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November 28, 2011
U7-C-NINA-NRC-110143

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
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South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Revised Response to Request for Additional Information

The attachment provides a revised response to NRC staff question 03.07.01-29 included in the Request for Additional Information (RAI) letter number 378 related to COLA Part 2, Tier 2, Section 3.7. During audits of May 23-27, 2011, July 25-29, 2011, and September 27-30, 2011, the NRC Staff requested that Nuclear Innovation North America LLC (NINA) provide additional information to support the review of the Combined License Application (COLA) pertaining to the Defense Nuclear Facilities Safety Board (DNFSB) letter of April 8, 2011. This submittal completes the actions requested by the NRC Staff.

There are no commitments in this letter.

If you have any questions regarding these responses, please contact me at (361) 972-7136 or Bill Mookhoek at (361) 972-7274.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on 11/28/11

Scott Head
Manager, Regulatory Affairs
South Texas Project Units 3 & 4

jep

Attachment:
RAI 03.07.01-29, Supplement 1, Revision 1

D091
NRO

STI 33137376

cc: w/o attachment except*
(paper copy)

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RAI 03.07.01-29, Supplement 1, Revision 1

QUESTION:

The Defense Nuclear Facilities Safety Board (DNFSB) has identified a technical issue in SASSI that when subtraction method is used to analyze embedded structures, the results may be non-conservative. Because the subtraction method has been used for the STP Units 3&4 SSI/SSSI analyses, NINA is requested to demonstrate the acceptability of the subtraction method and the results, or provide a plan and schedule to ensure that the SSCs are designed to meet the requirements of GDC 2. Therefore, the applicant is requested to address the following:

1. For all STP Units 3&4 Seismic Category I structures, compare the In-Structure Response Spectra (ISRS), structural loads, and any other design response quantities developed by using the subtraction method with those using the direct method or modified subtraction method and evaluate the differences.
2. Demonstrate and justify that the differences identified in Item 1 either have no impact on the design of Seismic Category I structures, or revise the design to address the differences.
3. If the modified subtraction method is used to validate the subtraction method, provide a validation program for the modified subtraction method.
4. Provide FSAR mark-up, if any, in the response to document actions taken to address the resolution of the DNFSB's issues with SASSI versions used by STP Units 3&4 analyses.

The staff needs this information to ensure that the STP design basis loads and ISRS will envelop the corresponding ISRS generated from either the direct method or the modified subtraction method.

REVISED SUPPLEMENTAL RESPONSE:

The supplement 1 response to this RAI was submitted with Nuclear Innovation North America (NINA) letter U7-C-NINA-NRC-110127, dated November 14, 2011. This revision provides the response to additional action items discussed in the NRC audits performed during the weeks of May 23, 2011, July 25, 2011 and September 27, 2011. The revisions are indicated by revision bars in the margin.

> *Subsequent to Action Item 3.7-37, revise the results presented in COLA as necessary. (Clarification Issue 22)* ***(Audit Action Item 3.7-38, Punch List Item 72)***
>
> *For groundwater resolution, in addition to the RAI response provided, perform the following* ***(Audit Action Item 3.7-46, Punch List Item 91)****:*
>
> > *1) Use 28 ft groundwater level in the analysis being performed for issues identified in April 8, 2011 DNFSB letter (AI 3.7-37)*
> > *2) Revise the COLA markup provided in the previous RAI response 03.07.01-27 S3*
> > *3) Revise the SSI calculations to add a clarification for groundwater level*

Note: ***Clarifications for item 3 of Punch List Item 91 have been added to SSI calculations for RSW Piping Tunnels and UHS/RSW Pump House***

In RAI response, provide explanation of "modified subtraction model" -- state that all surface nodes are included ***(Punch List Item 114)***

In RAI response, when describing soil cases for Section 6 SSSI analysis, justify considering only UB Backfill and LB In-situ soil cases ***(Punch List Item 115)***

In RAI response, provide reasoning as to why for the section east of Section 7 where no SSSI analysis is performed, the DGFOSV is adequate ***(Punch List Item 116)***

In RAI responses, where "engineering judgment" is used, provide supporting technical justification ***(Punch List Item 117)***

Provide results for Punch List Items 72, 114, 115, 117, 123, and 124 (Refer to RAI 03.07.01-29 S1 Draft) ***(Punch List Item 118)***

Provide results for Punch List Items 91 & 116 related to groundwater elevation and DOE letter resolution. Include results in COLA Mark-up ***(Punch List Item 121)***

Show why soil pressures obtained from MSM SSI analysis for the UHS/RSW Pump house and DGFOSV are conservatively bounded by the actual design pressures. ***(Punch List Item 123)***

During the South Texas Project, Units 3&4, Audit of FSAR Section 3.7, RAI 03.07.01-29, SASSI Issues Raised by the DNFSB Letter to DOE, NINA presented Table 6.2 – Comparison of Direct and Modified Subtraction Method Beam Forces in the Y-Direction. NINA is requested to clarify Table 6.2. ***(Punch List Item 124)***

Include flow chart for DOE issue in the response to RAI 03.07.01-29 S1 ***(Punch List Item 140)***

Acceptance of section cut forces obtained from SASSI soil structure interaction (SSI) analysis for structural design (RSW piping tunnel, diesel generator fuel oil tunnel, diesel generator fuel oil storage vault, and UHS/RSW pump house). ***(Punch List Item 149)***

Refinement of SSI models to extract section cut forces for structural evaluation and design. ***(Punch List Item 149)***

Identify RAI responses that justify exceedances seen in soil pressure plots ***(Punch List Item 112)***

Issues identified by the NRC that needs further clarification to resolve DOE SASSI issues ***(Punch List Item 127)*** *Note: The issues discussed in Punch List Item 127 are reflected in Punch List Items 141 through 149*

In RAI response 03.07.01-30, also discuss the pressure exerted by the compressible material on the Pump House wall and also why no additional SSSI section is needed for the Fuel Oil Storage Vault adjacent to the RSW Tunnel ***(Punch List Item 141)***

When addressing amplified motion, clearly describe why Control Building Annex is not affected by DOE issue ***(Punch List Item 142)***

Demonstrate that the amplified seismic input (i.e., amplified input spectra due to presence of the nearby heavy structures), if generated by using the Subtraction Method (SM) for DGFOT, RSWPT, DGFOSV, and any other structures as applicable would be conservative as compared to those obtained using the Modified Subtraction Method (MSM) or the Direct Method (DM). Alternatively, the applicant may use amplified spectra derived from the use of MSM or the DM. ***(Punch List Item 143)***

While SSI soil pressures obtained using both the SM and the MSM were in general comparable (See Figure 4.13 of July 27 & 28 audit presentation, SASSI Issues Raised by the DNFSB Letter to DOE), the results, presented at July 27, audit, did not fully demonstrate acceptability of the soil pressure distribution obtained from either the MSM or SM in comparison to results obtained from the DM. STP's project specific confirmation of the MSM method (using CB SSI analysis) or the SSSI analysis performed for one model (consisting of RWB, RSW Tunnel, and RB) did not include any comparison of the transfer functions of the soil pressure parameter at the interaction nodes at the exterior walls and the interacting adjacent building walls. The applicant is requested to further demonstrate that the soil pressure distribution obtained from the SM or MSM method is acceptable and is conservative for use in seismic design. ***(Punch List Item 144)***

For SSSI analysis (for soil pressure determination considering interaction of adjacent building), only one model (consisting of RWB, RSW Tunnel, and RB) was evaluated using the DM, SM, and MSM. STP has completed the analysis only for the lower bound soil case (UB case using backfill will also be performed). Preliminary results indicate that absolute soil pressure profile obtained from SM and MSM in some instances (particularly for exterior walls) did not compare well with those obtained from the DM. However, maximum total wall force (obtained from the TH analysis) due to soil pressure in general is within 5% for all three methods (Table 5.1 of July 27 & 28 audit presentation, SASSI Issues Raised by the DNFSB Letter to DOE). Based on this analysis, STP preliminarily concluded that the total soil pressure on the embedded wall obtained from SM is acceptable. However, the applicant is requested to further clarify the entries (including how they were computed) as presented in Table 5.1 provided by STP at July 27 Audit. ***(Punch List Item 145)***

The applicant is requested to reassess the seismic demand for stability evaluation of any applicable Category I and II/I structures in light of the DNFSB issue and confirm acceptability of the factors of safety against stability during an SSE. ***(Punch List Item 146)***

The applicant is requested to review all the Punch List Items and any applicable RAI responses to determine if any of the responses previously provided should be revised as a result of the assessment performed for addressing DNFSB issues. ***(Punch List Item 147)***

The issue of zero SSSI pressure on portions of the RSWPH North wall (Figure 3H.6-219, letter U7-C-NINA-NRC-110096) was further discussed with STP at July 27, 2011 meeting. It was indicated that there is a gap at these locations between the RSWPT south wall and the RSWPH north wall filled by the compressible material. However, for better clarity and understanding of the analysis model, STP is requested to provide an engineering sketch showing typical sections between the RSWPT and RSWPH including the tunnel entries to the RSWPH.

In addition it was noted that Section 7 of Figure 1 (see seismic soil pressure handout of July 27 & 28, 2011 meeting) was cut through RSWPH north wall, inter space between the tunnel entries to the RSWPH north wall, RSW tunnel cross section, and other buildings. However Figure 3H.6-211 (see letter U7-C-NINA-NRC-110042 - 2D SSSI model of RSWPH, RSWPT, DGFOSVs, and RB) indicates that the actual SSSI model section has been cut through the tunnel entries to the RSWPH instead of the inter space between the tunnel entries as depicted in Section 7. While the SSSI model analyzed appears to be consistent with the soil pressure shown in Figure 3H.6-219, the resulting SSSI pressure may not conservatively represent the interaction pressure that could develop on the RSWPH North wall and RSWPT south wall through interaction of soil in the space enclosed by the tunnel entries, RSWPH North wall, and RSWPT south wall. The applicant is requested to address this issue and demonstrate that SSSI interaction pressure used for design is still conservative. ***(Punch List Item 148)***

A) STP 3 & 4 Use of SASSI2000 for Seismic Analyses

SASSI2000 program is used to perform seismic analyses for Seismic Category I structures. These seismic analyses are comprised of:

- Soil-Structure-Interaction (SSI) analysis
- Structure-Soil-Structure-Interaction (SSSI) analysis

The results of the above seismic analyses are used for:

- Determination of amplified site-specific motions for light structures considering the influence of nearby heavy structures
- Generation of In-Structure Response Spectra (ISRS) using the acceleration time histories from SSI analyses
- Structural design and stability evaluations of structures using:

    1. Maximum nodal accelerations and section cut forces from SSI analyses
    2. Soil pressures from the SSI and SSSI analyses

For the STP 3 & 4 project, Subtraction Method of analysis was used for all SSSI and some SSI analyses. The results of these analyses were used in addressing the design of the following buildings. For Reactor and Control buildings the results were compared to the DCD design values to ensure that DCD design envelopes the results of these analyses.

- Reactor Building (RB)
- Control Building (CB)
- Ultimate Heat Sink (UHS)/Reactor Service Water (RSW) Pump House
- RSW Piping Tunnels
- Diesel Generator Fuel Oil Storage Vaults (DGFOSV)
- Diesel Generator Fuel Oil Tunnels (DGFOT)
- Radwaste Building (RWB)

Considering the above, an initial plan to address the issues identified by the DNFSB with the Subtraction Method (SM) in the SASSI computer program was discussed with NRC during the audit performed during the week of May 23, 2011. This initial plan, shown in Table 03.07.01-29 S1.1, was submitted in the original response to this RAI.

During the execution of this initial plan, based on the results from the various analyses performed and based on additional feedback from the NRC staff, the initial plan was revised as shown in Table 03.07.01-29 S1.2 (revisions are shown in red). The revisions in the plan were due to the following:

- In the initial plan the final modification factors at each frequency for generation of in-structure Response Spectra (ISRS) to account for cumulative effect of structural mesh refinement, SSI refined model, and Modified Subtraction Method (MSM) were to be determined as the product of the three corresponding modification factors. Referring to RAI 03.07.02-24 S2 response (submitted with STPNOC letter U7-C-STP-NRC-100268, dated December 14, 2010), the modification factors for the cumulative effect of structural mesh refinement and refined SSI model were to be based on the envelope of the two corresponding modification factors. Therefore, in the revised plan, the final spectra modification factors accounting for cumulative effect of structural mesh refinement, SSI refined model, and MSM are determined by the product of the modification factor for MSM and that determined based on envelope of the modification factors for structural mesh and SSI model refinements.

- In the initial plan, when addressing the impact of the maximum accelerations from MSM on the design of Ultimate Heat Sink (UHS)/Reactor Service Water (RSW) Pump House, based on the comparison of maximum accelerations for each of the element groups, a modification factor was to be determined for each of the element groups. Based on the results from the MSM analyses, application of a single modification factor for each element group was found to be too conservative. Thus the plan for addressing this issue was revised as described in Section D1.4, and as referenced in Table 03.07.01-29 S1.2.

- In the initial plan, there were no actions for the DGFOT because the original SSI analysis used the Direct Method of analysis. In the revised plan, because soil pressures had not been obtained in the original SSI analysis of DGFOT, it was reanalyzed using the Direct Method of analysis to obtain SSI seismic soil pressures. In addition in this reanalysis the ground water level was increased from 26' to 28'.

- The initial plan did not address the impact of MSM on the amplified site-specific motions for light structures considering the influence of nearby heavy structures. Before the DNFSB letter, these amplified motions had been determined from the three SSI analyses described below:

    1) Reactor Building (RB) SSI Analysis

        In this SSI analysis, the amplified site-specific motions were determined for the following adjacent light structures:

        - RSW Piping Tunnels
        - Diesel Generator Fuel Oil Storage Vaults (DGFOSV)
        - Diesel Generator Fuel Oil Tunnels (DGFOT)
        - Radwaste Building (RWB)
        - Control Building Annex (CBA)
        - Service Building (SB)

2) Control Building (CB) SSI Analysis

In this SSI analysis, the amplified site-specific motions were determined for the following adjacent light structures:

- CBA
- SB

3) UHS/RSW Pump House SSI Analysis

In this SSI analysis, the amplified site-specific motions were determined for the following adjacent light structures:

- RSW Piping Tunnels
- the one DGFOSV which is located adjacent to the RSW Pump House

Since the RB SSI model includes the great majority of the light structures adjacent to heavy structures (i.e. all but the CBA), in the revised plan the RB SSI analysis was selected to examine the impact of MSM on the amplified site-specific motions. In addition, in this re-analysis of the RB SSI using MSM, in accordance with the previous agreements with the NRC, the Poisson's ratio cap was increased to 0.495 and the ground water table was increased to 6 feet below grade (i.e. El. 28 ft MSL).

Evaluations to address the impact of MSM on amplified motions are discussed in Section "G" of this response.

The revised plan as shown in Table 03.07.01-29 S1.2 was executed and the results were used to re-evaluate and where required modify all STP 3 & 4 designs affected by the results of the new analyses. Figure 03.07.01-29 S1.251 provides a brief summary of this evaluation. The following provides the details of these actions.

B) Modified Subtraction Method

Consistent with the recommendations of DOE in their July 29, 2011 letter to the DNFSB, the Modified Subtraction Method of analysis is used to assess adequacy of STP 3 & 4 design.

B.1 Definition of Modified Subtraction Method

Modified Subtraction Method, similar to the Subtraction Method, uses a subset of the interaction nodes that are used in the Direct Method. In this method, number of interaction nodes lies between those for Subtraction and Direct Methods of analysis. For all STP 3 & 4 models, the interaction nodes for Modified Subtraction Method of analysis are comprised of all those at the soil-structure interface and all those at the top of excavated soil elements. An example is shown in Figure 03.07.01-29 S1.1 for the Control Building (CB).

B.2 Project Specific Verification of Modified Subtraction Method (MSM)

A project specific verification is performed. In the previous SSI analysis in support of shear wave velocity departure, the CB SSI analysis was performed using the Direct Method (DM) of analysis. For this verification, the CB was re-analyzed using MSM. The results of SSI analyses from the DM and MSM were compared to verify MSM results.

The results of the verification are provided below. For location of nodes and sections discussed below, see Figures 03.07.01-29 S1.2 through 03.07.01-29 S1.4.

Comparison of In-Structure Response Spectra:

Figures 03.07.01-29 S1.5 through 03.07.01-29 S1.11 provide comparison of ISRS from MSM and DM at several nodes of the CB model. As can be seen, the ISRS from MSM compare very well to those from DM.

Comparison of Transfer Functions

Figures 03.07.01-29 S1.12 through 03.07.01-29 S1.18 provide comparison of transfer functions from MSM and DM for several nodes of the CB model. These transfer functions are generally quite comparable. Note that the interpolated peak at about 14.5 Hz frequency in the MSM transfer function in Figure 03.07.01-29 S1.13 has no significant impact on the results. This is evident from the response spectra shown in Figure 03.07.01-29 S1.6.

Comparison of Maximum Accelerations

Tables 03.07.01-29 S1.3 and 03.07.01-29 S1.4 provide comparison of maximum accelerations in X, Y, and Z directions. The maximum accelerations from the DM and MSM compare very well. The maximum difference is less than 4%.

Comparison of Forces

Tables 03.07.01-29 S1.5 through 03.07.01-29 S1.7 provide comparison of axial forces, shears and moments for the beam elements of the CB model. The axial forces, shear and moments from the DM and MSM compare very well. The maximum difference is less than 2%.

Table 03.07.01-29 S1.8 provides comparison of axial forces, in-plane shears and in-plane moments (with respect to model axes of symmetry) along 4 sections of the exterior walls of the model (see Figures 03.07.01-29 S1.2 and 03.07.01-29 S1.3 for section locations). These comparisons are provided for each individual excitation as well as SRSS of all three excitations. The resultant axial forces, in-plane shears and in-plane moments for the DM and MSM compare very well. The maximum difference is about 4%.

Based on the above comparisons, the Modified Subtraction Method of analysis with interaction nodes comprised of those at the soil-structure interface and the nodes at the top of excavated soil elements is verified for STP 3 & 4 project use.

C) Generation of In-Structure Response Spectra (ISRS)

In-structure response spectra have been generated from SSI analyses for the following Seismic Category I structures:

- RSW Piping Tunnels
- DGFOSV
- DGFOT
- UHS/RSW Pump House

Note: No in-structure response spectra have been generated from SSSI analyses.

RSW Piping Tunnels:

The in-structure response spectra for the RSW Piping tunnels were generated using the acceleration time histories obtained from a 2-D SSI model. For this SSI analysis, Direct Method of analysis was used. Therefore, no further investigation is required for the in-structure response spectra of RSW Piping tunnels.

Diesel Generator Fuel Oil Tunnels (DGFOT):

The in-structure response spectra for DGFOT were initially generated using the acceleration time histories obtained from 2-D SSI analyses using Direct Method of analysis. However, in these SSI analyses, SSI soil pressures were not obtained. In order to obtain SSI soil pressures, the SSI model has been revised and the analysis repeated using Direct Method of analysis. In addition, in this revised analysis the ground water level has been increased to El. 28'. The results from this revised SSI analysis are used for generation of revised ISRS and DGFOT design. See Figures 3H.7-31 and 3H.7-32 provided with COLA mark-ups. No further investigation is required for the in-structure response spectra of DGFOT.

Diesel Generator Fuel Oil Storage Vaults (DGFOSV):

The in-structure response spectra for DGFOSV were initially generated using the acceleration time histories obtained from 3-D SSI analyses using Subtraction Method of analysis. This SSI analysis has been reanalyzed using Modified Subtraction Method of analysis. In addition, in this revised analysis the ground water level has been increased to El. 28'. The results from this revised SSI analysis are used for generation of ISRS and DGFOSV design. For revised

DGFOSV ISRS see Figures 3H.6-223 and 3H.6-224 provided with COLA mark-ups. No further investigation is required for the in-structure response spectra of DGFOSV.

UHS/RSW Pump House:

The in-structure response spectra for UHS/RSW Pump House were initially generated using the acceleration time histories obtained from 3-D SSI analyses using Subtraction Method of analysis. Based on studies performed for mesh refinements, these spectra were amplified at several locations to account for impact of SSI model and structural mesh refinements (see RAI 03.07.02-24 S2). To address the DOE issue, the full and empty basin SSI models for upper bound in-situ soil (same soil case used for investigation of SSI mesh refinement) were modified and reanalyzed using the Modified Subtraction Method of analysis. In addition, in these revised analyses, the ground water level was increased to El. 28'.

Figures 03.07.01-29 S1.22 through 03.07.01-29 S1.45 provide comparison of transfer functions from Subtraction and Modified Subtraction Methods of analysis for upper bound in-situ soil case at several locations for both empty and full basin cases. These figures show smoother transfer functions for Modified Subtraction Method of analysis. Figures 03.07.01-29 S1.46 through 03.07.01-29 S1.75 show comparison of response spectra (5% damping) from Subtraction and Modified Subtraction Methods of analysis for upper bound in-situ soil case for both empty and full basin cases.

The resulting in-structure response spectra for upper bound in-situ soil case from the Modified Subtraction and Subtraction Methods for both full and empty basin cases were compared and spectra amplification factors (always higher than or equal to 1) were determined to account for impact of Modified Subtraction Method on spectra generation. These amplification factors are shown in Tables 03.07.01-29 S1.11 and 03.07.01-29 S1.12 for full and empty basin case, respectively. Tables 03.07.01-29 S1.9 and 03.07.01-29 S1.10 provide the spectra amplification factors to account for impact of structural and SSI mesh refinements for full and empty basin cases, respectively. The product of the modification factors for MSM and that determined based on the envelope of the modification factors for structural mesh and SSI model refinements are selected as the final spectra amplification factors shown in Table 03.07.01-29 S1.13. The final UHS/RSW Pump House ISRS are determined in a manner similar to that described in RAI 03.07.02-24 S2 using the spectra amplification factors in Table 03.07.01-29 S1.13. See Figures 3H.6-16 through 3H.6-39 provided with COLA mark-ups for revised UHS/RSW Pump House ISRS. No further investigation is required for the in-structure response spectra of the UHS/RSW Pump House.

D. Structural Design

The following from SSI and SSSI analyses have been utilized for STP 3 & 4 structural designs:

- Maximum accelerations and section cut forces from SSI analyses
- Seismic soil pressures from SSI analyses
- Seismic soil pressures from SSSI analyses

In the following, each of the above items is addressed for all affected structures.

D.1 Maximum accelerations and section cut forces

All maximum accelerations and section cut forces for structural design were obtained from SSI analysis. The STP 3 & 4 structures utilizing maximum accelerations and/or section cut forces from SSI analysis include the following structures:

- RSW Piping Tunnels
- Diesel Generator Fuel Oil Tunnels
- Diesel Generator Fuel Oil Storage Vaults
- UHS/RSW Pump House

D.1.1 RSW Piping Tunnels:

SSI analyses of the RSW Piping tunnels have been performed using Direct Method of analysis. Therefore, no further investigation is required for structural design of RSW Piping tunnels in regards to maximum accelerations and section cut forces from SSI analyses.

D.1.2 Diesel Generator Fuel Oil Tunnels (DGFOT):

SSI analyses of DGFOT have been performed using Direct Method of analysis. Therefore, no further investigation is required for structural design of DGFOT in regards to maximum accelerations and section cut forces from SSI analyses.

D.1.3 Diesel Generator Fuel Oil Storage Vaults (DGFOSV):

The latest (final) SSI analyses of DGFOSV have been performed using Modified Subtraction Method of analysis. Therefore, no further investigation is required for structural design of DGFOSV in regards to maximum accelerations and section cut forces from SSI analyses.

D.1.4 UHS/RSW Pump House:

The existing design of the UHS/RSW Pump House is based on the SSI results using Subtraction Method of analysis. In this design, the seismic loads are determined using a conservative equivalent static method. For this equivalent static method of analysis, as shown in Figures 03.07.01-29 S1.76 and 03.07.01-29 S1.77, the elements of the structure are subdivided into 9 major groups and each group is further divided into panels (subgroups) resulting in a total of 208 panels. For each panel, the accelerations are determined based on the average of maximum accelerations for all nodes within the panel.

In order to assess the impact of Subtraction Method of analysis, the SSI analysis of UHS/RSW Pump House was repeated for upper bound in-situ soil case for both full and empty basin cases using Modified Subtraction Method of analysis. The maximum accelerations for the upper bound in-situ soil case for empty and full basin cases from SSI analyses using Subtraction and Modified Subtraction Methods of analysis were compared to assess the impact of Subtraction Method of analysis on structural design of this structure.

Table 03.07.01-29 S1.14 presents the difference in the magnitude of the panel accelerations for Modified Subtraction Method vs. Subtraction Method for all 208 panels of this structure. In this table, positive difference indicates increase in acceleration due to use of Modified Subtraction Method and negative difference indicates the opposite. Table 03.07.01-29 S1.15 presents the same information presented in Table 03.07.01-29 S1.14 in terms of percent (%) change in accelerations with respect to the accelerations for Subtraction Method of analysis. Similarly, positive percent (%) change indicates increase in acceleration due to use of Modified Subtraction Method and negative difference indicates the opposite. These two tables show that the majority of panel accelerations based on Modified Subtraction Method of analysis are lower than those based on Subtraction Method of analysis. However, some panels also see increase in acceleration due to use of Modified Subtraction Method.

Considering that the majority of accelerations are reduced and the fact that the existing design is based on conservative equivalent static method, it is expected that the existing design based on SSI analysis results using Subtraction Method of analysis is adequate. However, in order to confirm this, the following additional assessments were performed.

Evaluation of Walls and Slab Panels:

In order to assess the cumulative effect of change in acceleration, for a number of section cuts the % difference in SSI forces from Subtraction and Modified Subtraction Methods of analysis were determined and compared to the available margin in section cut forces due to use of equivalent static method. Tables 03.07.01-29 S1.16 and 03.07.01-29 S1.17 provide the results of this assessment for full and empty basin cases respectively. The following observations are based on these two tables:

- In the majority of cases, the individual force components from Modified Subtraction Method of analysis along a section cut are lower than the respective force component from Subtraction Method of analysis.
- With the exception of one case (discussed in the following bullet), for all those cases where an individual force component from Modified Subtraction Method of analysis along a section cut exceeds the corresponding force from Subtraction

Method of analysis, the increase is bounded by the available margin due to use of conservative equivalent static method.

- For section cut #61 of the full basin case, the percent (%) increase in in-plane moment is 59.9%. This exceeds the available margin of 57% for applied in-plane moment. This difference of 2.9% is of no consequence for the following reasons:

  1. This deficit is only applicable to the in-plane moment. For the remaining force components (i.e. axial force, in-plane shear, out-of-plane shear, and out-of-plane moments), Modified Subtraction Method yields lower force components.
  2. The design of in-plane reinforcement is a function of four force components, namely axial force, in-plane shear, in-plane moment, and out-of-plane moment. The minimum margins for axial force, in-plane shear and out-of-plane moment are 60%, 124%, and 134%, respectively.
  3. The available margins noted in these tables are conservative because they are only based on the applied loads and do not consider any additional margin based on provided reinforcement vs. calculated required reinforcement. Generally provided reinforcement is at least 5 to 10% more than the calculated required reinforcement.

Based on the above, all wall and slab panels of UHS/RSW Pump House designed based on SSI analysis using Subtraction Method of analysis will be adequate for resulting forces due to use Modified Subtraction Method of analysis. However, based on discussions with the NRC staff during the September 2011 audit, the following two additional confirmatory studies will be performed to provide further assurance that 1) the section cut forces from the SASSI2000 are accurate; and 2) the SSI mesh is adequately refined to produce accurate section cut forces.

Benchmark Study:

In order to benchmark the calculation of section cut forces from SASSI2000, a dynamic analysis performed in SASSI2000 will be repeated using SAP2000 with an identical model and input. The models will be identical to the so-called coarse mesh model used for SSI analysis of UHS/RSW Pump House, but will be run as fixed base. Input ground motions will be the site-specific SSE, the results from the three seismic components will be combined using SRSS, and only the full basin case will be considered. Comparison will include all section cut forces from the same 19 locations listed in Tables 03.07.01-29 S1.16 and 03.07.01-29 S1.17. If section cut forces from the two analyses are within approximately 10%, the section cut forces from the SSI analysis using SASSI2000 will be considered acceptable.

