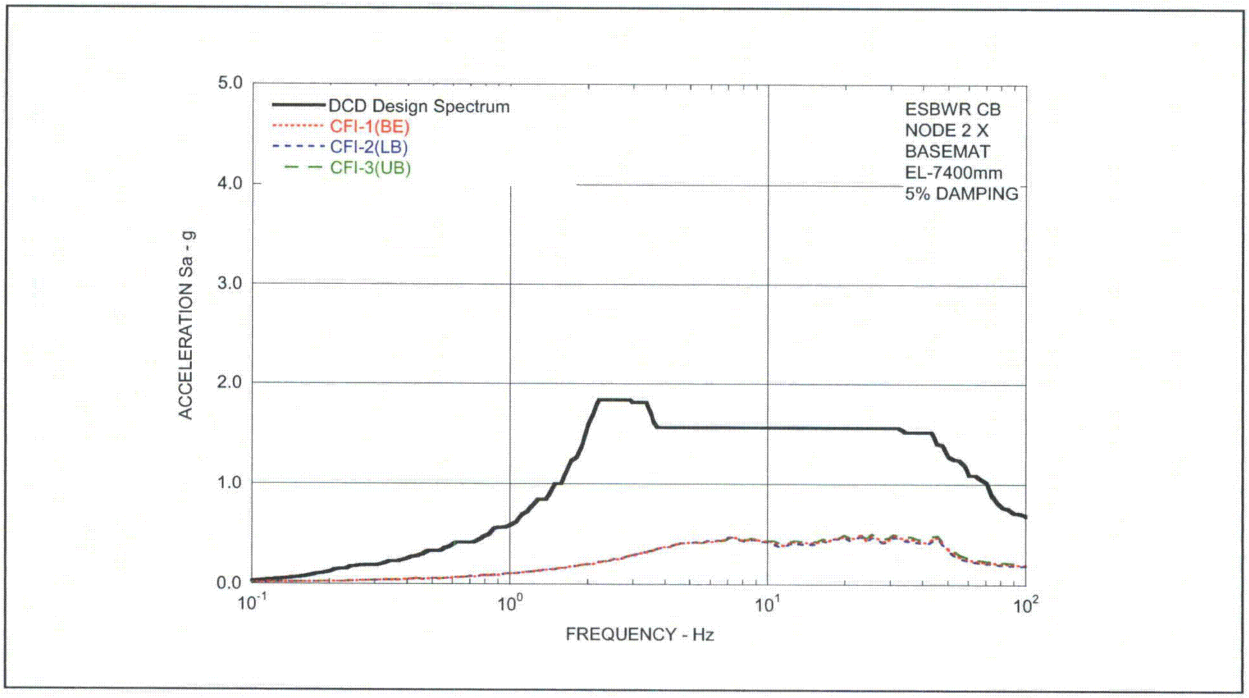

Figure 3.7.2-210b Comparison of Floor Response Spectra - CB Basemat in X-Direction

