**RAI 03.07.02-24, Supplement 2**

**QUESTION:**

**Follow-up Question to RAI 03.07.02-15 (STP-NRC-100036)**

UHS Basin and RSW Pump House:

1. 10CFR50, Appendix S requires that evaluation for SSE must take into account soil-structure interaction (SSI) effects and the expected duration of vibratory motion. In the response to Item 6 of RAI 03.07.01-15, the applicant has provided a table summarizing the frequencies at which transfer functions are calculated as well as the cut-off frequency used in the SSI analysis for various analysis cases including the lower bound (LB), best estimate (BE) and upper bound (UB) in-situ soil cases; LB, BE and UB backfill soil cases; the cracked concrete and de-bonded soil case. The selected cut-off frequency for the different analysis cases varies from a low of about 16 Hz to a high of 25 Hz. The applicant has stated that the lowest cut-off frequency of 16 Hz meets the ASCE 4-98 Section C3.3.3.4 recommended values.

   With respect to the selected frequency cut-off and frequencies of analysis, the staff needs the following information:

   a) Staff has not endorsed ASCE 4-98 Section C3.3.3.4 as acceptable criteria for selecting the cutoff frequency for the SSI analysis for detailed finite element model such as UHS Basin with cooling tower enclosure and RSW Pump House. The applicant is requested to provide comparisons of in-structure response spectra at some selected locations by increasing the frequency cut-off to a minimum of 33 Hz and using a SSI model capable of transmitting a frequency up to 33 Hz (refer to Follow-up Question to RAI 03.07.02-17) for all analysis cases considered demonstrating that cut-off frequencies used in the SSI analysis are acceptable. The staff needs this information to ensure that the selected cut off frequencies less than 33 Hz in SSI analysis will accurately or conservatively account for the expected frequency content of the SSE in the SSI analysis.

   b) In reviewing the tabulated SSI analysis frequencies, it is observed that some frequencies are excluded from the calculation of un-interpolated transfer functions in certain directions. For example, the frequency 14.16 Hz is not included in the z-response analysis for the mean soil case and 9.521 Hz is not included in the z-response analysis for the upper bound soil case. The applicant is requested to provide the basis for selecting the frequencies of analysis for calculating the un-interpolated transfer functions and excluding any frequencies from such calculations. The staff requires this information to ensure that the SSI analysis results are not adversely affected by any numerical instability that may be caused by large numbers of soil layers used in SASSI to model deep non-uniform soil site at the UHS/RSW Pump House.

RSW Piping Tunnel:

10CFR50, Appendix S requires that evaluation for SSE must take into account soil-structure interaction (SSI) effects and the expected duration of vibratory motion. In order to ensure that evaluation of RSW Piping Tunnel for SSE has appropriately taken into account SSI effects, the staff needs the following information:

1. In the response to Item 1 of RAI 03.07.02-15, the applicant has stated that a 2D SSI analysis of the RSW tunnel has been performed to quantify the in-structure response of the tunnel. No details of this analysis have been provided. As such, the applicant is requested to describe in sufficient detail in the FSAR how the SSI analysis of the RSW tunnel has been performed. The description shall include the SSI methodology, figures showing the SSI model and boundary conditions, summary of the soil and structure properties, the input motion, etc. so the review can be completed.

2. In the response to Item 2 of RAI 03.07.02-15, the applicant has stated that simple manual calculations were used for the analysis and design of individual components of the RSW piping tunnel. For this analysis, the tunnel walls, slabs and base mat are considered as rigid elements, and seismic loads are calculated based on a ZPA of 0.21g. The applicant further states that the analysis did not include any model or soil springs; the seismic loads are applied in terms of dynamic soil pressures on the exterior walls, calculated as per ASCE 4-98 recommendations. Staff has not endorsed ASCE 4-98 recommended dynamic soil pressures for design of tunnel walls. As such, the applicant is requested to provide comparisons of the dynamic soil pressures on the RSW tunnel walls calculated using 2D SSI model versus those of ASCE 4-98 to demonstrate that the design pressures are still bounding when the effects of kinematic interaction between tunnel structures and surrounding soils as well as the effects of structure-soil-structure interaction (SSSI) due to nearby heavy structures are considered.

**SUPPLEMENTAL RESPONSE:**

The response to Ultimate Heat Sink (UHS) Basin/Reactor Service Water (RSW) Pump House Part 1b of this RAI was submitted with STPNOC letter U7-C-STP-NRC-100208, dated September 15, 2010. The response to Parts 1 and 2 of the RSW Piping Tunnel was submitted with STPNOC letter U7-C-STP-NRC-100253, dated November 29, 2010. This supplemental response provides the response to Part 1a of the UHS Basin/RSW Pump House.

***UHS Basin and RSW Pump House (Part 1a):***

The original soil-structure interaction (SSI) analysis of the UHS/RSW Pump House was performed considering full UHS basin. The SSI analysis of the UHS/RSW Pump House has been expanded to also consider empty UHS basin as described below.

Following a Loss of Coolant Accident (LOCA), the UHS/RSW Pump House will need to perform its safety-related cooling function for a period of 30 days without any make-up water.

During this period, the UHS basin water inventory will reduce and the water height within the basin may get as low as 3 ft above the top of UHS basin foundation, which is nearly an empty UHS basin.

In order to assess the impact of reduced UHS basin water inventory on the SSI analysis, the original SSI model was modified by removing the hydrodynamic mass and the SSI analysis was repeated. This SSI analysis was performed for six cases (i.e. in-situ lower bound soil, in-situ mean soil, in-situ upper bound soil, backfill upper bound soil, in-situ mean soil with separation in top 20 feet, and cracked case with in-situ mean soil). The results of this analysis show significant impact on the resulting in-structure response spectra as well as seismic forces. Figures 03.07.02-24.3 through 03.07.02-24.16 provide comparison of resulting response spectra for full and empty UHS basin for selected nodes of the UHS/RSW Pump House. Based on the analysis results for the empty UHS basin, modifications in the existing in-structure response spectra of the UHS/RSW Pump House are warranted.

Based on discussions during the August 4, 2010 NRC public meeting in Rockville, MD., two additional UHS/RSW Pump House SSI analyses have been performed for the upper bound soil profile case (UB soil case) considering both full and empty UHS basin, with a refined model which has the following passing frequency capability (passing frequency, $f = V_s / 5\ h$, where $V_s$ is the shear wave velocity of the soil layer and h is the vertical or horizontal distance between the adjacent interaction nodes). :

Vertical direction: 40.4 Hz
Horizontal direction: 23.5 Hz

The original SSI model and the refined SSI model are shown in Figures 03.07.02-24.1 and 03.07.02-24.2, respectively. A cut-off frequency of 33 Hz was used in these analyses for transfer function calculation. For soil layers below groundwater level, the Poisson's ratio was capped at 0.495 for determining the compression wave velocity. In the original model the Poisson's ratio was capped at 0.48.

The mesh refinement needed to meet the passing frequency requirement made the model so large that it exceeded the capability of the SASSI2000, Version 3, which has been used in all the SSI analyses. To analyze this larger model, the SASSI2000 Version 3 was modified to allow handling of larger file sizes and to reduce the run time by using a more efficient solver. The modified SASSI2000 program has been verified and validated for analyzing this specific case.

The passing frequency of about 24 Hz was selected since the site has a deep soil profile; the SSI frequencies are below 6 Hz. Also, as noted in Standard Review Plan Section 3.7.1, Revision 3, Appendix A, the energy content of earthquake motions above 24 Hz is inconsequential.

To further assess the adequacy of the passing frequency of 23.5 Hz, the refined SSI model for the full basin case was also analyzed with a cut-off frequency of 23.5 Hz, instead of 33 Hz. The un-widened 5% damped in-structure response spectra from this analysis are compared with the refined SSI analysis where 33 HZ cut-off frequency was used. Figures 03.07.02-24.17 through

03.07.02-24.36 show this comparison for the Y (as representative of the horizontal) and Z (vertical) directions. Also shown on these figures are the corresponding spectra from the original SSI analysis which had a passing frequency capability of 15.6 Hz and a cutoff frequency of 25.4 Hz. The comparison of the spectra shows that:

- Comparison of the spectra from the original SSI analysis which had passing frequency of 15.6 Hz with the refined model SSI analysis with 23.5 Hz passing frequency shows that the responses in the original model were adequately captured for frequencies significantly beyond 15.6 Hz.

- Note that the increase in the spectra from refined SSI analysis at the four locations discussed in the following section is mainly due to the structural mesh refinement rather than the SSI model refinement for passing frequency.

Based on the above, passing frequency of 23.5 Hz is adequate.

**Impact of Refined SSI analysis on In-Structure Response Spectra:**

To assess the effect of refined model on the resulting in-structure response spectra, the resulting un-widened 5% damping response spectra for the UB soil case from the refined SSI model, for both the full and empty UHS basin cases, are compared to the corresponding spectra from the original SSI model at key locations of the structure (i.e. Pump House walls, Pump House Operating Floor, Pump House roof, UHS Basin Walls, and UHS Cooling Tower walls). Note that these locations include locations for comparison of results for structural mesh sensitivity discussed in the response to RAI 03.07.02-25 which is being submitted concurrently with this response. The following summary is based on the examination of these spectra comparison plots shown in Figures 03.07.02-24.37 through 03.07.02-24.87 for the full UHS basin and Figures 03.07.02-24.88 through 03.07.02-24.138 for the empty UHS basin:

There is good agreement between the spectra from the refined and the original SSI models in all three X, Y, and Z directions, with the exception of the following cases where the spectra from the refined model are significantly higher than the respective spectra from the original SSI model:

- Vertical direction spectra at the center of the Pump House Roof (see Figures 03.07.02-24.48 and 03.07.02-24.99)
- Vertical direction spectra at the center of the Pump House Operating Floor (see Figure 03.07.02-24.54)
- Vertical direction spectra of the Cooling Tower Walls (see Figures 03.07.02-24.69 and 03.07.02-24.120)
- Out-of-plane horizontal spectra of the UHS Basin Walls (see Figures 03.07.02-24.65 and 03.07.02-24.116)

There are small differences in some other locations also, but those differences are within an acceptable range of uncertainty in seismic analysis and at locations not critical to design of subsystems.

Based on the above, modifications are warranted for the existing UHS/RSW Pump House response spectra for the above 4 cases.

Additionally, in RAI 03.07.02-25, the NRC requested that a structural mesh sensitivity study be performed. The details of this mesh sensitivity study are provided in the response to RAI 03.07.02-25, which is being submitted concurrently with this response. Based on the results of this structural mesh sensitivity study, the following was concluded:

There was good agreement between the in-structure response spectra and maximum accelerations generated from the original SSI model and refined structural model in all three X, Y, and Z directions with the exception of the following cases:

- Vertical direction spectra at the center of the Pump House Roof
- Vertical direction spectra at the center of the Pump House Operating Floor
- Vertical direction spectra of the Cooling Tower Walls
- Out-of-plane horizontal spectra of the Basin Walls

As can be seen from the conclusions for the refined SSI analysis and the mesh sensitivity study, the cases from the refined SSI analysis requiring modifications in the existing in-structure response spectra match those from the mesh sensitivity study.

**Impact of Refined SSI analysis on Maximum Accelerations:**

Tables 03.07.02-24.1 and 03.07.02-24.2 show the comparison between the maximum accelerations from the original and refined SSI analyses for the full and empty UHS basin cases, respectively. These comparisons are also shown in the contour plots provided in Figures 03.07.02-24.140 through 03.07.02-24.145.

Design of UHS/RSW Pump House envelopes the maximum accelerations from the original and refined SSI analyses for both full and empty UHS basin cases. For further details, see Supplement 1 response to RAI 03.08.04-30 currently scheduled to be submitted in January 2011.

**Resolution of Items Observed in Various Sensitivity Analyses**

Based on the results presented above, modifications in the existing in-structure response spectra are required to address the 1) local increases in response spectra due to structural mesh refinement and the SSI model refinement, and 2) the impact of the empty basin. The following process is used to conservatively account for these effects:

Step 1: Based on the envelope of the ratios of the in-structure response spectra comparisons from the structural mesh sensitivity study described in the response to RAI 03.07.02-25, and spectra comparisons from the SSI model refinement described in this response for both empty and full basin, determine the envelope modification factors for the following in-structure response spectra:

- Vertical response spectra at the center of Pump House Roof
- Vertical response spectra at the center of Pump House Operating Floor
- Vertical response spectra for Cooling Tower Walls
- Out-of-plane response spectra for the Basin Walls

The resulting modification factors for the above response spectra are shown in Table 03.07.02-24.3.

Step 2: Adjust the applicable spectra in the four locations listed above by multiplying them with the modification factors determined in Step 1 above. This step is performed for results from each of the eight analysis cases for the full basin and each of the six analysis cases for the empty basin using the original SSI mesh.

Step 3: For all locations and all x, y, and z directions, determine the envelope un-widened response spectra from all the eight cases of the full basin SSI analysis using the original SSI mesh and the upper bound refined SSI mesh full basin analysis.

Step 4: For all locations and all x, y, and z directions, determine the envelope un-widened response spectra from all the six cases of the empty basin SSI analysis using the original SSI mesh and the upper bound refined SSI mesh empty basin analysis.

Step 5: For all locations and all x, y, and z directions, determine the envelope of spectra from steps 3 and 4 above.

Step 6: Increase the results of Step 5 to include interpolation between the results of Step 3 and Step 4 to account for a potential frequency shift observed between the empty or full basin cases. The result is a single envelope data set which envelopes the empty and full basin analysis sets and includes the interpolated values between the empty and full basin envelopes. The results of this step are visible in the "C" regions of Figures 03.07.02-24.139a and 03.07.02-24.139b.

Step 7: Widen the spectra produced in Step 6 by ± 15% on frequency scale. The results of this step are seen in the "A" and "D" regions of Figures 03.07.02-24.139a and 03.07.02-24.139b.

Step 8: To produce the final in-structure response spectra for UHS/RSW Pump House, fill in all valleys of the spectra obtained in Step 7 to remove local minima. The results of step 8 are seen in the "B" regions of Figures 03.07.02-24.139a and 03.07.02-24.139b.

The revised in-structure response spectra per the above criteria are shown in the revised COLA Part 2, Tier 2 Figures 3H.6-16 through 3H.6-39 (see Enclosure 1).

**In-Structure Response Spectra Generation for Site-specific Seismic Category I structures**

In-structure response spectra for all site-specific seismic category I structures are determined based on SSI analysis, using the Operating Basis Earthquake level structural damping values as given in Regulatory Guide 1.61, except for cracked concrete cases where SSE level structural damping is used.

**Table 03.07.02-24.1: Peak Nodal Accelerations in Refined Mesh Model from Full Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) Upper Bound Soil | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| Bottom of PH walls | | | | | | | | | | | | |
| | 663 | 1163 | 2495 | 0.115 | 0.118 | 0.128 | 0.113 | 0.118 | 0.129 | 1.6% | 0.1% | -0.5% |
| | 843 | 1527 | 3279 | 0.113 | 0.117 | 0.133 | 0.114 | 0.117 | 0.126 | -1.3% | 0.1% | 6.1% |
| | 860 | 1561 | 3328 | 0.113 | 0.117 | 0.135 | 0.115 | 0.120 | 0.137 | -1.9% | -2.0% | -1.5% |
| | 680 | 1197 | 2544 | 0.113 | 0.118 | 0.130 | 0.112 | 0.123 | 0.126 | 1.0% | -4.4% | 3.2% |
| Mid-level of PH walls | | | | | | | | | | | | |
| | 11920 | 14995 | 31429 | 0.139 | 0.130 | 0.133 | 0.137 | 0.128 | 0.130 | 2.0% | 1.9% | 2.9% |
| | 11863 | 15101 | 31606 | 0.114 | 0.161 | 0.125 | 0.113 | 0.151 | 0.127 | 1.0% | 6.3% | -1.5% |
| | 11823 | 15015 | 31456 | 0.128 | 0.135 | 0.137 | 0.135 | 0.141 | 0.130 | -4.9% | -4.1% | 5.4% |
| | 11766 | 14851 | 31140 | 0.116 | 0.140 | 0.120 | 0.114 | 0.143 | 0.120 | 1.8% | -2.3% | 0.0% |
| PH roof | | | | | | | | | | | | |
| | 5511 | 16429 | 34070 | 0.118 | 0.134 | 0.132 | 0.119 | 0.134 | 0.129 | -0.6% | -0.3% | 2.1% |
| | 5690 | 16608 | 34537 | 0.118 | 0.136 | 0.133 | 0.116 | 0.130 | 0.135 | 2.0% | 5.0% | -1.1% |
| | 5707 | 16625 | 34562 | 0.118 | 0.143 | 0.136 | 0.113 | 0.145 | 0.136 | 3.6% | -0.9% | 0.0% |
| | 5528 | 16446 | 34095 | 0.118 | 0.146 | 0.132 | 0.120 | 0.149 | 0.131 | -1.5% | -1.9% | 0.8% |
| | 5626 | 16544 | 34368 | 0.116 | 0.137 | 0.375 | 0.112 | 0.137 | 0.304 | 3.7% | 0.1% | 23.5% |
| | 5621 | 16539 | 34360 | 0.119 | 0.137 | 0.318 | 0.115 | 0.132 | 0.280 | 3.1% | 3.7% | 13.3% |
| | 5632 | 16550 | 34376 | 0.117 | 0.139 | 0.353 | 0.115 | 0.147 | 0.279 | 1.6% | -5.9% | 26.8% |
| Bottom of UHS basin walls | | | | | | | | | | | | |
| | 3397 | 8546 | 18334 | 0.122 | 0.133 | 0.138 | 0.125 | 0.130 | 0.125 | -2.7% | 2.7% | 10.2% |
| | 3989 | 9753 | 20945 | 0.116 | 0.129 | 0.130 | 0.115 | 0.128 | 0.130 | 1.2% | 0.8% | 0.4% |
| | 4023 | 9821 | 21044 | 0.115 | 0.139 | 0.132 | 0.119 | 0.140 | 0.133 | -2.8% | -0.5% | -0.7% |

**Table 03.07.02-24.1: Peak Nodal Accelerations in Refined Mesh Model from Full Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) Upper Bound Soil | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | 3431 | 8614 | 18384 | 0.117 | 0.139 | 0.130 | 0.119 | 0.142 | 0.131 | -1.8% | -1.7% | -0.4% |
| Mid-level of UHS basin walls | | | | | | | | | | | | |
| | 5778 | 16815 | 34846 | 0.236 | 0.135 | 0.132 | 0.244 | 0.137 | 0.129 | -3.4% | -1.1% | 1.7% |
| | 5832 | 16869 | 34930 | 0.121 | 0.164 | 0.133 | 0.119 | 0.153 | 0.132 | 1.3% | 7.0% | 0.4% |
| | 5779 | 16816 | 34847 | 0.252 | 0.144 | 0.131 | 0.262 | 0.144 | 0.129 | -3.8% | -0.3% | 1.5% |
| | 5728 | 16765 | 34769 | 0.118 | 0.218 | 0.141 | 0.123 | 0.201 | 0.141 | -4.2% | 8.3% | -0.1% |
| Top of UHS basin walls | | | | | | | | | | | | |
| | 6180 | 17263 | 35484 | 0.128 | 0.144 | 0.138 | 0.129 | 0.141 | 0.128 | -0.6% | 2.3% | 8.1% |
| | 6410 | 17493 | 35780 | 0.124 | 0.143 | 0.134 | 0.129 | 0.139 | 0.130 | -3.4% | 2.9% | 3.1% |
| | 6444 | 17527 | 35830 | 0.133 | 0.151 | 0.134 | 0.126 | 0.156 | 0.135 | 5.1% | -2.8% | -0.9% |
| | 6214 | 17297 | 35534 | 0.129 | 0.150 | 0.131 | 0.136 | 0.155 | 0.135 | -5.5% | -3.2% | -2.3% |
| Bottom of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 6258 | 17341 | 35584 | 0.317 | 0.143 | 0.142 | 0.310 | 0.140 | 0.136 | 2.3% | 2.2% | 4.3% |
| | 6330 | 17413 | 35682 | 0.320 | 0.144 | 0.143 | 0.310 | 0.139 | 0.138 | 3.2% | 3.6% | 3.9% |
| | 6336 | 17419 | 35690 | 0.386 | 0.226 | 0.200 | 0.379 | 0.231 | 0.186 | 1.9% | -2.1% | 7.9% |
| | 6264 | 17347 | 35592 | 0.391 | 0.255 | 0.204 | 0.385 | 0.252 | 0.185 | 1.5% | 1.3% | 10.4% |
| | | | | | | | | | | | | |
| cell 3 | 6270 | 17353 | 35600 | 0.406 | 0.274 | 0.233 | 0.406 | 0.281 | 0.210 | 0.2% | -2.2% | 10.9% |
| | 6342 | 17425 | 35698 | 0.394 | 0.240 | 0.224 | 0.383 | 0.259 | 0.207 | 3.0% | -7.6% | 8.1% |
| | 6348 | 17431 | 35706 | 0.401 | 0.271 | 0.231 | 0.391 | 0.245 | 0.220 | 2.6% | 10.4% | 4.8% |
| | 6276 | 17359 | 35608 | 0.413 | 0.307 | 0.228 | 0.413 | 0.279 | 0.202 | 0.1% | 10.2% | 13.1% |
| | | | | | | | | | | | | |
| cell 6 | 6288 | 17371 | 35624 | 0.386 | 0.342 | 0.183 | 0.390 | 0.342 | 0.172 | -1.0% | -0.1% | 6.1% |
| | 6360 | 17443 | 35722 | 0.383 | 0.343 | 0.179 | 0.372 | 0.334 | 0.164 | 3.0% | 2.7% | 9.0% |

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| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) Upper Bound Soil | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | 6366 | 17449 | 35730 | 0.323 | 0.148 | 0.139 | 0.303 | 0.153 | 0.135 | 6.7% | -3.3% | 2.6% |
| | 6294 | 17377 | 35632 | 0.311 | 0.148 | 0.141 | 0.306 | 0.152 | 0.139 | 1.6% | -2.5% | 1.4% |
| Mid-level of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 6823 | 17956 | 36372 | 0.436 | 0.164 | 0.142 | 0.419 | 0.159 | 0.136 | 4.2% | 3.4% | 4.3% |
| | 6847 | 17980 | 36404 | 0.389 | 0.261 | 0.183 | 0.385 | 0.256 | 0.173 | 1.2% | 2.1% | 6.0% |
| | 6824 | 17957 | 36373 | 0.516 | 0.252 | 0.216 | 0.491 | 0.267 | 0.209 | 5.2% | -5.4% | 3.7% |
| | 6775 | 17908 | 36306 | 0.401 | 0.257 | 0.180 | 0.396 | 0.258 | 0.164 | 1.2% | -0.2% | 10.3% |
| | | | | | | | | | | | | |
| cell 3 | 6825 | 17958 | 36374 | 0.533 | 0.278 | 0.260 | 0.609 | 0.297 | 0.228 | -12.6% | -6.6% | 13.9% |
| | 6859 | 17992 | 36420 | 0.398 | 0.391 | 0.261 | 0.391 | 0.383 | 0.241 | 1.6% | 2.3% | 8.0% |
| | 6826 | 17959 | 36375 | 0.512 | 0.292 | 0.230 | 0.496 | 0.285 | 0.208 | 3.4% | 2.7% | 10.6% |
| | 6787 | 17920 | 36322 | 0.406 | 0.385 | 0.260 | 0.407 | 0.369 | 0.234 | -0.2% | 4.5% | 11.1% |
| | | | | | | | | | | | | |
| cell 6 | 6828 | 17961 | 36377 | 0.507 | 0.377 | 0.184 | 0.498 | 0.361 | 0.172 | 1.7% | 4.3% | 7.5% |
| | 6877 | 18010 | 36444 | 0.394 | 0.358 | 0.155 | 0.389 | 0.357 | 0.155 | 1.2% | 0.3% | 0.0% |
| | 6829 | 17962 | 36378 | 0.429 | 0.169 | 0.138 | 0.431 | 0.174 | 0.139 | -0.6% | -2.6% | -0.9% |
| | 6805 | 17938 | 36346 | 0.393 | 0.338 | 0.169 | 0.396 | 0.353 | 0.155 | -0.6% | -4.2% | 9.4% |
| Top of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 7208 | 18341 | 36890 | 0.444 | 0.185 | 0.159 | 0.440 | 0.183 | 0.148 | 0.8% | 1.0% | 7.3% |
| | 7280 | 18413 | 36988 | 0.421 | 0.183 | 0.157 | 0.416 | 0.182 | 0.149 | 1.2% | 0.3% | 5.4% |
| | 7286 | 18419 | 36996 | 0.399 | 0.305 | 0.226 | 0.394 | 0.296 | 0.208 | 1.2% | 3.2% | 8.9% |
| | 7214 | 18347 | 36898 | 0.419 | 0.306 | 0.227 | 0.416 | 0.303 | 0.209 | 0.7% | 1.0% | 8.6% |
| | | | | | | | | | | | | |
| cell 3 | 7220 | 18353 | 36906 | 0.406 | 0.333 | 0.271 | 0.404 | 0.336 | 0.244 | 0.6% | -0.8% | 11.1% |

**Table 03.07.02-24.1: Peak Nodal Accelerations in Refined Mesh Model from Full Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) Upper Bound Soil | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | 7292 | 18425 | 37004 | 0.396 | 0.335 | 0.262 | 0.397 | 0.336 | 0.239 | -0.3% | -0.2% | 9.8% |
| | 7298 | 18431 | 37012 | 0.398 | 0.330 | 0.267 | 0.389 | 0.330 | 0.249 | 2.3% | 0.1% | 7.2% |
| | 7226 | 18359 | 36914 | 0.397 | 0.333 | 0.259 | 0.399 | 0.328 | 0.236 | -0.6% | 1.6% | 9.9% |
| | | | | | | | | | | | | |
| cell 6 | 7238 | 18371 | 36930 | 0.415 | 0.425 | 0.204 | 0.419 | 0.405 | 0.196 | -1.0% | 4.9% | 4.3% |
| | 7310 | 18443 | 37028 | 0.414 | 0.422 | 0.204 | 0.406 | 0.406 | 0.181 | 1.8% | 3.8% | 12.8% |
| | 7316 | 18449 | 37036 | 0.446 | 0.188 | 0.147 | 0.431 | 0.203 | 0.142 | 3.4% | -7.4% | 3.9% |
| | 7244 | 18377 | 36938 | 0.447 | 0.190 | 0.152 | 0.433 | 0.201 | 0.148 | 3.3% | -5.7% | 2.9% |
| PH operating floor | | | | | | | | | | | | |
| | 3989 | 9753 | 20945 | 0.116 | 0.129 | 0.130 | 0.115 | 0.128 | 0.130 | 1.2% | 0.8% | 0.4% |
| | 4188 | 10155 | 21899 | 0.115 | 0.128 | 0.135 | 0.112 | 0.124 | 0.128 | 2.6% | 3.7% | 5.6% |
| | 4205 | 10189 | 21948 | 0.114 | 0.131 | 0.134 | 0.122 | 0.135 | 0.135 | -6.2% | -3.2% | -0.9% |
| | 4006 | 9787 | 20994 | 0.114 | 0.135 | 0.130 | 0.111 | 0.138 | 0.133 | 2.4% | -2.3% | -2.0% |
| | 4119 | 10015 | 21594 | 0.116 | 0.130 | 0.440 | 0.115 | 0.129 | 0.377 | 0.3% | 0.8% | 16.6% |
| | 4124 | 10025 | 21610 | 0.113 | 0.133 | 0.494 | 0.113 | 0.133 | 0.465 | -0.5% | 0.6% | 6.2% |
| | 4130 | 10037 | 21626 | 0.117 | 0.133 | 0.488 | 0.118 | 0.132 | 0.443 | -1.1% | 0.4% | 10.1% |

**Table 03.07.02-24.2: Peak Nodal Accelerations in Refined Mesh Model from Empty Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| Bottom of PH walls | | | | | | | | | | | | |
| | 663 | 1163 | 2495 | 0.113 | 0.127 | 0.124 | 0.110 | 0.117 | 0.131 | 2.5% | 9.0% | -5.2% |
| | 843 | 1527 | 3279 | 0.113 | 0.127 | 0.132 | 0.109 | 0.117 | 0.126 | 3.7% | 8.4% | 4.7% |
| | 860 | 1561 | 3328 | 0.115 | 0.119 | 0.136 | 0.110 | 0.121 | 0.129 | 4.6% | -1.7% | 5.6% |
| | 680 | 1197 | 2544 | 0.111 | 0.118 | 0.126 | 0.108 | 0.122 | 0.122 | 3.2% | -3.6% | 3.5% |
| Mid-level of PH walls | | | | | | | | | | | | |
| | 1192 0 | 14995 | 31429 | 0.140 | 0.138 | 0.130 | 0.132 | 0.132 | 0.131 | 5.8% | 4.5% | -0.6% |
| | 1186 3 | 15101 | 31606 | 0.113 | 0.169 | 0.124 | 0.115 | 0.167 | 0.126 | -2.1% | 1.3% | -2.1% |
| | 1182 3 | 15015 | 31456 | 0.151 | 0.131 | 0.135 | 0.142 | 0.135 | 0.125 | 6.2% | -2.6% | 8.3% |
| | 1176 6 | 14851 | 31140 | 0.117 | 0.138 | 0.127 | 0.115 | 0.135 | 0.125 | 2.0% | 2.7% | 0.9% |
| PH roof | | | | | | | | | | | | |
| | 5511 | 16429 | 34070 | 0.122 | 0.139 | 0.145 | 0.118 | 0.136 | 0.143 | 3.7% | 2.4% | 1.4% |
| | 5690 | 16608 | 34537 | 0.117 | 0.142 | 0.139 | 0.117 | 0.136 | 0.137 | 0.1% | 4.5% | 1.2% |
| | 5707 | 16625 | 34562 | 0.124 | 0.141 | 0.142 | 0.122 | 0.142 | 0.136 | 2.0% | -0.9% | 4.9% |
| | 5528 | 16446 | 34095 | 0.122 | 0.140 | 0.136 | 0.117 | 0.138 | 0.126 | 4.0% | 1.1% | 7.5% |
| | 5626 | 16544 | 34368 | 0.116 | 0.141 | 0.369 | 0.119 | 0.137 | 0.319 | -2.5% | 3.1% | 15.8% |

**Table 03.07.02-24.2: Peak Nodal Accelerations in Refined Mesh Model from Empty Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | 5621 | 16539 | 34360 | 0.115 | 0.139 | 0.395 | 0.116 | 0.137 | 0.318 | -0.9% | 1.3% | 24.4% |
| | 5632 | 16550 | 34376 | 0.118 | 0.137 | 0.416 | 0.120 | 0.141 | 0.321 | -2.2% | -2.8% | 29.6% |
| Bottom of UHS basin walls | | | | | | | | | | | | |
| | 3397 | 8546 | 18334 | 0.122 | 0.137 | 0.131 | 0.121 | 0.136 | 0.131 | 0.4% | 0.9% | -0.3% |
| | 3989 | 9753 | 20945 | 0.118 | 0.132 | 0.134 | 0.111 | 0.131 | 0.139 | 6.4% | 0.9% | -3.7% |
| | 4023 | 9821 | 21044 | 0.122 | 0.141 | 0.136 | 0.120 | 0.140 | 0.141 | 1.7% | 0.8% | -3.3% |
| | 3431 | 8614 | 18384 | 0.121 | 0.138 | 0.132 | 0.119 | 0.139 | 0.134 | 1.5% | -1.0% | -1.9% |
| Mid-level of UHS basin walls | | | | | | | | | | | | |
| | 5778 | 16815 | 34846 | 0.230 | 0.146 | 0.144 | 0.238 | 0.146 | 0.141 | -3.1% | 0.0% | 2.2% |
| | 5832 | 16869 | 34930 | 0.115 | 0.162 | 0.136 | 0.120 | 0.151 | 0.128 | -4.0% | 7.8% | 5.9% |
| | 5779 | 16816 | 34847 | 0.243 | 0.137 | 0.140 | 0.223 | 0.137 | 0.138 | 8.9% | -0.3% | 1.2% |
| | 5728 | 16765 | 34769 | 0.117 | 0.199 | 0.144 | 0.119 | 0.179 | 0.134 | -2.4% | 10.7% | 7.6% |
| Top of UHS basin walls | | | | | | | | | | | | |
| | 6180 | 17263 | 35484 | 0.134 | 0.156 | 0.142 | 0.132 | 0.162 | 0.137 | 1.1% | -3.5% | 3.8% |
| | 6410 | 17493 | 35780 | 0.128 | 0.159 | 0.157 | 0.130 | 0.153 | 0.146 | -1.6% | 4.0% | 7.6% |
| | 6444 | 17527 | 35830 | 0.135 | 0.154 | 0.140 | 0.132 | 0.152 | 0.146 | 2.7% | 1.1% | -4.2% |
| | 6214 | 17297 | 35534 | 0.135 | 0.158 | 0.142 | 0.137 | 0.155 | 0.139 | -0.9% | 1.7% | 2.1% |
| Bottom of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 6258 | 17341 | 35584 | 0.313 | 0.154 | 0.153 | 0.319 | 0.160 | 0.143 | -2.1% | -4.0% | 7.4% |
| | 6330 | 17413 | 35682 | 0.295 | 0.154 | 0.162 | 0.299 | 0.158 | 0.157 | -1.1% | -2.9% | 3.1% |
| | 6336 | 17419 | 35690 | 0.359 | 0.202 | 0.224 | 0.355 | 0.208 | 0.207 | 1.0% | -3.1% | 8.1% |
| | 6264 | 17347 | 35592 | 0.372 | 0.227 | 0.189 | 0.370 | 0.218 | 0.187 | 0.4% | 3.9% | 1.0% |

**Table 03.07.02-24.2: Peak Nodal Accelerations in Refined Mesh Model from Empty Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | | | | | | | | | | | | |
| cell 3 | 6270 | 17353 | 35600 | 0.376 | 0.256 | 0.249 | 0.378 | 0.252 | 0.217 | -0.4% | 1.5% | 15.1% |
| | 6342 | 17425 | 35698 | 0.375 | 0.225 | 0.248 | 0.366 | 0.248 | 0.214 | 2.4% | -9.4% | 15.7% |
| | 6348 | 17431 | 35706 | 0.368 | 0.251 | 0.278 | 0.362 | 0.231 | 0.240 | 1.7% | 8.8% | 15.8% |
| | 6276 | 17359 | 35608 | 0.377 | 0.257 | 0.282 | 0.373 | 0.251 | 0.253 | 1.1% | 2.5% | 11.4% |
| | | | | | | | | | | | | |
| cell 6 | 6288 | 17371 | 35624 | 0.359 | 0.298 | 0.176 | 0.364 | 0.300 | 0.187 | -1.4% | -0.6% | -6.0% |
| | 6360 | 17443 | 35722 | 0.363 | 0.305 | 0.176 | 0.358 | 0.300 | 0.190 | 1.5% | 1.8% | -7.1% |
| | 6366 | 17449 | 35730 | 0.322 | 0.151 | 0.152 | 0.314 | 0.151 | 0.143 | 2.6% | 0.3% | 6.4% |
| | 6294 | 17377 | 35632 | 0.301 | 0.153 | 0.149 | 0.297 | 0.153 | 0.139 | 1.4% | 0.3% | 7.5% |
| Mid-level of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 6823 | 17956 | 36372 | 0.418 | 0.168 | 0.166 | 0.396 | 0.187 | 0.160 | 5.5% | -9.9% | 4.0% |
| | 6847 | 17980 | 36404 | 0.360 | 0.245 | 0.204 | 0.352 | 0.266 | 0.197 | 2.2% | -8.0% | 3.3% |
| | 6824 | 17957 | 36373 | 0.500 | 0.235 | 0.225 | 0.480 | 0.229 | 0.211 | 4.2% | 2.5% | 6.7% |
| | 6775 | 17908 | 36306 | 0.375 | 0.266 | 0.189 | 0.374 | 0.245 | 0.181 | 0.2% | 8.8% | 4.5% |
| | | | | | | | | | | | | |
| cell 3 | 6825 | 17958 | 36374 | 0.486 | 0.255 | 0.269 | 0.528 | 0.275 | 0.231 | -8.0% | -7.4% | 16.4% |
| | 6859 | 17992 | 36420 | 0.362 | 0.364 | 0.284 | 0.362 | 0.340 | 0.253 | -0.1% | 7.2% | 12.0% |
| | 6826 | 17959 | 36375 | 0.469 | 0.281 | 0.292 | 0.436 | 0.281 | 0.253 | 7.6% | 0.1% | 15.2% |

**Table 03.07.02-24.2: Peak Nodal Accelerations in Refined Mesh Model from Empty Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| | 6787 | 17920 | 36322 | 0.373 | 0.360 | 0.301 | 0.372 | 0.328 | 0.254 | 0.3% | 9.8% | 18.7% |
| | | | | | | | | | | | | |
| cell 6 | 6828 | 17961 | 36377 | 0.484 | 0.334 | 0.186 | 0.478 | 0.322 | 0.198 | 1.2% | 3.9% | -5.8% |
| | 6877 | 18010 | 36444 | 0.366 | 0.335 | 0.175 | 0.363 | 0.320 | 0.177 | 0.8% | 4.9% | -1.4% |
| | 6829 | 17962 | 36378 | 0.413 | 0.174 | 0.147 | 0.414 | 0.173 | 0.145 | -0.3% | 1.0% | 1.6% |
| | 6805 | 17938 | 36346 | 0.378 | 0.336 | 0.172 | 0.365 | 0.318 | 0.178 | 3.4% | 5.9% | -3.8% |
| Top of cooling tower walls | | | | | | | | | | | | |
| cell 1 | 7208 | 18341 | 36890 | 0.415 | 0.188 | 0.171 | 0.409 | 0.224 | 0.154 | 1.6% | -15.9% | 10.9% |
| | 7280 | 18413 | 36988 | 0.395 | 0.192 | 0.187 | 0.389 | 0.222 | 0.176 | 1.7% | -13.4% | 6.1% |
| | 7286 | 18419 | 36996 | 0.372 | 0.272 | 0.252 | 0.368 | 0.262 | 0.228 | 1.2% | 4.0% | 10.6% |
| | 7214 | 18347 | 36898 | 0.387 | 0.276 | 0.224 | 0.390 | 0.256 | 0.219 | -0.7% | 7.9% | 2.1% |
| | | | | | | | | | | | | |
| cell 3 | 7220 | 18353 | 36906 | 0.375 | 0.289 | 0.283 | 0.376 | 0.298 | 0.242 | -0.2% | -2.8% | 16.7% |
| | 7292 | 18425 | 37004 | 0.360 | 0.290 | 0.280 | 0.357 | 0.297 | 0.245 | 1.0% | -2.2% | 14.2% |
| | 7298 | 18431 | 37012 | 0.366 | 0.319 | 0.287 | 0.364 | 0.312 | 0.262 | 0.6% | 2.2% | 9.3% |
| | 7226 | 18359 | 36914 | 0.370 | 0.320 | 0.298 | 0.371 | 0.314 | 0.274 | -0.4% | 2.1% | 8.6% |
| | | | | | | | | | | | | |
| cell 6 | 7238 | 18371 | 36930 | 0.385 | 0.373 | 0.206 | 0.385 | 0.356 | 0.210 | -0.1% | 4.6% | -1.8% |
| | 7310 | 18443 | 37028 | 0.382 | 0.369 | 0.199 | 0.378 | 0.357 | 0.221 | 1.1% | 3.4% | -10.1% |
| | 7316 | 18449 | 37036 | 0.402 | 0.212 | 0.173 | 0.413 | 0.199 | 0.157 | -2.5% | 6.3% | 10.1% |
| | 7244 | 18377 | 36938 | 0.417 | 0.207 | 0.177 | 0.412 | 0.198 | 0.160 | 1.1% | 4.3% | 10.6% |

**Table 03.07.02-24.2: Peak Nodal Accelerations in Refined Mesh Model from Empty Basin Upper Bound Soil Case.**

| Description of Location | SAP Node | Original Mesh SASSI Node | Refined Mesh SASSI Node | Peak Nodal Acceleration in Refined Mesh Model (g) | | | Peak Nodal Acceleration in Original Model (g) | | | Percentage Change in Peak Acceleration from Original Model to Refined Mesh | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) | X (East-West) | Y (North-South) | Z (Vertical) |
| PH operating floor | | | | | | | | | | | | |
| | 3989 | 9753 | 20945 | 0.118 | 0.132 | 0.134 | 0.111 | 0.131 | 0.139 | 6.4% | 0.9% | -3.7% |
| | 4188 | 10155 | 21899 | 0.111 | 0.135 | 0.136 | 0.115 | 0.129 | 0.138 | -3.8% | 4.9% | -1.9% |
| | 4205 | 10189 | 21948 | 0.116 | 0.125 | 0.145 | 0.115 | 0.131 | 0.130 | 0.8% | -4.1% | 12.0% |
| | 4006 | 9787 | 20994 | 0.113 | 0.130 | 0.127 | 0.111 | 0.132 | 0.122 | 2.5% | -1.6% | 3.9% |
| | 4119 | 10015 | 21594 | 0.114 | 0.130 | 0.450 | 0.114 | 0.130 | 0.404 | 0.3% | 0.0% | 11.4% |
| | 4124 | 10025 | 21610 | 0.113 | 0.133 | 0.537 | 0.112 | 0.134 | 0.524 | 0.7% | -0.5% | 2.4% |
| | 4130 | 10037 | 21626 | 0.117 | 0.128 | 0.537 | 0.117 | 0.132 | 0.500 | 0.1% | -2.9% | 7.6% |

**Table 03.07.02-24.3: Response Spectra Modification Factors**

| Location | Direction | 20% Damping | | 15% Damping | | 10% Damping | | 7% Damping | | 5% Damping | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz |
| Pump House Roof | Vertical | 1.444 | 1.331 | 1.495 | 1.346 | 1.577 | 1.372 | 1.629 | 1.409 | 1.667 | 1.463 |
| Pump House Operating Floor | Vertical | 1.223 | 1.190 | 1.243 | 1.194 | 1.294 | 1.198 | 1.362 | 1.202 | 1.469 | 1.204 |
| Mid-Level of Basin Walls | Horizontal | 1.310 | 1.113 | 1.338 | 1.110 | 1.404 | 1.112 | 1.461 | 1.117 | 1.458 | 1.129 |
| CTSS Walls | Vertical | 1.405 | 1.197 | 1.441 | 1.191 | 1.433 | 1.205 | 1.450 | 1.231 | 1.478 | 1.264 |

| Location | Direction | 4% Damping | | 3% Damping | | 2% Damping | | 1% Damping | | 0.5% Damping | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz | 1-30 Hz | 30-33 Hz |
| Pump House Roof | Vertical | 1.686 | 1.511 | 1.793 | 1.588 | 2.038 | 1.718 | 2.682 | 1.926 | 2.769 | 2.165 |
| Pump House Operating Floor | Vertical | 1.550 | 1.206 | 1.678 | 1.209 | 1.914 | 1.217 | 2.486 | 1.241 | 2.826 | 1.373 |
| Mid-Level of Basin Walls | Horizontal | 1.502 | 1.153 | 1.563 | 1.186 | 1.835 | 1.237 | 2.372 | 1.326 | 2.922 | 1.370 |
| CTSS Walls | Vertical | 1.540 | 1.289 | 1.585 | 1.321 | 1.749 | 1.364 | 1.966 | 1.418 | 2.593 | 1.574 |

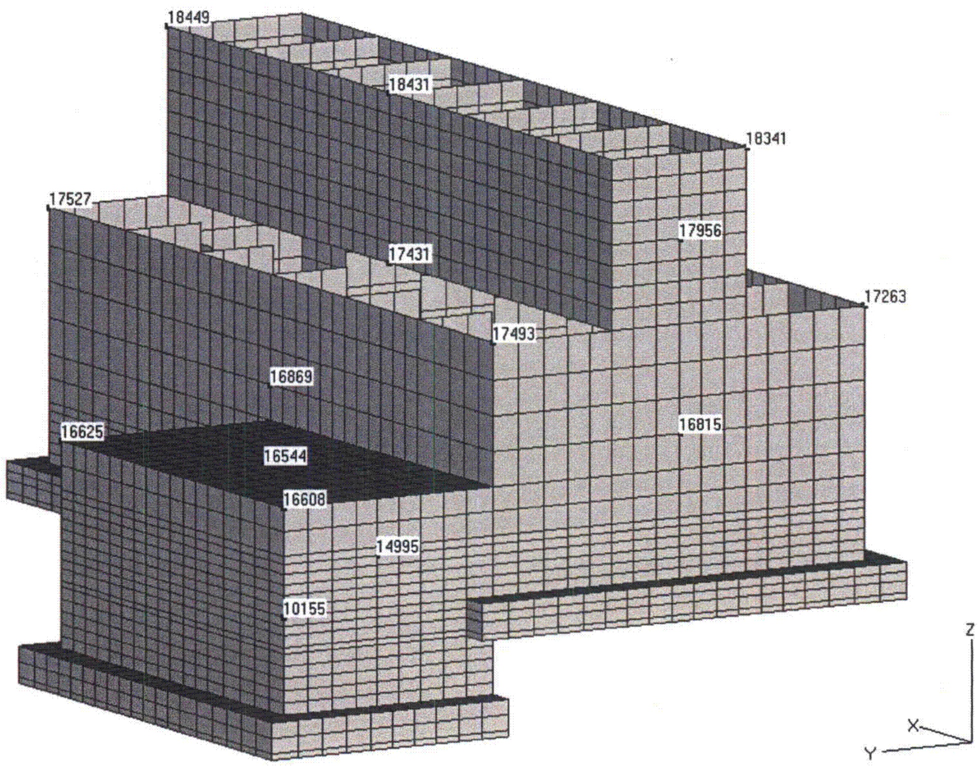


**Figure 03.07.02-24.1 - SSI Original Mesh Model Node Numbers**
**Note that nodes 10025 at center of operating floor and 16765 on south basin wall opposite 16869 are not visible)**

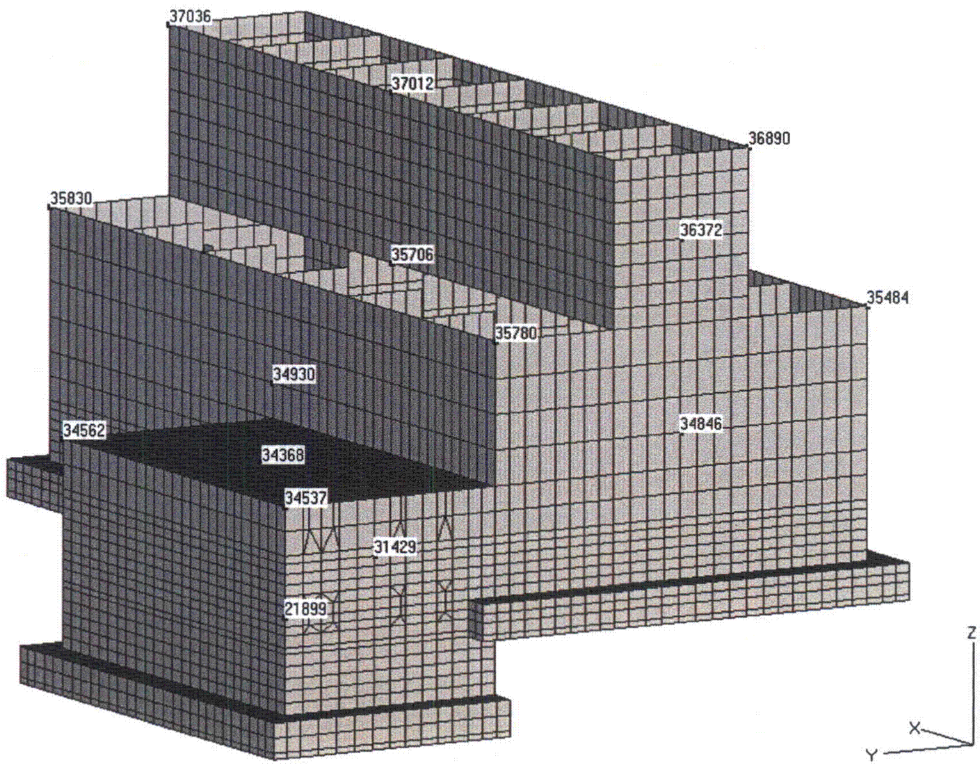


**Figure 03.07.02-24.2 - SSI Refined Mesh Model Node Numbers**
**Note that node 21610 at center of operating floor and 34769 on south basin wall opposite 34930 not visible)**

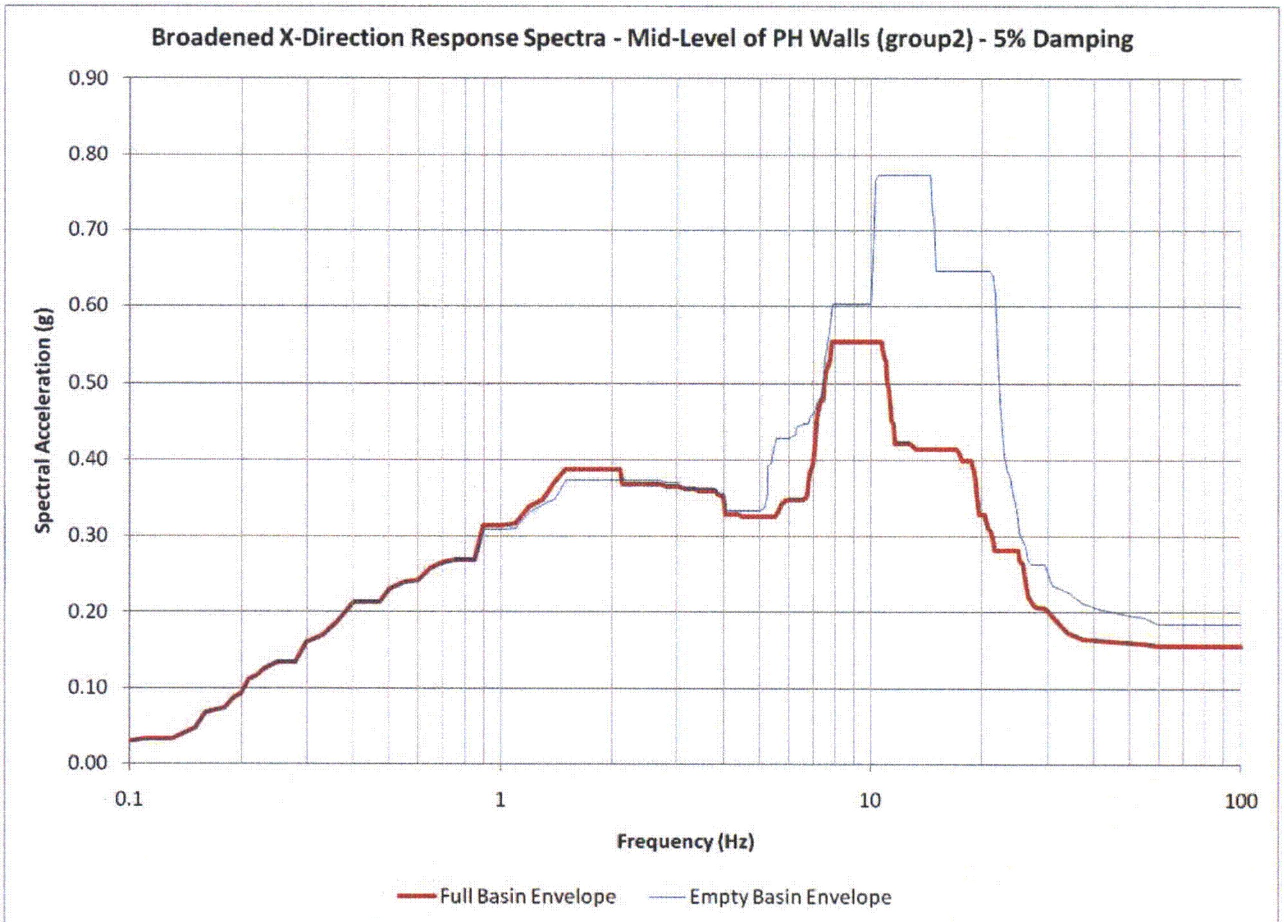


**Figure 03.07.02-24.3: Comparison of Envelope Raw X-Direction Response Spectra at Mid-Level of PH Walls (group2) at 5% Damping.**

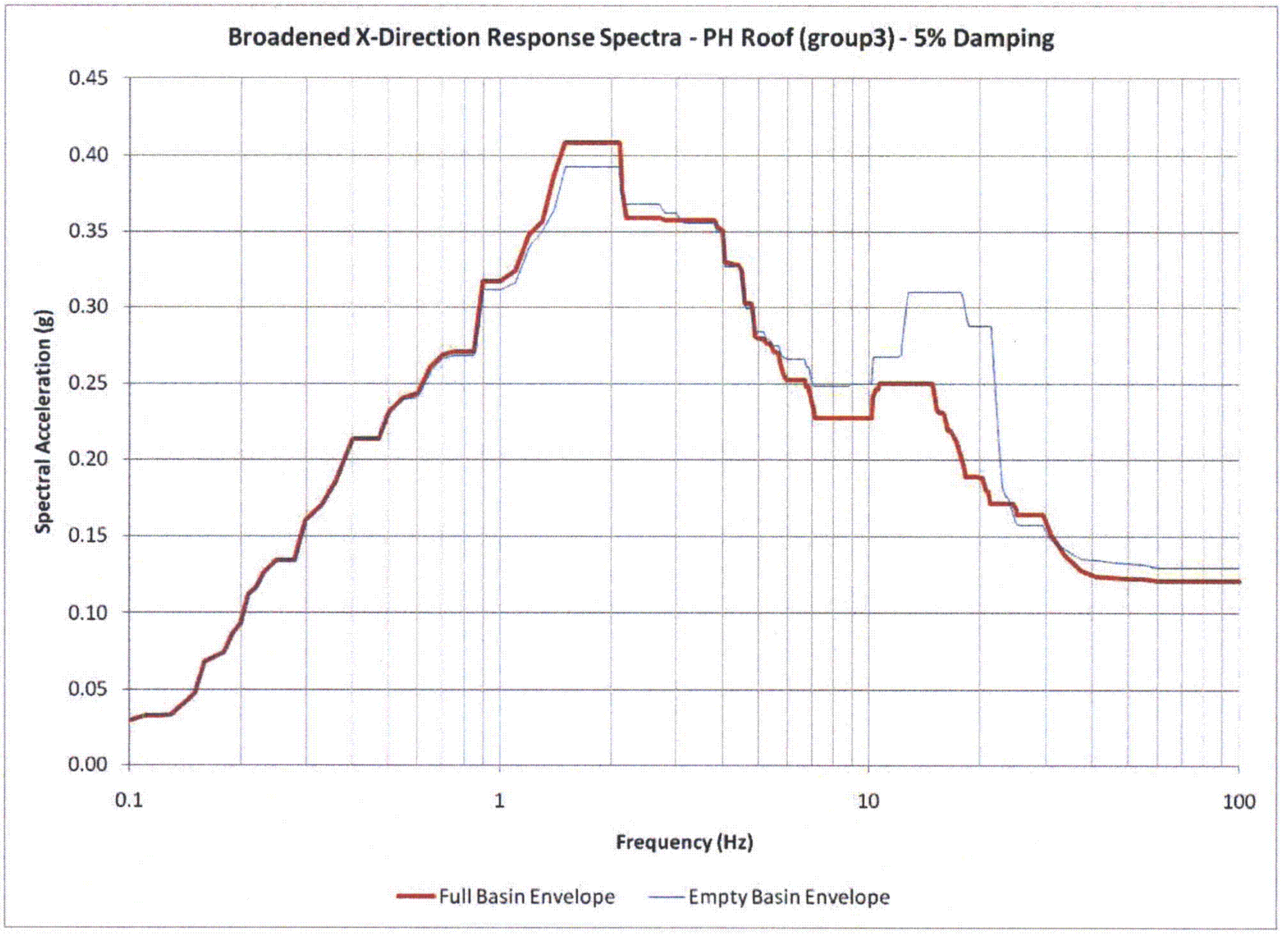


**Figure 03.07.02-24.4: Comparison of Envelope Raw X-Direction Response Spectra at PH Roof (group3) at 5% Damping.**

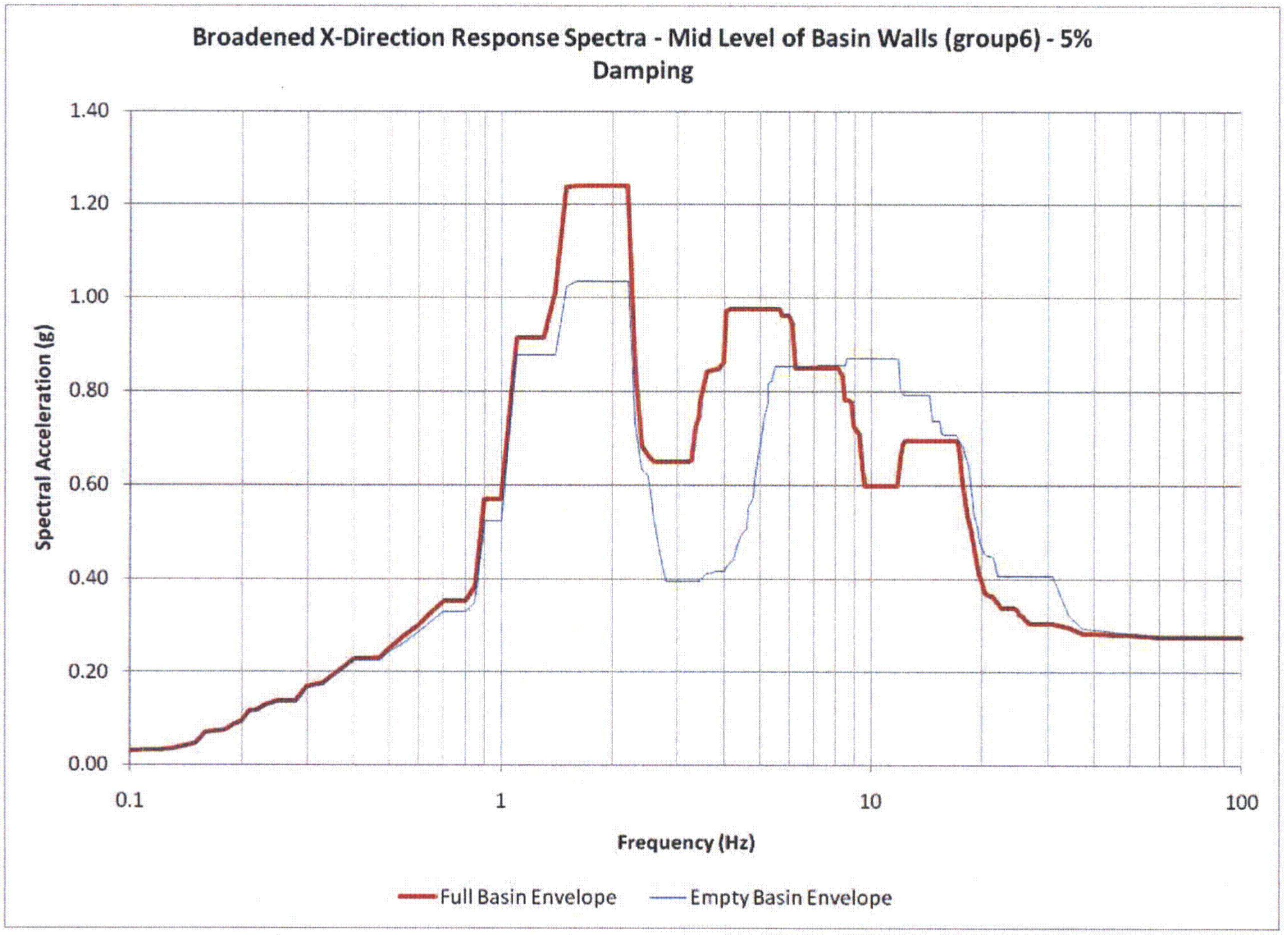


**Figure 03.07.02-24.5: Comparison of Envelope Raw X-Direction Response Spectra at Mid Level of Basin Walls (group6) at 5% Damping.**