Mesh Refinement Study:

To confirm that the coarse mesh model of the SSI analysis of the UHS/RSW Pump House using Modified Subtraction Method is sufficiently refined for determination of section cut forces, a dynamic analysis performed in SASSI2000 will be repeated using a mesh that has been modified to best approximate that used in the SAP2000 design model using equivalent static method. The models and input motions will be identical except for this mesh modification. Both dynamic analyses will be run using fixed base boundary conditions subject to site-specific SSE ground motions considering both full and empty basin cases. The results from the three seismic components will be combined using SRSS. Comparison will include all section cut forces from the same 19 locations listed in Tables 03.07.01-29 S1.16 and 03.07.01-29 S1.17. If section cut forces are within 10%, the SSI coarse mesh will be considered adequately refined for determination of section cut forces from MSM SSI analysis. For any section where the section cut forces from the modified mesh are higher by more than 10%, the corresponding section cut forces from the MSM SSI analysis will be increased by the same percent (%) increase prior to comparison with the section cut forces from the SAP2000 design model for demonstrating adequacy of the existing design.

The above confirmatory studies are currently in progress. The results of these confirmatory studies will be provided in RAI 03.07.01-29, Supplement 2 which is currently scheduled to be submitted in December 2011.

Evaluation of UHS Basin Columns and Beams:

The design of concrete beams and columns within the UHS basin are not only affected by the maximum accelerations, but it can also be affected by the resulting in-structure response spectra at the top and bottom of the columns which are used to account for the effect of hydrodynamic mass on the UHS columns. For additional information on this issue, see RAI 03.08.04-30 S4 response (submitted with NINA letter U7-C-NINA-NRC-110087, dated June 28, 2011).

Considering the above, the procedure described in Figure 03.07.01-29 S1.78 was used to assess adequacy of UHS basin columns and beams. Based on the results of this assessment, all UHS basin concrete beams and columns designed based on SSI analysis using Subtraction Method of analysis will be adequate for SSI analysis results using Modified Subtraction Method of analysis.

D.2 Seismic Soil Pressures

Structural designs as well as stability evaluations for the following STP 3 & 4 structures consider seismic soil pressures from SSI and SSSI analyses:

- RSW Piping Tunnels
- Diesel Generator Fuel Oil Tunnels
- Diesel Generator Fuel Oil Storage Vaults

- UHS/RSW Pump House
- Radwaste Building

The impact on the stability evaluations will be addressed in RAI 03.07.02-13 S4 response currently scheduled for submittal to NRC in November of 2011. The following provides the impact evaluation for structural design.

D.2.1 Seismic Soil Pressures from SSSI analysis

The main purpose of the SSSI analyses was to determine the increase in soil pressure on the interior walls (walls facing adjacent structure) due to the adjacent structure. For the STP 3 & 4, a total of seven (7) SSSI analyses using Subtraction Method of analysis have been performed. Figure 03.07.01-29 S1.79 shows the sections for these SSSI analyses.

Based on the discussions with NRC during May 2011 NRC audit, the SSSI analysis for RB + RSW Piping Tunnels + RWB model shown in Figure 03.07.01-29 S1.80 (corresponding to Section 6 in Figure 03.07.01-29 S1.79) was selected for further evaluation using Direct and Modified Subtraction Methods of analysis. The results of this evaluation will be used for addressing all SSSI analyses.

The bounding SSSI soil pressures for this SSSI analysis using Subtraction Method of analysis were determined considering lower bound in-situ, upper bound in-situ, and upper bound backfill soil cases. Figures 03.07.01-29 S1.81 through 03.07.01-29 S1.86 show the governing soil case for soil pressures for each of the six walls in this SSSI model. The following observations are based on examination of these figures:

- Great majority (~ 85%) of these soil pressures are governed by lower bound in-situ and upper bound backfill soil cases
- Only a small percentage of soil pressures are governed by upper bound in-situ soil case and in these cases the soil pressures from the upper bound in-situ soil case are in general within 10% of those from lower bound in-situ or upper bound backfill soil cases.

Based on the above observations, the re-analysis of this SSSI section using Direct and Modified Subtraction Methods of analysis was carried out using only the lower bound in-situ and upper bound backfill soil cases.

The following provides the results of the reanalysis for this SSSI section using Subtraction, Modified Subtraction, and Direct Methods of analyses.

D.2.1.1 Investigation of SSSI Section 6 for Lower Bound In-situ Soil Case

The following are based on the results from SSSI analysis of Section 6 for lower bound in-situ soil case using Subtraction, Modified Subtraction, and Direct Methods of analyses.

Comparison of Maximum Absolute Soil Pressures Profiles:

Figures 03.07.01-29 S1.87 through 03.07.01-29 S1.92 provide comparison of maximum absolute soil pressures from Subtraction, Modified Subtraction, and Direct Methods of analyses for all walls of this model. These pressures represent the absolute value of the highest magnitude soil pressure experienced by each element during any point in the analysis time history. The following observations are based on examination of these figures:

- The maximum absolute pressure profiles from the Subtraction and Modified Subtraction Methods of analysis are comparable for all walls.
- For exterior walls of the SSSI model (i.e. RB east wall, RB west wall below the RWB mudmat and RWB west wall), the maximum absolute pressure profiles from the Direct Method of analysis are different from those from Subtraction and Modified Subtraction Methods of analysis.
- For interior walls, i.e., walls that face an adjacent structure, the maximum absolute pressure profiles from all three methods are comparable.

Comparison of Transfer Functions for Soil Pressures:

The soil pressures are determined from soil element forces, which are dependent on element nodal displacements. The nodal displacements are calculated using the acceleration transfer functions, therefore soil pressures are related to nodal acceleration transfer functions for the soil element used to calculate soil pressure. For comparison of transfer functions, total of six elements along the RB east, RB west, and RWB west walls where there is significant difference between the soil pressures from the SM and DM of analysis are selected for comparison of soil pressure transfer functions. The location of these six elements is shown in Figure 03.07.01-29 S1.93. Figures 03.07.01-29 S1.94 through 03.07.01-29 S1.111 provide comparison of transfer functions for these six elements for SM, MSM, and DM of analysis. As can be seen from these figures, for low frequencies (i.e. up to about 7 Hz) there is good agreement among the transfer functions from all three methods of analysis. For higher frequencies, some significant differences exist among the transfer functions from the three methods. The differences at higher frequencies are not significant for the structural design because soil pressures are mainly due to low frequency responses. To demonstrate this, Figures 03.07.01-29 S1.112 through 03.07.01-29 S1.117 provide comparison of maximum absolute soil pressures for the six walls of this SSSI model computed considering responses from 0 to 5 Hz and 0 to 33 Hz. This comparison shows that the great majority of the maximum soil pressure at any location along these walls is due to responses from 0 to 5 Hz. Figures 03.07.01-29 S1.118 through 03.07.01-29 S1.135 provide a more detailed comparison of the transfer functions for 0 to 5 Hz frequencies for these six elements along with three additional elements along the east and west walls of RSW Piping tunnel (for location of these additional elements see Figure 03.07.01-29 S1.93). These figures show very good agreement among the transfer functions from SM, MSM, and DM of analysis for all nine elements.

Comparison of Total Soil Force Time Histories:

Figures 03.07.01-29 S1.136 through 03.07.01-29 S1.141 provide comparison of the total soil force time histories from Subtraction, Modified Subtraction, and Direct Methods of analyses for all walls of this model. Also, shown in these figures are the magnitudes of the maximum total soil forces, the times corresponding to the maximum total soil forces, and the locations of the maximum total soil forces with respect to the grade elevation. As can be seen from these figures the time history shapes are quite similar and the differences in the magnitudes of the peaks and valleys are small.

Comparison of Soil Pressure profiles:

Figures 03.07.01-29 S1.142 through 03.07.01-29 S1.147 provide comparison of the soil pressure profiles for the maximum total soil forces, magnitudes of the maximum total soil forces, the times corresponding to the maximum total soil forces, and the locations of the maximum total soil forces with respect to the grade elevation for all walls of this model. The following observations are based on these figures:

- The maximum total soil forces from the three methods of analysis are almost the same (i.e. within ±10%)
- For the same time, not only are the total soil forces from the three methods close (i.e. within ±10%), but the locations of the total soil forces from the three methods also are close. To demonstrate this point, the comparisons for the RB east and west walls are repeated for two equal times in Figures 03.07.01-29 S1.148 through 03.07.01-29 S1.151.

Based on the above, the magnitudes and locations of the total soil forces from the three methods of analysis are close (i.e. within ±10%).

D.2.1.2 Investigation of SSSI Section 6 for Upper Bound Backfill soil Case

The following discussion is based on the results from SSSI analysis of Section 6 for upper bound backfill soil case using Subtraction, Modified Subtraction, and Direct Methods of analyses.

Comparison of Maximum Absolute Soil Pressures Profiles:

Figures 03.07.01-29 S1.152 through 03.07.01-29 S1.157 provide comparison of maximum absolute soil pressures from Subtraction, Modified Subtraction, and Direct Methods of analyses for all walls of this model. The following observations are based on examination of these figures:

- The maximum absolute pressure profiles from all three methods of analysis are comparable for all walls.

Comparison of Total Soil Force Time Histories:

Figures 03.07.01-29 S1.158 through 03.07.01-29 S1.163 provide comparison of the total soil force time histories from Subtraction, Modified Subtraction, and Direct Methods of analyses for all walls of this model. Also, shown in these figures are the magnitudes of the maximum total soil forces, the times corresponding to the maximum total soil forces, and the locations of the maximum total soil forces with respect to the grade elevation. As can be seen from these figures the time history shapes are quite similar and the differences in the magnitudes of the peaks and valleys are small.

Comparison of Soil Pressure profiles:

Figures 03.07.01-29 S1.164 through 03.07.01-29 S1.169 provide comparison of the soil pressure profiles for the maximum total soil forces, magnitudes of the maximum total soil forces, the times corresponding to the maximum total soil forces, and the locations of the maximum total soil forces with respect to the grade elevation for all walls of this model. The following observations are based on these figures:

- The maximum total soil forces from the three methods of analysis are almost the same (i.e. within ±10%)
- For the same time, not only are the total soil forces from the three methods close (i.e. within ±10%), but the locations of the total soil forces from the three methods also are close. To demonstrate this point, the comparisons for the RB east and west walls are repeated for two equal times in Figures 03.07.01-29 S1.170 through 03.07.01-29 S1.173.

Based on the above, the magnitudes and locations of the total soil forces from the three methods of analysis are close (i.e. within ±10%).

D.2.1.3 Conclusions based on SSSI Investigation of Section 6

Based on the results presented above, the following conclusions are applicable:

- The method of SSSI analysis (SM, MSM, or DM) has negligible impact on the total force due to seismic soil pressure (i.e. within ±10%)

- The method of SSSI analysis (SM, MSM, or DM) has negligible impact on location (i.e. C.G.) of the total force due to seismic soil pressure (i.e. within ±10%)

- DM analytical results show some changes in the distribution of seismic soil pressure for exterior walls.

- The method of SSSI analysis (SM, MSM, or DM) has negligible impact on the soil pressure distribution for interior walls. This is due to the fact that the interior walls, and the soil between them, collectively act as interior structural members and are not directly connected to the interaction nodes. Therefore, for interior walls, there is no need for any additional investigation for method of analysis used.

D.2.1.4 Evaluation of all SSSI Sections

The analysis results from the STP 3 & 4 SSSI analyses were used in addressing the seismic soil pressures on the following structures:

- Reactor Building (RB)
- Control Building (CB)
- Ultimate Heat Sink (UHS)/Reactor Service Water (RSW) Pump House
- RSW Piping Tunnels
- Diesel Generator Fuel Oil Storage Vaults (DGFOSV)
- Diesel Generator Fuel Oil Tunnels (DGFOT)
- Radwaste Building (RWB)

Among the above structures, RB and CB are part of the certified design. The certified design of RB and CB are based on 0.3g Regulatory Guide 1.60 response spectra. Therefore, for site-specific seismic input motions which are significantly lower than 0.3g Regulatory Guide 1.60 response spectra, these structures possess significant design margin. Note that SSSI analyses are site-specific analyses. Due to this significant design margin and based on the conclusions noted in Section D.2.1.3 above, the evaluation of SSSI analyses will be based on detailed examination of the impact on the following structures:

- UHS/RSW Pump House
- RSW Piping Tunnels
- DGFOSV
- DGFOT
- RWB

Evaluation of each of the SSSI sections shown in Figure 03.07.01-29 S1.79 is discussed below:

SSSI Sections 1 and 2:

These two sections were analyzed to address the Crane Foundation Retaining Wall (CFRW) effect on the Reactor Building (RB) and the Control Building (CB). It should be noted that Section 1 did not include DGFOT. The analysis results for these two sections have no impact on design of Category I site-specific structures, DGFOT, or RWB. Thus no further investigation is required for these two sections.

SSSI Section 3:

This confirmatory analysis was performed to evaluate the impact of site-specific input motion and soil properties for the DCD SSSI soil pressures. The only SSSI soil pressures reported in the DCD are for RB north wall and CB south wall obtained from an SSSI analysis of RB + CB + TB. Since in this SSSI analysis the RB and CB walls are interior walls, the method of analysis (SM, MSM or DM) has negligible impact on total force due to seismic soil pressure or the distribution of seismic soil pressure. Thus no further investigation is required for this section.

SSSI Section 4:

This SSSI analysis is for the CFRW+DGFOT+RB section. The walls of the DGFOT are interior walls, which are not impacted by the method of analysis. Therefore no further investigation is required for this section.

SSSI Section 5:

This SSSI analysis is for the CFRW+DGFOSV+DGFOT section. The east wall of the DGFOT and the east and part of west walls of the DGFOSV are interior walls, which are not impacted by the method of analysis. Note that DGFOSV walls, in addition to SSI and SSI soil pressures, are designed for ASCE 4-98 seismic soil pressure as well as full passive soil pressure (i.e. Kp = 3.0) which meets acceptance criterion II.4.H of SRP 3.8.4. Therefore no further investigation is required for these walls.

The west wall of the DGFOT is exterior and therefore the soil pressure distribution for this wall may be impacted by the method of analysis. The wall has been designed for seismic soil pressures obtained from SSI, ASCE 4-98, SSSI (SM) as well as passive soil pressure. Figure 03.07.01-29 S1.174 provides comparison of SSSI soil pressure vs. seismic soil pressure used for design of this wall. Figures 03.07.01-29 S1.176 and 03.07.01-29 S1.177 provide comparison of out-of-plane shears and moments due to SSSI and design seismic soil pressure for a typical panel of this wall shown in Figure 03.07.01-29 S1.175. Based on the summary of the results presented in Table 03.07.01-29 S1.18, the minimum existing margin for the seismic soil pressure is 43%. This margin will more than adequately account for change in out-of-plane shear and moment due to seismic soil pressure distribution from SSSI analysis using Direct Method of analysis.

SSSI Section 6:

This SSSI analysis is for the RWB+RSW Piping Tunnel + RB section. This SSSI analysis was initially done using SM, and subsequently reevaluated using the MSM and DM.

Both the east and west walls of the RSW Piping Tunnel are interior walls, which are not impacted by the method of analysis. Therefore no further investigation is required for these walls.

The east wall of the RWB (a non-Category I structure) is an interior wall, which is not impacted by method of analysis. The seismic soil pressure distribution for the west wall of the RWB is impacted by the method of the analysis. Figure 03.07.01-29 S1.178 provides comparison of SSSI soil pressure vs. seismic soil pressure used for the design of west wall. Note that the SSSI soil pressure in this figure is from the Direct Method of analysis. Figure 03.07.01-29 S1.179 shows the finite element model of this wall used for determination of out-of-plane shears and moments due to SSSI and design seismic soil pressures, and Figures 03.07.01-29 S1.180 through 03.07.01-29 S1.183 provide comparison of contour plots for out-of-plane shears and moments. Table 03.07.01-29 S1.19 provides a summary of these comparisons which shows a minimum margin of 38% for seismic soil pressure.

SSSI Section 7:

This SSSI analysis is for the RB + DGFOSV 1B + DGFOSV 1C + RSW Piping Tunnel + UHS/RSW Pump House section. Location selection of this SSSI section was based on discussions with the NRC staff during the August 2010 meeting in Rockville, Maryland. This SSSI section which cuts through two DGFOSV was selected instead of another possible SSSI section to the east of it which cuts through only one DGFOSV for the following reasons:

1. For the section to the east of this section, the distance between the DGFOSV and the RB is in excess of 140 feet. Therefore no significant impact from the RB is expected.
2. DGFOSV walls, in addition to seismic soil pressures from the SSI and SSSI analyses, are designed for seismic soil pressures per ASCE 4-98 as well as full passive soil pressure (i.e. Kp = 3.0) which meets acceptance criterion II.4.H of SRP 3.8.4.
3. RSW Pump House north wall, in addition to seismic soil pressures from the SSI and SSSI analyses, is designed for seismic soil pressures per ASCE 4-98 as well as passive soil pressure (Kp = 1.2) without taking any credit for lack of soil pressure at its juncture with the RSW Piping Tunnel.

In this SSSI model, the walls of the two DGFOSVs, the RSW Piping Tunnel, and north wall of the UHS/RSW Pump House with the exception of bottom portion are interior walls, which are not impacted by method of analysis. Bottom portion of the UHS/RSW Pump House north wall is exterior. However, the UHS/RSW Pump House north wall, in addition to SSI and SSSI soil pressures, is designed for seismic soil pressure per ASCE 4-98 and passive soil pressure (Kp=1.2) without taking any credit for lack of soil pressure at its juncture with the RSW Piping Tunnel. Therefore no further investigation is required for these walls.

The south wall of the UHS Basin is an exterior wall. While the distribution of the seismic soil pressure on the bottom 20 feet (measured from top of basin basemat) of this wall may change due to method of analysis, the change in the total force due to seismic soil pressure and the location (i.e. C.G.) of the resultant seismic soil force will be negligible. As shown in Figure 03.07.01-29 S1.184, this wall has been designed considering a conservative seismic soil pressure profile which significantly envelopes the seismic soil pressure from SSSI analysis. Figures 03.07.01-29 S1.186 through 03.07.01-29 S1.189 provide the contour plots for out-of-plane shears and moments due to SSSI and design seismic soil pressures based on analysis of a typical section of this wall shown in Figure 03.07.01-29 S1.185. Based on summary of the results shown in Table 03.07.01-29 S1.20, the minimum existing margin for the seismic soil pressure is 243%. This margin will more than adequately account for change in out-of-plane shear and moment due to seismic soil pressure distribution from SSSI analysis using Direct Method of analysis.

Based on the evaluations presented above, it is concluded that the existing STP 3 & 4 designs based on SSSI seismic soil pressures obtained from SSSI analyses using Subtraction Method of analysis will be adequate for SSSI seismic soil pressures from SSSI analyses using Modified Subtraction Method and/or Direct Method of analysis.

D.2.2 Seismic Soil Pressures from SSI analysis

The SSI seismic soil pressures from the STP 3 & 4 SSI analyses were used in structural design of the following structures:

- RSW Piping Tunnels
- DGFOSV
- UHS/RSW Pump House
- DGFOT

Evaluation of each of the above structures in regards to SSI seismic soil pressures is presented below:

RSW Piping Tunnels:

Figures 03.07.01-29 S1.190 and 03.07.01-29 S1.191 provide comparison of seismic soil pressures from SSI analysis based on maximum absolute pressures (conservative) and seismic soil pressures used for design of RSW Piping tunnel east and west walls, respectively. The SSI soil pressures were obtained from SSI analysis using Direct Method of analysis. No further investigation is required for SSI seismic soil pressures of RSW Piping tunnels.

DGFOSV:

Figure 03.07.01-29 S1.192 provides wall numbering for the four walls of each DGFOSV. Figures 03.07.01-29 S1.194, 03.07.01-29 S1.204, 03.07.01-29 S1.214, and 03.07.01-29 S1.224 provide a comparison of seismic soil pressures from SSI analysis based on maximum absolute pressures (conservative) and seismic soil pressures used for design of DGFOSV walls No. 1 through 4, respectively. The SSI soil pressures were obtained from SSI analysis using Modified Subtraction Method of analysis.

Each of the four walls of the DGFOSV have been analyzed using SAP2000 models considering the SSI and design seismic soil pressures using the models shown in Figures 03.07.01-29 S1.193, 03.07.01-29 S1.203, 03.07.01-29 S1.213, and 03.07.01-29 S1.223. The comparison of the contour plots for the resulting out-of-plane shears and moments due to SSI and design seismic soil pressures are shown in the following figures:

- Figures 03.07.01-29 S1.195 through 03.07.01-29 S1.202 for wall #1
- Figures 03.07.01-29 S1.205 through 03.07.01-29 S1.212 for wall #2
- Figures 03.07.01-29 S1.215 through 03.07.01-29 S1.222 for wall #3
- Figures 03.07.01-29 S1.225 through 03.07.01-29 S1.232 for wall #4

A summary of the above comparisons for the out-of-plane shears and moments of DGFOSV walls is provided in Table 03.07.01-29 S1.21 which shows a minimum existing margin of about 90% for the seismic soil pressure.

For the DGFOSV, due to size of the SSI model, obtaining SSI seismic soil pressure using Direct Method of analysis is not feasible. However, from the investigation of SSSI soil pressures described in Section D.2.1.3 above, the SSI soil pressures from the Direct Method of analysis are expected to have soil pressure distribution which may differ from those from Modified Subtraction Method of analysis. However, the total soil forces due to seismic soil pressures and the location (C.G.) of the resultant soil forces are expected to be similar to those from Modified Subtraction Method of analysis with only small variations (~10%). As noted above the margin for design seismic soil pressure is about 90%. This margin will adequately account for any change in seismic soil pressure distribution due to use of Direct Method of analysis. Therefore, it is concluded that the design of DGFOSV using the design seismic soil pressures described above is adequate for SSI seismic soil pressures regardless of method of analysis. Thus no further investigation is required for SSI seismic soil pressures of DGFOSV.

UHS/RSW Pump House:

The design basis SSI analysis of the UHS/RSW Pump House is performed using Subtraction Method of analysis. The UHS/RSW Pump House SSI analysis for upper bound in-situ soil case is repeated using Modified Subtraction Method of analysis.

Figures 03.07.01-29 S1.233 through 03.07.01-29 S1.240 provide a comparison of SSI soil pressures (based on maximum of absolute soil pressures) from Subtraction and Modified Subtraction Methods of analysis. Based on examination of these figures, the following observations are applicable:

- The pressure profiles for the two methods are rather similar
- The total soil force due to seismic soil pressure from the two methods are close and the total soil force from Subtraction Method of analysis either exceeds the total soil force from Modified Subtraction Method of analysis or it is within 5%

Figures 03.07.01-29 S1.241 through 03.07.01-29 S1.248 provide comparison of design seismic soil pressure vs. SSI soil pressures from Subtraction Method of analysis for all eight (8) walls of UHS/RSW Pump House. Also shown in these figures are the total soil forces due to seismic soil pressures as well as the location (i.e. C.G.) of resultant total soil forces. Referring to these figures and Table 03.07.01-29 S1.22, it is concluded that the design seismic soil pressure considered for design of UHS/RSW Pump House provides a minimum margin of about 220% against the SSI seismic soil pressures from Subtraction Method of analysis.

For the UHS/RSW Pump House, due to size of the SSI model, obtaining SSI seismic soil pressures using Direct Method of analysis is not feasible. However, from the investigation of SSSI soil pressures described in Section D.2.1.3 above, the SSI soil pressures from the Direct Method of Analysis are expected to have soil pressure distribution which may differ from those from Subtraction Method of analysis. However, the total soil forces due to seismic soil pressures and the location (C.G.) of the resultant soil forces are expected to be similar to those from Subtraction Method of analysis with only small variations. As noted above the minimum margin for design seismic soil pressure is 220%. This margin will adequately account for any change in seismic soil pressure distribution due to use of Direct Method of analysis. Therefore, it is concluded that the design of UHS/RSW Pump House using the design seismic soil pressures described above is adequate for SSI seismic soil pressures regardless of method of analysis. Thus no further investigation is required for SSI seismic soil pressures of UHS/RSW Pump House.

DGFOT:

Figures 03.07.01-29 S1.249 and 03.07.01-29 S1.250 provide comparison of seismic soil pressures from SSI analysis based on maximum absolute soil pressures (conservative) and seismic soil pressures used for design of DGFOT walls. The SSI soil pressures were obtained from SSI analysis using the Direct Method of analysis. These figures show that the seismic soil pressure profiles used for design of these walls envelope the SSI seismic soil pressure profiles. Thus no further investigation is required for SSI seismic soil pressures of DGFOT.

E) Punch List Item 141

The expected pressure on the RSW Pump House wall from the compressible (seal) material is less than 25 psi. This is based on the detailed discussion provided in RAI 03.08.01-31 which was submitted with STP letter U7-C-STP-NRC-100208 dated September 15, 2010. RAI 03.08.01-31 also provides discussion regarding the adequacy of the structures subjected to this expected pressure of 25 psi.

The reason for not needing any additional SSSI section is discussed in sub-section "SSSI Section 7" of Section D.2.1.4 of this response.

F) Punch List Item 142

The amplified input motion for CBA is considered in II/I design and stability evaluation of the CBA. For the impact on the stability evaluation, see RAI 03.07.02-13 S4 which is being submitted concurrently with this response.

The input motion for the II/I design of CBA is based on the envelope of the amplified site-specific SSE and 0.3g RG 1.60 spectra and since the 0.3g RG 1.60 spectra significantly envelopes the amplified site-specific SSE, the II/I design of the CBA will not be affected by the change in the amplified site-specific SSE due to use of MSM.

G) Punch List Item 143

Based on the discussions presented for the revised plan in Section "A" of this response, in order to examine the impact of MSM on amplified input motions of light structures which are located adjacent to heavy structures, the SSI analysis of the Reactor Building (RB) was repeated using MSM. The SSI analysis of the RB is used to determine amplified input motions for RSW Piping Tunnels, DGFOSV, DGFOT, RWB and SB. Figures 03.07.01-29 S1.251 through 03.07.01-29 S1.268 provide comparison of amplified motions (5% damping) from MSM and SM for these structures.

Changes in amplified input motions may affect one or more of the following:

- Generated In-Structure Response Spectra (ISRS)
- Design of Seismic Category I Structures
- Seismic II/I Designs
- Stability Evaluations of Seismic Category I and II/I structures

Each of the above items is discussed below.

Impact on Generated ISRS:

ISRS are only generated for Seismic Category I structures. The impact on generation of ISRS for DGFOSV, DGFOT and RAW Piping Tunnels is discussed below.

DGFOSV and DGFOT:

The ISRS for these two structures were generated considering the amplified input motion from SSI analysis of the RB using MSM. Therefore, no further evaluation is required for these structures.

RSW Piping Tunnels:

Considering the significant change in amplified input motion of the RSW Piping Tunnels shown in Figure 03.07.01-29 S1.264, the ISRS of the RSW Piping Tunnels were increased using scale factors to account for the impact of MSM on the generated ISRS.

Considering the amplified input motions for the RSW Piping Tunnels from SSI analyses of the RB and UHS/RSW Pump House, for each damping, each direction and each soil case, the scale factors were computed as the in-structure response spectra (ISRS) based on amplified input motions from MSM SSI analysis divided by the corresponding ISRS based on amplified input motions from SM SSI analysis. These scale factors were determined on frequency basis and enveloped over frequency intervals of 0-2 Hz, 2-5 Hz, 5-10 Hz, 10-15 Hz, 15-20 Hz, 20-25 Hz, 25-30 Hz, 30-35 Hz, 35-40 Hz, 40-45 Hz, 45-50 Hz, 50-55 Hz and 55-100 Hz. Figures 03.07.01-29 S1.277 and 03.07.01-29 S1.278 show the final envelope scaling factors for increase of horizontal and vertical response spectra. For each damping, each direction and each soil case, these scale factors were applied to the raw spectra based on amplified input motions from SM SSI analysis of the RB and UHS/RSW Pump House prior to generation of final broadened response spectra.
Figures 3H.6-138 and 3H.6-139 provided in Enclosure 1 are the final scaled response spectra for the RSW Piping Tunnels for the horizontal and vertical directions, respectively.

Impact on Design of Seismic Category I Structures:

Each of the structures affected (i.e. DGFOSV, DGFOT and RSW Piping Tunnels) by this item is discussed below.

DGFOSV and DGFOT:

The designs of these structures were completed considering the amplified input motion from SSI analysis of the RB using MSM. Therefore, no further evaluation is required for these structures.

RSW Piping Tunnels:

Design of RSW Piping Tunnel was re-evaluated considering the impact of amplified input motions from MSM analysis and found to be conservative. For additional information, see Punch List Item 84 of RAI 03.07.02-13 Supplement 4 response which is being submitted concurrently with this response.

Impact on Seismic II/I Designs:

Each of the structures affected (i.e. RWB, SB, and CBA) by this item is discussed below.

