ISSUED BY RPP-WTP PDC

# MECHANICAL DATA SHEET

## SHELL AND TUBE HEAT EXCHANGER

**PLANT ITEM No.**
***24590-PTF-ME-CNP-HX-00003*** △3
**Data Sheet No.**
***24590-PTF-MED-CNP-00010***

R11105813

| | | | |
|---|---|---|---|
| Project: | ***RPP-WTP*** | Description: | ***Cesium Evaporator Inter-Condenser*** |
| Project No: | ***24590*** | P&ID: | ***24590-PTF-M6-CNP-00010, 24590-QL-POA-MEVV-00002-07-24*** △3 |
| Site: | ***Hanford*** | Process Data: △3 | ***24590-PTF-MVC-CNP-00015*** △3 |
| Process flow diagram: | ***24590-PTF-M5-V17T-00014*** | Manufacturer Name: | ***Framatome ANP / Graham Corporation.*** |

### General Data

| | | | |
|---|---|---|---|
| Quality Level | ***Q (Note 1 & 7)*** △3 | TEMA (Class/Type) | ***B*** |
| Seismic Category | ***SC-I (Note 7)*** △3 | Flow Type (Counter current, etc) | ***N/A*** |
| Design Code | ***ASME VIII Div 1*** | Heat Exchanger Duty Btu/hr | ***436,064*** |
| Code Stamp | ***Yes*** | Heat Exchanger Area $ft^2$ | ***50.7*** |
| NB Registration | ***Yes*** | ΔT (LMTD/Corrected LMTD) °F | ***59.8*** |

### Thermal/Hydraulic Data

| | | Shell Side | | Tube Side | |
|---|---|---|---|---|---|
| Fluid Name | | ***In Steam Out*** | | ***In Cooling Water Out*** | |
| Fluid Quantities: Total | lbm/hr | ***448.3*** | | ***32,500*** | |
| Condensable Vapor (In/Out) | | ***404.6*** | ***6.4*** | ***N/A*** | ***N/A*** |
| Liquid | | ***N/A*** | ***398.2*** | ***32,500*** | ***32,500*** |
| Noncondensable | | ***43.7*** | ***43.7*** | ***N/A*** | ***N/A*** |
| Temperature (In/Out) | °F | ***226*** | ***90*** | △3 ***80.0 **** | △3 ***92.0 **** |
| Specific Gravity | | ***N/A*** | ***N/A*** | ***1.000*** | ***0.998*** |
| Viscosity | Cp | ***N/A*** | ***N/A*** | ***2.209*** | ***1.875*** |
| Molecular Weight | | ***18.02*** | ***18.02*** | ***N/A*** | ***N/A*** |
| Molecular Weight, Noncondensable | | ***29*** | ***29*** | ***N/A*** | ***N/A*** |
| Specific Heat | Btu/lbm-°F | ***N/A*** | ***N/A*** | ***1.000*** | ***0.999*** |
| Thermal Conductivity | Btu/hr-ft-°F | ***N/A*** | ***N/A*** | ***0.350*** | ***0.357*** |
| Latent Heat | Btu/lbm @ °F | ***N/A*** | | ***N/A*** | |
| Inlet pressure | psia | ***200 Torr*** | | △3 ***84.7 **** | |
| Tube side Velocity | ft/s | ***N/A*** | | ***3.2*** | |
| Pressure Drop (Allowed) | psi | ***10 mmHg*** | | ***1.2*** | |
| Fouling Resistance (Min) | $hr\text{-}ft^2\text{-}°F/Btu$ | ***0.0020*** | | ***0.0020*** | |

### Mechanical Data

| | | Shell Side | | Tube Side | |
|---|---|---|---|---|---|
| Design Pressure (Max/Min) | psig | ***50*** | ***Full vacuum**** | △3 ***100*** | ***Full vacuum**** |
| Design Temperature (Max/Min) | °F | ***378*** | ***40*** | ***150*** | ***40*** |
| Corrosion Allowance | inch | ***0.04*** | | ***0.04*** | |
| Erosion Allowance | inch | ***N/A*** | | ***N/A*** | |
| Shell OD/ID | inch | ***8 5/8" O.D.*** | | Overall Dimensions (H x W x L) inch | ***20 x 13 1/2 x 95 1/8*** |
| Total Number of Tubes | | ***43*** | | Tube OD inch | ***0.750*** |

### Material Data (Note 9) △3

| | | | |
|---|---|---|---|
| Shell | ***SA 312, SA 182 316L SS*** | Shell Cover | ***N/A*** |
| Channel/Bonnet | ***SA 312, SA 182, SA 403 316L SS*** | Channel Cover | ***N/A*** |
| Tube | ***SA 213 316 Seamless SS*** △3 | Floating Head Cover | ***N/A*** |
| Stationary Tube Sheet | ***SA 240 316L SS*** | Floating Tube Sheet | ***N/A*** |
| Shell Side Gaskets | ***N/A*** | Tube Side Gaskets | ***316 SS Spiral Wound, PTFE Filler*** |
| Partition Seals | ***N/A*** | Baffles/Supports | ***SA 240 316L SS*** |
| Insulation | ***N/A*** | Forgings (Shell side) | ***SA 182 F316L*** |
| Bolting | ***SA 193 B8M / SA 194 8M*** △3 | Forgings (Channel) | ***SA 182 316L*** |

| | | |
|---|---|---|
| BECHTEL | **MECHANICAL DATA SHEET**<br>**SHELL AND TUBE HEAT EXCHANGER** | **PLANT ITEM No.**<br>***24590-PTF-ME-CNP-HX-00003***<br>**Data Sheet No.**<br>***24590-PTF-MED-CNP-00010*** |

**Construction Data** *(To be determined by the supplier when not specified by the buyer)*

| | | | | | |
|---|---|---|---|---|---|
| Cross Baffle Type | * | % Baffle Cut (Dia.) | * | Spacing (c/c) inch | * |
| Bypass Seal Arrangement | * | Longitudinal Seal Type | * | Expansion Joint Type | * |
| Inlet Nozzle $\rho V^2$ | * | Bundle Entrance $\rho V^2$ | * | Bundle Exit $\rho V^2$ | * |
| Tube Support Type | * | U-bend Support Type | * | Weight of Bundle lbf | * |
| Operating Weight lbf | * | Full of Water lbf | * | Weight of Shell lbf | * |

**Notes**

**** To be determined / confirmed by Seller***

****** Not Used.*** △3

△3

***(1) Vendor will provide item at BNI quality level Q specification, which corresponds with vendor quality level QL-2.***

***(2) Equipment Cyclic Data is from document 24590-QL-POA-MEVV-00002-10-00002.***

***(3) Vendor Design information is from document 24590-QL-POA-MEVV-00002-10-00011.***

***(4) The physical design parameters shall be determined by the seller based on TEMA and HEI standards.***

***(5) Contents of this document are Dangerous Waste Permit Affecting.*** △3

***(6) Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954*** △3 ***(AEA), are regulated at the U.S. Department of Energy (DOE) facilities exclusively by DOE acting pursuant to its AEA authority. DOE asserts, that pursuant to the AEA, it has sole and exclusive responsibility and authority to regulate source, special nuclear, and byproduct materials at DOE-owned nuclear facilities. Information contained herein on radionuclides is provided for process description purposes only.***

***(7) For commercial reasons, safety and seismic classification may be higher than elsewhere documented, and*** △3 ***therefore conservative.***

***(8) Allowable nozzle loads shall be per SC-I stainless steel nozzle design loads of 24590-WTP-3PS-MV00-T0001.*** △3

***(9) 304SS (max. carbon 0.030%) originally specified; 316L SS used due to availability.*** △3

***Safety screening / evaluation required? ☒Yes ☐No If yes per 24590-WTP-GPP-SREG-002, E&NS signature required below.***

| Rev | Description | By | Checked | EN&S | Approved | Date |
|---|---|---|---|---|---|---|
| 3 | Updated to incorporate 24590-WTP-M6N-M80T-00005 (Dangerous Waste Permit Affecting), DOE AEA note (6), reflect WSGM analysis, 24590-PTF-U0D-W16T-00001 changes, and update other data. | D. Tate | S. Thakkar | B. Hall | J. Julyk | 8/24/09 |
| 2 | Incorporated Vendor Design Information and Equipment Qualification Data. | R. Rickenbach | S. Thakkar | S. Woolfolk | J. Julyk | 07/15/2008 |
| 1 | Issued for Purchase. Incorporates updated vendor data. | J. Hickman | K. Sadler | N/A | J. Julyk | 08/11/2004 |
| 0 | Issued for Purchase | J. Hickman | E. Le | N/A | J. Julyk | 12/18/2003 |

# EQUIPMENT QUALIFICATION DATASHEET (EQD)



## Equipment Identification

| | | | |
|---|---|---|---|
| Component Tag Number | 24590-PTF-ME-CNP-HX-00003 | Safety Classification | ☒ SC ☐ SS ☐ APC ☐ SDC ☐ SDS ☐ RRC Note 12 3 |
| Manufacturer / Supplier | GRAHAM CORPORATION / FRAMATOME ANP, INC. | | |
| Requisition Number | 24590-QL-POA-MEVV-00002 | | |
| Model | N/A | Seismic Category | ☒ SC-I ☐ SC-II ☐ SC-III ☐ SC-IV Note 12 3 |
| Description (Include descriptive text [e.g., location, elevation]) | CESIUM EVAPORATOR INTER-CONDENSER, ROOM P-0430, ELEVATION 77'-0". | | |
| Safety Function(s) | Prevent post seismic disruption of H2 vessel purge air pathways, spread of contamination into C3 areas from PVP blowback. 3 | | |

| | | | |
|---|---|---|---|
| Seismic Safety Function | ☒ Yes ☐ No | Room Number(s): | P-0430 |
| Maintenance Accessible | ☒ Yes ☐ No | Method of Maintenance Access: | ☐ Remote ☒ Hands On ☐ None |
| Seismic Operability Requirements: 3 | ☐ During Seismic Event 3 ☐ After Seismic Event | | |
| ITS Equipment Type: | ☒ Passive Mechanical | ☐ Active Mechanical | ☐ Electrical |

## Equipment Environmental Qualification (EEQ)

| | | |
|---|---|---|
| Environment ☒ Mild ☐ Harsh | Hi Rad Service ☐ Yes ☒ No | Design Life (yrs) ☐ 40 ☒ Other ____ |
| Contamination Class: C3 | | Note 13 3 |
| Radiation Class: R3 | | |

| Parameter Type/Units | Parameter Value | Time Duration (number) | Time Units | WTP Document Number (BUYER) | Submittal Number (SELLER) |
|---|---|---|---|---|---|
| **Normal** | | | | | |
| Normal High Temperature (°F) | 95 | 40 | yrs | 24590-PTF-U0D-W16T-00001, Note 8 | NOTE 1 |
| Normal Low Temperature (°F) | 59 | 40 | yrs | 24590-PTF-U0D-W16T-00001, Note 8 | NOTE 1 |
| Normal High Relative Humidity (%RH) | 100 | 40 | yrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Normal Low Relative Humidity (%RH) | 10 | 40 | yrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Normal High Pressure (in.-w.g.) | 0 | 40 | yrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Normal Low Pressure (in.-w.g.) | -0.4 | 40 | yrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Normal Radiation Dose Rate (mR/hr) | 10 | 40 | yrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Vibration Magnitude (g) | N/A | N/A | N/A | N/A 3 | NOTE 1 |
| Vibration Frequency (Hz) | N/A | N/A | N/A | N/A 3 | NOTE 1 |
| Additional Normal Information: | See Note 2 for pressure units. | | | | |