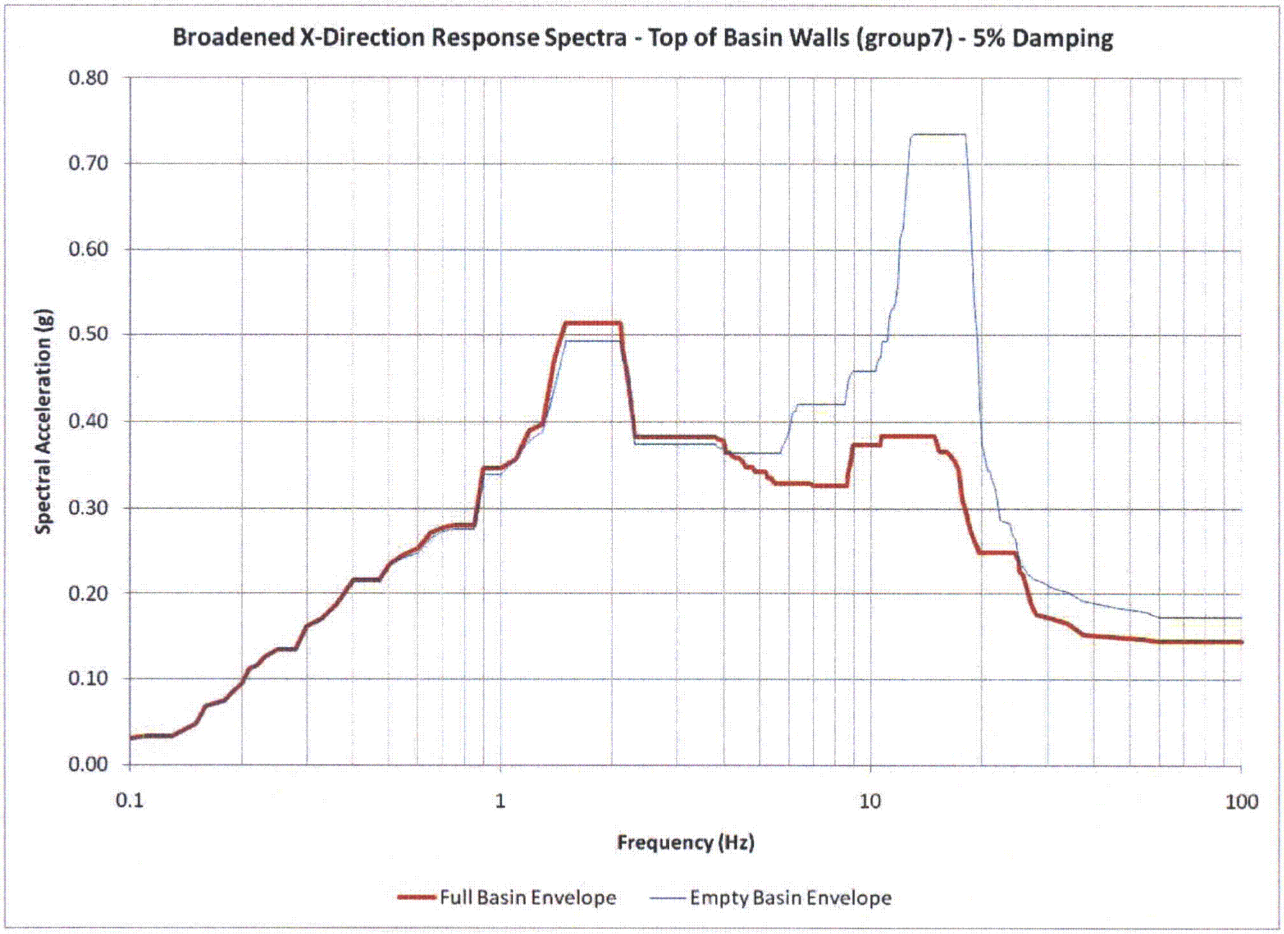


**Figure 03.07.02-24.6: Comparison of Envelope Raw X-Direction Response Spectra at Top of Basin Walls (group7) at 5% Damping.**

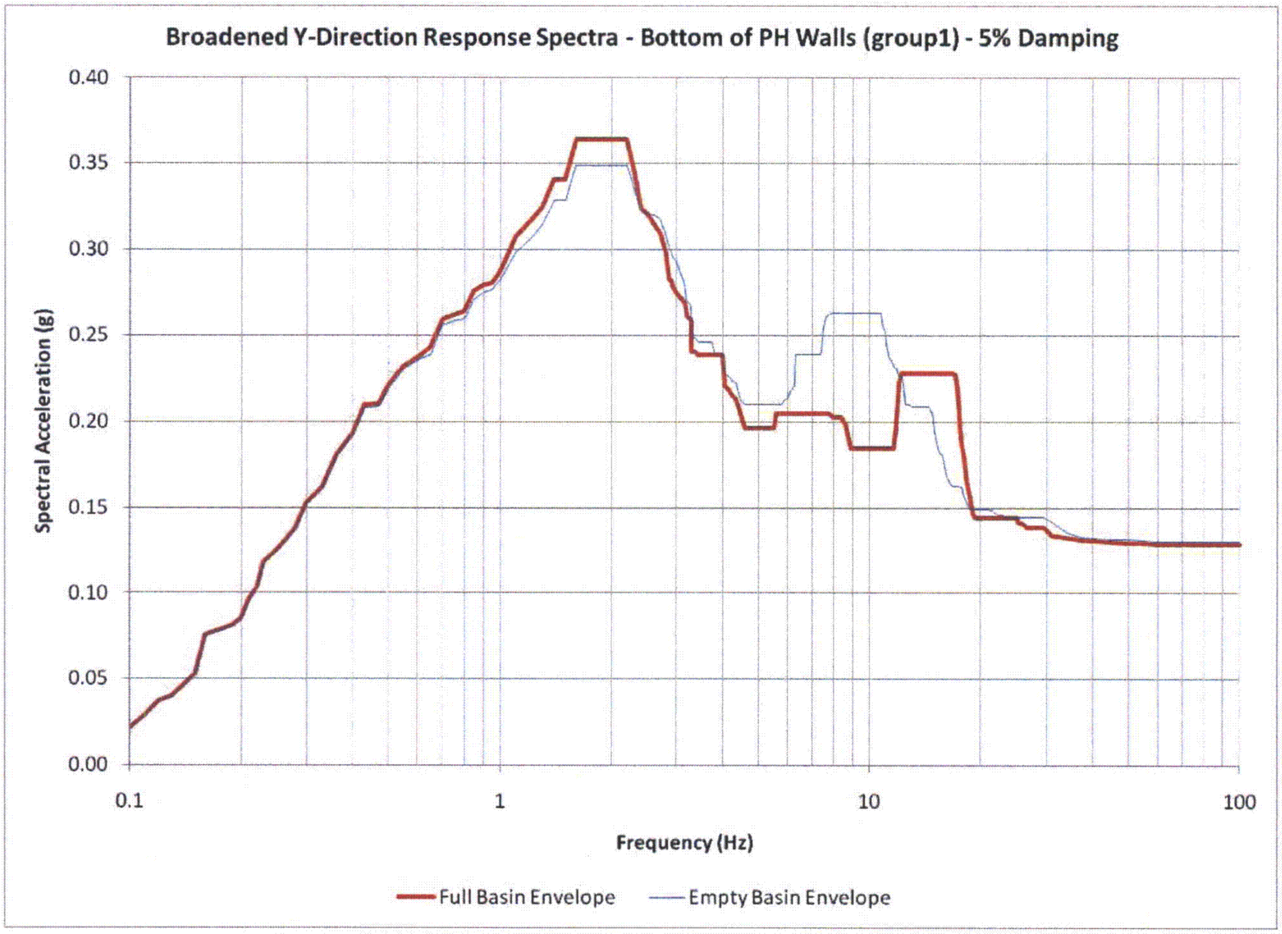


**Figure 03.07.02-24.7: Comparison of Envelope Raw Y-Direction Response Spectra at Bottom of PH Walls (group1) at 5% Damping.**

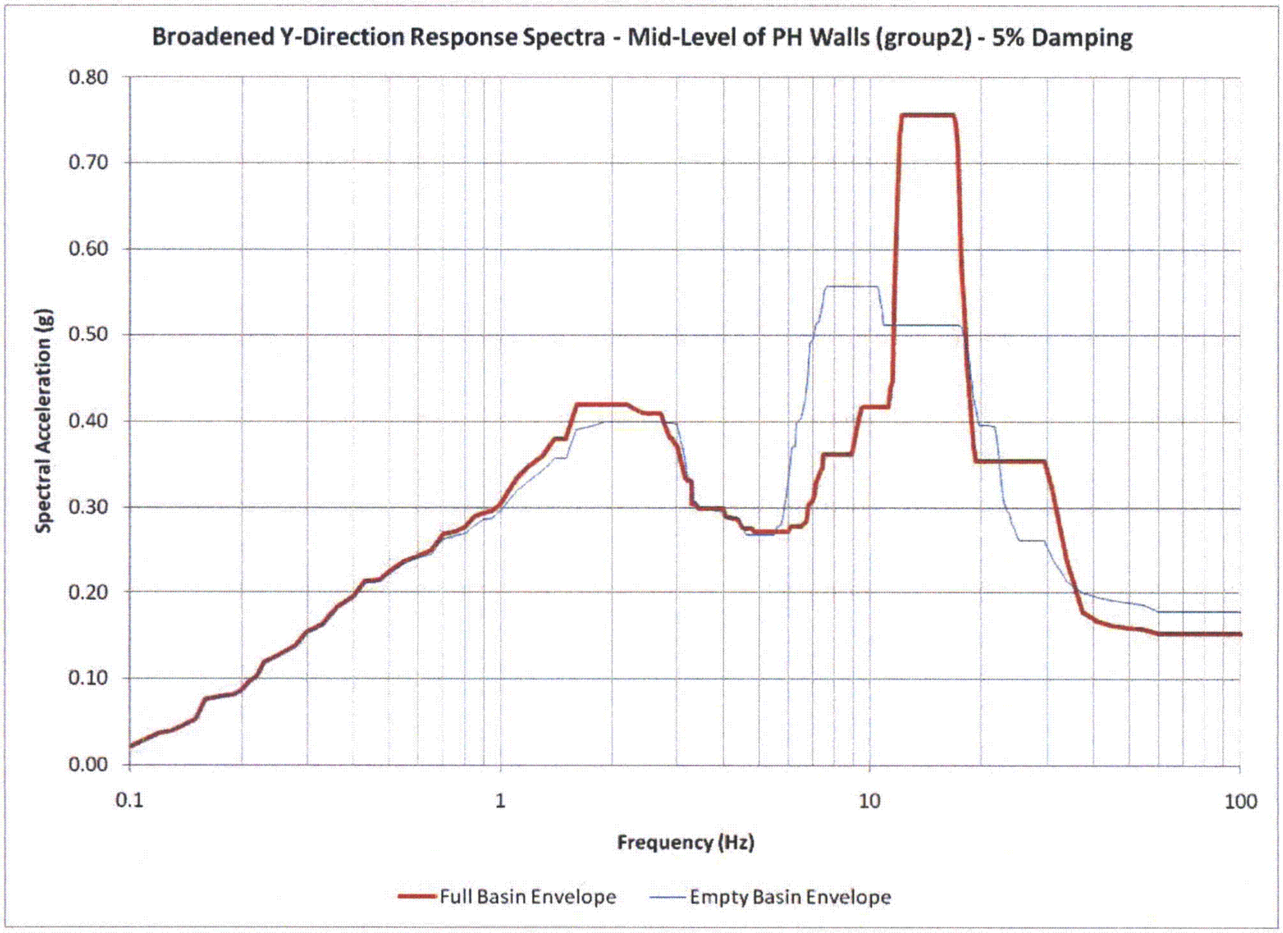


**Figure 03.07.02-24.8: Comparison of Envelope Raw Y-Direction Response Spectra at Mid-Level of PH Walls (group2) at 5% Damping.**

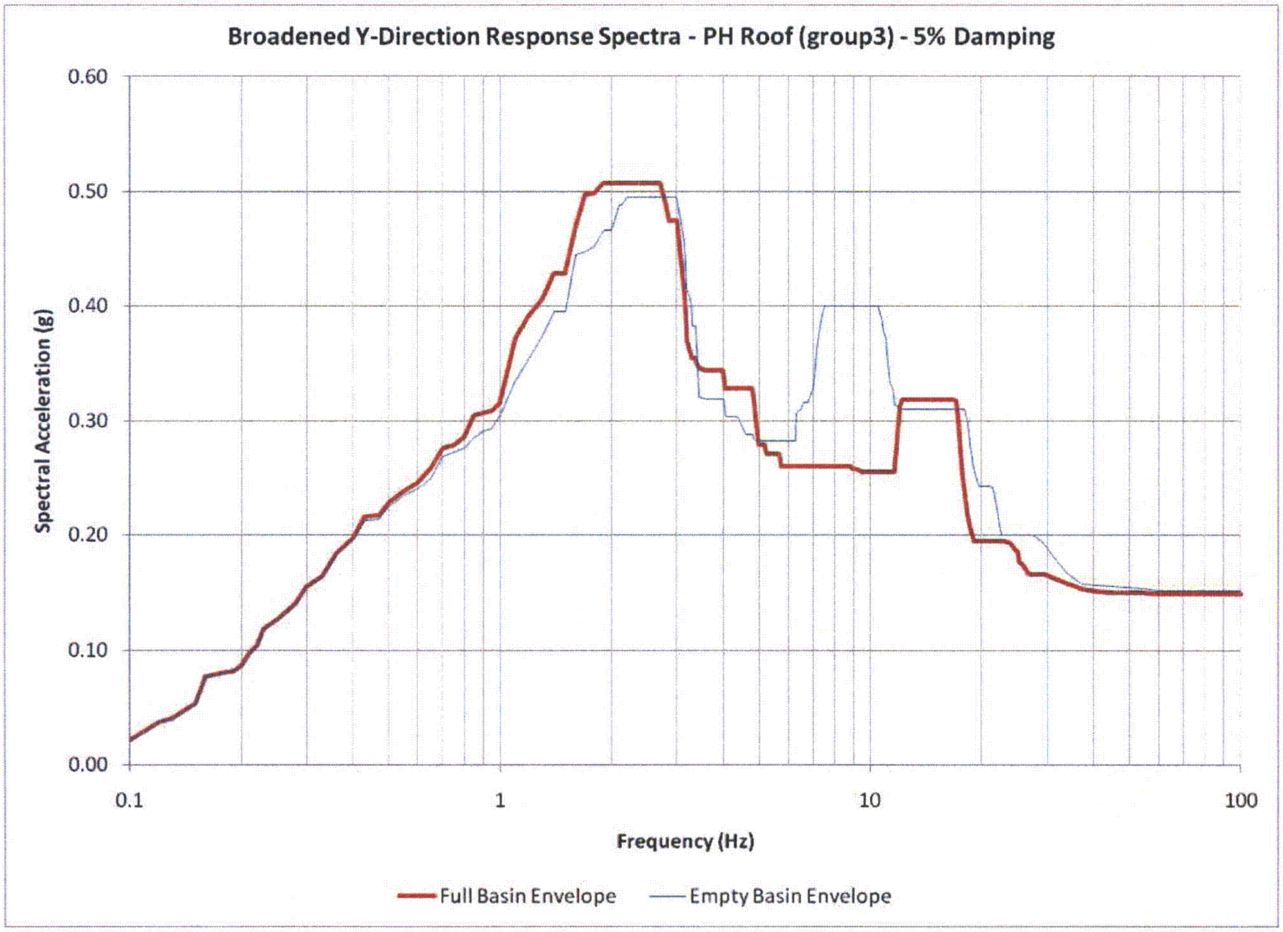


**Figure 03.07.02-24.9: Comparison of Envelope Raw Y-Direction Response Spectra at PH Roof (group3) at 5% Damping.**

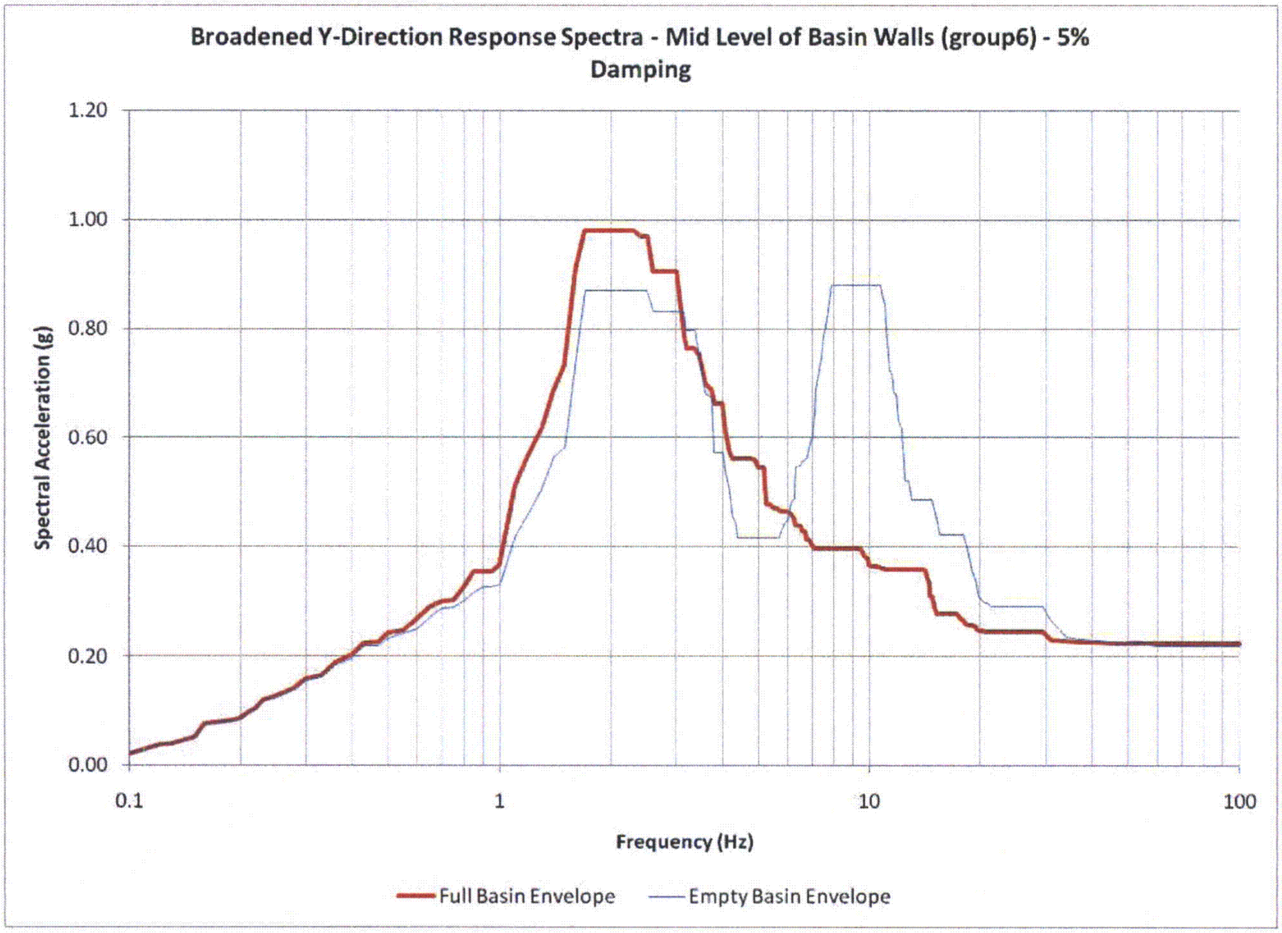


**Figure 03.07.02-24.10: Comparison of Envelope Raw Y-Direction Response Spectra at Mid Level of Basin Walls (group6) at 5% Damping.**

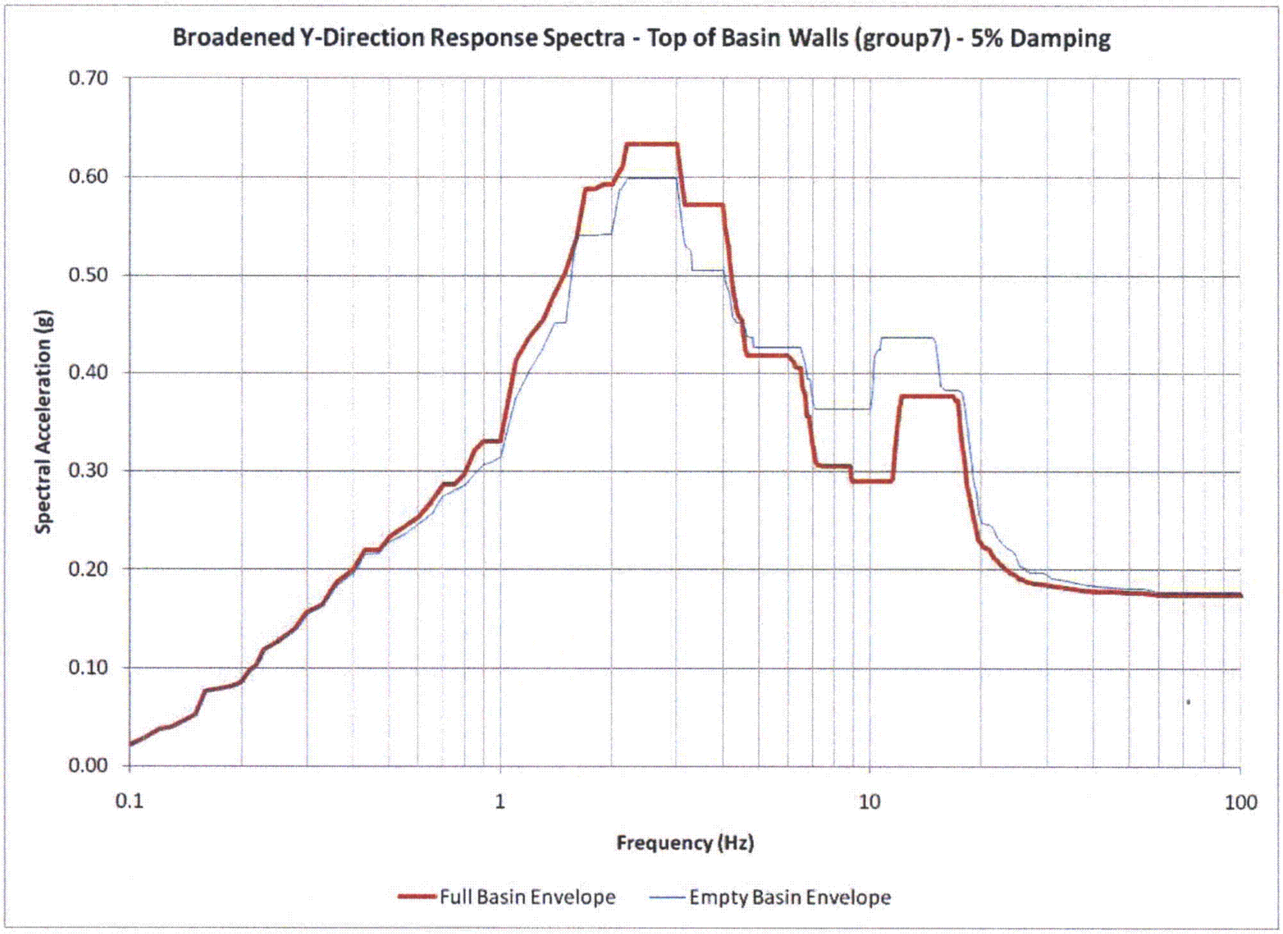


**Figure 03.07.02-24.11: Comparison of Envelope Raw Y-Direction Response Spectra at Top of Basin Walls (group7) at 5% Damping.**

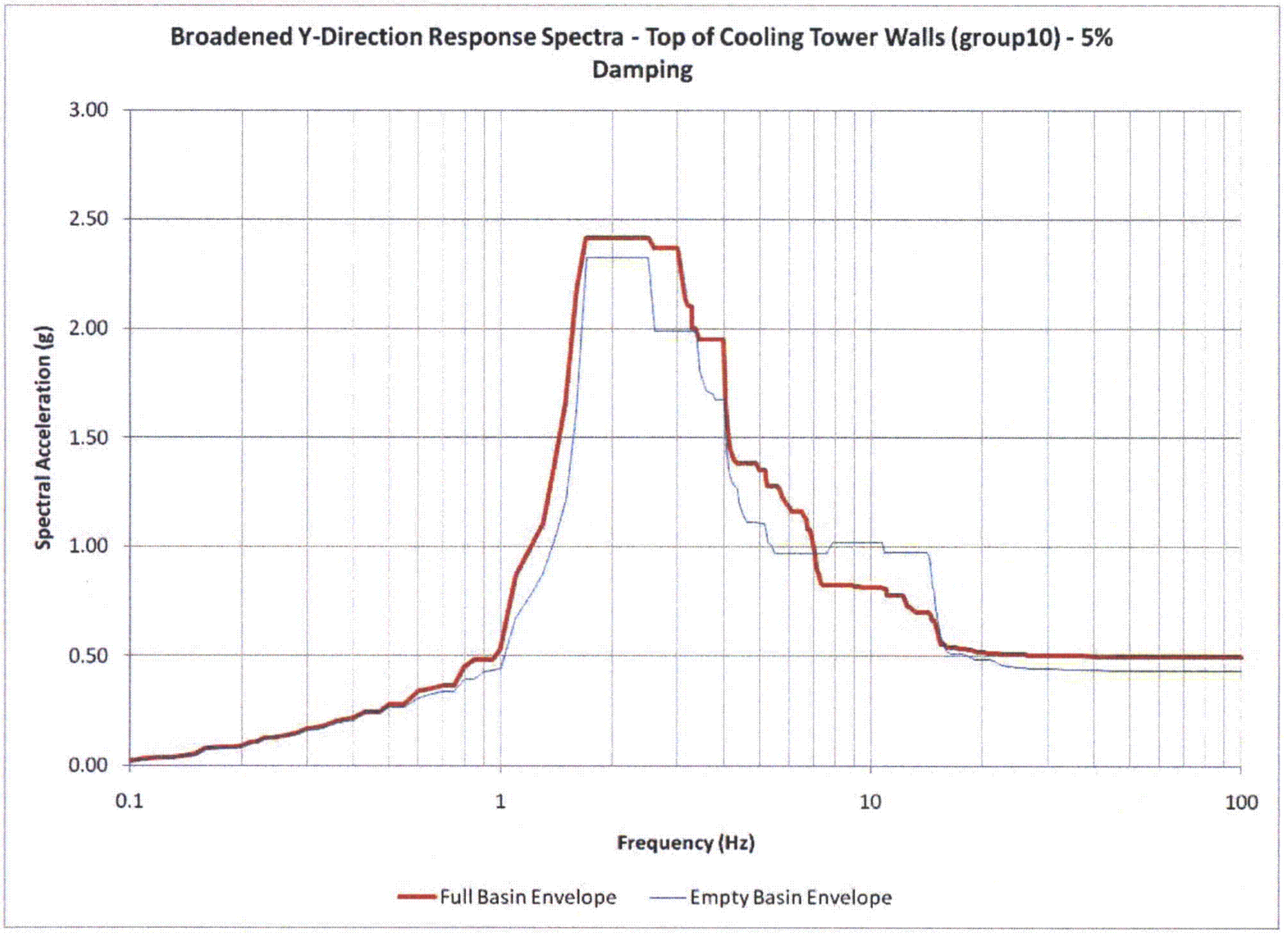


**Figure 03.07.02-24.12: Comparison of Envelope Raw Y-Direction Response Spectra at Top of Cooling Tower Walls (group10) at 5% Damping.**

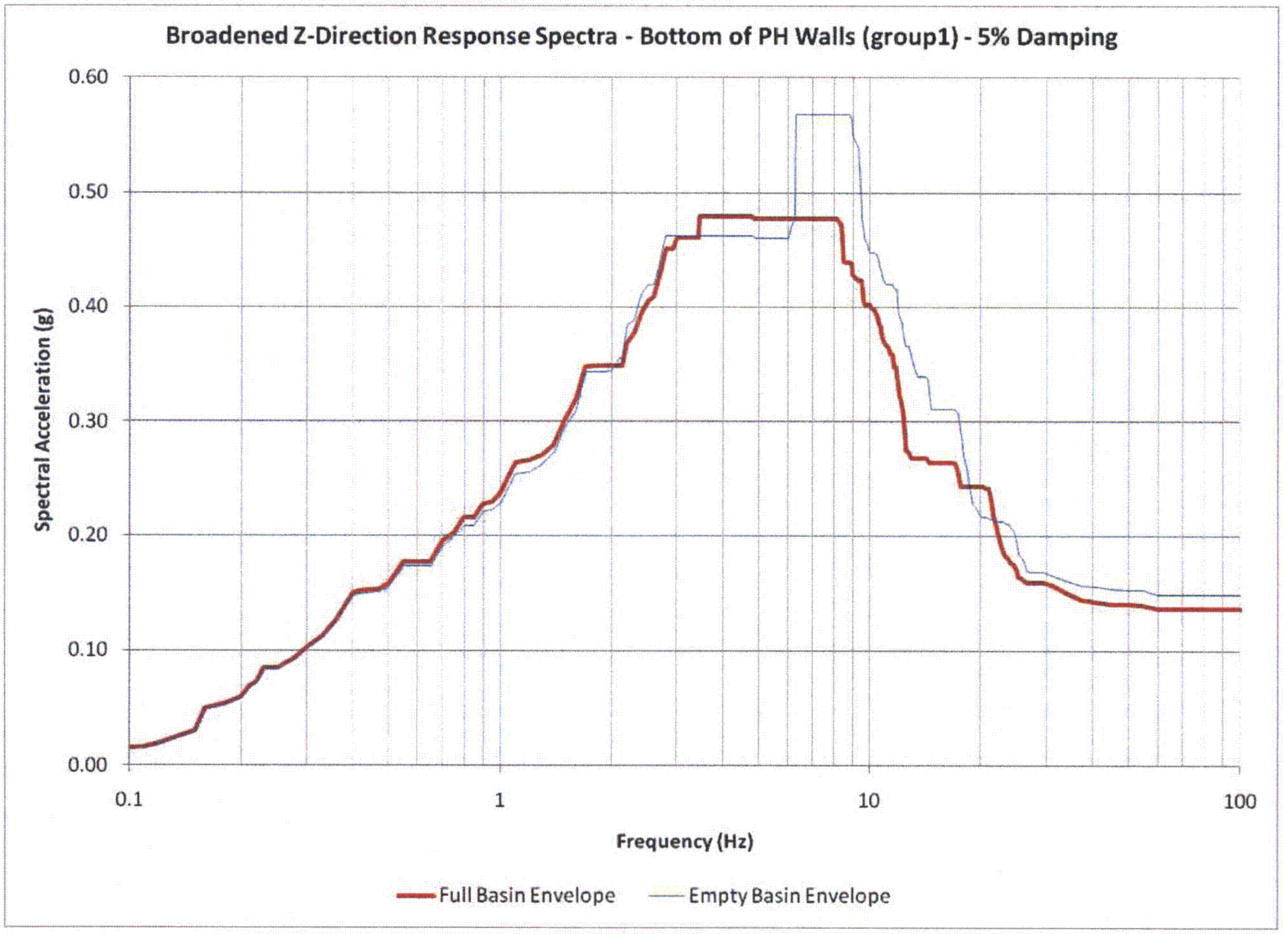


**Figure 03.07.02-24.13: Comparison of Envelope Raw Z-Direction Response Spectra at Bottom of PH Walls (group1) at 5% Damping.**

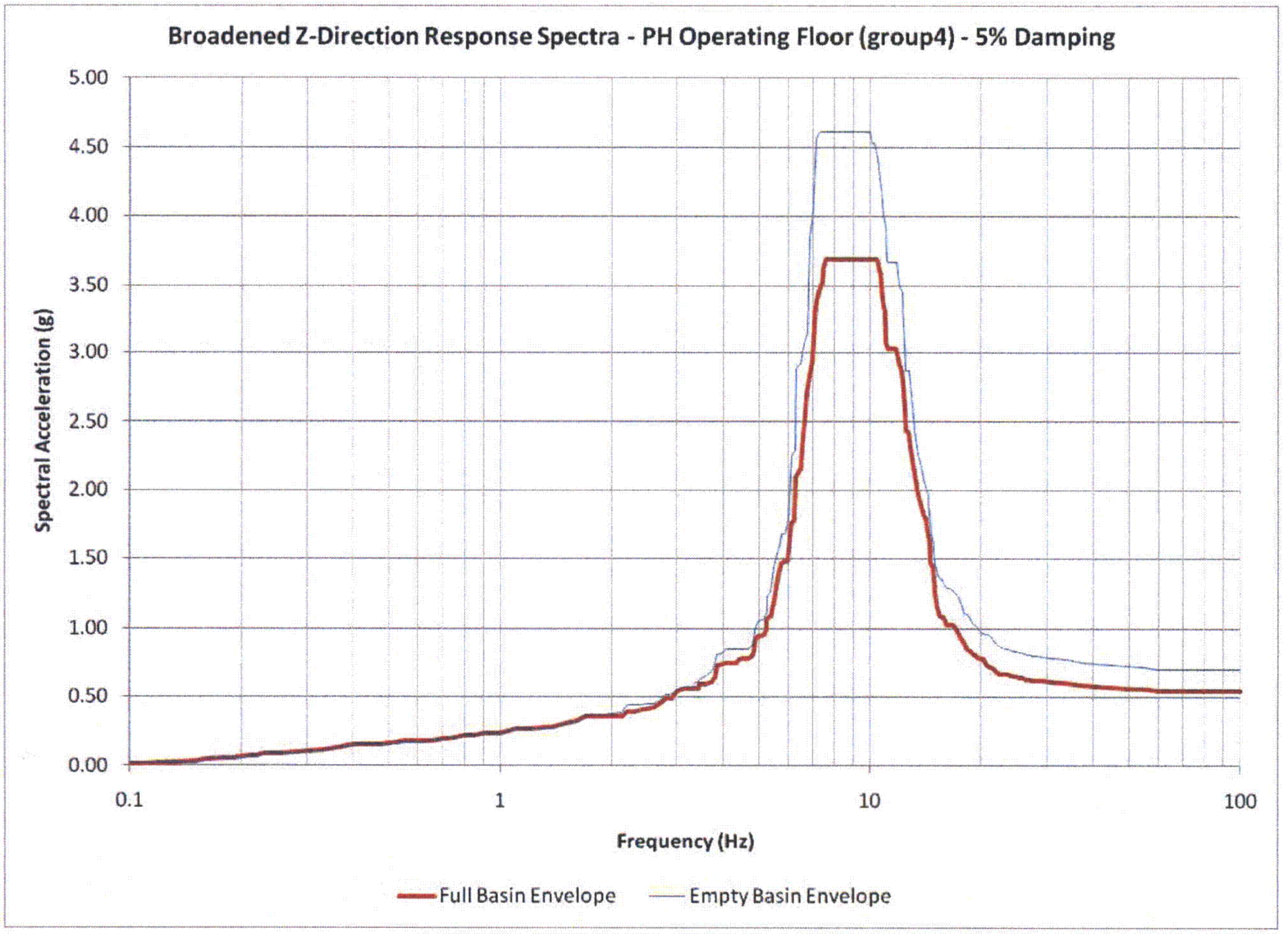


**Figure 03.07.02-24.14: Comparison of Envelope Raw Z-Direction Response Spectra at PH Operating Floor (group4) at 5% Damping.**

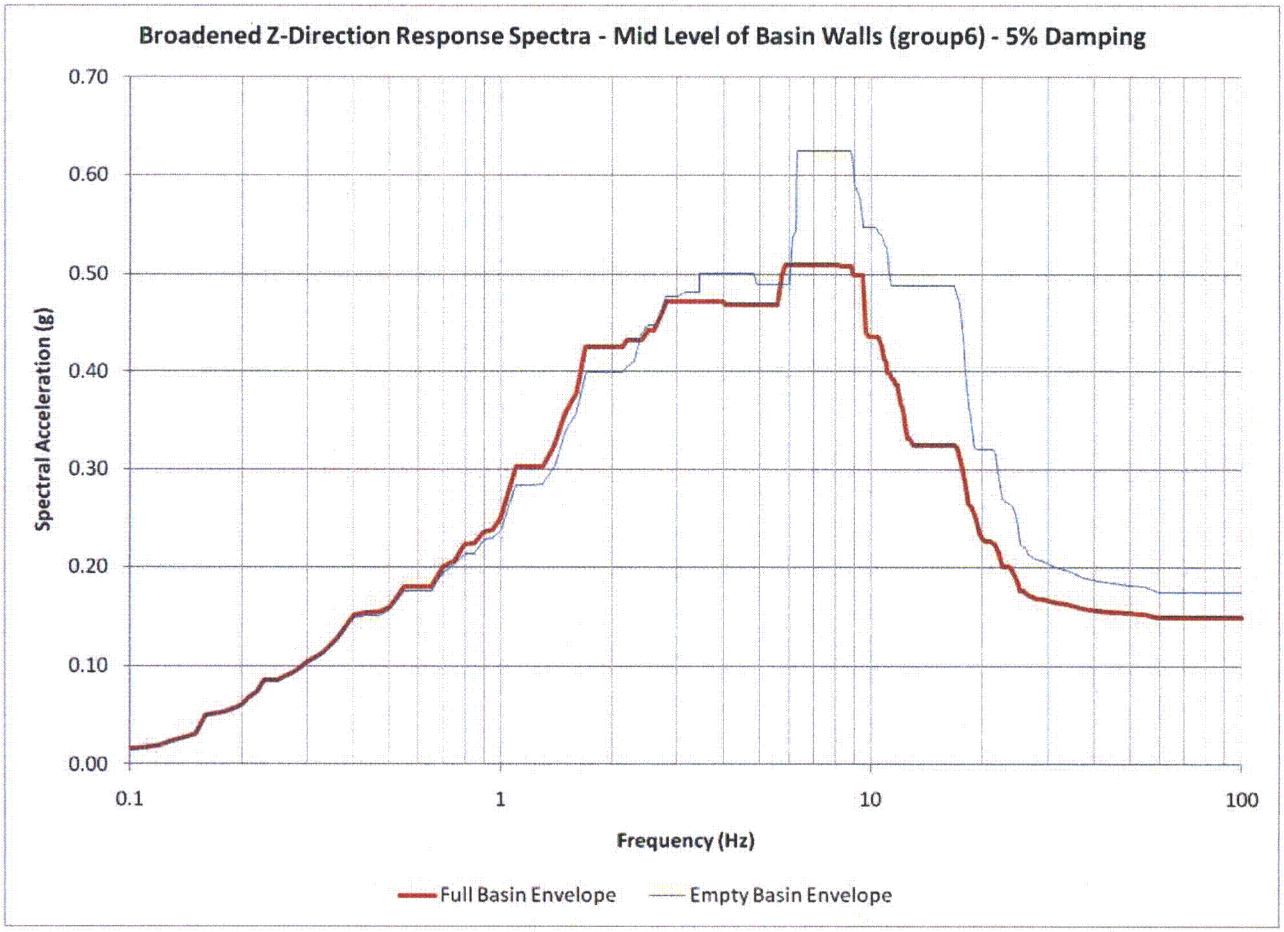


**Figure 03.07.02-24.15: Comparison of Envelope Raw Z-Direction Response Spectra at Mid Level of Basin Walls (group6) at 5% Damping.**

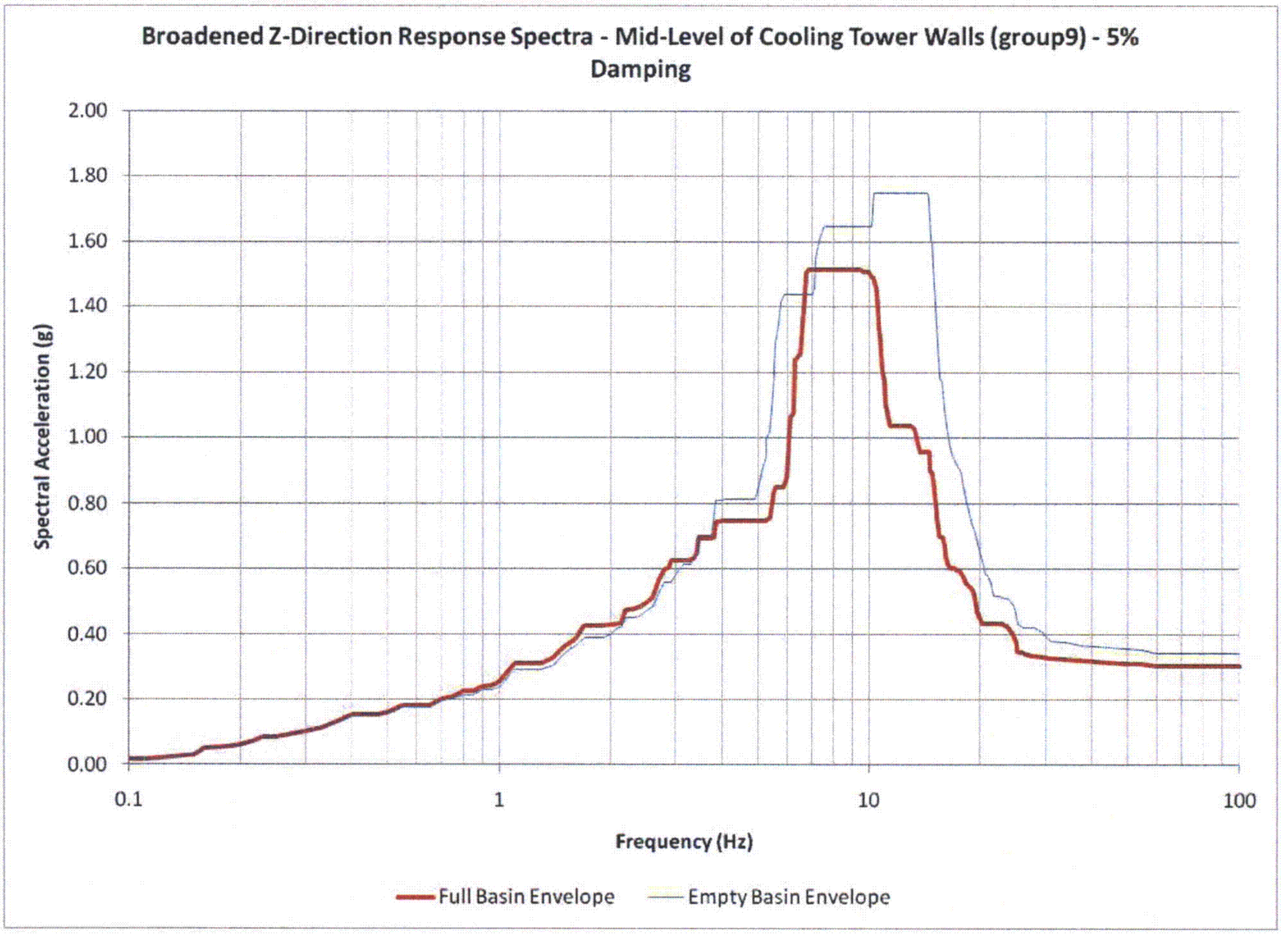


**Figure 03.07.02-24.16: Comparison of Envelope Raw Z-Direction Response Spectra at Mid-Level of Cooling Tower Walls (group9) at 5% Damping.**

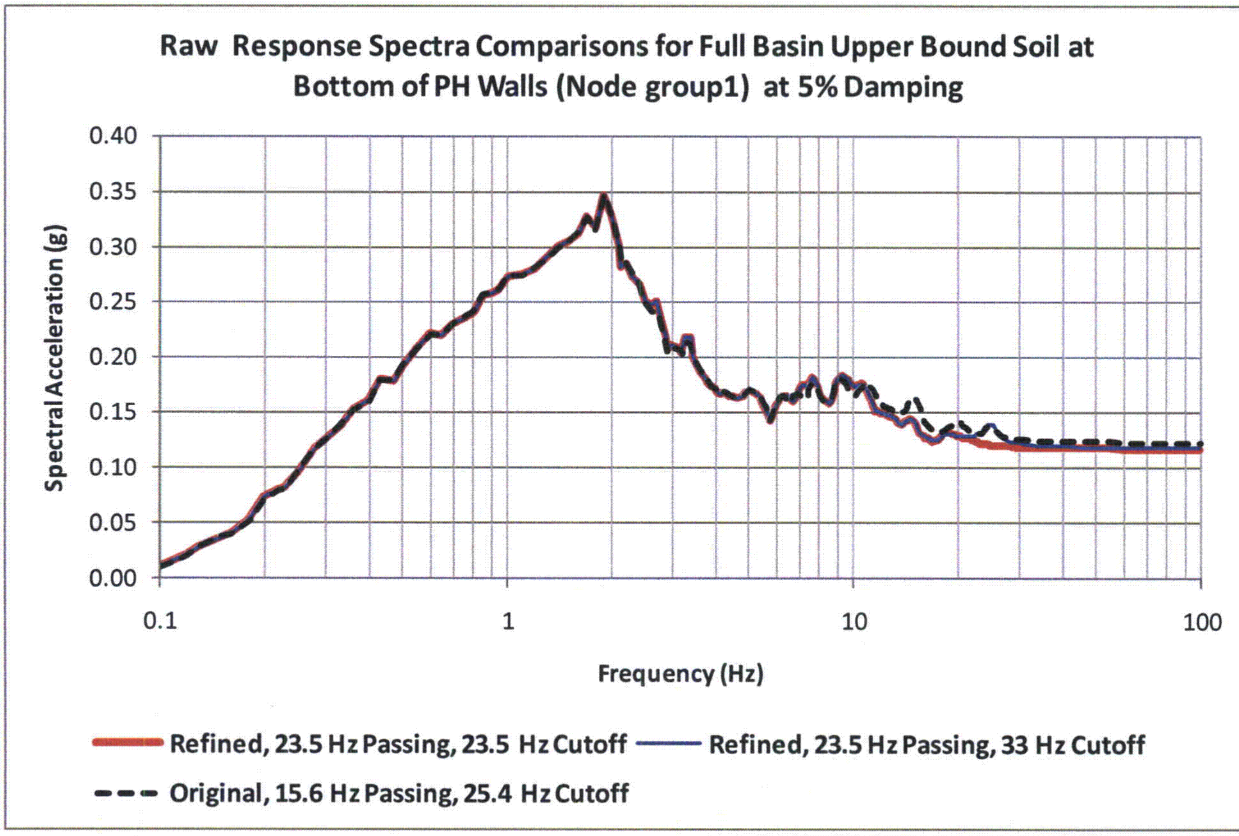


**Figure 03.07.02-24.17: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of PH Walls (Node group1), 5% Damping**

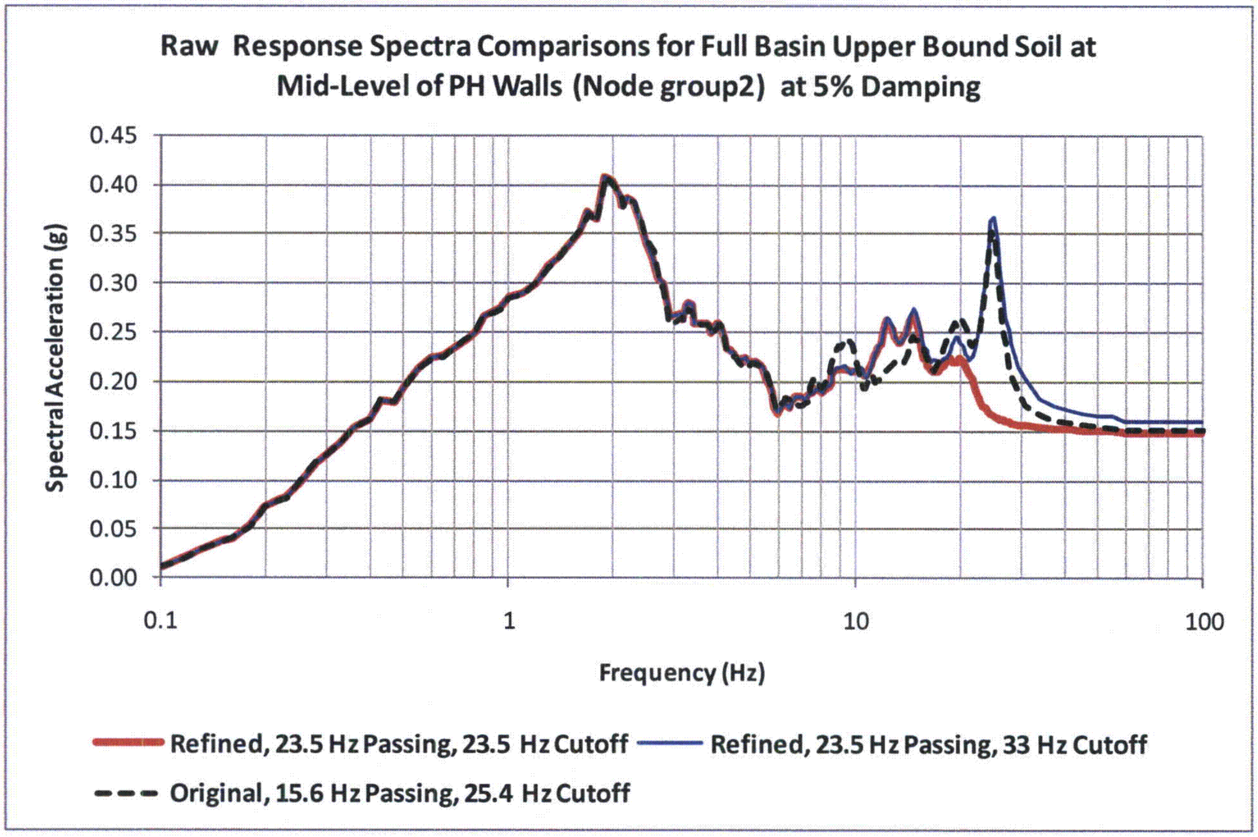


**Figure 03.07.02-24.18 Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid-Level of PH Walls (Node group2), 5% Damping**

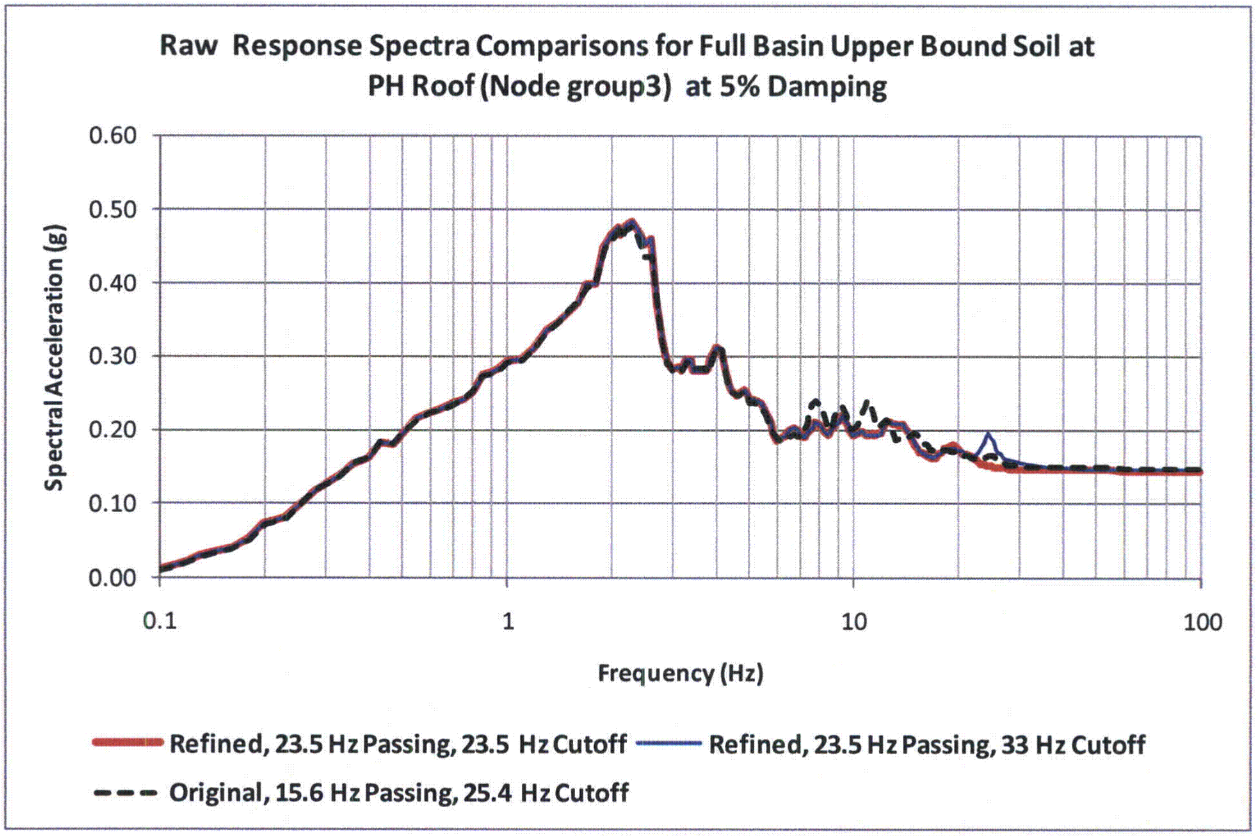


**Figure 03.07.02-24.19: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at PH Roof (Node group3), 5% Damping**

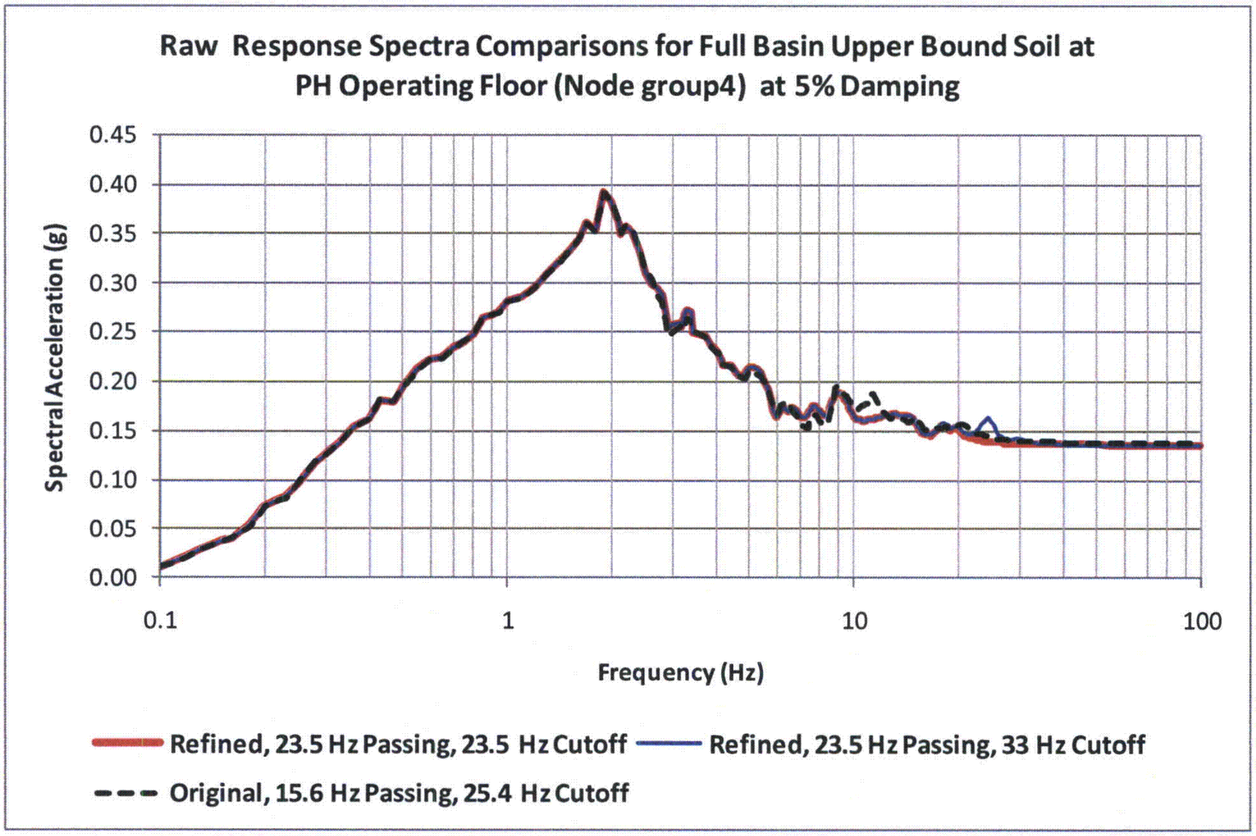


**Figure 03.07.02-24.20: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at PH Operating Floor (Node group4), 5% Damping**

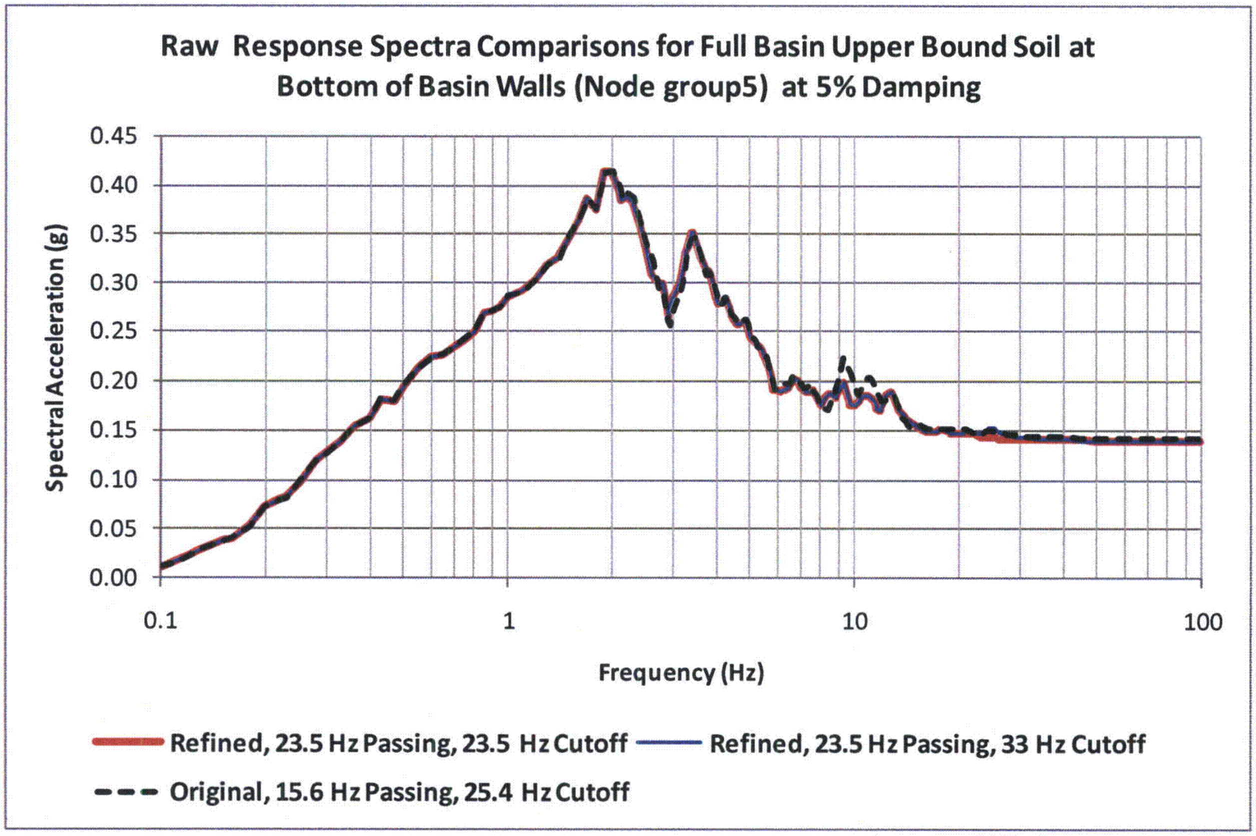


**Figure 03.07.02-24.21: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of Basin Walls (Node group5), 5% Damping**

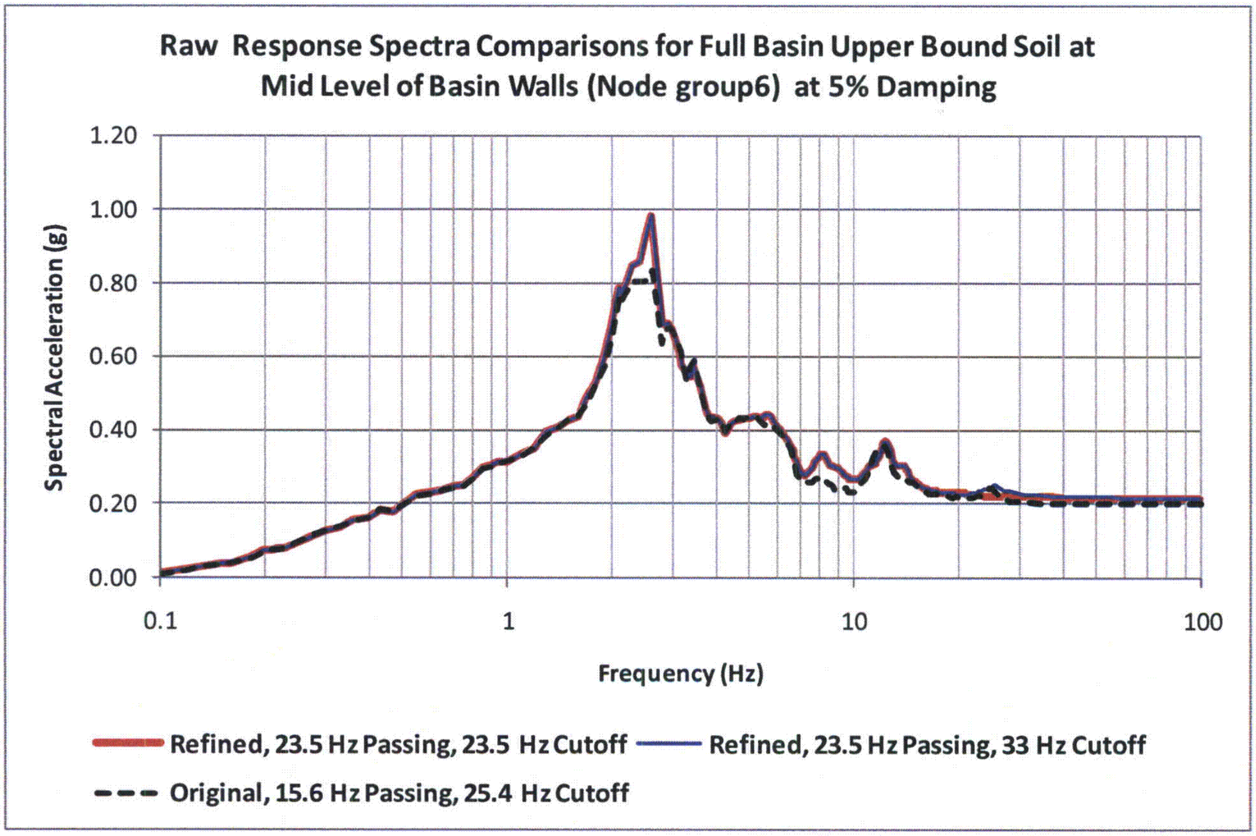


**Figure 03.07.02-24.22: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid Level of Basin Walls (Node group6), 5% Damping**