RWB:

The II/I design of this structure as noted in COLA Table 3H.9-1 is based on envelope of amplified site-specific SSE and 0.3g RG 1.60 spectra. As can be seen from Figures 03.07.01-29 S1.265 and 03.07.01-29 S1.266, the amplified input motions for the RWB obtained from MSM analysis of the RB are significantly bounded by the 0.3g RG 1.60 spectra. Therefore, the existing II/I design of the RWB is not impacted and requires no further evaluation.

SB:

The II/I design of this structure as noted in COLA Table 3H.9-1 is based on envelope of amplified site-specific SSE and 0.3g RG 1.60 spectra. As can be seen from Figures 03.07.01-29 S1.267 and 03.07.01-29 S1.268, the amplified input motions for the SB obtained from MSM analysis of the RB are significantly bounded by the 0.3g RG 1.60 spectra. Therefore no further evaluation is required for II/I design of SB.

CBA:

The II/I design of this structure as noted in COLA Table 3H.9-1 is based on envelope of amplified site-specific SSE and 0.3g RG 1.60 spectra. No amplified site-specific SSE has been generated for CBA using MSM analysis. However, the existing amplified site-specific SSE motions obtained from SSI analysis of the CB using SM are significantly bounded by the 0.3g RG 1.60 spectra. Considering the comparisons shown in Figures 03.07.01-29 S1.251 through 03.07.01-29 S1.268 the amplified input motions from a MSM SSI analysis of CB will still be bounded by 0.3g RG 1.60 spectra. Therefore no further evaluation is required for II/I design of CBA.

Impact on Stability Evaluations:

See RAI 03.07.02-13 Supplement 4 response which is being submitted concurrently with this response.

H) Punch List Item 144

See Section D.2.1.1 of this response, which provides a discussion of the comparison of the transfer functions for soil pressures.

I) Punch List Item 145

Table 5.1 presented to the NRC during the July 27, 2011 audit is shown in Figure 03.07.01-29 S1.272. The values for the maximum total force from time history analyses shown in Table 5.1 were calculated by integrating the area under the actual soil pressure profiles from SM, MSM and Direct methods of analysis. The values shown under the "Used for Design" column were calculated by integrating the area under the soil pressure profiles based on use of absolute value of maximum soil pressures. This is graphically demonstrated in Figures 03.07.01-29 S1.273 through 03.07.01-29 S1.276.

J) Punch List Item 146

See RAI 03.07.02-13 Supplement 4 response which is being submitted concurrently with this response.

K) Punch List Item 147

Based on the discussions with the NRC staff during the September 27, 2011 audit, since the required changes in COLA as a result of this response are provided with this response, there is no need to revise all previous RAI responses.

L) Punch List Item 148

Figure 03.07.01-29 S1.269 provides a partial plan of the RSW Piping Tunnels and RSW Pump House. Figure 03.07.01-29 S1.270 provides a cross sectional view of the RSW Piping Tunnels and RSW Pump House where the two structures interface. Figure 03.07.01-29 S1.271 provides the conceptual detail of the seismic joints between the two structures.

The location of Section 7 of Figure 1 that was presented in July 27 & 28, 2011 was not drawn accurately. See Figure 03.07.01-29 S1-79 for correct location of SSSI Section 7. For additional discussion in regards to selection of Section 7 for SSSI analysis and its adequacy for evaluation of interface between the two structures, see the discussion in sub-section "SSSI Section 7" of Section D.2.1.4 of this response.

M) Punch List Item 112

COLA Figures 3H.6-212, 213, 218 through 220, 226 through 231 and 3H.7-5 through 3H.7-8 are replaced in Enclosure 1 due to the following:

- Figures 3H.6-212 and 3H.6-213 have been revised to include SSI soil pressures as well as a design pressure profile.

- Figures 3H.6-218 through 3H.6-220 have been revised with updated SSI soil pressures for empty basin and full basin cases.

- Figures 3H.6-226 through 3H.6-231 have been revised to include SSI soil pressures and an updated design pressure profile.

- Figures 3H.7-5 through 3H.7-8 have been revised to include SSI soil pressures and an updated design pressure profile.

Discussion of exceedances:

COLA Figure 3A-302 shows a minor exceedance of the SSSI seismic soil pressures beyond the DCD soil pressures for the Control Building south wall. This exceedance was previously discussed in response to RAI 03.07.01-26 Revision 1 (Letter U7-C-NINA-NRC-110042 dated March 7, 2011) and added to COLA Section 3A.21; see excerpt below:

"The soil pressure from the SSSI analysis for the CB slightly exceeds the certified design soil pressure at a depth of about 26 to 30 feet below the ground surface. At all other elevations the DCD soil pressures are higher than the site-specific soil pressure. Therefore, the total force due to the certified design soil pressure on the wall panel above or below it will be significantly higher than the total force due to soil pressure from the SSSI analysis. Therefore, the design based on certified design soil pressures is adequate."

COLA Figure 3H.1-2 shows an exceedance of the SSSI seismic soil pressures beyond the DCD soil pressures for the Reactor Building west wall. This exceedance was previously discussed in response to RAI 03.08.04-30 Supplement 1 (Letter U7-C-NINA-NRC-110043 dated March 15, 2011); see excerpt below:

"As shown in these figures, site-specific seismic soil pressures are enveloped by the DCD lateral seismic soil pressures for all walls except for portions of the RB West wall when considering SSSI effects with the Radwaste Building and Reactor Service Water Tunnel. However, when comparing the total force applied to any segment of the wall from slab to slab, the DCD seismic soil loads are greater than the Site-Specific soil loads. Therefore, the seismic lateral soil pressures calculated for site-specific soil conditions present at STP 3&4 are enveloped by those presented in the DCD."

Figure 3H.6-219 shows exceedances of the SSSI seismic soil pressures beyond the design dynamic soil pressures on the north wall of the Reactor Service Water Pump House. See Section D.2.1.4 of this response for acceptance of these exceedances.

Figures 3H.6-228 through 3H.6-231 show exceedances of the SSI seismic soil pressures beyond the design dynamic soil pressures on the walls of the Diesel Generator Fuel Oil Storage Vault at approximately 35 to 37 ft below grade. A discussion of the out-of-plane shear and moment on the walls of the vault due to SSI and design soil pressures is provided in Section D.2.2 of this response for acceptance of these exceedances.

N) Summary Flowchart

Figure 03.07.01-29 S1.279 provides a brief summary flowchart of the actions and/or evaluations discussed in Sections A through D of this response for addressing the issues identified by the DNFSB with the SASSI Subtraction Method of analysis.

COLA will be revised as shown in Enclosures 1 as a result of this response. COLA Section 3H.10 is added to specifically address the DNFSB issues with the Subtraction Method of analysis. Note that all COLA figures and tables in Enclosure 1 are revised figures and tables replacing the existing figures and tables in their entirety.

Table 03.07.01-29 S1.1: Initial Plan to Address issues with Subtraction Method Noted in April 8, 2011 DNFSB Letter

<table>
<tr><th></th><th>Category I Structure</th><th>Method Used</th><th>Plan</th></tr>
<tr><td rowspan="5">SSI Analysis</td><td>DGFOT</td><td>Direct</td><td>None</td></tr>
<tr><td>RSW Piping Tunnel</td><td>Direct</td><td>None</td></tr>
<tr><td>CB and RB
(Shear Wave Velocity Departure Assessment)</td><td>Direct</td><td>None</td></tr>
<tr><td>DGFOSV</td><td>Subtraction</td><td>All analysis cases will be repeated using Modified Subtraction Method (MSM) and ground water level of 28' to assess the impact on spectra, maximum accelerations and any other parameters used for design.</td></tr>
<tr><td>UHS/RSW Pump House</td><td>Subtraction</td><td>The impact will be addressed by reanalyzing the UHS/RSW Pump House using MSM with the following parameters:

* Coarse mesh
* Ground water level of 28'
* UB In-situ Soil Case (same soil case used for refined SSI mesh effect)
* Full and empty basin cases

The spectra and maximum accelerations from the MSM will be compared to those from Subtraction Method and, where required, an additional modification factor will be determined for modification of the results obtained from the Subtraction Method.

For generation of the response spectra, the final modification factor at each frequency, to account for cumulative effect of structural mesh, SSI mesh refinement and Subtraction Method will be determined by the product of the three corresponding modification factors.

The impact on the maximum accelerations/design will be accounted for by determining a modification factor for each of the element groups used for determination of equivalent accelerations.</td></tr>
</table>

Table 03.07.01-29 S1.1: Initial Plan to Address issues with Subtraction Method Noted in April 8, 2011 DNFSB Letter (Continued)

	Category I Structure	Method Used	Plan
SSSI Analyses	All SSSI analyses	Subtraction	RB + RSW Piping Tunnel + RWB SSSI Model will be analyzed with upper bound back-fill soil case and lower bound in-situ soil case using Direct Method to assess the impact on calculated total soil pressures.
Project Specific Confirmation	Control Building	Direct	The Control Building Model used for shear wave velocity departure assessment was analyzed using Direct Method. This model will be reanalyzed for upper bound in-situ soil case using MSM. The analysis results (transfer functions, in-structure response spectra, forces, and maximum accelerations) from the Direct Method and MSM will be compared for confirmation of MSM.

Table 03.07.01-29 S1.2: Revised Plan to Address issues with Subtraction Method Noted in April 8, 2011 DNFSB Letter

	Category I Structure	**Method Used**	**Plan**
SSI Analysis	DGFOT	Direct	None
	RSW Piping Tunnel	Direct	None
	CB and RB (Shear Wave Velocity Departure Assessment)	Direct	None
	DGFOSV	Subtraction	All analysis cases will be repeated using Modified Subtraction Method (MSM) and ground water level of 28' to assess the impact on spectra, maximum accelerations and any other parameters used for design.
	UHS/RSW Pump House	Subtraction	The impact will be addressed by reanalyzing the UHS/RSW Pump House using MSM with the following parameters: * Coarse mesh * Ground water level of 28' * UB In-situ Soil Case (same soil case used for refined SSI mesh effect) * Full and empty basin cases The spectra and maximum accelerations from the MSM will be compared to those from Subtraction Method and, where required, an additional modification factor will be determined for modification of the results obtained from the Subtraction Method. For generation of the response spectra, the final modification factor at each frequency, to account for cumulative effect of structural mesh, SSI mesh refinement and Modified Subtraction Method (MSM) will be determined by the product of the modification factor for MSM and that for structural mesh and SSI mesh refinement (determined based on envelope of the modification factors for structural mesh and SSI mesh refinement).

Table 03.07.01-29 S1.2: Revised Plan to Address issues with Subtraction Method Noted in April 8, 2011 DNFSB Letter (Continued)

	Category I Structure	Method Used	Plan
SSI Analysis (Continued)	UHS/RSW Pump House (Continued)	Subtraction	The impact on the design will be determined as described in Section D1.4 of this response.
SSSI Analyses	All SSSI analyses	Subtraction	RB + RSW Piping Tunnel + RWB SSSI Model will be analyzed with upper bound back-fill soil case and lower bound in-situ soil case using Direct Method to assess the impact on calculated total soil pressures.
SSI Analyses for Amplified Motions	RB	Subtraction	Since the RB SSI model includes the great majority of the light structures adjacent to heavy structures (i.e. all but the CBA), the RB SSI analysis will be repeated using MSM to examine the impact of MSM on the amplified site-specific motions. In addition, in this re-analysis in accordance with the previous agreements with the NRC, the Poisson's ratio cap will be increased to 0.495 and the ground water table will be increased to 6 feet below grade (i.e. El. 28 ft MSL).
	CB		
	UHS/RSW Pump House		
Project Specific Confirmation	Control Building	Direct	The Control Building Model used for shear wave velocity departure assessment was analyzed using Direct Method. This model will be reanalyzed for upper bound in-situ soil case using MSM. The analysis results (transfer functions, in-structure response spectra, forces, and maximum accelerations) from the Direct Method and MSM will be compared for confirmation of MSM.

Table 03.07.01-29 S1.3: Comparison of Direct and Modified Subtraction Method Accelerations in the X- and Y-Directions

Node	Elev	Direct Method	Modified Subtraction Method	
		Max. X-Direction Acc	Max. X-Direction Acc	difference
		(g)	(g)	(%)
102	-26.9	0.1177	0.1177	0.00
103	-7.1	0.1235	0.1232	-0.24
104	11.5	0.1272	0.1275	0.24
105	25.9	0.1301	0.1304	0.23
106	40.4	0.1325	0.1327	0.15
107	56.3	0.1343	0.1342	-0.07
108	72.8	0.1418	0.1420	0.14

Node	Elev	Direct Method	Modified Subtraction Method	
		Max. Y-Direction Acc	Max. Y-Direction Acc	difference
		(g)	(g)	(%)
102	-26.9	0.1022	0.1010	-1.17
103	-7.1	0.1076	0.1074	-0.19
104	11.5	0.1096	0.1100	0.36
105	25.9	0.1099	0.1095	-0.36
106	40.4	0.1100	0.1096	-0.36
107	56.3	0.1103	0.1100	-0.27
108	72.8	0.1114	0.1106	-0.72

\+ Modified Subtraction method is higher than the Direct method
\- Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.4: Comparison of Direct and Modified Subtraction Method Accelerations in the Z-Direction

Node	Elev	Direct Method	Modified Subtraction Method	
		Max. Vertical Acc	Max. Vertical Acc	difference
		(g)	(g)	(%)
102	-26.9	0.1132	0.1146	1.24
103	-7.1	0.1152	0.1149	-0.26
104	11.5	0.1185	0.1165	-1.69
105	25.9	0.1205	0.1181	-1.99
106	40.4	0.1227	0.1222	-0.41
107	56.3	0.1253	0.1256	0.24
108	72.8	0.1277	0.1282	0.39
109	-7.1	0.1483	0.1538	3.71
110	11.5	0.1701	0.1766	3.82
111	25.9	0.1904	0.1961	2.99
112	40.4	0.2139	0.2197	2.71
113	56.3	0.2301	0.2343	1.83

+ Modified Subtraction method is higher than the Direct method
- Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.5: Comparison of Direct and Modified Subtraction Method Beam Forces in the X-Direction

Elem	Node	Direct Method		Modified Subtraction Method			
		Max. Shear (kip)	Max. Moment (kip-ft)	Max. Shear		Max. Moment	
				(kip)	(% Diff.)	(kip-ft)	(%)
7	108	1478	7584	1481	0.2	7512	-0.9
	107	1478	29200	1481	0.2	29304	0.4
6	107	3205	36192	3211	0.2	36444	0.7
	106	3205	86360	3211	0.2	86560	0.2
5	106	3236	15400	3240	0.1	15468	0.4
	105	3236	50480	3240	0.1	50680	0.4
4	105	4540	23196	4536	-0.1	22904	-1.3
	104	4540	44120	4536	-0.1	44360	0.5
3	104	6436	36712	6440	0.1	36280	-1.2
	103	6436	82640	6440	0.1	83000	0.4
2	103	8108	14028	8096	-0.1	13828	-1.4
	102	8108	157600	8096	-0.1	158120	0.3

Maximum Difference	Shear (+)	0.2%	Moment (+)	0.7%
	Shear (-)	-0.1%	Moment (-)	-1.4%

\+ Modified Subtraction method is higher than the Direct method
\- Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.6: Comparison of Direct and Modified Subtraction Method Beam Forces in the Y-Direction

Elem	Node	Direct Method		Modified Subtraction Method			
		Max. Shear	Max. Moment	Max. Shear		Max. Moment	
		(kip)	(kip-ft)	(kip)	(% Diff.)	(kip-ft)	(%)
7	108	1156	10728	1151.2	-0.4	10772	0.4
	107	1156	23140	1151.2	-0.4	23156	0.1
6	107	2618	34536	2609.6	-0.3	34868	1.0
	106	2618	68160	2609.6	-0.3	67920	-0.4
5	106	NA	NA	NA	NA	NA	NA
	105	NA	NA	NA	NA	NA	NA
		NA	NA	NA	NA	NA	NA
4	105	NA	NA	NA	NA	NA	NA
	104	NA	NA	NA	NA	NA	NA
		NA	NA	NA	NA	NA	NA
3	104	NA	NA	NA	NA	NA	NA
	103	NA	NA	NA	NA	NA	NA
		NA	NA	NA	NA	NA	NA
2	103	NA	NA	NA	NA	NA	NA
	102	NA	NA	NA	NA	NA	NA

Maximum Difference	Shear (+)	0.0%	Moment (+)	1.0%
	Shear (-)	-0.4%	Moment (-)	-0.4%

\+ Modified Subtraction method is higher than the Direct method
\- Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.7: Comparison of Direct and Modified Subtraction Method Beam Forces in the Z-Direction

Elem	Node	Direct Method	Modified Subtraction Method	
		Max. Axial	Max. Axial	
		(kip)	(kip)	(% Diff.)
7	108	1328	1333.2	0.4
	107	1328	1333.2	0.4
6	107	3323	3312.8	-0.3
	106	3323	3312.8	-0.3
5	106	2155	2153.2	-0.1
	105	2155	2153.2	-0.1
4	105	1924	1936.8	0.7
	104	1924	1936.8	0.7
3	104	2212	2231.6	0.9
	103	2212	2231.6	0.9
2	103	2704	2746.4	1.6
	102	2704	2746.4	1.6

Maximum Difference	Axial (+)	1.6%
	Axial (-)	-0.3%

+ Modified Subtraction method is higher than the Direct method

- Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.8: Comparison of Direct and Modified Subtraction Method Section Forces

X-Direction Analysis

Section	Axial Force			In-Plane Shear			In-Plane Moment		
	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference
	kip	kip	%	kip	kip	%	k-ft	k-ft	%
1	340	349	2.6	476	466	-2.1	42513	40336	-5.1
2	545	558	2.4	436	435	-0.2	29599	30214	2.1
3	407	412	1.2	2375	2327	-2.0	14706	14608	-0.7
4	175	175	0.0	617	620	0.5	3695	3804	2.9

Y-Direction Analysis

Section	Axial Force			In-Plane Shear			In-Plane Moment		
	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference
	kip	kip	%	kip	kip	%	k-ft	k-ft	%
1	724	721	-0.4	3954	3861	-2.4	47599	47186	-0.9
2	223	226	1.3	1439	1440	0.1	12307	12888	4.7
3	285	272	-4.6	83	97	16.9	2938	2759	-6.1
4	215	230	7.0	116	115	-0.9	5075	5382	6.0

Z-Direction Analysis

Section	Axial Force			In-Plane Shear			In-Plane Moment		
	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference
	kip	kip	%	kip	kip	%	k-ft	k-ft	%
1	1406	1407	0.1	34	32	-5.9	57918	58053	0.2
2	491	493	0.4	42	43	2.4	20739	20990	1.2
3	868	872	0.5	332	341	2.7	8632	8484	-1.7
4	205	208	1.5	21	21	0.0	3903	3967	1.6

SRSS

Section	Axial Force			In-Plane Shear			In-Plane Moment		
	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference	Direct	Modified Subtraction	Difference
	kip	kip	%	kip	kip	%	k-ft	k-ft	%
1	1618	1619	0.1	3983	3889	-2.4	86183	84992	-1.4
2	767	778	1.4	1504	1505	0.1	38179	38982	2.1
3	1000	1002	0.2	2400	2354	-1.9	17303	17117	-1.1
4	345	356	3.2	628	631	0.5	7392	7692	4.1

+ Modified Subtraction method is higher than the Direct method, - Modified Subtraction method is lower than the Direct method

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.204	1.247	2.143	2.101	2.101	2.640	2.640	1.161
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.223	1.242	1.819	1.836	1.836	2.144	2.144	1.132
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.206	1.206	1.551	1.612	1.612	1.697	1.697	1.111
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.190	1.190	1.431	1.447	1.447	1.484	1.484	1.107
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.183	1.183	1.355	1.339	1.339	1.374	1.374	1.107
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.176	1.176	1.302	1.274	1.267	1.307	1.307	1.106
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.167	1.167	1.226	1.226	1.181	1.228	1.228	1.104
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.151	1.151	1.180	1.171	1.107	1.157	1.157	1.098
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.130	1.130	1.154	1.126	1.092	1.115	1.115	1.091
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.122	1.122	1.120	1.103	1.083	1.095	1.095	1.088
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.204	1.247	2.143	2.101	2.101	2.640	2.640	1.161
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.223	1.242	1.819	1.836	1.836	2.144	2.144	1.132
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.206	1.206	1.551	1.612	1.612	1.697	1.697	1.111
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.190	1.190	1.431	1.447	1.447	1.484	1.484	1.107
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.183	1.183	1.355	1.339	1.339	1.374	1.374	1.107
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5	Y	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.176	1.176	1.302	1.274	1.267	1.307	1.307	1.106
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5	Y	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.167	1.167	1.226	1.226	1.181	1.228	1.228	1.104
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5	Y	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.151	1.151	1.180	1.171	1.107	1.157	1.157	1.098
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5	Y	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.130	1.130	1.154	1.126	1.092	1.115	1.115	1.091
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5	Y	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.122	1.122	1.120	1.103	1.083	1.095	1.095	1.088
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.032	1.115	1.438	2.179	1.585	1.781	2.165	2.165
group4			1.030	1.094	1.471	1.851	1.851	2.235	2.235	1.275
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.020	1.093	1.567	1.762	2.018	2.090	2.090	1.574
group9			1.020	1.093	1.567	1.762	2.018	2.090	2.090	1.574
group10			1.020	1.093	1.567	1.762	2.018	2.090	2.090	1.574
group1	Z	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.032	1.105	1.448	2.008	1.415	1.650	1.898	1.898
group4			1.030	1.100	1.440	1.592	1.592	2.120	2.120	1.241
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.020	1.086	1.548	1.570	1.741	1.849	1.849	1.327
group9			1.020	1.086	1.548	1.570	1.741	1.849	1.849	1.327
group10			1.020	1.086	1.548	1.570	1.741	1.849	1.849	1.327
group1	Z	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.031	1.123	1.500	1.758	1.361	1.483	1.696	1.696
group4			1.030	1.087	1.400	1.400	1.373	1.677	1.677	1.217
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.020	1.067	1.368	1.438	1.470	1.492	1.492	1.275
group9			1.020	1.067	1.368	1.438	1.470	1.492	1.492	1.275
group10			1.020	1.067	1.368	1.438	1.470	1.492	1.492	1.275
group1	Z	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.028	1.121	1.533	1.702	1.305	1.464	1.577	1.577
group4			1.031	1.098	1.383	1.383	1.271	1.543	1.543	1.209
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.018	1.063	1.302	1.331	1.387	1.452	1.452	1.254
group9			1.018	1.063	1.302	1.331	1.387	1.452	1.452	1.254
group10			1.018	1.063	1.302	1.331	1.387	1.452	1.452	1.254
group1	Z	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.026	1.124	1.535	1.686	1.280	1.438	1.497	1.497
group4			1.028	1.081	1.375	1.375	1.263	1.472	1.457	1.206
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.016	1.063	1.264	1.365	1.365	1.347	1.347	1.239
group9			1.016	1.063	1.264	1.365	1.365	1.347	1.347	1.239
group10			1.016	1.063	1.264	1.365	1.365	1.347	1.347	1.239

Table 03.07.01-29 S1.9: Mesh Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.025	1.130	1.521	1.667	1.269	1.394	1.439	1.439
group4			1.027	1.077	1.338	1.338	1.255	1.417	1.402	1.204
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.016	1.063	1.240	1.326	1.326	1.307	1.304	1.227
group9			1.016	1.063	1.240	1.326	1.326	1.307	1.304	1.227
group10			1.016	1.063	1.240	1.326	1.326	1.307	1.304	1.227
group1	Z	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.027	1.135	1.555	1.629	1.277	1.367	1.367	1.365
group4			1.034	1.085	1.293	1.293	1.249	1.343	1.328	1.202
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.015	1.070	1.215	1.249	1.282	1.321	1.321	1.212
group9			1.015	1.070	1.215	1.249	1.282	1.321	1.321	1.212
group10			1.015	1.070	1.215	1.249	1.282	1.321	1.321	1.212
group1	Z	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.030	1.144	1.498	1.577	1.291	1.340	1.340	1.305
group4			1.041	1.076	1.249	1.249	1.235	1.280	1.258	1.198
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.016	1.073	1.185	1.218	1.306	1.294	1.294	1.198
group9			1.016	1.073	1.185	1.218	1.306	1.294	1.294	1.198
group10			1.016	1.073	1.185	1.218	1.306	1.294	1.294	1.198
group1	Z	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.024	1.159	1.450	1.495	1.337	1.319	1.319	1.264
group4			1.054	1.089	1.196	1.196	1.212	1.221	1.205	1.194
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.017	1.093	1.183	1.200	1.270	1.265	1.262	1.188
group9			1.017	1.093	1.183	1.200	1.270	1.265	1.262	1.188
group10			1.017	1.093	1.183	1.200	1.270	1.265	1.262	1.188
group1	Z	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.032	1.186	1.373	1.444	1.348	1.299	1.299	1.266
group4			1.065	1.090	1.174	1.178	1.193	1.188	1.188	1.190
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.019	1.074	1.167	1.184	1.209	1.214	1.210	1.183
group9			1.019	1.074	1.167	1.184	1.209	1.214	1.210	1.183
group10			1.019	1.074	1.167	1.184	1.209	1.214	1.210	1.183

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.041	1.149	2.922	2.143	2.640	2.573	2.573	1.370
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.042	1.143	2.372	2.001	1.916	2.199	2.199	1.326
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.044	1.110	1.835	1.679	1.528	1.734	1.734	1.237
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.040	1.115	1.613	1.563	1.418	1.522	1.522	1.186
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.057	1.119	1.546	1.502	1.368	1.430	1.430	1.153
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.051	1.119	1.515	1.458	1.359	1.363	1.363	1.129
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.042	1.126	1.428	1.461	1.365	1.259	1.259	1.117
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.044	1.132	1.338	1.404	1.362	1.209	1.177	1.112
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.048	1.140	1.301	1.338	1.329	1.201	1.139	1.110
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	X	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.050	1.159	1.310	1.297	1.289	1.196	1.125	1.113
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.041	1.149	2.922	2.143	2.640	2.573	2.573	1.370
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.042	1.143	2.372	2.001	1.916	2.199	2.199	1.326
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.044	1.110	1.835	1.679	1.528	1.734	1.734	1.237
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.040	1.115	1.613	1.563	1.418	1.522	1.522	1.186
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.057	1.119	1.546	1.502	1.368	1.430	1.430	1.153
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.051	1.119	1.515	1.458	1.359	1.363	1.363	1.129
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.042	1.126	1.428	1.461	1.365	1.259	1.259	1.117
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.044	1.132	1.338	1.404	1.362	1.209	1.177	1.112
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.048	1.140	1.301	1.338	1.329	1.201	1.139	1.110
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group1	Y	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group4			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.050	1.159	1.310	1.297	1.289	1.196	1.125	1.113
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group9			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group10			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.005	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.040	1.135	1.791	2.769	2.322	2.322	1.993	1.993
group4			1.026	1.098	1.415	1.656	1.656	2.826	2.826	1.188
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.024	1.050	1.392	2.157	2.593	2.593	1.909	1.451
group9			1.024	1.050	1.392	2.157	2.593	2.593	1.909	1.451
group10			1.024	1.050	1.392	2.157	2.593	2.593	1.909	1.451
group1	Z	0.01	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.038	1.103	1.718	2.682	1.888	1.888	1.926	1.926
group4			1.027	1.098	1.408	1.468	1.468	2.486	2.486	1.206
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.022	1.049	1.292	1.873	1.966	1.966	1.717	1.418
group9			1.022	1.049	1.292	1.873	1.966	1.966	1.717	1.418
group10			1.022	1.049	1.292	1.873	1.966	1.966	1.717	1.418
group1	Z	0.02	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.037	1.107	1.697	2.038	1.553	1.729	1.729	1.718
group4			1.018	1.075	1.366	1.366	1.254	1.856	1.856	1.203
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.020	1.054	1.282	1.749	1.484	1.484	1.389	1.364
group9			1.020	1.054	1.282	1.749	1.484	1.484	1.389	1.364
group10			1.020	1.054	1.282	1.749	1.484	1.484	1.389	1.364
group1	Z	0.03	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.034	1.116	1.651	1.793	1.374	1.586	1.588	1.588
group4			1.017	1.078	1.374	1.374	1.223	1.667	1.667	1.194
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.020	1.055	1.283	1.585	1.343	1.343	1.321	1.321
group9			1.020	1.055	1.283	1.585	1.343	1.343	1.321	1.321
group10			1.020	1.055	1.283	1.585	1.343	1.343	1.321	1.321
group1	Z	0.04	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.032	1.096	1.526	1.653	1.372	1.496	1.511	1.511
group4			1.019	1.075	1.347	1.347	1.234	1.550	1.550	1.186
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.018	1.059	1.286	1.540	1.328	1.288	1.289	1.289
group9			1.018	1.059	1.286	1.540	1.328	1.288	1.289	1.289
group10			1.018	1.059	1.286	1.540	1.328	1.288	1.289	1.289