## Equipment Environmental Qualification (EEQ) *(continued)*

| Parameter Type/Units | Parameter Value | Time Duration (number) | Time units | WTP Document Number (BUYER) | Submittal Number (SELLER) |
|---|---|---|---|---|---|
| **Abnormal** | | | | | |
| Abnormal High Temperature (°F) | 3 115 | 8 | hr/yr | 24590-PTF-U0D-W16T-00001, Note 8 3 | NOTE 1 |
| Abnormal Low Temperature (°F) | 3 Note 10 40 | 8 | hr/yr | 24590-PTF-U0D-W16T-00001, Notes 8 & 10 3 | NOTE 1 |
| Abnormal High Relative Humidity (%RH) | 100 | 24 | hr/yr | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Abnormal Low Relative Humidity (%RH) | 4 | 22 | hr/yr | 24590-PTF-U0D-W16T-00001, Note 11 3 | NOTE 1 |
| Abnormal High Pressure (in.-w.g.) | 4 | 8 | hr/yr | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Abnormal Low Pressure (in.-w.g.) | -7.3 | 8 | hr/yr | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Abnormal Radiation Dose Rate (mR/hr) | 10, Note 5 | 0 | hr/yr | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Wet Sprinkler System Present | Yes | 2 | 3 hr | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Additional Abnormal Information | See Note 2 for pressure units. | | | | |
| **Design Basis Events (DBE)** | | | | | |
| DBE High Temperature (°F) | 125 | 1000 | hrs | 24590-PTF-U0D-W16T-00001, Note 8 & 11 3 | NOTE 1 |
| DBE Low Temperature (°F) | 40 | 1000 | hrs | 24590-PTF-U0D-W16T-00001, Note 8 | NOTE 1 |
| DBE High Relative Humidity (%RH) | 100 | 482 | 3 hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| DBE Low Relative Humidity (%RH) | 3 8 | 1000 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| DBE High Pressure (in.-w.g.) | 4 | 1000 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| DBE Low Pressure (in.-w.g.) | -7.3 | 1000 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| DBE Radiation Dose Rate (mR/hr) | 10, Note 5 | 0 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Flood Height (ft) | 1.58 | 1000 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Submergence (ft) | 0, Note 6 | 1000 3 | hrs | 3 24590-QL-POA-MEVV-00002-07-17 | NOTE 1 |
| Chemical/Spray Exposure | YES, Note 9 | 12.5 | hrs | 24590-PTF-U0D-W16T-00001 | NOTE 1 |
| Additional DBE Information | See Note 2 for pressure units. | | | | |

# EQUIPMENT QUALIFICATION DATASHEET (EQD)



| DBE Chemical Exposure Details | |
|---|---|
| DBE Chemical Types/Concentrations | 2M, 5M, 19M SODIUM HYDROXIDE 3<br>0.5M NITRIC ACID 3<br>1M SODIUM PERMANGANATE |

| Interfaces (Electrical) | |
|---|---|
| Power Supply Voltage (VAC, VDC) | N/A |
| Power Supply Frequency (Hz) | N/A |
| Power Connection Method | N/A |
| I/O Signals to/from Equipment | N/A |
| I/O Connection Method | N/A |

| Interfaces (Mechanical) | |
|---|---|
| Mounting Configuration (orientation) | SEE VENDOR SUBMITAL 24590-QL-POA-MEVV-00002-07-17 |
| Mounting Method (bolts, welds, etc.) | CNP-SKID-00002, BOLTED, 24590-PTF-DD-S13T-00167 |
| Auxiliary Devices | N/A |

**Equipment Seismic Qualification (ESQ)**

| Parameter | Title | Reference/Document Number | Version / Revision | Remarks |
|---|---|---|---|---|
| WTP Seismic Design Specification (BUYER) | Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks. | 24590-WTP-3PS-SS90-T0001 | 001 3 | N/A |
| Specified Seismic Load (BUYER) | Seismic Analysis of Pretreatment Building - WSGM In-Structure Response Spectre (ISRS) 3 | 24590-PTF-S0C-S15T-00057 3 | 00A 3 | Calculation is not included in MR, see attached figures 16, 17, 22, 23 and 144 per CCN 185267. 3 |
| Design Seismic Load (SELLER | 3 | 3 | 3 | Note 1 3 |
| Qualification Method (SELLER) | 3 | 3 | 3 | Note 1 3 |
| Qualification Report Number (SELLER) | 3 | 3 | 3 | Note 1 3 |
| Submittal Number (BUYER) | TBD 3 | TBD 3 | TBD 3 | None 3 |

## Notes and Additional Information

Notes:

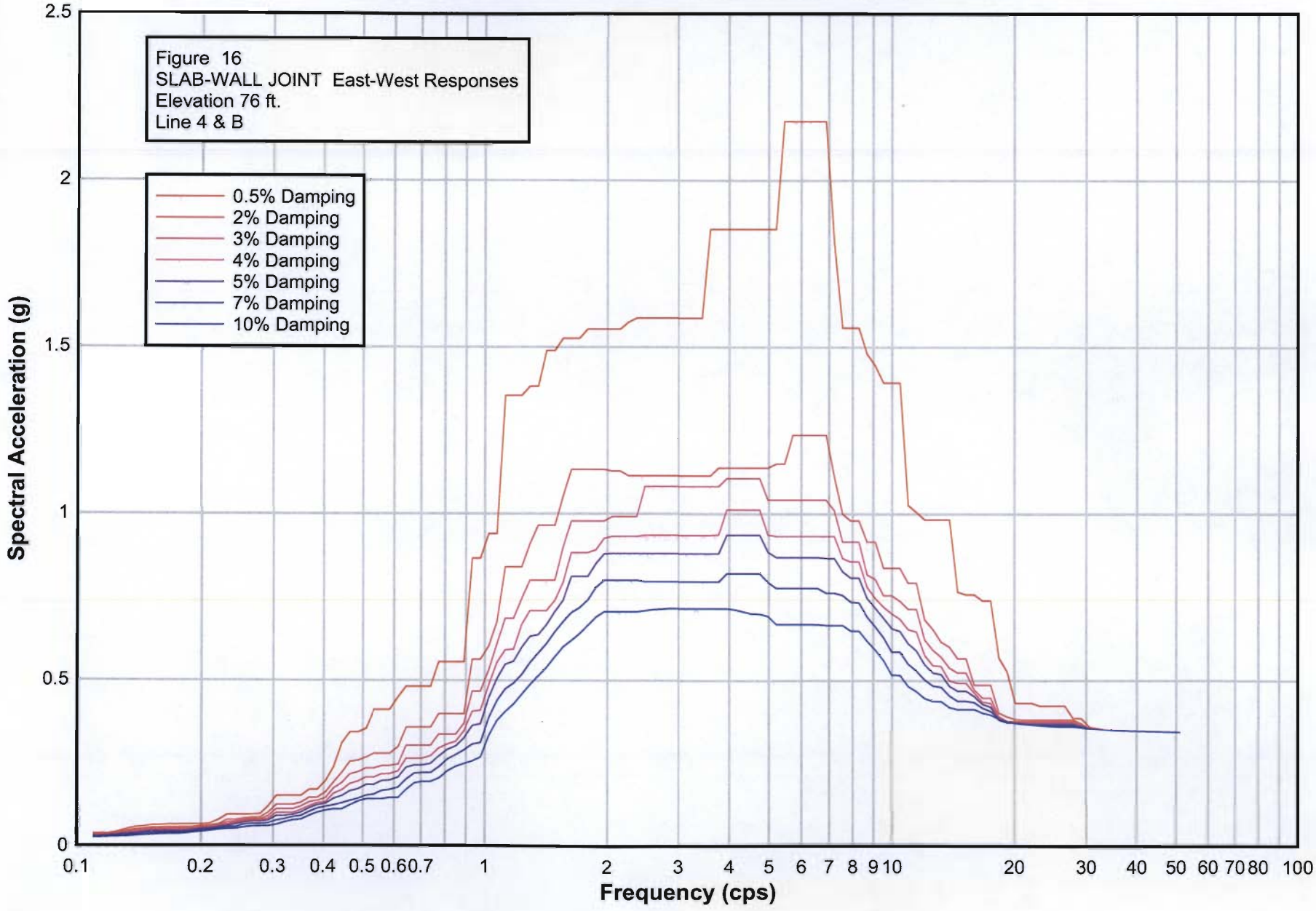
1. Data to be provided by seller through the submittal process as required on the G-321-E form.
2. Where pressure is given in inches of water column (in.-w.c.) in the source document, it is generally assumed that this is in reference to atmospheric pressure and is therefore equivalent to inches of water gage (in.-w.g.)
3. deleted. 3
4. The equipment qualification will be documented in accordance with the requirements in Appendix D of Engineering Specification for Environmental Qualification of Mechanical Equipment, document number 24590-WTP-3PS-G000-T0015. for the passive and active safety functions.
5. Abnormal and DBE radiation dose rates are set equal to normal and do not contribute to the total integrated dose. 3
6. Submergence depth is the difference between the lowest point on the equipment and the flood depth above the floor. The submergence depth is set to zero if the lowest section of the equipment is above the flood depth.
7. Environmental data from calculation 24590-PTF-U0D-W16T-00001 is for room environment only.
8. For application of AISC N690, 3 abnormal temperatures shall be applied as Normal Operation Temperature, $T_O$, with seismic effects, $E_S$. The Design basis event temperatures shall be applied as a Thermal Load generated by a postulated accident, $T_A$, without seismic effects, $E_s$. 3
9. See DBE Chemical Exposure Details. 3
10. Abnormal minimum temperature is set equal to the normal minimum temperature (59F) for the purposes of seismic 3 analysis. A DBE seismic event coincident with an extreme low abnormal temperature is not a credible scenario. [The probability of an abnormal minimum temperature is estimated as follows: temperatures <40 F occur 31% of the year (average historical weather data, 0.31 probability); a loss of heating is assumed to occur 8 hrs/yr (0.001 probability); combined probability is 0.31 x 0.001 = 0.00031 (3.1E-4). The combination of this event with a seismic DBE (4 E-04 probability) is not credible (<1 E-06 probability).]
11. Parameter value used on data sheet has been previously established and determined to provide more conservative 3 constraint than values derived from 24590-PTF-U0D-W16T-00001.
12. For commercial reasons, safety and seismic classification may be higher than elsewhere documented, and therefore 3 conservative.
13. Facility design life is 40 years. Seller will determine equipment design life and required maintenance / replacement 3 intervals to maintain qualification of equipment components subject to wear or aging.

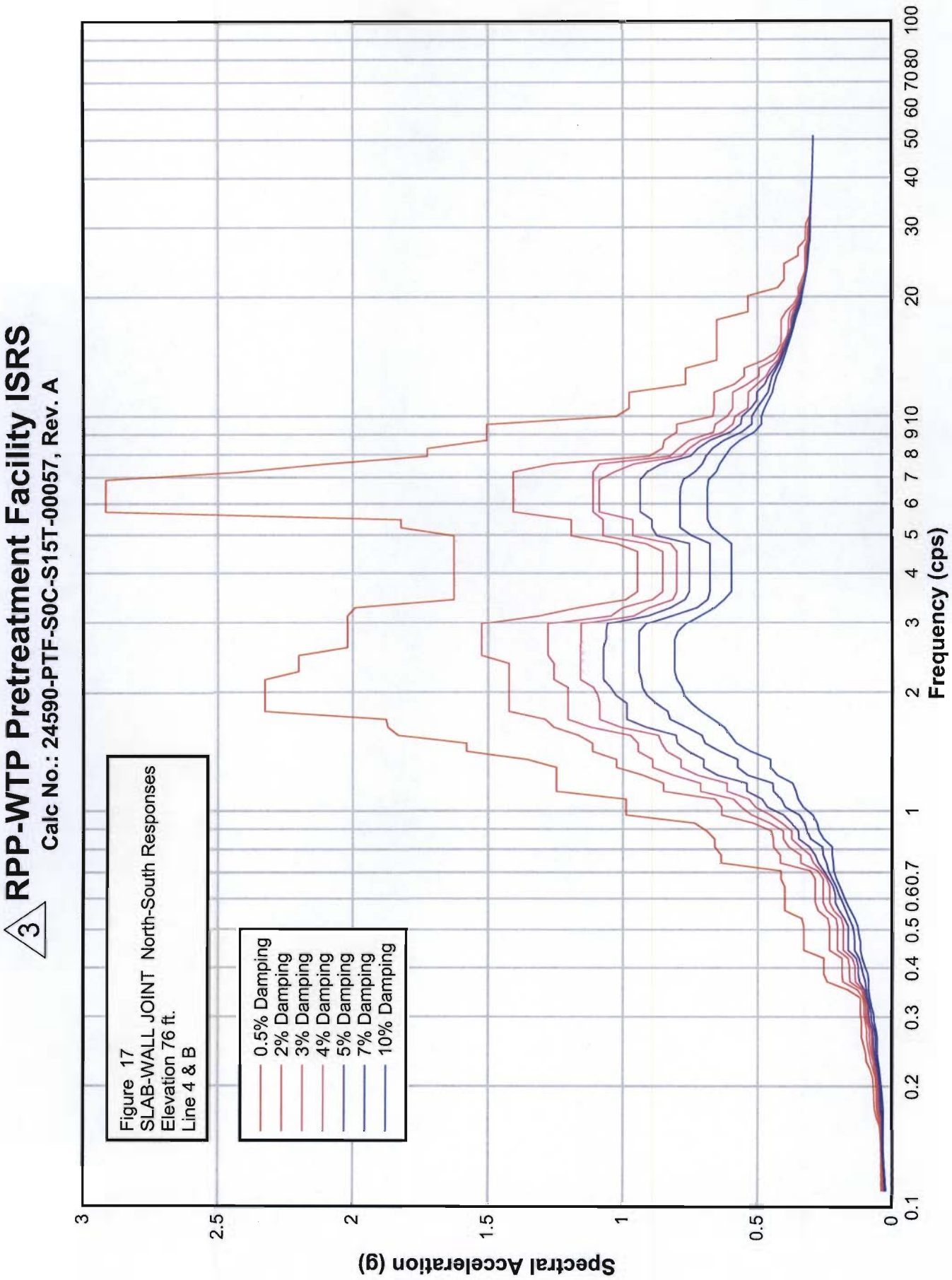
References:

1. 24590-WTP-PSAR-ESH-01-002-02, Rev. 04E, Preliminary Documented Safety Analysis to Support Construction 3 Authorization; PT Facility Specific Information.
2. deleted. 3
3. 24590-PTF-M6-CNP-00010, Rev. 2, P&ID - PTF Cesium Nitric Acid Recovery Process System Rectifier and 3 Condensers.
4. 24590-PTF-U0D-W16T-00001, Rev. 0, PTF Room Environment Datasheet [Including DCNs: 24590-PTF-U0N-W16T-3 00001, 24590-PTF-U0N-W16T-00003, & 24590-PTF-U0N-W16T-00004].
5. 24590-WTP-DB-ENG-01-001, Rev. 1N, Basis Of Design.
6. 24590-QL-POA-MEVV-00002-07-00091, Rev. 00B, DRAWING - INTERCONDENSER MODEL 8 X 6' BEM 3
7. 24590-PTF-M6X-CNP-00037 Rev. 002, MS LINE LIST FOR P&ID 24590-PTF-M6-CNP-00010, REV. 2 3

# RPP-WTP Pretreatment Facility ISRS

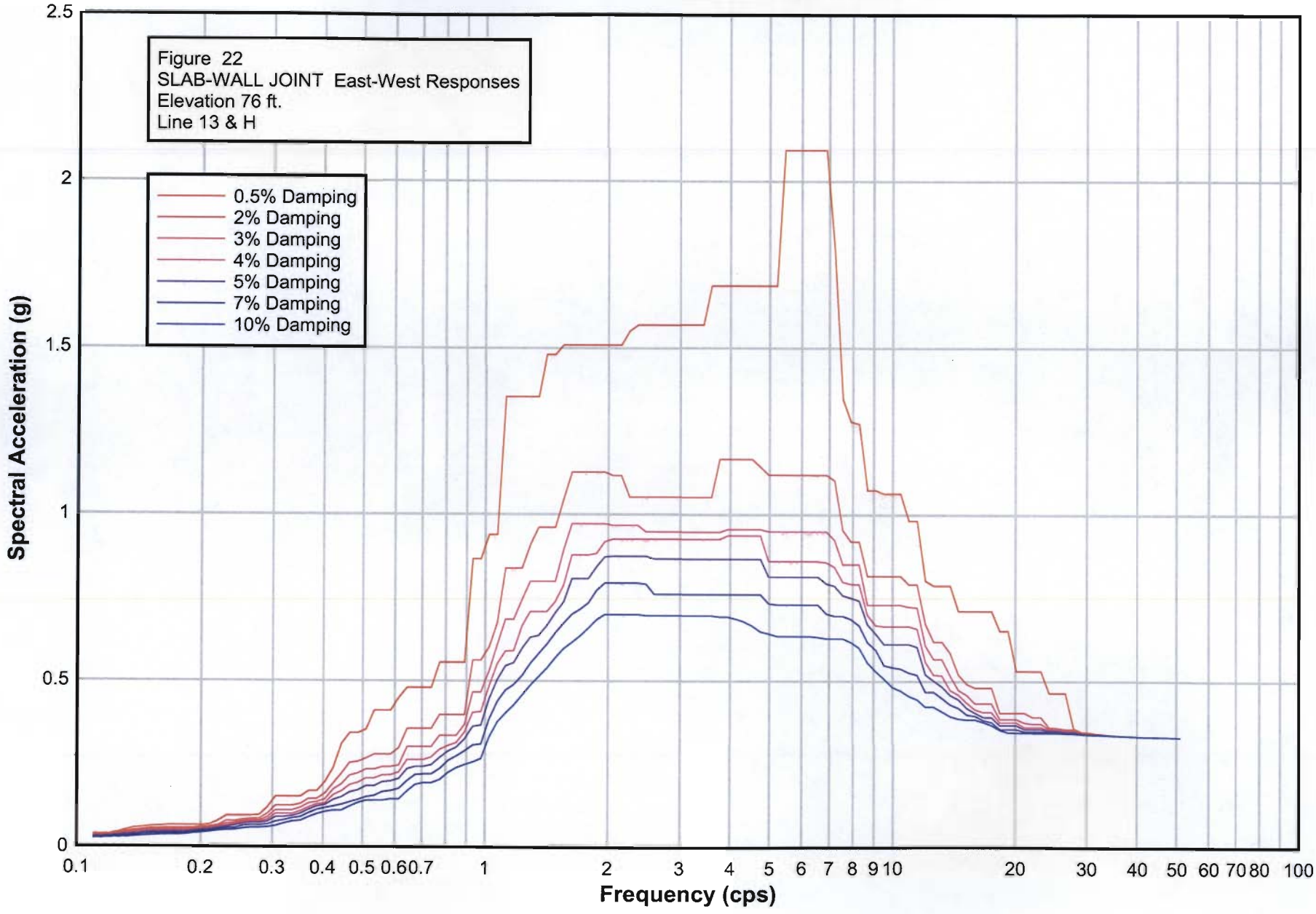
**Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A**




3 RPP-WTP Pretreatment Facility ISRS
Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A
Figure 17
SLAB-WALL JOINT North-South Responses
Elevation 76 ft.
Line 4 & B
0.5% Damping
2% Damping
3% Damping
4% Damping
5% Damping
7% Damping
10% Damping
Spectral Acceleration (g)
Frequency (cps)
0
0.5
1
1.5
2
2.5
3
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
100