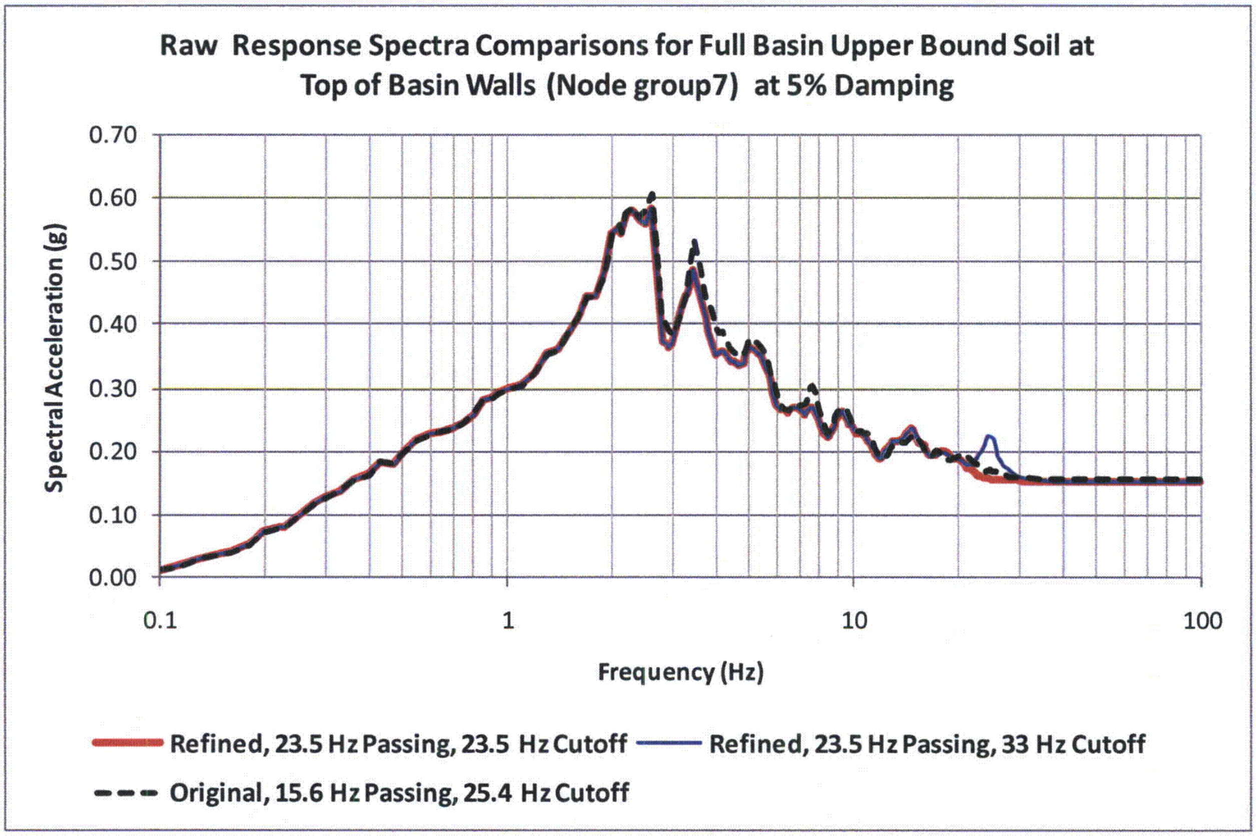


**Figure 03.07.02-24.23: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Top of Basin Walls (Node group7), 5% Damping**

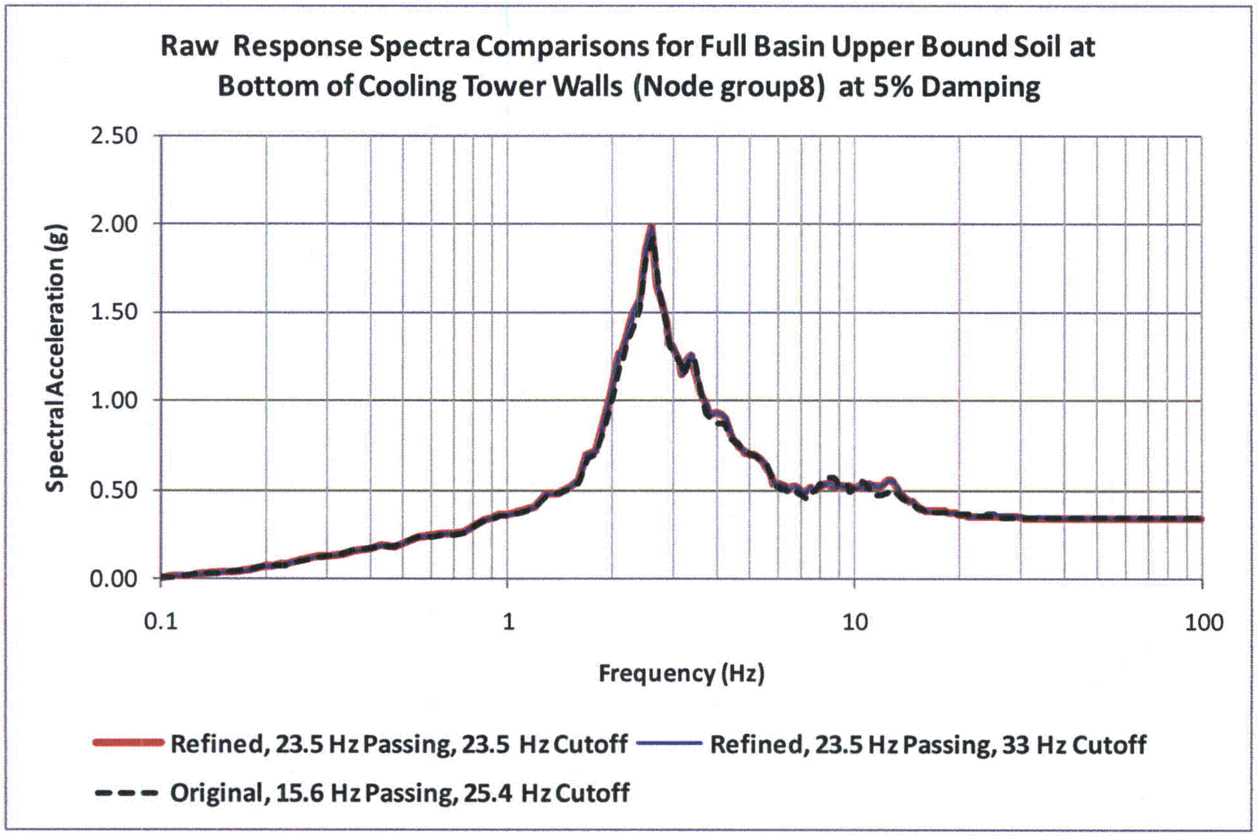


**Figure 03.07.02-24.24: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of Cooling Tower Walls (Node group8), 5% Damping**

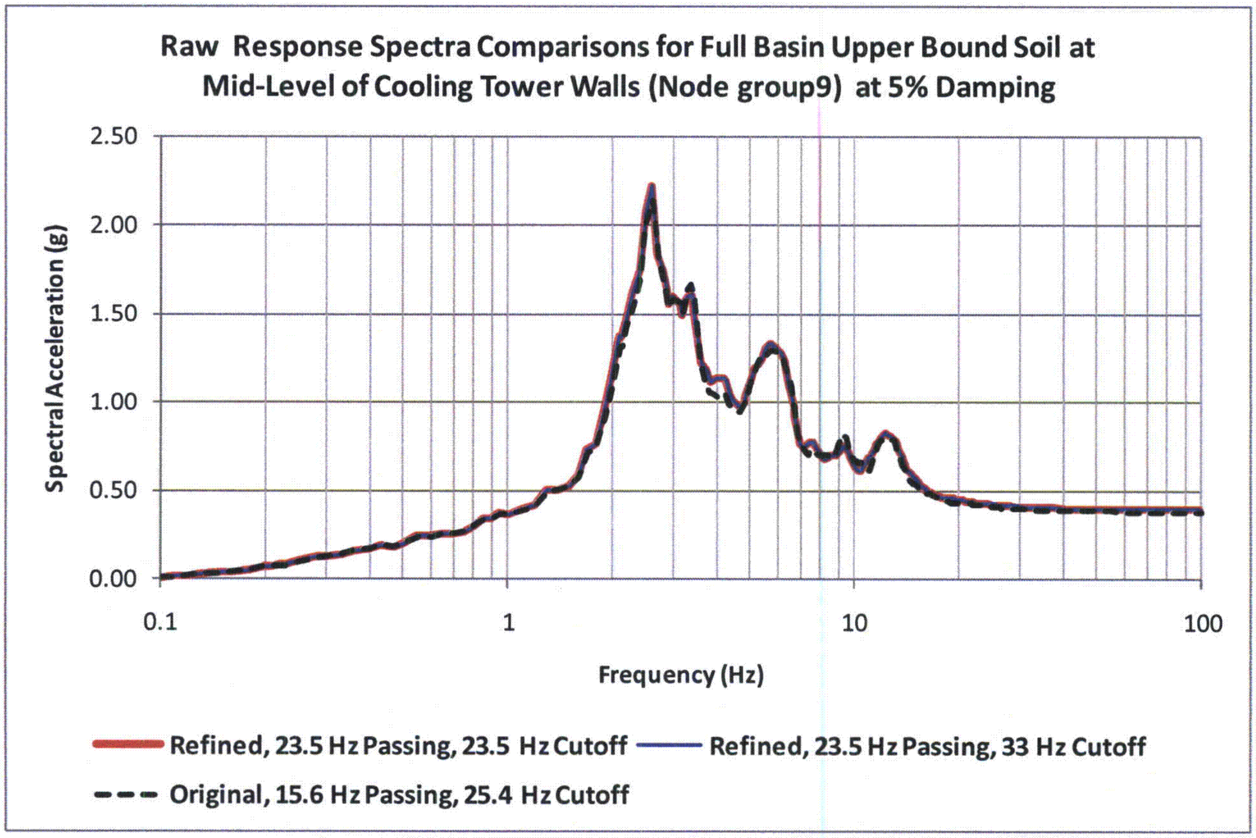


**Figure 03.07.02-24.25: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid-Level of Cooling Tower Walls (Node group9), 5% Damping**

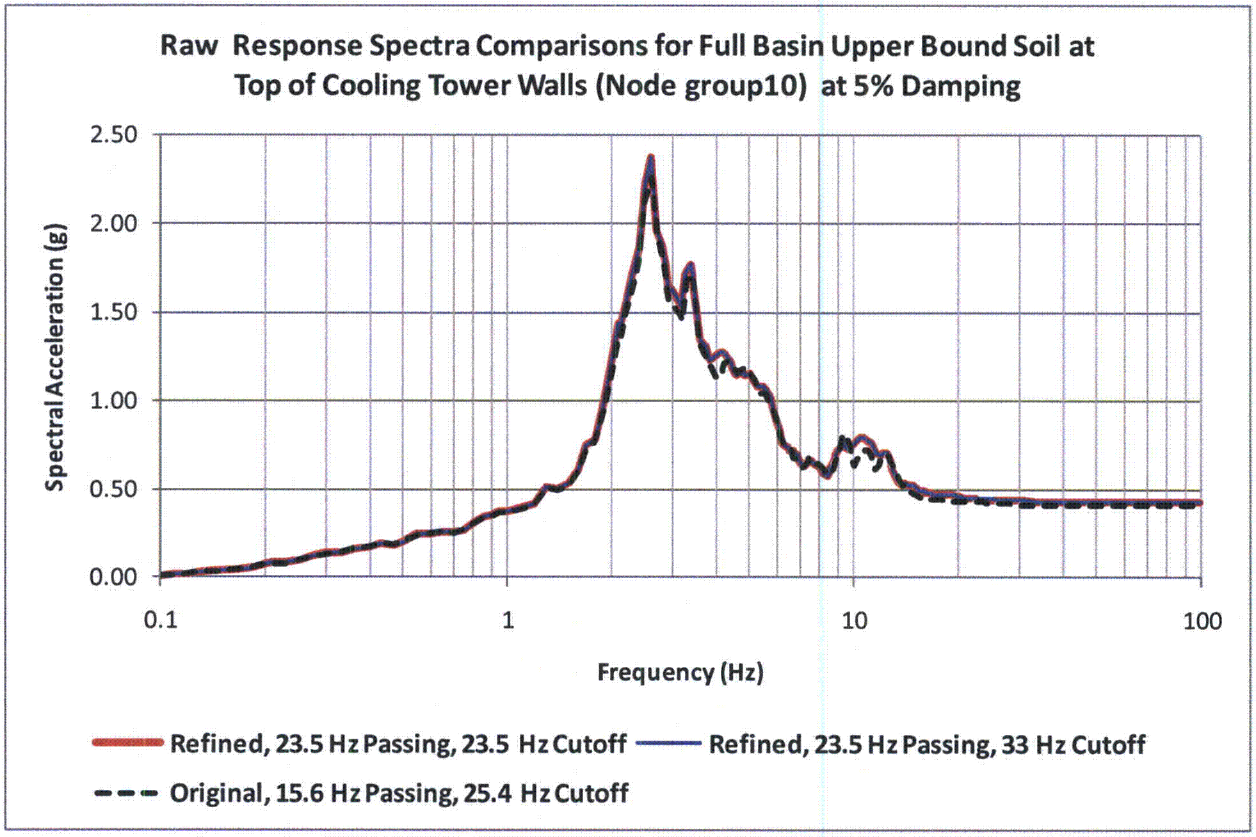


**Figure 03.07.02-24.26: Comparison of Y - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Top of Cooling Tower Walls (Node group10), 5% Damping**

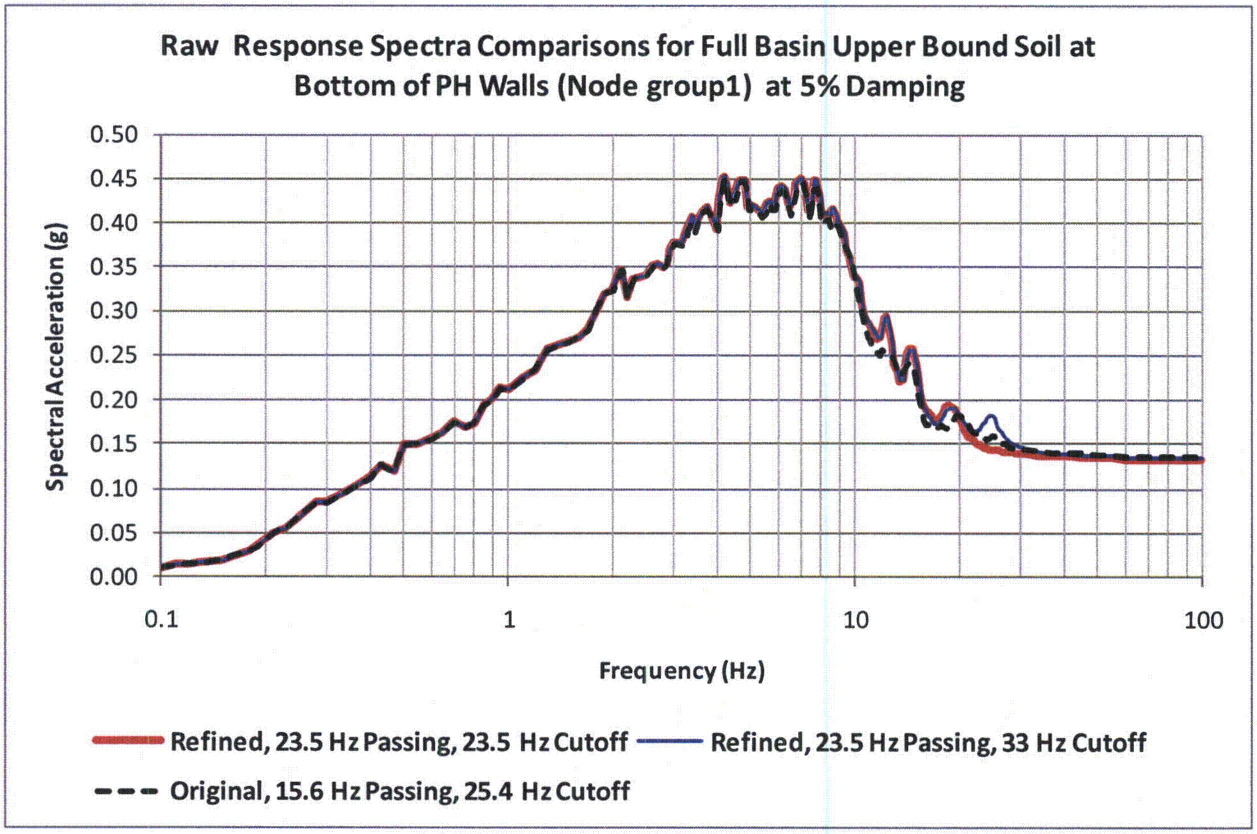


**Figure 03.07.02-24.27: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of PH Walls (Node group1), 5% Damping**

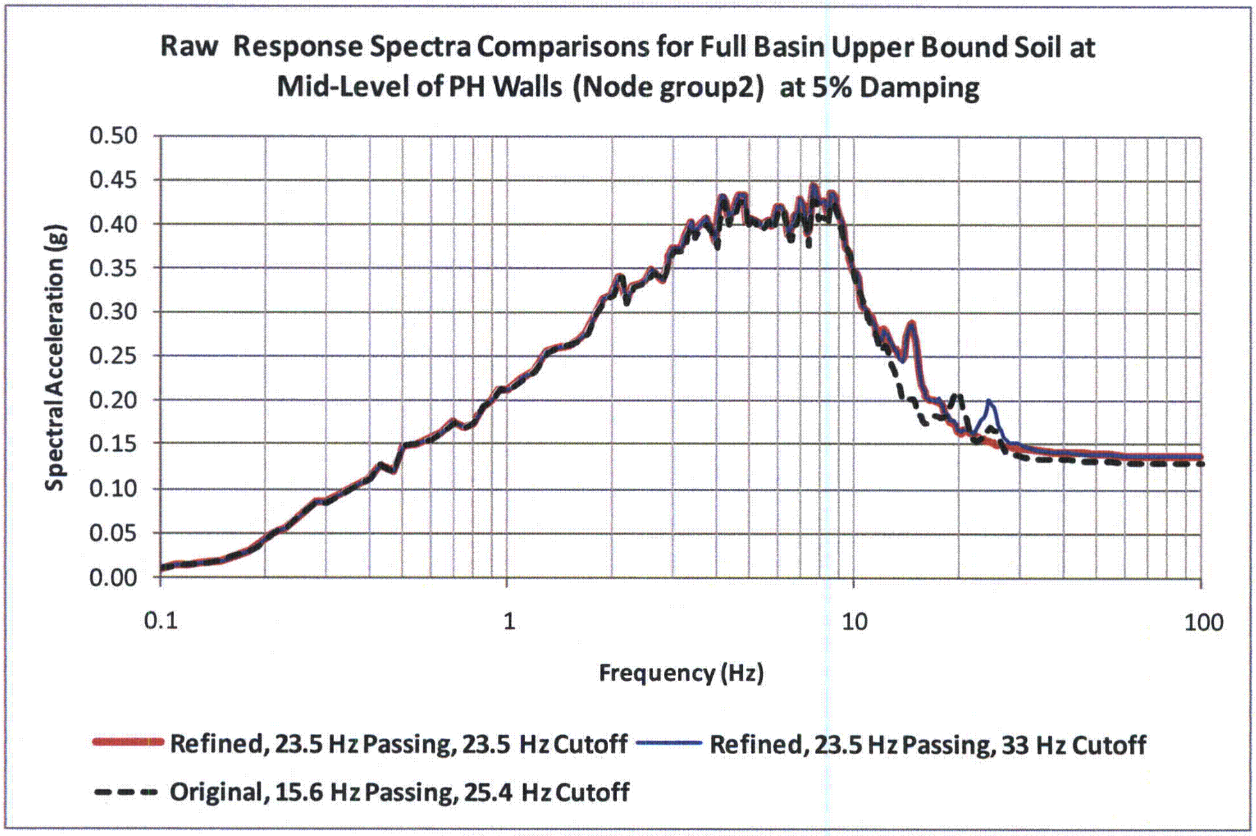


**Figure 03.07.02-24.28: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid-Level of PH Walls (Node group2), 5% Damping**

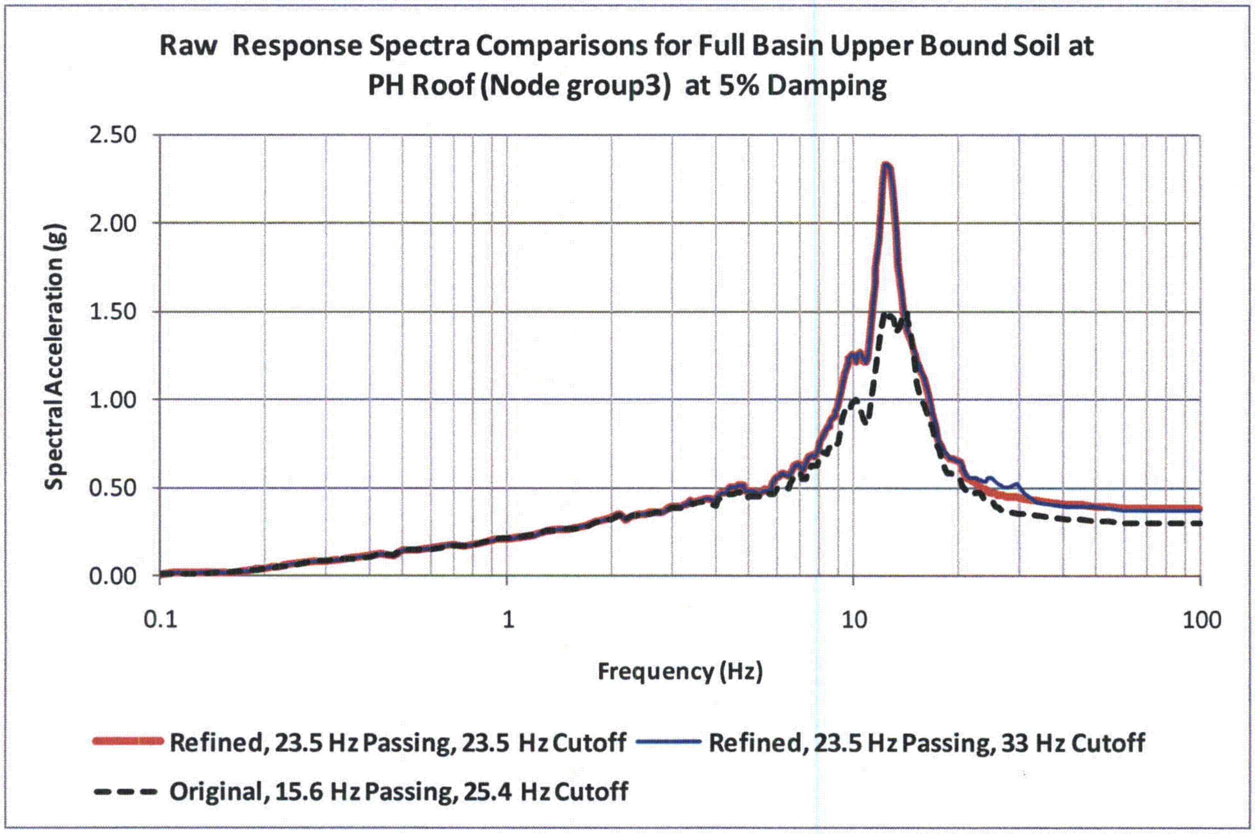


**Figure 03.07.02-24.29: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at PH Roof (Node group3), 5% Damping**

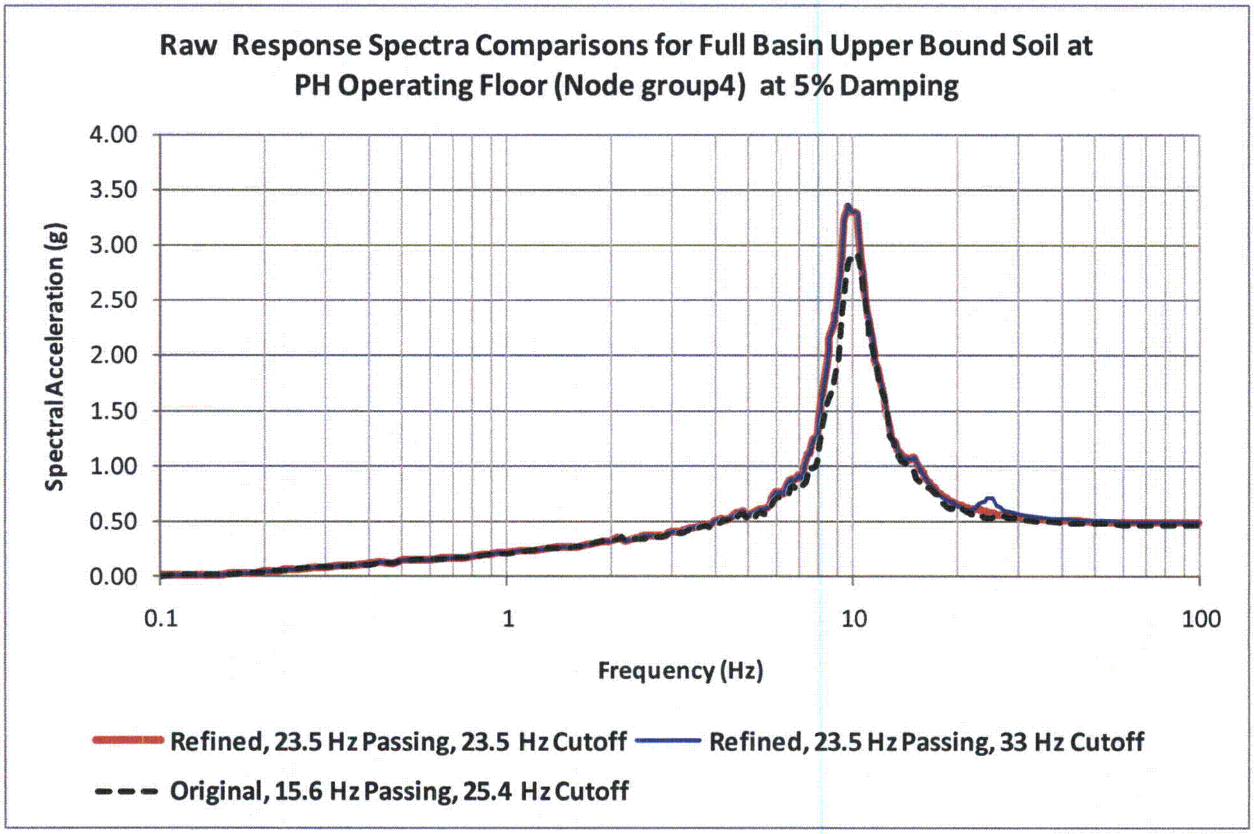


**Figure 03.07.02-24.30: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at PH Operating Floor (Node group4), 5% Damping**

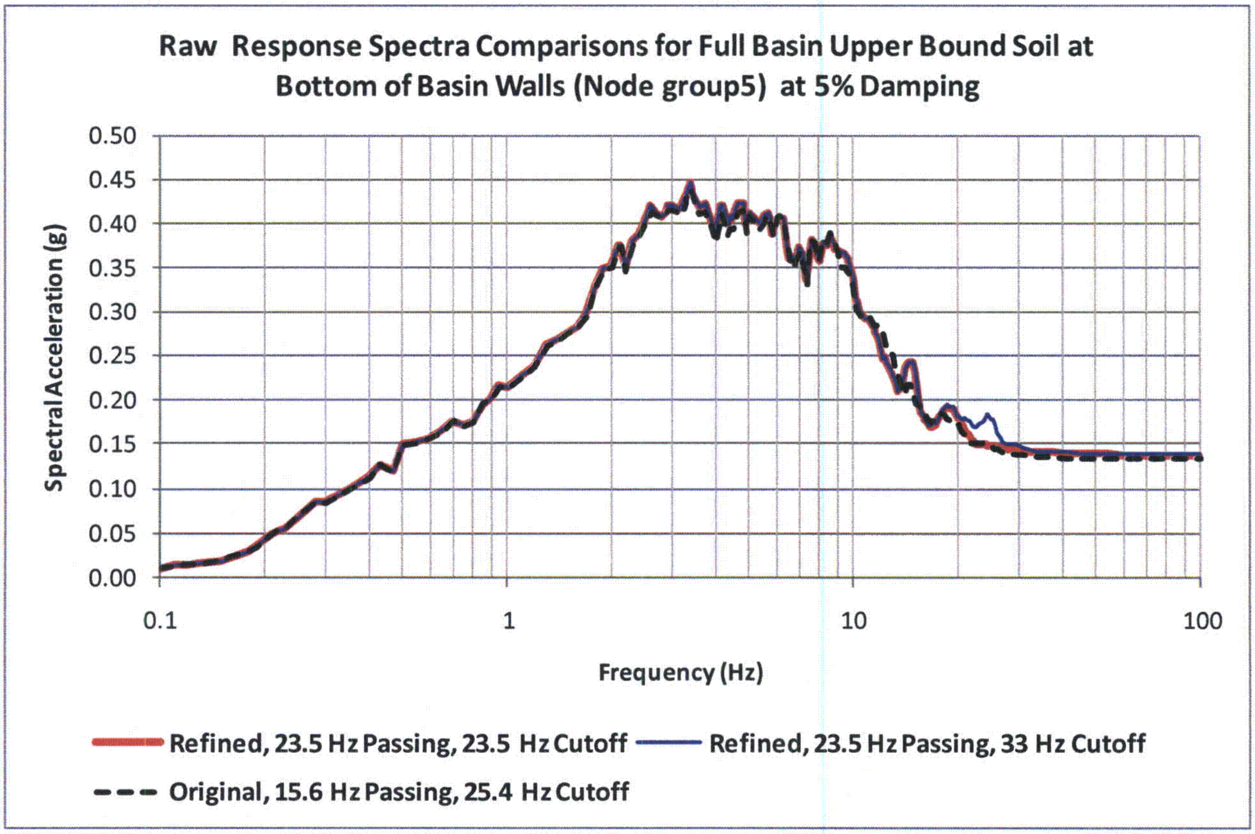


**Figure 03.07.02-24.31: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of Basin Walls (Node group5), 5% Damping**

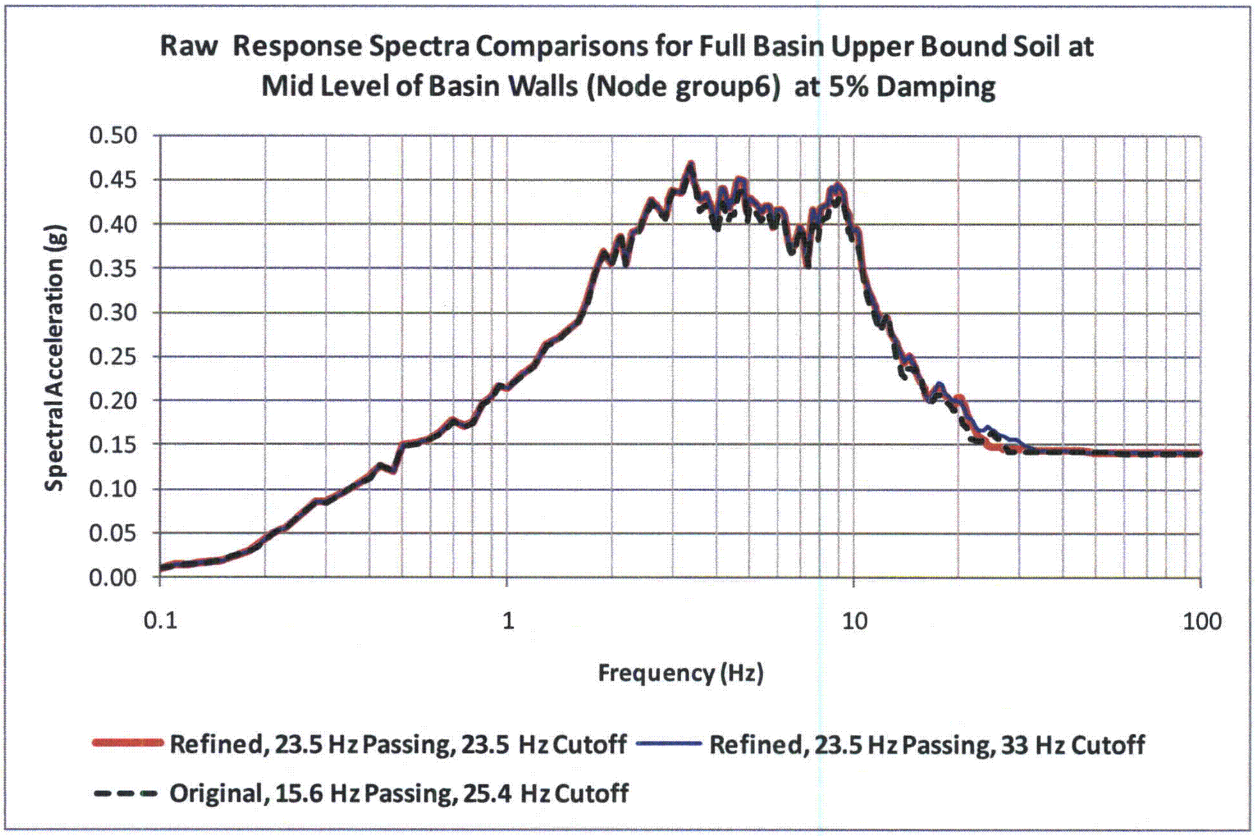


**Figure 03.07.02-24.32: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid Level of Basin Walls (Node group6), 5% Damping**

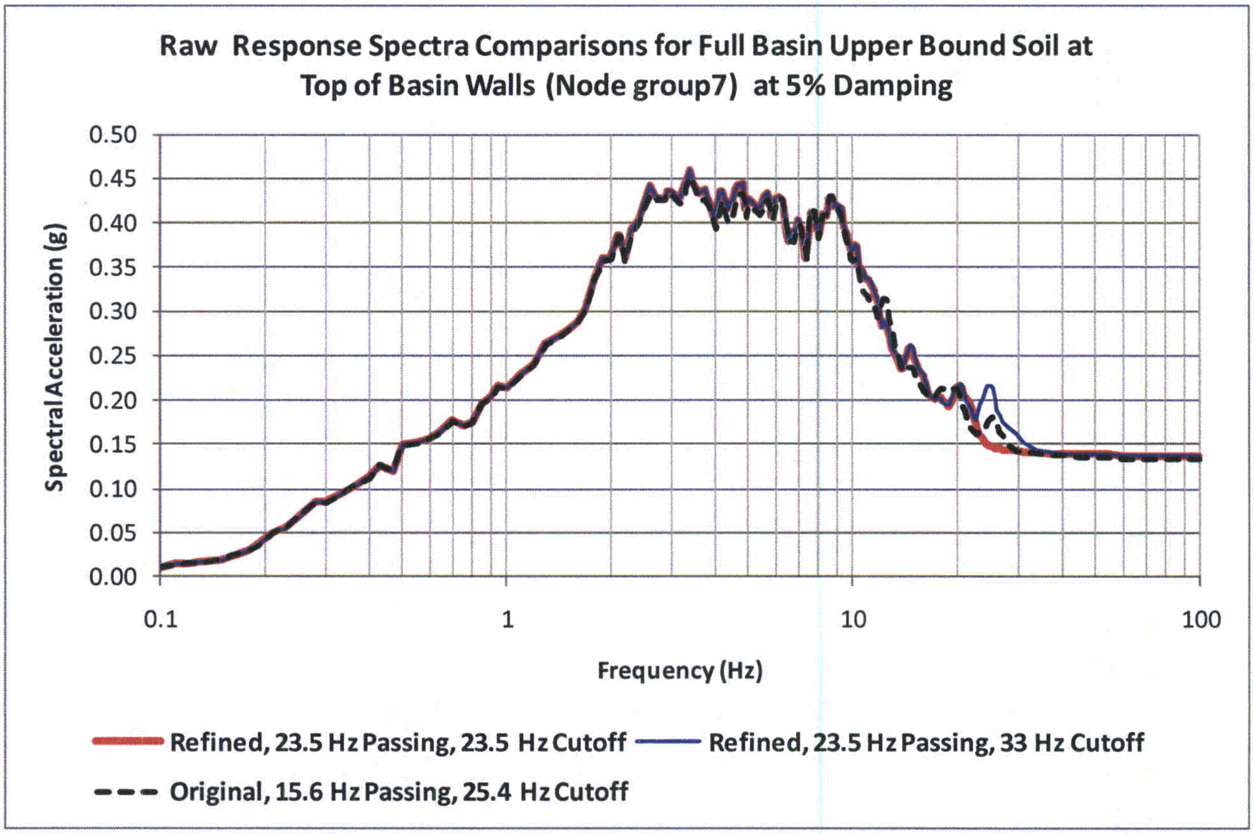


**Figure 03.07.02-24.33: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Top of Basin Walls (Node group7), 5% Damping**

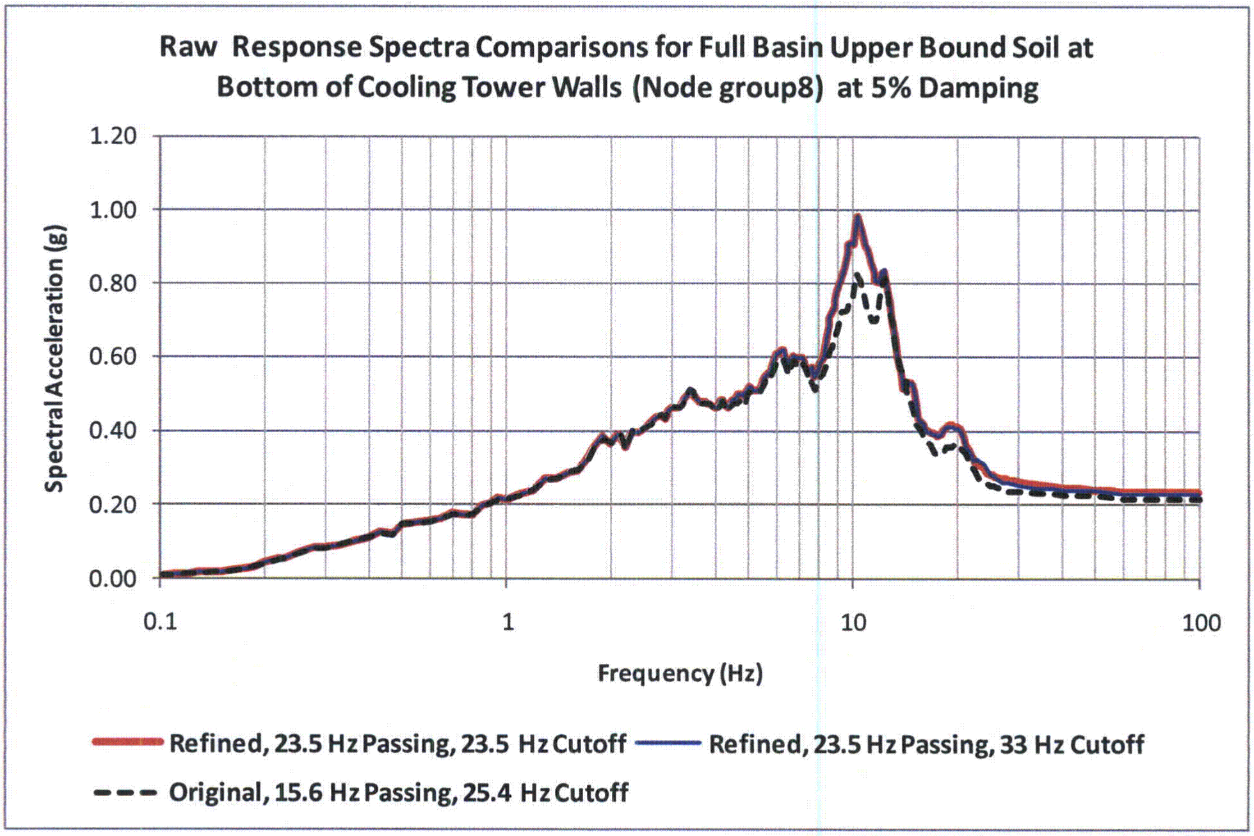


**Figure 03.07.02-24.34: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Bottom of Cooling Tower Walls (Node group8), 5% Damping**

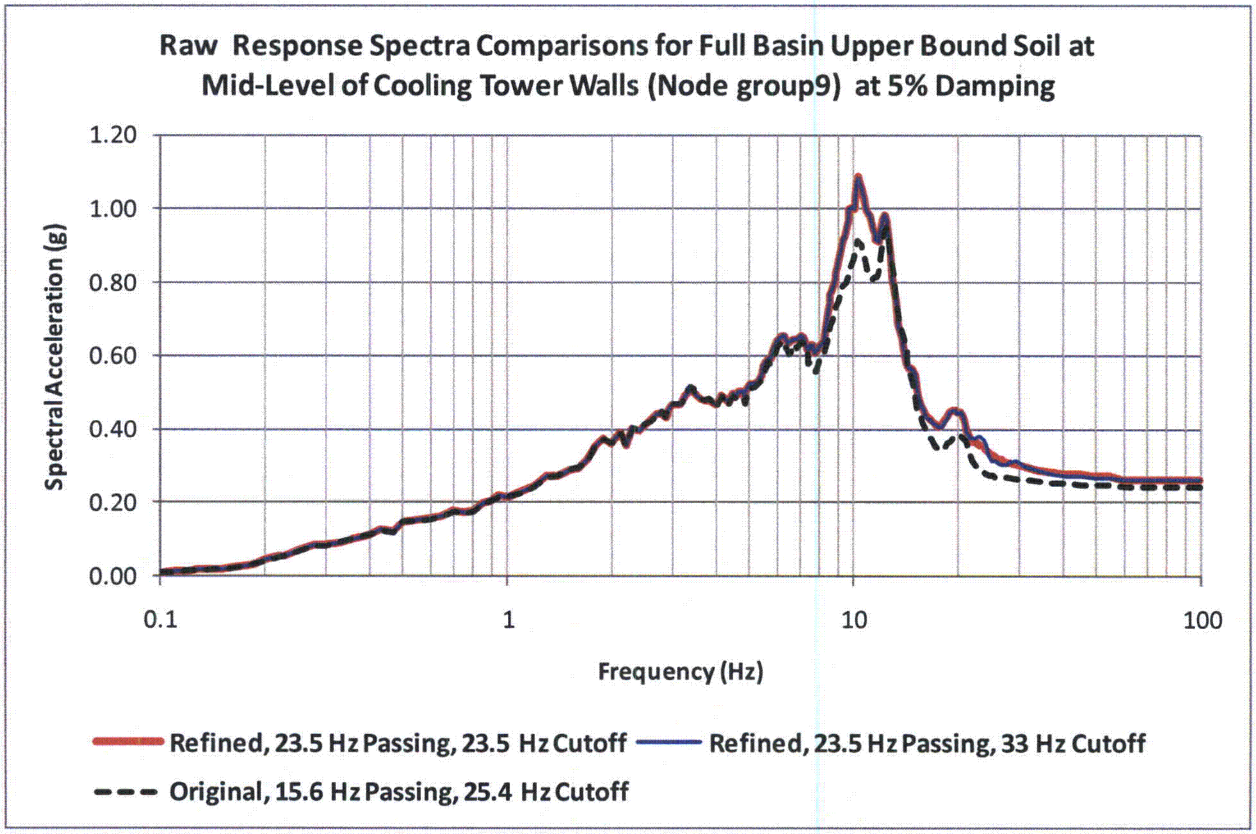


**Figure 03.07.02-24.35: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Mid-Level of Cooling Tower Walls (Node group9), 5% Damping**

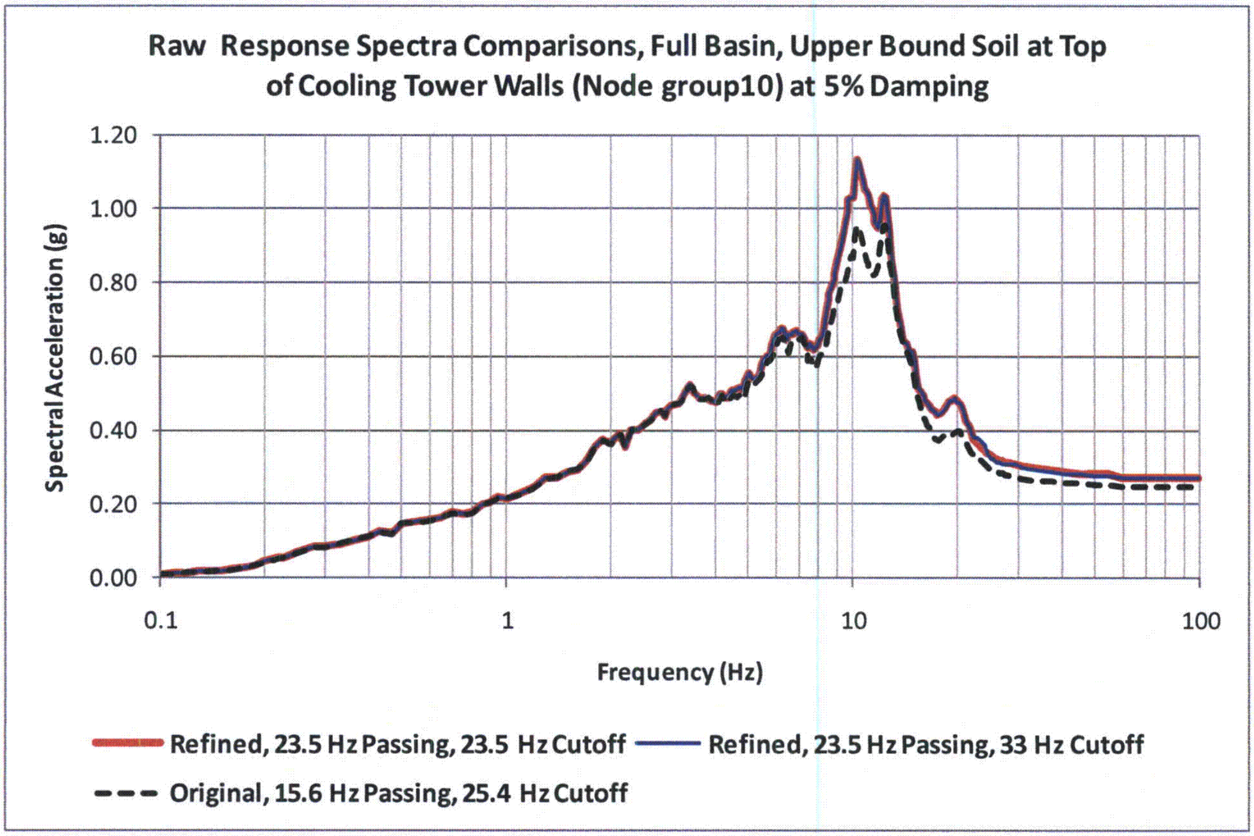


**Figure 03.07.02-24.36: Comparison of Z - Direction Raw Response Spectra, Full Basin, Upper Bound Soil at Top of Cooling Tower Walls (Node group10), 5% Damping**

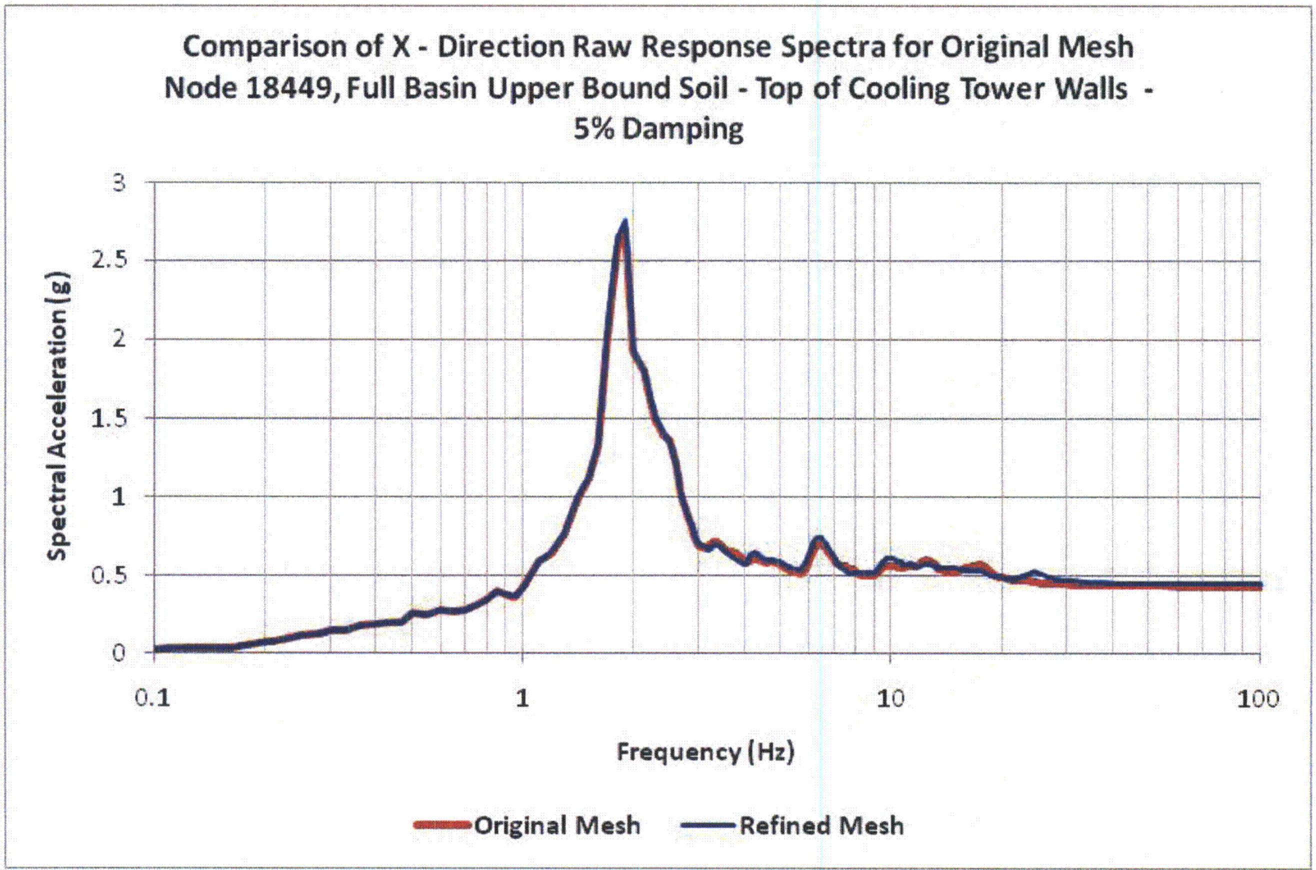


**Figure 03.07.02-24.37: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 18449, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

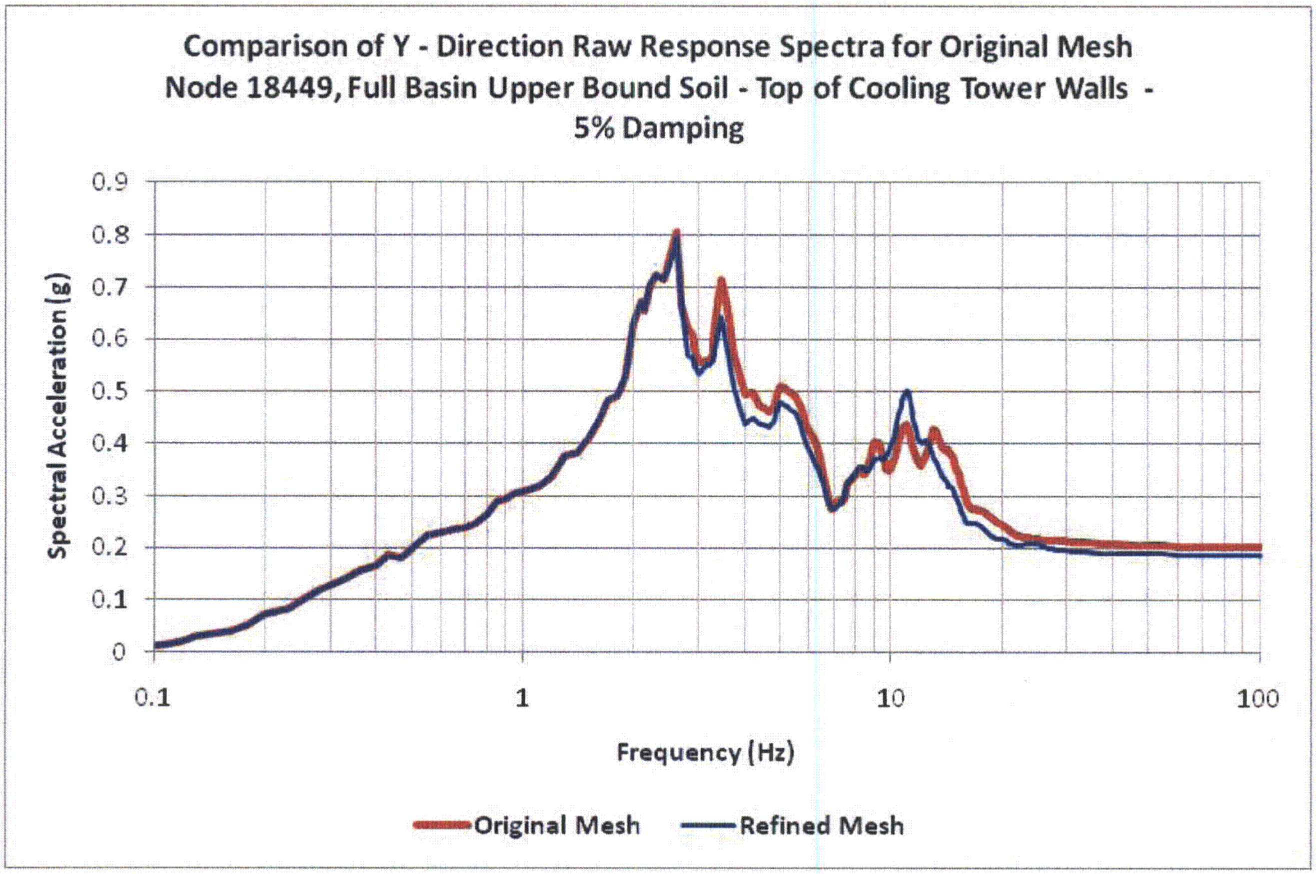


**Figure 03.07.02-24.38: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 18449, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

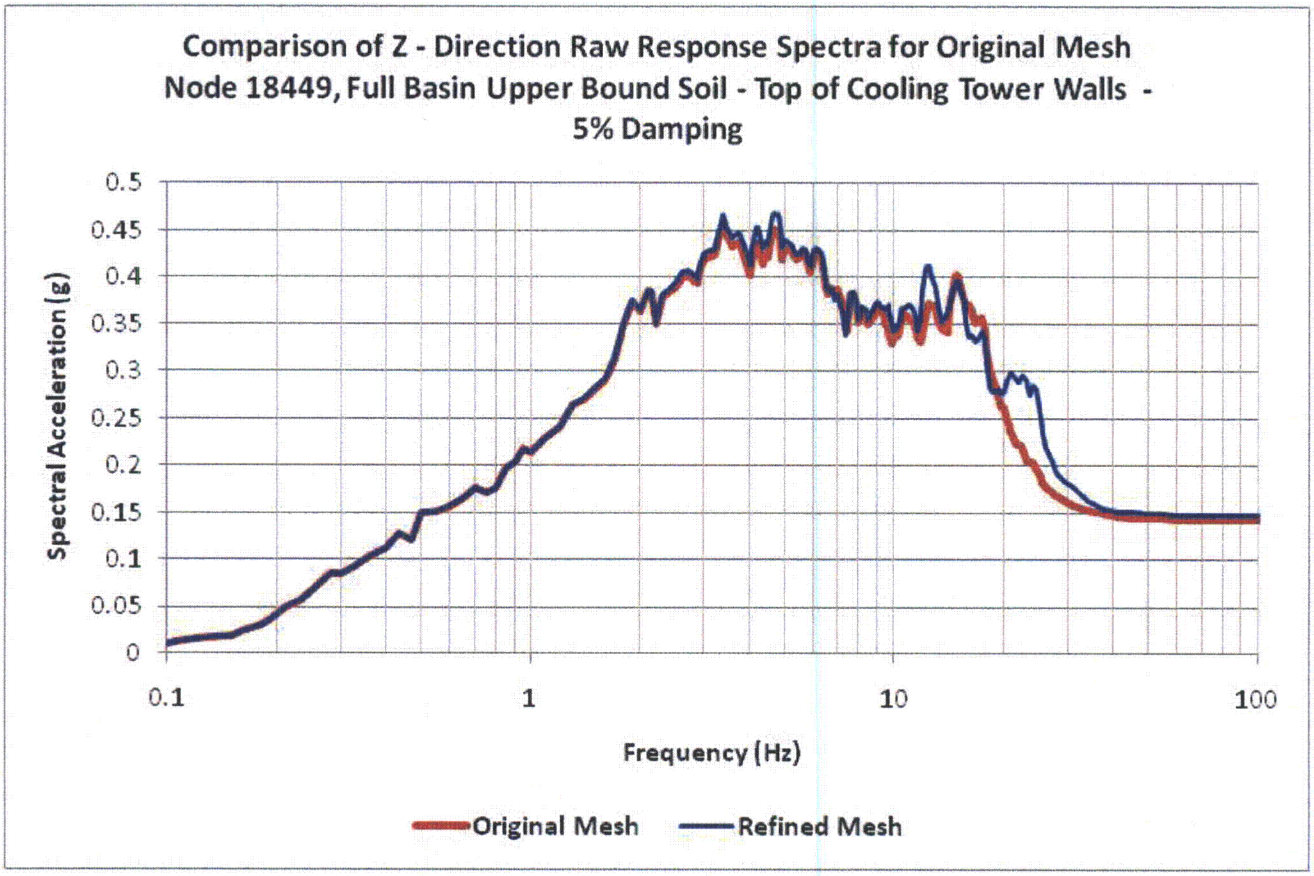


**Figure 03.07.02-24.39: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 18449, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

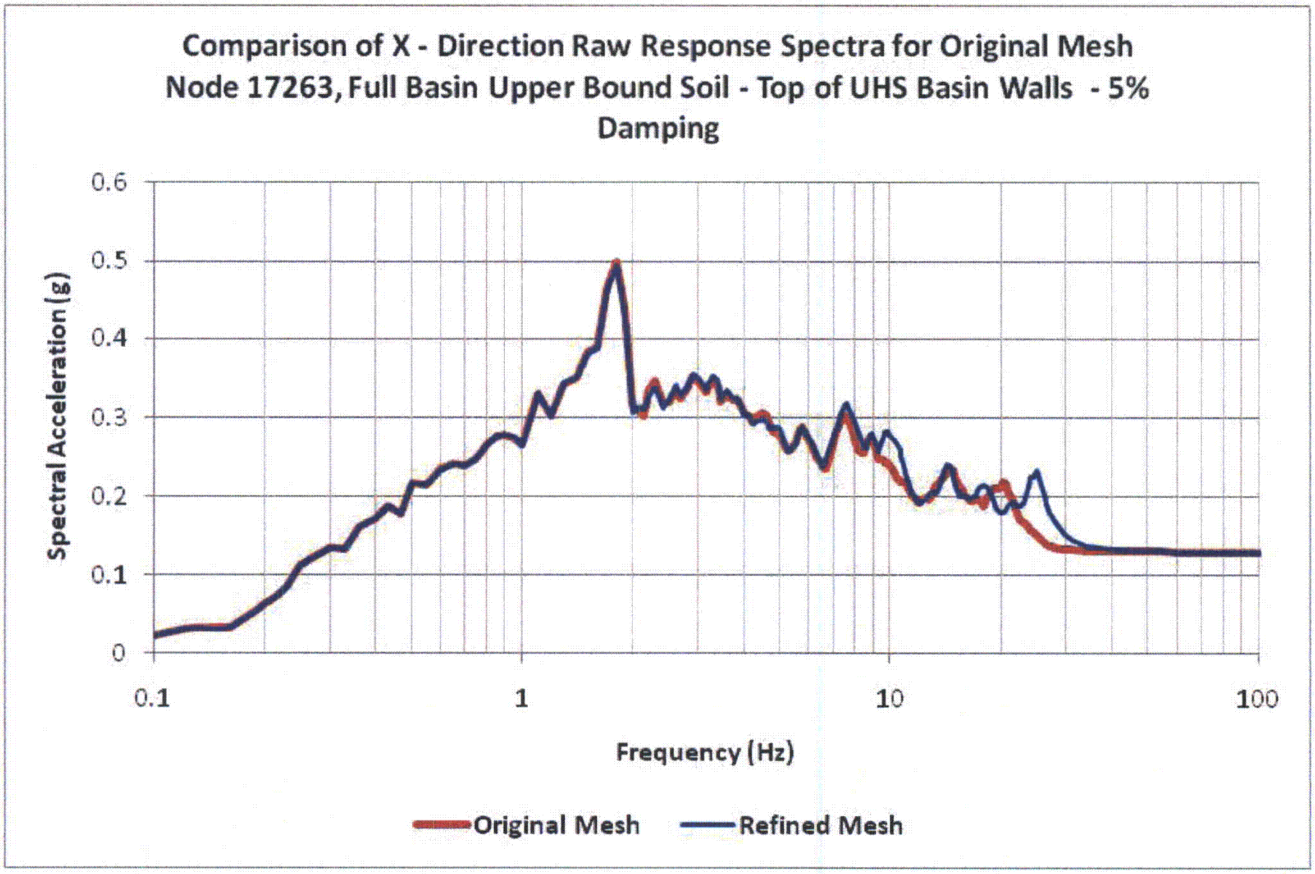


**Figure 03.07.02-24.40: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17263, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