Table 03.07.01-29 S1.10: Mesh Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.05	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.028	1.101	1.423	1.522	1.341	1.445	1.463	1.463
group4			1.022	1.078	1.324	1.321	1.234	1.469	1.469	1.179
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.017	1.063	1.294	1.478	1.289	1.266	1.266	1.264
group9			1.017	1.063	1.294	1.478	1.289	1.266	1.266	1.264
group10			1.017	1.063	1.294	1.478	1.289	1.266	1.266	1.264
group1	Z	0.07	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.027	1.106	1.337	1.424	1.322	1.375	1.409	1.409
group4			1.027	1.092	1.317	1.317	1.216	1.362	1.362	1.165
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.018	1.068	1.304	1.450	1.271	1.260	1.260	1.231
group9			1.018	1.068	1.304	1.450	1.271	1.260	1.260	1.231
group10			1.018	1.068	1.304	1.450	1.271	1.260	1.260	1.231
group1	Z	0.1	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.045	1.100	1.286	1.371	1.294	1.314	1.372	1.372
group4			1.034	1.075	1.294	1.294	1.183	1.269	1.269	1.153
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.019	1.075	1.316	1.433	1.278	1.263	1.234	1.205
group9			1.019	1.075	1.316	1.433	1.278	1.263	1.234	1.205
group10			1.019	1.075	1.316	1.433	1.278	1.263	1.234	1.205
group1	Z	0.15	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.051	1.112	1.327	1.301	1.247	1.299	1.347	1.346
group4			1.047	1.070	1.221	1.221	1.168	1.189	1.189	1.146
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.016	1.091	1.295	1.441	1.312	1.272	1.214	1.191
group9			1.016	1.091	1.295	1.441	1.312	1.272	1.214	1.191
group10			1.016	1.091	1.295	1.441	1.312	1.272	1.214	1.191
group1	Z	0.2	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group2			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group3			1.062	1.133	1.379	1.379	1.250	1.309	1.331	1.331
group4			1.061	1.075	1.221	1.221	1.151	1.162	1.162	1.141
group5			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group6			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group7			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
group8			1.019	1.096	1.299	1.405	1.373	1.263	1.206	1.197
group9			1.019	1.096	1.299	1.405	1.373	1.263	1.206	1.197
group10			1.019	1.096	1.299	1.405	1.373	1.263	1.206	1.197

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1			1.255	1.255	1.472	1.755	1.484	1.611	1.352	1.047
group2			1.432	1.432	1.515	2.164	2.164	1.888	1.367	1.021
group3			1.321	1.321	1.741	2.083	2.083	1.775	1.097	1.097
group4			1.193	1.193	1.688	2.459	2.459	2.136	1.646	1.020
group5	X	0.005	1.195	1.195	1.608	1.531	1.208	1.219	1.219	1.000
group6			1.255	1.276	1.276	1.831	1.318	1.462	1.414	1.105
group7			1.230	1.230	1.601	1.582	1.553	2.234	1.202	1.003
group8			1.660	4.430	4.430	1.450	1.372	1.237	1.192	1.136
group9			1.660	2.138	1.859	1.450	1.299	1.237	1.192	1.117
group10			1.660	2.138	1.349	1.553	1.553	1.275	1.192	1.117
group1			1.273	1.273	1.423	1.621	1.288	1.340	1.250	1.047
group2			1.381	1.381	1.413	1.804	1.804	1.424	1.235	1.019
group3			1.285	1.285	1.584	1.728	1.728	1.384	1.097	1.097
group4			1.207	1.207	1.572	2.164	2.164	1.692	1.385	1.021
group5	X	0.01	1.166	1.166	1.494	1.309	1.215	1.124	1.059	1.000
group6			1.243	1.245	1.245	1.556	1.327	1.215	1.215	1.106
group7			1.192	1.192	1.572	1.347	1.532	1.553	1.110	1.002
group8			1.417	3.653	3.653	1.323	1.231	1.228	1.149	1.136
group9			1.417	2.072	1.662	1.323	1.185	1.149	1.149	1.117
group10			1.417	2.072	1.286	1.332	1.332	1.215	1.149	1.117
group1			1.264	1.264	1.363	1.472	1.191	1.181	1.181	1.047
group2			1.317	1.317	1.392	1.419	1.450	1.292	1.085	1.018
group3			1.252	1.252	1.454	1.377	1.377	1.113	1.097	1.097
group4			1.247	1.247	1.406	1.708	1.708	1.358	1.164	1.021
group5	X	0.02	1.151	1.151	1.339	1.167	1.167	1.043	1.000	1.000
group6			1.232	1.232	1.193	1.388	1.158	1.107	1.115	1.106
group7			1.205	1.205	1.388	1.262	1.334	1.158	1.078	1.001
group8			1.251	2.770	2.770	1.186	1.151	1.194	1.156	1.136
group9			1.251	1.843	1.483	1.186	1.151	1.122	1.123	1.117
group10			1.251	1.843	1.244	1.186	1.156	1.151	1.123	1.117
group1			1.227	1.227	1.326	1.342	1.162	1.152	1.152	1.048
group2			1.338	1.338	1.339	1.295	1.316	1.186	1.026	1.018
group3			1.274	1.274	1.352	1.272	1.272	1.054	1.097	1.097
group4			1.274	1.274	1.309	1.415	1.415	1.203	1.116	1.021
group5	X	0.03	1.123	1.123	1.261	1.142	1.142	1.007	1.000	1.000
group6			1.225	1.267	1.187	1.340	1.133	1.100	1.115	1.106
group7			1.181	1.181	1.281	1.246	1.208	1.104	1.073	1.000
group8			1.221	2.315	2.315	1.168	1.151	1.174	1.162	1.136
group9			1.221	1.672	1.317	1.168	1.151	1.117	1.120	1.117
group10			1.221	1.672	1.253	1.168	1.151	1.130	1.120	1.117
group1			1.202	1.202	1.269	1.256	1.128	1.122	1.122	1.047
group2			1.283	1.283	1.295	1.212	1.242	1.126	1.020	1.017
group3			1.236	1.236	1.294	1.239	1.239	1.061	1.097	1.097
group4			1.250	1.250	1.248	1.273	1.273	1.113	1.070	1.022
group5	X	0.04	1.102	1.102	1.215	1.121	1.121	1.000	1.000	1.000
group6			1.214	1.266	1.201	1.308	1.143	1.105	1.115	1.106
group7			1.159	1.159	1.231	1.223	1.145	1.048	1.045	1.000
group8			1.173	2.009	2.009	1.154	1.145	1.163	1.163	1.136
group9			1.173	1.595	1.263	1.154	1.145	1.115	1.118	1.116
group10			1.173	1.595	1.263	1.154	1.145	1.115	1.118	1.116

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.05	1.191	1.191	1.230	1.182	1.127	1.103	1.103	1.047
group2			1.245	1.245	1.241	1.181	1.194	1.089	1.020	1.017
group3			1.208	1.208	1.250	1.219	1.219	1.064	1.096	1.096
group4			1.240	1.240	1.206	1.208	1.208	1.058	1.032	1.022
group5			1.127	1.127	1.184	1.089	1.072	1.000	1.000	1.000
group6			1.202	1.252	1.221	1.271	1.143	1.112	1.115	1.105
group7			1.140	1.140	1.190	1.207	1.074	1.018	1.018	1.000
group8			1.157	1.809	1.809	1.146	1.141	1.161	1.161	1.135
group9			1.157	1.545	1.218	1.146	1.141	1.114	1.117	1.116
group10			1.157	1.545	1.218	1.146	1.141	1.114	1.117	1.116
group1	X	0.07	1.191	1.191	1.124	1.112	1.112	1.075	1.075	1.046
group2			1.212	1.212	1.174	1.128	1.135	1.090	1.037	1.016
group3			1.190	1.190	1.195	1.185	1.185	1.072	1.096	1.096
group4			1.234	1.234	1.155	1.187	1.187	1.029	1.024	1.022
group5			1.095	1.095	1.153	1.057	1.000	1.000	1.000	1.000
group6			1.185	1.249	1.234	1.226	1.151	1.115	1.115	1.105
group7			1.112	1.112	1.154	1.174	1.063	1.000	1.000	1.000
group8			1.147	1.582	1.582	1.138	1.135	1.152	1.152	1.135
group9			1.147	1.460	1.184	1.138	1.135	1.114	1.116	1.116
group10			1.147	1.460	1.184	1.138	1.135	1.114	1.116	1.116
group1	X	0.1	1.164	1.164	1.081	1.080	1.076	1.054	1.054	1.044
group2			1.163	1.163	1.118	1.080	1.091	1.086	1.032	1.014
group3			1.153	1.153	1.148	1.144	1.144	1.079	1.095	1.095
group4			1.182	1.182	1.109	1.155	1.150	1.021	1.022	1.021
group5			1.091	1.091	1.107	1.031	1.000	1.000	1.000	1.000
group6			1.183	1.217	1.201	1.198	1.153	1.110	1.110	1.104
group7			1.083	1.083	1.124	1.145	1.042	1.000	1.000	1.000
group8			1.135	1.416	1.416	1.151	1.130	1.141	1.141	1.134
group9			1.135	1.371	1.164	1.132	1.130	1.113	1.115	1.115
group10			1.135	1.371	1.164	1.132	1.130	1.113	1.115	1.115
group1	X	0.15	1.153	1.153	1.073	1.066	1.057	1.040	1.042	1.041
group2			1.130	1.130	1.079	1.055	1.058	1.058	1.008	1.010
group3			1.122	1.122	1.108	1.104	1.104	1.083	1.094	1.094
group4			1.152	1.152	1.100	1.086	1.086	1.021	1.021	1.020
group5			1.088	1.088	1.024	1.000	1.000	1.000	1.000	1.000
group6			1.172	1.185	1.147	1.157	1.143	1.106	1.106	1.103
group7			1.068	1.068	1.089	1.118	1.007	1.000	1.000	1.000
group8			1.122	1.350	1.350	1.180	1.124	1.134	1.134	1.132
group9			1.122	1.292	1.151	1.125	1.124	1.112	1.115	1.115
group10			1.122	1.292	1.151	1.125	1.124	1.112	1.115	1.115
group1	X	0.2	1.101	1.101	1.067	1.056	1.049	1.034	1.038	1.038
group2			1.111	1.111	1.054	1.028	1.040	1.034	1.007	1.009
group3			1.105	1.105	1.072	1.080	1.082	1.085	1.094	1.094
group4			1.116	1.116	1.090	1.053	1.052	1.019	1.020	1.020
group5			1.059	1.059	1.009	1.000	1.000	1.000	1.000	1.000
group6			1.158	1.166	1.153	1.129	1.128	1.104	1.104	1.102
group7			1.063	1.063	1.071	1.061	1.000	1.000	1.000	1.000
group8			1.122	1.305	1.305	1.201	1.120	1.130	1.131	1.131
group9			1.122	1.269	1.145	1.120	1.120	1.112	1.115	1.115
group10			1.122	1.269	1.145	1.120	1.120	1.112	1.115	1.115

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.005	1.017	1.229	1.290	1.290	1.291	1.416	1.210	1.024
group2			1.051	1.116	1.737	2.424	2.424	5.938	3.282	1.055
group3			1.088	1.153	1.923	2.208	1.529	2.398	1.289	1.061
group4			1.082	1.113	2.005	1.855	1.556	2.427	1.073	1.031
group5			1.183	1.183	1.667	1.438	1.406	1.513	1.089	1.040
group6			1.175	1.318	1.641	1.281	1.319	1.399	1.022	1.010
group7			1.184	1.425	1.411	1.411	1.245	1.605	1.078	1.081
group8			1.269	3.845	1.758	2.941	1.801	1.401	1.096	1.092
group9			1.269	3.845	1.758	2.941	1.801	1.201	1.096	1.070
group10			1.269	3.845	1.758	2.941	1.801	1.201	1.096	1.070
group1	Y	0.01	1.020	1.203	1.280	1.280	1.172	1.275	1.153	1.024
group2			1.046	1.102	1.594	2.089	2.089	4.171	2.709	1.049
group3			1.091	1.134	1.656	1.793	1.408	1.764	1.209	1.062
group4			1.077	1.098	1.766	1.462	1.292	1.639	1.058	1.031
group5			1.174	1.174	1.539	1.311	1.311	1.241	1.096	1.040
group6			1.152	1.235	1.481	1.168	1.317	1.176	1.014	1.011
group7			1.250	1.318	1.256	1.256	1.022	1.362	1.081	1.081
group8			1.263	3.161	1.606	2.278	1.558	1.259	1.093	1.093
group9			1.263	3.161	1.606	2.278	1.558	1.118	1.069	1.070
group10			1.263	3.161	1.606	2.278	1.558	1.118	1.069	1.070
group1	Y	0.02	1.023	1.108	1.156	1.156	1.101	1.157	1.116	1.024
group2			1.044	1.079	1.438	1.736	1.807	2.625	2.053	1.038
group3			1.074	1.110	1.424	1.430	1.190	1.260	1.117	1.062
group4			1.078	1.078	1.438	1.211	1.136	1.214	1.036	1.031
group5			1.163	1.163	1.358	1.194	1.194	1.131	1.093	1.040
group6			1.115	1.215	1.348	1.128	1.176	1.130	1.015	1.012
group7			1.191	1.258	1.154	1.126	1.048	1.175	1.090	1.081
group8			1.253	2.349	1.409	1.697	1.229	1.180	1.112	1.094
group9			1.253	2.349	1.409	1.697	1.229	1.070	1.069	1.070
group10			1.253	2.349	1.409	1.697	1.229	1.070	1.069	1.070
group1	Y	0.03	1.012	1.077	1.138	1.090	1.077	1.101	1.091	1.024
group2			1.046	1.073	1.270	1.711	1.767	1.973	1.762	1.038
group3			1.073	1.091	1.263	1.262	1.106	1.113	1.058	1.062
group4			1.076	1.076	1.267	1.152	1.084	1.091	1.035	1.031
group5			1.117	1.117	1.179	1.132	1.132	1.104	1.098	1.040
group6			1.149	1.200	1.264	1.069	1.108	1.107	1.025	1.012
group7			1.163	1.221	1.133	1.130	1.069	1.124	1.101	1.081
group8			1.260	1.976	1.346	1.406	1.174	1.143	1.110	1.094
group9			1.260	1.976	1.346	1.406	1.174	1.071	1.071	1.070
group10			1.260	1.976	1.346	1.406	1.174	1.071	1.071	1.070
group1	Y	0.04	1.012	1.077	1.131	1.093	1.060	1.077	1.077	1.024
group2			1.047	1.068	1.177	1.691	1.691	1.641	1.542	1.038
group3			1.072	1.072	1.171	1.188	1.105	1.073	1.059	1.063
group4			1.071	1.071	1.183	1.153	1.059	1.059	1.034	1.031
group5			1.099	1.117	1.130	1.101	1.103	1.103	1.103	1.040
group6			1.129	1.187	1.211	1.066	1.077	1.084	1.029	1.012
group7			1.143	1.206	1.135	1.133	1.076	1.110	1.107	1.082
group8			1.221	1.777	1.270	1.303	1.166	1.126	1.108	1.094
group9			1.221	1.777	1.270	1.303	1.166	1.070	1.070	1.070
group10			1.221	1.777	1.270	1.303	1.166	1.070	1.070	1.070

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.05	1.015	1.078	1.122	1.086	1.047	1.067	1.067	1.024
group2			1.055	1.055	1.126	1.571	1.571	1.449	1.398	1.038
group3			1.070	1.070	1.132	1.152	1.091	1.062	1.062	1.063
group4			1.067	1.067	1.157	1.157	1.057	1.053	1.033	1.031
group5			1.092	1.105	1.088	1.088	1.098	1.105	1.105	1.041
group6			1.119	1.182	1.180	1.053	1.068	1.077	1.029	1.012
group7			1.126	1.198	1.132	1.124	1.081	1.106	1.106	1.082
group8			1.242	1.648	1.207	1.228	1.157	1.113	1.105	1.094
group9			1.242	1.648	1.207	1.228	1.157	1.069	1.069	1.070
group10			1.242	1.648	1.207	1.228	1.157	1.069	1.069	1.070
group1	Y	0.07	1.022	1.075	1.101	1.040	1.031	1.059	1.059	1.024
group2			1.055	1.055	1.123	1.389	1.389	1.246	1.234	1.038
group3			1.068	1.088	1.135	1.149	1.074	1.072	1.072	1.064
group4			1.053	1.053	1.162	1.162	1.061	1.052	1.037	1.031
group5			1.030	1.087	1.059	1.083	1.086	1.097	1.097	1.041
group6			1.093	1.162	1.136	1.051	1.040	1.047	1.028	1.012
group7			1.134	1.168	1.110	1.116	1.086	1.097	1.097	1.082
group8			1.196	1.485	1.173	1.165	1.131	1.101	1.101	1.094
group9			1.196	1.485	1.173	1.165	1.131	1.067	1.069	1.070
group10			1.196	1.485	1.173	1.165	1.131	1.067	1.069	1.070
group1	Y	0.1	1.025	1.067	1.083	1.023	1.024	1.044	1.044	1.024
group2			1.049	1.052	1.092	1.250	1.250	1.116	1.115	1.038
group3			1.063	1.087	1.111	1.098	1.069	1.075	1.075	1.065
group4			1.048	1.064	1.110	1.110	1.052	1.051	1.039	1.032
group5			1.024	1.063	1.063	1.069	1.070	1.078	1.078	1.043
group6			1.078	1.142	1.096	1.054	1.020	1.030	1.027	1.012
group7			1.129	1.139	1.105	1.105	1.086	1.089	1.090	1.083
group8			1.154	1.258	1.186	1.128	1.118	1.097	1.097	1.094
group9			1.154	1.258	1.186	1.128	1.118	1.065	1.069	1.070
group10			1.154	1.258	1.186	1.128	1.118	1.065	1.069	1.070
group1	Y	0.15	1.005	1.055	1.066	1.058	1.027	1.031	1.031	1.024
group2			1.036	1.055	1.075	1.166	1.166	1.058	1.037	1.038
group3			1.028	1.068	1.084	1.078	1.068	1.070	1.070	1.066
group4			1.012	1.049	1.079	1.079	1.054	1.046	1.040	1.033
group5			1.021	1.042	1.044	1.056	1.056	1.062	1.062	1.045
group6			1.056	1.124	1.096	1.059	1.018	1.024	1.022	1.012
group7			1.105	1.114	1.090	1.090	1.075	1.085	1.085	1.083
group8			1.124	1.158	1.200	1.130	1.112	1.094	1.095	1.093
group9			1.124	1.158	1.200	1.130	1.112	1.063	1.069	1.069
group10			1.124	1.158	1.200	1.130	1.112	1.063	1.069	1.069
group1	Y	0.2	1.005	1.049	1.071	1.067	1.027	1.027	1.026	1.024
group2			1.017	1.028	1.068	1.119	1.119	1.055	1.036	1.038
group3			1.029	1.061	1.096	1.096	1.074	1.076	1.074	1.067
group4			1.012	1.027	1.062	1.062	1.055	1.045	1.039	1.033
group5			1.021	1.042	1.066	1.048	1.049	1.054	1.054	1.046
group6			1.053	1.107	1.091	1.037	1.015	1.019	1.019	1.012
group7			1.090	1.103	1.086	1.087	1.073	1.080	1.082	1.083
group8			1.093	1.109	1.142	1.127	1.112	1.092	1.092	1.092
group9			1.091	1.109	1.142	1.127	1.112	1.063	1.068	1.069
group10			1.091	1.109	1.142	1.127	1.112	1.063	1.068	1.069

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.005	1.024	1.025	1.307	1.522	1.410	1.481	1.481	1.043
group2			1.009	1.024	1.341	2.580	2.580	2.301	1.294	1.070
group3			1.025	1.070	1.316	2.328	2.467	1.935	1.754	1.633
group4			1.030	1.040	1.287	2.047	2.047	1.735	1.226	1.113
group5			1.042	1.140	1.156	1.447	1.447	1.867	1.374	1.018
group6			1.023	1.042	1.191	1.562	2.041	2.041	1.529	1.061
group7			1.034	1.173	1.184	1.636	1.636	1.724	1.334	1.072
group8			1.029	1.115	1.532	2.081	1.962	1.962	1.679	1.219
group9			1.024	1.115	1.532	2.081	2.105	2.105	2.054	1.219
group10			1.025	1.115	1.532	2.081	2.055	2.055	1.645	1.219
group1	Z	0.01	1.021	1.025	1.244	1.489	1.262	1.272	1.230	1.043
group2			1.008	1.023	1.264	2.281	2.281	2.042	1.256	1.031
group3			1.022	1.083	1.257	2.297	2.297	1.861	1.752	1.633
group4			1.027	1.036	1.229	1.841	1.841	1.425	1.143	1.113
group5			1.032	1.074	1.139	1.356	1.356	1.471	1.387	1.018
group6			1.019	1.028	1.169	1.519	1.660	1.660	1.369	1.052
group7			1.031	1.090	1.151	1.456	1.456	1.406	1.331	1.036
group8			1.025	1.075	1.519	1.858	1.710	1.710	1.606	1.210
group9			1.020	1.075	1.519	1.858	1.766	1.766	1.717	1.210
group10			1.021	1.075	1.519	1.858	1.772	1.772	1.606	1.210
group1	Z	0.02	1.022	1.024	1.211	1.407	1.158	1.078	1.099	1.042
group2			1.008	1.026	1.228	1.756	1.752	1.621	1.166	1.023
group3			1.022	1.055	1.308	2.278	2.278	1.976	1.737	1.632
group4			1.027	1.036	1.202	1.660	1.492	1.259	1.103	1.113
group5			1.027	1.052	1.107	1.268	1.268	1.274	1.274	1.018
group6			1.011	1.020	1.157	1.296	1.473	1.473	1.191	1.052
group7			1.029	1.059	1.110	1.352	1.282	1.275	1.240	1.033
group8			1.021	1.039	1.341	1.546	1.437	1.507	1.507	1.208
group9			1.011	1.039	1.341	1.546	1.437	1.507	1.507	1.208
group10			1.015	1.039	1.341	1.546	1.437	1.515	1.515	1.208
group1	Z	0.03	1.019	1.024	1.192	1.330	1.134	1.102	1.062	1.041
group2			1.009	1.027	1.202	1.654	1.654	1.435	1.134	1.023
group3			1.022	1.064	1.393	2.115	2.141	2.030	1.725	1.630
group4			1.023	1.034	1.183	1.550	1.438	1.268	1.129	1.114
group5			1.026	1.045	1.078	1.170	1.170	1.164	1.164	1.018
group6			1.012	1.020	1.153	1.256	1.449	1.449	1.156	1.052
group7			1.028	1.049	1.085	1.231	1.217	1.243	1.220	1.036
group8			1.021	1.030	1.294	1.445	1.433	1.460	1.460	1.209
group9			1.012	1.030	1.294	1.445	1.433	1.460	1.460	1.209
group10			1.011	1.030	1.294	1.445	1.433	1.460	1.460	1.209
group1	Z	0.04	1.016	1.023	1.178	1.277	1.126	1.113	1.048	1.040
group2			1.009	1.027	1.194	1.606	1.606	1.359	1.112	1.023
group3			1.023	1.061	1.464	2.103	2.126	2.013	1.754	1.629
group4			1.019	1.038	1.158	1.465	1.394	1.260	1.154	1.114
group5			1.027	1.039	1.079	1.125	1.114	1.112	1.096	1.017
group6			1.009	1.021	1.149	1.275	1.411	1.411	1.101	1.051
group7			1.027	1.041	1.092	1.235	1.210	1.205	1.205	1.036
group8			1.021	1.026	1.243	1.424	1.424	1.373	1.373	1.211
group9			1.011	1.026	1.243	1.424	1.424	1.373	1.373	1.211
group10			1.010	1.026	1.243	1.424	1.424	1.373	1.373	1.211

Table 03.07.01-29 S1.11: MSM Full Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.05	1.014	1.024	1.170	1.244	1.125	1.123	1.042	1.039
group2			1.009	1.028	1.196	1.515	1.515	1.300	1.086	1.023
group3			1.019	1.067	1.502	2.103	2.118	1.976	1.774	1.628
group4			1.016	1.044	1.148	1.409	1.362	1.250	1.155	1.114
group5			1.026	1.035	1.071	1.119	1.097	1.091	1.058	1.017
group6			1.009	1.021	1.148	1.275	1.362	1.362	1.117	1.051
group7			1.026	1.035	1.078	1.242	1.158	1.181	1.181	1.034
group8			1.021	1.028	1.228	1.394	1.390	1.360	1.360	1.212
group9			1.009	1.028	1.228	1.394	1.390	1.360	1.360	1.212
group10			1.009	1.028	1.228	1.394	1.390	1.360	1.360	1.212
group1	Z	0.07	1.011	1.024	1.156	1.189	1.120	1.088	1.037	1.037
group2			1.009	1.029	1.192	1.400	1.400	1.266	1.091	1.023
group3			1.022	1.075	1.599	2.100	2.132	2.012	1.713	1.626
group4			1.021	1.052	1.143	1.335	1.320	1.236	1.146	1.114
group5			1.025	1.029	1.064	1.116	1.080	1.064	1.047	1.016
group6			1.010	1.021	1.153	1.223	1.268	1.268	1.112	1.051
group7			1.023	1.028	1.077	1.212	1.116	1.138	1.138	1.031
group8			1.019	1.033	1.212	1.390	1.355	1.308	1.308	1.214
group9			1.008	1.033	1.212	1.390	1.355	1.308	1.308	1.214
group10			1.008	1.033	1.212	1.390	1.355	1.308	1.308	1.214
group1	Z	0.1	1.010	1.023	1.138	1.153	1.101	1.053	1.034	1.034
group2			1.009	1.030	1.181	1.314	1.314	1.231	1.105	1.023
group3			1.028	1.089	1.614	2.076	2.117	2.004	1.664	1.624
group4			1.021	1.058	1.120	1.280	1.280	1.216	1.140	1.115
group5			1.021	1.023	1.071	1.071	1.065	1.049	1.036	1.016
group6			1.009	1.021	1.121	1.182	1.203	1.203	1.096	1.049
group7			1.019	1.022	1.082	1.130	1.112	1.093	1.064	1.024
group8			1.010	1.032	1.187	1.388	1.339	1.248	1.248	1.198
group9			1.010	1.032	1.187	1.388	1.339	1.248	1.248	1.198
group10			1.010	1.032	1.187	1.388	1.339	1.248	1.248	1.198
group1	Z	0.15	1.009	1.025	1.092	1.136	1.090	1.026	1.032	1.032
group2			1.009	1.032	1.118	1.217	1.217	1.192	1.095	1.024
group3			1.040	1.113	1.616	1.931	1.999	1.931	1.647	1.620
group4			1.027	1.074	1.132	1.234	1.234	1.195	1.137	1.117
group5			1.016	1.017	1.071	1.074	1.045	1.045	1.023	1.016
group6			1.006	1.022	1.089	1.160	1.160	1.158	1.078	1.043
group7			1.014	1.017	1.077	1.114	1.103	1.081	1.018	1.014
group8			1.012	1.034	1.155	1.335	1.300	1.200	1.179	1.169
group9			1.012	1.034	1.155	1.335	1.300	1.200	1.179	1.169
group10			1.012	1.034	1.155	1.335	1.300	1.200	1.179	1.169
group1	Z	0.2	1.010	1.025	1.089	1.118	1.085	1.017	1.029	1.029
group2			1.009	1.032	1.085	1.153	1.165	1.165	1.073	1.026
group3			1.052	1.138	1.548	1.874	1.960	1.849	1.636	1.616
group4			1.033	1.087	1.134	1.199	1.199	1.179	1.136	1.119
group5			1.014	1.017	1.082	1.087	1.039	1.039	1.017	1.016
group6			1.006	1.023	1.060	1.140	1.140	1.124	1.064	1.040
group7			1.011	1.017	1.076	1.108	1.079	1.071	1.017	1.015
group8			1.014	1.042	1.150	1.174	1.191	1.189	1.166	1.163
group9			1.014	1.042	1.150	1.174	1.191	1.189	1.166	1.163
group10			1.014	1.042	1.150	1.174	1.191	1.189	1.166	1.163