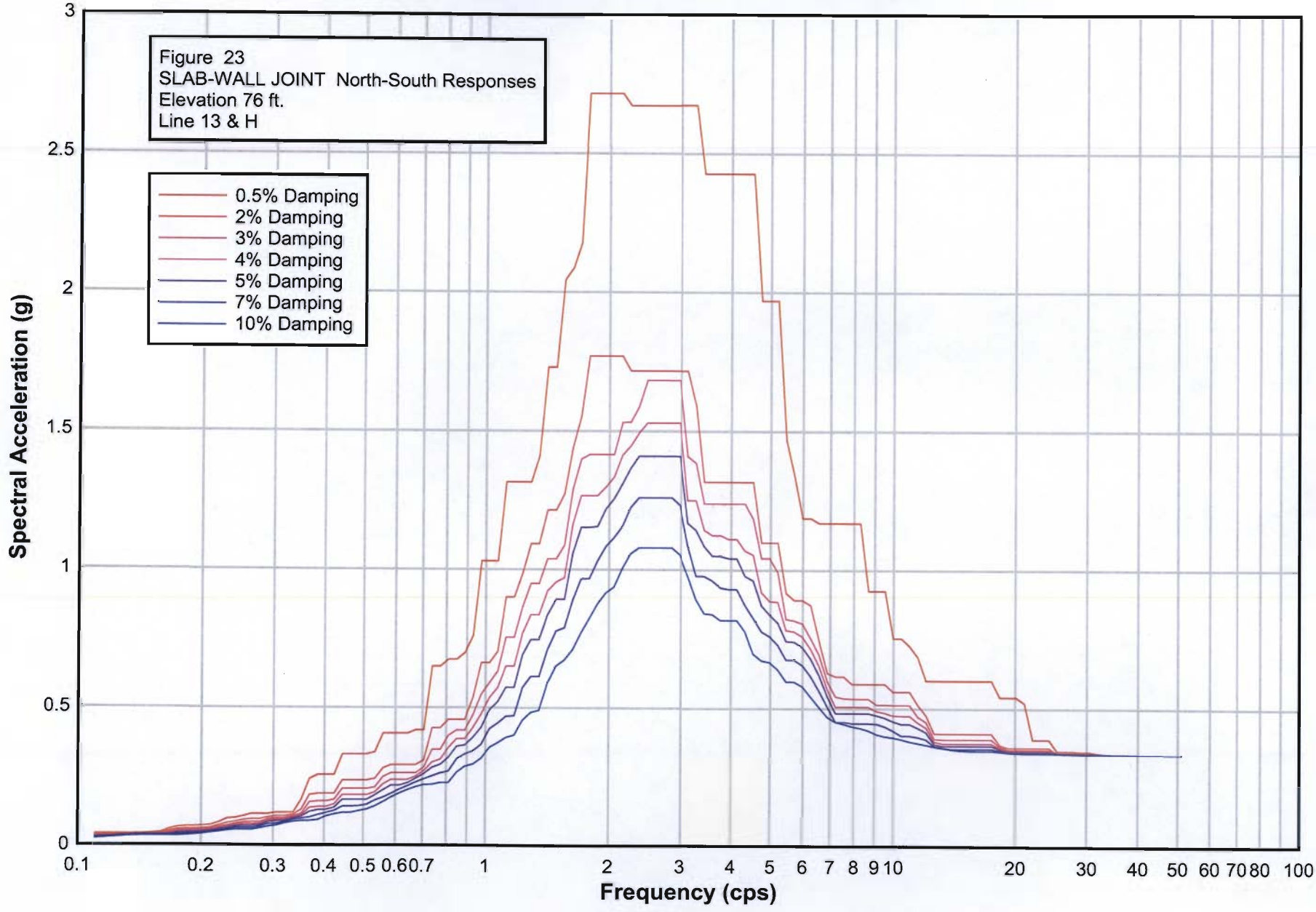
# RPP-WTP Pretreatment Facility ISRS

**Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A** 3



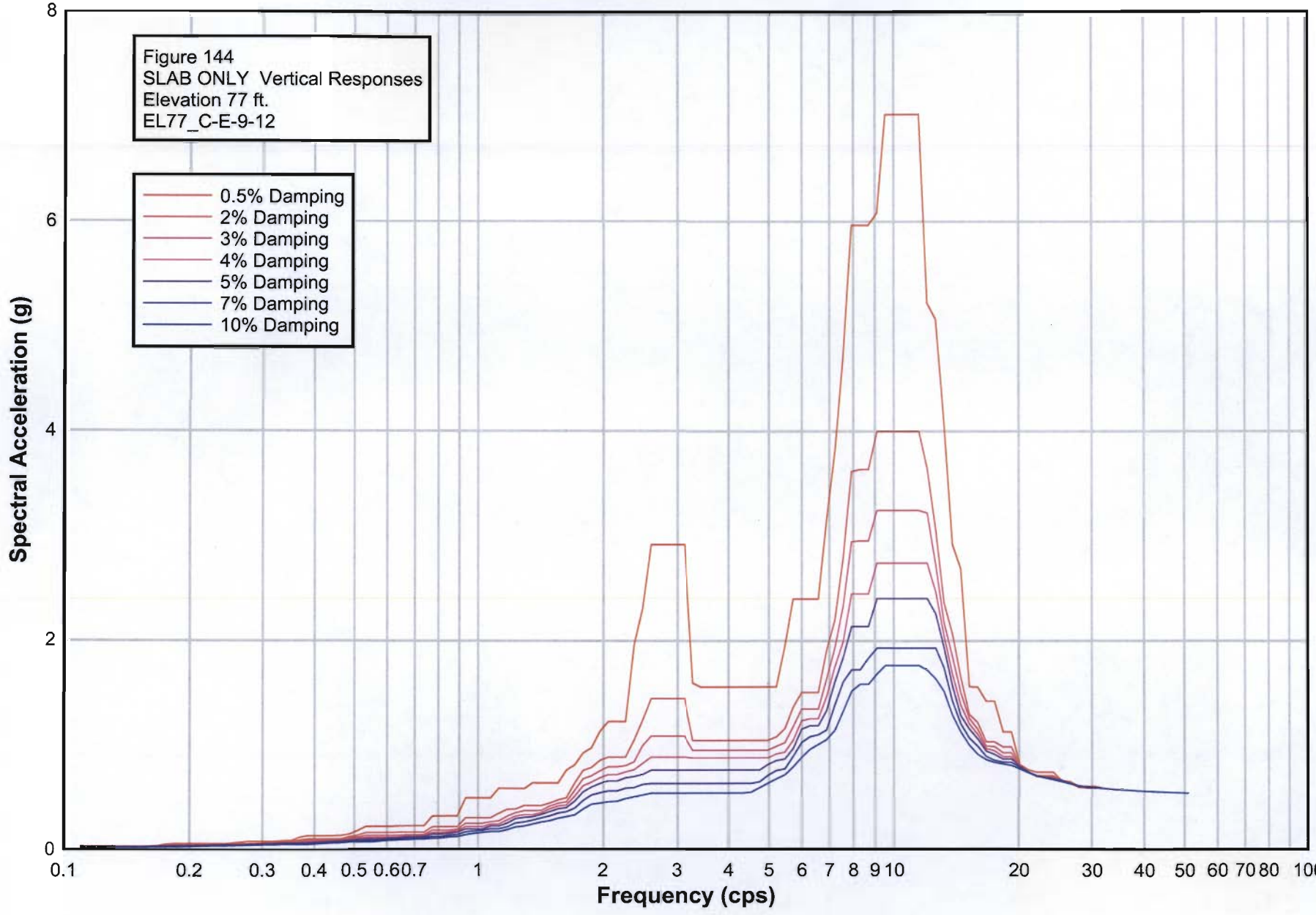
# 3 RPP-WTP Pretreatment Facility ISRS

**Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A**



# 3 RPP-WTP Pretreatment Facility ISRS

**Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A**



PTWW016.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 16 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.1098 | 0.0375 | 0.1098 | 0.0344 | 0.1098 | 0.0327 | 0.1098 | 0.0312 | 0.1098 | 0.0298 | 0.1098 | 0.0274 | 0.1098 | 0.0252 |
| 0.115 | 0.0375 | 0.115 | 0.0344 | 0.115 | 0.0327 | 0.115 | 0.0312 | 0.115 | 0.0299 | 0.115 | 0.0277 | 0.115 | 0.0258 |
| 0.1204 | 0.0375 | 0.1204 | 0.0344 | 0.1204 | 0.0331 | 0.1204 | 0.0322 | 0.1204 | 0.0312 | 0.1204 | 0.0294 | 0.1204 | 0.0269 |
| 0.1262 | 0.0431 | 0.1262 | 0.0398 | 0.1262 | 0.0378 | 0.1262 | 0.036 | 0.1262 | 0.0343 | 0.1262 | 0.0314 | 0.1262 | 0.0278 |
| 0.1322 | 0.0504 | 0.1322 | 0.045 | 0.1322 | 0.042 | 0.1322 | 0.0393 | 0.1322 | 0.0369 | 0.1322 | 0.0328 | 0.1322 | 0.0281 |
| 0.1385 | 0.056 | 0.1385 | 0.0489 | 0.1385 | 0.0449 | 0.1385 | 0.0414 | 0.1385 | 0.0384 | 0.1385 | 0.0345 | 0.1385 | 0.0304 |
| 0.1451 | 0.0582 | 0.1451 | 0.051 | 0.1451 | 0.0475 | 0.1451 | 0.0446 | 0.1451 | 0.0419 | 0.1451 | 0.0375 | 0.1451 | 0.0326 |
| 0.152 | 0.0617 | 0.152 | 0.0547 | 0.152 | 0.0507 | 0.152 | 0.0473 | 0.152 | 0.0442 | 0.152 | 0.0392 | 0.152 | 0.0339 |
| 0.1592 | 0.0621 | 0.1592 | 0.0547 | 0.1592 | 0.0507 | 0.1592 | 0.0473 | 0.1592 | 0.0442 | 0.1592 | 0.0398 | 0.1592 | 0.0353 |
| 0.1668 | 0.0641 | 0.1668 | 0.0561 | 0.1668 | 0.0518 | 0.1668 | 0.0482 | 0.1668 | 0.0452 | 0.1668 | 0.0404 | 0.1668 | 0.0358 |
| 0.1748 | 0.0641 | 0.1748 | 0.0561 | 0.1748 | 0.0518 | 0.1748 | 0.0482 | 0.1748 | 0.0452 | 0.1748 | 0.0404 | 0.1748 | 0.0358 |
| 0.1831 | 0.0641 | 0.1831 | 0.0561 | 0.1831 | 0.0518 | 0.1831 | 0.0482 | 0.1831 | 0.0452 | 0.1831 | 0.0404 | 0.1831 | 0.037 |
| 0.1918 | 0.0642 | 0.1918 | 0.0562 | 0.1918 | 0.0518 | 0.1918 | 0.0496 | 0.1918 | 0.0478 | 0.1918 | 0.0446 | 0.1918 | 0.0405 |
| 0.2009 | 0.0642 | 0.2009 | 0.0584 | 0.2009 | 0.0559 | 0.2009 | 0.0536 | 0.2009 | 0.0514 | 0.2009 | 0.0475 | 0.2009 | 0.0425 |
| 0.2105 | 0.0665 | 0.2105 | 0.0603 | 0.2105 | 0.0575 | 0.2105 | 0.0549 | 0.2105 | 0.0526 | 0.2105 | 0.049 | 0.2105 | 0.0448 |
| 0.2205 | 0.0781 | 0.2205 | 0.0647 | 0.2205 | 0.062 | 0.2205 | 0.0595 | 0.2205 | 0.0573 | 0.2205 | 0.0533 | 0.2205 | 0.0485 |
| 0.231 | 0.0934 | 0.231 | 0.0774 | 0.231 | 0.0694 | 0.231 | 0.0631 | 0.231 | 0.0598 | 0.231 | 0.0556 | 0.231 | 0.0504 |
| 0.242 | 0.0934 | 0.242 | 0.0774 | 0.242 | 0.0722 | 0.242 | 0.0678 | 0.242 | 0.0638 | 0.242 | 0.0567 | 0.242 | 0.0513 |
| 0.2535 | 0.0934 | 0.2535 | 0.0818 | 0.2535 | 0.0771 | 0.2535 | 0.073 | 0.2535 | 0.0693 | 0.2535 | 0.063 | 0.2535 | 0.0554 |
| 0.2656 | 0.0934 | 0.2656 | 0.084 | 0.2656 | 0.0795 | 0.2656 | 0.0755 | 0.2656 | 0.0718 | 0.2656 | 0.0654 | 0.2656 | 0.0576 |
| 0.2783 | 0.0953 | 0.2783 | 0.0846 | 0.2783 | 0.0795 | 0.2783 | 0.0755 | 0.2783 | 0.0718 | 0.2783 | 0.0654 | 0.2783 | 0.0583 |
| 0.2915 | 0.1187 | 0.2915 | 0.0988 | 0.2915 | 0.0891 | 0.2915 | 0.0815 | 0.2915 | 0.0755 | 0.2915 | 0.0671 | 0.2915 | 0.0596 |
| 0.3054 | 0.1504 | 0.3054 | 0.1235 | 0.3054 | 0.1098 | 0.3054 | 0.0986 | 0.3054 | 0.0895 | 0.3054 | 0.0759 | 0.3054 | 0.0634 |
| 0.3199 | 0.1504 | 0.3199 | 0.1235 | 0.3199 | 0.1098 | 0.3199 | 0.0986 | 0.3199 | 0.0895 | 0.3199 | 0.0803 | 0.3199 | 0.0708 |
| 0.3352 | 0.1504 | 0.3352 | 0.1235 | 0.3352 | 0.1098 | 0.3352 | 0.0986 | 0.3352 | 0.0933 | 0.3352 | 0.0859 | 0.3352 | 0.0765 |
| 0.3511 | 0.1504 | 0.3511 | 0.1293 | 0.3511 | 0.1176 | 0.3511 | 0.1073 | 0.3511 | 0.0998 | 0.3511 | 0.0896 | 0.3511 | 0.0788 |
| 0.3678 | 0.1683 | 0.3678 | 0.144 | 0.3678 | 0.1305 | 0.3678 | 0.1188 | 0.3678 | 0.1122 | 0.3678 | 0.1019 | 0.3678 | 0.0901 |
| 0.3853 | 0.1683 | 0.3853 | 0.144 | 0.3853 | 0.1348 | 0.3853 | 0.1282 | 0.3853 | 0.1222 | 0.3853 | 0.1119 | 0.3853 | 0.0995 |
| 0.4037 | 0.1943 | 0.4037 | 0.1602 | 0.4037 | 0.1429 | 0.4037 | 0.1309 | 0.4037 | 0.1262 | 0.4037 | 0.1173 | 0.4037 | 0.1059 |
| 0.4229 | 0.2369 | 0.4229 | 0.1909 | 0.4229 | 0.1723 | 0.4229 | 0.156 | 0.4229 | 0.1418 | 0.4229 | 0.1222 | 0.4229 | 0.1097 |
| 0.4431 | 0.3093 | 0.4431 | 0.2196 | 0.4431 | 0.1883 | 0.4431 | 0.1672 | 0.4431 | 0.1497 | 0.4431 | 0.1277 | 0.4431 | 0.1101 |
| 0.4642 | 0.3423 | 0.4642 | 0.2533 | 0.4642 | 0.2146 | 0.4642 | 0.186 | 0.4642 | 0.1645 | 0.4642 | 0.1352 | 0.4642 | 0.122 |
| 0.4863 | 0.3423 | 0.4863 | 0.2566 | 0.4863 | 0.2214 | 0.4863 | 0.1933 | 0.4863 | 0.1706 | 0.4863 | 0.1417 | 0.4863 | 0.1333 |
| 0.5094 | 0.353 | 0.5094 | 0.266 | 0.5094 | 0.2329 | 0.5094 | 0.2058 | 0.5094 | 0.1835 | 0.5094 | 0.1506 | 0.5094 | 0.1402 |