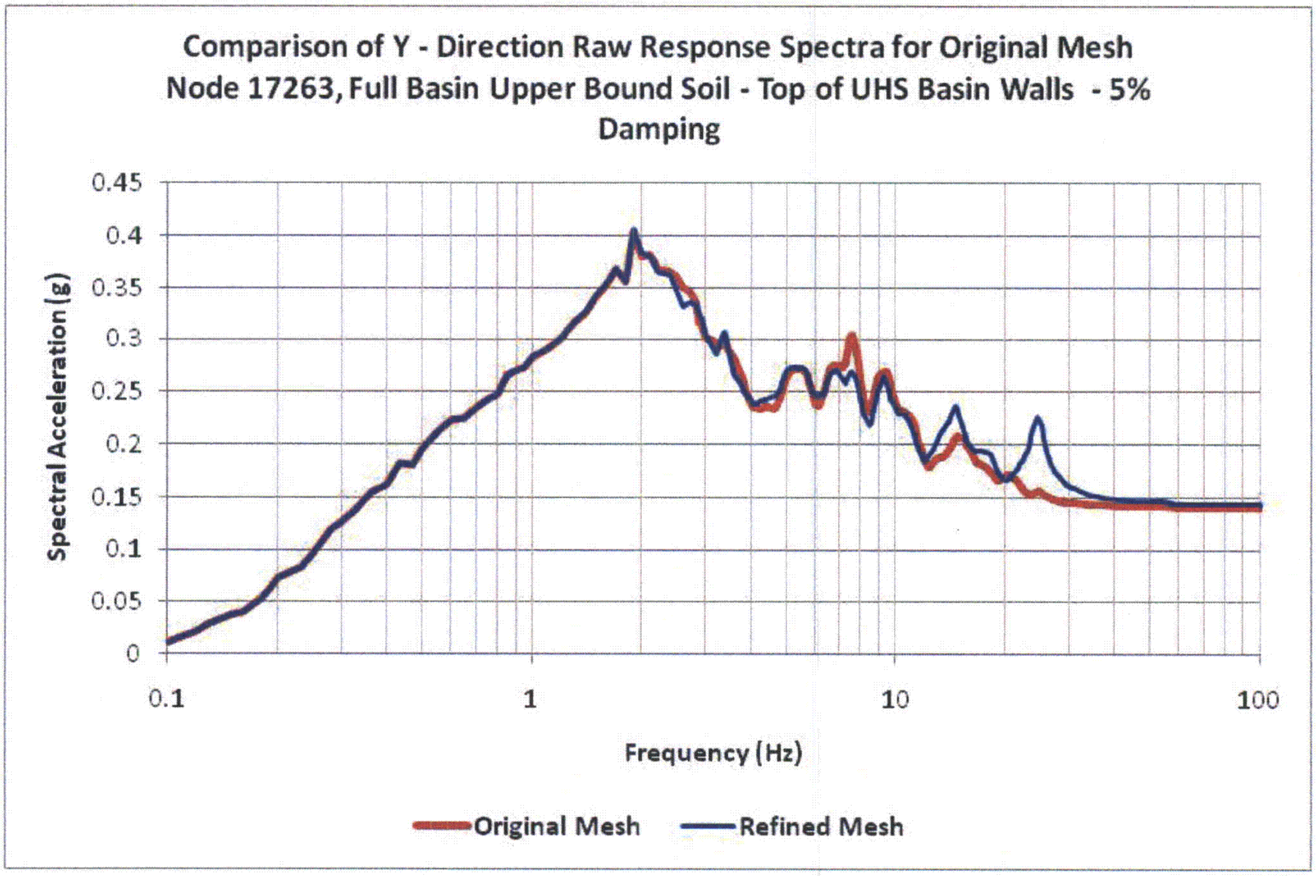


**Figure 03.07.02-24.41: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17263, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

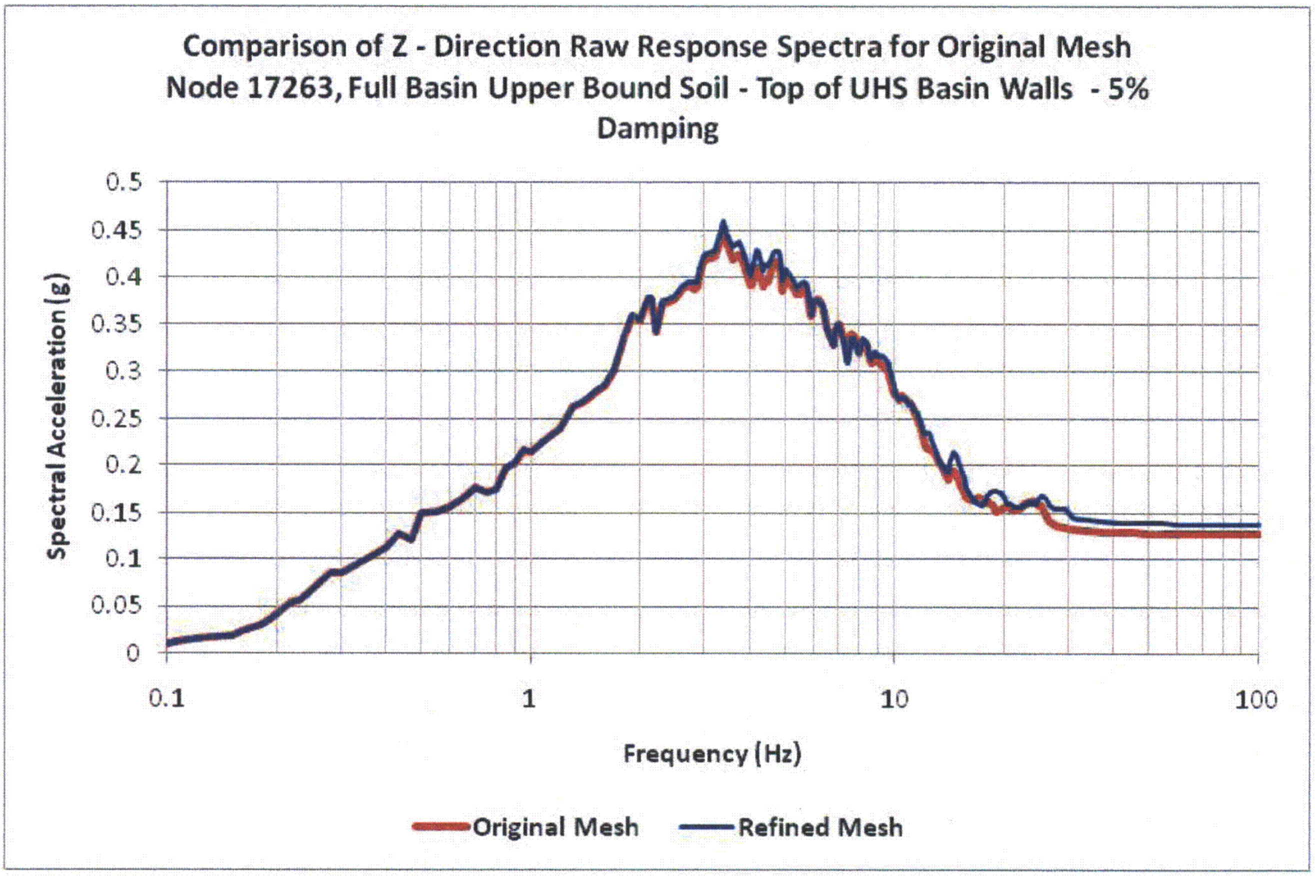


**Figure 03.07.02-24.42: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17263, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

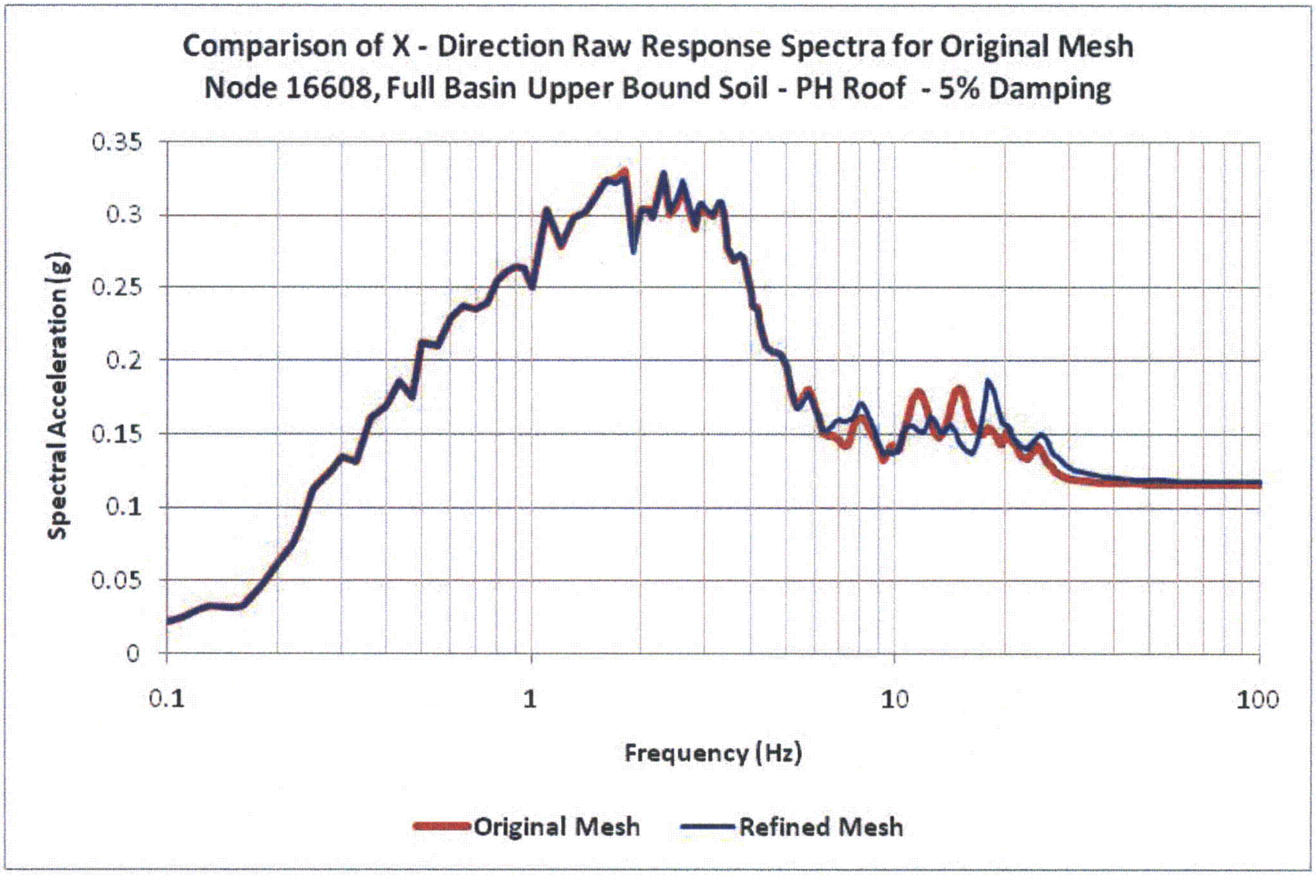


**Figure 03.07.02-24.43: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16608, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

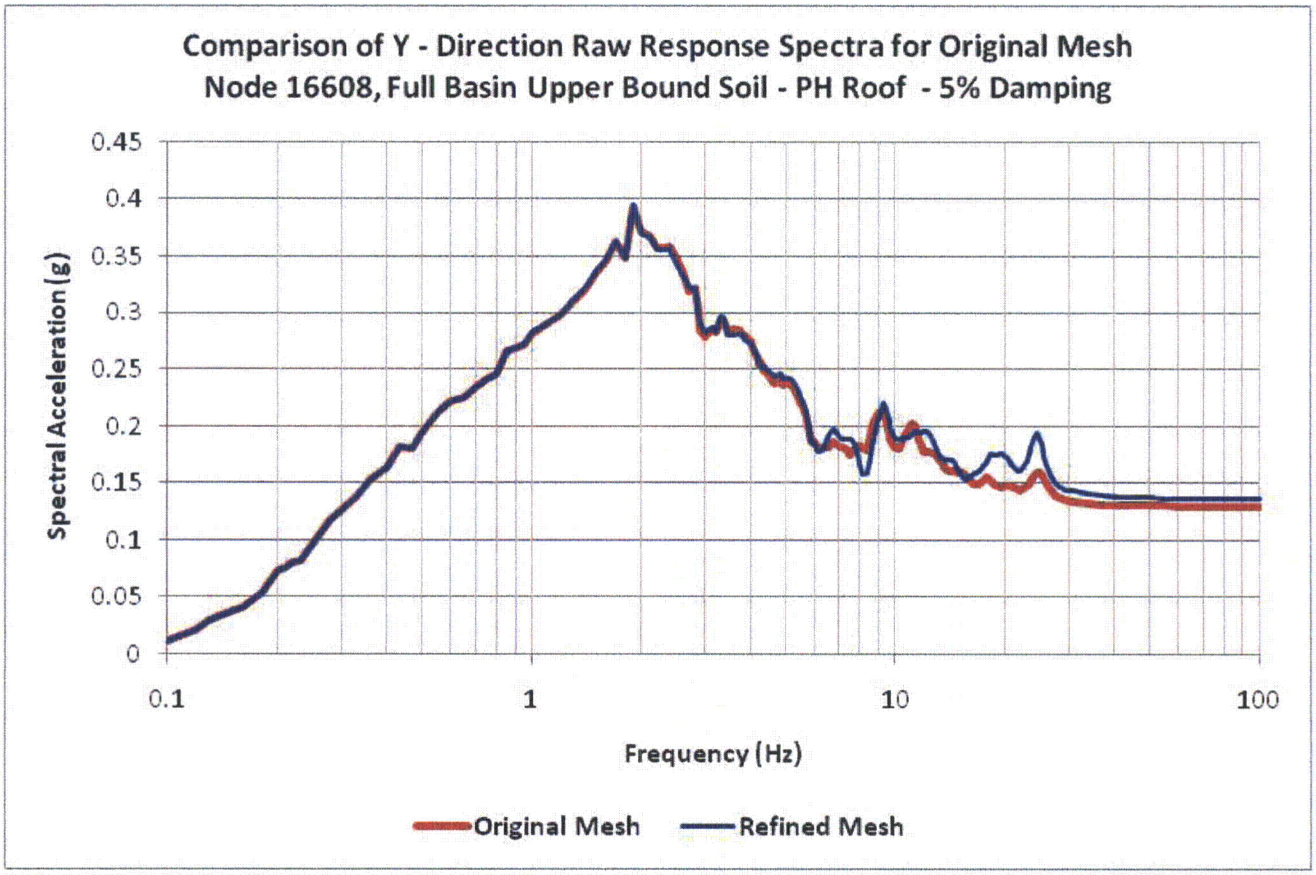


**Figure 03.07.02-24.44: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16608, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

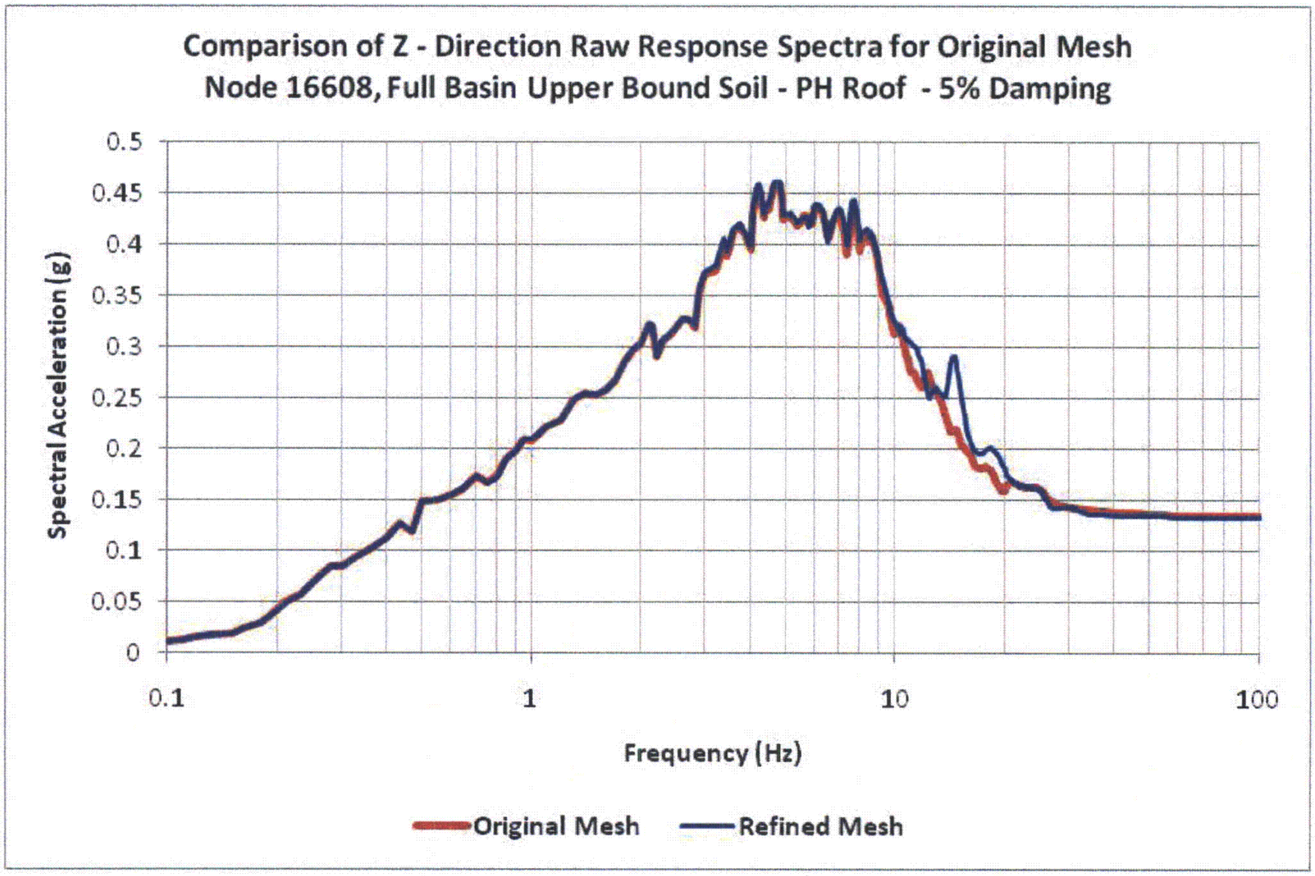


**Figure 03.07.02-24.45: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16608, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

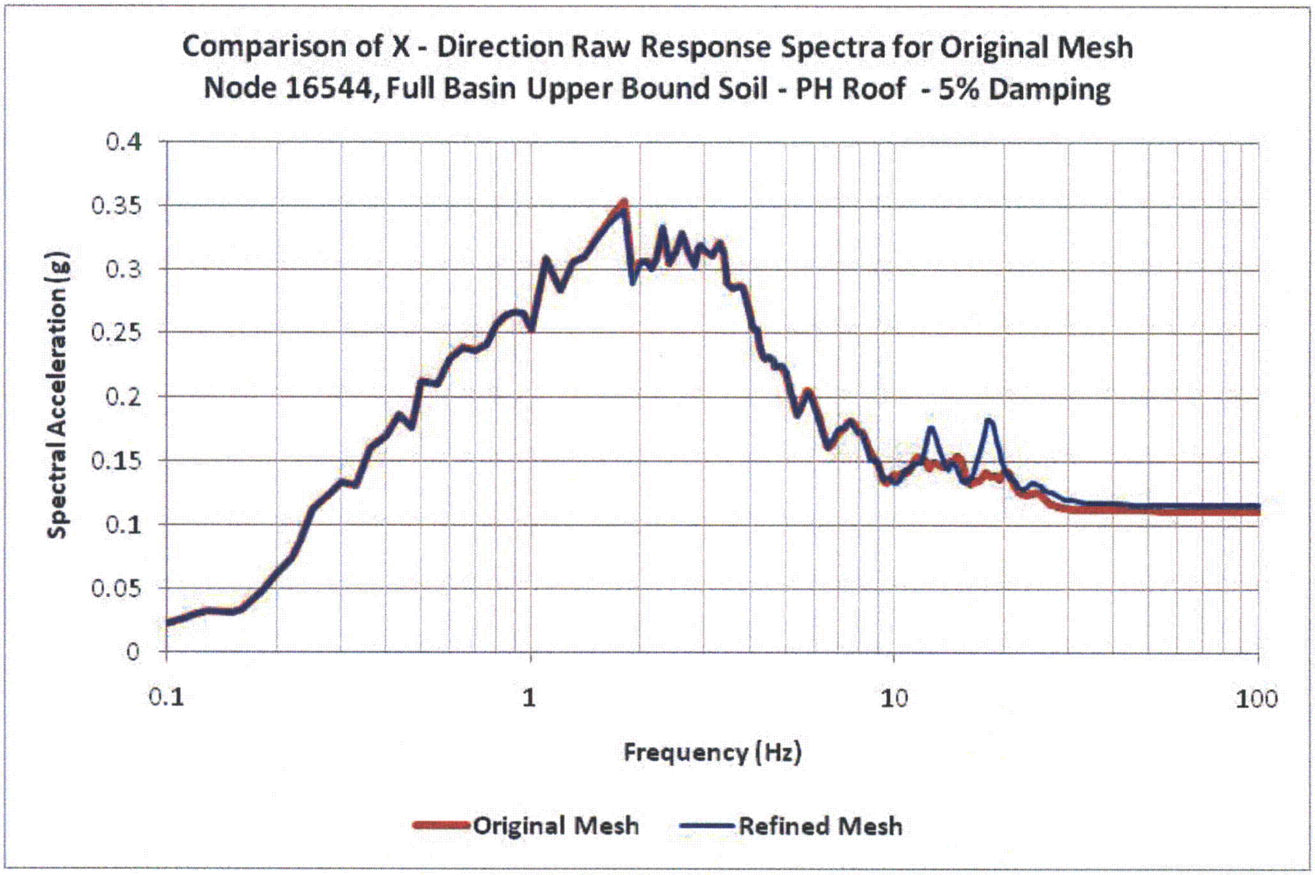


**Figure 03.07.02-24.46: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16544, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

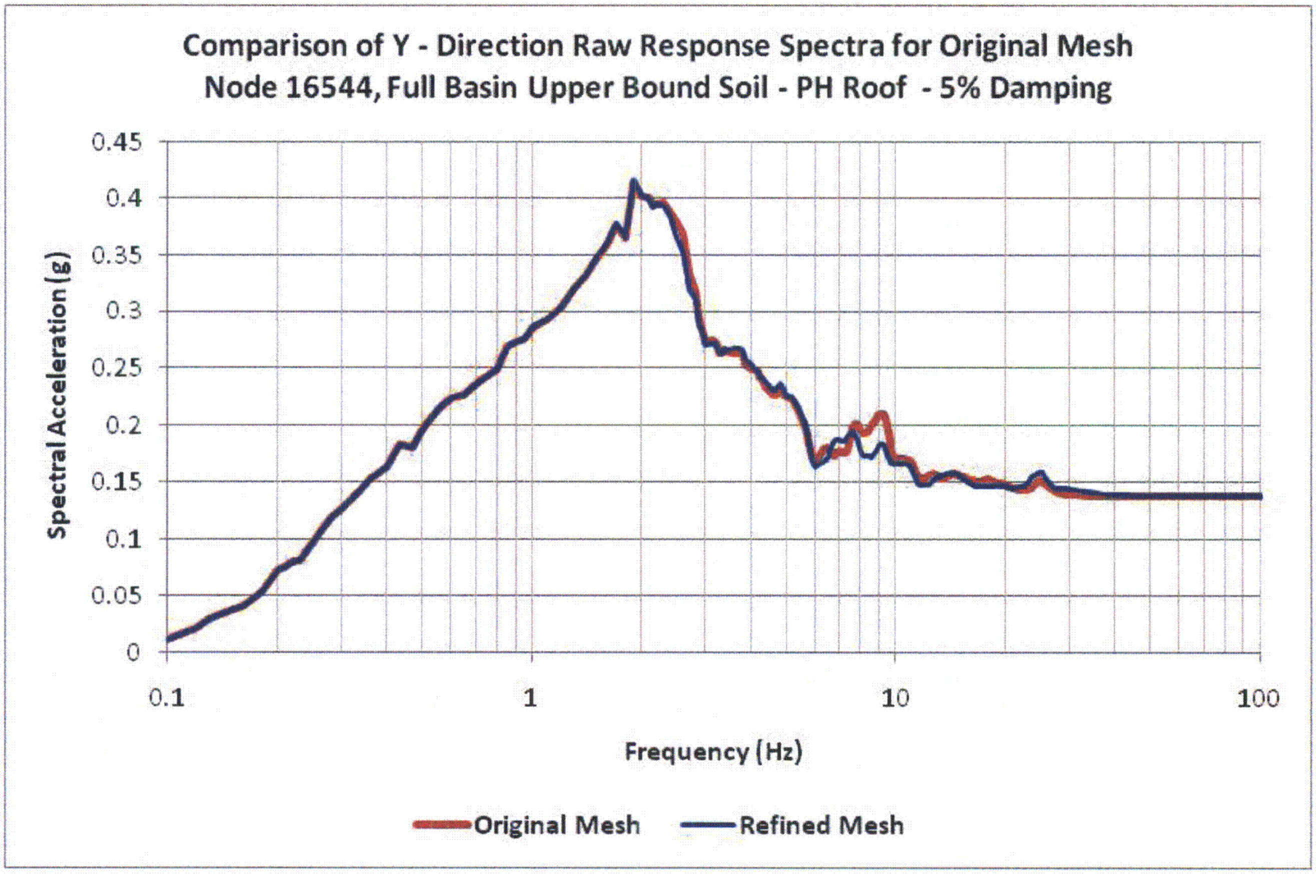


**Figure 03.07.02-24.47: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16544, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

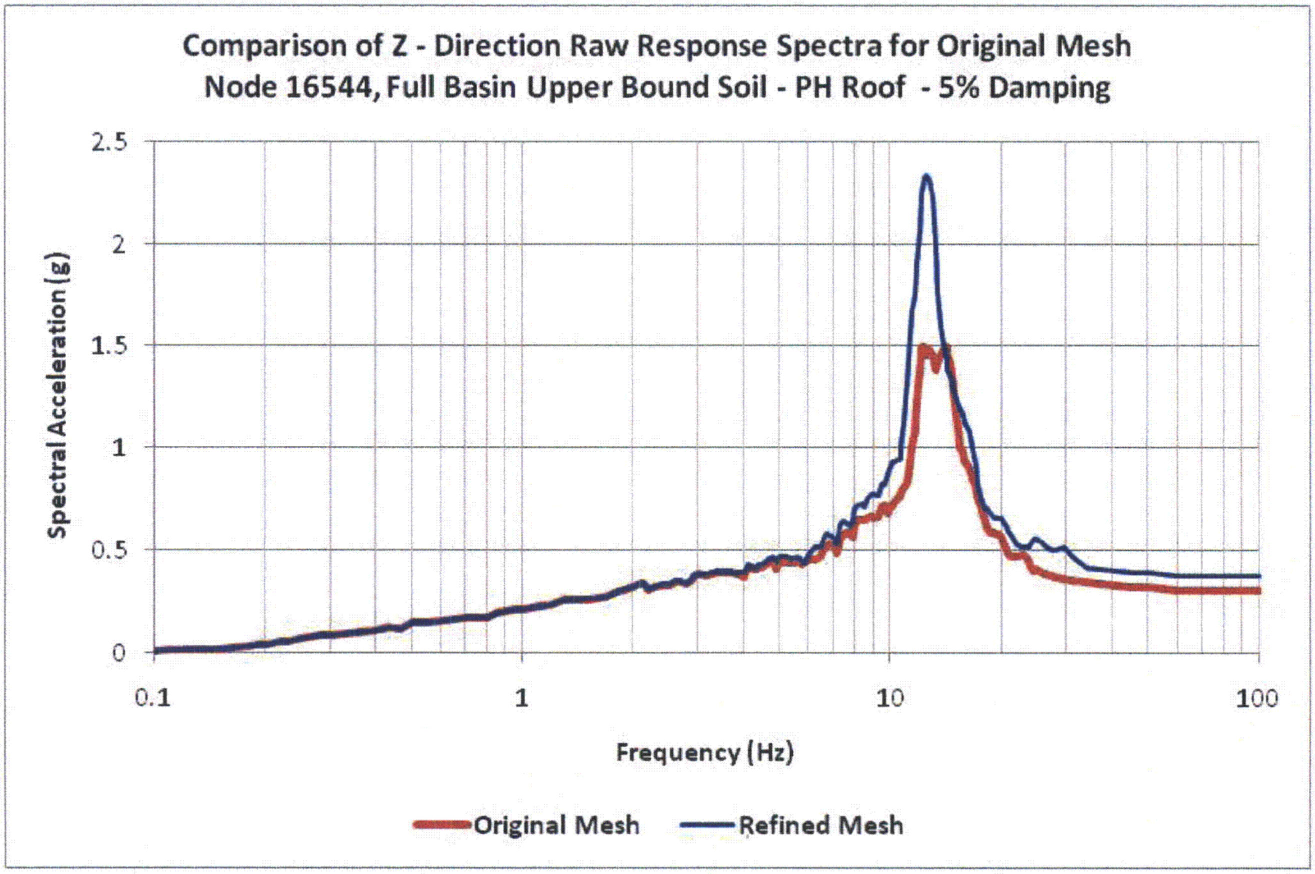


**Figure 03.07.02-24.48: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16544, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

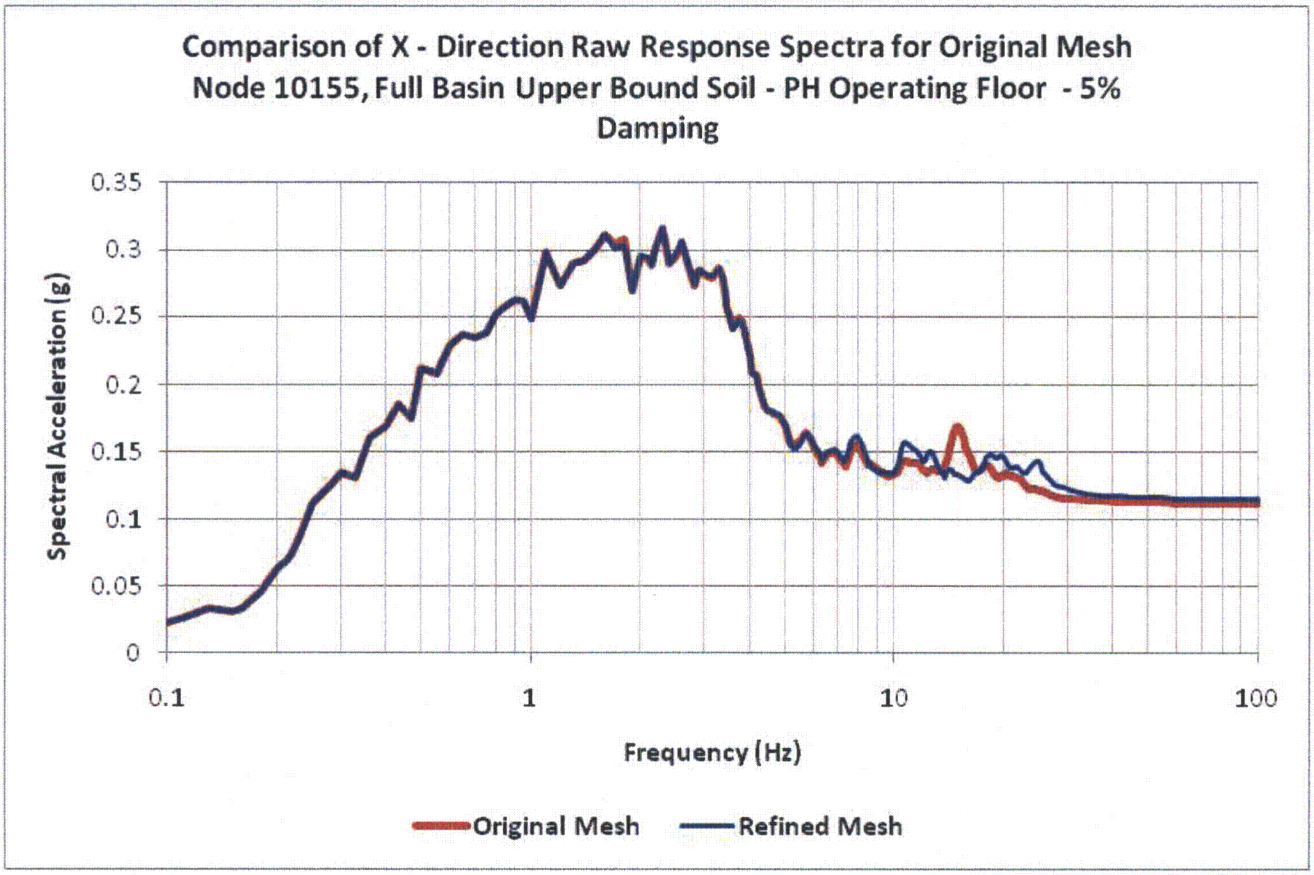


**Figure 03.07.02-24.49: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 10155, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

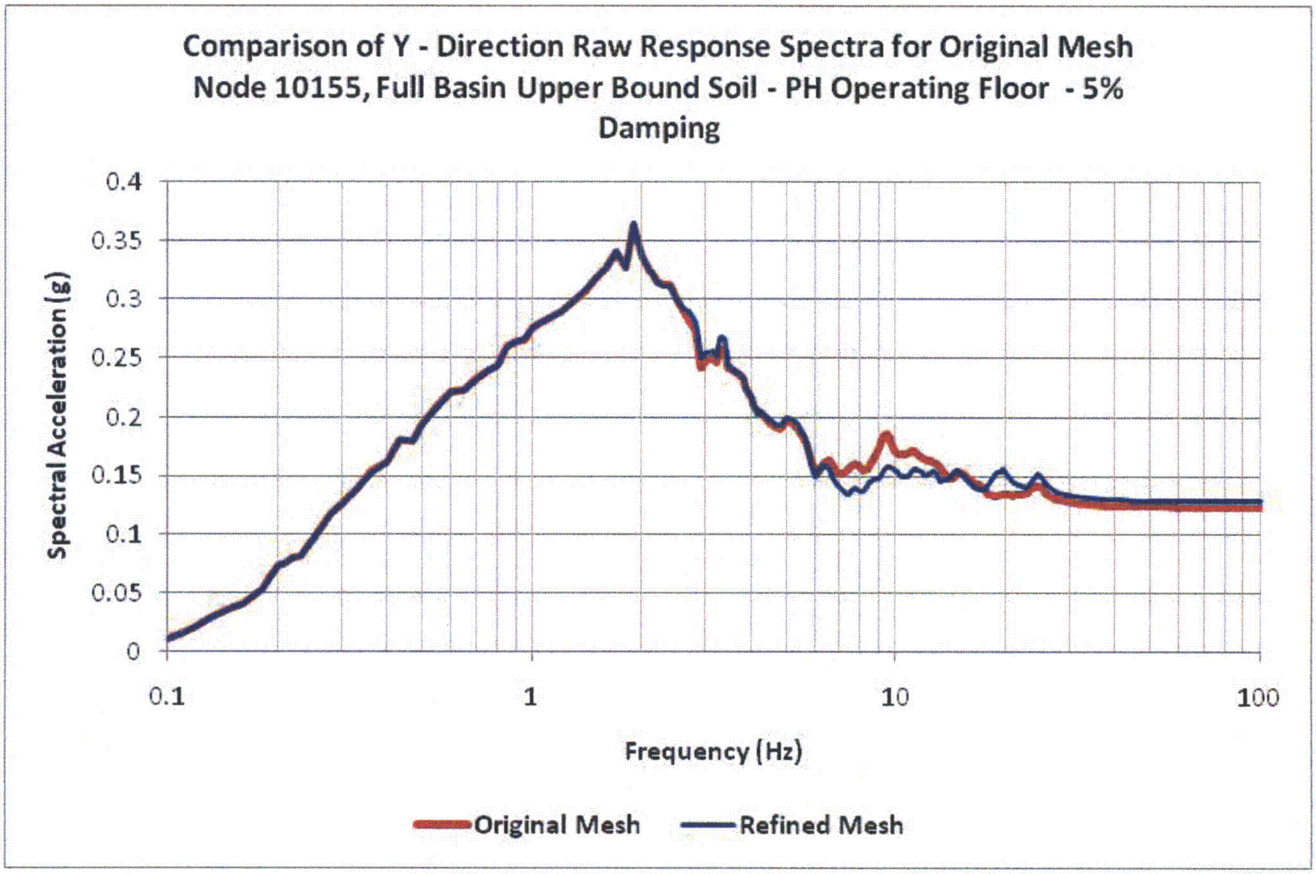


**Figure 03.07.02-24.50: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 10155, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

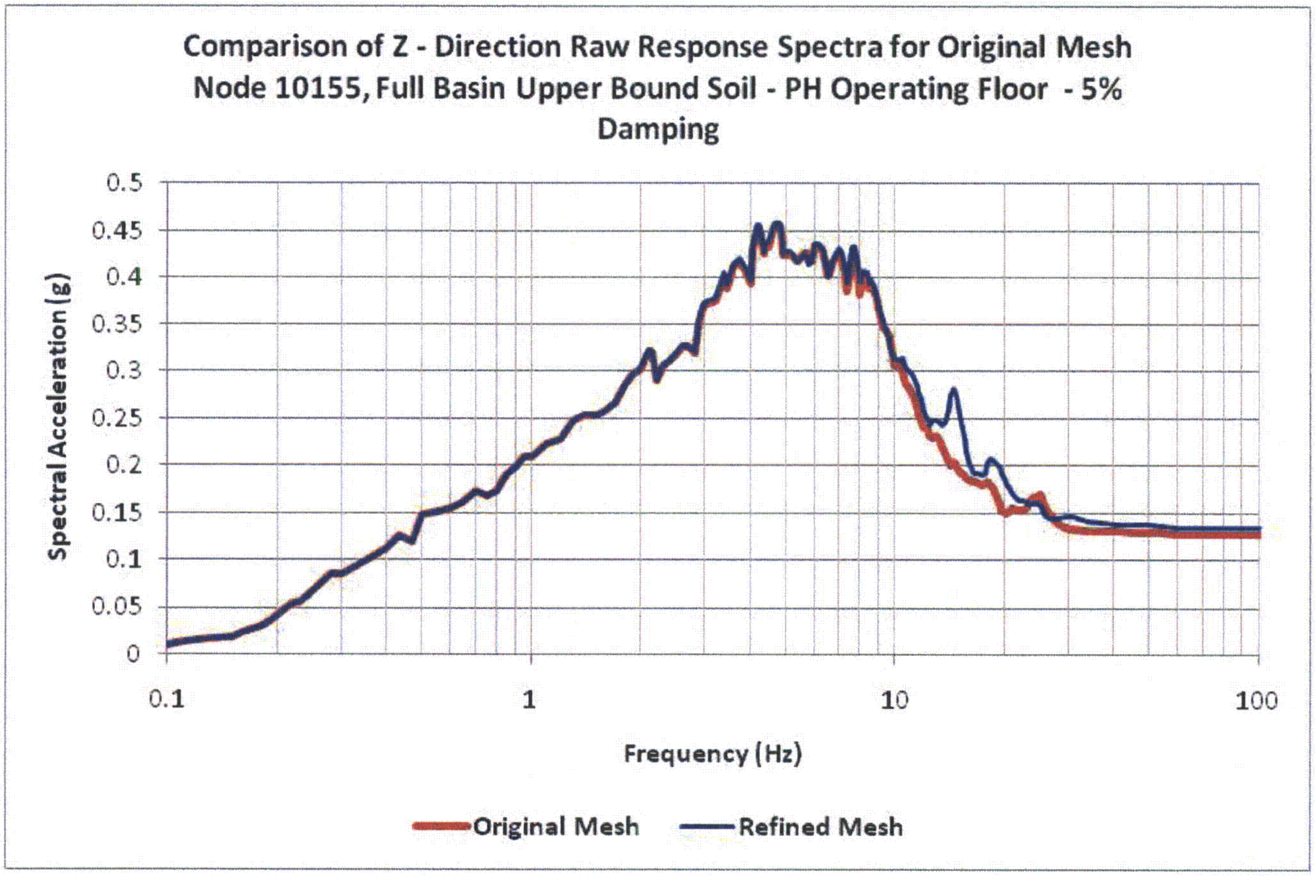


**Figure 03.07.02-24.51: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 10155, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

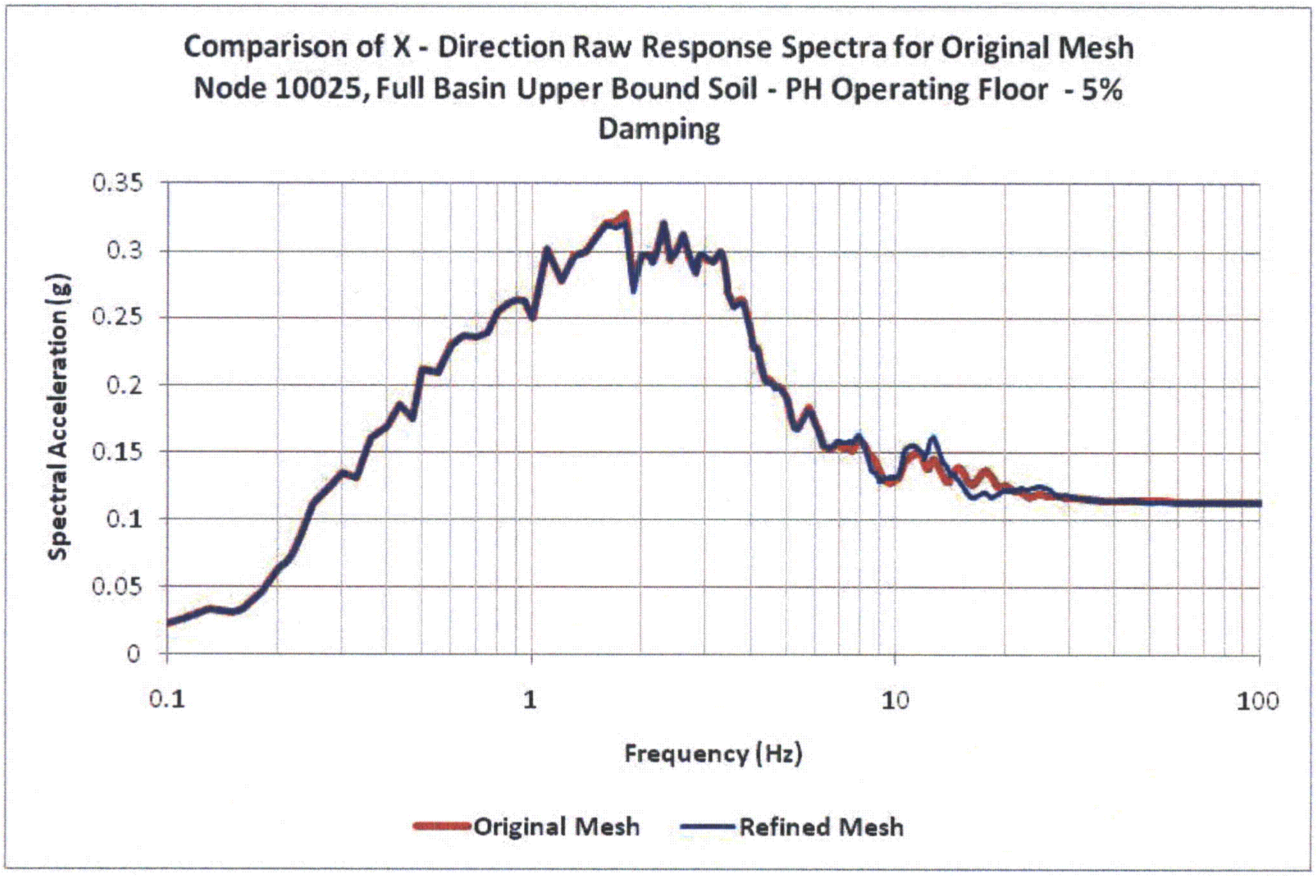


**Figure 03.07.02-24.52: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 10025, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

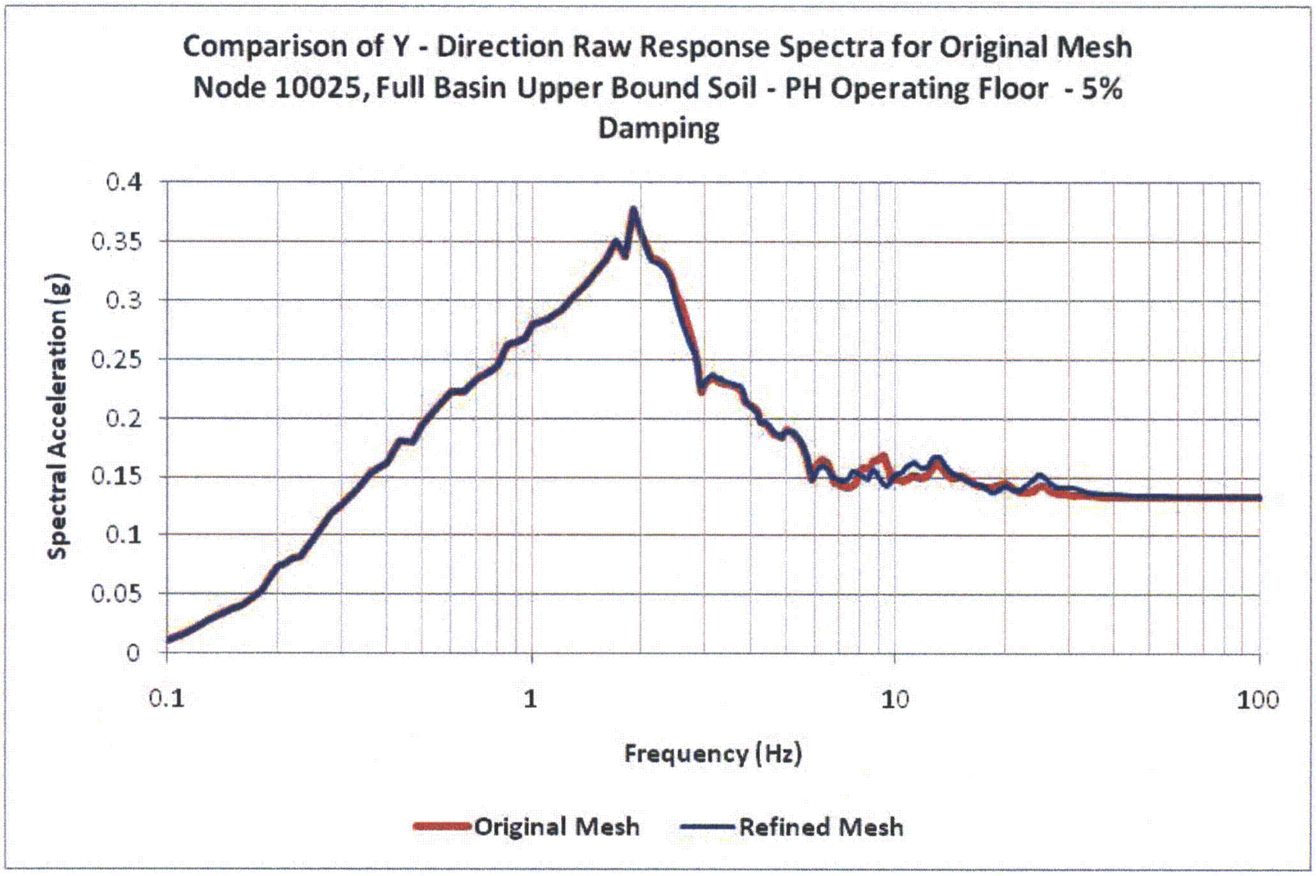


**Figure 03.07.02-24.53: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 10025, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

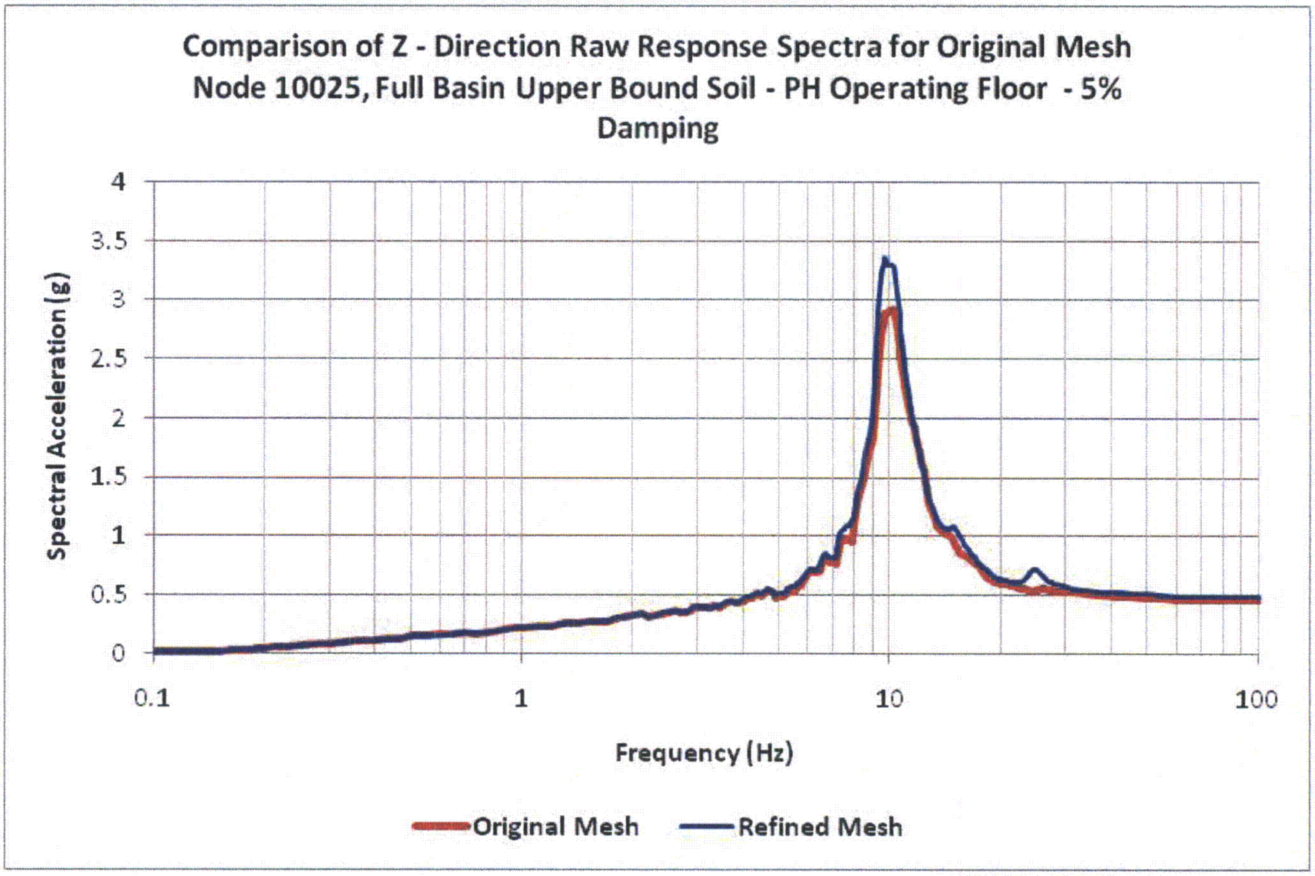


**Figure 03.07.02-24.54: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 10025, Full Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

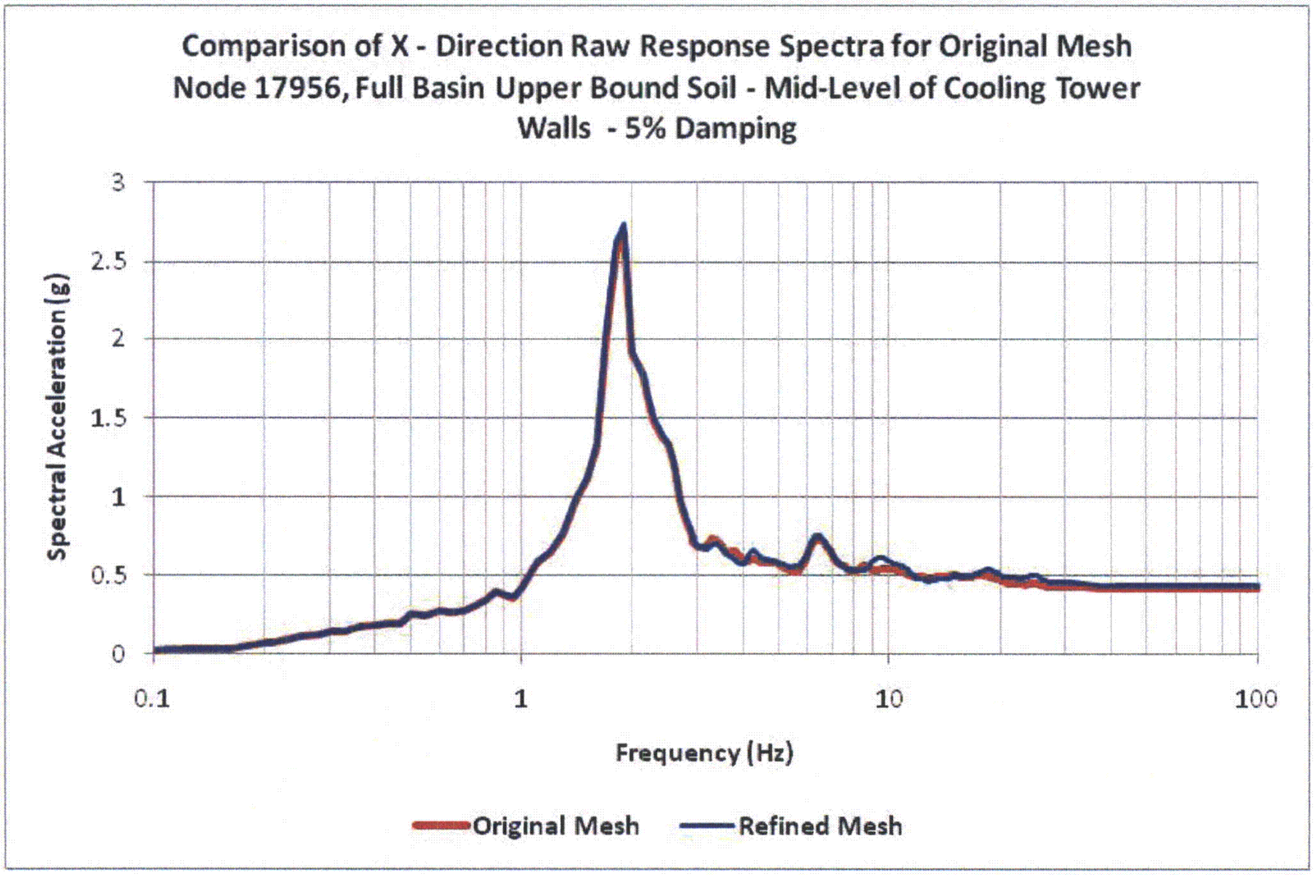


**Figure 03.07.02-24.55: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17956, Full Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

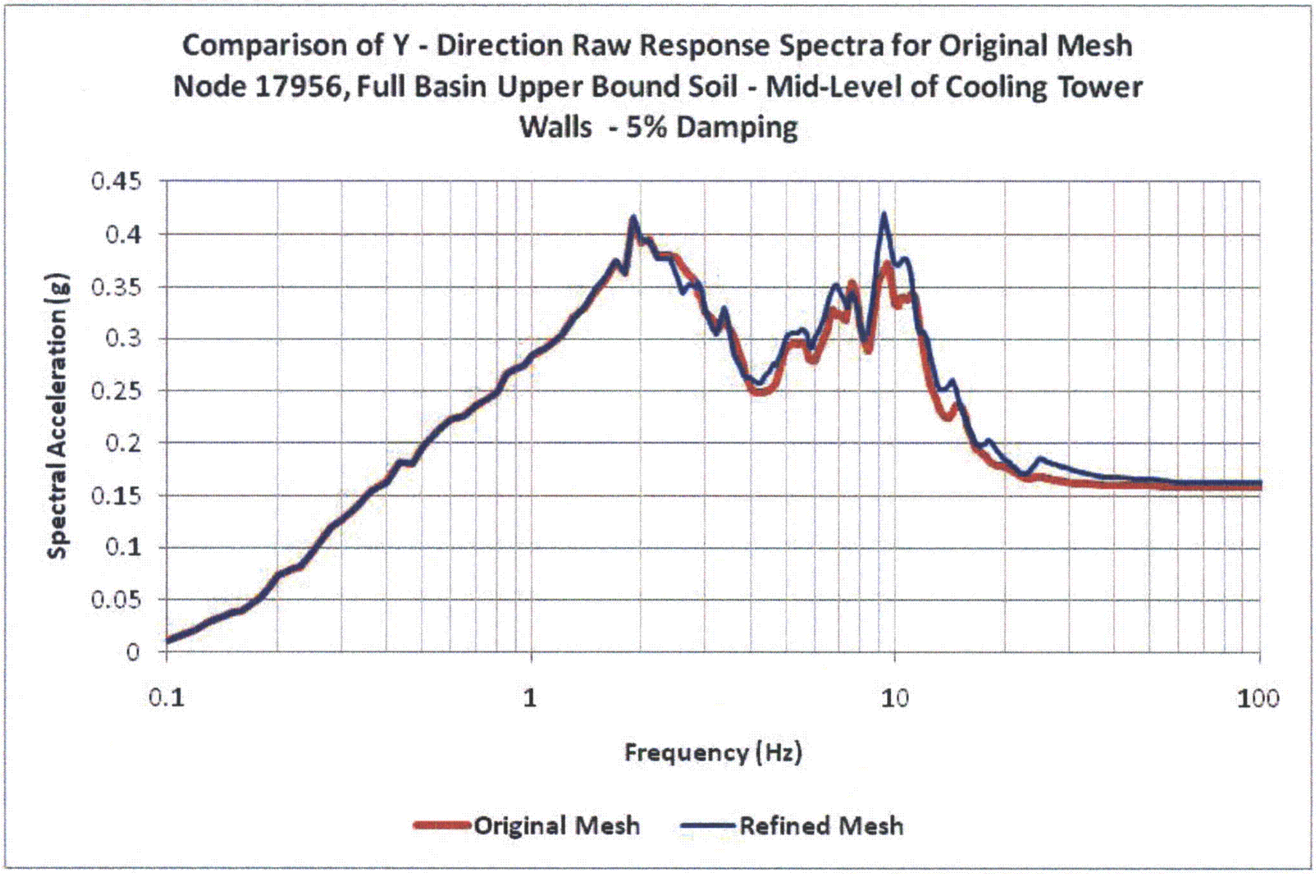


**Figure 03.07.02-24.56: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17956, Full Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