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.005	1.110	1.110	1.355	2.195	2.195	1.837	1.837	1.009
group2			1.088	1.088	1.882	2.348	2.348	1.436	1.067	1.000
group3			1.080	1.080	1.868	1.898	1.898	1.697	1.697	1.000
group4			1.117	1.117	1.858	2.630	2.630	1.677	1.677	1.002
group5			1.046	1.046	1.864	1.838	1.838	1.317	1.095	1.000
group6			1.005	1.273	1.273	2.207	1.332	1.143	1.143	1.026
group7			1.179	1.179	1.814	1.364	1.364	1.222	1.056	1.000
group8			1.276	1.515	1.374	1.734	1.315	1.222	1.222	1.070
group9			1.276	1.515	1.374	1.734	1.413	1.154	1.139	1.070
group10			1.276	1.770	1.770	1.734	1.753	1.154	1.139	1.070
group1	X	0.01	1.120	1.120	1.250	1.754	1.754	1.298	1.298	1.012
group2			1.078	1.078	1.729	1.917	1.917	1.166	1.041	1.000
group3			1.071	1.071	1.734	1.638	1.638	1.185	1.184	1.000
group4			1.108	1.108	1.700	2.048	2.048	1.308	1.308	1.002
group5			1.041	1.041	1.760	1.567	1.567	1.216	1.036	1.000
group6			1.006	1.238	1.238	1.878	1.239	1.087	1.062	1.025
group7			1.150	1.150	1.727	1.314	1.314	1.083	1.000	1.000
group8			1.237	1.459	1.292	1.464	1.231	1.110	1.104	1.070
group9			1.237	1.459	1.292	1.464	1.301	1.104	1.104	1.070
group10			1.237	1.637	1.637	1.464	1.429	1.104	1.104	1.070
group1	X	0.02	1.145	1.145	1.151	1.505	1.505	1.117	1.086	1.014
group2			1.087	1.087	1.518	1.587	1.587	1.123	1.035	1.000
group3			1.071	1.071	1.535	1.364	1.364	1.044	1.035	1.000
group4			1.129	1.129	1.497	1.582	1.582	1.116	1.116	1.002
group5			1.042	1.042	1.576	1.348	1.348	1.118	1.016	1.000
group6			1.011	1.154	1.160	1.676	1.202	1.068	1.023	1.025
group7			1.132	1.132	1.561	1.303	1.303	1.000	1.000	1.000
group8			1.149	1.402	1.287	1.300	1.122	1.085	1.085	1.070
group9			1.149	1.402	1.287	1.300	1.197	1.085	1.085	1.070
group10			1.149	1.402	1.364	1.300	1.195	1.085	1.085	1.070
group1	X	0.03	1.133	1.133	1.105	1.312	1.312	1.070	1.056	1.014
group2			1.063	1.063	1.395	1.426	1.436	1.123	1.068	1.000
group3			1.065	1.065	1.413	1.244	1.244	1.006	1.000	1.000
group4			1.099	1.099	1.382	1.398	1.398	1.079	1.063	1.002
group5			1.039	1.039	1.459	1.217	1.217	1.055	1.000	1.000
group6			1.012	1.132	1.135	1.477	1.187	1.051	1.023	1.025
group7			1.118	1.118	1.456	1.247	1.247	1.000	1.000	1.000
group8			1.093	1.341	1.293	1.182	1.107	1.078	1.073	1.070
group9			1.093	1.341	1.293	1.182	1.140	1.078	1.073	1.070
group10			1.093	1.341	1.293	1.182	1.107	1.078	1.073	1.070
group1	X	0.04	1.099	1.099	1.088	1.247	1.233	1.039	1.039	1.013
group2			1.064	1.064	1.318	1.319	1.322	1.107	1.079	1.000
group3			1.067	1.067	1.336	1.171	1.171	1.000	1.000	1.000
group4			1.081	1.081	1.312	1.286	1.286	1.059	1.046	1.002
group5			1.043	1.043	1.379	1.102	1.102	1.012	1.000	1.000
group6			1.013	1.134	1.127	1.339	1.170	1.058	1.023	1.025
group7			1.119	1.119	1.381	1.207	1.207	1.000	1.000	1.000
group8			1.088	1.302	1.282	1.127	1.096	1.078	1.073	1.070
group9			1.088	1.302	1.282	1.127	1.103	1.078	1.073	1.070
group10			1.088	1.302	1.282	1.127	1.096	1.078	1.073	1.070

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.05	1.092	1.092	1.084	1.245	1.188	1.026	1.026	1.013
group2			1.060	1.060	1.267	1.241	1.248	1.082	1.081	1.000
group3			1.056	1.056	1.283	1.116	1.116	1.000	1.000	1.000
group4			1.068	1.068	1.265	1.244	1.244	1.058	1.036	1.003
group5			1.040	1.040	1.324	1.087	1.087	1.000	1.000	1.000
group6			1.027	1.183	1.114	1.245	1.152	1.065	1.023	1.025
group7			1.107	1.107	1.326	1.166	1.166	1.000	1.000	1.000
group8			1.084	1.236	1.224	1.111	1.096	1.080	1.074	1.070
group9			1.084	1.236	1.224	1.111	1.096	1.080	1.074	1.070
group10			1.084	1.236	1.224	1.111	1.096	1.080	1.074	1.070
group1	X	0.07	1.101	1.101	1.052	1.157	1.128	1.010	1.012	1.012
group2			1.035	1.035	1.177	1.140	1.140	1.057	1.039	1.000
group3			1.039	1.039	1.216	1.044	1.044	1.000	1.000	1.000
group4			1.052	1.052	1.198	1.167	1.167	1.055	1.022	1.003
group5			1.029	1.029	1.239	1.037	1.000	1.000	1.000	1.000
group6			1.048	1.169	1.100	1.191	1.126	1.073	1.028	1.025
group7			1.088	1.088	1.255	1.141	1.141	1.000	1.000	1.000
group8			1.077	1.170	1.117	1.097	1.095	1.081	1.073	1.070
group9			1.077	1.170	1.117	1.097	1.095	1.081	1.073	1.070
group10			1.077	1.170	1.117	1.097	1.095	1.081	1.073	1.070
group1	X	0.1	1.090	1.090	1.043	1.087	1.084	1.027	1.010	1.010
group2			1.030	1.030	1.045	1.069	1.069	1.013	1.000	1.000
group3			1.030	1.030	1.079	1.005	1.000	1.000	1.000	1.000
group4			1.043	1.043	1.068	1.107	1.107	1.037	1.014	1.003
group5			1.022	1.024	1.163	1.063	1.000	1.003	1.000	1.000
group6			1.066	1.146	1.130	1.106	1.095	1.080	1.038	1.026
group7			1.067	1.067	1.187	1.092	1.092	1.000	1.000	1.000
group8			1.084	1.116	1.100	1.093	1.092	1.082	1.073	1.071
group9			1.084	1.116	1.100	1.093	1.092	1.082	1.073	1.071
group10			1.084	1.116	1.100	1.093	1.092	1.082	1.073	1.071
group1	X	0.15	1.084	1.084	1.026	1.058	1.058	1.036	1.006	1.006
group2			1.020	1.027	1.027	1.017	1.017	1.000	1.000	1.000
group3			1.028	1.028	1.042	1.000	1.000	1.000	1.000	1.000
group4			1.037	1.037	1.023	1.059	1.059	1.020	1.008	1.002
group5			1.028	1.029	1.087	1.058	1.002	1.007	1.001	1.000
group6			1.079	1.115	1.124	1.065	1.070	1.065	1.043	1.028
group7			1.049	1.067	1.116	1.056	1.040	1.000	1.000	1.000
group8			1.057	1.090	1.090	1.087	1.087	1.081	1.074	1.071
group9			1.057	1.090	1.090	1.087	1.087	1.081	1.074	1.071
group10			1.057	1.090	1.090	1.087	1.087	1.081	1.074	1.071
group1	X	0.2	1.031	1.031	1.009	1.046	1.047	1.031	1.005	1.005
group2			1.015	1.020	1.020	1.014	1.014	1.000	1.000	1.000
group3			1.026	1.026	1.031	1.000	1.000	1.000	1.000	1.000
group4			1.036	1.036	1.040	1.035	1.035	1.009	1.007	1.001
group5			1.021	1.029	1.061	1.040	1.000	1.004	1.000	1.000
group6			1.057	1.103	1.130	1.083	1.055	1.055	1.043	1.030
group7			1.057	1.066	1.090	1.056	1.006	1.000	1.000	1.000
group8			1.050	1.085	1.085	1.083	1.083	1.080	1.074	1.071
group9			1.050	1.085	1.085	1.083	1.083	1.080	1.074	1.071
group10			1.050	1.085	1.085	1.083	1.083	1.080	1.074	1.071

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.005	1.014	1.065	1.252	1.742	1.742	1.232	1.111	1.033
group2			1.017	1.054	2.071	1.518	1.518	1.506	1.104	1.000
group3			1.048	1.053	1.939	2.213	2.213	1.492	1.199	1.023
group4			1.082	1.094	2.647	1.755	1.687	1.666	1.666	1.000
group5			1.544	1.544	2.718	1.550	1.550	1.231	1.173	1.000
group6			1.098	1.226	1.892	1.949	1.949	1.255	1.058	1.000
group7			1.174	1.240	1.801	1.801	1.699	1.474	1.474	1.000
group8			2.327	9.258	1.967	1.967	1.801	1.495	1.485	1.485
group9			2.327	9.258	1.967	1.967	1.694	1.495	1.485	1.485
group10			2.327	9.258	1.967	2.357	2.357	1.495	1.485	1.485
group1	Y	0.01	1.014	1.064	1.166	1.513	1.513	1.133	1.120	1.033
group2			1.017	1.044	1.877	1.310	1.310	1.115	1.077	1.000
group3			1.040	1.043	1.788	1.753	1.753	1.212	1.111	1.023
group4			1.064	1.072	2.223	1.479	1.360	1.249	1.179	1.000
group5			1.303	1.303	2.137	1.348	1.348	1.108	1.056	1.000
group6			1.094	1.217	1.762	1.566	1.566	1.163	1.047	1.000
group7			1.165	1.271	1.456	1.512	1.512	1.165	1.153	1.000
group8			2.195	5.394	1.666	1.666	1.588	1.480	1.482	1.484
group9			2.195	5.394	1.666	1.666	1.588	1.480	1.482	1.484
group10			2.195	5.394	1.666	1.847	1.847	1.480	1.482	1.484
group1	Y	0.02	1.014	1.072	1.148	1.233	1.233	1.123	1.123	1.033
group2			1.018	1.039	1.575	1.167	1.099	1.031	1.020	1.001
group3			1.040	1.047	1.488	1.416	1.416	1.031	1.031	1.023
group4			1.038	1.052	1.653	1.284	1.142	1.091	1.053	1.000
group5			1.151	1.151	1.715	1.144	1.144	1.048	1.048	1.000
group6			1.173	1.193	1.575	1.198	1.198	1.059	1.000	1.000
group7			1.144	1.179	1.207	1.207	1.207	1.032	1.032	1.000
group8			1.962	3.812	1.647	1.552	1.552	1.487	1.483	1.485
group9			1.962	3.812	1.647	1.552	1.552	1.487	1.483	1.485
group10			1.962	3.812	1.647	1.552	1.552	1.487	1.483	1.485
group1	Y	0.03	1.014	1.071	1.138	1.132	1.132	1.101	1.101	1.033
group2			1.014	1.051	1.335	1.154	1.076	1.002	1.001	1.001
group3			1.029	1.047	1.279	1.313	1.285	1.003	1.023	1.023
group4			1.022	1.047	1.385	1.183	1.073	1.040	1.032	1.000
group5			1.103	1.103	1.447	1.068	1.068	1.054	1.054	1.000
group6			1.153	1.170	1.455	1.136	1.136	1.006	1.000	1.000
group7			1.124	1.146	1.154	1.043	1.038	1.000	1.000	1.000
group8			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group9			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group10			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group1	Y	0.04	1.012	1.055	1.131	1.092	1.092	1.080	1.080	1.033
group2			1.014	1.044	1.210	1.105	1.075	1.000	1.001	1.001
group3			1.024	1.041	1.189	1.251	1.251	1.000	1.023	1.023
group4			1.013	1.050	1.243	1.157	1.056	1.027	1.020	1.000
group5			1.082	1.082	1.301	1.038	1.038	1.032	1.032	1.000
group6			1.138	1.151	1.375	1.087	1.076	1.000	1.000	1.000
group7			1.108	1.130	1.130	1.012	1.000	1.000	1.000	1.000
group8			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485
group9			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485
group10			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.05	1.014	1.053	1.073	1.083	1.087	1.063	1.063	1.033
group2			1.016	1.031	1.140	1.077	1.050	1.000	1.001	1.001
group3			1.021	1.040	1.143	1.216	1.216	1.000	1.023	1.023
group4			1.015	1.043	1.177	1.136	1.044	1.019	1.012	1.000
group5			1.069	1.069	1.228	1.037	1.037	1.022	1.022	1.000
group6			1.126	1.138	1.319	1.076	1.048	1.000	1.000	1.000
group7			1.095	1.107	1.122	1.000	1.000	1.000	1.000	1.000
group8			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group9			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group10			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group1	Y	0.07	1.015	1.037	1.037	1.089	1.089	1.047	1.047	1.034
group2			1.015	1.044	1.116	1.064	1.016	1.000	1.001	1.001
group3			1.020	1.032	1.100	1.163	1.163	1.012	1.022	1.022
group4			1.017	1.042	1.155	1.108	1.033	1.014	1.000	1.000
group5			1.048	1.048	1.168	1.033	1.033	1.011	1.011	1.000
group6			1.110	1.117	1.247	1.060	1.019	1.000	1.000	1.000
group7			1.110	1.137	1.124	1.000	1.000	1.000	1.000	1.000
group8			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group9			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group10			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group1	Y	0.1	1.015	1.030	1.044	1.098	1.098	1.044	1.038	1.034
group2			1.015	1.062	1.092	1.036	1.000	1.000	1.000	1.000
group3			1.018	1.062	1.087	1.112	1.114	1.014	1.021	1.021
group4			1.019	1.087	1.114	1.072	1.031	1.012	1.000	1.000
group5			1.035	1.079	1.146	1.043	1.025	1.003	1.003	1.000
group6			1.096	1.107	1.160	1.045	1.000	1.000	1.000	1.000
group7			1.090	1.100	1.123	1.000	1.000	1.000	1.000	1.000
group8			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group9			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group10			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group1	Y	0.15	1.017	1.022	1.021	1.082	1.082	1.049	1.033	1.035
group2			1.016	1.060	1.060	1.009	1.000	1.000	1.000	1.000
group3			1.017	1.045	1.048	1.081	1.081	1.011	1.019	1.020
group4			1.018	1.078	1.078	1.032	1.025	1.008	1.000	1.000
group5			1.029	1.062	1.093	1.016	1.016	1.000	1.000	1.000
group6			1.076	1.080	1.104	1.054	1.000	1.000	1.000	1.000
group7			1.069	1.073	1.084	1.000	1.000	1.000	1.000	1.000
group8			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group9			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group10			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group1	Y	0.2	1.016	1.020	1.015	1.069	1.069	1.052	1.035	1.036
group2			1.014	1.027	1.027	1.002	1.000	1.000	1.000	1.000
group3			1.016	1.034	1.034	1.058	1.058	1.019	1.018	1.019
group4			1.015	1.048	1.048	1.022	1.018	1.010	1.004	1.000
group5			1.024	1.046	1.055	1.013	1.010	1.000	1.000	1.000
group6			1.066	1.067	1.085	1.065	1.000	1.000	1.000	1.000
group7			1.059	1.067	1.067	1.000	1.000	1.000	1.000	1.000
group8			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487
group9			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487
group10			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.005	1.006	1.019	1.267	1.439	1.274	1.819	1.819	1.115
group2			1.005	1.014	1.458	2.802	2.802	1.480	1.480	1.093
group3			1.013	1.040	1.411	2.066	2.000	1.855	1.767	1.615
group4			1.007	1.030	1.372	1.954	1.954	1.366	1.259	1.086
group5			1.145	1.145	1.230	1.655	1.467	1.276	1.153	1.002
group6			1.027	1.029	1.210	1.472	1.447	1.589	1.589	1.145
group7			1.121	1.121	1.193	1.655	1.395	1.555	1.555	1.039
group8			1.047	1.254	1.277	2.083	1.688	1.798	1.446	1.198
group9			1.029	1.254	1.277	2.083	1.688	1.798	1.523	1.198
group10			1.068	1.254	1.277	2.083	1.688	1.798	1.524	1.198
group1	Z	0.01	1.005	1.008	1.210	1.329	1.274	1.308	1.308	1.113
group2			1.005	1.008	1.322	2.493	2.493	1.385	1.385	1.092
group3			1.013	1.049	1.287	2.052	2.052	1.765	1.749	1.615
group4			1.006	1.011	1.246	1.678	1.678	1.400	1.211	1.113
group5			1.109	1.109	1.187	1.521	1.391	1.163	1.163	1.002
group6			1.022	1.024	1.148	1.383	1.392	1.539	1.539	1.096
group7			1.094	1.094	1.155	1.571	1.361	1.395	1.395	1.029
group8			1.040	1.159	1.195	1.878	1.474	1.565	1.359	1.180
group9			1.024	1.159	1.195	1.878	1.474	1.565	1.399	1.180
group10			1.058	1.159	1.195	1.878	1.474	1.565	1.425	1.180
group1	Z	0.02	1.006	1.009	1.185	1.319	1.288	1.291	1.120	1.093
group2			1.004	1.007	1.222	2.051	2.051	1.324	1.219	1.092
group3			1.011	1.041	1.254	2.042	2.042	1.810	1.719	1.617
group4			1.006	1.014	1.228	1.461	1.461	1.411	1.122	1.114
group5			1.073	1.073	1.143	1.360	1.254	1.107	1.107	1.002
group6			1.013	1.017	1.169	1.352	1.334	1.420	1.420	1.065
group7			1.053	1.053	1.158	1.409	1.263	1.271	1.271	1.031
group8			1.017	1.074	1.179	1.817	1.437	1.341	1.210	1.170
group9			1.014	1.074	1.179	1.817	1.437	1.341	1.260	1.170
group10			1.029	1.074	1.179	1.817	1.437	1.341	1.297	1.170
group1	Z	0.03	1.004	1.007	1.197	1.256	1.293	1.307	1.099	1.093
group2			1.004	1.008	1.191	1.778	1.778	1.272	1.125	1.091
group3			1.013	1.047	1.287	1.925	1.920	1.796	1.704	1.618
group4			1.006	1.022	1.205	1.396	1.396	1.350	1.118	1.118
group5			1.064	1.064	1.132	1.274	1.204	1.052	1.052	1.002
group6			1.011	1.014	1.184	1.305	1.290	1.396	1.396	1.055
group7			1.039	1.039	1.162	1.292	1.197	1.197	1.197	1.031
group8			1.016	1.046	1.206	1.746	1.342	1.248	1.201	1.169
group9			1.014	1.046	1.206	1.746	1.342	1.248	1.205	1.169
group10			1.024	1.046	1.206	1.746	1.342	1.248	1.201	1.169
group1	Z	0.04	1.004	1.007	1.210	1.253	1.294	1.294	1.093	1.093
group2			1.003	1.006	1.180	1.554	1.554	1.227	1.108	1.091
group3			1.014	1.049	1.350	1.917	1.889	1.781	1.702	1.619
group4			1.006	1.026	1.218	1.341	1.341	1.316	1.119	1.119
group5			1.054	1.054	1.123	1.224	1.180	1.009	1.000	1.001
group6			1.010	1.011	1.194	1.301	1.263	1.375	1.375	1.048
group7			1.031	1.031	1.165	1.229	1.161	1.152	1.152	1.030
group8			1.014	1.033	1.224	1.661	1.387	1.196	1.193	1.170
group9			1.013	1.033	1.224	1.661	1.387	1.196	1.193	1.170
group10			1.020	1.033	1.224	1.661	1.387	1.196	1.193	1.170

Table 03.07.01-29 S1.12: MSM Empty Basin Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.05	1.005	1.008	1.219	1.270	1.288	1.288	1.092	1.092
group2			1.003	1.007	1.171	1.461	1.461	1.198	1.090	1.090
group3			1.016	1.054	1.380	1.911	1.911	1.758	1.702	1.619
group4			1.007	1.033	1.227	1.304	1.298	1.299	1.119	1.119
group5			1.043	1.043	1.125	1.194	1.138	1.002	1.000	1.001
group6			1.009	1.009	1.203	1.301	1.245	1.304	1.304	1.042
group7			1.026	1.026	1.167	1.221	1.152	1.120	1.120	1.029
group8			1.013	1.031	1.242	1.586	1.396	1.202	1.199	1.172
group9			1.012	1.031	1.242	1.586	1.396	1.202	1.199	1.172
group10			1.019	1.031	1.242	1.586	1.396	1.202	1.199	1.172
group1	Z	0.07	1.004	1.008	1.225	1.253	1.256	1.256	1.109	1.092
group2			1.004	1.007	1.151	1.325	1.325	1.157	1.089	1.089
group3			1.019	1.058	1.414	1.939	1.939	1.755	1.729	1.619
group4			1.007	1.036	1.239	1.293	1.273	1.278	1.120	1.120
group5			1.029	1.029	1.134	1.198	1.053	1.006	1.006	1.000
group6			1.008	1.008	1.214	1.280	1.224	1.229	1.165	1.038
group7			1.019	1.019	1.166	1.231	1.080	1.066	1.066	1.029
group8			1.012	1.033	1.264	1.590	1.409	1.213	1.211	1.175
group9			1.010	1.033	1.264	1.590	1.409	1.213	1.211	1.175
group10			1.017	1.033	1.264	1.590	1.409	1.213	1.211	1.175
group1	Z	0.1	1.002	1.010	1.199	1.214	1.226	1.226	1.133	1.092
group2			1.002	1.008	1.107	1.232	1.232	1.167	1.111	1.089
group3			1.026	1.073	1.435	1.847	1.847	1.778	1.715	1.615
group4			1.009	1.042	1.225	1.245	1.257	1.262	1.121	1.121
group5			1.022	1.022	1.135	1.207	1.036	1.000	1.000	1.000
group6			1.006	1.011	1.219	1.259	1.207	1.211	1.122	1.041
group7			1.017	1.018	1.142	1.189	1.048	1.012	1.028	1.028
group8			1.010	1.042	1.227	1.548	1.422	1.241	1.212	1.186
group9			1.010	1.042	1.227	1.548	1.422	1.241	1.212	1.186
group10			1.014	1.042	1.227	1.548	1.422	1.241	1.212	1.186
group1	Z	0.15	1.003	1.011	1.099	1.144	1.220	1.217	1.155	1.093
group2			1.003	1.011	1.101	1.120	1.168	1.168	1.092	1.088
group3			1.039	1.097	1.500	1.697	1.737	1.737	1.660	1.605
group4			1.012	1.053	1.129	1.161	1.246	1.249	1.160	1.120
group5			1.016	1.016	1.098	1.166	1.031	1.000	1.000	1.000
group6			1.006	1.014	1.152	1.183	1.195	1.197	1.129	1.048
group7			1.013	1.013	1.090	1.128	1.029	1.002	1.026	1.027
group8			1.016	1.053	1.184	1.484	1.436	1.249	1.213	1.202
group9			1.016	1.053	1.184	1.484	1.436	1.249	1.213	1.202
group10			1.016	1.053	1.184	1.484	1.436	1.249	1.213	1.202
group1	Z	0.2	1.003	1.013	1.051	1.191	1.220	1.217	1.152	1.095
group2			1.004	1.015	1.088	1.120	1.141	1.141	1.097	1.088
group3			1.051	1.127	1.468	1.668	1.692	1.692	1.626	1.592
group4			1.015	1.066	1.092	1.196	1.239	1.239	1.177	1.119
group5			1.014	1.016	1.100	1.120	1.021	1.000	1.000	1.000
group6			1.005	1.018	1.118	1.201	1.189	1.190	1.143	1.056
group7			1.009	1.013	1.091	1.111	1.016	1.009	1.026	1.028
group8			1.021	1.069	1.267	1.413	1.413	1.263	1.213	1.212
group9			1.021	1.069	1.267	1.413	1.413	1.263	1.213	1.212
group10			1.021	1.069	1.267	1.413	1.413	1.263	1.213	1.212

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1			1.255	1.255	1.472	2.195	2.195	1.837	1.837	1.047
group2			1.432	1.432	1.882	2.348	2.348	1.888	1.367	1.021
group3			1.321	1.321	1.868	2.083	2.083	1.775	1.697	1.097
group4			1.193	1.193	1.858	2.630	2.630	2.136	1.677	1.020
group5	X	0.005	1.195	1.195	1.864	1.838	1.838	1.317	1.219	1.000
group6			1.449	1.590	3.253	3.849	3.270	3.763	3.639	1.514
group7			1.230	1.230	1.814	1.582	1.553	2.234	1.202	1.003
group8			1.660	4.430	4.430	1.734	1.372	1.237	1.222	1.136
group9			1.660	2.138	1.859	1.734	1.413	1.237	1.192	1.117
group10			1.660	2.138	1.770	1.734	1.753	1.275	1.192	1.117
group1			1.273	1.273	1.423	1.754	1.754	1.340	1.298	1.047
group2			1.381	1.381	1.729	1.917	1.917	1.424	1.235	1.019
group3			1.285	1.285	1.734	1.728	1.728	1.384	1.184	1.097
group4			1.207	1.207	1.700	2.164	2.164	1.692	1.385	1.021
group5	X	0.01	1.166	1.166	1.760	1.567	1.567	1.216	1.059	1.000
group6			1.483	1.514	2.566	2.856	2.274	2.672	2.672	1.467
group7			1.192	1.192	1.727	1.347	1.532	1.553	1.110	1.002
group8			1.417	3.653	3.653	1.464	1.231	1.228	1.149	1.136
group9			1.417	2.072	1.662	1.464	1.301	1.149	1.149	1.117
group10			1.417	2.072	1.637	1.464	1.429	1.215	1.149	1.117
group1			1.264	1.264	1.363	1.505	1.505	1.181	1.181	1.047
group2			1.317	1.317	1.518	1.587	1.587	1.292	1.085	1.018
group3			1.252	1.252	1.535	1.377	1.377	1.113	1.097	1.097
group4			1.247	1.247	1.497	1.708	1.708	1.358	1.164	1.021
group5	X	0.02	1.151	1.151	1.576	1.348	1.348	1.118	1.016	1.000
group6			1.441	1.479	2.039	2.277	1.938	1.879	1.893	1.369
group7			1.205	1.205	1.561	1.303	1.334	1.158	1.078	1.001
group8			1.251	2.770	2.770	1.300	1.151	1.194	1.156	1.136
group9			1.251	1.843	1.483	1.300	1.197	1.122	1.123	1.117
group10			1.251	1.843	1.364	1.300	1.195	1.151	1.123	1.117
group1			1.227	1.227	1.326	1.342	1.312	1.152	1.152	1.048
group2			1.338	1.338	1.395	1.426	1.436	1.186	1.068	1.018
group3			1.274	1.274	1.413	1.272	1.272	1.054	1.097	1.097
group4			1.274	1.274	1.382	1.415	1.415	1.203	1.116	1.021
group5	X	0.03	1.123	1.123	1.459	1.217	1.217	1.055	1.000	1.000
group6			1.416	1.507	1.871	1.958	1.718	1.673	1.697	1.311
group7			1.181	1.181	1.456	1.247	1.247	1.104	1.073	1.000
group8			1.221	2.315	2.315	1.182	1.151	1.174	1.162	1.136
group9			1.221	1.672	1.317	1.182	1.151	1.117	1.120	1.117
group10			1.221	1.672	1.293	1.182	1.151	1.130	1.120	1.117
group1			1.202	1.202	1.269	1.256	1.233	1.122	1.122	1.047
group2			1.283	1.283	1.318	1.319	1.322	1.126	1.079	1.017
group3			1.236	1.236	1.336	1.239	1.239	1.061	1.097	1.097
group4			1.250	1.250	1.312	1.286	1.286	1.113	1.070	1.022
group5	X	0.04	1.102	1.102	1.379	1.121	1.121	1.012	1.000	1.000
group6			1.402	1.498	1.755	1.834	1.566	1.580	1.595	1.274
group7			1.159	1.159	1.381	1.223	1.207	1.048	1.045	1.000
group8			1.173	2.009	2.009	1.154	1.145	1.163	1.163	1.136
group9			1.173	1.595	1.282	1.154	1.145	1.115	1.118	1.116
group10			1.173	1.595	1.282	1.154	1.145	1.115	1.118	1.116