PTWW016.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 16 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.5337 | 0.4107 | 0.5337 | 0.2781 | 0.5337 | 0.2329 | 0.5337 | 0.2058 | 0.5337 | 0.1835 | 0.5337 | 0.1543 | 0.5337 | 0.1408 |
| 0.5591 | 0.4107 | 0.5591 | 0.2781 | 0.5591 | 0.2405 | 0.5591 | 0.2157 | 0.5591 | 0.1952 | 0.5591 | 0.1655 | 0.5591 | 0.1408 |
| 0.5857 | 0.4107 | 0.5857 | 0.2781 | 0.5857 | 0.241 | 0.5857 | 0.2165 | 0.5857 | 0.1977 | 0.5857 | 0.1688 | 0.5857 | 0.1449 |
| 0.6136 | 0.4487 | 0.6136 | 0.2979 | 0.6136 | 0.2453 | 0.6136 | 0.2243 | 0.6136 | 0.2059 | 0.6136 | 0.1759 | 0.6136 | 0.1449 |
| 0.6428 | 0.48 | 0.6428 | 0.3562 | 0.6428 | 0.3018 | 0.6428 | 0.2625 | 0.6428 | 0.236 | 0.6428 | 0.2002 | 0.6428 | 0.1694 |
| 0.6734 | 0.48 | 0.6734 | 0.3562 | 0.6734 | 0.3018 | 0.6734 | 0.2625 | 0.6734 | 0.2428 | 0.6734 | 0.218 | 0.6734 | 0.1886 |
| 0.7055 | 0.48 | 0.7055 | 0.3562 | 0.7055 | 0.3018 | 0.7055 | 0.2625 | 0.7055 | 0.2428 | 0.7055 | 0.2198 | 0.7055 | 0.1933 |
| 0.7391 | 0.48 | 0.7391 | 0.3562 | 0.7391 | 0.3018 | 0.7391 | 0.27 | 0.7391 | 0.247 | 0.7391 | 0.2198 | 0.7391 | 0.1933 |
| 0.7743 | 0.5542 | 0.7743 | 0.3977 | 0.7743 | 0.3353 | 0.7743 | 0.2937 | 0.7743 | 0.2698 | 0.7743 | 0.2368 | 0.7743 | 0.2034 |
| 0.8111 | 0.5542 | 0.8111 | 0.3977 | 0.8111 | 0.3353 | 0.8111 | 0.3056 | 0.8111 | 0.2895 | 0.8111 | 0.2605 | 0.8111 | 0.2253 |
| 0.8497 | 0.5542 | 0.8497 | 0.3977 | 0.8497 | 0.3353 | 0.8497 | 0.3138 | 0.8497 | 0.3004 | 0.8497 | 0.2743 | 0.8497 | 0.2392 |
| 0.8902 | 0.5542 | 0.8902 | 0.3977 | 0.8902 | 0.3682 | 0.8902 | 0.3455 | 0.8902 | 0.3247 | 0.8902 | 0.2891 | 0.8902 | 0.2477 |
| 0.9326 | 0.8662 | 0.9326 | 0.5625 | 0.9326 | 0.4663 | 0.9326 | 0.4051 | 0.9326 | 0.3625 | 0.9326 | 0.3066 | 0.9326 | 0.2561 |
| 0.977 | 0.8662 | 0.977 | 0.5625 | 0.977 | 0.4663 | 0.977 | 0.4085 | 0.977 | 0.3679 | 0.977 | 0.311 | 0.977 | 0.2675 |
| 1.0235 | 0.9397 | 1.0235 | 0.6023 | 1.0235 | 0.5301 | 1.0235 | 0.485 | 1.0235 | 0.4471 | 1.0235 | 0.3868 | 1.0235 | 0.3327 |
| 1.0723 | 0.9397 | 1.0723 | 0.6755 | 1.0723 | 0.6093 | 1.0723 | 0.5524 | 1.0723 | 0.5049 | 1.0723 | 0.4387 | 1.0723 | 0.3788 |
| 1.1233 | 1.3542 | 1.1233 | 0.8403 | 1.1233 | 0.6861 | 1.1233 | 0.5909 | 1.1233 | 0.5475 | 1.1233 | 0.4739 | 1.1233 | 0.4054 |
| 1.1768 | 1.3542 | 1.1768 | 0.8403 | 1.1768 | 0.6861 | 1.1768 | 0.593 | 1.1768 | 0.5568 | 1.1768 | 0.4913 | 1.1768 | 0.4287 |
| 1.2328 | 1.3542 | 1.2328 | 0.8403 | 1.2328 | 0.7451 | 1.2328 | 0.6666 | 1.2328 | 0.5988 | 1.2328 | 0.5173 | 1.2328 | 0.4581 |
| 1.2916 | 1.3816 | 1.2916 | 0.9092 | 1.2916 | 0.8003 | 1.2916 | 0.709 | 1.2916 | 0.632 | 1.2916 | 0.5529 | 1.2916 | 0.4868 |
| 1.353 | 1.3816 | 1.353 | 0.9646 | 1.353 | 0.8003 | 1.353 | 0.709 | 1.353 | 0.6372 | 1.353 | 0.5822 | 1.353 | 0.5131 |
| 1.4175 | 1.4891 | 1.4175 | 0.9646 | 1.4175 | 0.8003 | 1.4175 | 0.709 | 1.4175 | 0.6669 | 1.4175 | 0.6106 | 1.4175 | 0.5387 |
| 1.485 | 1.4891 | 1.485 | 0.9646 | 1.485 | 0.8003 | 1.485 | 0.74 | 1.485 | 0.707 | 1.485 | 0.6462 | 1.485 | 0.5713 |
| 1.5557 | 1.5256 | 1.5557 | 1.0523 | 1.5557 | 0.8995 | 1.5557 | 0.7933 | 1.5557 | 0.7403 | 1.5557 | 0.6763 | 1.5557 | 0.6006 |
| 1.6298 | 1.5256 | 1.6298 | 1.1325 | 1.6298 | 0.9776 | 1.6298 | 0.8831 | 1.6298 | 0.8122 | 1.6298 | 0.704 | 1.6298 | 0.6204 |
| 1.7074 | 1.5256 | 1.7074 | 1.1325 | 1.7074 | 0.9776 | 1.7074 | 0.8831 | 1.7074 | 0.8122 | 1.7074 | 0.7191 | 1.7074 | 0.6405 |
| 1.7887 | 1.5537 | 1.7887 | 1.1325 | 1.7887 | 0.9776 | 1.7887 | 0.8831 | 1.7887 | 0.8122 | 1.7887 | 0.7414 | 1.7887 | 0.6653 |
| 1.8738 | 1.5537 | 1.8738 | 1.1325 | 1.8738 | 0.9776 | 1.8738 | 0.8911 | 1.8738 | 0.8509 | 1.8738 | 0.7792 | 1.8738 | 0.6908 |
| 1.963 | 1.5537 | 1.963 | 1.1325 | 1.963 | 0.9776 | 1.963 | 0.9255 | 1.963 | 0.8796 | 1.963 | 0.8012 | 1.963 | 0.7066 |
| 2.0565 | 1.5537 | 2.0565 | 1.1279 | 2.0565 | 0.991 | 2.0565 | 0.9319 | 2.0565 | 0.8812 | 2.0565 | 0.8012 | 2.0565 | 0.7066 |
| 2.1544 | 1.5537 | 2.1544 | 1.1279 | 2.1544 | 0.991 | 2.1544 | 0.9319 | 2.1544 | 0.8812 | 2.1544 | 0.8012 | 2.1544 | 0.7066 |
| 2.257 | 1.5743 | 2.257 | 1.1134 | 2.257 | 0.991 | 2.257 | 0.9319 | 2.257 | 0.8812 | 2.257 | 0.8012 | 2.257 | 0.7066 |
| 2.3645 | 1.5864 | 2.3645 | 1.1134 | 2.3645 | 0.991 | 2.3645 | 0.9319 | 2.3645 | 0.8812 | 2.3645 | 0.8012 | 2.3645 | 0.7066 |
| 2.4771 | 1.5864 | 2.4771 | 1.1134 | 2.4771 | 1.0817 | 2.4771 | 0.936 | 2.4771 | 0.8812 | 2.4771 | 0.7969 | 2.4771 | 0.71 |
| 2.595 | 1.5864 | 2.595 | 1.1134 | 2.595 | 1.0817 | 2.595 | 0.936 | 2.595 | 0.8812 | 2.595 | 0.7969 | 2.595 | 0.7136 |

PTWW016.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 16 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 2.7186 | 1.5864 | 2.7186 | 1.1134 | 2.7186 | 1.0817 | 2.7186 | 0.936 | 2.7186 | 0.8812 | 2.7186 | 0.7969 | 2.7186 | 0.7147 |
| 2.848 | 1.5864 | 2.848 | 1.1134 | 2.848 | 1.0817 | 2.848 | 0.936 | 2.848 | 0.8812 | 2.848 | 0.7969 | 2.848 | 0.7165 |
| 2.9836 | 1.5864 | 2.9836 | 1.1134 | 2.9836 | 1.0817 | 2.9836 | 0.936 | 2.9836 | 0.8812 | 2.9836 | 0.7969 | 2.9836 | 0.7168 |
| 3.1257 | 1.5864 | 3.1257 | 1.1134 | 3.1257 | 1.0817 | 3.1257 | 0.936 | 3.1257 | 0.8812 | 3.1257 | 0.7969 | 3.1257 | 0.7168 |
| 3.2745 | 1.5864 | 3.2745 | 1.1134 | 3.2745 | 1.0817 | 3.2745 | 0.936 | 3.2745 | 0.8812 | 3.2745 | 0.7969 | 3.2745 | 0.7168 |
| 3.4305 | 1.5864 | 3.4305 | 1.1134 | 3.4305 | 1.0817 | 3.4305 | 0.936 | 3.4305 | 0.8812 | 3.4305 | 0.7969 | 3.4305 | 0.7168 |
| 3.5938 | 1.8535 | 3.5938 | 1.1134 | 3.5938 | 1.0817 | 3.5938 | 0.936 | 3.5938 | 0.8812 | 3.5938 | 0.7969 | 3.5938 | 0.7168 |
| 3.7649 | 1.8535 | 3.7649 | 1.1379 | 3.7649 | 1.0817 | 3.7649 | 0.9372 | 3.7649 | 0.8812 | 3.7649 | 0.7969 | 3.7649 | 0.7168 |
| 3.9442 | 1.8535 | 3.9442 | 1.1379 | 3.9442 | 1.1062 | 3.9442 | 1.0119 | 3.9442 | 0.9368 | 3.9442 | 0.822 | 3.9442 | 0.7168 |
| 4.132 | 1.8535 | 4.132 | 1.1379 | 4.132 | 1.1062 | 4.132 | 1.0119 | 4.132 | 0.9368 | 4.132 | 0.822 | 4.132 | 0.7133 |
| 4.3288 | 1.8535 | 4.3288 | 1.1379 | 4.3288 | 1.1062 | 4.3288 | 1.0119 | 4.3288 | 0.9368 | 4.3288 | 0.822 | 4.3288 | 0.7073 |
| 4.5349 | 1.8535 | 4.5349 | 1.1379 | 4.5349 | 1.1062 | 4.5349 | 1.0119 | 4.5349 | 0.9368 | 4.5349 | 0.822 | 4.5349 | 0.7011 |
| 4.7508 | 1.8535 | 4.7508 | 1.1379 | 4.7508 | 1.1062 | 4.7508 | 1.0119 | 4.7508 | 0.9368 | 4.7508 | 0.822 | 4.7508 | 0.7005 |
| 4.977 | 1.8535 | 4.977 | 1.1379 | 4.977 | 1.0415 | 4.977 | 0.9371 | 4.977 | 0.8856 | 4.977 | 0.7959 | 4.977 | 0.6942 |
| 5.214 | 1.8535 | 5.214 | 1.15 | 5.214 | 1.0415 | 5.214 | 0.9333 | 5.214 | 0.8702 | 5.214 | 0.7781 | 5.214 | 0.6697 |
| 5.4623 | 2.1772 | 5.4623 | 1.15 | 5.4623 | 1.0415 | 5.4623 | 0.9333 | 5.4623 | 0.8702 | 5.4623 | 0.7781 | 5.4623 | 0.6697 |
| 5.7224 | 2.1772 | 5.7224 | 1.2364 | 5.7224 | 1.0415 | 5.7224 | 0.9333 | 5.7224 | 0.8702 | 5.7224 | 0.7781 | 5.7224 | 0.6697 |
| 5.9948 | 2.1772 | 5.9948 | 1.2364 | 5.9948 | 1.0415 | 5.9948 | 0.9333 | 5.9948 | 0.8702 | 5.9948 | 0.7781 | 5.9948 | 0.6697 |
| 6.2803 | 2.1772 | 6.2803 | 1.2364 | 6.2803 | 1.0415 | 6.2803 | 0.9333 | 6.2803 | 0.8702 | 6.2803 | 0.7781 | 6.2803 | 0.6697 |
| 6.5793 | 2.1772 | 6.5793 | 1.2364 | 6.5793 | 1.0415 | 6.5793 | 0.9333 | 6.5793 | 0.8702 | 6.5793 | 0.7781 | 6.5793 | 0.6692 |
| 6.8926 | 2.1772 | 6.8926 | 1.2364 | 6.8926 | 1.0415 | 6.8926 | 0.9333 | 6.8926 | 0.868 | 6.8926 | 0.7639 | 6.8926 | 0.6672 |
| 7.2208 | 1.8137 | 7.2208 | 1.111 | 7.2208 | 1.0099 | 7.2208 | 0.9333 | 7.2208 | 0.868 | 7.2208 | 0.7639 | 7.2208 | 0.6672 |
| 7.5646 | 1.5583 | 7.5646 | 1 | 7.5646 | 0.9162 | 7.5646 | 0.8668 | 7.5646 | 0.8278 | 7.5646 | 0.7569 | 7.5646 | 0.6672 |
| 7.9248 | 1.5583 | 7.9248 | 0.9797 | 7.9248 | 0.9162 | 7.9248 | 0.8567 | 7.9248 | 0.8091 | 7.9248 | 0.7367 | 7.9248 | 0.6498 |
| 8.3022 | 1.5583 | 8.3022 | 0.9797 | 8.3022 | 0.9162 | 8.3022 | 0.8567 | 8.3022 | 0.8091 | 8.3022 | 0.7348 | 8.3022 | 0.6498 |
| 8.6975 | 1.4793 | 8.6975 | 0.9161 | 8.6975 | 0.8178 | 8.6975 | 0.7806 | 8.6975 | 0.7481 | 8.6975 | 0.6917 | 8.6975 | 0.6191 |
| 9.1116 | 1.4446 | 9.1116 | 0.9161 | 9.1116 | 0.8046 | 9.1116 | 0.747 | 9.1116 | 0.7178 | 9.1116 | 0.6619 | 9.1116 | 0.5921 |
| 9.5455 | 1.3932 | 9.5455 | 0.8381 | 9.5455 | 0.7557 | 9.5455 | 0.7218 | 9.5455 | 0.6885 | 9.5455 | 0.6299 | 9.5455 | 0.5611 |
| 10 | 1.3932 | 10 | 0.8381 | 10 | 0.7557 | 10 | 0.7016 | 10 | 0.6574 | 10 | 0.5866 | 10 | 0.5174 |
| 10.4762 | 1.3932 | 10.4762 | 0.8381 | 10.4762 | 0.7387 | 10.4762 | 0.6854 | 10.4762 | 0.6486 | 10.4762 | 0.5866 | 10.4762 | 0.5168 |
| 10.975 | 1.0262 | 10.975 | 0.7928 | 10.975 | 0.715 | 10.975 | 0.6537 | 10.975 | 0.6116 | 10.975 | 0.5505 | 10.975 | 0.4833 |
| 11.4976 | 1.0052 | 11.4976 | 0.7928 | 11.4976 | 0.715 | 11.4976 | 0.6468 | 11.4976 | 0.5901 | 11.4976 | 0.5294 | 11.4976 | 0.4672 |
| 12.045 | 0.9828 | 12.045 | 0.6834 | 12.045 | 0.6222 | 12.045 | 0.576 | 12.045 | 0.5483 | 12.045 | 0.5027 | 12.045 | 0.4467 |
| 12.6186 | 0.9828 | 12.6186 | 0.6539 | 12.6186 | 0.5915 | 12.6186 | 0.5447 | 12.6186 | 0.5232 | 12.6186 | 0.4843 | 12.6186 | 0.4381 |
| 13.2194 | 0.9828 | 13.2194 | 0.6159 | 13.2194 | 0.5704 | 13.2194 | 0.5426 | 13.2194 | 0.5185 | 13.2194 | 0.48 | 13.2194 | 0.4372 |