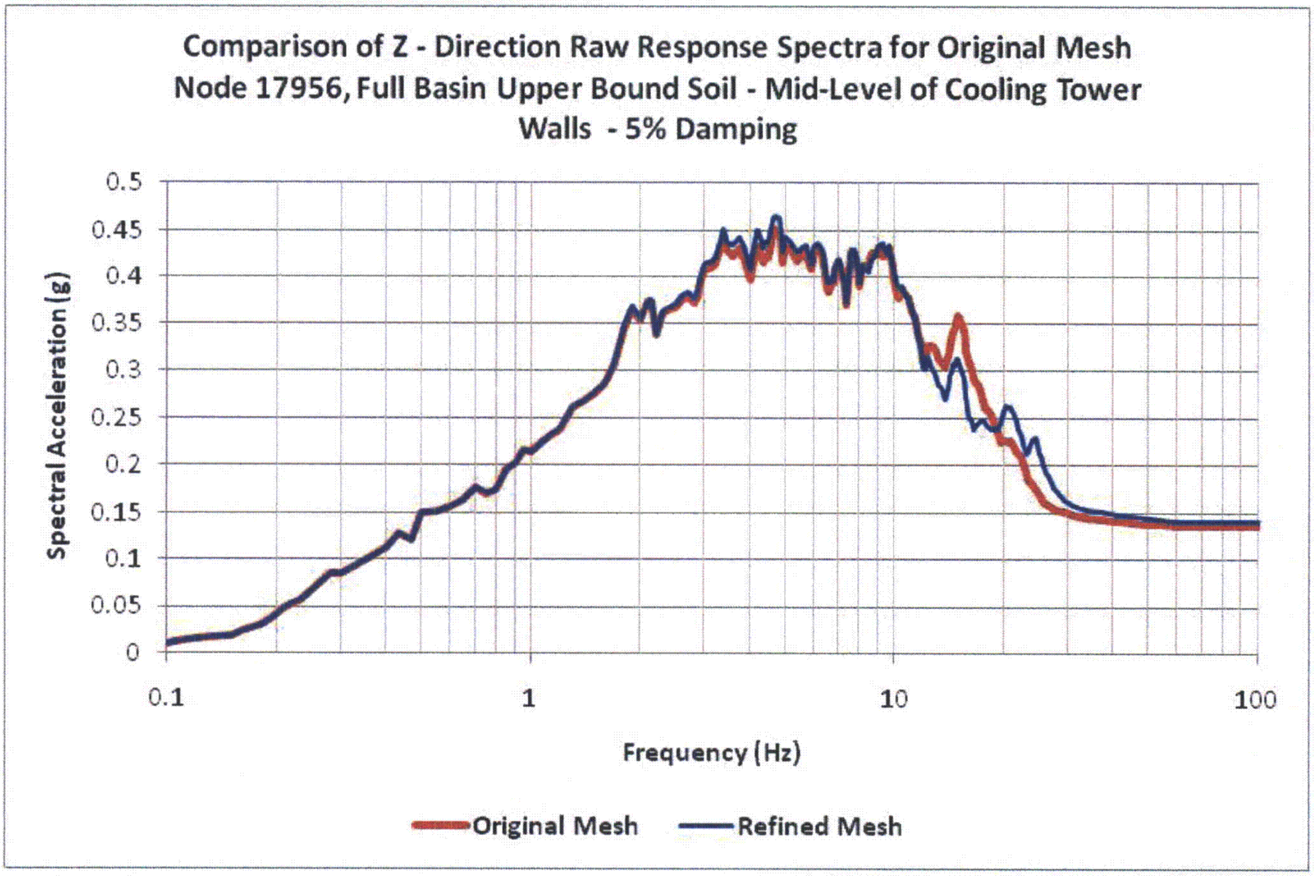


**Figure 03.07.02-24.57: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17956, Full Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

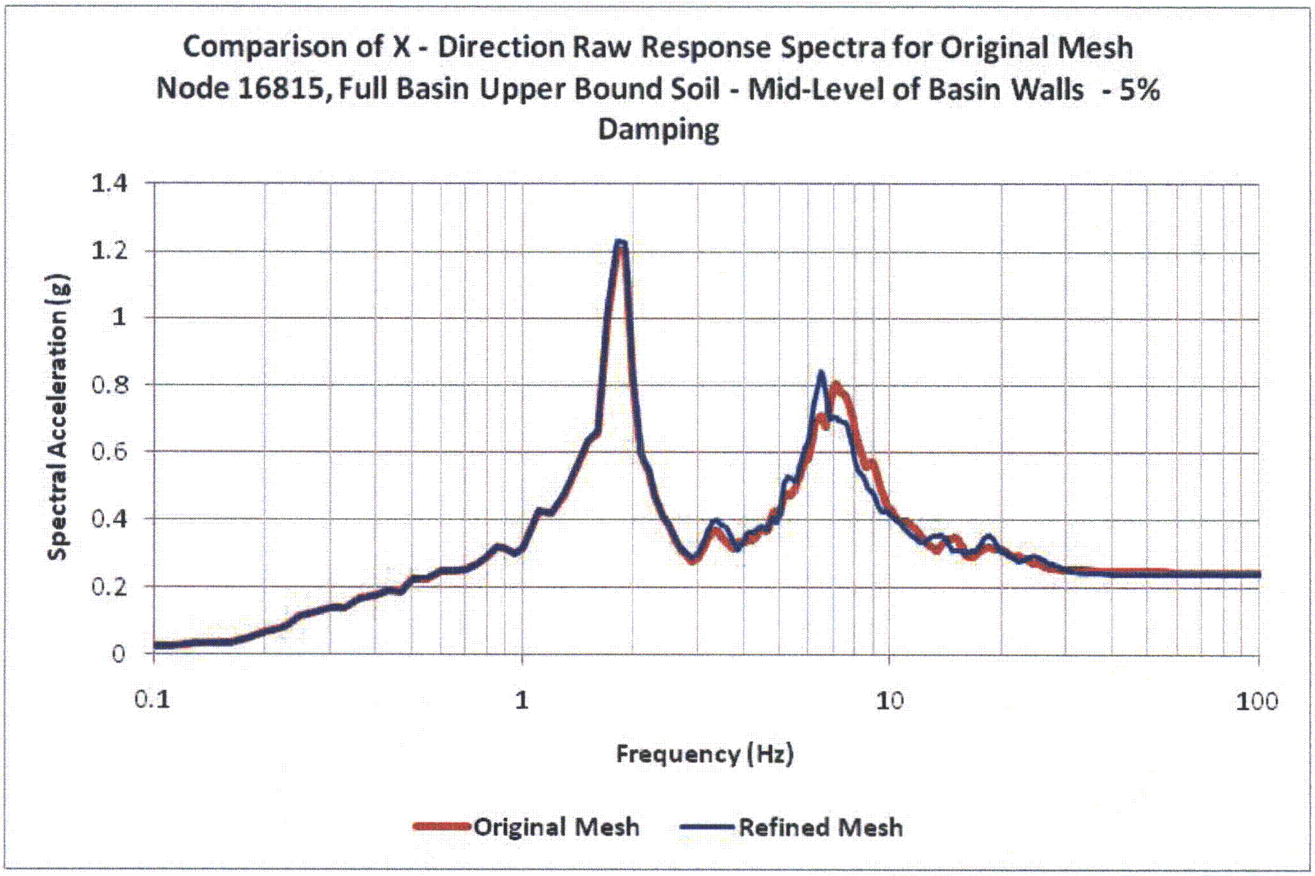


**Figure 03.07.02-24.58: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16815, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

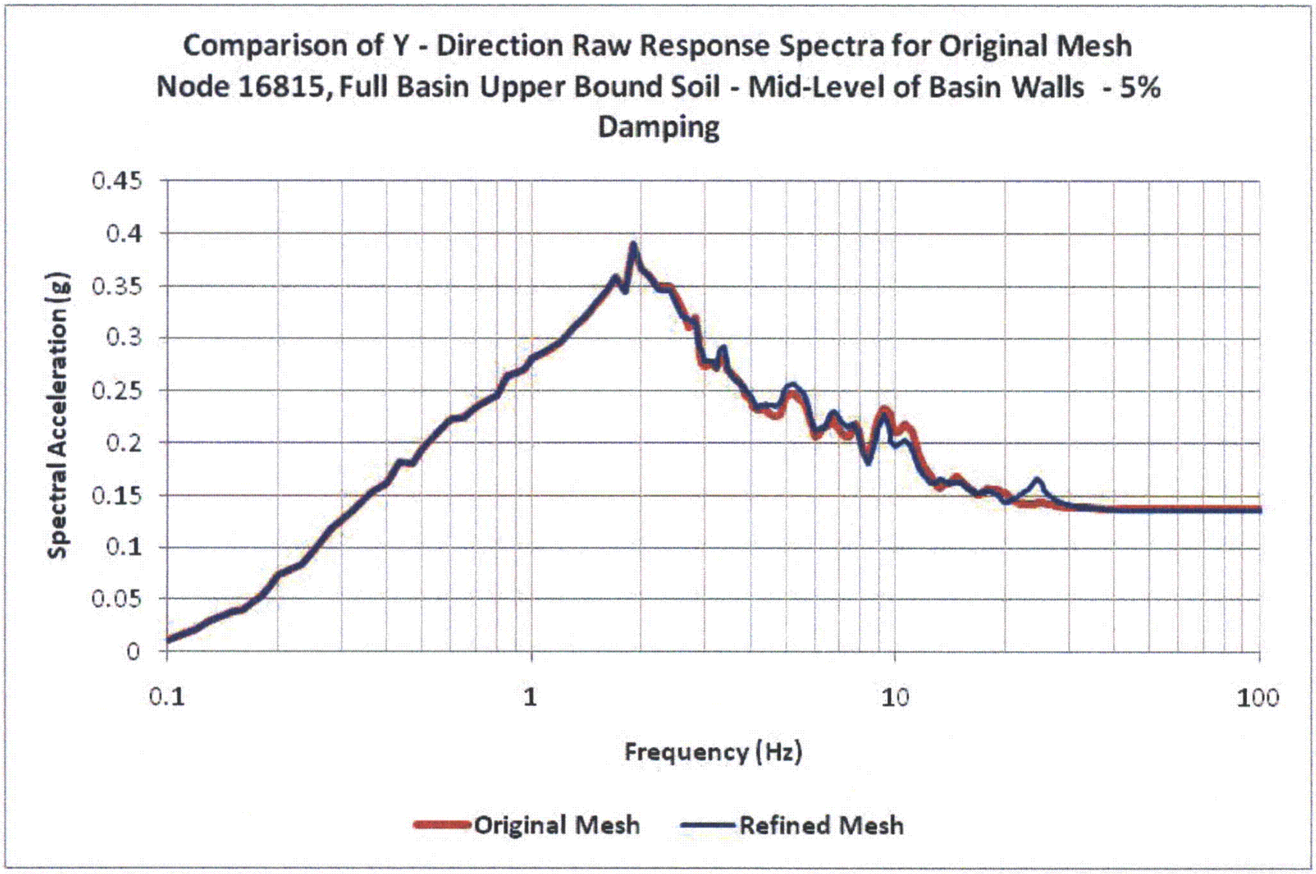


**Figure 03.07.02-24.59: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16815, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

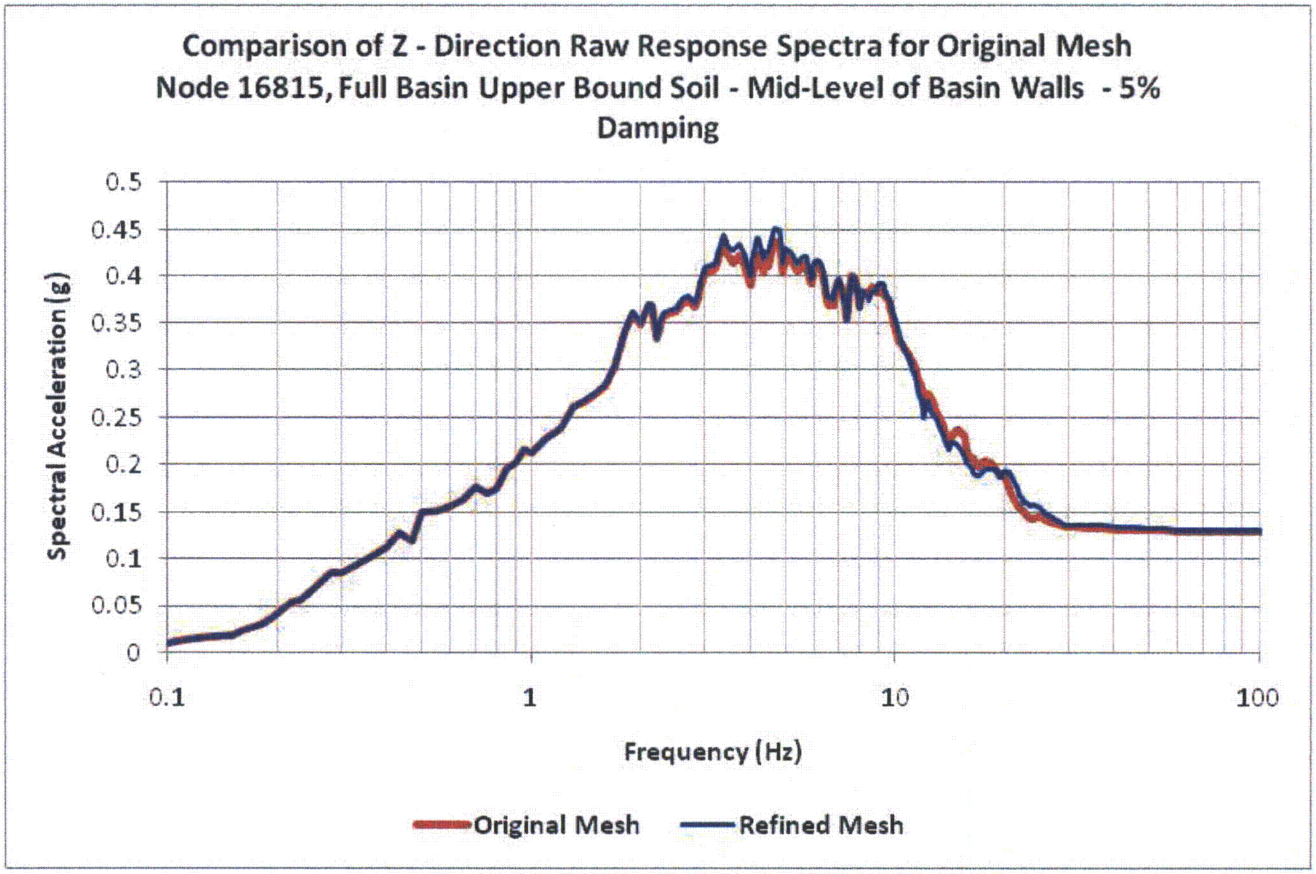


**Figure 03.07.02-24.60: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16815, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

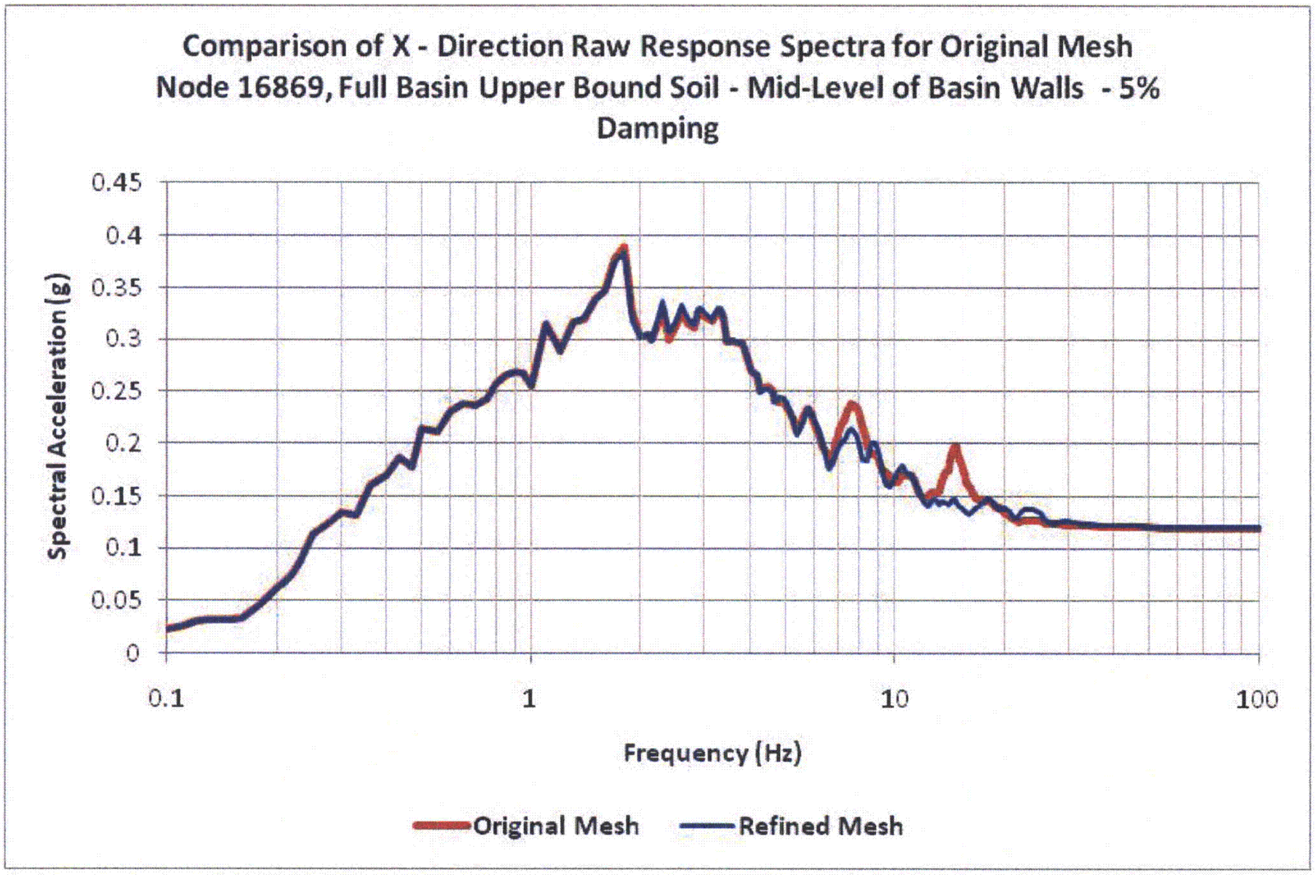


**Figure 03.07.02-24.61: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16869, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

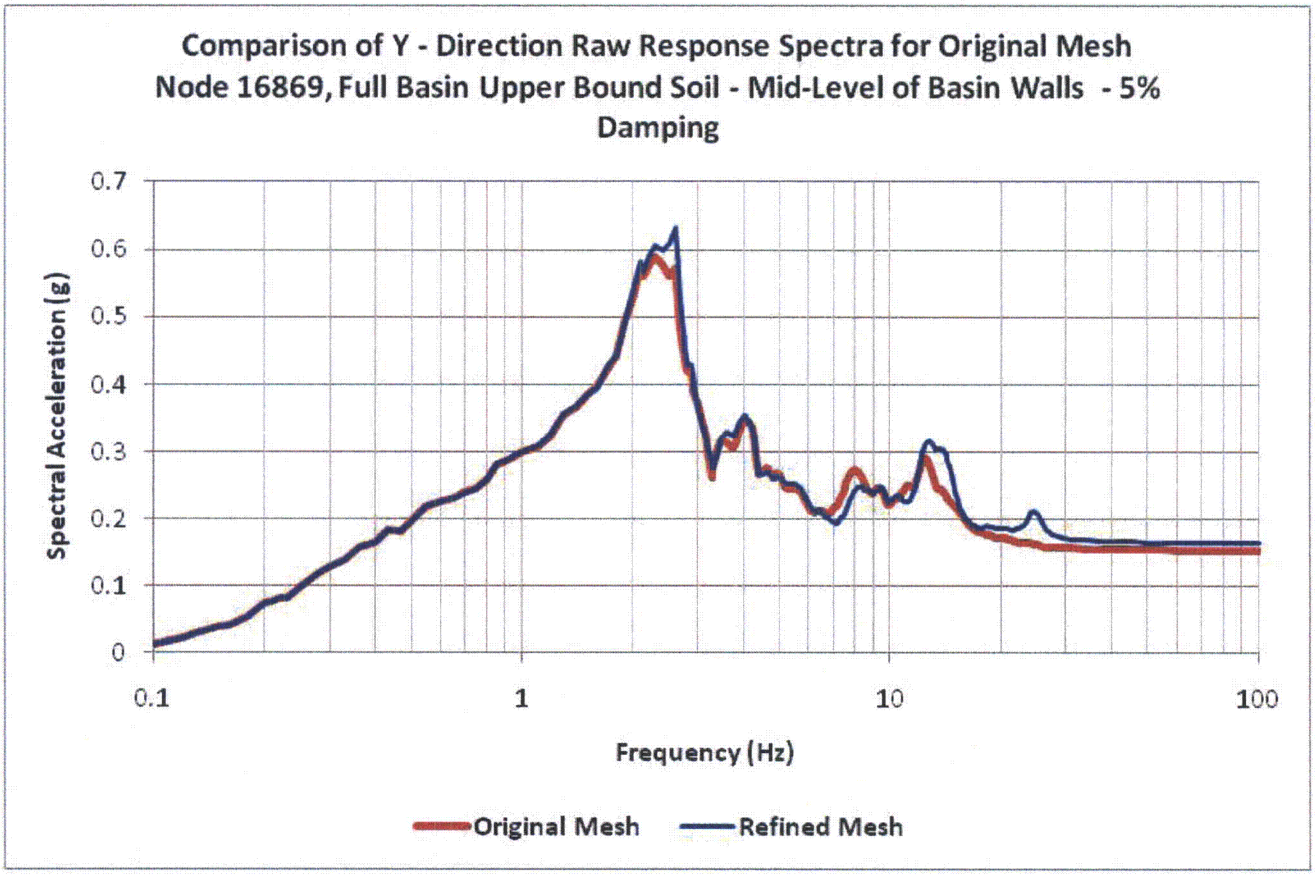


**Figure 03.07.02-24.62: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16869, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

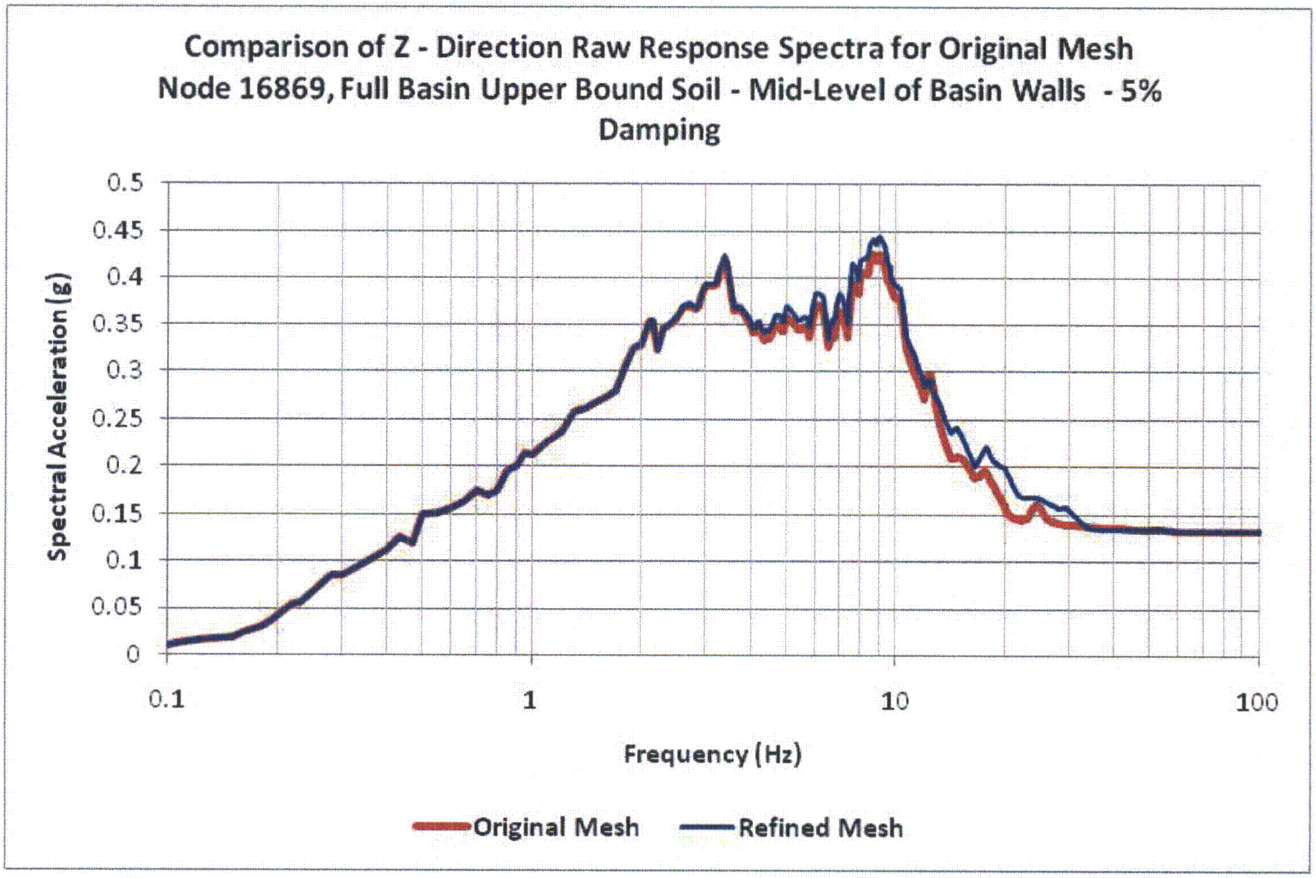


**Figure 03.07.02-24.63: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16869, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

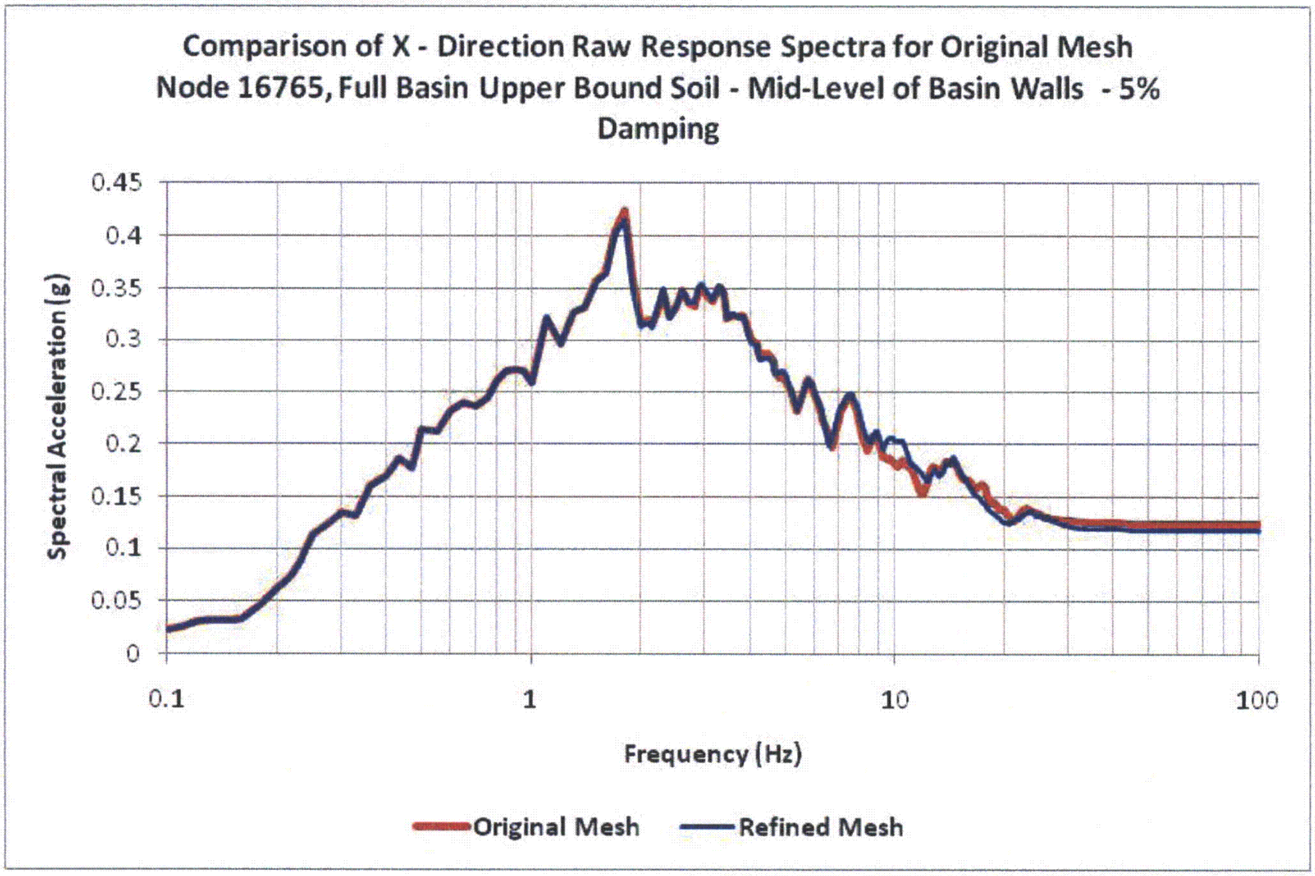


**Figure 03.07.02-24.64: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16765, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

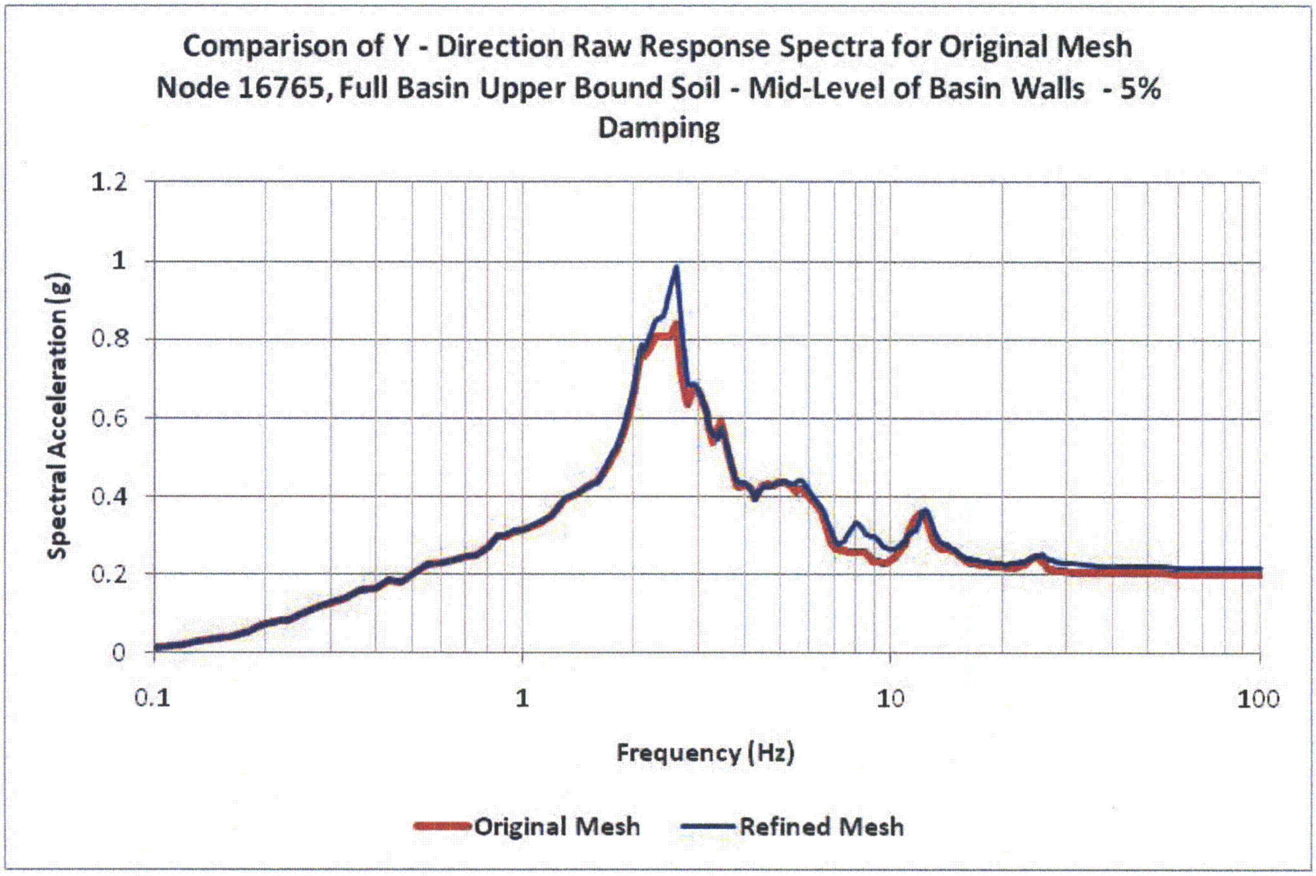


**Figure 03.07.02-24.65: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16765, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

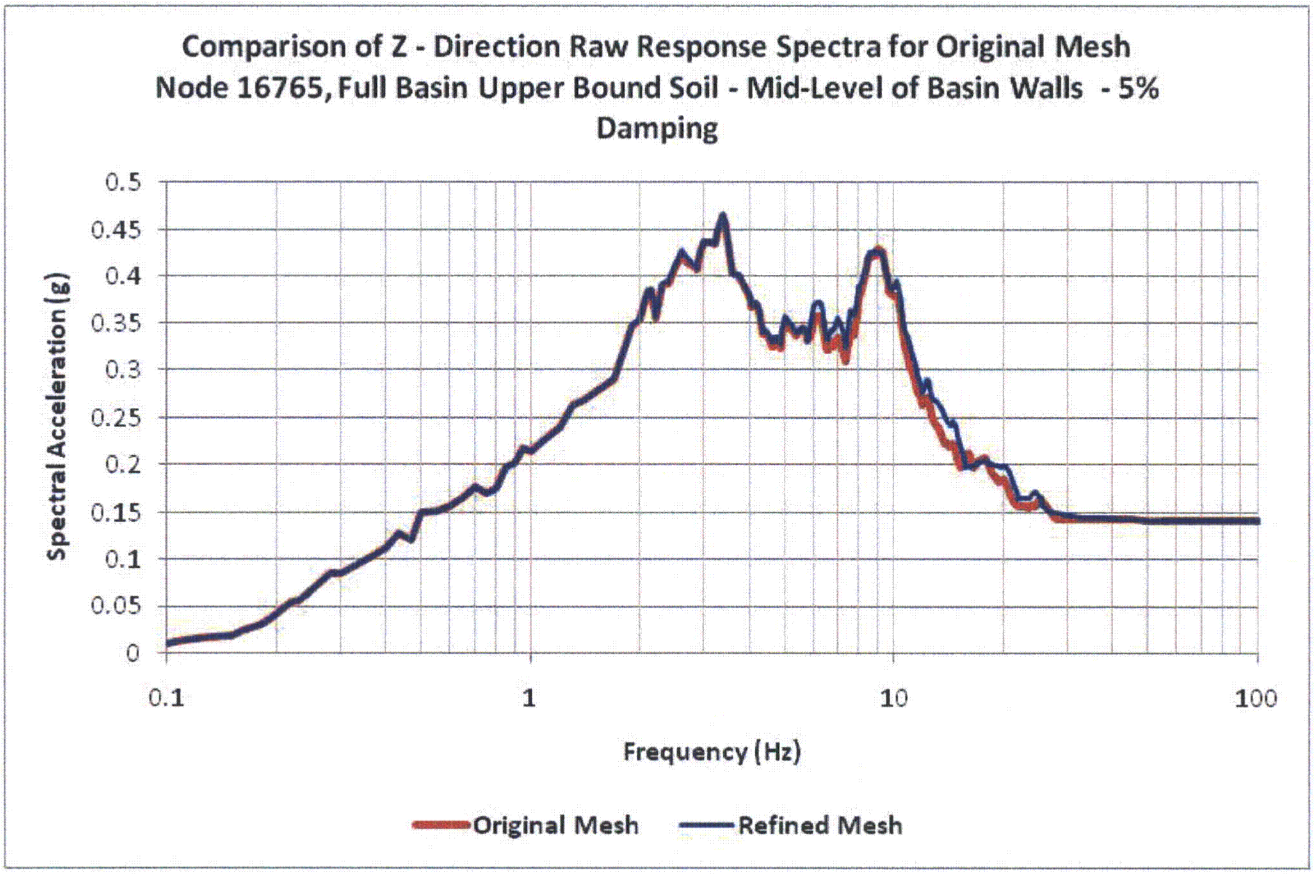


**Figure 03.07.02-24.66: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16765, Full Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

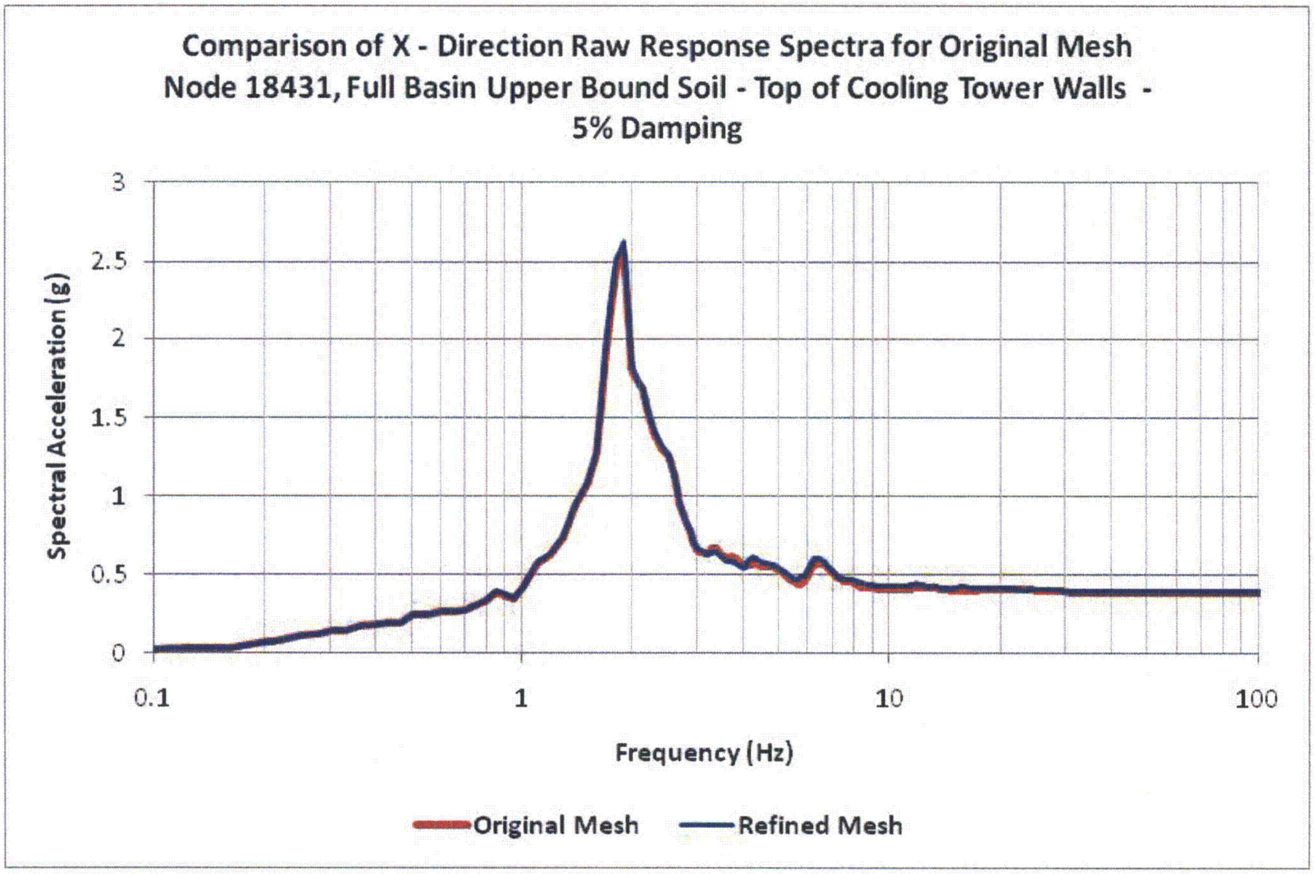


**Figure 03.07.02-24.67: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 18431, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

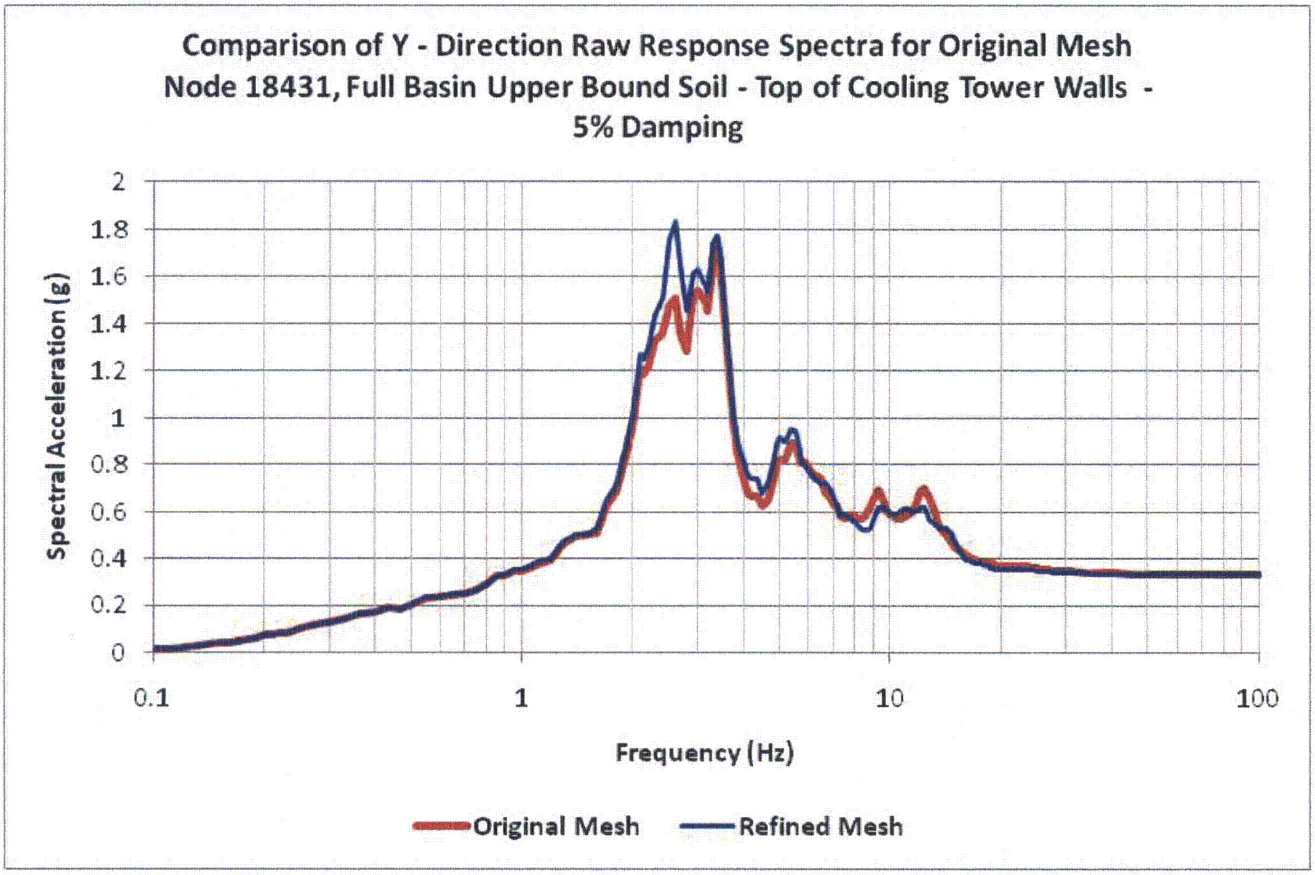


**Figure 03.07.02-24.68: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 18431, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

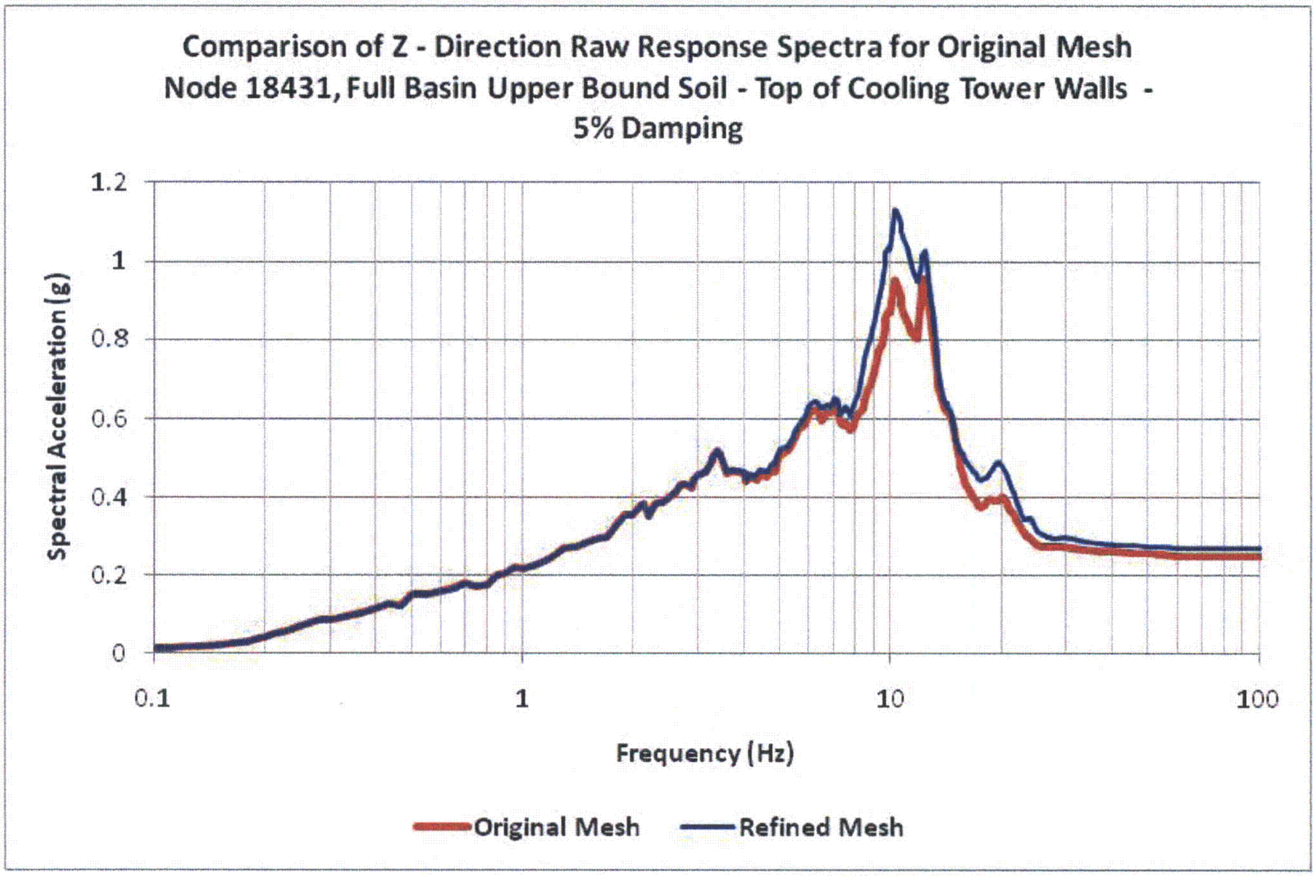


**Figure 03.07.02-24.69: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 18431, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

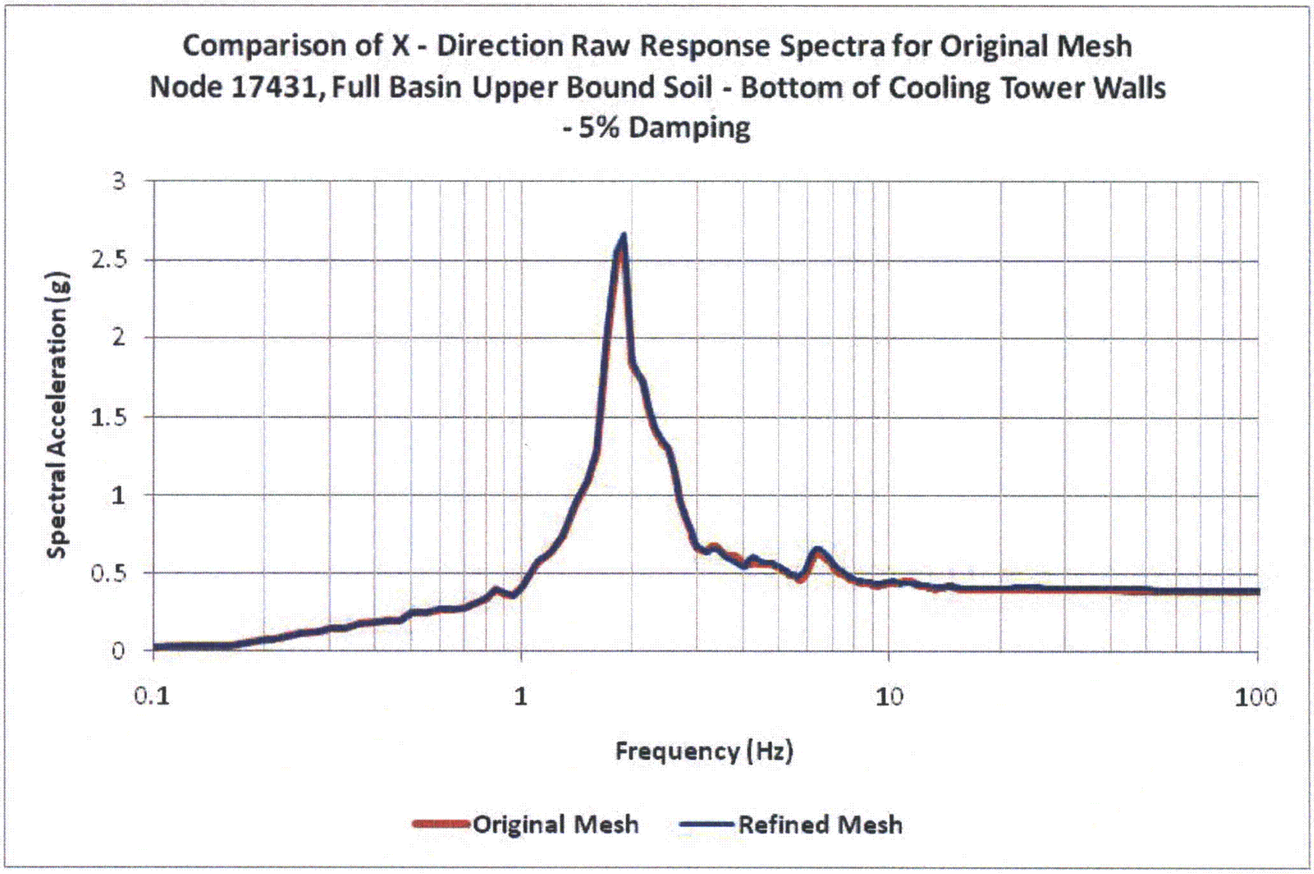


**Figure 03.07.02-24.70: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17431, Full Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**

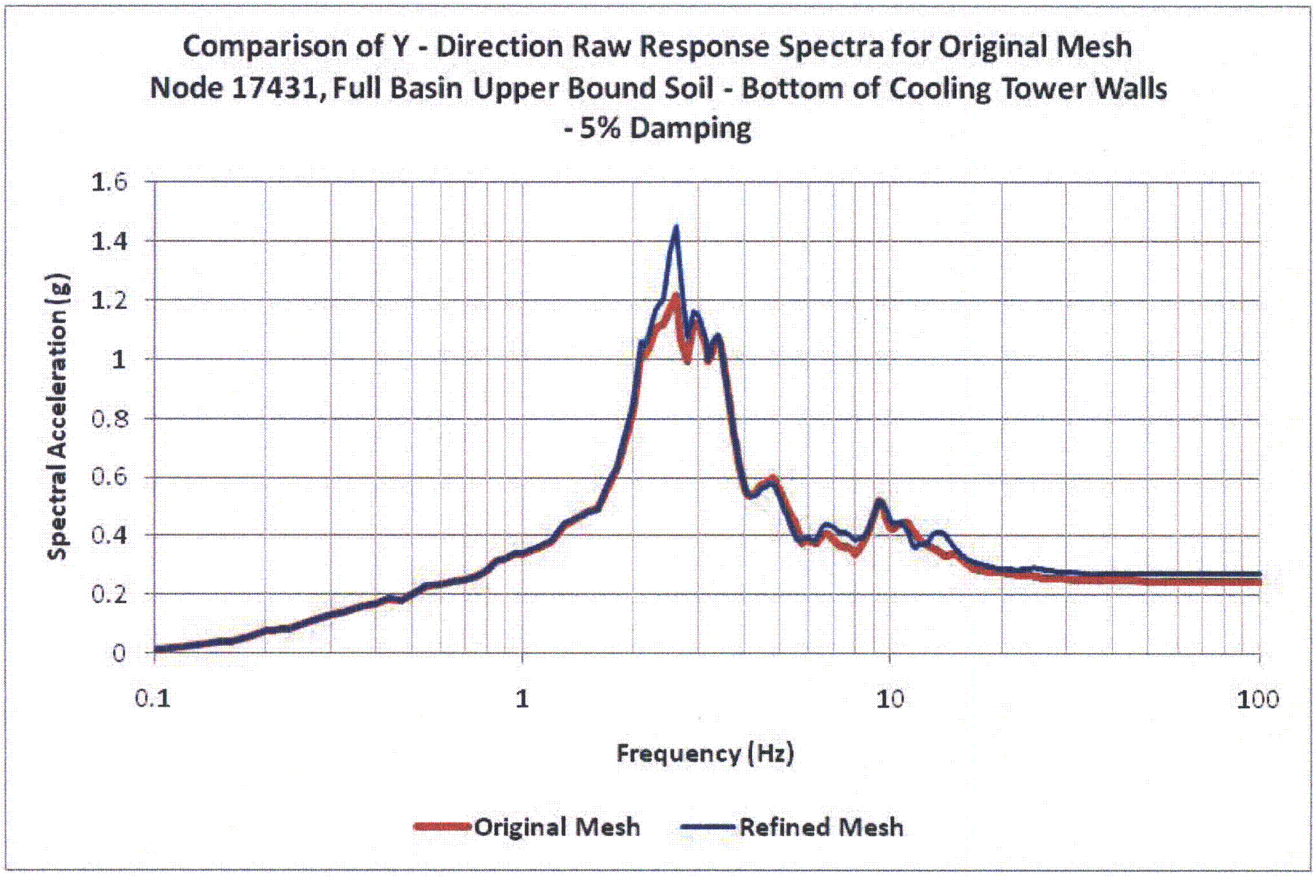


**Figure 03.07.02-24.71: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17431, Full Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**

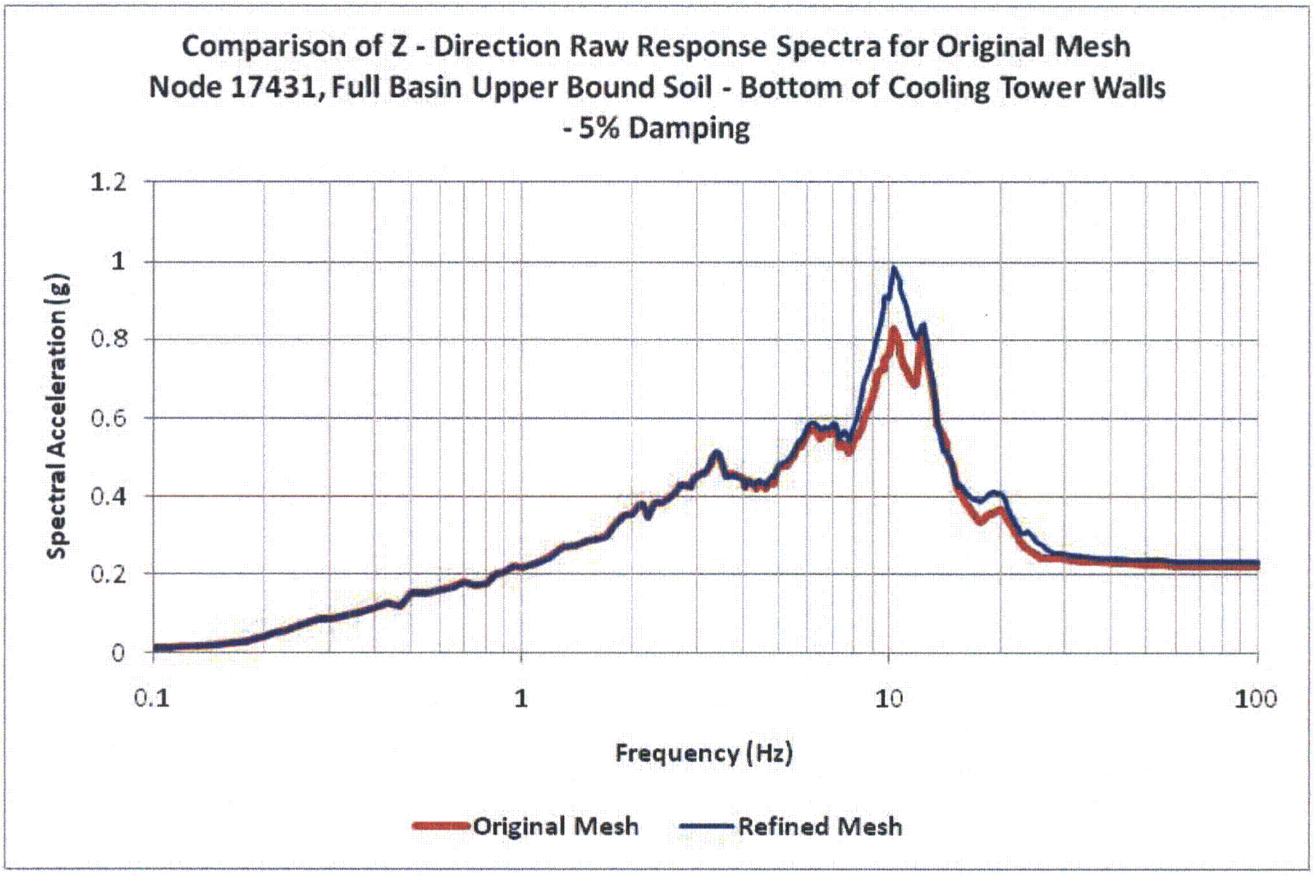


**Figure 03.07.02-24.72: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17431, Full Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**

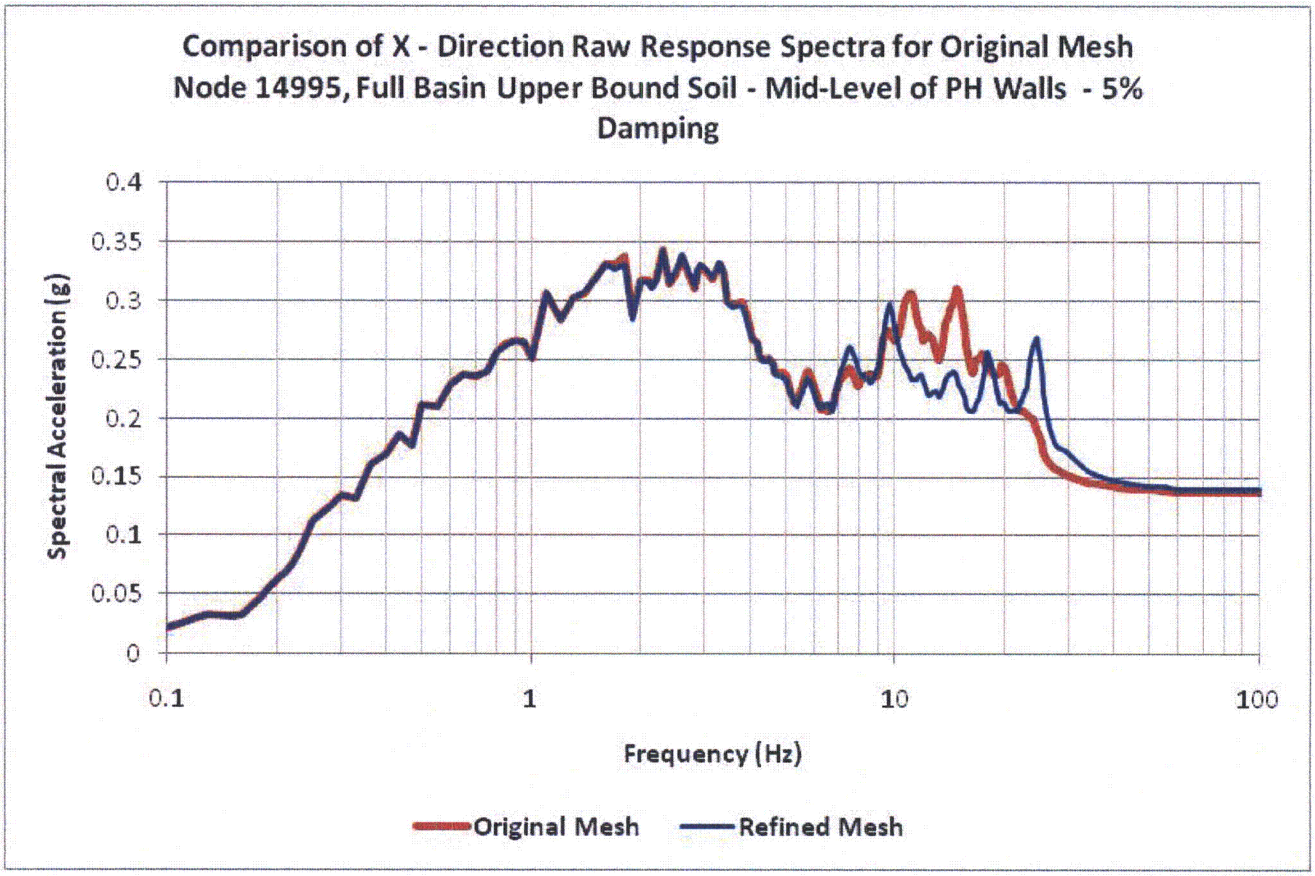


**Figure 03.07.02-24.73: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 14995, Full Basin Upper Bound Soil - Mid-Level of PH Walls - 5% Damping**