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	X	0.05	1.191	1.191	1.230	1.245	1.188	1.103	1.103	1.047
group2			1.245	1.245	1.267	1.241	1.248	1.089	1.081	1.017
group3			1.208	1.208	1.283	1.219	1.219	1.064	1.096	1.096
group4			1.240	1.240	1.265	1.244	1.244	1.058	1.036	1.022
group5			1.127	1.127	1.324	1.089	1.087	1.000	1.000	1.000
group6			1.391	1.476	1.692	1.732	1.460	1.515	1.520	1.248
group7			1.140	1.140	1.326	1.207	1.166	1.018	1.018	1.000
group8			1.157	1.809	1.809	1.146	1.141	1.161	1.161	1.135
group9			1.157	1.545	1.224	1.146	1.141	1.114	1.117	1.116
group10			1.157	1.545	1.224	1.146	1.141	1.114	1.117	1.116
group1	X	0.07	1.191	1.191	1.124	1.157	1.128	1.075	1.075	1.046
group2			1.212	1.212	1.177	1.140	1.140	1.090	1.039	1.016
group3			1.190	1.190	1.216	1.185	1.185	1.072	1.096	1.096
group4			1.234	1.234	1.198	1.187	1.187	1.055	1.024	1.022
group5			1.095	1.095	1.239	1.057	1.000	1.000	1.000	1.000
group6			1.383	1.457	1.604	1.597	1.373	1.404	1.404	1.223
group7			1.112	1.112	1.255	1.174	1.141	1.000	1.000	1.000
group8			1.147	1.582	1.582	1.138	1.135	1.152	1.152	1.135
group9			1.147	1.460	1.184	1.138	1.135	1.114	1.116	1.116
group10			1.147	1.460	1.184	1.138	1.135	1.114	1.116	1.116
group1	X	0.1	1.164	1.164	1.081	1.087	1.084	1.054	1.054	1.044
group2			1.163	1.163	1.118	1.080	1.091	1.086	1.032	1.014
group3			1.153	1.153	1.148	1.144	1.144	1.079	1.095	1.095
group4			1.182	1.182	1.109	1.155	1.150	1.037	1.022	1.021
group5			1.091	1.091	1.163	1.063	1.000	1.003	1.000	1.000
group6			1.362	1.401	1.559	1.486	1.393	1.306	1.306	1.217
group7			1.083	1.083	1.187	1.145	1.092	1.000	1.000	1.000
group8			1.135	1.416	1.416	1.151	1.130	1.141	1.141	1.134
group9			1.135	1.371	1.164	1.132	1.130	1.113	1.115	1.115
group10			1.135	1.371	1.164	1.132	1.130	1.113	1.115	1.115
group1	X	0.15	1.153	1.153	1.073	1.066	1.058	1.040	1.042	1.041
group2			1.130	1.130	1.079	1.055	1.058	1.058	1.008	1.010
group3			1.122	1.122	1.108	1.104	1.104	1.083	1.094	1.094
group4			1.152	1.152	1.100	1.086	1.086	1.021	1.021	1.020
group5			1.088	1.088	1.087	1.058	1.002	1.007	1.001	1.000
group6			1.324	1.339	1.493	1.390	1.373	1.259	1.260	1.211
group7			1.068	1.068	1.116	1.118	1.040	1.000	1.000	1.000
group8			1.122	1.350	1.350	1.180	1.124	1.134	1.134	1.132
group9			1.122	1.292	1.151	1.125	1.124	1.112	1.115	1.115
group10			1.122	1.292	1.151	1.125	1.124	1.112	1.115	1.115
group1	X	0.2	1.101	1.101	1.067	1.056	1.049	1.034	1.038	1.038
group2			1.111	1.111	1.054	1.028	1.040	1.034	1.007	1.009
group3			1.105	1.105	1.072	1.080	1.082	1.085	1.094	1.094
group4			1.116	1.116	1.090	1.053	1.052	1.019	1.020	1.020
group5			1.059	1.059	1.061	1.040	1.000	1.004	1.000	1.000
group6			1.300	1.308	1.481	1.350	1.341	1.246	1.242	1.209
group7			1.063	1.066	1.090	1.061	1.006	1.000	1.000	1.000
group8			1.122	1.305	1.305	1.201	1.120	1.130	1.131	1.131
group9			1.122	1.269	1.145	1.120	1.120	1.112	1.115	1.115
group10			1.122	1.269	1.145	1.120	1.120	1.112	1.115	1.115

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.005	1.017	1.229	1.290	1.742	1.742	1.416	1.210	1.033
group2			1.051	1.116	2.071	2.424	2.424	5.938	3.282	1.055
group3			1.088	1.153	1.939	2.213	2.213	2.398	1.289	1.061
group4			1.082	1.113	2.647	1.855	1.687	2.427	1.666	1.031
group5			1.544	1.544	2.718	1.550	1.550	1.513	1.173	1.040
group6			1.394	1.639	5.529	3.093	3.093	3.693	2.794	1.370
group7			1.184	1.425	1.801	1.801	1.699	1.605	1.474	1.081
group8			2.327	9.258	1.967	2.941	1.801	1.495	1.485	1.485
group9			2.327	9.258	1.967	2.941	1.801	1.495	1.485	1.485
group10			2.327	9.258	1.967	2.941	2.357	1.495	1.485	1.485
group1	Y	0.01	1.020	1.203	1.280	1.513	1.513	1.275	1.153	1.033
group2			1.046	1.102	1.877	2.089	2.089	4.171	2.709	1.049
group3			1.091	1.134	1.788	1.793	1.753	1.764	1.209	1.062
group4			1.077	1.098	2.223	1.479	1.360	1.639	1.179	1.031
group5			1.303	1.303	2.137	1.348	1.348	1.241	1.096	1.040
group6			1.372	1.533	4.155	2.303	2.290	2.520	2.246	1.326
group7			1.250	1.318	1.456	1.512	1.512	1.362	1.153	1.081
group8			2.195	5.394	1.666	2.278	1.588	1.480	1.482	1.484
group9			2.195	5.394	1.666	2.278	1.588	1.480	1.482	1.484
group10			2.195	5.394	1.666	2.278	1.847	1.480	1.482	1.484
group1	Y	0.02	1.023	1.108	1.156	1.233	1.233	1.157	1.123	1.033
group2			1.044	1.079	1.575	1.736	1.807	2.625	2.053	1.038
group3			1.074	1.110	1.488	1.430	1.416	1.260	1.117	1.062
group4			1.078	1.078	1.653	1.284	1.142	1.214	1.053	1.031
group5			1.163	1.163	1.715	1.194	1.194	1.131	1.093	1.040
group6			1.317	1.422	2.837	1.931	1.931	1.820	1.752	1.237
group7			1.191	1.258	1.207	1.207	1.207	1.175	1.090	1.081
group8			1.962	3.812	1.647	1.697	1.552	1.487	1.483	1.485
group9			1.962	3.812	1.647	1.697	1.552	1.487	1.483	1.485
group10			1.962	3.812	1.647	1.697	1.552	1.487	1.483	1.485
group1	Y	0.03	1.014	1.077	1.138	1.132	1.132	1.101	1.101	1.033
group2			1.046	1.073	1.335	1.711	1.767	1.973	1.762	1.038
group3			1.073	1.091	1.279	1.313	1.285	1.113	1.058	1.062
group4			1.076	1.076	1.385	1.183	1.084	1.091	1.035	1.031
group5			1.117	1.117	1.447	1.132	1.132	1.104	1.098	1.040
group6			1.307	1.379	2.238	1.726	1.644	1.574	1.522	1.186
group7			1.163	1.221	1.154	1.130	1.069	1.124	1.101	1.081
group8			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group9			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group10			1.793	3.145	1.696	1.537	1.537	1.493	1.483	1.485
group1	Y	0.04	1.012	1.077	1.131	1.093	1.092	1.080	1.080	1.033
group2			1.047	1.068	1.210	1.691	1.691	1.641	1.542	1.038
group3			1.072	1.072	1.189	1.251	1.251	1.073	1.059	1.063
group4			1.071	1.071	1.243	1.157	1.059	1.059	1.034	1.031
group5			1.099	1.117	1.301	1.101	1.103	1.103	1.103	1.040
group6			1.283	1.383	1.953	1.632	1.458	1.473	1.430	1.153
group7			1.143	1.206	1.135	1.133	1.076	1.110	1.107	1.082
group8			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485
group9			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485
group10			1.770	2.845	1.710	1.521	1.521	1.494	1.483	1.485

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Y	0.05	1.015	1.078	1.122	1.086	1.087	1.067	1.067	1.033
group2			1.055	1.055	1.140	1.571	1.571	1.449	1.398	1.038
group3			1.070	1.070	1.143	1.216	1.216	1.062	1.062	1.063
group4			1.067	1.067	1.177	1.157	1.057	1.053	1.033	1.031
group5			1.092	1.105	1.228	1.088	1.098	1.105	1.105	1.041
group6			1.260	1.394	1.791	1.570	1.452	1.386	1.363	1.129
group7			1.126	1.198	1.132	1.124	1.081	1.106	1.106	1.082
group8			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group9			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group10			1.751	2.636	1.720	1.512	1.512	1.495	1.484	1.485
group1	Y	0.07	1.022	1.075	1.101	1.089	1.089	1.059	1.059	1.034
group2			1.055	1.055	1.123	1.389	1.389	1.246	1.234	1.038
group3			1.068	1.088	1.135	1.163	1.163	1.072	1.072	1.064
group4			1.053	1.053	1.162	1.162	1.061	1.052	1.037	1.031
group5			1.048	1.087	1.168	1.083	1.086	1.097	1.097	1.041
group6			1.228	1.321	1.578	1.549	1.420	1.259	1.259	1.117
group7			1.134	1.168	1.124	1.116	1.086	1.097	1.097	1.082
group8			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group9			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group10			1.818	2.384	1.744	1.502	1.502	1.495	1.484	1.485
group1	Y	0.1	1.025	1.067	1.083	1.098	1.098	1.044	1.044	1.034
group2			1.049	1.062	1.092	1.250	1.250	1.116	1.115	1.038
group3			1.063	1.087	1.111	1.112	1.114	1.075	1.075	1.065
group4			1.048	1.087	1.114	1.110	1.052	1.051	1.039	1.032
group5			1.035	1.079	1.146	1.069	1.070	1.078	1.078	1.043
group6			1.190	1.231	1.466	1.467	1.379	1.241	1.177	1.112
group7			1.129	1.139	1.123	1.105	1.086	1.089	1.090	1.083
group8			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group9			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group10			1.886	2.277	1.741	1.550	1.503	1.498	1.484	1.486
group1	Y	0.15	1.017	1.055	1.066	1.082	1.082	1.049	1.033	1.035
group2			1.036	1.060	1.075	1.166	1.166	1.058	1.037	1.038
group3			1.028	1.068	1.084	1.081	1.081	1.070	1.070	1.066
group4			1.018	1.078	1.079	1.079	1.054	1.046	1.040	1.033
group5			1.029	1.062	1.093	1.056	1.056	1.062	1.062	1.045
group6			1.180	1.242	1.362	1.410	1.329	1.228	1.139	1.110
group7			1.105	1.114	1.090	1.090	1.075	1.085	1.085	1.083
group8			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group9			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group10			1.762	1.988	1.761	1.598	1.522	1.500	1.485	1.486
group1	Y	0.2	1.016	1.049	1.071	1.069	1.069	1.052	1.035	1.036
group2			1.017	1.028	1.068	1.119	1.119	1.055	1.036	1.038
group3			1.029	1.061	1.096	1.096	1.074	1.076	1.074	1.067
group4			1.015	1.048	1.062	1.062	1.055	1.045	1.039	1.033
group5			1.024	1.046	1.066	1.048	1.049	1.054	1.054	1.046
group6			1.187	1.233	1.354	1.381	1.289	1.218	1.125	1.113
group7			1.090	1.103	1.086	1.087	1.073	1.080	1.082	1.083
group8			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487
group9			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487
group10			1.659	1.812	1.692	1.607	1.537	1.503	1.487	1.487

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz) 0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.005	1.024	1.025	1.307	1.522	1.410	1.819	1.819	1.115
group2			1.009	1.024	1.458	2.802	2.802	2.301	1.480	1.093
group3			1.054	1.183	1.922	6.446	5.706	3.806	3.825	3.535
group4			1.043	1.126	2.323	4.021	3.146	4.902	3.262	1.346
group5			1.145	1.145	1.230	1.655	1.467	1.867	1.374	1.018
group6			1.027	1.042	1.210	1.562	2.041	2.041	1.589	1.145
group7			1.121	1.173	1.193	1.655	1.636	1.724	1.555	1.072
group8			1.109	1.534	2.401	4.285	3.959	3.979	2.855	1.919
group9			1.109	1.534	2.401	4.285	3.959	3.979	2.855	1.919
group10			1.109	1.534	2.401	4.285	3.959	3.979	2.855	1.919
group1	Z	0.01	1.021	1.025	1.244	1.489	1.274	1.308	1.308	1.113
group2			1.008	1.023	1.322	2.493	2.493	2.042	1.385	1.092
group3			1.052	1.196	1.826	5.703	4.015	3.481	3.326	3.099
group4			1.046	1.131	2.326	3.602	2.459	3.543	2.841	1.310
group5			1.109	1.109	1.187	1.521	1.391	1.471	1.387	1.018
group6			1.022	1.028	1.169	1.519	1.660	1.660	1.539	1.096
group7			1.094	1.094	1.155	1.571	1.456	1.406	1.395	1.036
group8			1.109	1.374	2.351	3.517	2.936	2.936	2.405	1.670
group9			1.109	1.374	2.351	3.517	2.936	2.936	2.405	1.670
group10			1.109	1.374	2.351	3.517	2.936	2.936	2.405	1.670
group1	Z	0.02	1.022	1.024	1.211	1.407	1.288	1.291	1.120	1.093
group2			1.008	1.026	1.228	2.051	2.051	1.621	1.219	1.092
group3			1.051	1.152	1.962	3.999	3.028	3.417	3.004	2.767
group4			1.042	1.121	2.180	2.856	1.873	2.338	1.979	1.286
group5			1.073	1.073	1.143	1.360	1.268	1.274	1.274	1.018
group6			1.013	1.020	1.169	1.352	1.473	1.473	1.420	1.065
group7			1.053	1.059	1.158	1.409	1.282	1.275	1.271	1.033
group8			1.107	1.213	1.836	3.179	2.113	2.248	2.248	1.607
group9			1.107	1.213	1.836	3.179	2.113	2.248	2.248	1.607
group10			1.107	1.213	1.836	3.179	2.113	2.248	2.248	1.607
group1	Z	0.03	1.019	1.024	1.197	1.330	1.293	1.307	1.099	1.093
group2			1.009	1.027	1.202	1.778	1.778	1.435	1.134	1.091
group3			1.048	1.166	2.136	3.599	2.822	3.220	2.737	2.571
group4			1.042	1.128	1.901	2.413	1.755	1.986	1.808	1.278
group5			1.064	1.064	1.132	1.274	1.204	1.164	1.164	1.018
group6			1.012	1.020	1.184	1.305	1.449	1.449	1.396	1.055
group7			1.039	1.049	1.162	1.292	1.217	1.243	1.220	1.036
group8			1.101	1.144	1.685	2.767	1.878	2.120	2.120	1.557
group9			1.101	1.144	1.685	2.767	1.878	2.120	2.120	1.557
group10			1.101	1.144	1.685	2.767	1.878	2.120	2.120	1.557
group1	Z	0.04	1.016	1.023	1.210	1.277	1.294	1.294	1.093	1.093
group2			1.009	1.027	1.194	1.606	1.606	1.359	1.112	1.091
group3			1.047	1.166	2.248	3.545	2.811	3.012	2.626	2.439
group4			1.039	1.115	1.712	2.124	1.640	1.832	1.661	1.275
group5			1.054	1.054	1.123	1.224	1.180	1.112	1.096	1.017
group6			1.010	1.021	1.194	1.301	1.411	1.411	1.375	1.051
group7			1.031	1.041	1.165	1.235	1.210	1.205	1.205	1.036
group8			1.096	1.125	1.571	2.496	1.870	1.793	1.793	1.519
group9			1.096	1.125	1.571	2.496	1.870	1.793	1.793	1.519
group10			1.096	1.125	1.571	2.496	1.870	1.793	1.793	1.519

Table 03.07.01-29 S1.13: Final Response Spectra Modification Factors (Continued)

Group	Direction	Damping	Frequency Range (Hz)							
			0-2	2-5	5-10	10-15	15-20	20-25	25-30	30-35
group1	Z	0.05	1.014	1.024	1.219	1.270	1.288	1.288	1.092	1.092
group2			1.009	1.028	1.196	1.515	1.515	1.300	1.090	1.090
group3			1.046	1.163	2.285	3.504	2.739	2.855	2.564	2.344
group4			1.039	1.117	1.614	1.944	1.586	1.728	1.571	1.274
group5			1.043	1.043	1.125	1.194	1.138	1.091	1.058	1.017
group6			1.009	1.021	1.203	1.301	1.362	1.362	1.304	1.051
group7			1.026	1.035	1.167	1.242	1.158	1.181	1.181	1.034
group8			1.090	1.132	1.556	2.306	1.791	1.679	1.676	1.491
group9			1.090	1.132	1.556	2.306	1.791	1.679	1.676	1.491
group10			1.090	1.132	1.556	2.306	1.791	1.679	1.676	1.491
group1	Z	0.07	1.011	1.024	1.225	1.253	1.256	1.256	1.109	1.092
group2			1.009	1.029	1.192	1.400	1.400	1.266	1.091	1.089
group3			1.046	1.167	2.487	3.422	2.724	2.767	2.378	2.220
group4			1.056	1.125	1.521	1.776	1.524	1.594	1.497	1.273
group5			1.029	1.029	1.134	1.198	1.080	1.064	1.047	1.016
group6			1.010	1.021	1.214	1.280	1.268	1.268	1.165	1.051
group7			1.023	1.028	1.166	1.231	1.116	1.138	1.138	1.031
group8			1.062	1.137	1.554	2.248	1.724	1.586	1.586	1.451
group9			1.062	1.137	1.554	2.248	1.724	1.586	1.586	1.451
group10			1.062	1.137	1.554	2.248	1.724	1.586	1.586	1.451
group1	Z	0.1	1.010	1.023	1.199	1.214	1.226	1.226	1.133	1.092
group2			1.009	1.030	1.181	1.314	1.314	1.231	1.111	1.089
group3			1.066	1.188	2.418	3.274	2.734	2.633	2.254	2.120
group4			1.063	1.140	1.421	1.623	1.471	1.487	1.417	1.271
group5			1.022	1.023	1.135	1.207	1.065	1.049	1.036	1.016
group6			1.009	1.021	1.219	1.259	1.207	1.211	1.122	1.049
group7			1.019	1.022	1.142	1.189	1.112	1.093	1.064	1.028
group8			1.047	1.148	1.553	2.218	1.718	1.531	1.497	1.416
group9			1.047	1.148	1.553	2.218	1.718	1.531	1.497	1.416
group10			1.047	1.148	1.553	2.218	1.718	1.531	1.497	1.416
group1	Z	0.15	1.009	1.025	1.099	1.144	1.220	1.217	1.155	1.093
group2			1.009	1.032	1.118	1.217	1.217	1.192	1.095	1.088
group3			1.093	1.226	2.344	2.887	2.672	2.514	2.092	2.042
group4			1.083	1.169	1.354	1.478	1.414	1.398	1.354	1.275
group5			1.016	1.017	1.098	1.166	1.045	1.045	1.023	1.016
group6			1.006	1.022	1.152	1.183	1.195	1.197	1.129	1.048
group7			1.014	1.017	1.090	1.128	1.103	1.081	1.026	1.027
group8			1.056	1.160	1.470	2.138	1.885	1.516	1.472	1.429
group9			1.056	1.160	1.470	2.138	1.885	1.516	1.472	1.429
group10			1.056	1.160	1.470	2.138	1.885	1.516	1.472	1.429
group1	Z	0.2	1.010	1.025	1.089	1.191	1.220	1.217	1.152	1.095
group2			1.009	1.032	1.088	1.153	1.165	1.165	1.097	1.088
group3			1.117	1.298	2.125	2.705	2.643	2.440	2.032	2.007
group4			1.100	1.184	1.330	1.398	1.363	1.342	1.327	1.278
group5			1.014	1.017	1.100	1.120	1.039	1.039	1.017	1.016
group6			1.006	1.023	1.118	1.201	1.189	1.190	1.143	1.056
group7			1.011	1.017	1.091	1.111	1.079	1.071	1.026	1.028
group8			1.063	1.177	1.620	1.985	1.940	1.537	1.463	1.450
group9			1.063	1.177	1.620	1.985	1.940	1.537	1.463	1.450
group10			1.063	1.177	1.620	1.985	1.940	1.537	1.463	1.450

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
1	G2-PH West Wall Panel 1	0	0.002	-0.006	-0.003	0.001	-0.005
2	G2-PH West Wall Panel 2	0.001	0.001	-0.004	-0.002	0.001	-0.005
3	G2-PH West Wall Panel 3	-0.003	0.003	-0.001	-0.003	0.002	-0.004
4	G2-PH South Wall Panel 1	0	0.003	-0.002	-0.002	0	-0.004
5	G2-PH South Wall Panel 2	0	0.002	0.003	-0.003	-0.003	-0.005
6	G2-PH South Wall Panel 3	0.001	-0.003	0	-0.002	-0.002	0.004
7	G2-PH North Wall Panel 1	-0.001	0.004	-0.001	-0.003	0.001	-0.003
8	G2-PH North Wall Panel 2	-0.001	0	-0.002	-0.001	-0.003	0.001
9	G2-PH North Wall Panel 3	-0.004	0.002	0.001	0	-0.001	0.005
10	G2-PH East Wall Panel 1	0.009	-0.004	0	0	-0.001	0.01
11	G2-PH East Wall Panel 2	0.012	-0.003	0.003	0.003	0.001	0.01
12	G2-PH East Wall Panel 3	0.000	-0.002	0.002	0	0.001	0.01
13	G2-PH Op Fl Panel 1	0	0.004	0.004	-0.002	-0.003	-0.003
14	G2-PH Op Fl Panel 2	0	0.001	0.013	-0.002	-0.002	0.007
15	G2-PH Op Fl Panel 3	0	-0.001	0.007	-0.003	-0.001	0.006
16	G3-PH West Wall Panel 1	-0.003	0.004	-0.006	-0.006	0	-0.005
17	G3-PH West Wall Panel 2	-0.005	0.003	-0.005	-0.007	0	-0.006
18	G3-PH West Wall Panel 3	-0.006	0.006	-0.004	-0.004	-0.001	-0.007
19	G3-PH South Wall Panel 1	-0.001	0.004	-0.001	-0.002	-0.002	-0.005
20	G3-PH South Wall Panel 2	0	0.003	0.002	-0.005	-0.002	-0.003
21	G3-PH South Wall Panel 3	0	-0.003	-0.001	-0.004	-0.001	0.007

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
22	G3-PH North Wall Panel 1	-0.004	0.001	-0.003	-0.003	-0.009	-0.005
23	G3-PH North Wall Panel 2	-0.003	-0.003	-0.002	-0.004	-0.007	0
24	G3-PH North Wall Panel 3	-0.003	-0.006	0.001	-0.004	-0.007	0.003
25	G3-PH East Wall Panel 1	-0.004	-0.006	-0.003	-0.007	-0.002	0.008
26	G3-PH East Wall Panel 2	-0.003	-0.006	0	-0.013	0	0.009
27	G3-PH East Wall Panel 3	-0.005	-0.006	0.001	-0.009	0	0.008
28	G3-PH Roof Panel 1	0	0.004	0.01	-0.003	-0.001	0.007
29	G3-PH Roof Panel 2	0.002	0.002	0.035	-0.005	0	0.028
30	G3-PH Roof Panel 3	0.003	-0.005	0.016	-0.006	0.001	0.013
31	G5-Basin South Wall Panel 1	-0.005	0	0	0.001	-0.011	-0.006
32	G5-Basin South Wall Panel 2	0	-0.003	-0.002	0.001	-0.002	-0.004
33	G5-Basin South Wall Panel 3	-0.002	-0.01	-0.002	0.001	-0.004	0.003
34	G5-Basin South Wall Panel 4	-0.004	-0.009	-0.006	0	-0.009	0.005
35	G5-Basin South Wall Panel 5	-0.005	-0.007	-0.003	-1E-03	-0.02	-0.002
36	G5-Basin South Wall Panel 6	-0.006	0.002	-0.002	-0.003	-0.008	-0.002
37	G5-Basin North Wall Panel 1	0	0.005	-0.002	-0.001	-0.001	-0.006
38	G5-Basin North Wall Panel 2	0	0.003	0.002	-0.004	-0.001	-0.004
39	G5-Basin North Wall Panel 3	0.001	-0.003	-0.001	-0.004	-0.001	0.007
40	G5-Basin North Wall Panel 4	-0.001	-0.004	-0.002	-0.002	-0.013	0.007
41	G5-Basin North Wall Panel 5	-0.003	-0.005	-0.001	0	-0.018	-0.002
42	G5-Basin North Wall Panel 6	-0.005	0.002	0.001	-0.003	-0.012	-0.005
43	G5-Basin S Buttress 1 Panel 1	-0.005	-0.001	0.001	-0.018	-0.013	-0.004
44	G5-Basin S Buttress 2 Panel 1	-0.001	-0.004	-0.001	-0.009	0.005	-0.006

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
45	G5-Basin S Buttress 3 Panel 1	-0.003	-0.013	-0.003	-0.006	-0.003	0.007
46	G5-Basin S Buttress 4 Panel 1	0	-0.005	-0.004	-0.013	-0.014	-0.005
47	G5-Basin S Buttress 5 Panel 1	-0.009	0.009	0.001	-0.013	-0.006	-0.005
48	G5-Basin N Buttress 1 Panel 1	-0.005	0.004	0.002	-0.004	-0.002	-0.01
49	G5-Basin N Buttress 2 Panel 1	-0.007	0.001	0.002	-0.005	-0.001	0
50	G5-Basin N Buttress 3 Panel 1	-0.003	-0.006	-0.004	-0.008	-0.005	0.012
51	G5-Basin N Buttress 4 Panel 1	-0.007	-0.001	0.001	-0.013	-0.011	-0.001
52	G5-Basin N Buttress 5 Panel 1	-0.008	0.01	-0.003	-0.014	-0.016	-0.004
53	G5-Basin E Buttress 1 Panel 1	-0.007	0	-0.001	-0.007	-0.007	-0.001
54	G5-Basin E Buttress 2 Panel 1	-0.002	-0.002	0.002	-0.006	-0.017	-0.008
55	G5-Basin W Buttress 1 Panel 1	-0.003	0.003	-0.004	-0.009	-0.01	-0.001
56	G5-Basin W Buttress 2 Panel 1	-0.005	-0.005	-0.004	-0.011	-0.006	-0.003
57	G5-Basin West Wall Panel 1	-0.008	0.007	0.003	-0.01	-0.004	-0.004
58	G5-Basin West Wall Panel 2	-0.004	0.006	0.001	-0.02	-0.002	-0.002
59	G5-Basin West Wall Panel 3	-0.009	0.004	-0.003	-0.013	-0.002	-0.004
60	G5-Basin East Wall Panel 1	-0.011	0.001	0.001	-0.004	-0.003	-0.002
61	G5-Basin East Wall Panel 2	-0.006	0.001	0.003	-0.011	-0.003	-0.004
62	G5-Basin East Wall Panel 3	-0.003	0.002	0.002	-0.008	-0.004	-0.006
63	G6-Basin South Wall Panel 1	-0.009	-0.003	-0.001	-0.003	-0.026	-0.005
64	G6-Basin South Wall Panel 2	-0.006	-0.003	-0.002	-0.001	-0.032	-0.004
65	G6-Basin South Wall Panel 3	-0.005	-0.006	-0.003	0	-0.01	0.002
66	G6-Basin South Wall Panel 4	-0.002	-0.003	-0.006	-0.002	-0.013	0.002
67	G6-Basin South Wall Panel 5	0.001	0.002	-0.004	-0.002	-0.021	-0.002