Note: Sa = Spectral Acceleration

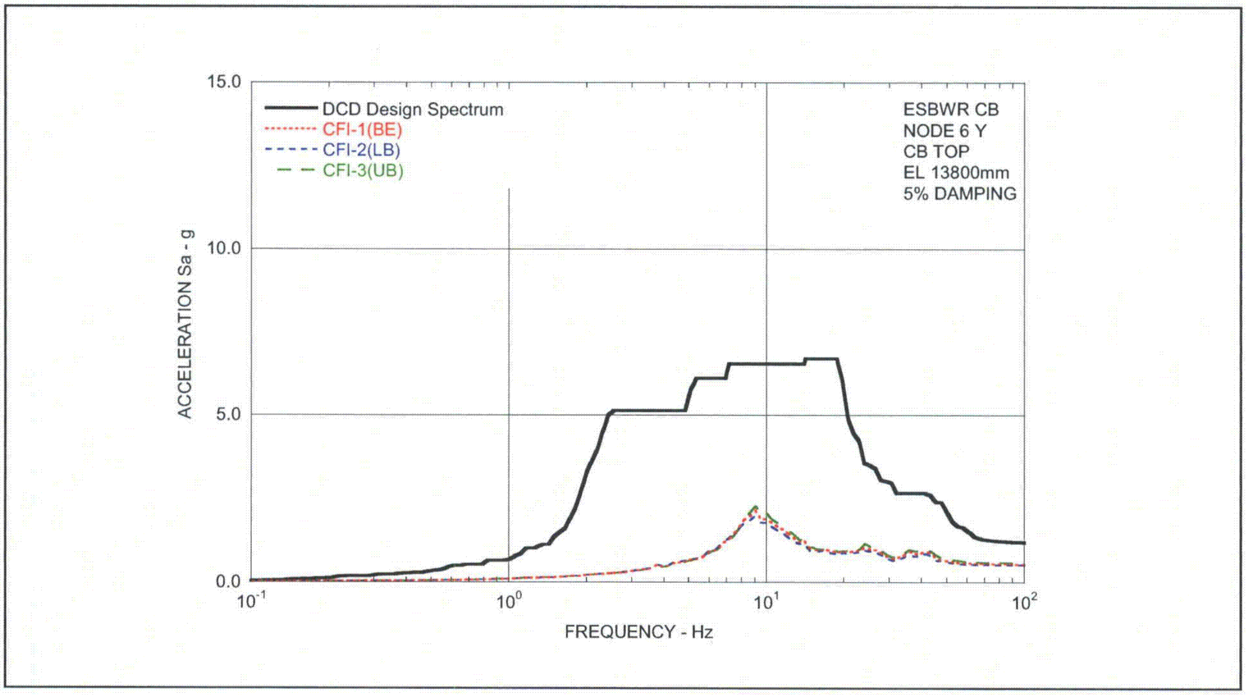

Figure 3.7.2-211a Comparison of Floor Response Spectra - CB Top in Y-Direction

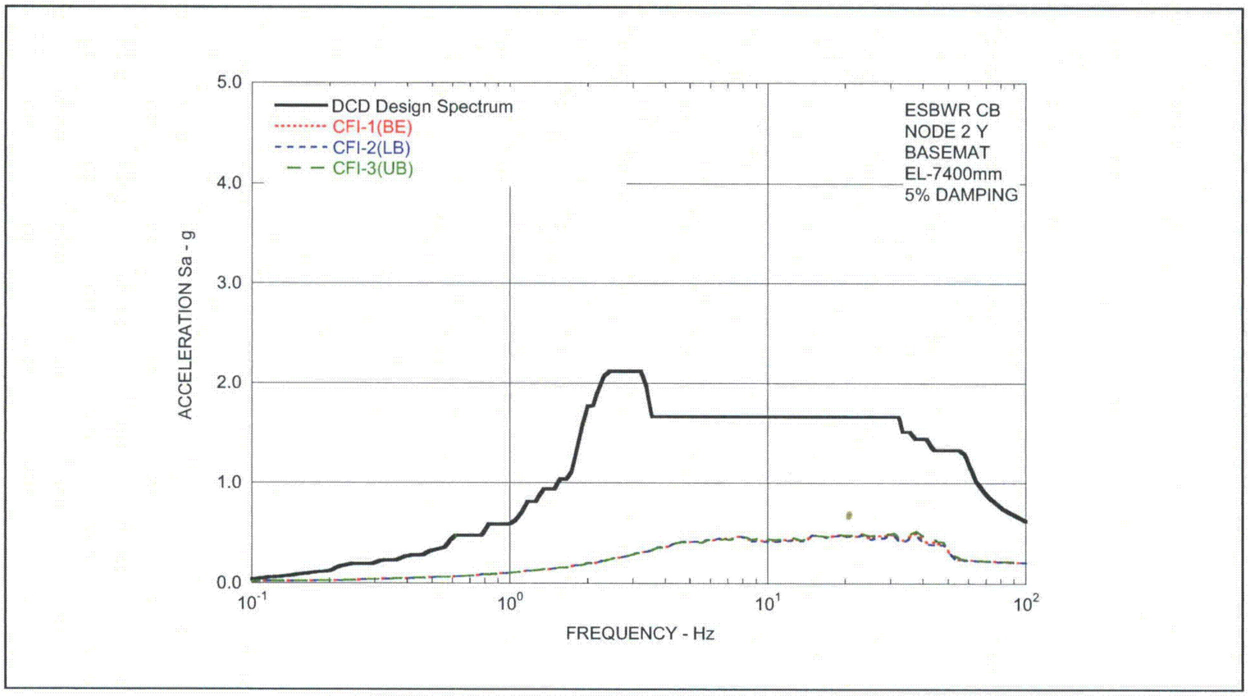

Figure 3.7.2-211b Comparison of Floor Response Spectra - CB Basemat in Y-Direction