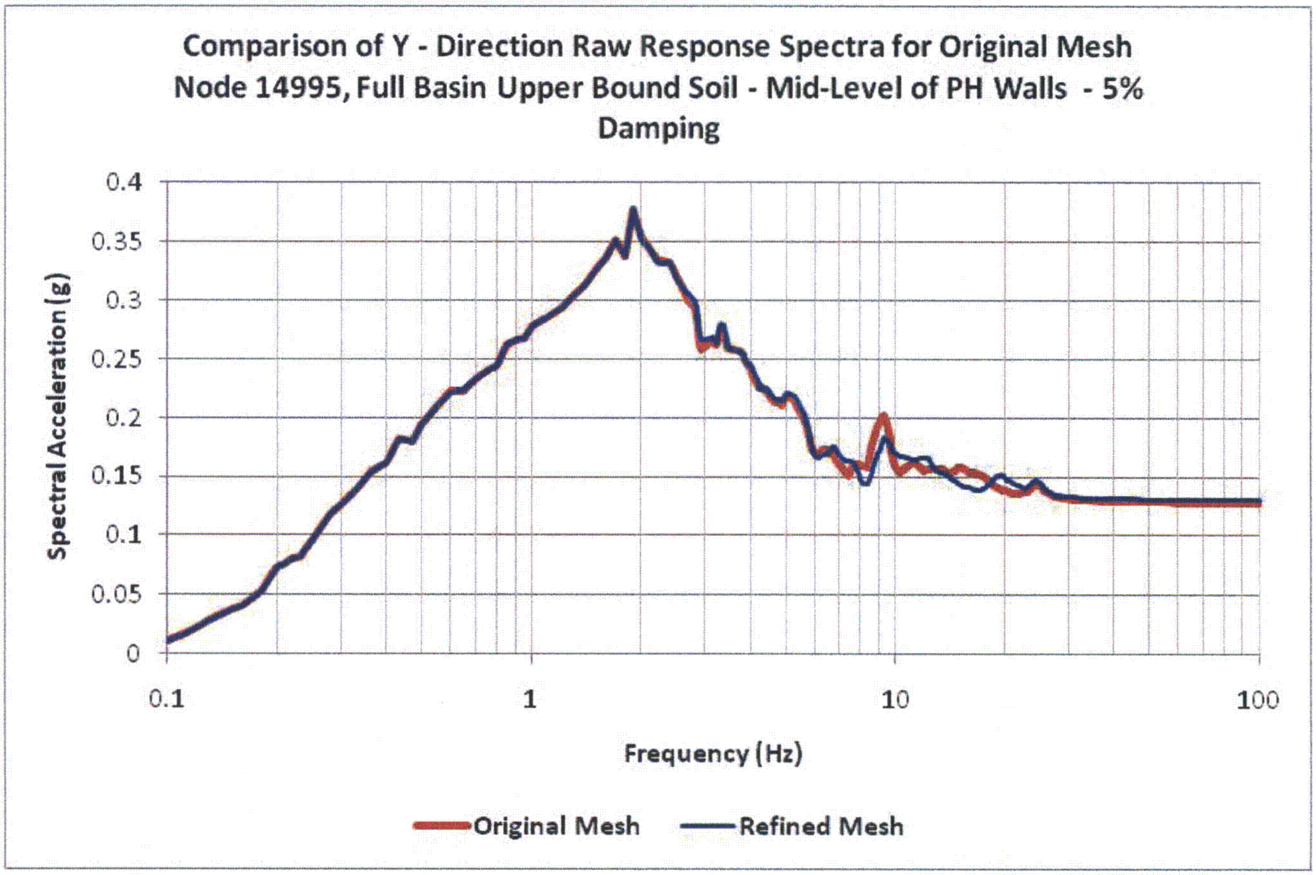


**Figure 03.07.02-24.74: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 14995, Full Basin Upper Bound Soil - Mid-Level of PH Walls - 5% Damping**

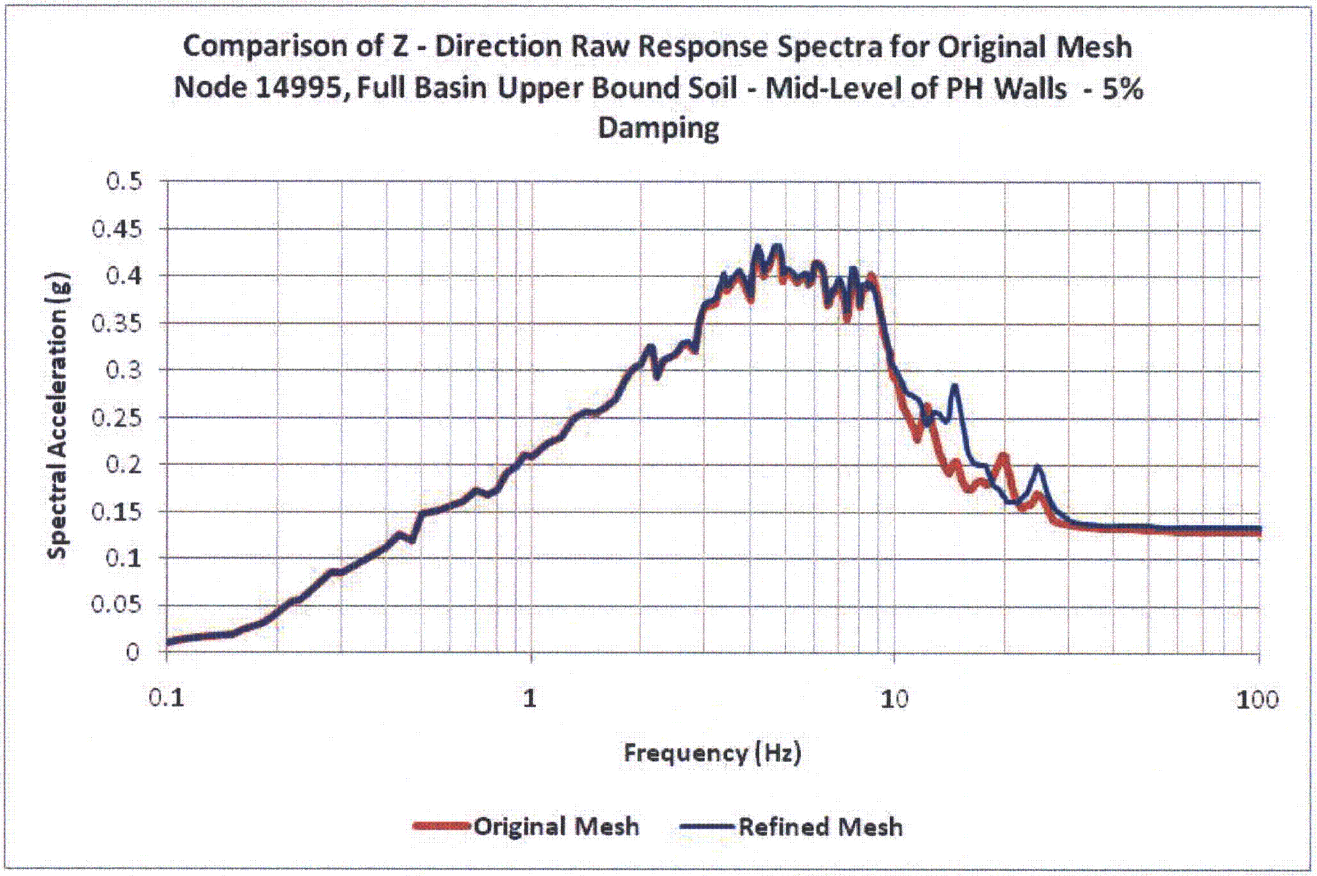


**Figure 03.07.02-24.75: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 14995, Full Basin Upper Bound Soil - Mid-Level of PH Walls - 5% Damping**

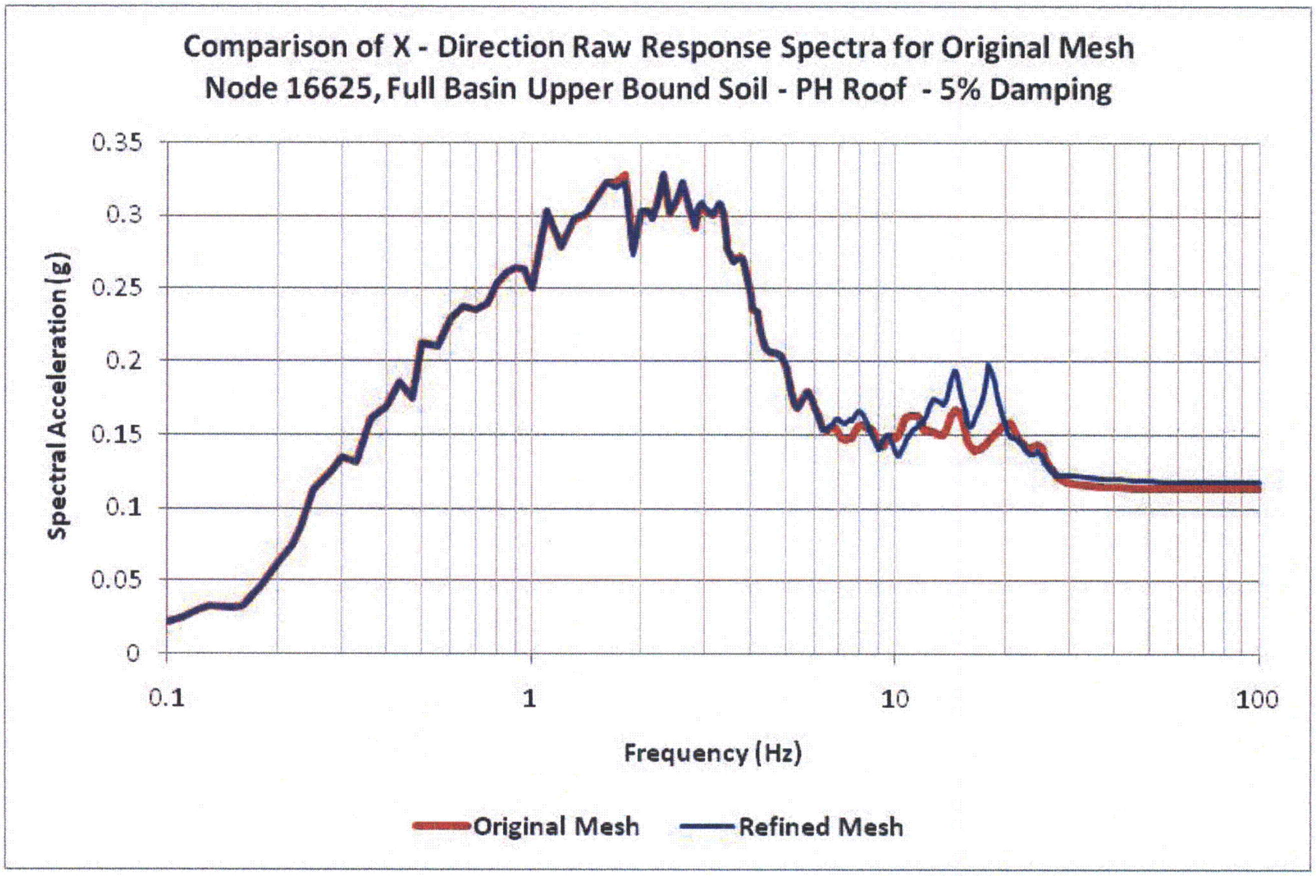


**Figure 03.07.02-24.76; Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16625, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

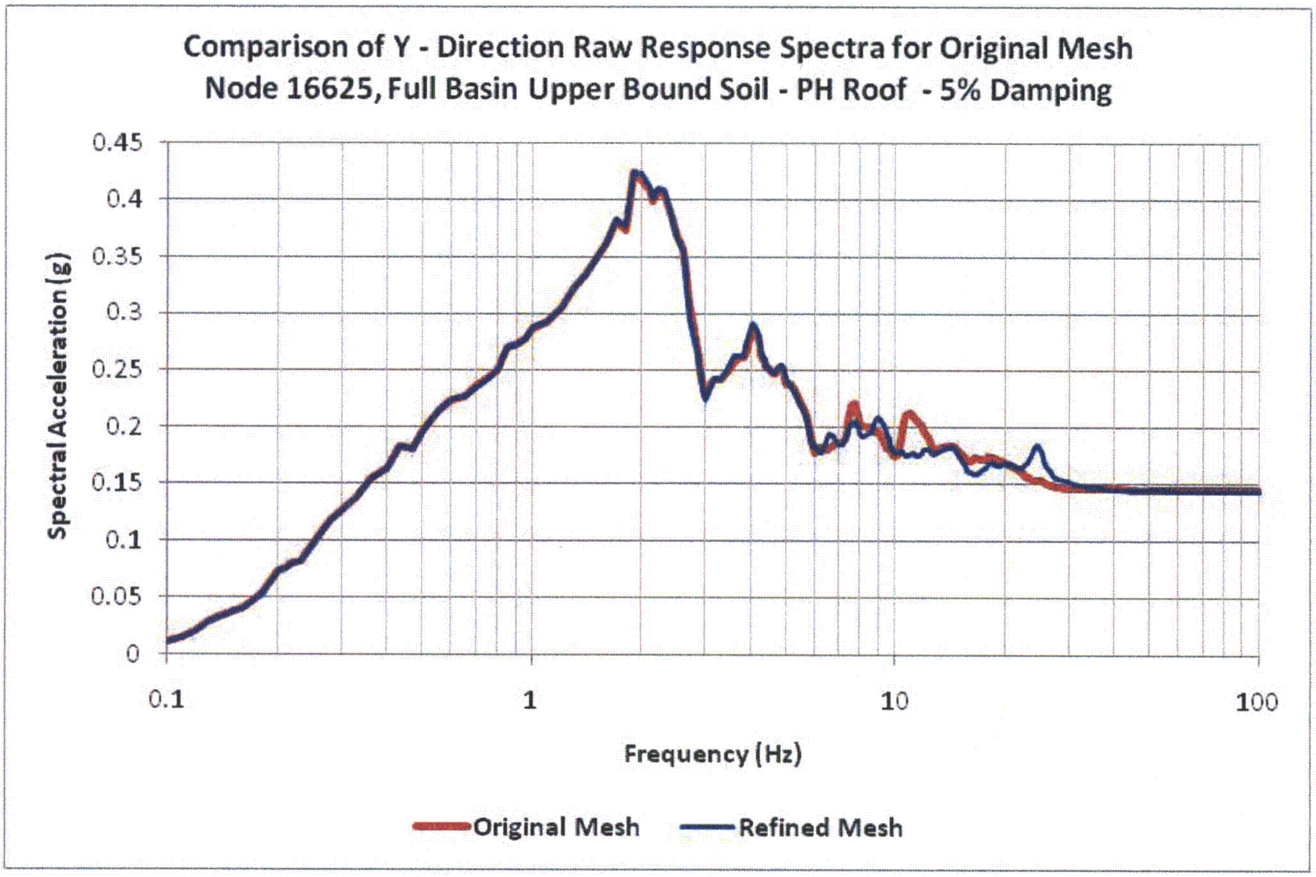


**Figure 03.07.02-24.77: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16625, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

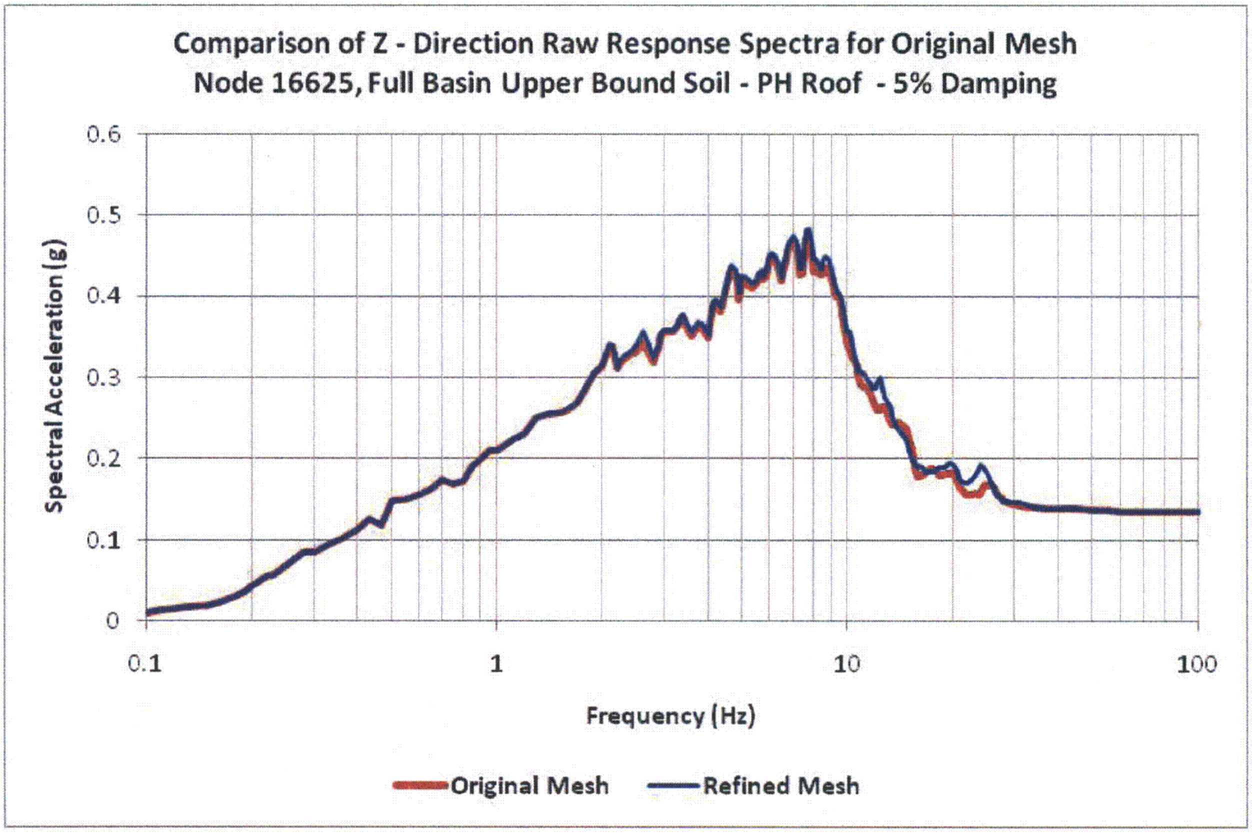


**Figure 03.07.02-24.78: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16625, Full Basin Upper Bound Soil - PH Roof - 5% Damping**

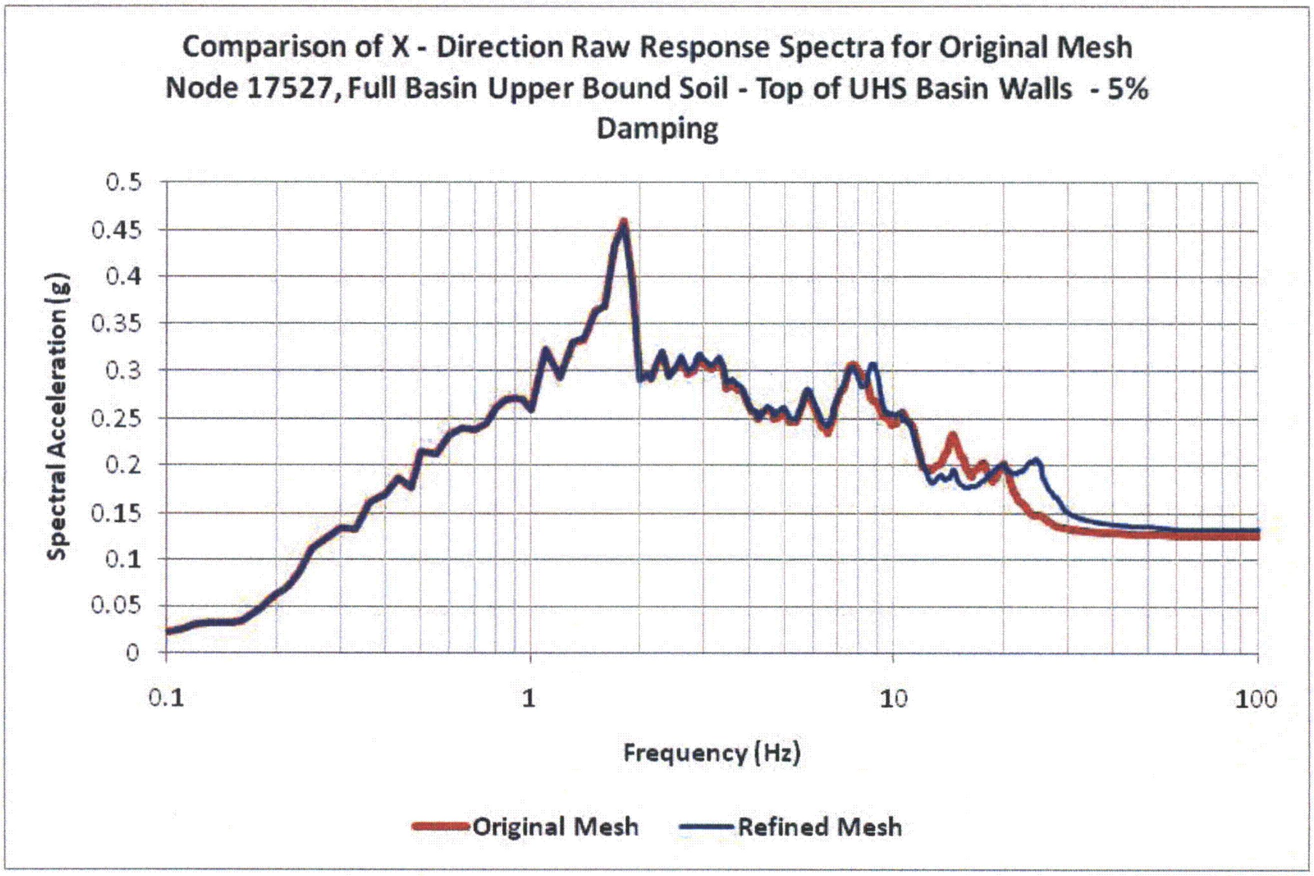


**Figure 03.07.02-24.79: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17527, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

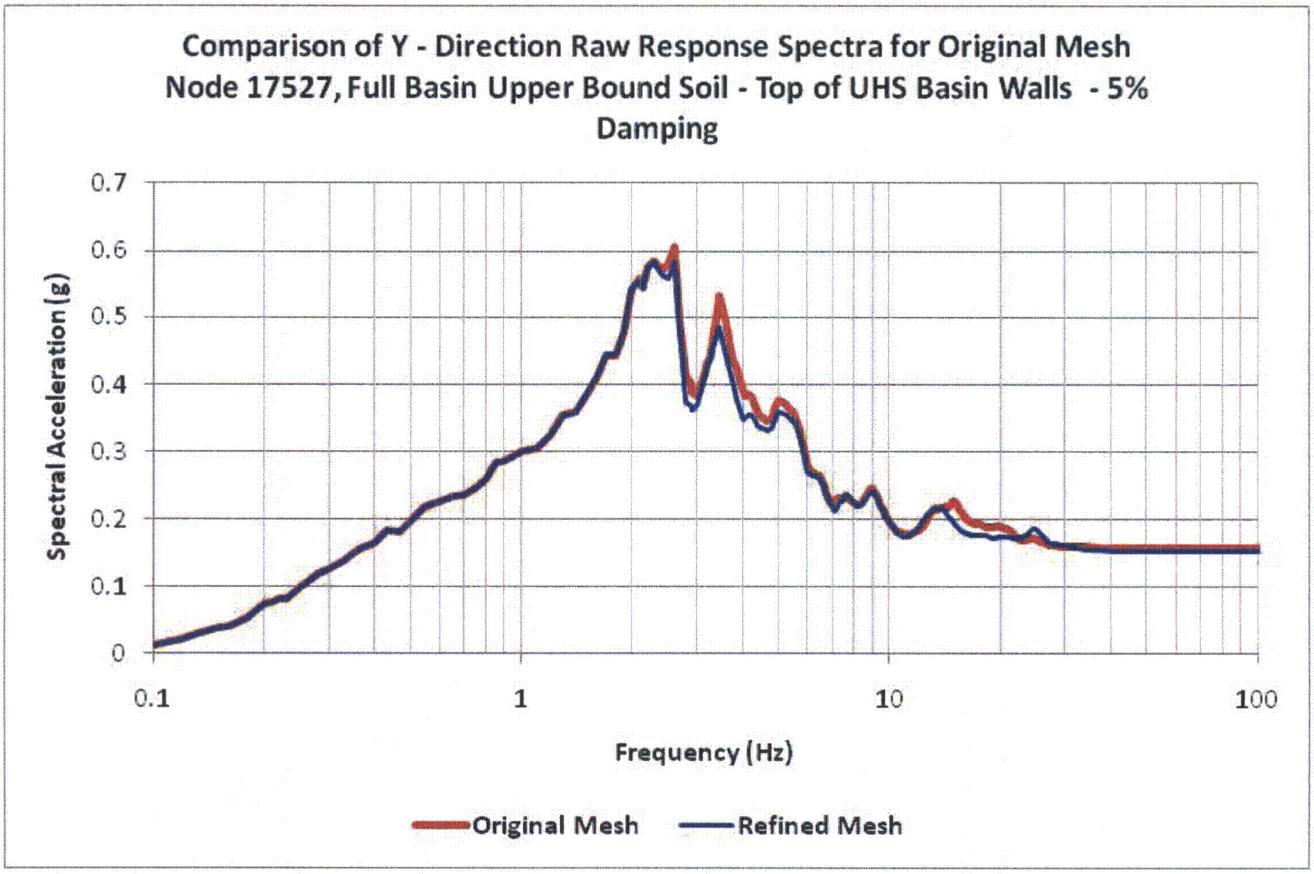


**Figure 03.07.02-24.80: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17527, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

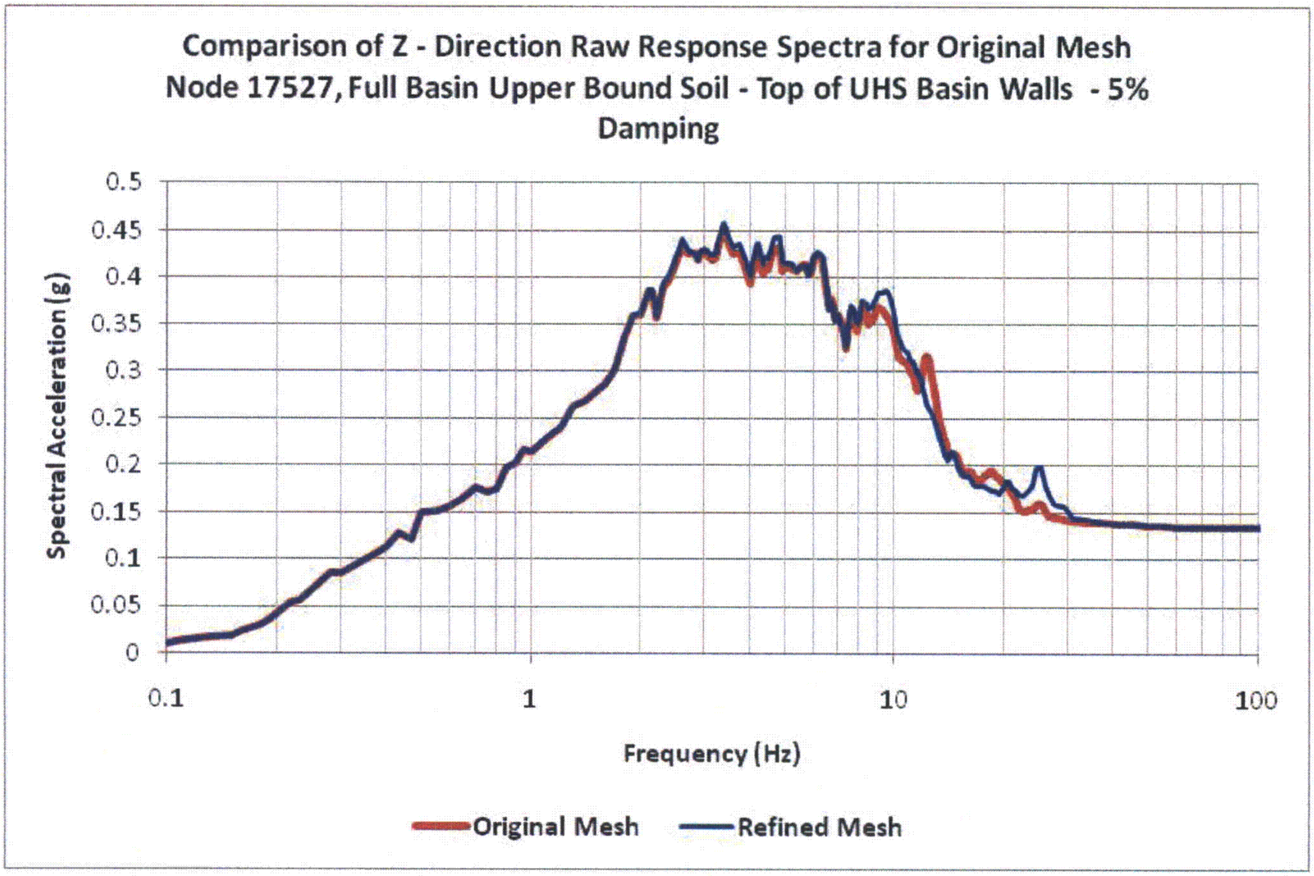


**Figure 03.07.02-24.81: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17527, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

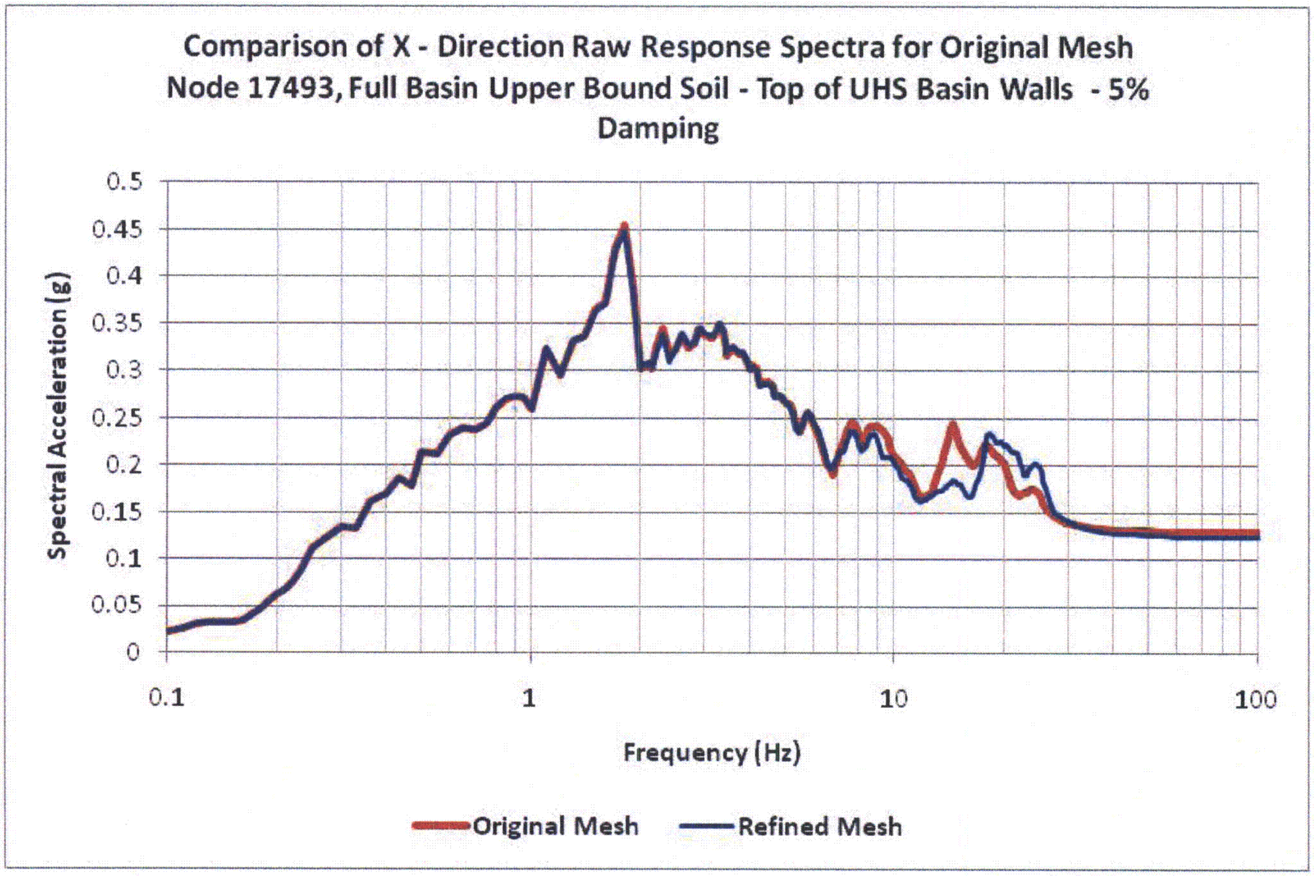


**Figure 03.07.02-24.82: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17493, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

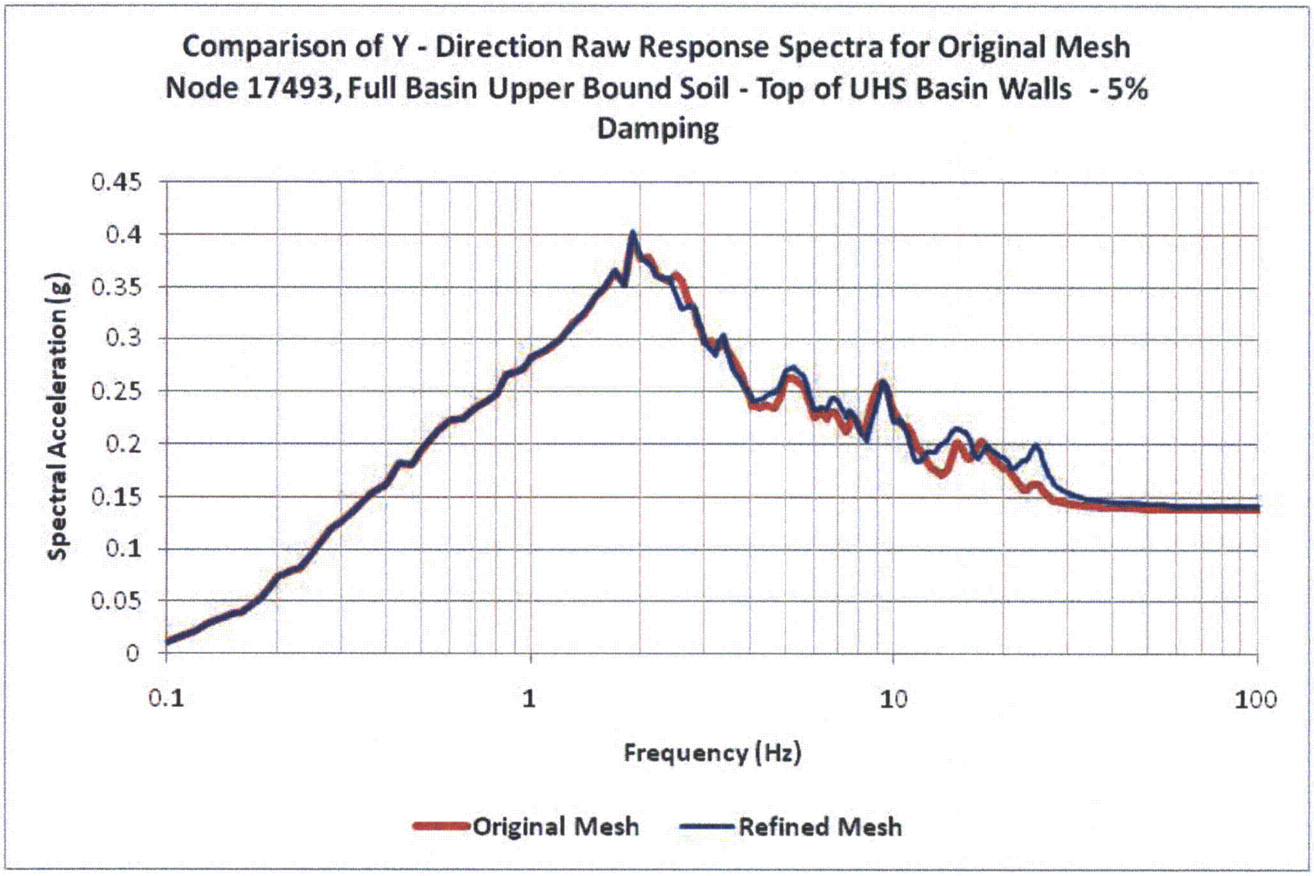


**Figure 03.07.02-24.83: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17493, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

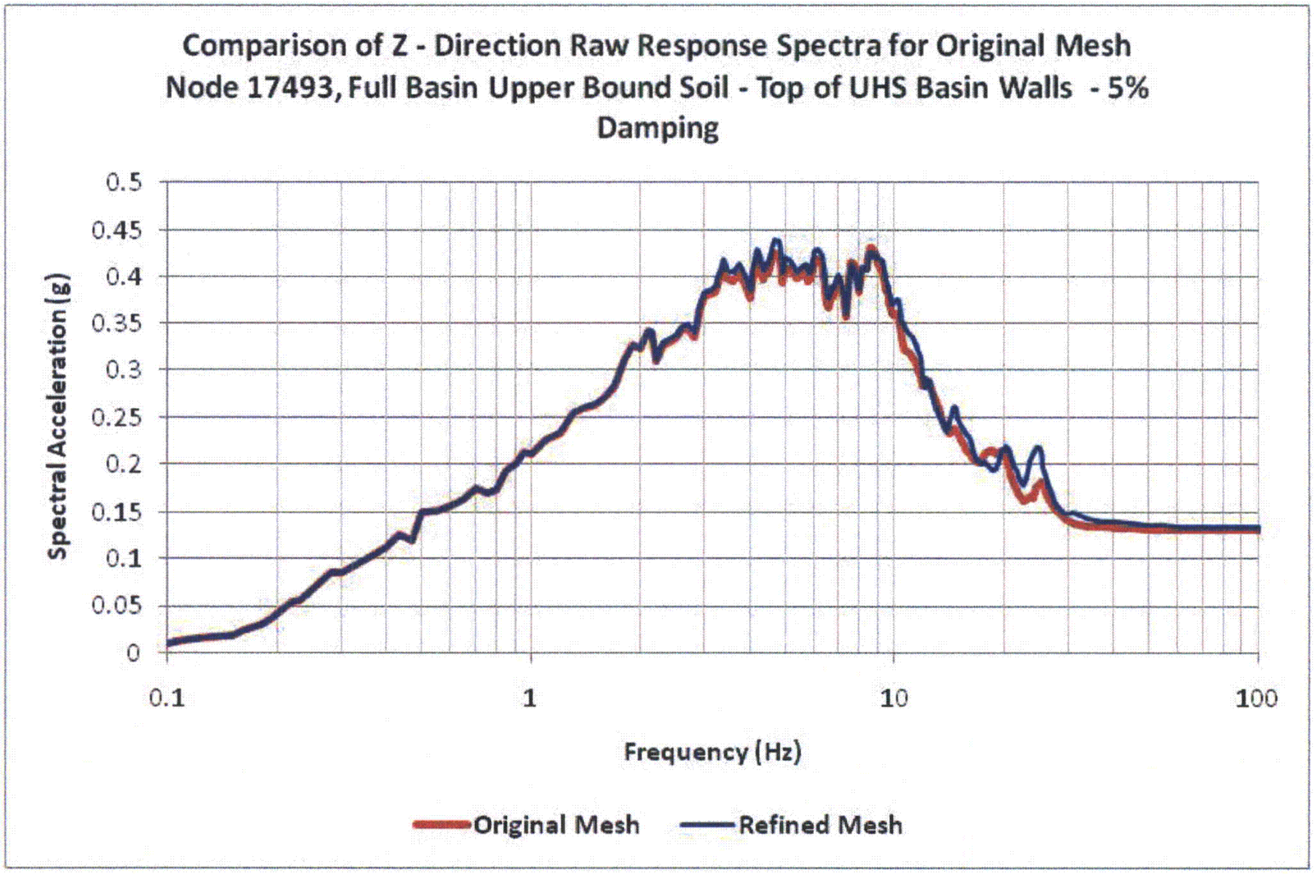


**Figure 03.07.02-24.84: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17493, Full Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

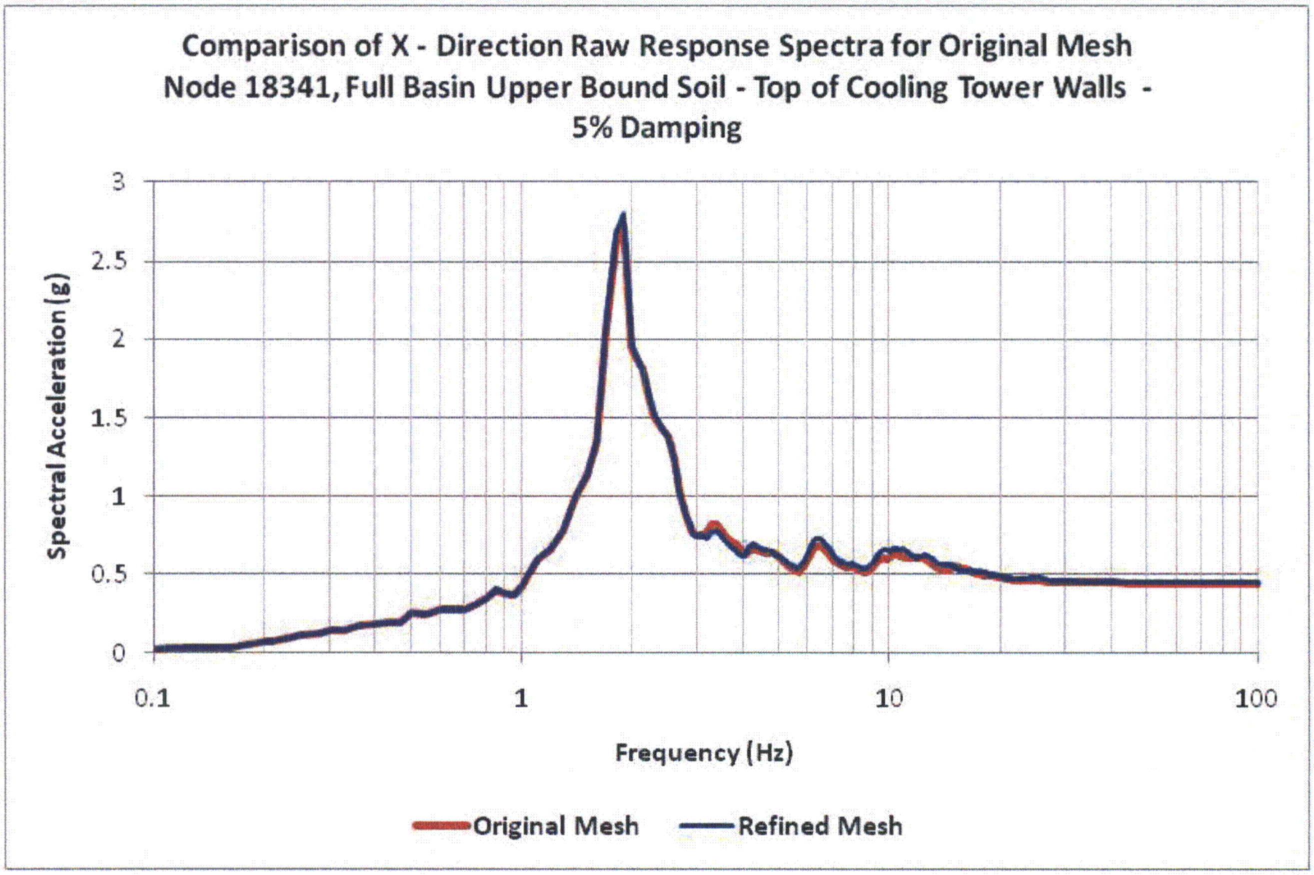


**Figure 03.07.02-24.85: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 18341, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

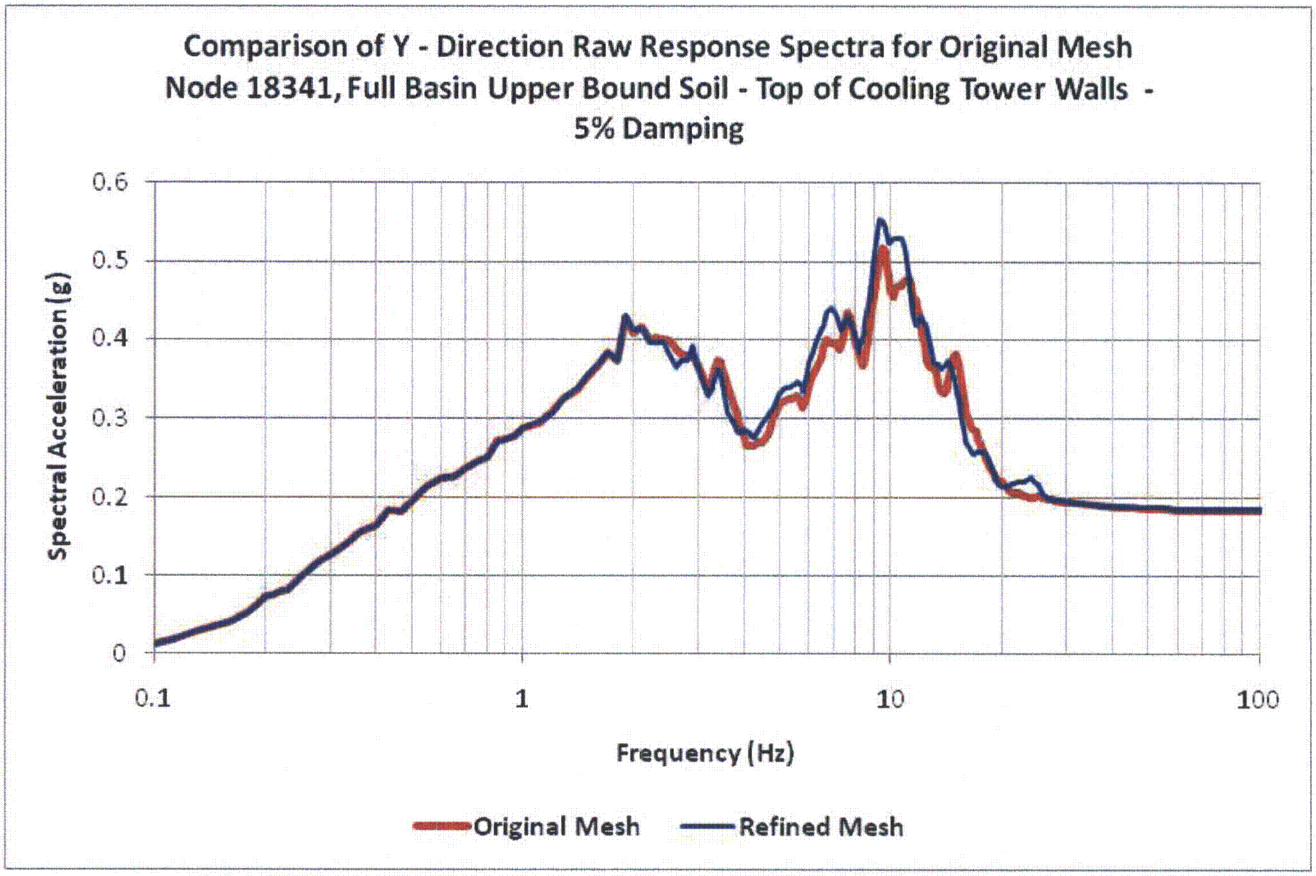


**Figure 03.07.02-24.86: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 18341, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

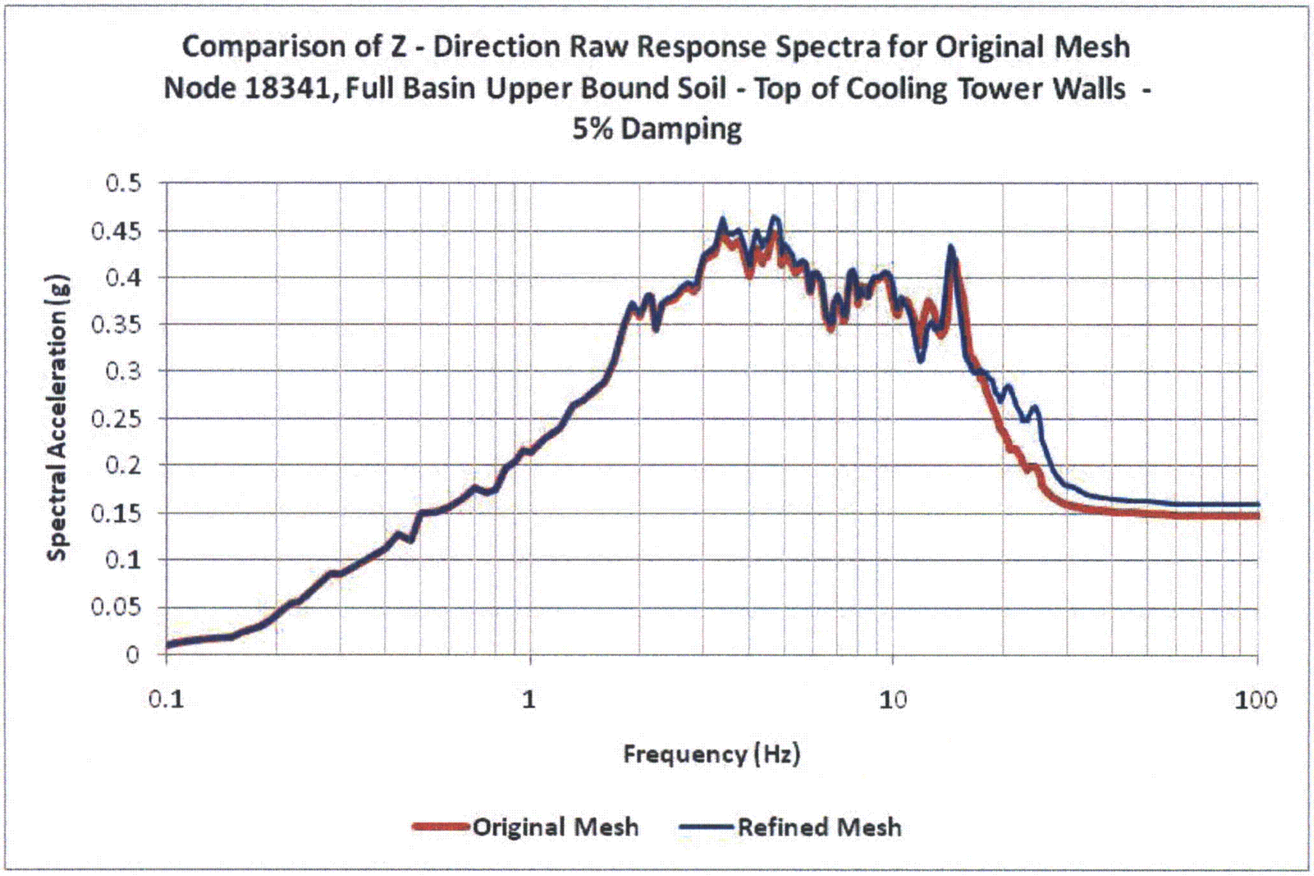


**Figure 03.07.02-24.87: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 18341, Full Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

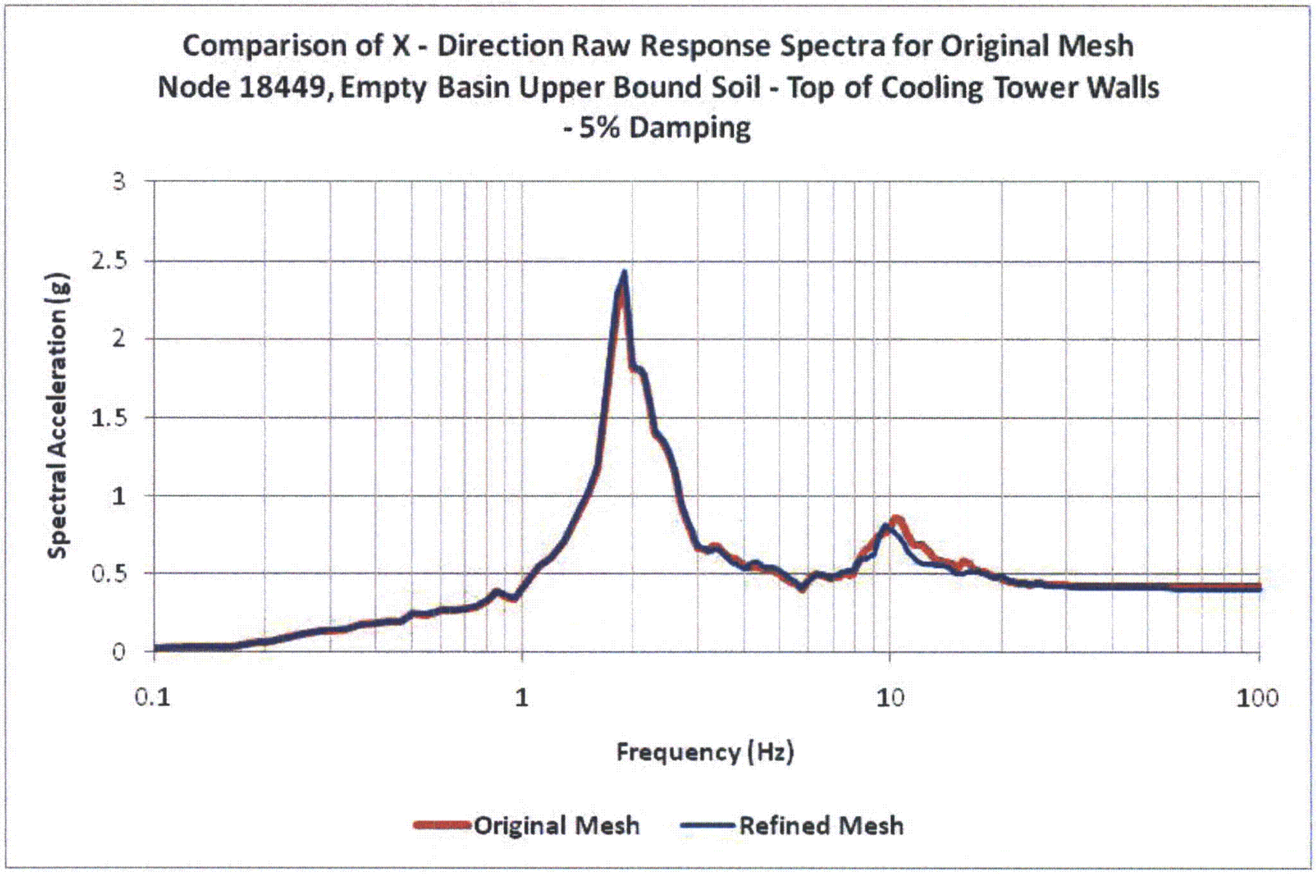


**Figure 03.07.02-24.88: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 18449, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

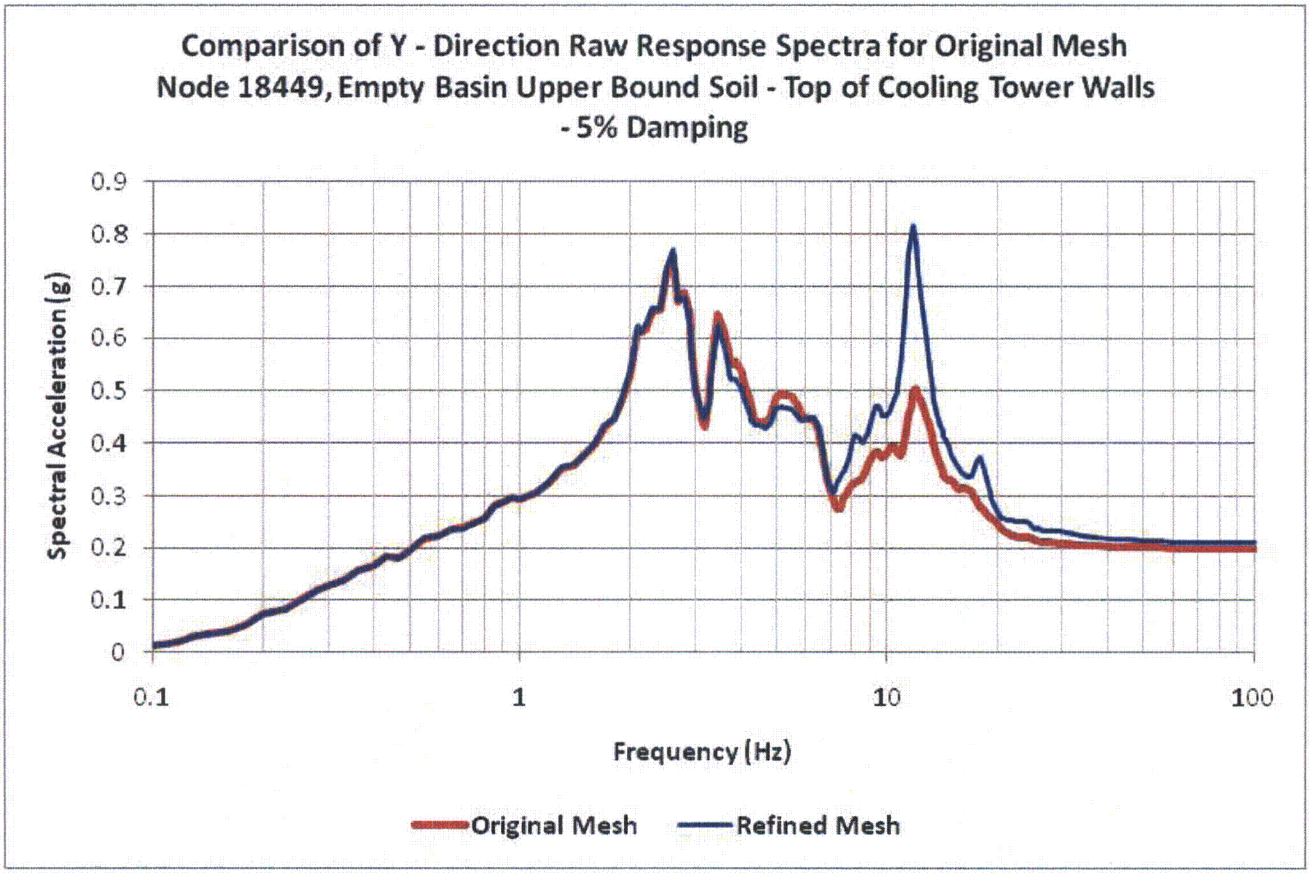


**Figure 03.07.02-24.89: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 18449, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

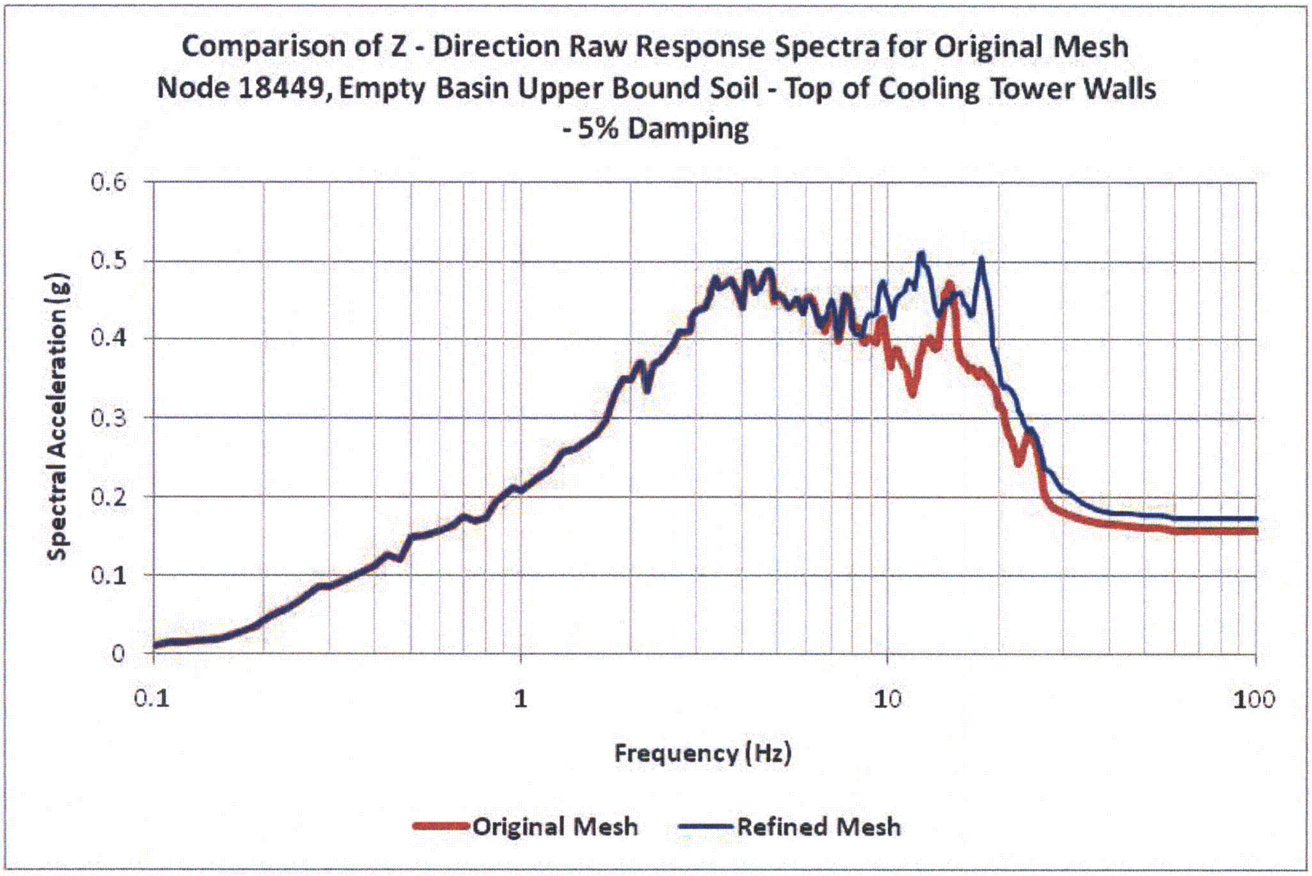


**Figure 03.07.02-24.90: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 18449, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