PTWW016.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 16 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 13.8489 | 0.9828 | 13.8489 | 0.6008 | 13.8489 | 0.5377 | 13.8489 | 0.4983 | 13.8489 | 0.4828 | 13.8489 | 0.4541 | 13.8489 | 0.4191 |
| 14.5083 | 0.7664 | 14.5083 | 0.5661 | 14.5083 | 0.5231 | 14.5083 | 0.4917 | 14.5083 | 0.4685 | 14.5083 | 0.4378 | 14.5083 | 0.4132 |
| 15.1991 | 0.7585 | 15.1991 | 0.5661 | 15.1991 | 0.5231 | 15.1991 | 0.4917 | 15.1991 | 0.4685 | 15.1991 | 0.4378 | 15.1991 | 0.4132 |
| 15.9228 | 0.7585 | 15.9228 | 0.486 | 15.9228 | 0.4712 | 15.9228 | 0.4619 | 15.9228 | 0.4519 | 15.9228 | 0.4336 | 15.9228 | 0.4132 |
| 16.681 | 0.7406 | 16.681 | 0.486 | 16.681 | 0.4464 | 16.681 | 0.4345 | 16.681 | 0.4286 | 16.681 | 0.4167 | 16.681 | 0.4021 |
| 17.4753 | 0.7406 | 17.4753 | 0.486 | 17.4753 | 0.4464 | 17.4753 | 0.4302 | 17.4753 | 0.4198 | 17.4753 | 0.4072 | 17.4753 | 0.3961 |
| 18.3074 | 0.5678 | 18.3074 | 0.4016 | 18.3074 | 0.3905 | 18.3074 | 0.3859 | 18.3074 | 0.3808 | 18.3074 | 0.3844 | 18.3074 | 0.384 |
| 19.1791 | 0.5264 | 19.1791 | 0.3903 | 19.1791 | 0.3769 | 19.1791 | 0.3738 | 19.1791 | 0.3725 | 19.1791 | 0.3745 | 19.1791 | 0.3756 |
| 20.0923 | 0.4312 | 20.0923 | 0.3818 | 20.0923 | 0.3769 | 20.0923 | 0.3738 | 20.0923 | 0.3724 | 20.0923 | 0.3716 | 20.0923 | 0.3713 |
| 21.049 | 0.4312 | 21.049 | 0.3813 | 21.049 | 0.3769 | 21.049 | 0.3729 | 21.049 | 0.3697 | 21.049 | 0.3688 | 21.049 | 0.3684 |
| 22.0513 | 0.4312 | 22.0513 | 0.3813 | 22.0513 | 0.3769 | 22.0513 | 0.3729 | 22.0513 | 0.3697 | 22.0513 | 0.3674 | 22.0513 | 0.3663 |
| 23.1013 | 0.4224 | 23.1013 | 0.3813 | 23.1013 | 0.3769 | 23.1013 | 0.3729 | 23.1013 | 0.3697 | 23.1013 | 0.3657 | 23.1013 | 0.3645 |
| 24.2013 | 0.4224 | 24.2013 | 0.3813 | 24.2013 | 0.3769 | 24.2013 | 0.3729 | 24.2013 | 0.3697 | 24.2013 | 0.3652 | 24.2013 | 0.3626 |
| 25.3536 | 0.4224 | 25.3536 | 0.3813 | 25.3536 | 0.3769 | 25.3536 | 0.3729 | 25.3536 | 0.3697 | 25.3536 | 0.3652 | 25.3536 | 0.3614 |
| 26.5609 | 0.4224 | 26.5609 | 0.3813 | 26.5609 | 0.3769 | 26.5609 | 0.3729 | 26.5609 | 0.3697 | 26.5609 | 0.3652 | 26.5609 | 0.3614 |
| 27.8256 | 0.3851 | 27.8256 | 0.3813 | 27.8256 | 0.3769 | 27.8256 | 0.3729 | 27.8256 | 0.3697 | 27.8256 | 0.3652 | 27.8256 | 0.3612 |
| 29.1505 | 0.3851 | 29.1505 | 0.37 | 29.1505 | 0.3667 | 29.1505 | 0.3645 | 29.1505 | 0.363 | 29.1505 | 0.3606 | 29.1505 | 0.3584 |
| 30.5386 | 0.3591 | 30.5386 | 0.3537 | 30.5386 | 0.3541 | 30.5386 | 0.3547 | 30.5386 | 0.355 | 30.5386 | 0.355 | 30.5386 | 0.3546 |
| 31.9927 | 0.355 | 31.9927 | 0.3527 | 31.9927 | 0.3524 | 31.9927 | 0.3523 | 31.9927 | 0.3522 | 31.9927 | 0.352 | 31.9927 | 0.3518 |
| 33.516 | 0.3506 | 33.516 | 0.3507 | 33.516 | 0.3506 | 33.516 | 0.3505 | 33.516 | 0.3504 | 33.516 | 0.3503 | 33.516 | 0.3501 |
| 35.1119 | 0.3483 | 35.1119 | 0.3484 | 35.1119 | 0.3485 | 35.1119 | 0.3485 | 35.1119 | 0.3486 | 35.1119 | 0.3486 | 35.1119 | 0.3486 |
| 36.7838 | 0.3471 | 36.7838 | 0.3472 | 36.7838 | 0.3472 | 36.7838 | 0.3473 | 36.7838 | 0.3473 | 36.7838 | 0.3473 | 36.7838 | 0.3474 |
| 38.5353 | 0.3463 | 38.5353 | 0.3463 | 38.5353 | 0.3463 | 38.5353 | 0.3463 | 38.5353 | 0.3464 | 38.5353 | 0.3464 | 38.5353 | 0.3464 |
| 40.3702 | 0.3455 | 40.3702 | 0.3455 | 40.3702 | 0.3455 | 40.3702 | 0.3455 | 40.3702 | 0.3456 | 40.3702 | 0.3456 | 40.3702 | 0.3456 |
| 42.2924 | 0.3448 | 42.2924 | 0.3448 | 42.2924 | 0.3448 | 42.2924 | 0.3448 | 42.2924 | 0.3448 | 42.2924 | 0.3448 | 42.2924 | 0.3449 |
| 44.3062 | 0.3441 | 44.3062 | 0.3441 | 44.3062 | 0.3441 | 44.3062 | 0.3442 | 44.3062 | 0.3442 | 44.3062 | 0.3442 | 44.3062 | 0.3442 |
| 46.4159 | 0.3435 | 46.4159 | 0.3435 | 46.4159 | 0.3435 | 46.4159 | 0.3435 | 46.4159 | 0.3435 | 46.4159 | 0.3436 | 46.4159 | 0.3436 |
| 48.626 | 0.343 | 48.626 | 0.343 | 48.626 | 0.343 | 48.626 | 0.343 | 48.626 | 0.343 | 48.626 | 0.343 | 48.626 | 0.343 |
| 50.9414 | 0.3424 | 50.9414 | 0.3424 | 50.9414 | 0.3424 | 50.9414 | 0.3424 | 50.9414 | 0.3424 | 50.9414 | 0.3424 | 50.9414 | 0.3425 |

PTWW017.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 17 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.1098 | 0.0405 | 0.1098 | 0.0365 | 0.1098 | 0.0342 | 0.1098 | 0.0321 | 0.1098 | 0.0303 | 0.1098 | 0.0271 | 0.1098 | 0.0235 |
| 0.115 | 0.0405 | 0.115 | 0.0365 | 0.115 | 0.0342 | 0.115 | 0.0321 | 0.115 | 0.0303 | 0.115 | 0.0271 | 0.115 | 0.0257 |
| 0.1204 | 0.0405 | 0.1204 | 0.0365 | 0.1204 | 0.0342 | 0.1204 | 0.0321 | 0.1204 | 0.031 | 0.1204 | 0.0296 | 0.1204 | 0.0278 |
| 0.1262 | 0.0405 | 0.1262 | 0.0365 | 0.1262 | 0.0352 | 0.1262 | 0.0342 | 0.1262 | 0.0333 | 0.1262 | 0.0316 | 0.1262 | 0.0298 |
| 0.1322 | 0.0405 | 0.1322 | 0.0382 | 0.1322 | 0.0369 | 0.1322 | 0.0358 | 0.1322 | 0.0348 | 0.1322 | 0.0333 | 0.1322 | 0.0317 |
| 0.1385 | 0.0411 | 0.1385 | 0.0391 | 0.1385 | 0.0381 | 0.1385 | 0.0372 | 0.1385 | 0.0363 | 0.1385 | 0.0348 | 0.1385 | 0.0329 |
| 0.1451 | 0.0417 | 0.1451 | 0.0398 | 0.1451 | 0.0387 | 0.1451 | 0.0378 | 0.1451 | 0.0369 | 0.1451 | 0.0353 | 0.1451 | 0.0334 |
| 0.152 | 0.044 | 0.152 | 0.0402 | 0.152 | 0.0387 | 0.152 | 0.0378 | 0.152 | 0.0369 | 0.152 | 0.0353 | 0.152 | 0.0334 |
| 0.1592 | 0.0462 | 0.1592 | 0.0417 | 0.1592 | 0.0396 | 0.1592 | 0.0378 | 0.1592 | 0.0369 | 0.1592 | 0.0353 | 0.1592 | 0.0334 |
| 0.1668 | 0.0584 | 0.1668 | 0.0506 | 0.1668 | 0.0463 | 0.1668 | 0.0426 | 0.1668 | 0.0395 | 0.1668 | 0.0353 | 0.1668 | 0.0334 |
| 0.1748 | 0.0644 | 0.1748 | 0.0566 | 0.1748 | 0.0522 | 0.1748 | 0.0484 | 0.1748 | 0.045 | 0.1748 | 0.0394 | 0.1748 | 0.0334 |
| 0.1831 | 0.0668 | 0.1831 | 0.0583 | 0.1831 | 0.0541 | 0.1831 | 0.0504 | 0.1831 | 0.047 | 0.1831 | 0.0415 | 0.1831 | 0.0356 |
| 0.1918 | 0.0678 | 0.1918 | 0.0585 | 0.1918 | 0.0543 | 0.1918 | 0.0507 | 0.1918 | 0.0474 | 0.1918 | 0.0418 | 0.1918 | 0.0382 |
| 0.2009 | 0.0697 | 0.2009 | 0.0596 | 0.2009 | 0.0543 | 0.2009 | 0.0513 | 0.2009 | 0.0485 | 0.2009 | 0.0436 | 0.2009 | 0.0411 |
| 0.2105 | 0.0722 | 0.2105 | 0.0619 | 0.2105 | 0.058 | 0.2105 | 0.0546 | 0.2105 | 0.0516 | 0.2105 | 0.0482 | 0.2105 | 0.0443 |
| 0.2205 | 0.0819 | 0.2205 | 0.071 | 0.2205 | 0.0652 | 0.2205 | 0.0601 | 0.2205 | 0.0573 | 0.2205 | 0.0529 | 0.2205 | 0.0476 |
| 0.231 | 0.096 | 0.231 | 0.0793 | 0.231 | 0.0704 | 0.231 | 0.0666 | 0.231 | 0.0632 | 0.231 | 0.0574 | 0.231 | 0.0529 |
| 0.242 | 0.0983 | 0.242 | 0.0845 | 0.242 | 0.0775 | 0.242 | 0.0718 | 0.242 | 0.0681 | 0.242 | 0.0621 | 0.242 | 0.0558 |
| 0.2535 | 0.1059 | 0.2535 | 0.0913 | 0.2535 | 0.0832 | 0.2535 | 0.0762 | 0.2535 | 0.0701 | 0.2535 | 0.0621 | 0.2535 | 0.0558 |
| 0.2656 | 0.1141 | 0.2656 | 0.0948 | 0.2656 | 0.0844 | 0.2656 | 0.0762 | 0.2656 | 0.0701 | 0.2656 | 0.0621 | 0.2656 | 0.0558 |
| 0.2783 | 0.1141 | 0.2783 | 0.0948 | 0.2783 | 0.0844 | 0.2783 | 0.078 | 0.2783 | 0.0739 | 0.2783 | 0.0675 | 0.2783 | 0.0605 |
| 0.2915 | 0.1141 | 0.2915 | 0.1004 | 0.2915 | 0.0942 | 0.2915 | 0.0888 | 0.2915 | 0.0839 | 0.2915 | 0.0759 | 0.2915 | 0.0673 |
| 0.3054 | 0.1177 | 0.3054 | 0.1054 | 0.3054 | 0.0985 | 0.3054 | 0.0924 | 0.3054 | 0.0871 | 0.3054 | 0.0783 | 0.3054 | 0.0694 |
| 0.3199 | 0.1177 | 0.3199 | 0.1054 | 0.3199 | 0.0985 | 0.3199 | 0.0924 | 0.3199 | 0.0889 | 0.3199 | 0.0837 | 0.3199 | 0.0776 |
| 0.3352 | 0.1177 | 0.3352 | 0.1094 | 0.3352 | 0.1051 | 0.3352 | 0.1012 | 0.3352 | 0.0975 | 0.3352 | 0.0913 | 0.3352 | 0.0842 |
| 0.3511 | 0.1652 | 0.3511 | 0.1285 | 0.3511 | 0.1129 | 0.3511 | 0.107 | 0.3511 | 0.103 | 0.3511 | 0.0961 | 0.3511 | 0.0879 |
| 0.3678 | 0.2416 | 0.3678 | 0.1833 | 0.3678 | 0.1566 | 0.3678 | 0.1365 | 0.3678 | 0.1213 | 0.3678 | 0.1003 | 0.3678 | 0.0879 |
| 0.3853 | 0.255 | 0.3853 | 0.187 | 0.3853 | 0.1595 | 0.3853 | 0.1386 | 0.3853 | 0.1268 | 0.3853 | 0.1091 | 0.3853 | 0.091 |
| 0.4037 | 0.255 | 0.4037 | 0.187 | 0.4037 | 0.1595 | 0.4037 | 0.1386 | 0.4037 | 0.1271 | 0.4037 | 0.1152 | 0.4037 | 0.1029 |
| 0.4229 | 0.255 | 0.4229 | 0.187 | 0.4229 | 0.1649 | 0.4229 | 0.1484 | 0.4229 | 0.1344 | 0.4229 | 0.1234 | 0.4229 | 0.1122 |
| 0.4431 | 0.329 | 0.4431 | 0.2338 | 0.4431 | 0.2038 | 0.4431 | 0.1815 | 0.4431 | 0.1644 | 0.4431 | 0.1404 | 0.4431 | 0.1188 |
| 0.4642 | 0.329 | 0.4642 | 0.2338 | 0.4642 | 0.2038 | 0.4642 | 0.1815 | 0.4642 | 0.1644 | 0.4642 | 0.1404 | 0.4642 | 0.1188 |
| 0.4863 | 0.329 | 0.4863 | 0.2338 | 0.4863 | 0.2038 | 0.4863 | 0.1815 | 0.4863 | 0.1644 | 0.4863 | 0.1424 | 0.4863 | 0.125 |
| 0.5094 | 0.329 | 0.5094 | 0.2338 | 0.5094 | 0.2038 | 0.5094 | 0.1815 | 0.5094 | 0.1644 | 0.5094 | 0.1479 | 0.5094 | 0.1295 |