Note: Sa = Spectral Acceleration

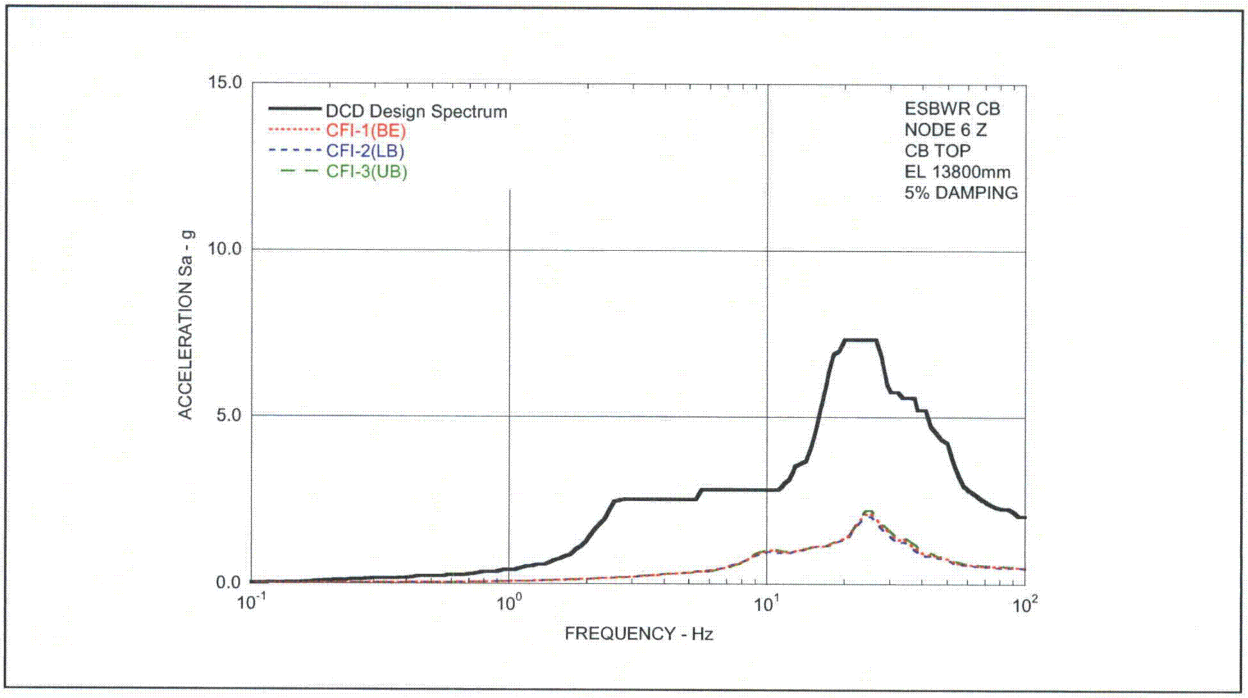

Figure 3.7.2-212a Comparison of Floor Response Spectra - CB Top in Z-Direction

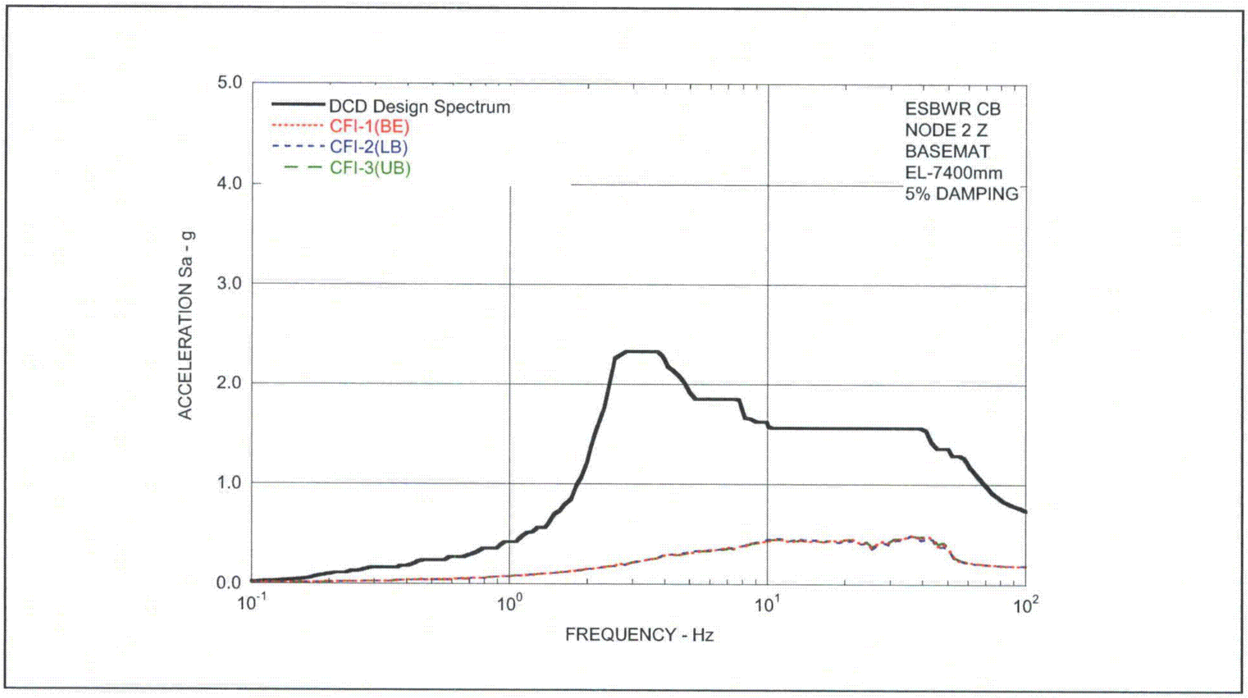

Figure 3.7.2-212b Comparison of Floor Response Spectra - CB Basemat in Z-Direction

Note: Sa = Spectral Acceleration

Insert 3.8.5-1

This section of the Referenced DCD is incorporated by reference with the following departures and/or supplements.

3.8.5.5 Structural Acceptance Criteria

Add the following subsections at the end of this section.

3.8.5.5.1 Foundation Stability

The Fermi 3 site-specific foundation stability for the RB/FB and CB are evaluated against overturning, sliding and floatation based on the results from the Fermi 3 site-specific SSI analyses for the RB/FB and CB presented in Section 3.7.2.4.1. The stability calculations against overturning, sliding, and floatation are executed according to the procedure presented in Referenced DCD Section 3.8.5.5.

The factor of safety against overturning due to earthquake loading is determined by the energy approach described in Referenced DCD Subsection 3.7.2.14. The calculated Fermi 3 site-specific factors of safety against overturning based on the Fermi 3 site-specific SSI for the RB/FB and CB are shown in Tables 3.8.5-201 and 3.8.5-202, respectively. It is shown that the Fermi 3 site-specific factors of safety against overturning for the RB/FB and CB are 1,907 and 1,029 (greater than 1.1 as required by SRP 3.8.5), respectively. These factors of safety indicate that the Fermi 3 RB/FB and CB are stable against overturning.