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	**Panel Description**	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
68	G6-Basin South Wall Panel 6	-0.003	0.005	0	-0.003	-0.016	-0.003
69	G6-Basin North Wall Panel 1	-0.005	-0.001	-0.001	-0.007	-0.007	-0.004
70	G6-Basin North Wall Panel 2	-0.002	0	0.001	-0.007	-0.009	-0.001
71	G6-Basin North Wall Panel 3	-1E-03	-0.006	-0.002	-0.007	-0.001	0.007
72	G6-Basin North Wall Panel 4	-0.002	-0.001	-0.003	-0.004	-0.006	0.007
73	G6-Basin North Wall Panel 5	0	0.01	-0.002	-0.002	-0.013	-0.001
74	G6-Basin North Wall Panel 6	-0.003	0.014	0.001	-1E-03	-0.02	-0.007
75	G6-Basin S Buttress 1 Panel 1	-0.003	-0.006	0	-0.025	-0.029	-0.002
76	G6-Basin S Buttress 2 Panel 1	-0.003	-0.007	-1E-03	-0.015	-0.022	-0.007
77	G6-Basin S Buttress 3 Panel 1	-0.005	-0.003	-0.004	-0.009	0.001	0.006
78	G6-Basin S Buttress 4 Panel 1	0.003	0.002	-0.003	-0.019	-0.022	0.001
79	G6-Basin S Buttress 5 Panel 1	-0.013	0.028	0	-0.011	-0.009	-0.002
80	G6-Basin S Buttress 1 Panel 2	-0.011	-0.005	0	-0.081	-0.03	0.001
81	G6-Basin S Buttress 2 Panel 2	-0.006	-0.006	-0.004	-0.033	-0.022	-0.019
82	G6-Basin S Buttress 3 Panel 2	-0.017	-0.001	-0.011	-0.028	0.002	0.007
83	G6-Basin S Buttress 4 Panel 2	-0.01	0.001	-0.003	-0.051	-0.021	-0.002
84	G6-Basin S Buttress 5 Panel 2	-0.039	0.025	0.001	-0.043	-0.009	-0.005
85	G6-Basin N Buttress 1 Panel 1	-0.039	0.002	0.004	-0.016	-0.012	-0.005
86	G6-Basin N Buttress 2 Panel 1	-0.035	-0.008	0.001	-0.023	-0.006	-0.002
87	G6-Basin N Buttress 3 Panel 1	-0.009	0.005	0.001	-0.025	0.001	0.017
88	G6-Basin N Buttress 4 Panel 1	-0.01	0.005	-0.002	-0.084	-0.001	-0.002
89	G6-Basin N Buttress 5 Panel 1	-0.013	0.056	-0.001	-0.072	-0.015	0.003
90	G6-Basin N Buttress 1 Panel 2	-0.011	0.002	0.003	-0.007	-0.012	-0.005

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
91	G6-Basin N Buttress 2 Panel 2	-0.013	-0.008	0.001	-0.011	-0.006	0.002
92	G6-Basin N Buttress 3 Panel 2	-0.004	0.005	-0.003	-0.008	0.001	0.013
93	G6-Basin N Buttress 4 Panel 2	-0.005	0.005	-0.002	-0.031	-0.001	0
94	G6-Basin N Buttress 5 Panel 2	-0.006	0.072	-0.001	-0.021	-0.015	-0.001
95	G6-Basin E Buttress 1 Panel 1	-0.008	-0.033	-0.001	-0.011	-0.031	-0.004
96	G6-Basin E Buttress 2 Panel 1	-0.007	0.014	0.002	-0.02	-0.045	-0.012
97	G6-Basin E Buttress 1 Panel 2	-0.009	-0.008	0.001	-0.007	-0.013	-0.003
98	G6-Basin E Buttress 2 Panel 2	-0.008	0.006	0.003	-0.021	-0.021	-0.006
99	G6-Basin W Buttress 1 Panel 1	-0.004	0.003	-0.001	-0.023	-0.021	-0.004
100	G6-Basin W Buttress 2 Panel 1	-0.004	-0.011	-0.003	-0.007	-0.019	-0.004
101	G6-Basin W Buttress 1 Panel 2	-0.005	0.009	-0.007	-0.024	-0.049	-0.001
102	G6-Basin W Buttress 2 Panel 2	-0.002	-0.014	-0.009	-0.007	-0.048	-0.008
103	G6-Basin West Wall Panel 1	-0.006	0.006	0.003	-0.019	-0.005	-0.005
104	G6-Basin West Wall Panel 2	-0.006	0.003	0.001	-0.019	-0.004	-0.005
105	G6-Basin West Wall Panel 3	-0.03	0.003	-0.002	-0.007	-0.004	-0.003
106	G6-Basin East Wall Panel 1	-0.012	0.002	0.001	-0.003	-0.004	-0.002
107	G6-Basin East Wall Panel 2	-0.004	0.003	0.003	-0.013	-0.004	-0.004
108	G6-Basin East Wall Panel 3	-0.007	0.004	0.002	-0.011	-0.005	-0.005
109	G7-Basin South Wall Panel 1	-0.009	0.004	0	-0.003	-0.043	-0.004
110	G7-Basin South Wall Panel 2	-0.009	-0.025	-0.002	-0.001	-0.074	-0.004
111	G7-Basin South Wall Panel 3	-0.003	-0.005	-0.002	-0.001	-0.013	0.002
112	G7-Basin South Wall Panel 4	-0.003	-0.005	-0.005	-0.004	-0.005	0
113	G7-Basin South Wall Panel 5	-0.001	-0.015	-0.004	-0.004	-0.018	-0.003

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	**Panel Description**	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
114	G7-Basin South Wall Panel 6	-0.002	-0.006	-0.001	-0.006	-0.021	-0.001
115	G7-Basin North Wall Panel 1	-0.011	-0.002	-0.001	-0.008	-0.019	-0.003
116	G7-Basin North Wall Panel 2	-0.007	-0.006	0.001	-0.009	-0.046	0
117	G7-Basin North Wall Panel 3	-0.003	-0.024	-0.003	-0.009	-0.008	0.007
118	G7-Basin North Wall Panel 4	0	-0.004	-0.003	-0.006	-0.025	0.007
119	G7-Basin North Wall Panel 5	0	-0.014	-0.003	-0.003	-0.019	-0.001
120	G7-Basin North Wall Panel 6	-0.001	0.004	0.001	-0.002	-0.03	-0.007
121	G7-Basin S Buttress 1 Panel 1	-0.02	0.005	0	-0.039	-0.045	-0.002
122	G7-Basin S Buttress 2 Panel 1	-0.013	-0.025	-0.002	-0.022	-0.04	-0.009
123	G7-Basin S Buttress 3 Panel 1	-0.009	0.007	-0.004	-0.024	0.046	0.005
124	G7-Basin S Buttress 4 Panel 1	-0.015	-0.005	-0.003	-0.03	-0.049	-1E-03
125	G7-Basin S Buttress 5 Panel 1	-0.005	-0.028	0	-0.01	0.012	-0.003
126	G7-Basin S Buttress 1 Panel 2	-0.031	0.002	0	-0.138	-0.048	-0.002
127	G7-Basin S Buttress 2 Panel 2	-0.029	-0.023	-0.003	-0.062	-0.037	-0.023
128	G7-Basin S Buttress 3 Panel 2	-0.019	0.012	-0.003	-0.056	0.041	0.004
129	G7-Basin S Buttress 4 Panel 2	-0.038	-0.031	-0.004	-0.068	-0.047	0.001
130	G7-Basin S Buttress 5 Panel 2	-0.021	-0.03	0.002	-0.038	0.015	-0.007
131	G7-Basin N Buttress 1 Panel 1	-0.061	-0.008	0.004	-0.016	-0.029	-0.002
132	G7-Basin N Buttress 2 Panel 1	-0.08	-0.02	-0.006	-0.035	-0.034	-0.004
133	G7-Basin N Buttress 3 Panel 1	-0.038	0.022	0.001	-0.04	0.005	0.018
134	G7-Basin N Buttress 4 Panel 1	0.001	0.009	0	-0.111	-0.004	-0.009
135	G7-Basin N Buttress 5 Panel 1	-0.017	-0.005	-0.002	-0.045	-0.012	0.004
136	G7-Basin N Buttress 1 Panel 2	-0.024	-0.005	0.004	-0.012	-0.032	-0.006

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	**Panel Description**	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
137	G7-Basin N Buttress 2 Panel 2	-0.015	-0.018	-0.001	-0.016	-0.038	0.001
138	G7-Basin N Buttress 3 Panel 2	-0.021	0.02	0	-0.016	0.007	0.013
139	G7-Basin N Buttress 4 Panel 2	0	0.009	-0.003	-0.045	-0.006	-0.003
140	G7-Basin N Buttress 5 Panel 2	-0.005	-0.007	0	-0.017	-0.013	0
141	G7-Basin E Buttress 1 Panel 1	-0.013	-0.039	0	-0.009	-0.063	-0.006
142	G7-Basin E Buttress 2 Panel 1	-0.005	0.015	0.002	-0.054	-0.059	-0.012
143	G7-Basin E Buttress 1 Panel 2	-0.009	-0.012	0.001	-0.018	-0.024	-0.007
144	G7-Basin E Buttress 2 Panel 2	-0.007	0.005	0.004	-0.051	-0.021	-0.006
145	G7-Basin W Buttress 1 Panel 1	-0.014	0.003	0	-0.047	-0.026	-0.003
146	G7-Basin W Buttress 2 Panel 1	-0.008	-0.018	-0.003	-0.02	-0.038	-0.003
147	G7-Basin W Buttress 1 Panel 2	-0.013	0.013	-0.008	-0.049	-0.06	0
148	G7-Basin W Buttress 2 Panel 2	-0.005	-0.034	-0.006	-0.022	-0.089	-0.008
149	G7-Basin West Wall Panel 1	-0.007	0.005	0.003	-0.033	-0.011	-0.005
150	G7-Basin West Wall Panel 2	-0.012	0.003	0.003	-0.021	-0.013	-0.003
151	G7-Basin West Wall Panel 3	-0.012	0.004	-0.001	-0.015	-0.009	-0.002
152	G7-Basin East Wall Panel 1	-0.005	0.011	0.002	-0.011	-0.005	-0.003
153	G7-Basin East Wall Panel 2	-0.005	0.01	0.003	-0.027	-0.004	-0.005
154	G7-Basin East Wall Panel 3	-0.011	0.01	0.002	-0.023	-0.005	-0.006
155	G8-Cooling Tower South Panel 1	-0.004	-0.002	0.005	-0.008	-0.021	-0.008
156	G8-Cooling Tower South Panel 2	0.001	-0.019	0.007	-0.004	-0.023	-0.002
157	G8-Cooling Tower South Panel 3	0.003	0.009	0.02	0.004	-0.016	0.016
158	G8-Cooling Tower South Panel 4	0.003	0.012	0.021	0.005	0.013	0.005
159	G8-Cooling Tower South Panel 5	0	0.004	0.021	0.001	-0.014	-0.018

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
160	G8-Cooling Tower South Panel 6	0	-0.003	0.009	-0.001	-0.007	-0.017
161	G8-Cooling Tower North Panel 1	0.001	-0.008	0.013	-0.004	-0.024	-0.011
162	G8-Cooling Tower North Panel 2	0.001	-0.023	0.024	-0.008	-0.035	-0.006
163	G8-Cooling Tower North Panel 3	0.003	0.004	0.022	-0.004	-0.016	0.037
164	G8-Cooling Tower North Panel 4	0.002	0.017	0.009	-0.005	0.013	0.024
165	G8-Cooling Tower North Panel 5	0.002	0.004	0.01	-0.01	-0.005	-0.017
166	G8-Cooling Tower North Panel 6	-0.001	-0.004	0.007	-0.017	0.004	-0.012
167	G8-Cooling Tower NS Panel 1	-0.008	0.001	0.004	-0.005	-0.02	-0.003
168	G8-Cooling Tower NS Panel 2	0.009	-0.006	0.005	0.009	-0.014	-0.013
169	G8-Cooling Tower NS Panel 3	-0.001	-0.021	0.024	-0.002	-0.016	0.01
170	G8-Cooling Tower NS Panel 4	0.002	0.013	0.017	0.002	-0.012	0.028
171	G8-Cooling Tower NS Panel 5	-0.006	0.012	0.011	-0.006	0.006	-0.024
172	G8-Cooling Tower NS Panel 6	0.01	-0.022	0.011	0.006	0.079	-0.018
173	G8-Cooling Tower NS Panel 7	-0.001	0.009	0.004	-0.013	-0.008	-0.002
174	G9-Cooling Tower South Panel 1	-0.002	0	0.005	-0.005	-0.019	-0.008
175	G9-Cooling Tower South Panel 2	0	0.001	0.007	-0.001	-0.02	-0.002
176	G9-Cooling Tower South Panel 3	0	-0.003	0.02	0	-0.024	0.017
177	G9-Cooling Tower South Panel 4	-0.001	-0.017	0.022	0.003	-0.028	0.006
178	G9-Cooling Tower South Panel 5	0	-0.03	0.022	0.007	0.007	-0.017
179	G9-Cooling Tower South Panel 6	0.005	-0.027	0.009	0.002	0.001	-0.015
180	G9-Cooling Tower North Panel 1	0.003	-0.005	0.013	-0.005	-0.033	-0.01
181	G9-Cooling Tower North Panel 2	-0.001	-0.006	0.025	-0.003	-0.019	-0.008
182	G9-Cooling Tower North Panel 3	-0.003	-0.007	0.023	-0.008	-0.029	0.037

Table 03.07.01-29 S1.14: Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

Panel No.	Panel Description	Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
		X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
183	G9-Cooling Tower North Panel 4	-0.003	-0.011	0.01	-0.004	-0.012	0.022
184	G9-Cooling Tower North Panel 5	0.002	-0.025	0.012	-0.03	-0.002	-0.018
185	G9-Cooling Tower North Panel 6	0	-0.026	0.008	-0.011	0.016	-0.013
186	G9-Cooling Tower NS Panel 1	-0.006	-0.007	0.006	-0.009	-0.034	-0.003
187	G9-Cooling Tower NS Panel 2	0.003	-0.014	0.005	0.001	-0.025	-0.014
188	G9-Cooling Tower NS Panel 3	-0.003	-0.012	0.025	-0.001	-0.012	0.013
189	G9-Cooling Tower NS Panel 4	-0.014	0.003	0.019	0.001	-0.02	0.031
190	G9-Cooling Tower NS Panel 5	0.001	-0.008	0.014	0.003	-0.004	-0.026
191	G9-Cooling Tower NS Panel 6	0.007	-0.026	0.014	0.005	0.148	-0.015
192	G9-Cooling Tower NS Panel 7	0.004	0.001	0.003	-0.015	-0.013	-0.003
193	G4-Basin Mat Panel 1	-0.003	0.004	-0.001	-0.004	-0.002	-0.005
194	G4-Basin Mat Panel 2	-0.003	0	-0.001	-0.003	-0.001	-0.004
195	G4-Basin Mat Panel 3	-0.003	-0.003	0	-0.002	-0.007	-0.002
196	G0-PH Mat Panel 1	-0.004	0.002	0	-0.001	0.003	0
197	G2-PH W Buttress 1 Panel 1	0	0	-0.006	-0.005	0.001	-0.004
198	G2-PH W Buttress 2 Panel 1	0.002	0.002	-0.001	-0.002	0.002	-0.007
199	G2-PH E Buttress 1 Panel 1	0.03	-0.004	0.003	0.001	0.001	0.008
200	G2-PH E Buttress 2 Panel 1	0.005	-0.002	0.004	0	0.001	0.012
201	G3-PH W Buttress 1 Panel 1	-0.002	0	-0.005	-0.011	-0.001	-0.004
202	G3-PH W Buttress 2 Panel 1	-0.011	0.003	-0.003	-0.005	-0.002	-0.008
203	G3-PH E Buttress 1 Panel 1	-0.006	-0.007	0	-0.013	-0.001	0.008
204	G3-PH E Buttress 2 Panel 1	-0.009	-0.006	0	-0.016	-0.002	0.011
205	G2-PH Int Wall 1 Panel 1	-0.002	0.002	-0.002	-0.001	-0.001	0

**Table 03.07.01-29 S1.14: Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)**

		Diff: Acc_MS - Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations (g)			Average Accelerations (g)		
Panel No.	**Panel Description**	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
206	G2-PH Int Wall 2 Panel 1	-0.002	0.001	0	-0.002	0.001	0
207	G3-PH Int Wall 1 Panel 1	-0.002	0.002	-0.002	-0.005	-0.002	-0.002
208	G3-PH Int Wall 2 Panel 1	-0.002	0	-0.001	-0.009	0	0

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	**Panel Description**	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
1	G2-PH West Wall Panel 1	0.0	1.6	-4.7	-2.5	0.8	-3.8
2	G2-PH West Wall Panel 2	0.8	0.8	-3.1	-1.6	0.8	-3.8
3	G2-PH West Wall Panel 3	-0.8	2.5	-0.8	-2.6	1.6	-3.1
4	G2-PH South Wall Panel 1	0.0	2.4	-1.6	-1.8	0.0	-3.1
5	G2-PH South Wall Panel 2	0.0	1.6	2.5	-2.7	-2.3	-4.0
6	G2-PH South Wall Panel 3	0.9	-2.2	0.0	-1.8	-1.5	3.3
7	G2-PH North Wall Panel 1	-0.9	3.2	-0.8	-2.7	0.8	-2.3
8	G2-PH North Wall Panel 2	-0.9	0.0	-1.6	-0.9	-2.2	0.8
9	G2-PH North Wall Panel 3	-3.4	1.5	0.8	0.0	-0.8	3.9
10	G2-PH East Wall Panel 1	7.8	-3.0	0.0	0.0	-0.8	8.0
11	G2-PH East Wall Panel 2	10.0	-2.3	2.3	2.5	0.8	7.9
12	G2-PH East Wall Panel 3	0.0	-1.5	1.5	0.0	0.8	7.8
13	G2-PH Op Fl Panel 1	0.0	3.1	2.3	-1.7	-2.2	-1.6
14	G2-PH Op Fl Panel 2	0.0	0.8	7.0	-1.8	-1.5	3.5
15	G2-PH Op Fl Panel 3	0.0	-0.7	3.8	-2.6	-0.7	3.0
16	G3-PH West Wall Panel 1	-2.4	3.1	-4.6	-4.9	0.0	-3.7
17	G3-PH West Wall Panel 2	-3.7	2.3	-3.9	-5.3	0.0	-4.5
18	G3-PH West Wall Panel 3	-4.9	4.7	-3.1	-3.3	-0.7	-5.1
19	G3-PH South Wall Panel 1	-0.9	3.0	-0.8	-1.8	-1.5	-3.8
20	G3-PH South Wall Panel 2	0.0	2.2	1.7	-4.3	-1.5	-2.4
21	G3-PH South Wall Panel 3	0.0	-2.1	-0.8	-3.5	-0.7	5.6
22	G3-PH North Wall Panel 1	-3.4	0.7	-2.3	-2.6	-6.2	-3.7

**Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)**

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
23	G3-PH North Wall Panel 2	-2.6	-2.1	-1.6	-3.4	-4.8	0.0
24	G3-PH North Wall Panel 3	-2.6	-4.1	0.8	-3.4	-4.8	2.3
25	G3-PH East Wall Panel 1	-3.2	-4.2	-2.3	-5.7	-1.5	6.3
26	G3-PH East Wall Panel 2	-2.3	-4.2	0.0	-9.6	0.0	7.1
27	G3-PH East Wall Panel 3	-4.0	-4.2	0.7	-7.0	0.0	6.1
28	G3-PH Roof Panel 1	0.0	2.9	6.4	-2.5	-0.7	4.3
29	G3-PH Roof Panel 2	1.7	1.4	22.7	-4.2	0.0	17.6
30	G3-PH Roof Panel 3	2.6	-3.4	10.3	-5.0	0.7	7.9
31	G5-Basin South Wall Panel 1	-4.0	0.0	0.0	0.8	-7.2	-4.5
32	G5-Basin South Wall Panel 2	0.0	-2.0	-1.5	0.8	-1.4	-3.1
33	G5-Basin South Wall Panel 3	-1.7	-6.5	-1.4	0.9	-2.7	2.3
34	G5-Basin South Wall Panel 4	-3.4	-5.8	-4.2	0.0	-6.2	3.8
35	G5-Basin South Wall Panel 5	-4.2	-4.3	-2.2	-0.8	-12.7	-1.5
36	G5-Basin South Wall Panel 6	-5.0	1.3	-1.5	-2.5	-5.6	-1.5
37	G5-Basin North Wall Panel 1	0.0	3.8	-1.6	-0.9	-0.7	-4.5
38	G5-Basin North Wall Panel 2	0.0	2.2	1.7	-3.5	-0.7	-3.1
39	G5-Basin North Wall Panel 3	0.9	-2.1	-0.8	-3.5	-0.7	5.6
40	G5-Basin North Wall Panel 4	-0.9	-2.7	-1.5	-1.8	-8.8	5.4
41	G5-Basin North Wall Panel 5	-2.6	-3.1	-0.8	0.0	-11.3	-1.5
42	G5-Basin North Wall Panel 6	-4.2	1.3	0.8	-2.5	-8.0	-3.6
43	G5-Basin S Buttress 1 Panel 1	-3.9	-0.7	0.8	-13.1	-8.4	-3.1
44	G5-Basin S Buttress 2 Panel 1	-0.8	-2.7	-0.7	-7.0	3.6	-4.5

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
45	G5-Basin S Buttress 3 Panel 1	-2.4	-8.4	-2.0	-4.8	-2.2	5.3
46	G5-Basin S Buttress 4 Panel 1	0.0	-3.3	-2.8	-9.9	-9.3	-3.7
47	G5-Basin S Buttress 5 Panel 1	-7.0	5.8	0.8	-10.0	-4.2	-3.9
48	G5-Basin N Buttress 1 Panel 1	-4.1	3.1	1.6	-3.4	-1.5	-7.5
49	G5-Basin N Buttress 2 Panel 1	-5.6	0.7	1.6	-4.3	-0.7	0.0
50	G5-Basin N Buttress 3 Panel 1	-2.5	-4.2	-3.0	-6.5	-3.6	9.4
51	G5-Basin N Buttress 4 Panel 1	-5.4	-0.7	0.8	-10.0	-7.4	-0.8
52	G5-Basin N Buttress 5 Panel 1	-6.3	6.5	-2.3	-10.9	-10.3	-3.0
53	G5-Basin E Buttress 1 Panel 1	-4.8	0.0	-0.8	-5.0	-4.7	-0.8
54	G5-Basin E Buttress 2 Panel 1	-1.4	-1.3	1.6	-4.3	-10.8	-5.8
55	G5-Basin W Buttress 1 Panel 1	-2.1	2.1	-3.0	-6.5	-6.6	-0.7
56	G5-Basin W Buttress 2 Panel 1	-3.7	-3.4	-3.0	-8.0	-4.1	-2.2
57	G5-Basin West Wall Panel 1	-5.6	5.4	2.4	-7.2	-2.8	-3.0
58	G5-Basin West Wall Panel 2	-2.6	4.6	0.8	-13.2	-1.4	-1.5
59	G5-Basin West Wall Panel 3	-6.9	3.1	-2.3	-9.8	-1.5	-2.9
60	G5-Basin East Wall Panel 1	-7.8	0.7	0.8	-3.0	-2.2	-1.5
61	G5-Basin East Wall Panel 2	-3.8	0.7	2.4	-7.5	-2.2	-3.0
62	G5-Basin East Wall Panel 3	-2.3	1.4	1.5	-6.0	-2.9	-4.4
63	G6-Basin South Wall Panel 1	-7.1	-1.8	-0.8	-2.4	-14.4	-3.7
64	G6-Basin South Wall Panel 2	-4.8	-1.5	-1.5	-0.8	-16.0	-3.1
65	G6-Basin South Wall Panel 3	-4.1	-3.1	-2.1	0.0	-5.5	1.5
66	G6-Basin South Wall Panel 4	-1.6	-1.4	-4.2	-1.7	-6.6	1.5
67	G6-Basin South Wall Panel 5	0.8	0.9	-2.9	-1.6	-10.5	-1.5

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
68	G6-Basin South Wall Panel 6	-2.4	2.8	0.0	-2.4	-9.5	-2.2
69	G6-Basin North Wall Panel 1	-4.2	-0.7	-0.8	-5.8	-4.7	-2.9
70	G6-Basin North Wall Panel 2	-1.7	0.0	0.8	-5.8	-5.8	-0.8
71	G6-Basin North Wall Panel 3	-0.8	-3.7	-1.6	-5.8	-0.7	5.5
72	G6-Basin North Wall Panel 4	-1.7	-0.5	-2.3	-3.4	-3.4	5.3
73	G6-Basin North Wall Panel 5	0.0	4.8	-1.5	-1.7	-6.6	-0.7
74	G6-Basin North Wall Panel 6	-2.5	8.0	0.8	-0.8	-11.6	-5.0
75	G6-Basin S Buttress 1 Panel 1	-2.0	-3.4	0.0	-15.6	-15.3	-1.5
76	G6-Basin S Buttress 2 Panel 1	-2.1	-3.6	-0.7	-9.6	-11.5	-5.1
77	G6-Basin S Buttress 3 Panel 1	-3.5	-1.5	-2.7	-6.2	0.6	4.4
78	G6-Basin S Buttress 4 Panel 1	2.2	0.9	-2.1	-12.4	-10.6	0.7
79	G6-Basin S Buttress 5 Panel 1	-8.3	14.4	0.0	-7.6	-5.0	-1.6
80	G6-Basin S Buttress 1 Panel 2	-4.8	-2.8	0.0	-30.8	-15.8	0.7
81	G6-Basin S Buttress 2 Panel 2	-2.9	-3.1	-2.6	-13.7	-11.5	-12.1
82	G6-Basin S Buttress 3 Panel 2	-8.5	-0.5	-6.7	-13.2	1.1	4.7
83	G6-Basin S Buttress 4 Panel 2	-5.2	0.5	-2.0	-21.8	-10.1	-1.4
84	G6-Basin S Buttress 5 Panel 2	-16.3	12.8	0.7	-19.6	-5.0	-3.7
85	G6-Basin N Buttress 1 Panel 1	-21.2	1.3	3.1	-9.6	-7.8	-3.6
86	G6-Basin N Buttress 2 Panel 1	-18.2	-5.0	0.7	-13.5	-3.9	-1.4
87	G6-Basin N Buttress 3 Panel 1	-4.9	3.2	0.7	-12.4	0.7	11.8
88	G6-Basin N Buttress 4 Panel 1	-4.8	2.4	-1.4	-29.3	-0.5	-1.3
89	G6-Basin N Buttress 5 Panel 1	-5.9	29.0	-0.7	-30.1	-8.0	2.1
90	G6-Basin N Buttress 1 Panel 2	-8.3	1.4	2.4	-5.3	-7.8	-3.8

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
91	G6-Basin N Buttress 2 Panel 2	-9.3	-5.0	0.8	-8.4	-3.9	1.5
92	G6-Basin N Buttress 3 Panel 2	-3.0	3.2	-2.2	-5.8	0.7	9.8
93	G6-Basin N Buttress 4 Panel 2	-3.4	2.4	-1.5	-18.5	-0.5	0.0
94	G6-Basin N Buttress 5 Panel 2	-4.1	36.9	-0.8	-14.1	-8.0	-0.7
95	G6-Basin E Buttress 1 Panel 1	-4.1	-11.1	-0.7	-5.5	-12.5	-2.8
96	G6-Basin E Buttress 2 Panel 1	-3.6	5.4	1.4	-10.0	-17.2	-8.1
97	G6-Basin E Buttress 1 Panel 2	-4.5	-4.3	0.7	-3.5	-7.7	-2.2
98	G6-Basin E Buttress 2 Panel 2	-4.1	3.4	2.3	-10.4	-11.9	-4.3
99	G6-Basin W Buttress 1 Panel 1	-2.1	1.8	-0.8	-11.3	-11.7	-2.9
100	G6-Basin W Buttress 2 Panel 1	-2.2	-6.2	-2.3	-3.8	-10.6	-2.8
101	G6-Basin W Buttress 1 Panel 2	-2.6	3.8	-4.8	-11.8	-18.8	-0.7
102	G6-Basin W Buttress 2 Panel 2	-1.1	-5.3	-6.2	-3.8	-17.9	-5.2
103	G6-Basin West Wall Panel 1	-3.7	4.4	2.3	-11.0	-3.4	-3.6
104	G6-Basin West Wall Panel 2	-2.8	2.2	0.8	-9.1	-2.8	-3.5
105	G6-Basin West Wall Panel 3	-16.8	2.2	-1.5	-4.4	-2.8	-2.1
106	G6-Basin East Wall Panel 1	-7.1	1.4	0.8	-1.8	-2.9	-1.4
107	G6-Basin East Wall Panel 2	-1.8	2.1	2.3	-6.2	-2.9	-2.9
108	G6-Basin East Wall Panel 3	-4.3	2.8	1.5	-6.7	-3.5	-3.6
109	G7-Basin South Wall Panel 1	-6.9	2.1	0.0	-2.3	-20.3	-3.0
110	G7-Basin South Wall Panel 2	-6.9	-8.9	-1.5	-0.8	-26.1	-3.0
111	G7-Basin South Wall Panel 3	-2.4	-1.9	-1.4	-0.8	-5.0	1.5
112	G7-Basin South Wall Panel 4	-2.4	-1.6	-3.5	-3.2	-1.7	0.0
113	G7-Basin South Wall Panel 5	-0.8	-4.7	-2.9	-3.1	-5.9	-2.2