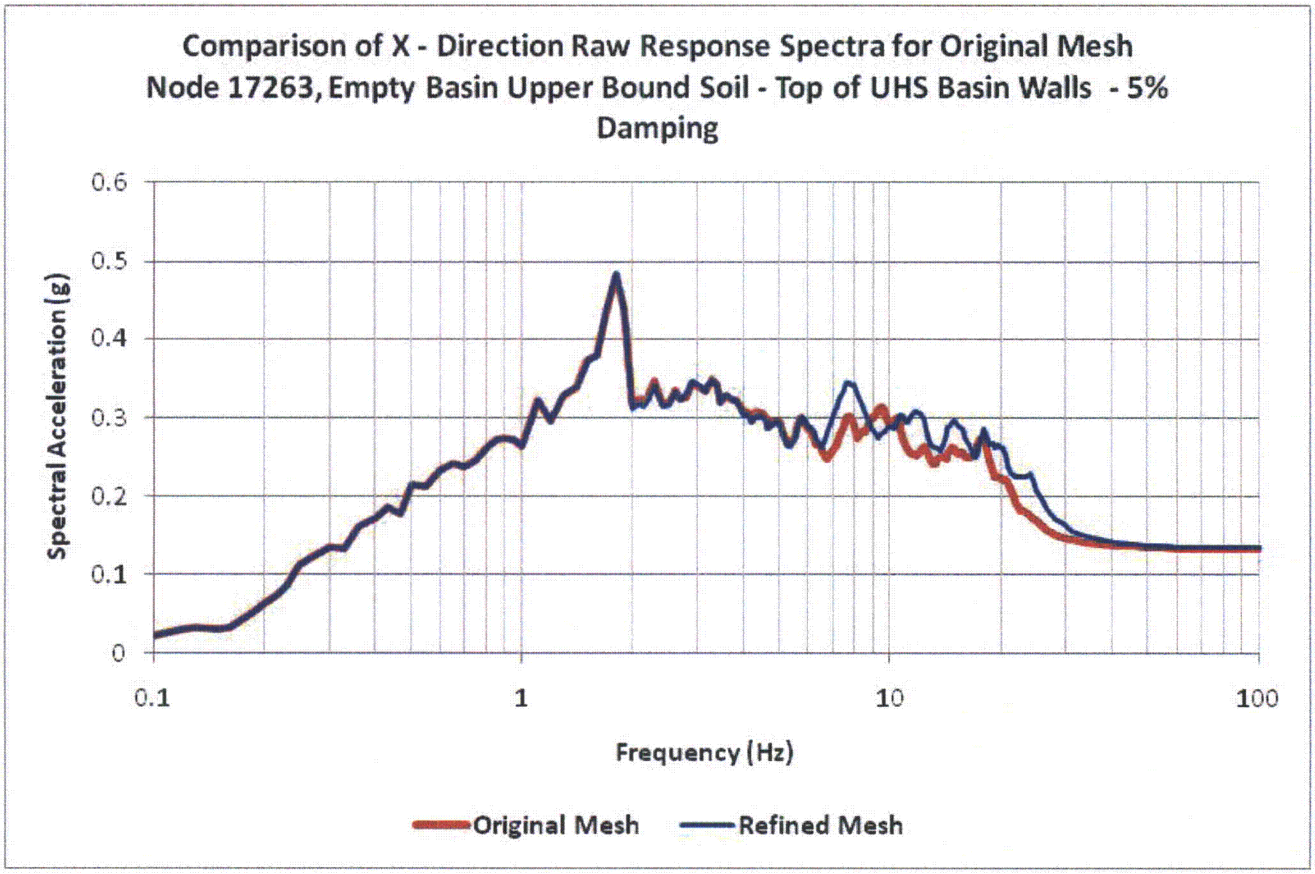


**Figure 03.07.02-24.91: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17263, Empty Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

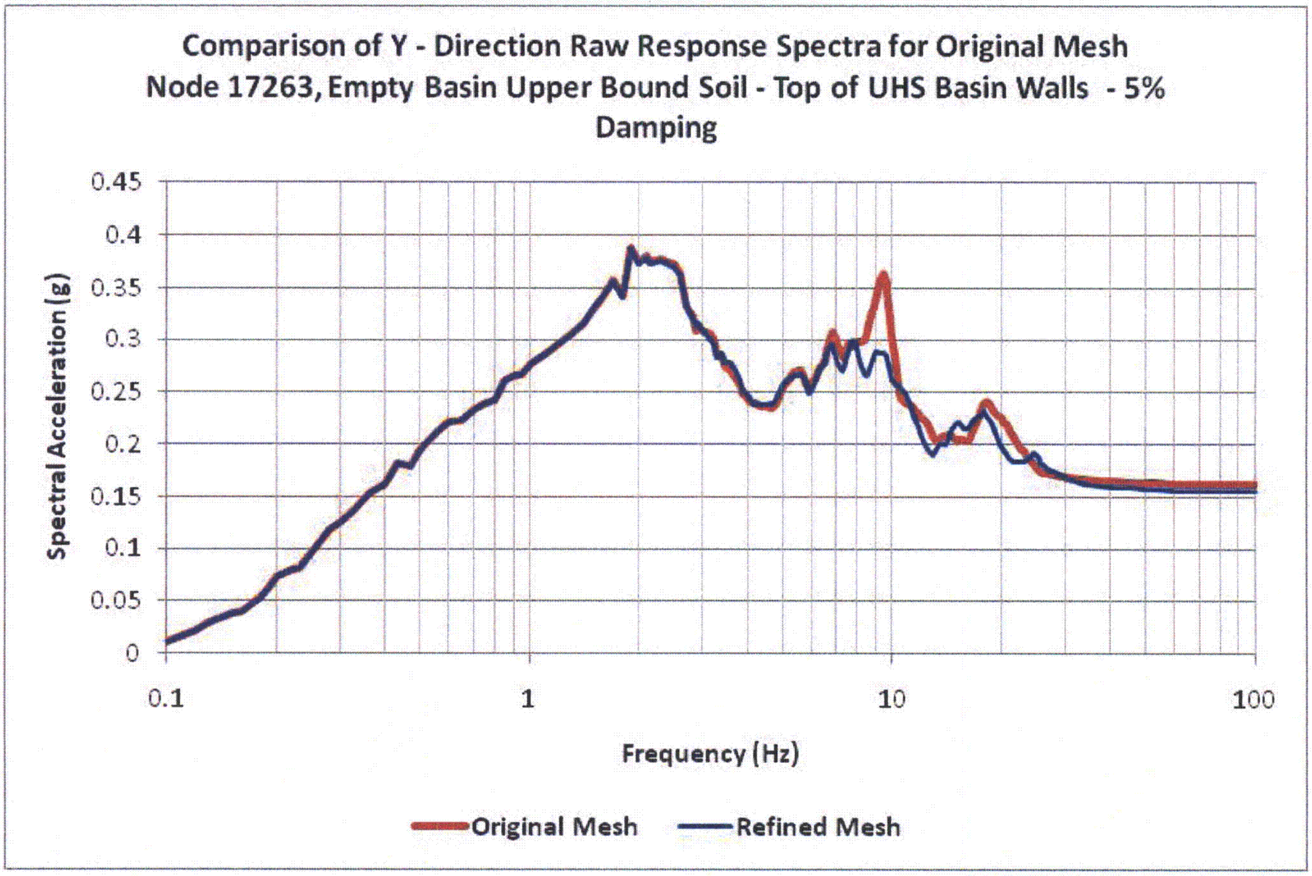


**Figure 03.07.02-24.92: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17263, Empty Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

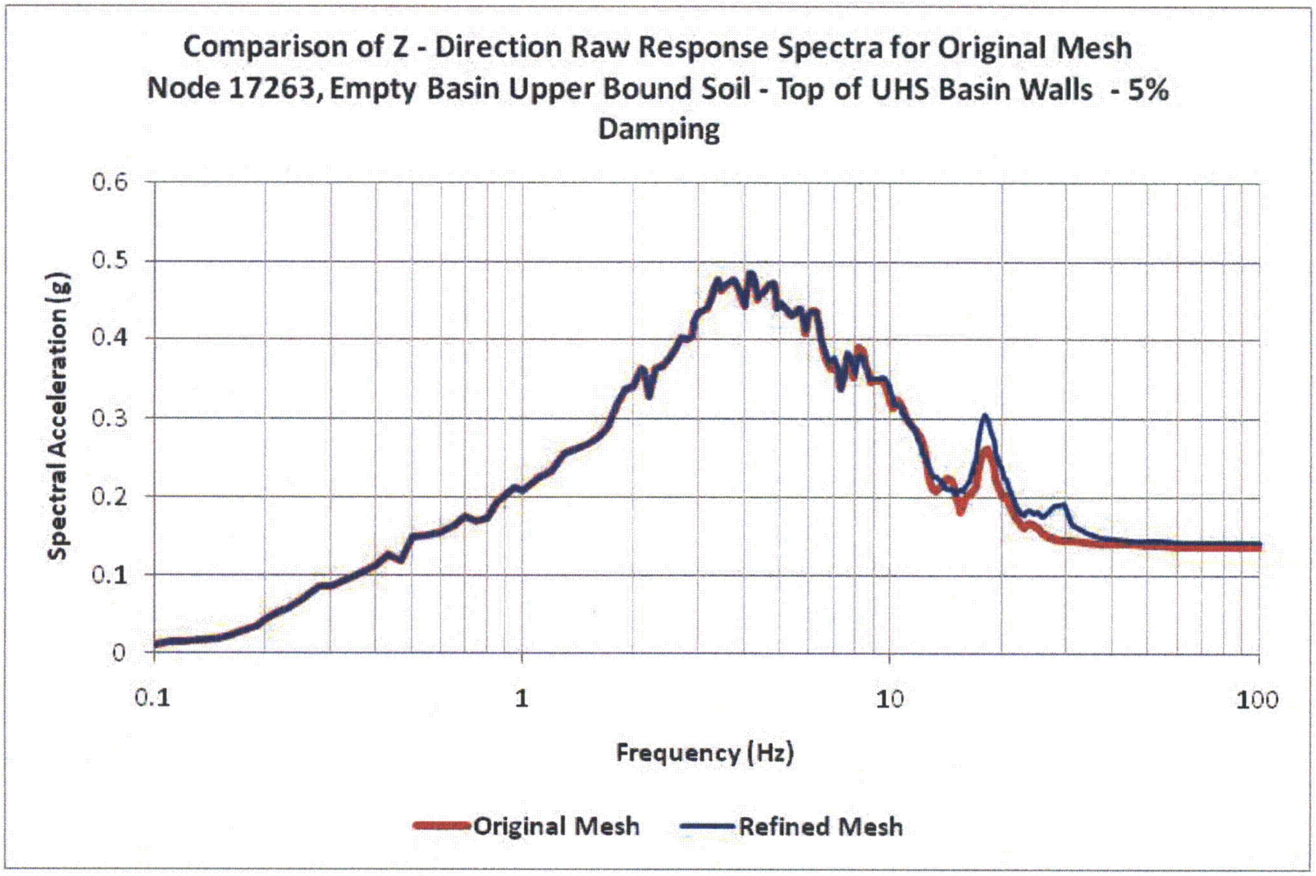


**Figure 03.07.02-24.93: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17263, Empty Basin Upper Bound Soil - Top of UHS Basin Walls - 5% Damping**

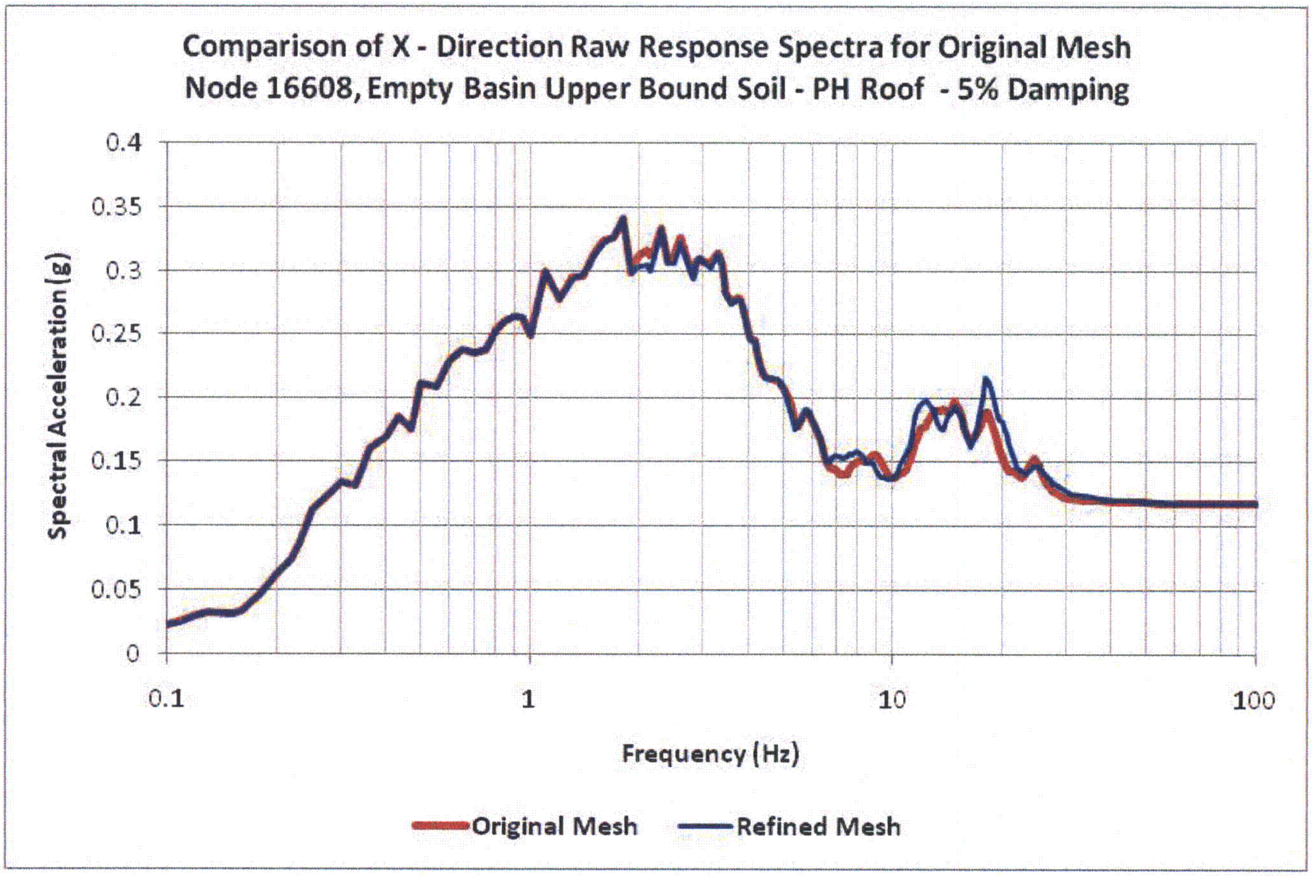


**Figure 03.07.02-24.94: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16608, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

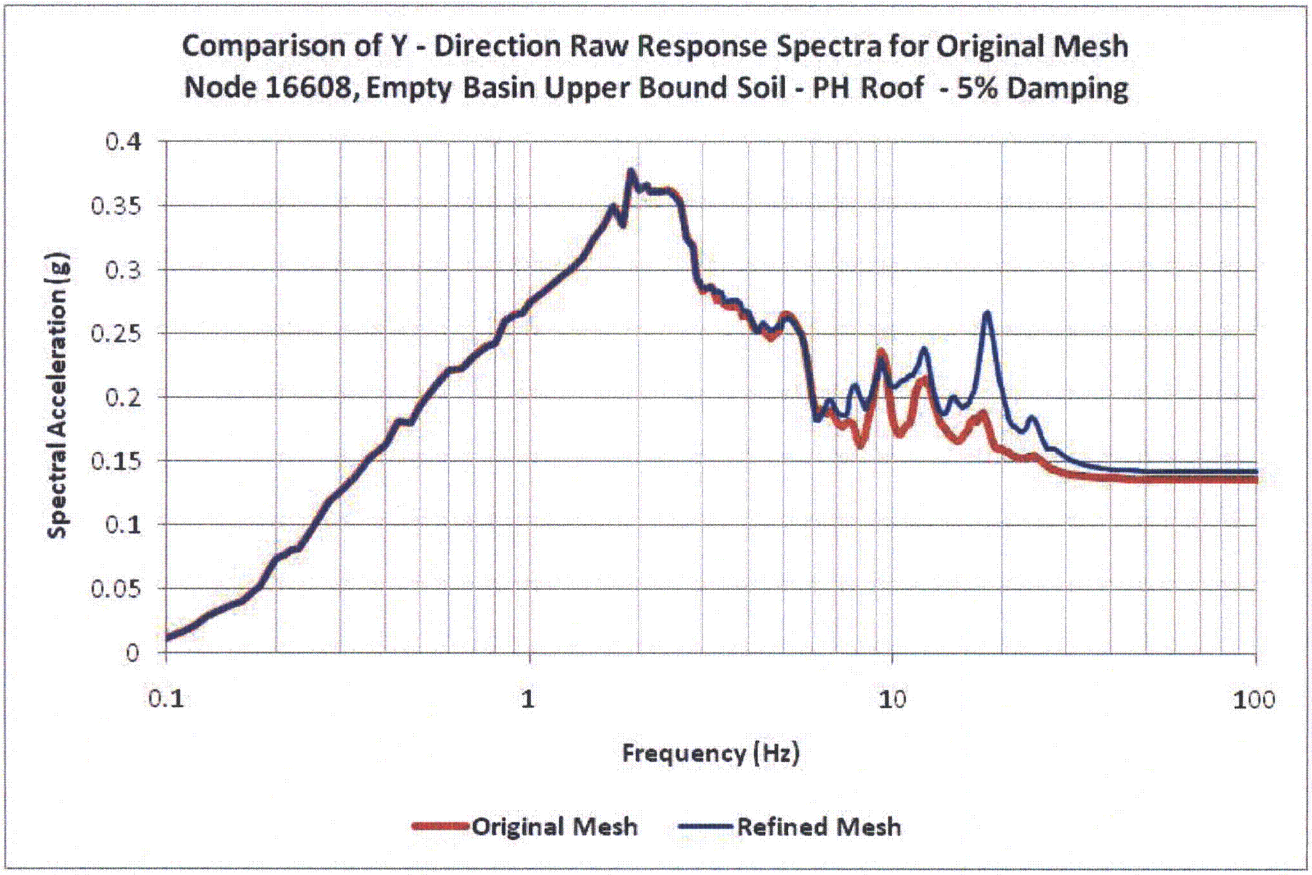


**Figure 03.07.02-24.95: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16608, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

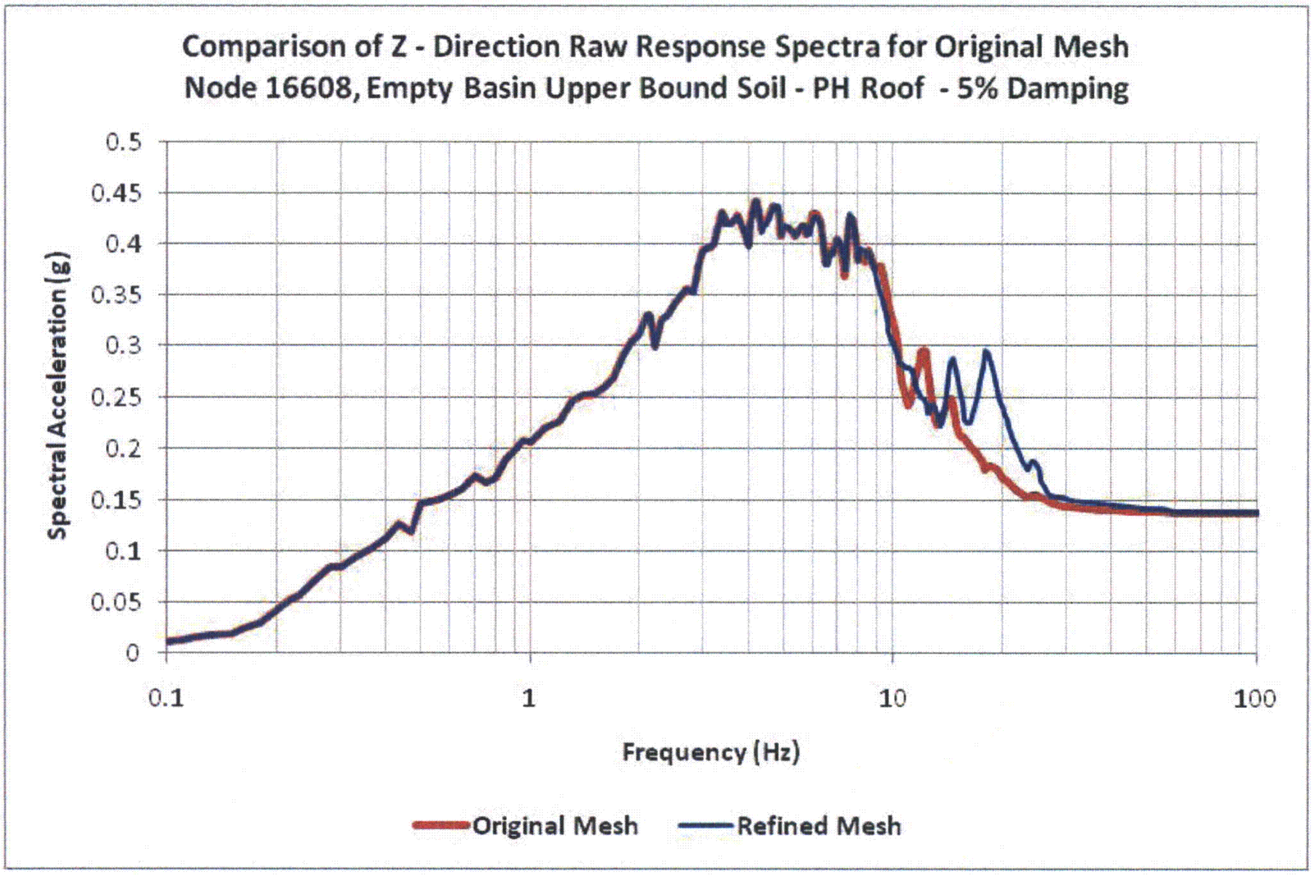


**Figure 03.07.02-24.96: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16608, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

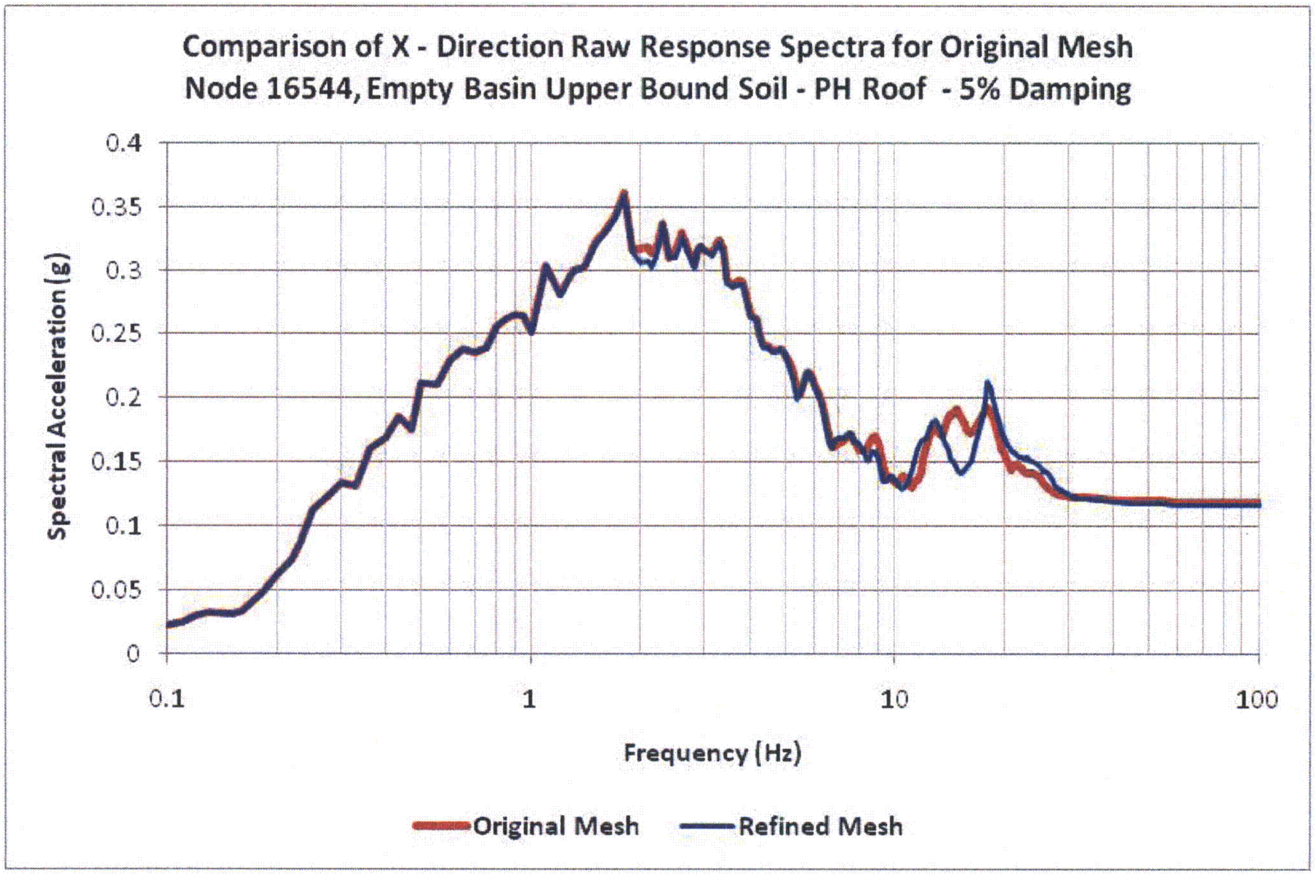


**Figure 03.07.02-24.97: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16544, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

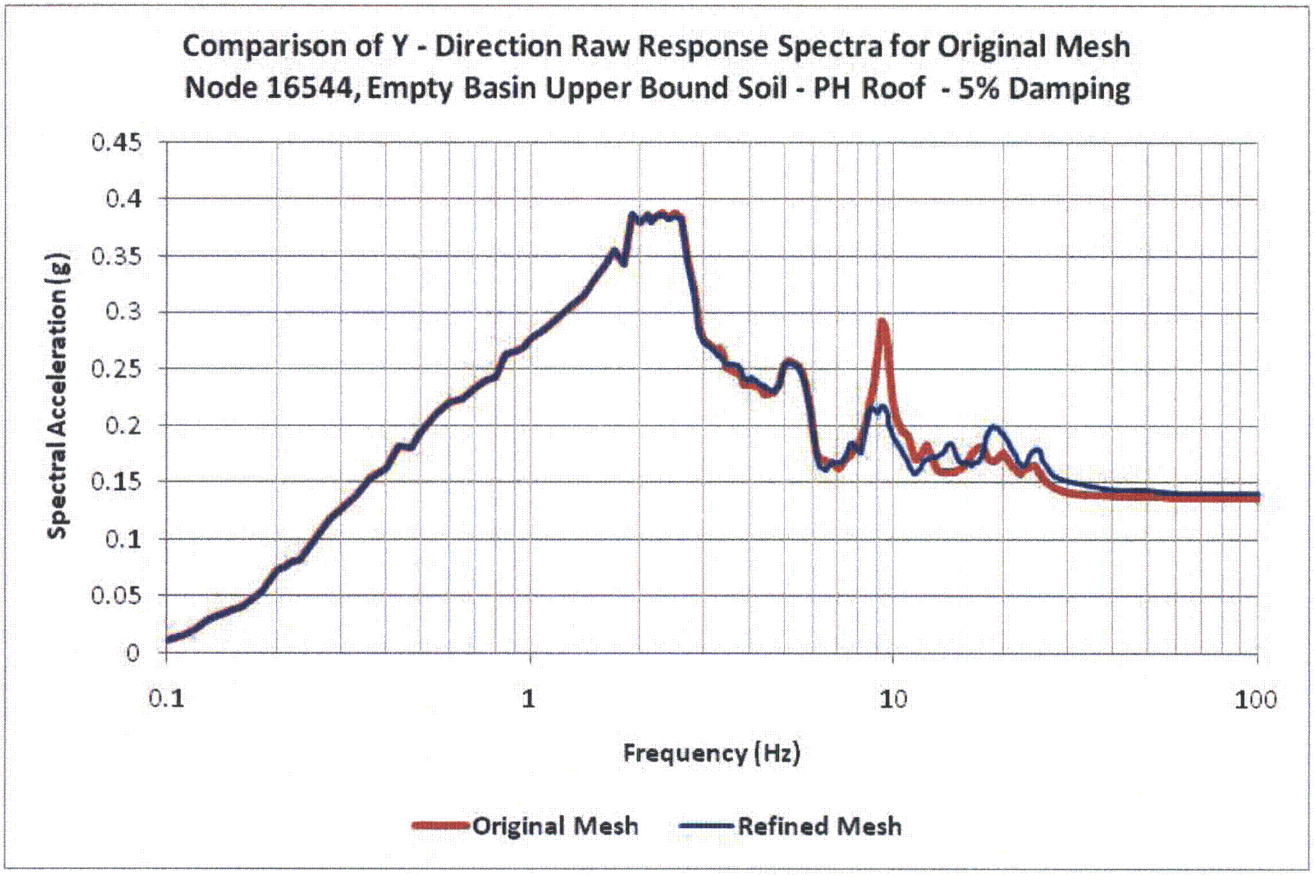


**Figure 03.07.02-24.98: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16544, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

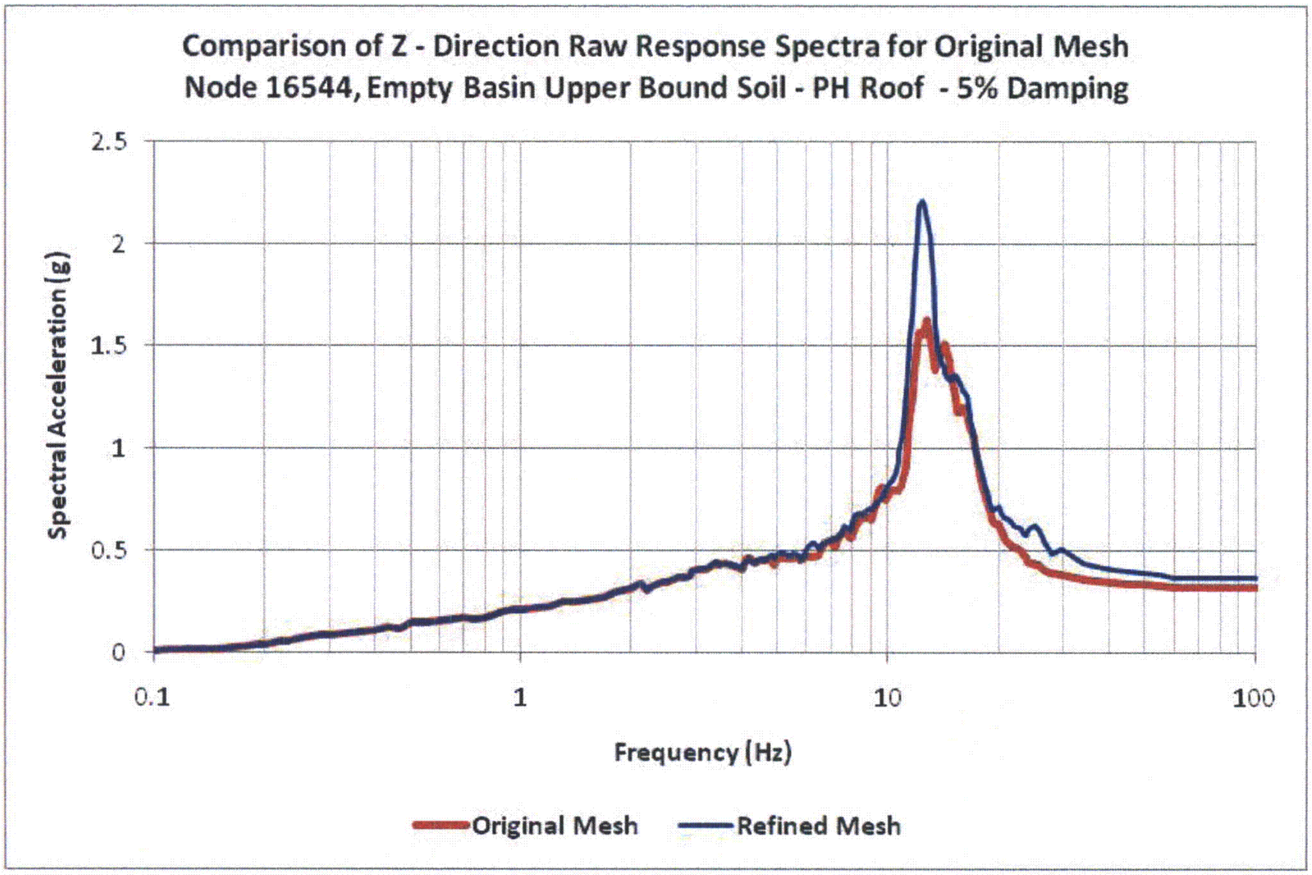


**Figure 03.07.02-24.99: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16544, Empty Basin Upper Bound Soil - PH Roof - 5% Damping**

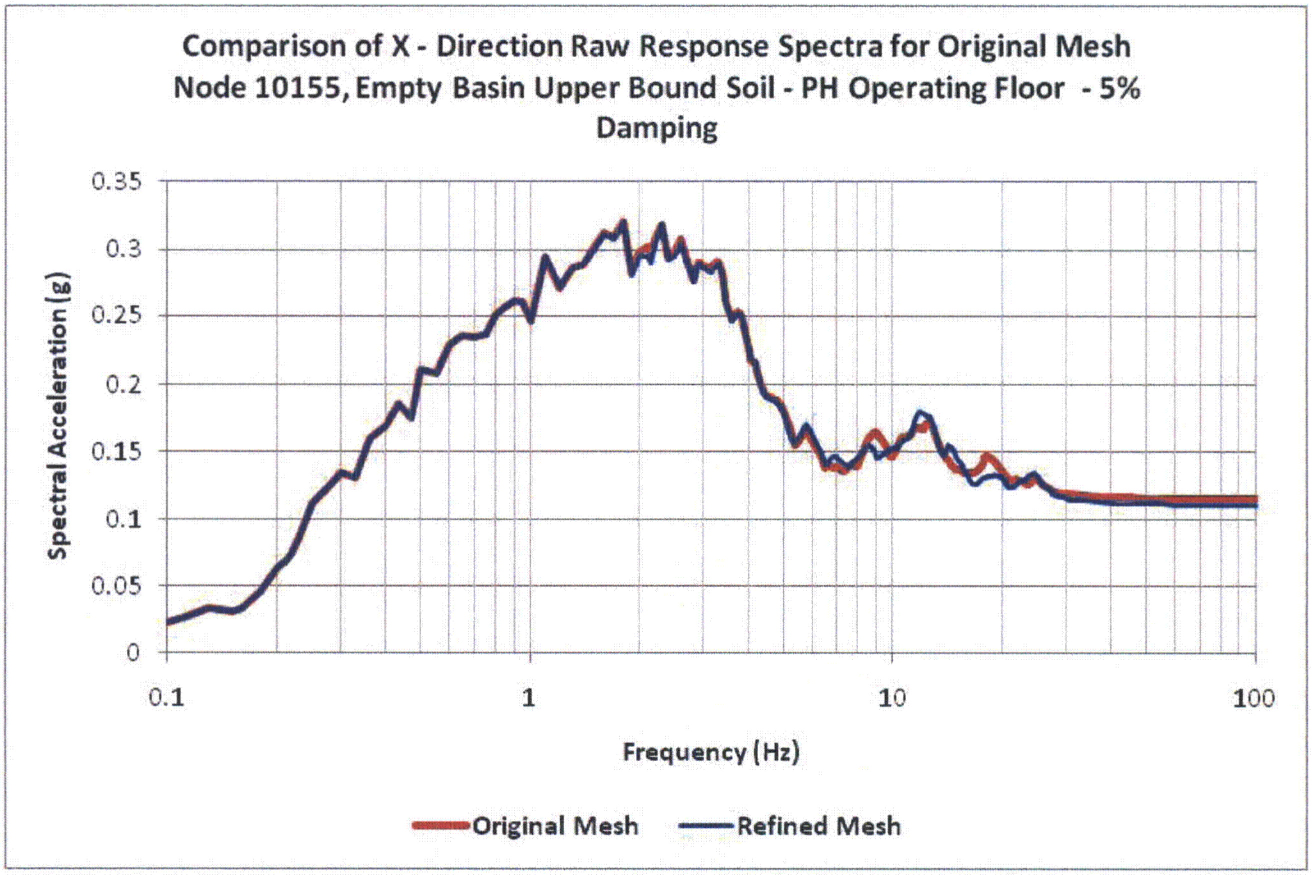


**Figure 03.07.02-24.100: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 10155, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

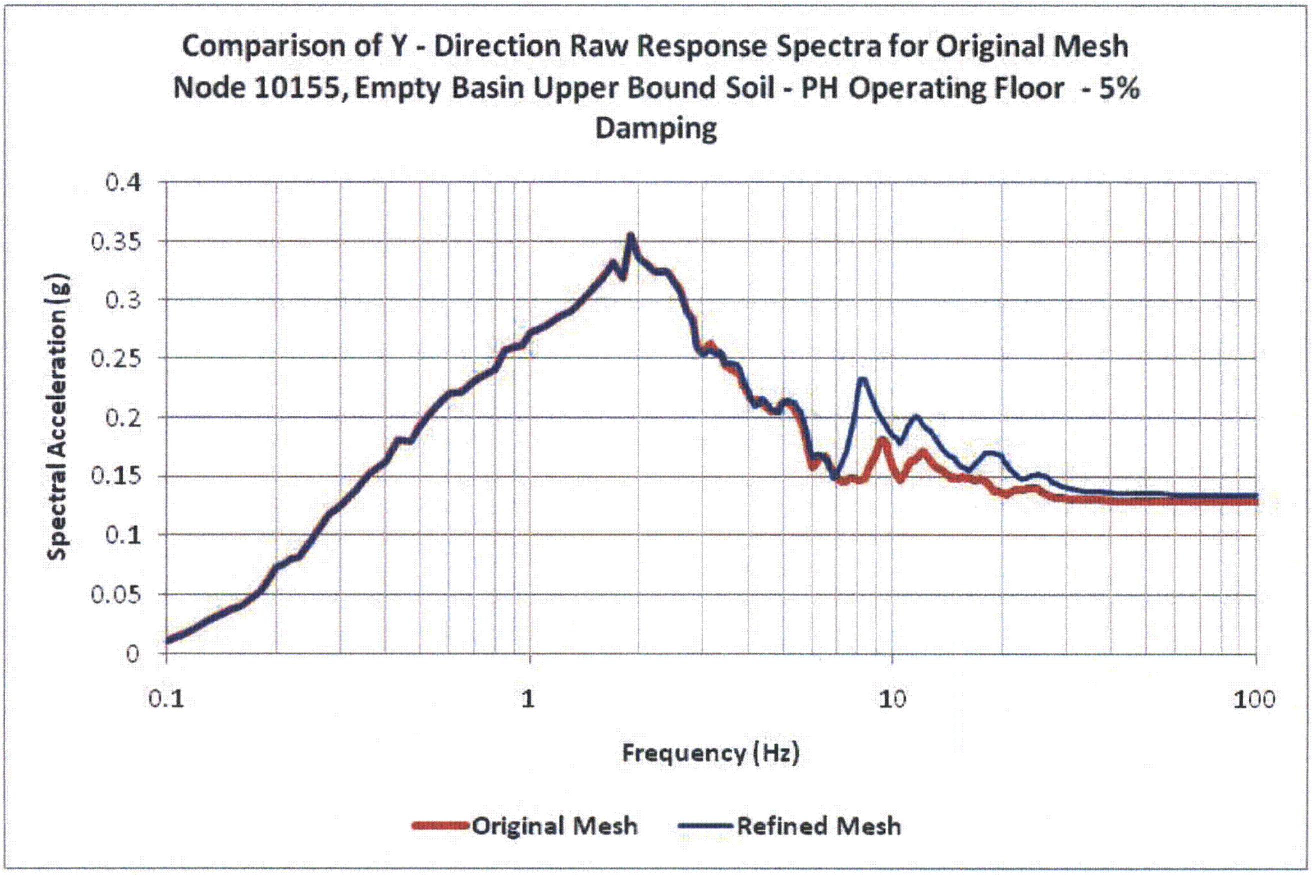


**Figure 03.07.02-24.101: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 10155, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

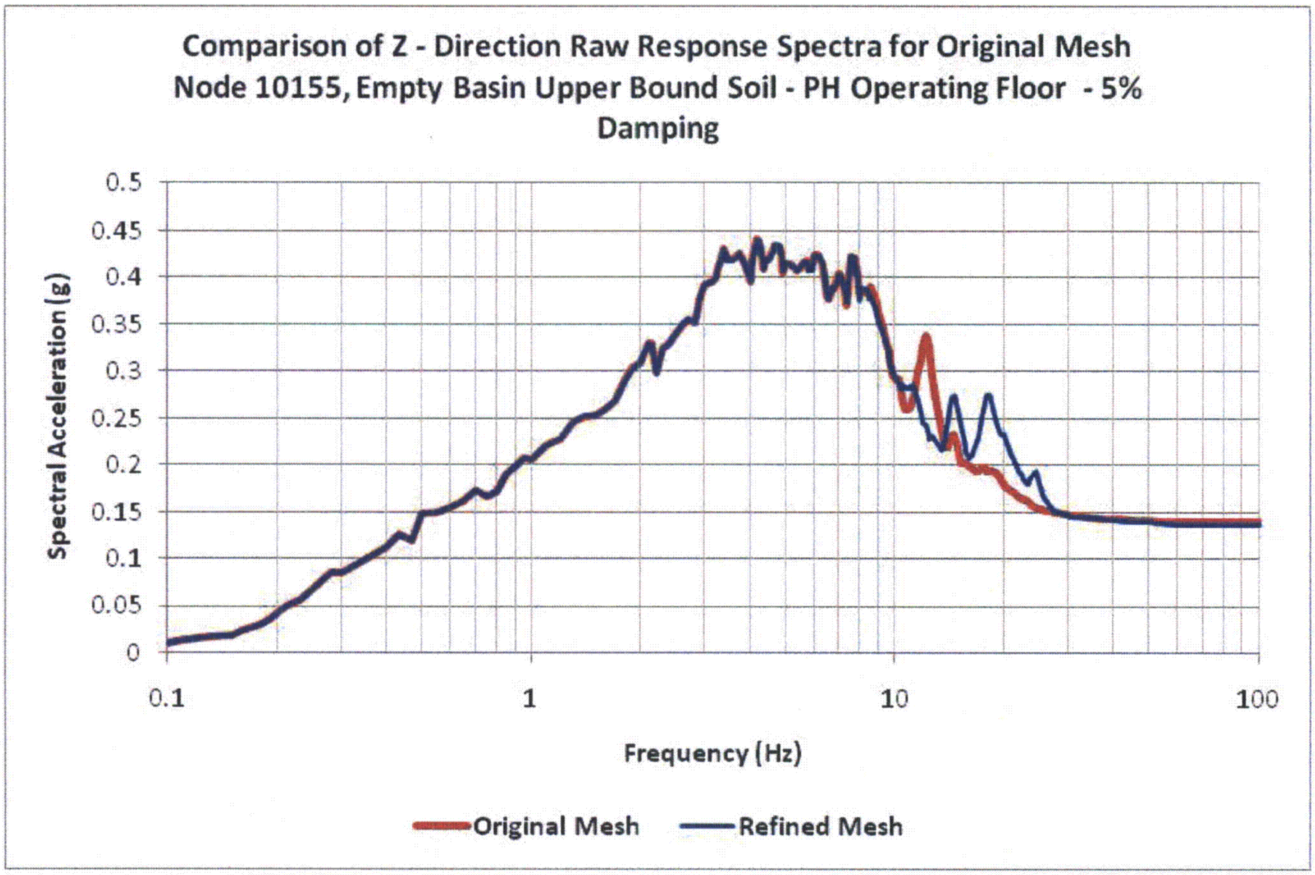


**Figure 03.07.02-24.102: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 10155, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

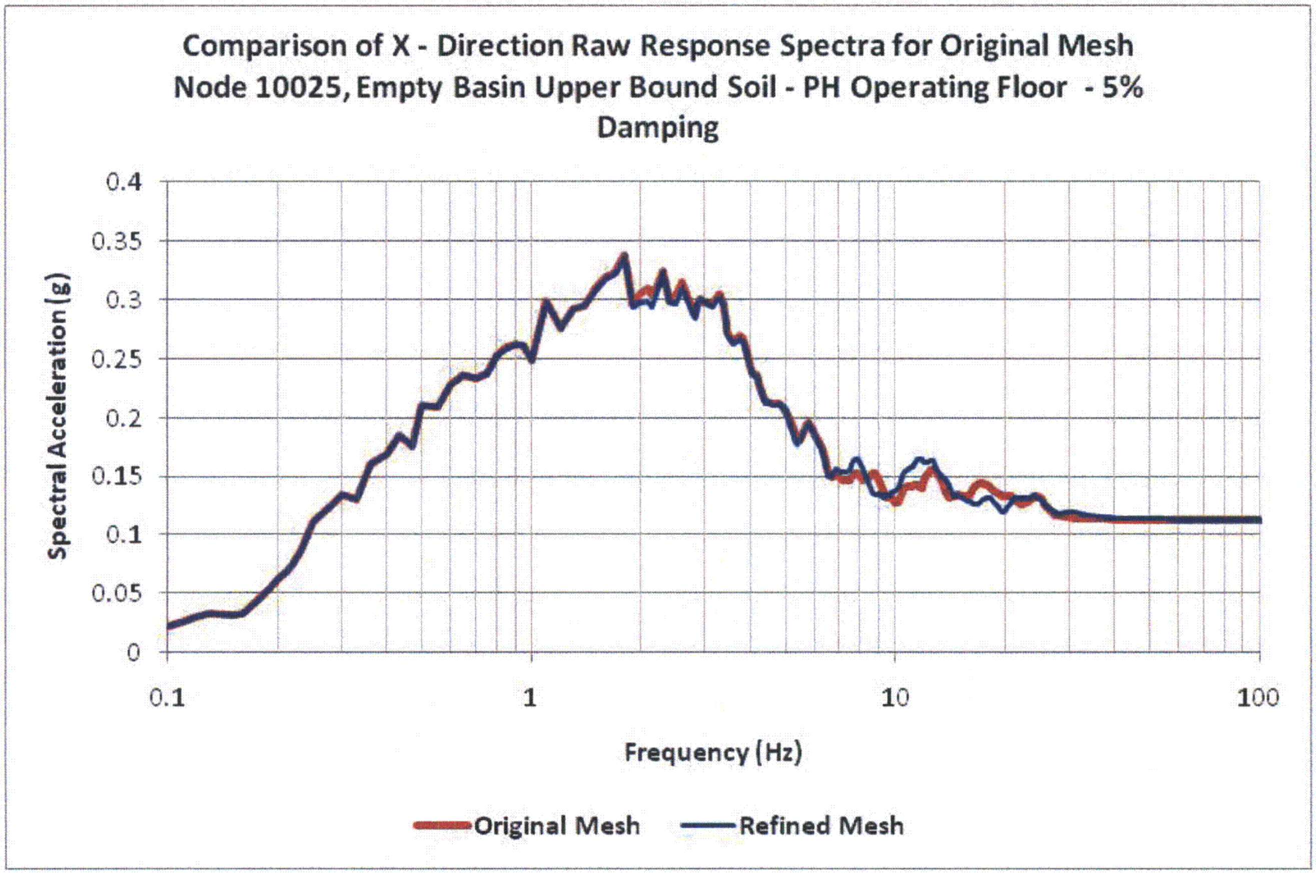


**Figure 03.07.02-24.103: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 10025, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

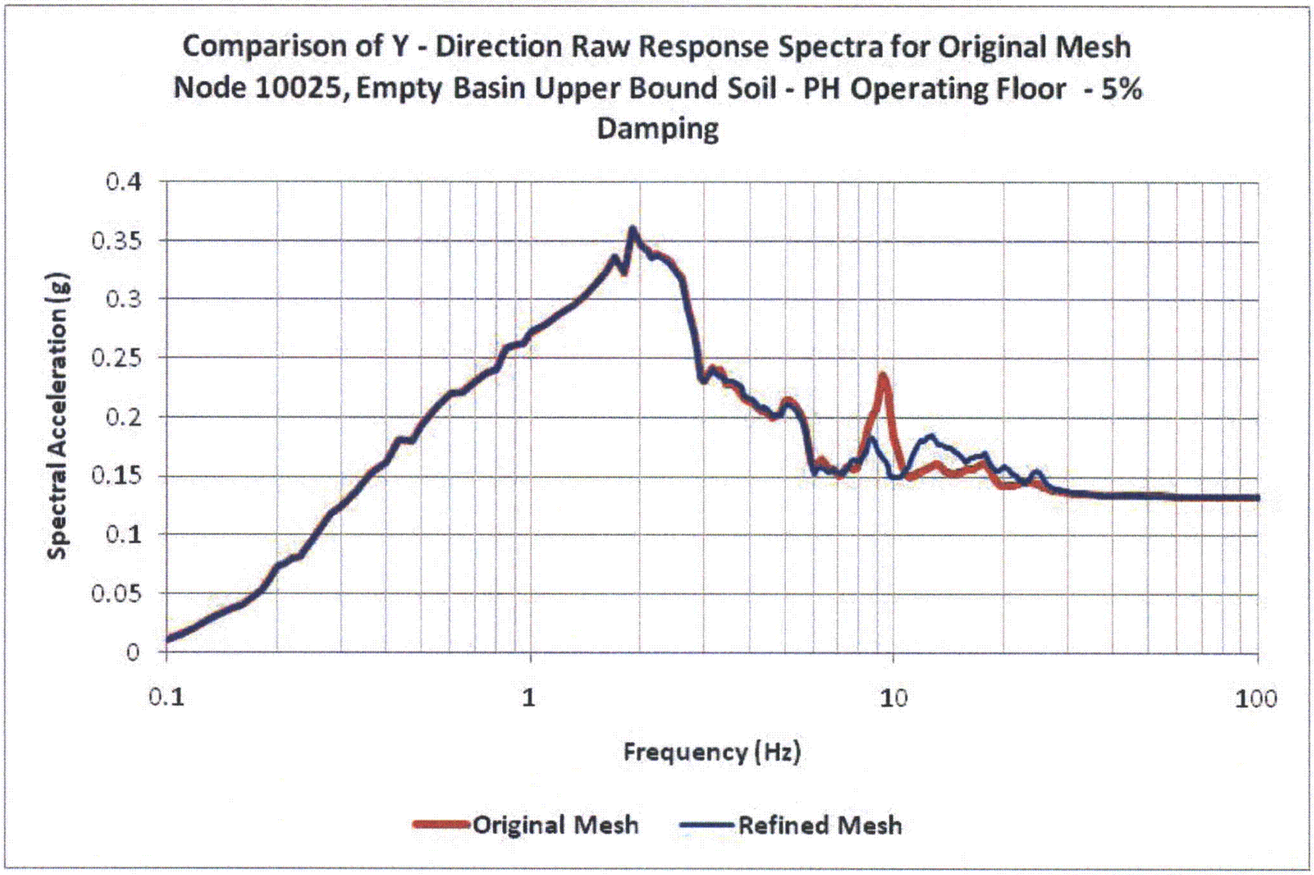


**Figure 03.07.02-24.104: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 10025, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

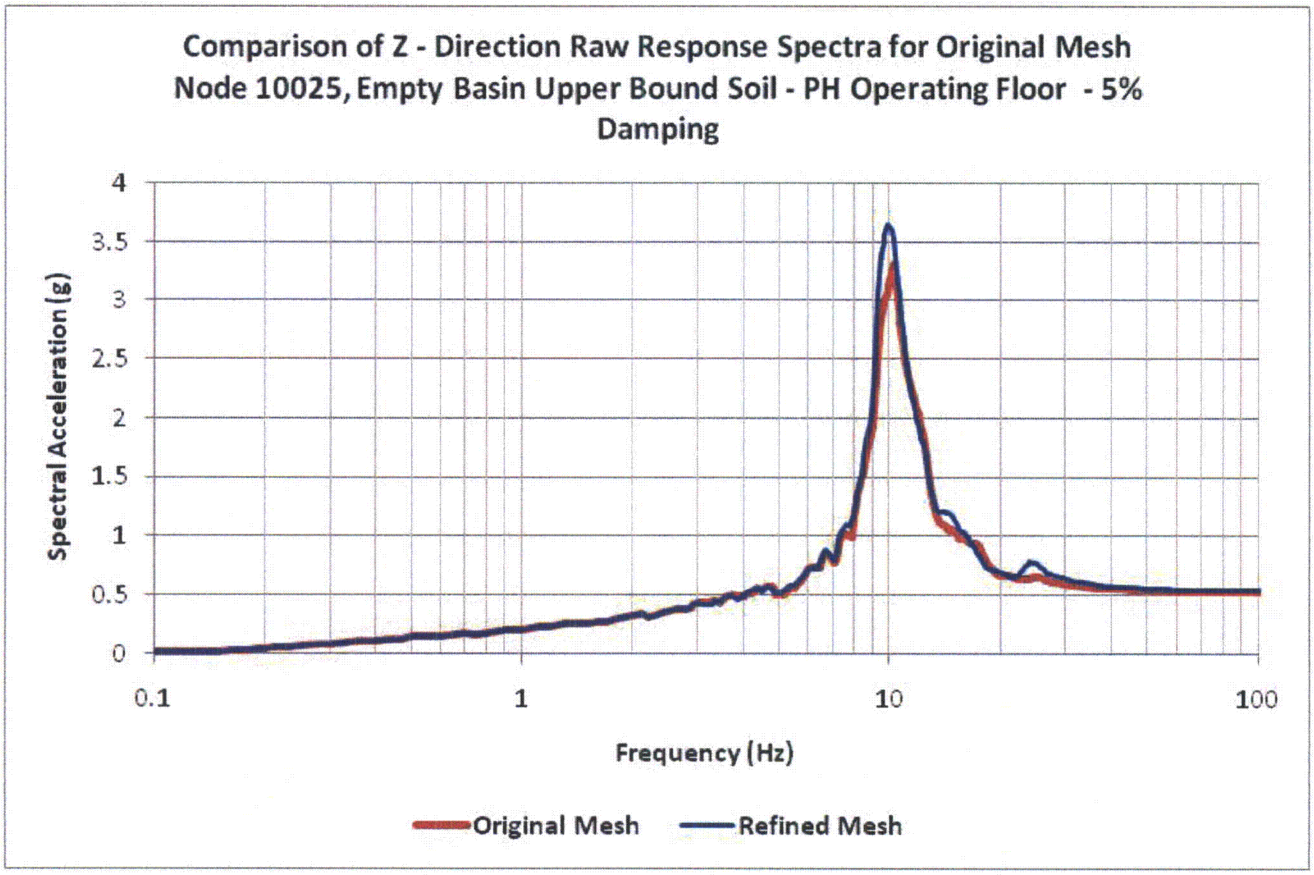


**Figure 03.07.02-24.105: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 10025, Empty Basin Upper Bound Soil - PH Operating Floor - 5% Damping**

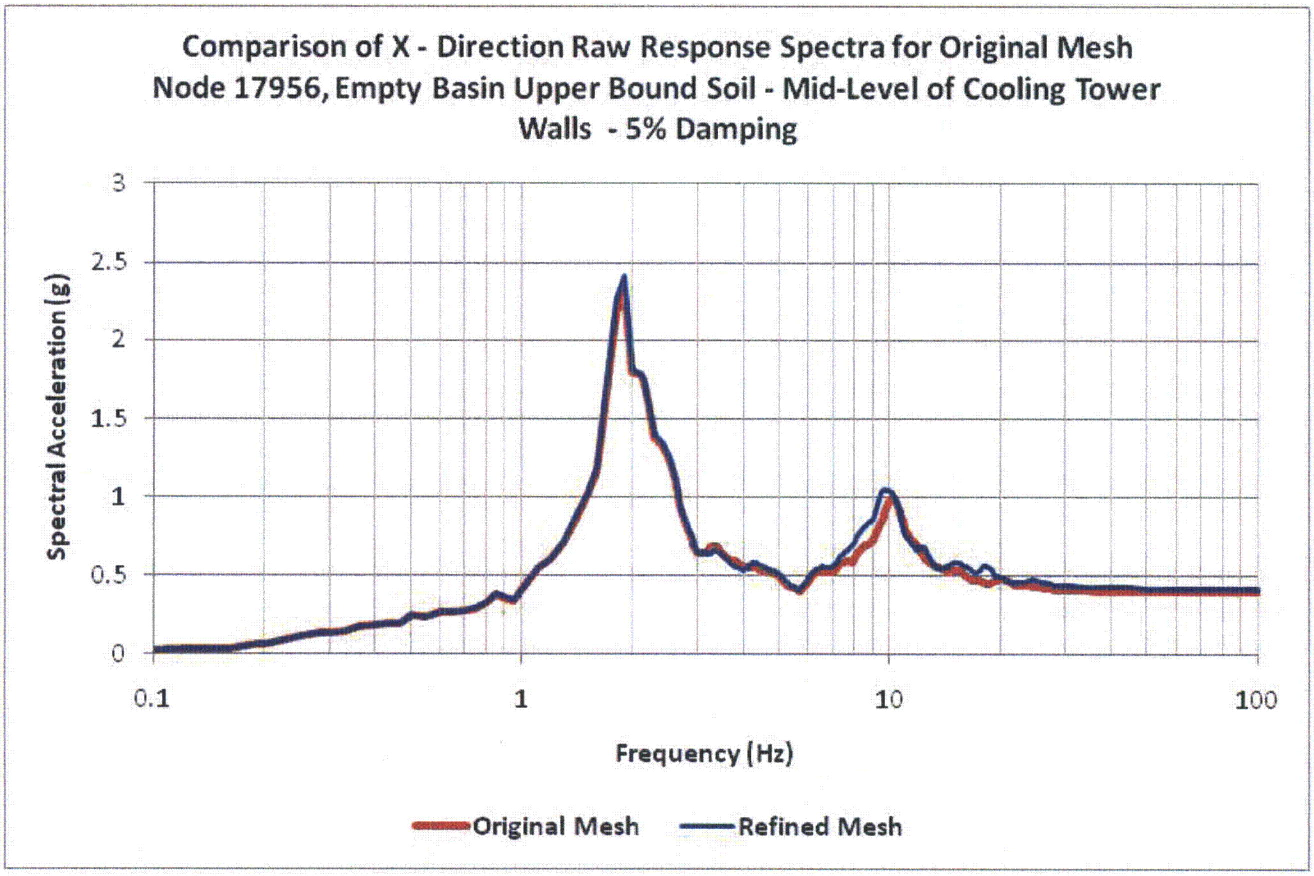


**Figure 03.07.02-24.106: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17956, Empty Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