The Fermi 3 site-specific sliding evaluation is performed using forces generated during the Fermi 3 site-specific SSI analyses, which neglects the backfill above the top of the bedrock and with the RB/FB and CB in firm contact with the bedrock using fill concrete as backfill in the gap between the RB/FB and CB, and the bedrock up to the top of Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88. The gap between the RB/FB and CB up to the top of the Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88 is also filled with fill concrete. As the Fermi 3 site-specific SSI neglects the backfill above the top of the bedrock, forces associated with the backfill are not included in the sliding analysis; therefore, the bedrock alone supplies the resistance to sliding of both the RB/FB and the CB. In the sliding evaluation for the Fermi 3 RB/FB and CB, the following skin friction resistance forces are neglected:

1. F_{us} = Skin friction resistance force provided by basemat side parallel to the direction of motion (i.e. $F_{us} = 0$)
2. F_{us}' = Skin friction resistance force provided by shear key side parallel to the direction of motion (when shear keys are used) (i.e. $F_{us}' = 0$).

The calculated Fermi 3 site-specific factors of safety against sliding for the RB/FB and CB are shown in Tables 3.8.5-201 and 3.8.5-202, respectively. The Fermi 3 site-specific factors of safety against sliding for the RB/FB and CB are 5.48 and 3.09 (greater than minimum factor of safety of 1.1 as required by SRP 3.8.5), respectively. These factors of safety indicate that the Fermi 3 RB/FB and CB are stable against sliding.