PTWW017.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 17 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.5337 | 0.3366 | 0.5337 | 0.2402 | 0.5337 | 0.2091 | 0.5337 | 0.1893 | 0.5337 | 0.1789 | 0.5337 | 0.1611 | 0.5337 | 0.1403 |
| 0.5591 | 0.3994 | 0.5591 | 0.2757 | 0.5591 | 0.2433 | 0.5591 | 0.2174 | 0.5591 | 0.1976 | 0.5591 | 0.173 | 0.5591 | 0.1559 |
| 0.5857 | 0.3994 | 0.5857 | 0.286 | 0.5857 | 0.257 | 0.5857 | 0.2329 | 0.5857 | 0.2125 | 0.5857 | 0.1854 | 0.5857 | 0.1716 |
| 0.6136 | 0.3994 | 0.6136 | 0.286 | 0.6136 | 0.257 | 0.6136 | 0.2329 | 0.6136 | 0.2125 | 0.6136 | 0.1986 | 0.6136 | 0.1834 |
| 0.6428 | 0.3994 | 0.6428 | 0.286 | 0.6428 | 0.257 | 0.6428 | 0.2329 | 0.6428 | 0.22 | 0.6428 | 0.2091 | 0.6428 | 0.1953 |
| 0.6734 | 0.4133 | 0.6734 | 0.286 | 0.6734 | 0.2573 | 0.6734 | 0.2433 | 0.6734 | 0.2362 | 0.6734 | 0.2239 | 0.6734 | 0.2086 |
| 0.7055 | 0.4133 | 0.7055 | 0.3041 | 0.7055 | 0.2763 | 0.7055 | 0.2647 | 0.7055 | 0.2547 | 0.7055 | 0.2378 | 0.7055 | 0.2184 |
| 0.7391 | 0.6352 | 0.7391 | 0.4157 | 0.7391 | 0.3392 | 0.7391 | 0.2923 | 0.7391 | 0.2745 | 0.7391 | 0.2448 | 0.7391 | 0.2198 |
| 0.7743 | 0.6352 | 0.7743 | 0.4157 | 0.7743 | 0.3392 | 0.7743 | 0.3048 | 0.7743 | 0.2868 | 0.7743 | 0.257 | 0.7743 | 0.2238 |
| 0.8111 | 0.6585 | 0.8111 | 0.4403 | 0.8111 | 0.3839 | 0.8111 | 0.3407 | 0.8111 | 0.3071 | 0.8111 | 0.2598 | 0.8111 | 0.2238 |
| 0.8497 | 0.6585 | 0.8497 | 0.4417 | 0.8497 | 0.4046 | 0.8497 | 0.3736 | 0.8497 | 0.3467 | 0.8497 | 0.3033 | 0.8497 | 0.2554 |
| 0.8902 | 0.6889 | 0.8902 | 0.4489 | 0.8902 | 0.4046 | 0.8902 | 0.3736 | 0.8902 | 0.3493 | 0.8902 | 0.3172 | 0.8902 | 0.2735 |
| 0.9326 | 0.7344 | 0.9326 | 0.5165 | 0.9326 | 0.454 | 0.9326 | 0.4087 | 0.9326 | 0.3743 | 0.9326 | 0.3257 | 0.9326 | 0.2797 |
| 0.977 | 0.988 | 0.977 | 0.6326 | 0.977 | 0.5215 | 0.977 | 0.4519 | 0.977 | 0.4046 | 0.977 | 0.3452 | 0.977 | 0.2961 |
| 1.0235 | 0.988 | 1.0235 | 0.6326 | 1.0235 | 0.56 | 1.0235 | 0.5076 | 1.0235 | 0.464 | 1.0235 | 0.3976 | 1.0235 | 0.3315 |
| 1.0723 | 0.988 | 1.0723 | 0.6582 | 1.0723 | 0.5892 | 1.0723 | 0.5317 | 1.0723 | 0.4833 | 1.0723 | 0.4119 | 1.0723 | 0.35 |
| 1.1233 | 1.2454 | 1.1233 | 0.849 | 1.1233 | 0.7113 | 1.1233 | 0.6128 | 1.1233 | 0.5401 | 1.1233 | 0.4417 | 1.1233 | 0.3579 |
| 1.1768 | 1.2454 | 1.1768 | 0.849 | 1.1768 | 0.7113 | 1.1768 | 0.6128 | 1.1768 | 0.5401 | 1.1768 | 0.4439 | 1.1768 | 0.3706 |
| 1.2328 | 1.2454 | 1.2328 | 0.9242 | 1.2328 | 0.8109 | 1.2328 | 0.7212 | 1.2328 | 0.6482 | 1.2328 | 0.5371 | 1.2328 | 0.4267 |
| 1.2916 | 1.2454 | 1.2916 | 1.0234 | 1.2916 | 0.889 | 1.2916 | 0.7839 | 1.2916 | 0.6998 | 1.2916 | 0.5744 | 1.2916 | 0.4525 |
| 1.353 | 1.3539 | 1.353 | 1.0234 | 1.353 | 0.889 | 1.353 | 0.7839 | 1.353 | 0.6998 | 1.353 | 0.5744 | 1.353 | 0.4525 |
| 1.4175 | 1.5778 | 1.4175 | 1.1114 | 1.4175 | 0.9435 | 1.4175 | 0.8371 | 1.4175 | 0.7571 | 1.4175 | 0.6404 | 1.4175 | 0.526 |
| 1.485 | 1.5778 | 1.485 | 1.1114 | 1.485 | 0.9435 | 1.485 | 0.8563 | 1.485 | 0.7981 | 1.485 | 0.6954 | 1.485 | 0.5786 |
| 1.5557 | 1.831 | 1.5557 | 1.163 | 1.5557 | 0.9714 | 1.5557 | 0.8673 | 1.5557 | 0.8026 | 1.5557 | 0.7075 | 1.5557 | 0.6018 |
| 1.6298 | 1.8691 | 1.6298 | 1.2535 | 1.6298 | 1.1171 | 1.6298 | 1.0068 | 1.6298 | 0.9124 | 1.6298 | 0.764 | 1.6298 | 0.6239 |
| 1.7074 | 1.8765 | 1.7074 | 1.2869 | 1.7074 | 1.2033 | 1.7074 | 1.0857 | 1.7074 | 0.9852 | 1.7074 | 0.825 | 1.7074 | 0.6665 |
| 1.7887 | 2.3239 | 1.7887 | 1.4211 | 1.7887 | 1.2033 | 1.7887 | 1.0857 | 1.7887 | 0.9852 | 1.7887 | 0.8339 | 1.7887 | 0.7098 |
| 1.8738 | 2.3239 | 1.8738 | 1.4211 | 1.8738 | 1.2033 | 1.8738 | 1.0857 | 1.8738 | 0.9852 | 1.8738 | 0.8769 | 1.8738 | 0.7461 |
| 1.963 | 2.3239 | 1.963 | 1.4211 | 1.963 | 1.2033 | 1.963 | 1.0919 | 1.963 | 1.0261 | 1.963 | 0.9107 | 1.963 | 0.7725 |
| 2.0565 | 2.3239 | 2.0565 | 1.4211 | 2.0565 | 1.2033 | 2.0565 | 1.108 | 2.0565 | 1.0451 | 2.0565 | 0.9279 | 2.0565 | 0.7815 |
| 2.1544 | 2.3239 | 2.1544 | 1.4211 | 2.1544 | 1.2547 | 2.1544 | 1.157 | 2.1544 | 1.0723 | 2.1544 | 0.9317 | 2.1544 | 0.8 |
| 2.257 | 2.1988 | 2.257 | 1.4211 | 2.257 | 1.2547 | 2.257 | 1.157 | 2.257 | 1.0723 | 2.257 | 0.9409 | 2.257 | 0.8088 |
| 2.3645 | 2.1988 | 2.3645 | 1.4211 | 2.3645 | 1.2547 | 2.3645 | 1.157 | 2.3645 | 1.0723 | 2.3645 | 0.9409 | 2.3645 | 0.8088 |
| 2.4771 | 2.1988 | 2.4771 | 1.5228 | 2.4771 | 1.2767 | 2.4771 | 1.157 | 2.4771 | 1.0723 | 2.4771 | 0.9409 | 2.4771 | 0.8088 |
| 2.595 | 2.0184 | 2.595 | 1.5228 | 2.595 | 1.2767 | 2.595 | 1.157 | 2.595 | 1.0723 | 2.595 | 0.9409 | 2.595 | 0.8088 |