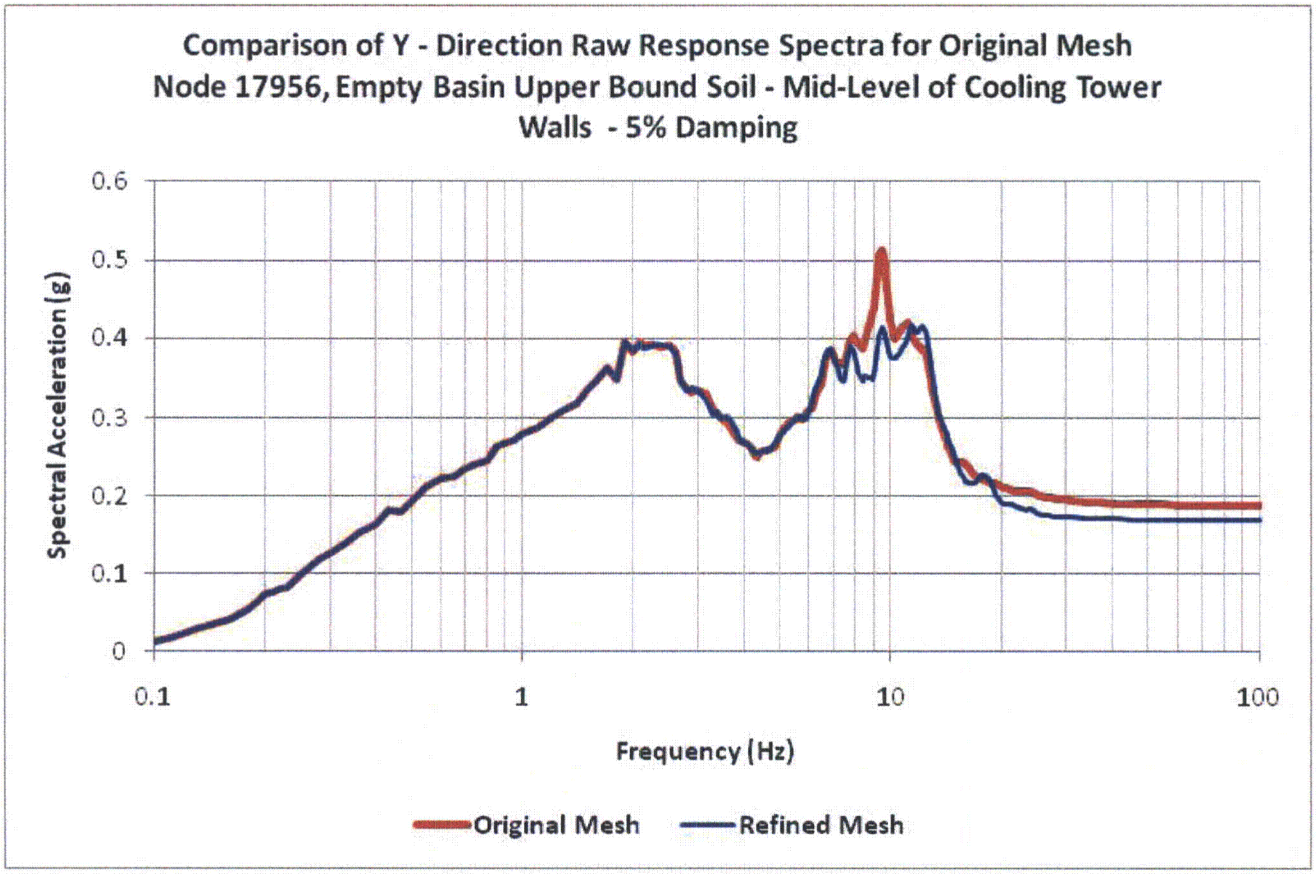


**Figure 03.07.02-24.107: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17956, Empty Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

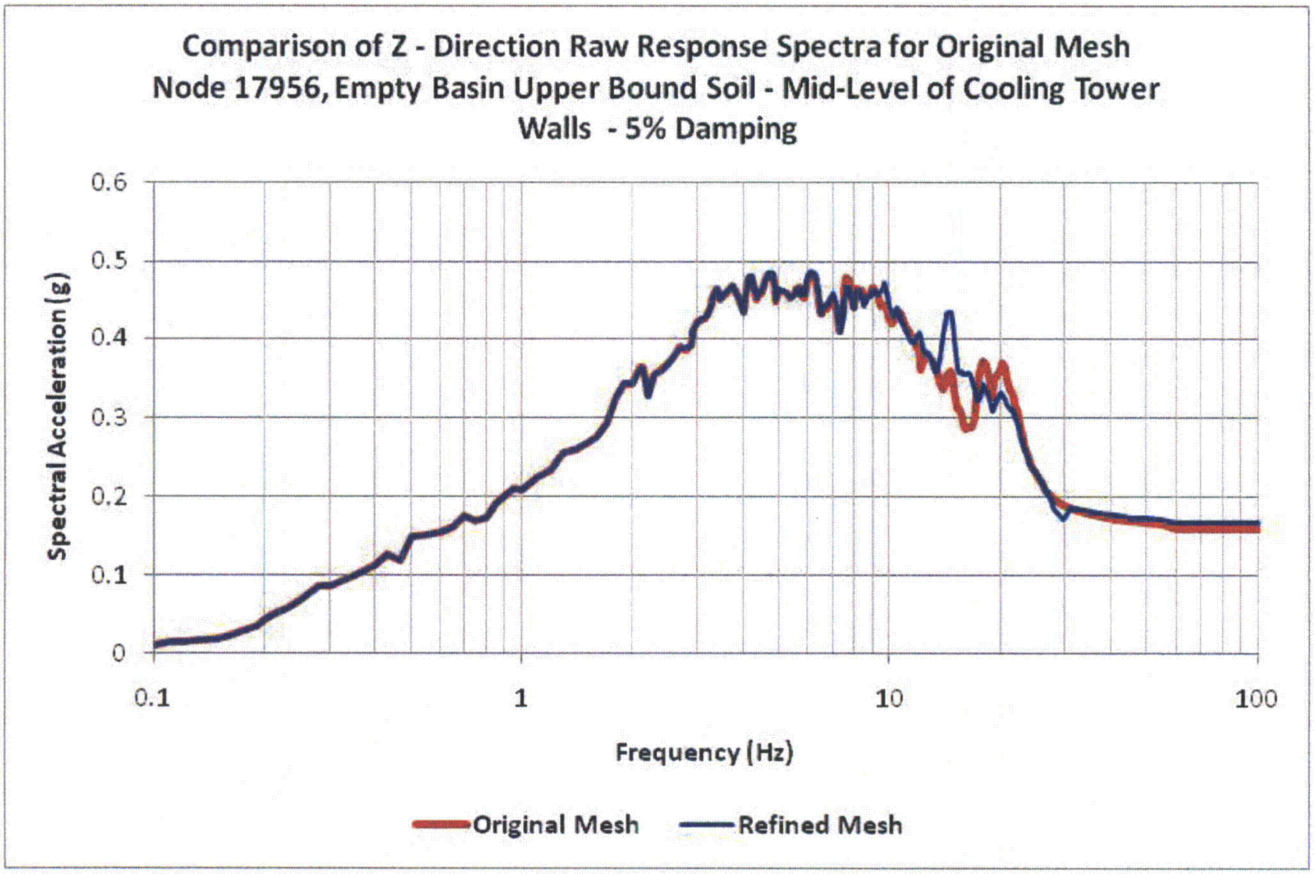


**Figure 03.07.02-24.108: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17956, Empty Basin Upper Bound Soil - Mid-Level of Cooling Tower Walls - 5% Damping**

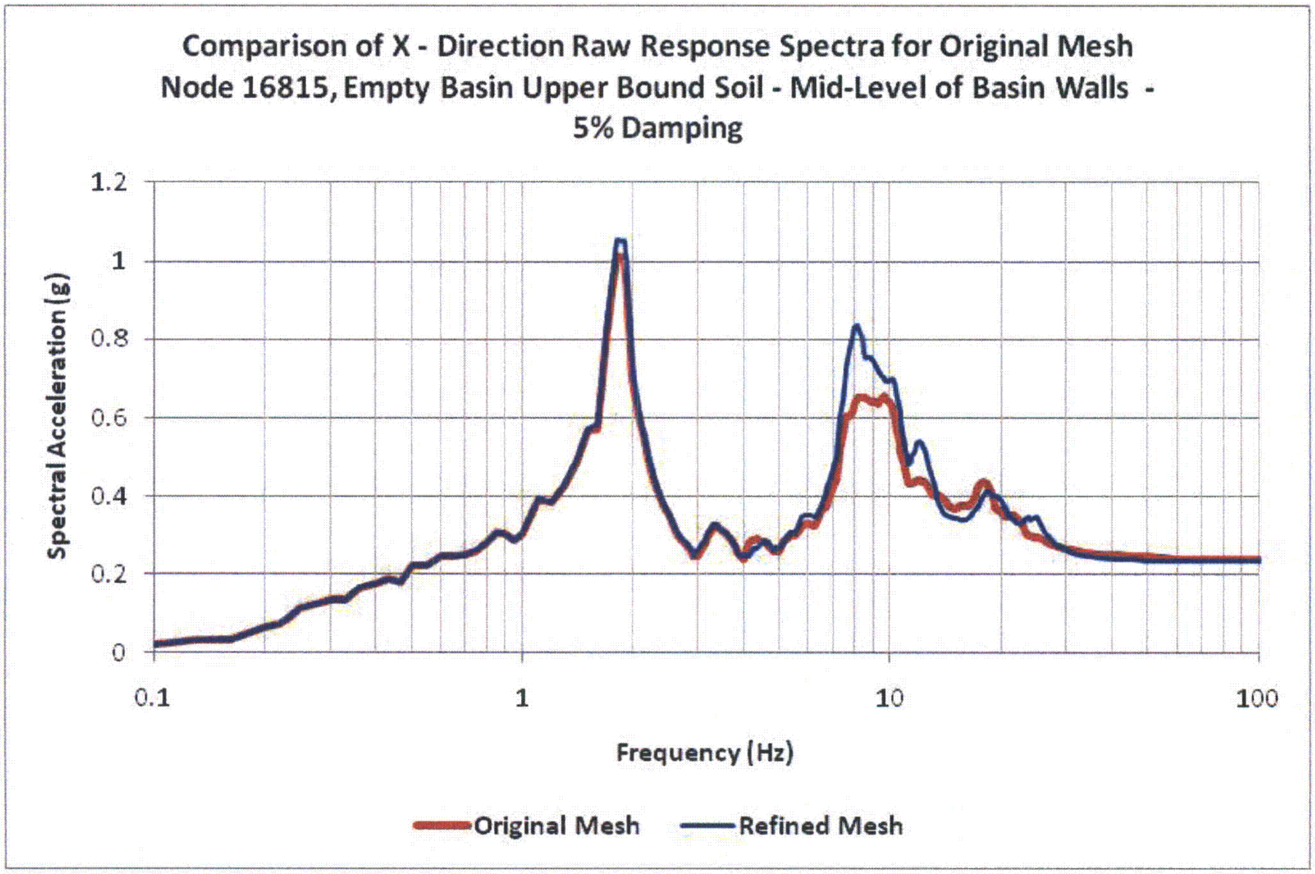


**Figure 03.07.02-24.109: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16815, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

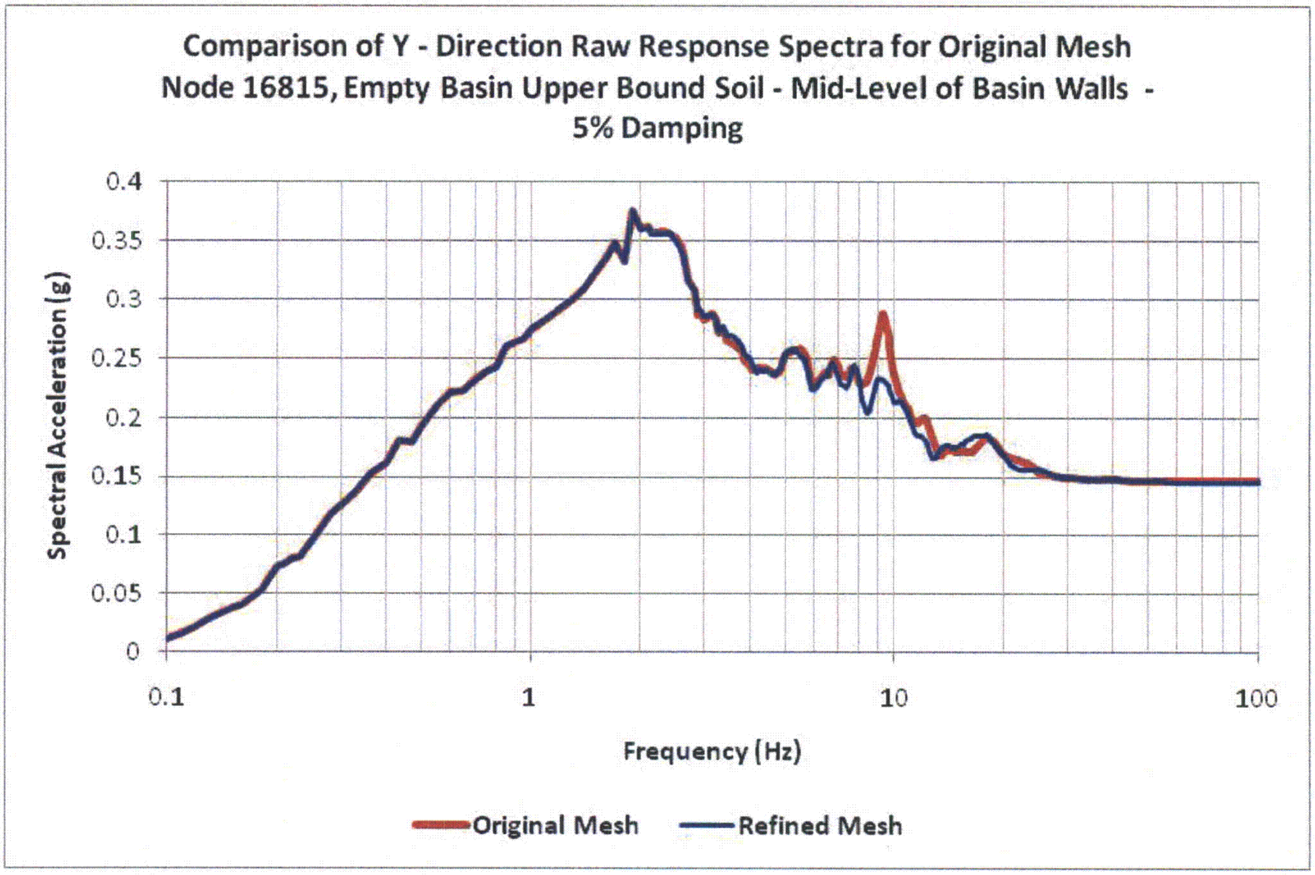


**Figure 03.07.02-24.110: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16815, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

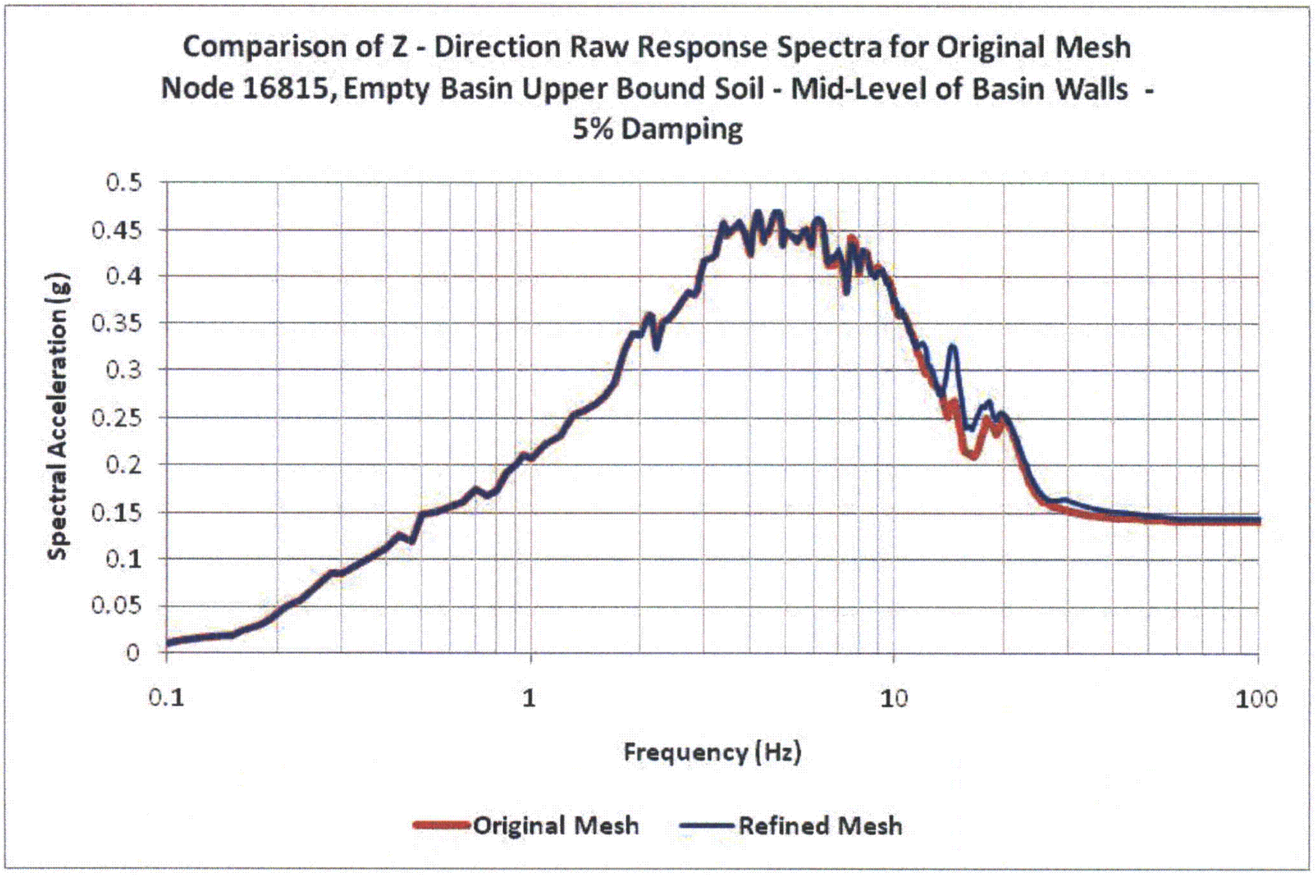


**Figure 03.07.02-24.111: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16815, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

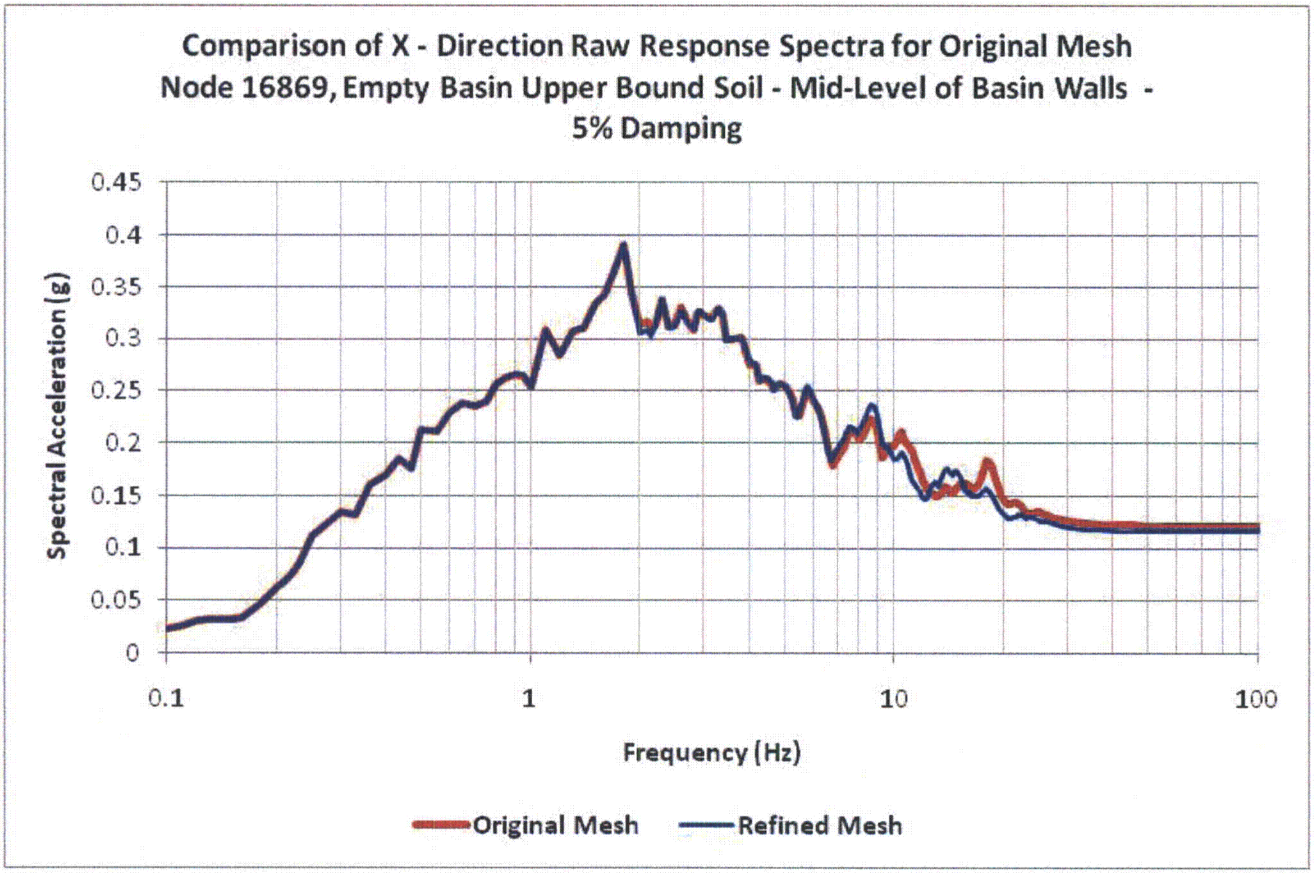


**Figure 03.07.02-24.112: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16869, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

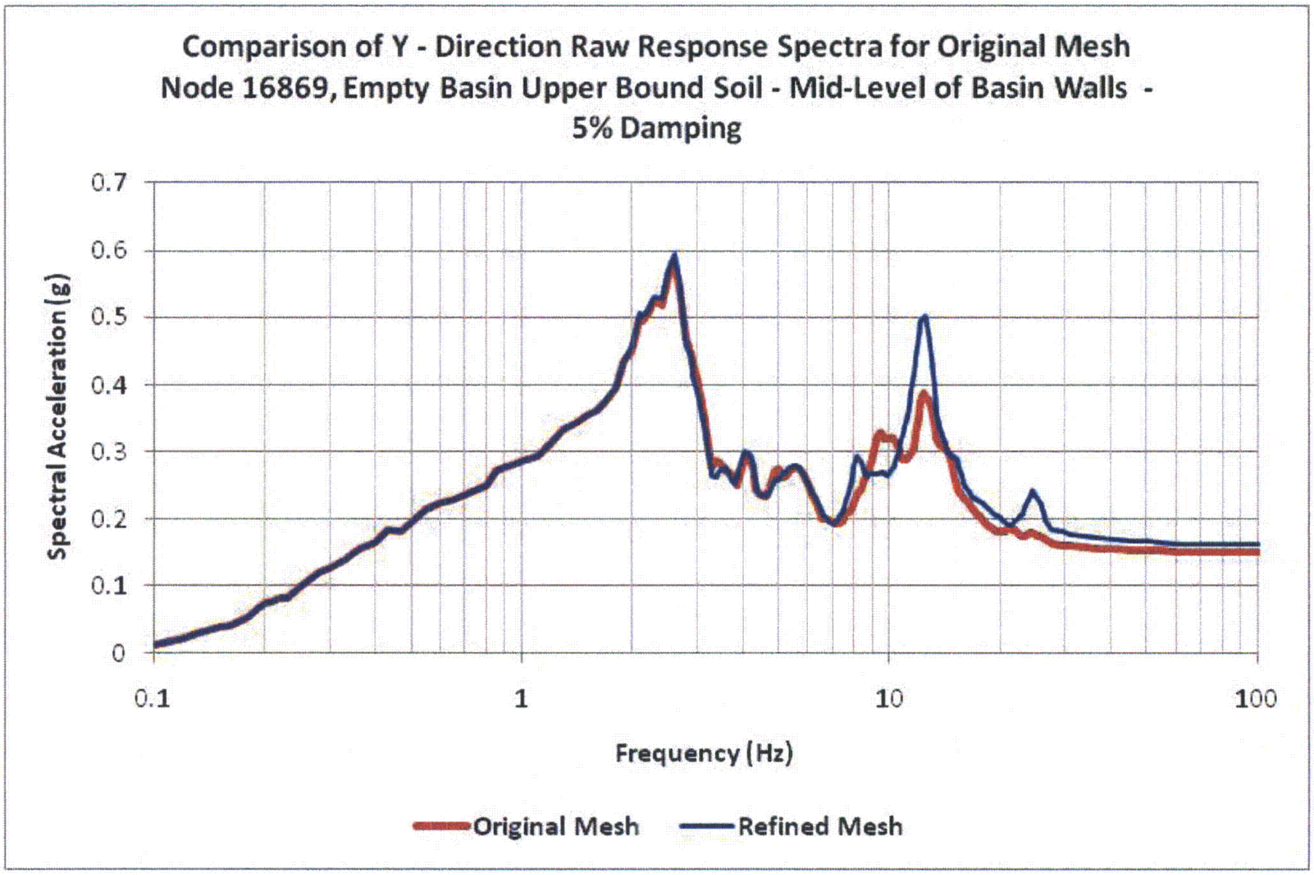


**Figure 03.07.02-24.113: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16869, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

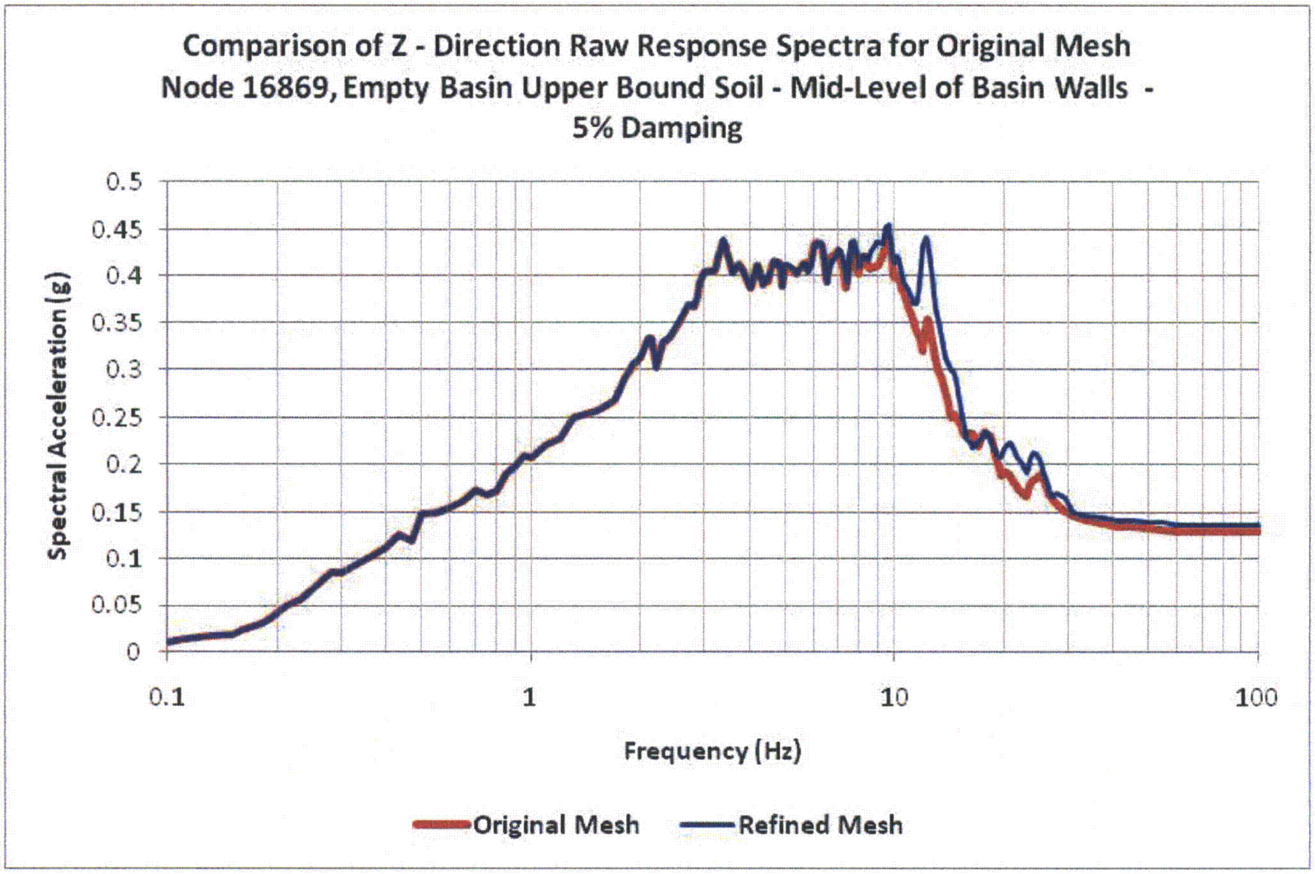


**Figure 03.07.02-24.114: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16869, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

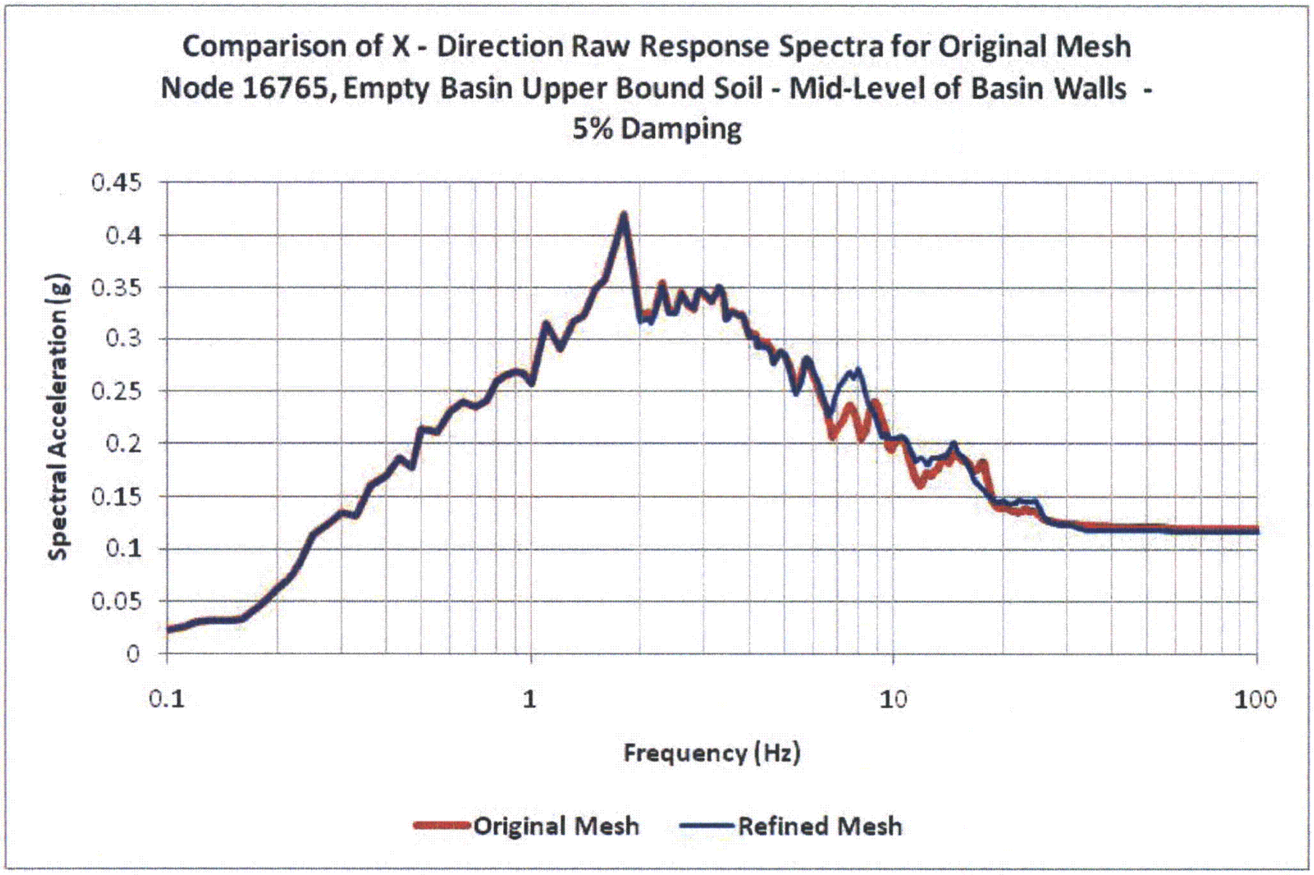


**Figure 03.07.02-24.115: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 16765, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

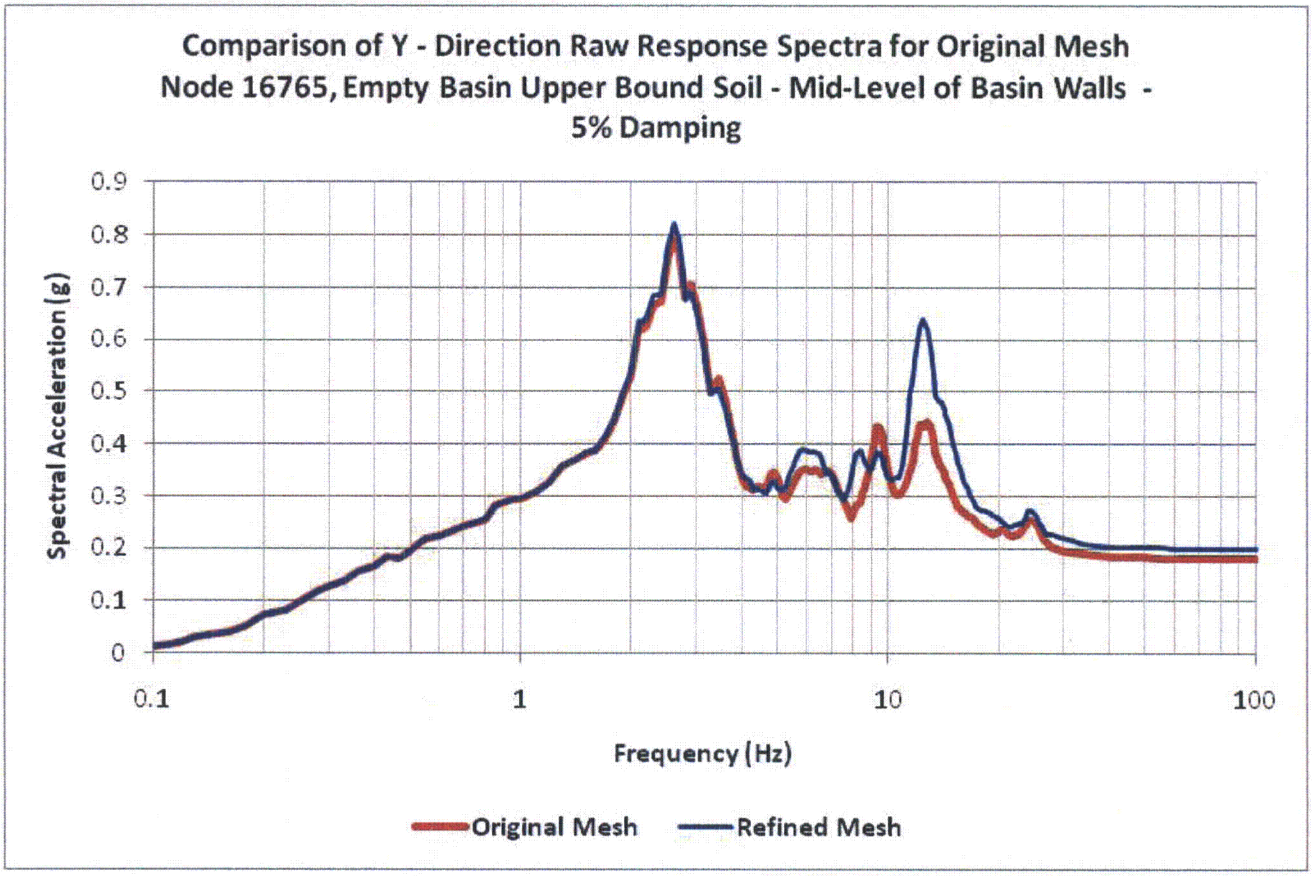


**Figure 03.07.02-24.116: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 16765, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

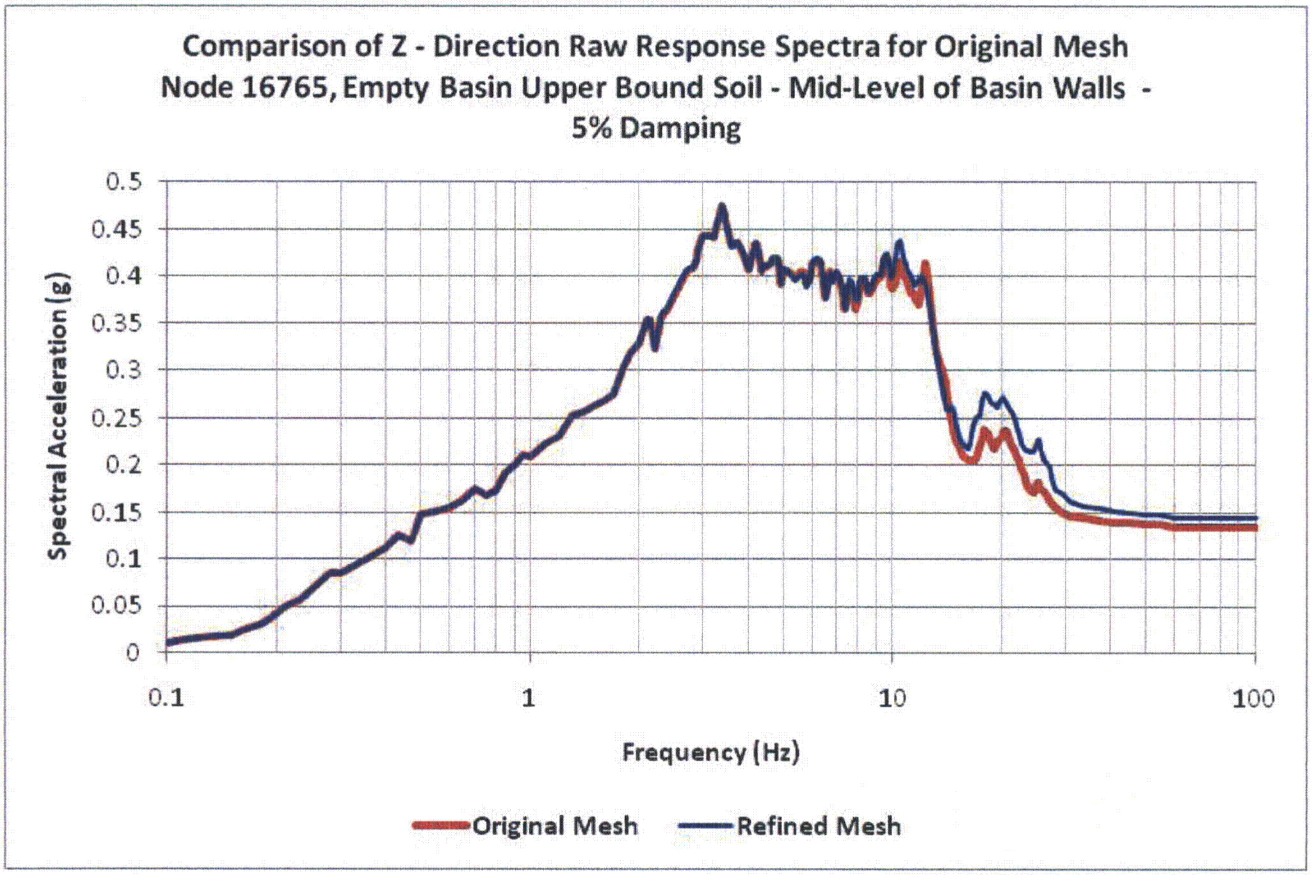


**Figure 03.07.02-24.117: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 16765, Empty Basin Upper Bound Soil - Mid-Level of Basin Walls - 5% Damping**

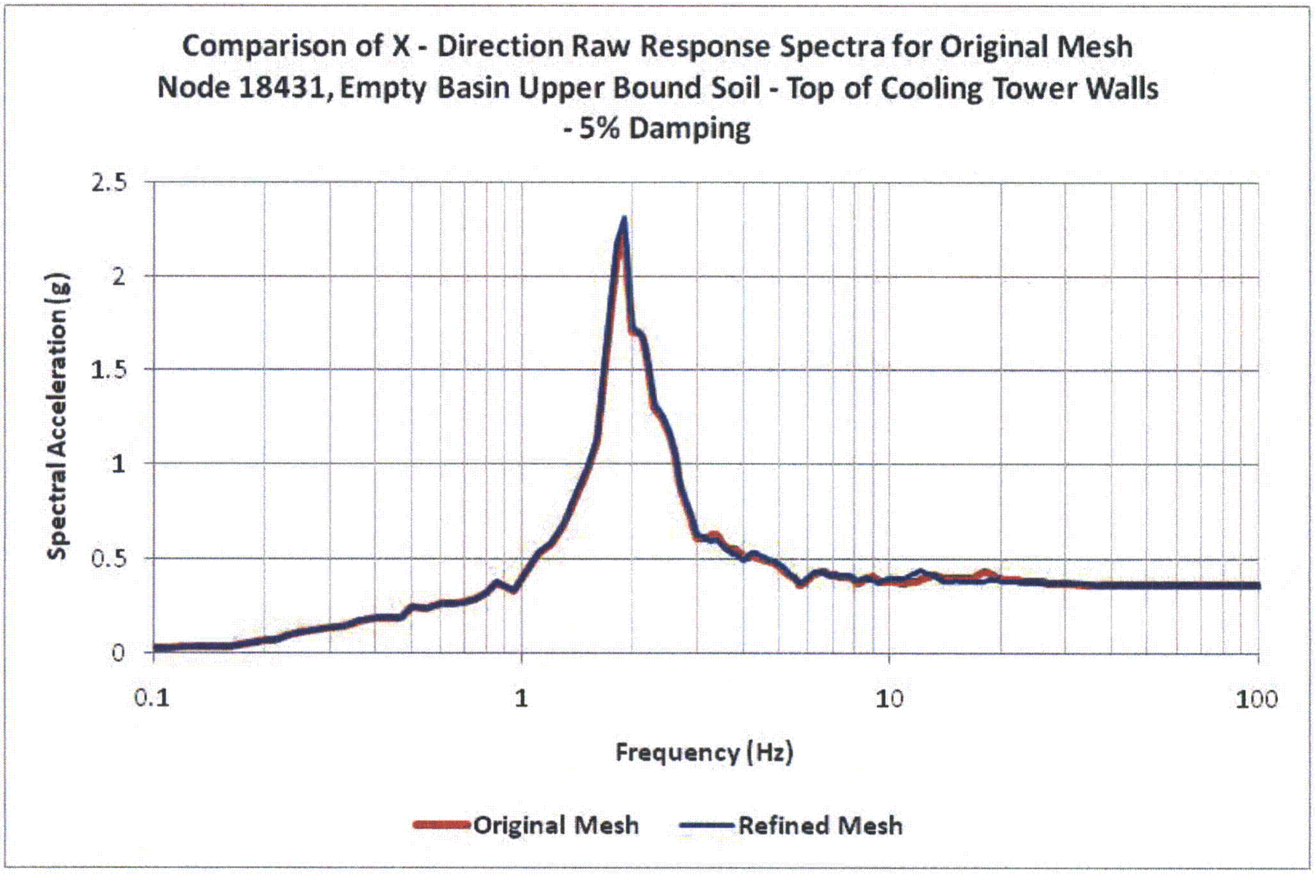


**Figure 03.07.02-24.118: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 18431, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

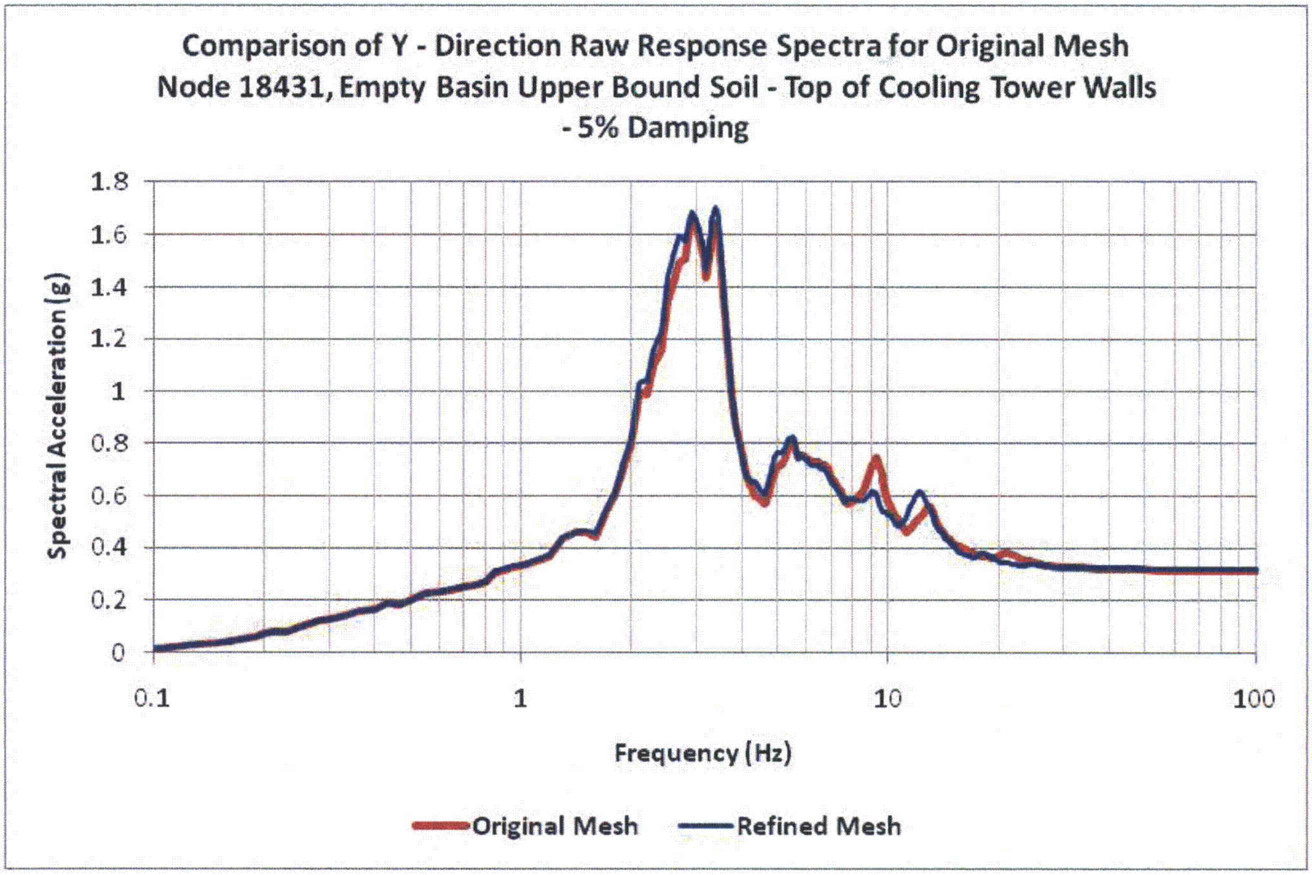


**Figure 03.07.02-24.119: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 18431, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

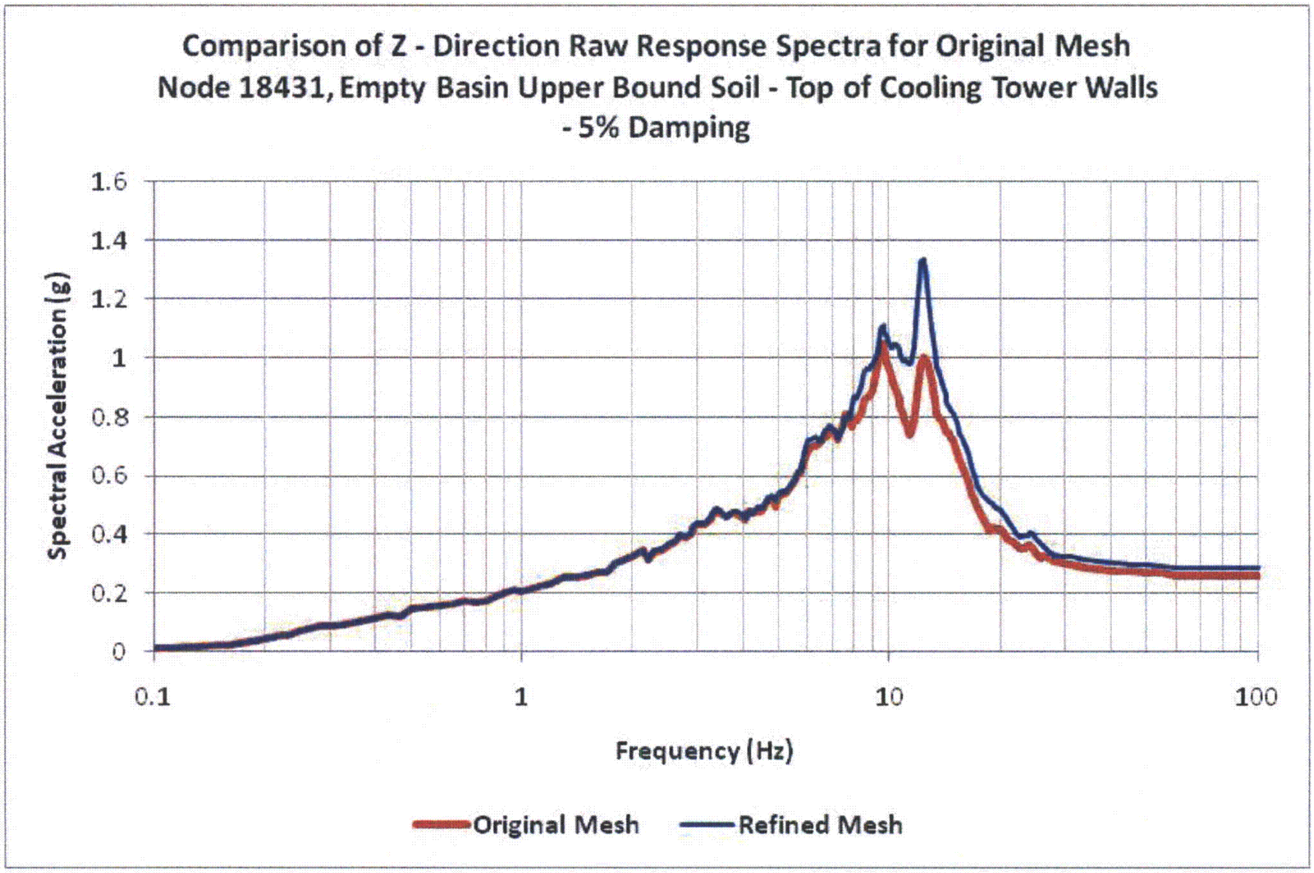


**Figure 03.07.02-24.120: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 18431, Empty Basin Upper Bound Soil - Top of Cooling Tower Walls - 5% Damping**

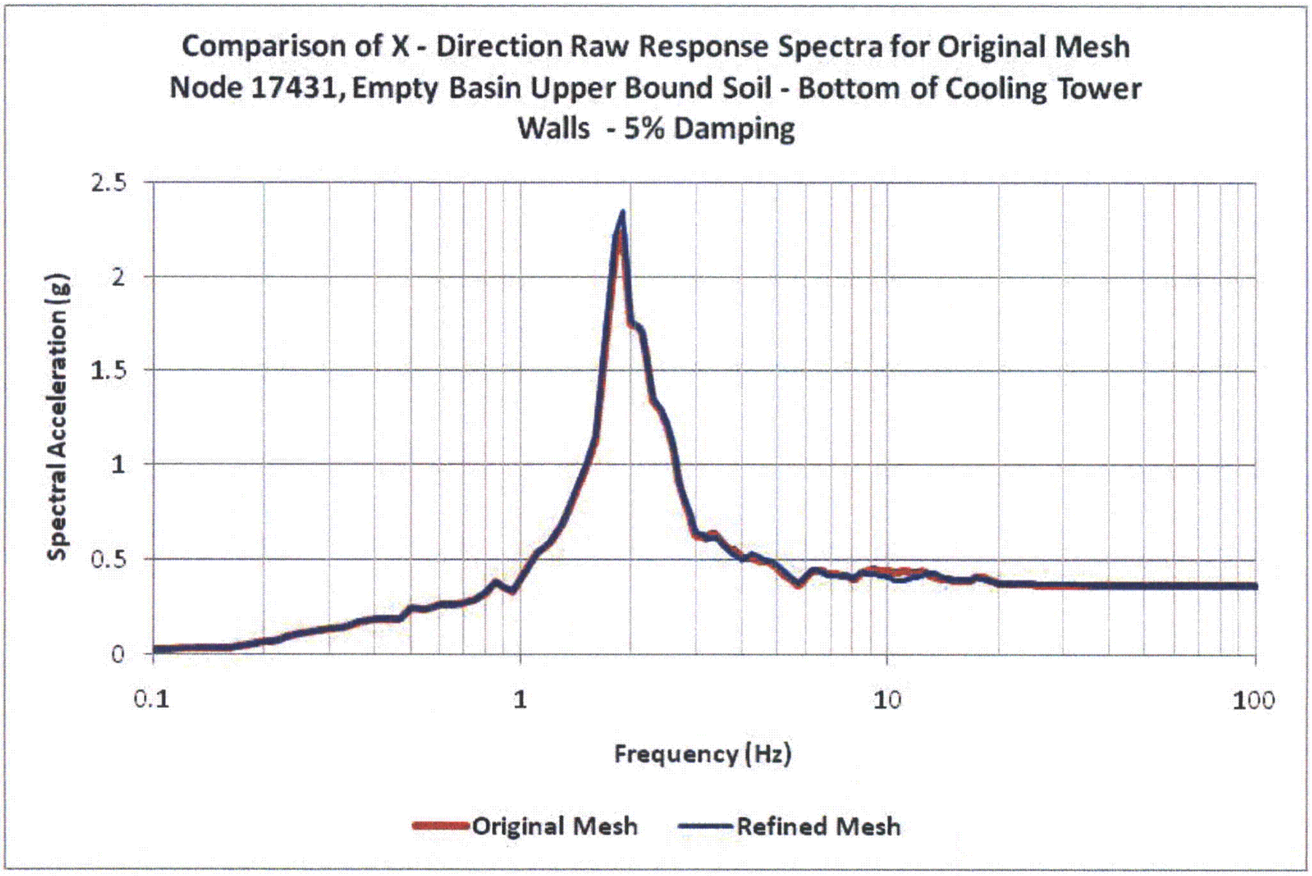


**Figure 03.07.02-24.121: Comparison of X - Direction Raw Response Spectra for Original Mesh Node 17431, Empty Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**

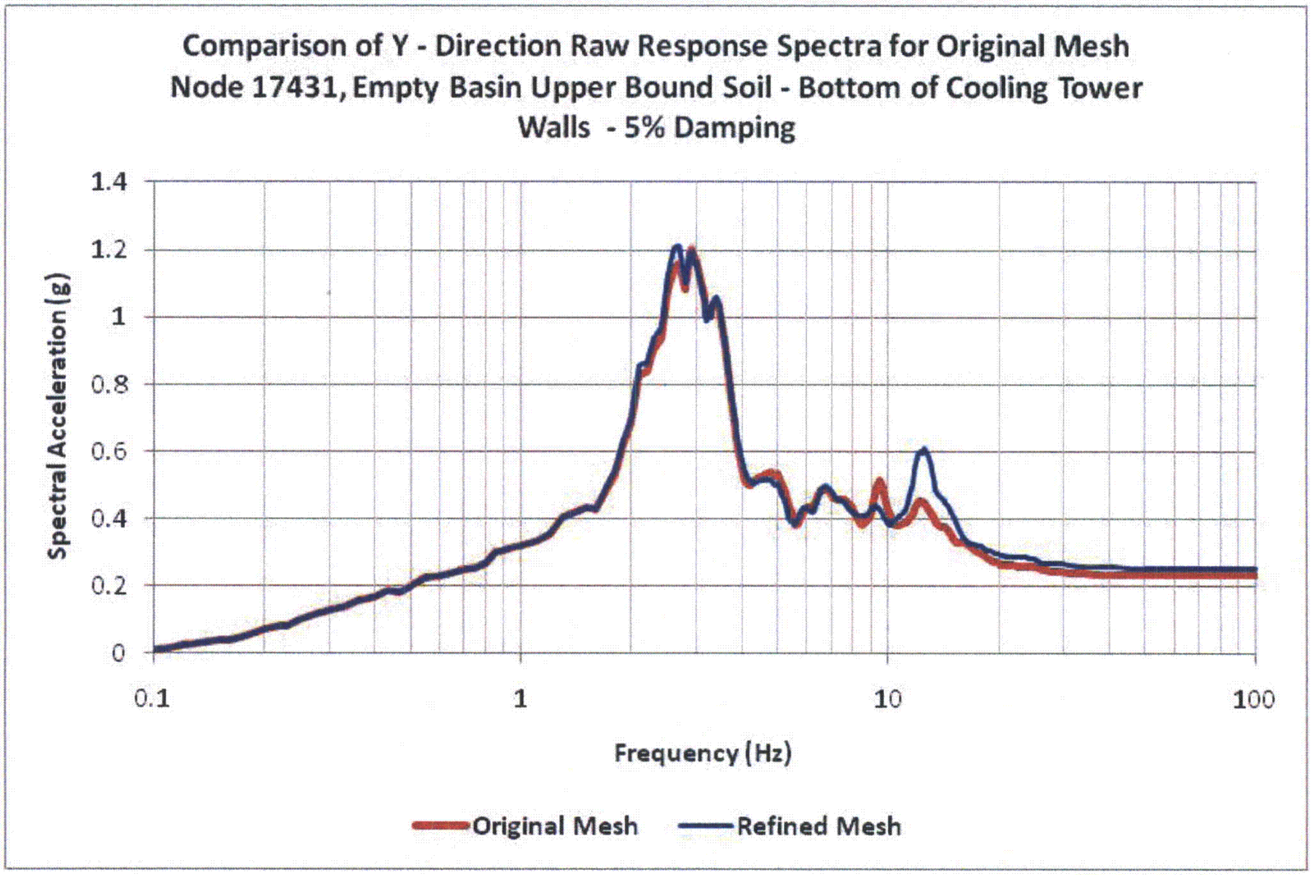


**Figure 03.07.02-24.122: Comparison of Y - Direction Raw Response Spectra for Original Mesh Node 17431, Empty Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**

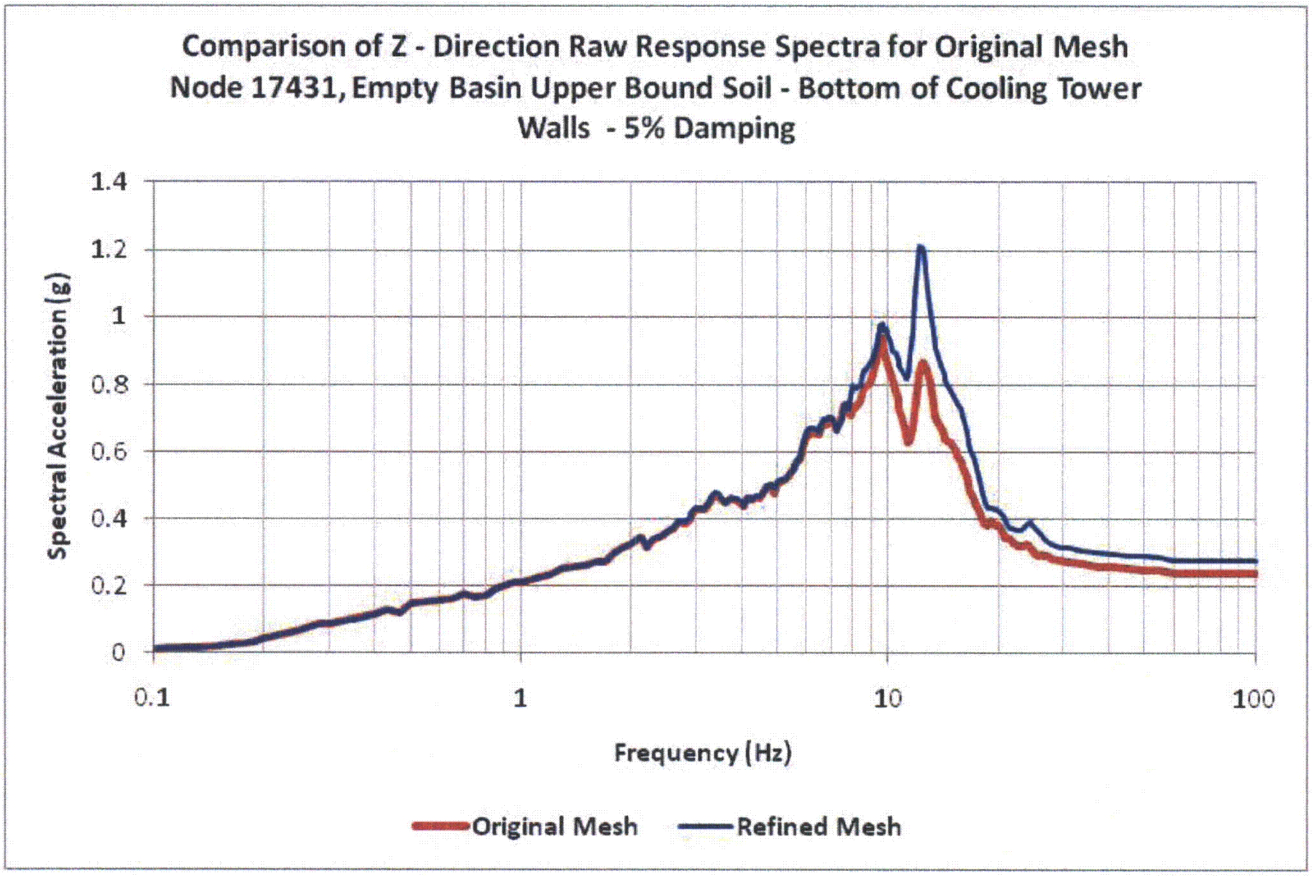


**Figure 03.07.02-24.123: Comparison of Z - Direction Raw Response Spectra for Original Mesh Node 17431, Empty Basin Upper Bound Soil - Bottom of Cooling Tower Walls - 5% Damping**