The sliding of the FWSC was evaluated using the driving forces (the base shear time history forces) based on the governing factor of safety cases from the Referenced DCD SSI analysis results without crediting the backfill surrounding the basemat. The sliding evaluation also includes the fill concrete below the FWSC in which the shear keys are embedded. The presence of the shear keys results in potential failure occurring within the fill concrete. The fill concrete was evaluated in accordance with ACI 318 and the corresponding portions of ACI 349 considering the following:

- Failure of the fill concrete in compression from lateral pressure applied by the shear keys. This potential failure condition is checked using the ACI 318 Section 22.5.5.
- Failure through the fill concrete at or below the base of the shear keys considering the maximum amount of shear resistance from shear-friction reinforcement allowed in ACI 318, Section 11.6 and the corresponding portions of ACI 349, Section 11.7.

The resulting factor of safety against sliding is greater than 15, which is greater than the minimum factor of safety of 1.1 as required by SRP 3.8.5.

The calculated Fermi 3 site-specific factors of safety against floatation for the RB/FB and CB are shown in Tables 3.8.5-201 and 3.8.5-202, respectively. It is shown that the Fermi 3 site-specific factors of safety against floatation for the RB/FB and CB are 3.48 and 1.85 (greater than minimum factor of safety of 1.1 as required by SRP 3.8.5), respectively. These factors of safety indicate that the Fermi 3 RB/FB and CB are stable against floatation.

3.8.5.5.2 Soil Bearing Pressures

The maximum soil dynamic bearing pressure demand at the Fermi 3 site for the BE, UB, and LB subsurface profiles, based on the results from the Fermi 3 site-specific SSI analyses for the RB/FB and CB presented in Section 3.7.2.4.1, are evaluated using the Modified Energy Balance Method according to the Referenced DCD Section 3G.1.5.5.

The Fermi 3 site-specific SSI maximum dynamic soil bearing pressure demands are summarized in Table 3.8.5-203 for the RB/FB and CB. As described in Section 3.7.2.4.1.6, the Fermi 3 site-specific enveloping SSI seismic loads are lower than the Referenced DCD enveloping seismic loads. However, the Fermi 3 site-specific SSI maximum soil bearing pressure demands for the BE, LB, and UB subsurface profile cases are all larger than the Referenced DCD maximum dynamic bearing demands for both the RB/FB and the CB in Referenced DCD, Table 2.0-1 for the hard soil site (Table 3.8.5-203). This is because the Referenced DCD SSI analyses were performed considering full embedment up to the finished ground level grade, while the Fermi 3 site-specific SSI analyses were performed considering partial embedment condition without taking credit for the backfill above the top of the Bass Islands Group bedrock at Elevation 168.2 m (552.0 ft) NAVD 88. Therefore, the Fermi 3 site-specific structure overturning moments resulting from the Fermi 3 site-specific SSI analyses become larger than the structure overturning moments resulting from the Referenced DCD SSI analyses. As a result, the Fermi 3 site-specific dynamic soil bearing pressure demands calculated based on the Fermi 3 site-specific SSI analyses are larger compared to the Referenced DCD hard soil site dynamic soil bearing pressure demands.

The Fermi 3 site-specific SSI maximum dynamic soil bearing pressure demands presented in Table 3.8.5-203 for the RB/FB and the CB, are compared with the Fermi 3 site-specific allowable bearing capacity under the dynamic condition in Table 2.5.4-227 in Section 2.5.4.10. It is confirmed that the Fermi 3 site-specific maximum dynamic soil bearing pressure demands for the RB/FB and CB are less than the allowable bearing capacity under dynamic condition presented in Table 2.5.4-227 in Section 2.5.4.10.

Table 3.8.5-201 Factors of Safety for RB/FB Foundation Stability

Load Combination	Overturning		Sliding		Floatation	
	SRP 3.8.5 Minimum FS	Calculated FS	SRP 3.8.5 Minimum FS	Calculated FS	SRP 3.8.5 Minimum FS	Calculated FS
D + H + E'	1.1	1907	1.1	5.48	--	--
D + F'	--	--	--	--	1.1	3.48

Where,
D = Dead Load
H = Lateral soil pressure
E' = Safe Shutdown Earthquake
F' = Buoyant forces of design basis flood
FS = Factor of safety

Table 3.8.5-202 Factors of Safety for CB Foundation Stability

Load Combination	Overturning		Sliding		Floatation	
	SRP 3.8.5 Minimum FS	Calculated FS	SRP 3.8.5 Minimum FS	Calculated FS	SRP 3.8.5 Minimum FS	Calculated FS
D + H + E'	1.1	1029	1.1	3.09	--	--
D + F'	--	--	--	--	1.1	1.85