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
114	G7-Basin South Wall Panel 6	-1.5	-2.6	-0.7	-4.4	-9.3	-0.7
115	G7-Basin North Wall Panel 1	-8.4	-1.1	-0.8	-6.2	-10.4	-2.2
116	G7-Basin North Wall Panel 2	-5.6	-2.8	0.8	-7.1	-20.3	0.0
117	G7-Basin North Wall Panel 3	-2.4	-9.6	-2.3	-7.2	-3.6	5.4
118	G7-Basin North Wall Panel 4	0.0	-1.5	-2.2	-4.8	-9.3	5.3
119	G7-Basin North Wall Panel 5	0.0	-4.4	-2.3	-2.4	-6.3	-0.7
120	G7-Basin North Wall Panel 6	-0.8	1.8	0.8	-1.6	-12.8	-4.9
121	G7-Basin S Buttress 1 Panel 1	-10.2	2.1	0.0	-19.8	-19.2	-1.5
122	G7-Basin S Buttress 2 Panel 1	-7.6	-9.3	-1.4	-11.8	-15.4	-6.3
123	G7-Basin S Buttress 3 Panel 1	-5.7	2.6	-2.7	-13.6	18.0	3.5
124	G7-Basin S Buttress 4 Panel 1	-9.0	-1.5	-2.1	-16.6	-14.5	-0.7
125	G7-Basin S Buttress 5 Panel 1	-2.9	-9.6	0.0	-6.0	4.5	-2.3
126	G7-Basin S Buttress 1 Panel 2	-9.7	0.8	0.0	-36.4	-20.3	-1.4
127	G7-Basin S Buttress 2 Panel 2	-10.9	-8.6	-1.9	-19.0	-14.4	-13.6
128	G7-Basin S Buttress 3 Panel 2	-8.0	4.4	-1.9	-20.1	16.1	2.5
129	G7-Basin S Buttress 4 Panel 2	-14.8	-8.5	-2.6	-22.8	-13.9	0.6
130	G7-Basin S Buttress 5 Panel 2	-7.4	-10.2	1.5	-14.3	5.7	-4.9
131	G7-Basin N Buttress 1 Panel 1	-25.2	-3.9	3.0	-8.1	-14.6	-1.4
132	G7-Basin N Buttress 2 Panel 1	-28.6	-8.7	-4.2	-16.7	-15.2	-2.7
133	G7-Basin N Buttress 3 Panel 1	-13.6	10.4	0.7	-15.6	2.3	11.9
134	G7-Basin N Buttress 4 Panel 1	0.4	2.9	0.0	-28.9	-1.4	-5.5
135	G7-Basin N Buttress 5 Panel 1	-6.0	-1.8	-1.4	-17.2	-4.1	2.7

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
136	G7-Basin N Buttress 1 Panel 2	-15.2	-2.4	3.2	-8.2	-16.0	-4.4
137	G7-Basin N Buttress 2 Panel 2	-9.5	-7.9	-0.8	-11.0	-16.8	0.7
138	G7-Basin N Buttress 3 Panel 2	-12.1	9.3	0.0	-9.9	3.2	9.6
139	G7-Basin N Buttress 4 Panel 2	0.0	2.9	-2.2	-22.0	-2.2	-2.1
140	G7-Basin N Buttress 5 Panel 2	-2.8	-2.5	0.0	-10.1	-4.5	0.0
141	G7-Basin E Buttress 1 Panel 1	-5.1	-10.6	0.0	-3.5	-18.9	-4.1
142	G7-Basin E Buttress 2 Panel 1	-2.0	4.5	1.4	-19.1	-17.8	-7.8
143	G7-Basin E Buttress 1 Panel 2	-3.6	-5.6	0.7	-6.9	-11.8	-5.0
144	G7-Basin E Buttress 2 Panel 2	-2.8	2.4	3.0	-18.1	-10.4	-4.3
145	G7-Basin W Buttress 1 Panel 1	-5.3	1.6	0.0	-16.9	-12.7	-2.2
146	G7-Basin W Buttress 2 Panel 1	-3.3	-8.9	-2.2	-7.9	-17.3	-2.1
147	G7-Basin W Buttress 1 Panel 2	-4.9	4.2	-5.3	-17.6	-18.3	0.0
148	G7-Basin W Buttress 2 Panel 2	-2.1	-10.1	-4.0	-8.6	-24.1	-5.1
149	G7-Basin West Wall Panel 1	-3.3	3.6	2.3	-14.2	-6.9	-3.5
150	G7-Basin West Wall Panel 2	-3.9	2.1	2.2	-6.9	-8.1	-2.0
151	G7-Basin West Wall Panel 3	-5.8	2.9	-0.8	-7.0	-5.8	-1.4
152	G7-Basin East Wall Panel 1	-2.4	7.2	1.5	-5.2	-3.3	-2.1
153	G7-Basin East Wall Panel 2	-1.7	6.6	2.2	-8.9	-2.7	-3.5
154	G7-Basin East Wall Panel 3	-5.2	6.6	1.5	-10.5	-3.3	-4.2
155	G8-Cooling Tower South Panel 1	-1.0	-0.9	3.0	-2.2	-9.2	-4.4
156	G8-Cooling Tower South Panel 2	0.2	-5.2	3.2	-1.1	-7.1	-0.9
157	G8-Cooling Tower South Panel 3	0.7	2.8	8.8	1.1	-5.1	6.3
158	G8-Cooling Tower South Panel 4	0.7	3.0	9.4	1.3	3.6	1.9

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
159	G8-Cooling Tower South Panel 5	0.0	0.9	10.3	0.3	-3.3	-8.0
160	G8-Cooling Tower South Panel 6	0.0	-1.0	5.6	-0.3	-2.6	-9.2
161	G8-Cooling Tower North Panel 1	0.3	-3.5	7.5	-1.2	-10.9	-5.5
162	G8-Cooling Tower North Panel 2	0.3	-6.5	11.1	-2.2	-10.8	-2.6
163	G8-Cooling Tower North Panel 3	0.8	1.2	9.4	-1.1	-5.2	15.0
164	G8-Cooling Tower North Panel 4	0.5	4.3	3.8	-1.4	3.6	9.8
165	G8-Cooling Tower North Panel 5	0.5	0.9	4.9	-2.7	-1.2	-7.6
166	G8-Cooling Tower North Panel 6	-0.3	-1.3	4.5	-4.8	1.5	-6.7
167	G8-Cooling Tower NS Panel 1	-2.1	0.7	2.9	-1.4	-11.4	-1.9
168	G8-Cooling Tower NS Panel 2	1.9	-2.4	2.5	2.1	-6.3	-6.2
169	G8-Cooling Tower NS Panel 3	-0.2	-7.3	10.5	-0.4	-6.0	4.3
170	G8-Cooling Tower NS Panel 4	0.4	4.7	7.9	0.5	-4.5	11.0
171	G8-Cooling Tower NS Panel 5	-1.1	2.8	4.9	-1.2	1.7	-9.8
172	G8-Cooling Tower NS Panel 6	2.2	-6.2	6.3	1.4	25.2	-9.0
173	G8-Cooling Tower NS Panel 7	-0.3	5.5	2.9	-3.6	-4.9	-1.4
174	G9-Cooling Tower South Panel 1	-0.5	0.0	2.9	-1.3	-7.3	-4.3
175	G9-Cooling Tower South Panel 2	0.0	0.3	3.1	-0.3	-6.0	-0.9
176	G9-Cooling Tower South Panel 3	0.0	-0.8	8.4	0.0	-7.3	6.5
177	G9-Cooling Tower South Panel 4	-0.2	-4.0	9.5	0.8	-7.0	2.3
178	G9-Cooling Tower South Panel 5	0.0	-6.1	10.3	1.9	1.6	-7.3
179	G9-Cooling Tower South Panel 6	1.2	-8.1	5.5	0.5	0.3	-8.2
180	G9-Cooling Tower North Panel 1	0.8	-1.9	7.3	-1.3	-12.0	-5.0
181	G9-Cooling Tower North Panel 2	-0.3	-1.5	11.1	-0.8	-5.8	-3.3

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations
Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
182	G9-Cooling Tower North Panel 3	-0.8	-1.9	9.4	-2.2	-8.4	14.6
183	G9-Cooling Tower North Panel 4	-0.8	-2.6	4.0	-1.1	-3.0	8.6
184	G9-Cooling Tower North Panel 5	0.5	-5.2	5.7	-7.7	-0.5	-7.7
185	G9-Cooling Tower North Panel 6	0.0	-7.6	5.1	-2.9	5.0	-7.1
186	G9-Cooling Tower NS Panel 1	-1.3	-4.0	4.2	-2.1	-16.2	-1.8
187	G9-Cooling Tower NS Panel 2	0.7	-4.8	2.4	0.2	-10.0	-6.4
188	G9-Cooling Tower NS Panel 3	-0.6	-3.7	10.5	-0.2	-4.1	5.5
189	G9-Cooling Tower NS Panel 4	-3.0	1.0	8.4	0.2	-6.6	11.7
190	G9-Cooling Tower NS Panel 5	0.2	-1.8	6.1	0.7	-1.1	-10.1
191	G9-Cooling Tower NS Panel 6	1.5	-6.7	7.7	1.2	42.8	-7.2
192	G9-Cooling Tower NS Panel 7	0.9	0.5	2.1	-3.5	-6.9	-2.0
193	G4-Basin Mat Panel 1	-2.5	3.1	-0.8	-3.3	-1.5	-3.6
194	G4-Basin Mat Panel 2	-2.6	0.0	-0.7	-2.6	-0.7	-2.9
195	G4-Basin Mat Panel 3	-2.6	-2.1	0.0	-1.7	-4.9	-1.5
196	G0-PH Mat Panel 1	-3.5	1.7	0.0	-0.9	2.5	0.0
197	G2-PH W Buttress 1 Panel 1	0.0	0.0	-4.7	-4.0	0.8	-3.1
198	G2-PH W Buttress 2 Panel 1	1.7	1.6	-0.8	-1.7	1.6	-5.3
199	G2-PH E Buttress 1 Panel 1	25.4	-3.0	2.4	0.9	0.8	6.3
200	G2-PH E Buttress 2 Panel 1	4.2	-1.5	3.1	0.0	0.8	9.5
201	G3-PH W Buttress 1 Panel 1	-1.5	0.0	-3.9	-8.1	-0.8	-3.1
202	G3-PH W Buttress 2 Panel 1	-8.0	2.3	-2.3	-3.9	-1.5	-6.0
203	G3-PH E Buttress 1 Panel 1	-4.5	-4.9	0.0	-9.7	-0.7	6.3
204	G3-PH E Buttress 2 Panel 1	-6.6	-4.2	0.0	-11.3	-1.5	8.7

Table 03.07.01-29 S1.15: % Difference in Maximum Accelerations Modified Subtraction Method vs. Subtraction Method (Continued)

		% Diff: (Acc_MS - Acc_S)/Acc_S					
		FULL Basin			EMPTY Basin		
		Average Accelerations			Average Accelerations		
Panel No.	Panel Description	X-Dir	Y-Dir	Z-Dir	X-Dir	Y-Dir	Z-Dir
205	G2-PH Int Wall 1 Panel 1	-1.7	1.6	-1.6	-0.9	-0.8	0.0
206	G2-PH Int Wall 2 Panel 1	-1.7	0.8	0.0	-1.8	0.8	0.0
207	G3-PH Int Wall 1 Panel 1	-1.7	1.5	-1.6	-4.2	-1.5	-1.6
208	G3-PH Int Wall 2 Panel 1	-1.7	0.0	-0.8	-7.3	0.0	0.0

Table 03.07.01-29 S1.16: Comparison of Section Cut Forces Modified Subtraction Method vs. Subtraction Method

FULL BASIN CONDITION

Cut #	Cut Location	Direction of Cut	Axial Force		In-plane Shear		Out-of-plane Shear		In-plane Moment		Out-of-plane Moment	
			% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI
55	Cooling Tower NS Wall Panel 3	Vert.	-0.1	259	-5.9	28	-1.8	79	-0.1	235	2.4	59
56	Cooling Tower NS Wall Panel 3	Vert.	0.5	164	-4.3	29	3.7	36	-0.3	140	2.3	150
57	Cooling Tower South Wall Panel 5	Vert.	1.3	2.4	2.9	84	-3.3	43	-1.3	52	1.8	96
58	Basin North Wall Panel 5	Vert.	-0.1	110	-4.5	197	-0.4	188	2	108	-20.5	112
59	Basin North Wall Panel 5	Horiz.	-5.5	74	-7.9	217	-6.2	273	77.6	145	-4	180
60	Basin South Wall Panel 5	Vert.	-2.2	152	-7.8	125	-3	215	-2.8	108	-18.8	103
61	Basin South Wall Panel 5	Horiz.	-1.9	60	-0.5	124	-16	240	59.9	57	-4.1	134
62	Basin North Buttress 4	Vert.	-3.8	171	-0.5	75	-6.6	272	1	47	-4.1	307
63	Basin North Buttress 4	Horiz.	1.2	45	-3.3	95	-12.9	278	1	86	-9.6	379
64	Basin East Buttress 1	Vert.	-8.9	125	1.3	109	-10.9	293	-3.9	175	-9.2	394
65	Basin East Buttress 1	Horiz.	-1.1	26	-2.4	58	-4.1	132	-1.2	20	-5.5	117

**Table 03.07.01-29 S1.16: Comparison of Section Cut Forces
Modified Subtraction Method vs. Subtraction Method (Continued)**

FULL BASIN CONDITION

Cut #	Cut Location	Direction of Cut	Axial Force		In-plane Shear		Out-of-plane Shear		In-plane Moment		Out-of-plane Moment	
			% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI
66	Basin West Wall Panel 2	Vert.	-2.6	174	0.5	147	1.1	224	4.5	101	-1.3	86
67	Basin West Wall Panel 2	Horiz.	6.4	22	3.3	192	-3.4	148	320.6	587	-4.7	113
68	Pump House West Wall Panel 2	Vert.	2.4	525	0.1	61	-8.7	3906	5.3	1681	-4.4	613
69	Pump House West Wall Panel 2	Horiz.	-3.2	74	0.1	49	-1.8	715	0.3	550	0.5	991
70	Pump House South Wall Panel 3	Vert.	10.2	246	-0.9	33	1.5	1375	5.7	165	0.3	2018
71	Pump House South Wall Panel 3	Horiz.	-2.8	56	-1.9	77	2.1	1258	-23.8	592	1.5	660
72	Pump House North Wall Panel 2	Vert.	-7.8	1215	-2.7	116	-13.4	1364	-7.2	642	-7.6	2408
73	Pump House North Wall Panel 2	Horiz.	1.1	229	-5.3	72	-14.9	2556	-20.4	276	3.4	989

Table 03.07.01-29 S1.17: Comparison of Section Cut Forces Modified Subtraction Method vs. Subtraction Method

EMPTY BASIN CONDITION

Cut #	Cut Location	Direction of Cut	Axial Force		In-plane Shear		Out-of-plane Shear		In-plane Moment		Out-of-plane Moment	
			% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI
55	Cooling Tower NS Wall Panel 3	Vert.	-3.1	322	-3.9	27	-4	61	-1.1	264	1.1	42
56	Cooling Tower NS Wall Panel 3	Vert.	5.2	190	-8.5	31	2.6	29	3	151	3.2	146
57	Cooling Tower South Wall Panel 5	Vert.	-4.2	10	0	73	-8.8	35	-3.8	58	-1.7	78
58	Basin North Wall Panel 5	Vert.	-1.1	126	-3.4	252	-12.8	584	2	113	-16.9	207
59	Basin North Wall Panel 5	Horiz.	1.5	85	-12.4	243	-22.2	605	69.6	201	-3	155
60	Basin South Wall Panel 5	Vert.	-2	179	-7.2	145	-13.9	612	-1.4	93	-19.9	158
61	Basin South Wall Panel 5	Horiz.	2.7	65	1.6	105	-24.9	704	49.9	70	-3.3	128
62	Basin North Buttress 4	Vert.	0.1	242	0.2	90	-21.2	133	-5.2	229	-8.6	266
63	Basin North Buttress 4	Horiz.	2.5	69	-5.6	206	-19	246	2.8	90	-13	354
64	Basin East Buttress 1	Vert.	-2.1	158	-1.3	104	-12.4	92	1.8	266	-7.5	261
65	Basin East Buttress 1	Horiz.	0.3	22	-4.5	80	-3.1	87	-0.2	19	-1.8	71

Table 03.07.01-29 S1.17: Comparison of Section Cut Forces Modified Subtraction Method vs. Subtraction Method (Continued)

EMPTY BASIN CONDITION

Cut #	Cut Location	Direction of Cut	Axial Force		In-plane Shear		Out-of-plane Shear		In-plane Moment		Out-of-plane Moment	
			% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI	% Increase MSM vs. SM	% Margin Design vs. SSI
66	Basin West Wall Panel 2	Vert.	-13.1	246	-3	91	-0.2	255	-0.2	113	0.3	85
67	Basin West Wall Panel 2	Horiz.	-0.5	33	1.1	169	-20.1	529	23.4	378	0.2	93
68	Pump House West Wall Panel 2	Vert.	-0.9	598	-0.3	29	1.1	2175	11.2	1456	-9.9	379
69	Pump House West Wall Panel 2	Horiz.	-9	65	0.3	17	-3.3	615	-7.2	490	-0.8	939
70	Pump House South Wall Panel 3	Vert.	-0.8	267	-2.6	46	-3.4	1425	-1.5	147	-6	2173
71	Pump House South Wall Panel 3	Horiz.	-6.8	115	-2.8	109	-4.5	1306	-4.7	578	-0.8	766
72	Pump House North Wall Panel 2	Vert.	-16.1	975	0	175	-15.4	1003	0	604	-1.9	1854
73	Pump House North Wall Panel 2	Horiz.	-11	141	-2.1	99	-28.8	883	-16.9	223	4.2	1207

Table 03.07.01-29 S1.18: Shear and Moment due to SSSI Soil Pressure vs. Design Seismic Soil Pressure for DGFOT West Wall

Location	Result	Sign	Maximum SSSI	Maximum Design	Ratio (Design/SSSI)	Margin
DGFOT West Wall	Moment (kip-ft/ft)	-	7.88	11.62	1.47	47%
		-	7.44	11.73	1.58	58%
		+	3.71	5.84	1.57	57%
	Shear (kip/ft)	+	5.01	7.86	1.57	57%
		-	5.38	7.71	1.43	43%

Table 03.07.01-29 S1.19: Shear and Moment due to SSSI Soil Pressure vs. Design Seismic Soil Pressure for RWB West Wall

Location	Result	Sign	Maximum SSSI	Maximum Design	Ratio (Design/SSSI)	Margin
RWB West Wall	Out-of-plane Shear Force along Z-axis, V13 (kip/ft)	+	25.3	72.9	2.88	188%
		-	25.5	74.7	2.93	193%
	Out-of-plane Shear Force along X-axis, V23 (kip/ft)	+	12	16.5	1.38	38%
		-	10.4	62.1	5.97	497%
	Moment about Z-axis, M11 (kip-ft/ft)	+	69.4	191.8	2.76	176%
		-	134.7	363.1	2.70	170%
	Moment about X-axis, M22 (kip-ft/ft)	+	43.9	103.5	2.36	136%
		-	80.8	341	4.22	322%

Table 03.07.01-29 S1.20: Shear and Moment due to SSSI Soil Pressure vs. Design Seismic Soil Pressure for UHS Basin South Wall

Location	Result	Sign	Maximum SSSI	Maximum Design	Ratio (Design/SSSI)	Margin
UHS South Wall	Out-of-plane Shear Force along Z-axis, V13 (kip/ft)	+	10.4	37.6	3.62	262%
		-	10.4	37.6	3.62	262%
	Out-of-plane Shear Force along X-axis, V23 (kip/ft)	+	4.8	17.2	3.58	258%
		-	11.4	71	6.23	523%
	Moment about Z-axis, M11 (kip-ft/ft)	+	24.6	84.9	3.45	245%
		-	63.7	221	3.47	247%
	Moment about X-axis, M22 (kip-ft/ft)	+	35.9	123.1	3.43	243%
		-	78.6	336.6	4.28	328%

Table 03.07.01-29 S1.21: Summary of Available Margin for Design Dynamic Soil Case versus SSI Soil Cases for the DGFOSV

		Moment about Z-axis (kip-ft)		Moment about X-axis (kip-ft)		Out-of-Plane Shear Force along Z-axis (kip)		Out-of-Plane Shear Force along X-axis (kip)	
		Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
Wall 1	Design Dynamic Soil Case	58.936	-191.442	141.038	-276.809	37.576	-67.679	63.195	-46.606
	SSI Soil without Separation Case	10.78	-34.79	25.47	-58.36	6.98	-9.66	9.9	-12.47
	SSI Soil with Separation Case	13.19	-43.44	35.72	-63.67	9.33	-9.27	5.12	-11.39
	Ratio of Design to SSI without Separation Case	5.467	5.503	5.537	4.743	5.383	7.006	6.383	3.737
	Ratio of Design to SSI with Separation Case	4.468	4.407	3.948	4.348	4.027	7.301	12.343	4.092
	Minimum Margin	**340.7%**		**294.8%**		**302.7%**		**273.7%**	
Wall 2	Design Dynamic Soil Case	168.76	-353.982	55.05	-186.848	48.118	-48.118	10.203	-35.554
	SSI Soil without Separation Case	33.93	-68.42	12.04	-42.45	10.11	-10.11	1.921	-9.41
	SSI Soil with Separation Case	23.46	-55.06	27.8	-50.58	11.77	-11.77	5.38	-9.04
	Ratio of Design to SSI without Separation Case	4.974	5.174	4.572	4.402	4.759	4.759	5.311	3.778
	Ratio of Design to SSI with Separation Case	7.194	6.429	1.980	3.694	4.088	4.088	1.896	3.933
	Minimum Margin	**397.4%**		**98.0%**		**308.8%**		**89.6%**	
Wall 3	Design Dynamic Soil Case	58.936	-191.442	141.038	-276.809	37.576	-67.679	63.195	-46.606
	SSI Soil without Separation Case	10.77	-34.76	25.45	-58.19	6.97	-9.664	9.89	-12.4
	SSI Soil with Separation Case	13.18	-43.42	35.7	-63.66	9.32	-9.27	5.12	-11.39
	Ratio of Design to SSI without Separation Case	5.472	5.508	5.542	4.757	5.391	7.003	6.390	3.759
	Ratio of Design to SSI with Separation Case	4.472	4.409	3.951	4.348	4.032	7.301	12.343	4.092
	Minimum Margin	**340.9%**		**295.1%**		**303.2%**		**275.9%**	
Wall 4	Design Dynamic Soil Case	71.13	-165.369	72.941	-167.661	33.442	-33.442	31.26	-32.891
	SSI Soil without Separation Case	16.36	-38.12	16.63	-42.21	7.77	-7.77	8.42	-8.82
	SSI Soil with Separation Case	21.82	-53.56	30.49	-50.28	11.86	-11.86	6.18	-9.01
	Ratio of Design to SSI without Separation Case	4.348	4.338	4.386	3.972	4.304	4.304	3.713	3.729
	Ratio of Design to SSI with Separation Case	3.260	3.088	2.392	3.335	2.820	2.820	5.058	3.650
	Minimum Margin	**208.8%**		**139.2%**		**182.0%**		**265.0%**	

Table 03.07.01-29 S1.22: Summary of Available Margin for Total Seismic Soil Force

Wall	Location	Applied Total Seismic Soil Force (k/ft)	Total Seismic Soil Force from SSI Analysis (k/ft)	Ratio	Minimum Margin for Total Seismic Soil Force
Pump House East Wall	Grade to Basemat	244.31	52.73	4.63	**223%**
	Grade to Operating Floor	96.98	18.53	5.23	
	Operating Floor to Basemat	147.33	45.58	3.23	
Pump House West Wall	Grade to Basemat	244.31	51.88	4.71	**300%**
	Grade to Operating Floor	96.98	18.21	5.33	
	Operating Floor to Basemat	147.33	36.82	4.00	
Pump House North Wall	Grade to Basemat	395.71	58.97	6.71	**353%**
	Grade to Operating Floor	158.98	23.4	6.79	
	Operating Floor to Basemat	236.73	52.28	4.53	
Pump House South Wall		118.52	27.68	4.28	**328%**
Basin East Wall		112.18	28.92	3.88	**288%**
Basin West Wall		112.18	28.96	3.87	**287%**
Basin North Wall		112.18	23.69	4.74	**374%**
Basin South Wall		112.18	21.74	5.16	**416%**

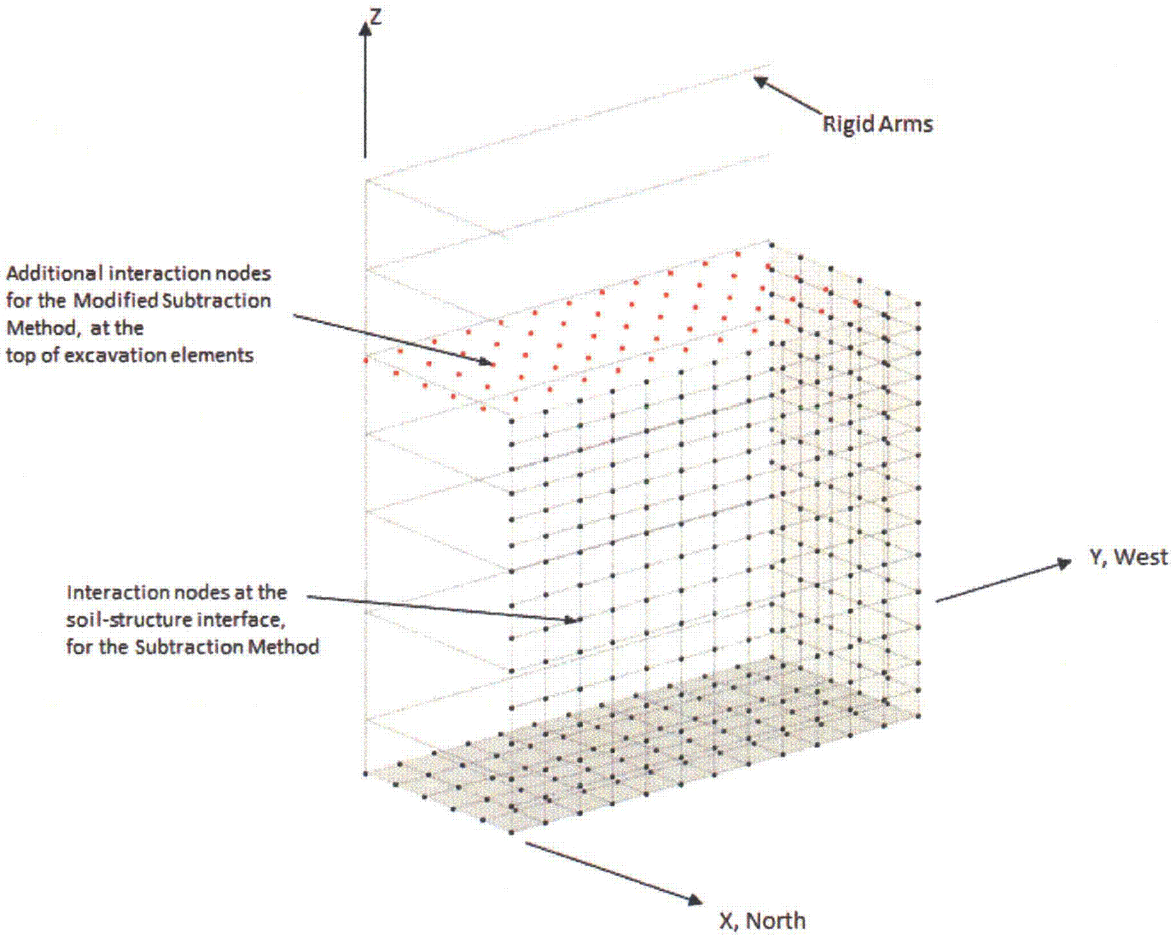

Figure 03.07.01-29 S1.1: Interaction Node for the Modified Subtraction Method