Where,
D = Dead Load
H = Lateral soil pressure
E' = Safe Shutdown Earthquake
F' = Buoyant forces of design basis flood
FS = Factor of safety

Table 3.8.5-203 Maximum Soil Dynamic Bearing Pressure Demand for RB/FB and CB

Subsurface Condition	Dynamic Bearing Pressure Demand			
	RB/FB		CB	
	Fermi 3 Site-Specific SSI (Static + FIRS[(1)])	Referenced DCD, (Static + SSE[(2)])	Fermi 3 Site-Specific SSI (Static + FIRS[(1)])	Referenced DCD, (Static + SSE[(2)])
Fermi 3 Lower Bound Subsurface Profile	1,120 KPa ($23,400\ lbf/ft^2$)	NA	520 KPa ($10,900\ lbf/ft^2$)	NA
Fermi 3 Best Estimate Subsurface Profile	1,190 KPa ($24,900\ lbf/ft^2$)	NA	560 KPa ($11,700\ lbf/ft^2$)	NA
Fermi 3 Upper Bound Subsurface Profile	1,240 KPa ($25,900\ lbf/ft^2$)	NA	600 KPa ($12,500\ lbf/ft^2$)	NA
Referenced DCD, Hard Soil Site	NA	1,100 kPa ($23,000\ lbf/ft^2$)	NA	420 kPa ($8,800\ lbf/ft^2$)

Notes:

(1) FIRS is the SSI FIRS developed based on full soil column in Subsection 3.7.1

(2) SSE is the Referenced DCD CSDRS

KPa = kilopascal

NA = Not applicable

2.4 SITE-SPECIFIC ITAAC

The Site Specific ITAAC are provided in the following sections. Site specific systems were evaluated against selection criteria in FSAR Section 14.3. If a site-specific system described in the FSAR does not meet an ITAAC selection criterion, only the system name and the statement "No entry for this system" is provided.

2.4.1 ITAAC FOR BACKFILL UNDER SEISMIC CATEGORY I STRUCTURES

Not applicable since no compactable backfill will be placed under Fermi 3 Seismic Category I structures.

2.4.2 ITAAC FOR BACKFILL SURROUNDING SEISMIC CATEGORY I STRUCTURES

~~Compactable backfill surrounding Fermi 3 Seismic Category I structures. The ITAAC for backfill surrounding the embedded walls of Seismic Category I structures are provided in Table 2.4.2-1.~~

The site parameter values in the Referenced DCD, Tier 2, Table 2.0-1 for compactable backfill surrounding the embedded walls of Fermi 3 Seismic Category I structures are not necessary as discussed in Subsections 2.5.4 and 3.7.2. Therefore, no ITAAC is necessary for compactable backfill surrounding the embedded walls of Fermi 3 Seismic Category I structures.

Table 2.4.2-1
ITAAC for Backfill Adjacent to Seismic Category I Structures

Design Commitment	Inspections, Tests, and Analyses	Acceptance Criteria
1. Shear wave velocity of the backfill material surrounding Seismic Category I structures, associated with seismic strains for lower bound soil properties at minus one sigma from the mean, is greater than or equal to 1,000 feet per second.	Field measurements and analyses of shear wave velocity in backfill will be performed.	An engineering report exists that concludes that the shear wave velocity within backfill material surrounding Seismic Category I structures, associated with seismic strains for lower bound soil properties at minus one sigma from the mean is greater than or equal to 1,000 feet per second.
2. The engineering properties of backfill material surrounding Seismic Category I structures are equal to or exceed the Design Control Document requirements.	Laboratory tests and field measurements to evaluate the engineering properties of the backfill will be performed. Laboratory tes Delete ude: • Direct Shear Tests • Relative Density and/or Proctor Tests • Sieve Analyses • Moisture Content Field measurement will include: • Standard Penetration Tests (SPT) • In-place Density Tests	An engineering report exists that concludes that the engineering properties of backfill material surrounding Seismic Category I structures are equal to or exceed the Design Control Document requirements as follows: • Angle of Internal Friction ≥ 35 degrees • Product of peak ground acceleration, α, (in g), Poisson's ratio, ν, and density, γ,: α(0.95ν+0.65)γ: 1220 kg/m^3 (76 lbf/ft^3) maximum • Product of at-rest pressure coefficient, k0, and density, γ,: k0γ: 750 kg/m^3 (47 lbf/ft^3) minimum • Soil density: γ: 2000 kg/m^3 (125 lbf/ft^3) minimum