PTWW017.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 17 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 2.7186 | 2.0184 | 2.7186 | 1.5228 | 2.7186 | 1.2767 | 2.7186 | 1.1545 | 2.7186 | 1.0625 | 2.7186 | 0.9409 | 2.7186 | 0.8088 |
| 2.848 | 2.0184 | 2.848 | 1.5228 | 2.848 | 1.2767 | 2.848 | 1.1545 | 2.848 | 1.0625 | 2.848 | 0.9399 | 2.848 | 0.7962 |
| 2.9836 | 2.0184 | 2.9836 | 1.5228 | 2.9836 | 1.2767 | 2.9836 | 1.1545 | 2.9836 | 1.0577 | 2.9836 | 0.9132 | 2.9836 | 0.7656 |
| 3.1257 | 2.0184 | 3.1257 | 1.3112 | 3.1257 | 1.0446 | 3.1257 | 0.9606 | 3.1257 | 0.9074 | 3.1257 | 0.8181 | 3.1257 | 0.713 |
| 3.2745 | 1.9901 | 3.2745 | 1.1665 | 3.2745 | 1.0008 | 3.2745 | 0.9022 | 3.2745 | 0.8233 | 3.2745 | 0.724 | 3.2745 | 0.6592 |
| 3.4305 | 1.6248 | 3.4305 | 0.9896 | 3.4305 | 0.8906 | 3.4305 | 0.8152 | 3.4305 | 0.7692 | 3.4305 | 0.6853 | 3.4305 | 0.6237 |
| 3.5938 | 1.6248 | 3.5938 | 0.9457 | 3.5938 | 0.8524 | 3.5938 | 0.8006 | 3.5938 | 0.7536 | 3.5938 | 0.6771 | 3.5938 | 0.5975 |
| 3.7649 | 1.6248 | 3.7649 | 0.9457 | 3.7649 | 0.8524 | 3.7649 | 0.8006 | 3.7649 | 0.7536 | 3.7649 | 0.6771 | 3.7649 | 0.5975 |
| 3.9442 | 1.6248 | 3.9442 | 0.9457 | 3.9442 | 0.8524 | 3.9442 | 0.8006 | 3.9442 | 0.7536 | 3.9442 | 0.6771 | 3.9442 | 0.5975 |
| 4.132 | 1.6248 | 4.132 | 0.9457 | 4.132 | 0.8524 | 4.132 | 0.8006 | 4.132 | 0.7536 | 4.132 | 0.6771 | 4.132 | 0.5975 |
| 4.3288 | 1.6248 | 4.3288 | 0.9457 | 4.3288 | 0.8524 | 4.3288 | 0.8006 | 4.3288 | 0.7536 | 4.3288 | 0.6771 | 4.3288 | 0.5975 |
| 4.5349 | 1.6248 | 4.5349 | 0.9457 | 4.5349 | 0.8524 | 4.5349 | 0.8006 | 4.5349 | 0.7536 | 4.5349 | 0.6771 | 4.5349 | 0.5975 |
| 4.7508 | 1.6248 | 4.7508 | 1.023 | 4.7508 | 0.9155 | 4.7508 | 0.8228 | 4.7508 | 0.7536 | 4.7508 | 0.6771 | 4.7508 | 0.5975 |
| 4.977 | 1.6248 | 4.977 | 1.191 | 4.977 | 1.0728 | 4.977 | 0.9637 | 4.977 | 0.875 | 4.977 | 0.745 | 4.977 | 0.6365 |
| 5.214 | 1.8207 | 5.214 | 1.191 | 5.214 | 1.0728 | 5.214 | 0.9637 | 5.214 | 0.8921 | 5.214 | 0.7878 | 5.214 | 0.6715 |
| 5.4623 | 1.8207 | 5.4623 | 1.191 | 5.4623 | 1.0728 | 5.4623 | 0.9637 | 5.4623 | 0.8921 | 5.4623 | 0.7878 | 5.4623 | 0.6865 |
| 5.7224 | 2.9149 | 5.7224 | 1.406 | 5.7224 | 1.1098 | 5.7224 | 1.0876 | 5.7224 | 0.9363 | 5.7224 | 0.7878 | 5.7224 | 0.6865 |
| 5.9948 | 2.9149 | 5.9948 | 1.406 | 5.9948 | 1.1098 | 5.9948 | 1.0876 | 5.9948 | 0.9363 | 5.9948 | 0.7878 | 5.9948 | 0.6865 |
| 6.2803 | 2.9149 | 6.2803 | 1.406 | 6.2803 | 1.1098 | 6.2803 | 1.0876 | 6.2803 | 0.9363 | 6.2803 | 0.7878 | 6.2803 | 0.6865 |
| 6.5793 | 2.9149 | 6.5793 | 1.406 | 6.5793 | 1.1098 | 6.5793 | 1.0876 | 6.5793 | 0.9363 | 6.5793 | 0.7865 | 6.5793 | 0.6865 |
| 6.8926 | 2.9149 | 6.8926 | 1.406 | 6.8926 | 1.1098 | 6.8926 | 1.0876 | 6.8926 | 0.9363 | 6.8926 | 0.7764 | 6.8926 | 0.6824 |
| 7.2208 | 2.4166 | 7.2208 | 1.406 | 7.2208 | 1.1098 | 7.2208 | 1.0322 | 7.2208 | 0.91 | 7.2208 | 0.7328 | 7.2208 | 0.6531 |
| 7.5646 | 2.1048 | 7.5646 | 1.2631 | 7.5646 | 1.0869 | 7.5646 | 0.9603 | 7.5646 | 0.8589 | 7.5646 | 0.7046 | 7.5646 | 0.6405 |
| 7.9248 | 1.7239 | 7.9248 | 0.9022 | 7.9248 | 0.8254 | 7.9248 | 0.7828 | 7.9248 | 0.7487 | 7.9248 | 0.69 | 7.9248 | 0.6204 |
| 8.3022 | 1.7239 | 8.3022 | 0.8525 | 8.3022 | 0.7912 | 8.3022 | 0.7524 | 8.3022 | 0.7205 | 8.3022 | 0.6659 | 8.3022 | 0.5997 |
| 8.6975 | 1.504 | 8.6975 | 0.8462 | 8.6975 | 0.7536 | 8.6975 | 0.7096 | 8.6975 | 0.6756 | 8.6975 | 0.623 | 8.6975 | 0.5646 |
| 9.1116 | 1.504 | 9.1116 | 0.8004 | 9.1116 | 0.6637 | 9.1116 | 0.629 | 9.1116 | 0.6017 | 9.1116 | 0.5591 | 9.1116 | 0.5122 |
| 9.5455 | 1.504 | 9.5455 | 0.8004 | 9.5455 | 0.6572 | 9.5455 | 0.5918 | 9.5455 | 0.5627 | 9.5455 | 0.5217 | 9.5455 | 0.4858 |
| 10 | 1.0253 | 10 | 0.666 | 10 | 0.6127 | 10 | 0.583 | 10 | 0.5582 | 10 | 0.5217 | 10 | 0.4858 |
| 10.4762 | 0.9769 | 10.4762 | 0.6615 | 10.4762 | 0.5918 | 10.4762 | 0.5361 | 10.4762 | 0.5247 | 10.4762 | 0.5026 | 10.4762 | 0.4744 |
| 10.975 | 0.9769 | 10.975 | 0.6615 | 10.975 | 0.5918 | 10.975 | 0.534 | 10.975 | 0.5032 | 10.975 | 0.4818 | 10.975 | 0.4602 |
| 11.4976 | 0.9769 | 11.4976 | 0.6615 | 11.4976 | 0.5918 | 11.4976 | 0.534 | 11.4976 | 0.5032 | 11.4976 | 0.462 | 11.4976 | 0.4453 |
| 12.045 | 0.767 | 12.045 | 0.5857 | 12.045 | 0.5386 | 12.045 | 0.5021 | 12.045 | 0.4738 | 12.045 | 0.4546 | 12.045 | 0.4387 |
| 12.6186 | 0.767 | 12.6186 | 0.5489 | 12.6186 | 0.495 | 12.6186 | 0.4679 | 12.6186 | 0.4603 | 12.6186 | 0.4466 | 12.6186 | 0.4298 |
| 13.2194 | 0.767 | 13.2194 | 0.5489 | 13.2194 | 0.495 | 13.2194 | 0.451 | 13.2194 | 0.4374 | 13.2194 | 0.429 | 13.2194 | 0.4161 |

PTWW017.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 17 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 4 B

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 13.8489 | 0.6514 | 13.8489 | 0.4765 | 13.8489 | 0.4405 | 13.8489 | 0.4243 | 13.8489 | 0.419 | 13.8489 | 0.4135 | 13.8489 | 0.4051 |
| 14.5083 | 0.6514 | 14.5083 | 0.4285 | 14.5083 | 0.4183 | 14.5083 | 0.4123 | 14.5083 | 0.4084 | 14.5083 | 0.4025 | 14.5083 | 0.3951 |
| 15.1991 | 0.6514 | 15.1991 | 0.4129 | 15.1991 | 0.4055 | 15.1991 | 0.4006 | 15.1991 | 0.3964 | 15.1991 | 0.391 | 15.1991 | 0.3853 |
| 15.9228 | 0.6514 | 15.9228 | 0.4115 | 15.9228 | 0.3896 | 15.9228 | 0.3881 | 15.9228 | 0.3858 | 15.9228 | 0.3814 | 15.9228 | 0.3762 |
| 16.681 | 0.6514 | 16.681 | 0.4115 | 16.681 | 0.3838 | 16.681 | 0.3759 | 16.681 | 0.3725 | 16.681 | 0.3708 | 16.681 | 0.3672 |
| 17.4753 | 0.6514 | 17.4753 | 0.4115 | 17.4753 | 0.3838 | 17.4753 | 0.3759 | 17.4753 | 0.3708 | 17.4753 | 0.3648 | 17.4753 | 0.3594 |
| 18.3074 | 0.5354 | 18.3074 | 0.3939 | 18.3074 | 0.3776 | 18.3074 | 0.3669 | 18.3074 | 0.3599 | 18.3074 | 0.3548 | 18.3074 | 0.3499 |
| 19.1791 | 0.5354 | 19.1791 | 0.3649 | 19.1791 | 0.3569 | 19.1791 | 0.3525 | 19.1791 | 0.3497 | 19.1791 | 0.3451 | 19.1791 | 0.3398 |
| 20.0923 | 0.5354 | 20.0923 | 0.3485 | 20.0923 | 0.3462 | 20.0923 | 0.3439 | 20.0923 | 0.3419 | 20.0923 | 0.3384 | 20.0923 | 0.3345 |
| 21.049 | 0.4241 | 21.049 | 0.3474 | 21.049 | 0.3402 | 21.049 | 0.3366 | 21.049 | 0.3343 | 21.049 | 0.3315 | 21.049 | 0.3287 |
| 22.0513 | 0.4 | 22.0513 | 0.3347 | 22.0513 | 0.3262 | 22.0513 | 0.3257 | 22.0513 | 0.3254 | 22.0513 | 0.3244 | 22.0513 | 0.323 |
| 23.1013 | 0.4 | 23.1013 | 0.3234 | 23.1013 | 0.32 | 23.1013 | 0.3187 | 23.1013 | 0.3182 | 23.1013 | 0.3181 | 23.1013 | 0.3178 |
| 24.2013 | 0.4 | 24.2013 | 0.3226 | 24.2013 | 0.3166 | 24.2013 | 0.3146 | 24.2013 | 0.3137 | 24.2013 | 0.3135 | 24.2013 | 0.3139 |
| 25.3536 | 0.3478 | 25.3536 | 0.3226 | 25.3536 | 0.3166 | 25.3536 | 0.3146 | 25.3536 | 0.3137 | 25.3536 | 0.3126 | 25.3536 | 0.3115 |
| 26.5609 | 0.3478 | 26.5609 | 0.3226 | 26.5609 | 0.3166 | 26.5609 | 0.3135 | 26.5609 | 0.3116 | 26.5609 | 0.3097 | 26.5609 | 0.3087 |
| 27.8256 | 0.3208 | 27.8256 | 0.3129 | 27.8256 | 0.3089 | 27.8256 | 0.3065 | 27.8256 | 0.305 | 27.8256 | 0.304 | 27.8256 | 0.3052 |
| 29.1505 | 0.3199 | 29.1505 | 0.3129 | 29.1505 | 0.3089 | 29.1505 | 0.3065 | 29.1505 | 0.305 | 29.1505 | 0.3036 | 29.1505 | 0.3035 |
| 30.5386 | 0.3182 | 30.5386 | 0.308 | 30.5386 | 0.3061 | 30.5386 | 0.3051 | 30.5386 | 0.3044 | 30.5386 | 0.3036 | 30.5386 | 0.3031 |
| 31.9927 | 0.3051 | 31.9927 | 0.3042 | 31.9927 | 0.304 | 31.9927 | 0.3036 | 31.9927 | 0.3033 | 31.9927 | 0.3028 | 31.9927 | 0.3023 |
| 33.516 | 0.3029 | 33.516 | 0.3021 | 33.516 | 0.3019 | 33.516 | 0.3018 | 33.516 | 0.3016 | 33.516 | 0.3014 | 33.516 | 0.3011 |
| 35.1119 | 0.3005 | 35.1119 | 0.3004 | 35.1119 | 0.3004 | 35.1119 | 0.3003 | 35.1119 | 0.3002 | 35.1119 | 0.3 | 35.1119 | 0.2998 |
| 36.7838 | 0.2989 | 36.7838 | 0.2989 | 36.7838 | 0.2989 | 36.7838 | 0.2989 | 36.7838 | 0.2988 | 36.7838 | 0.2988 | 36.7838 | 0.2987 |
| 38.5353 | 0.2977 | 38.5353 | 0.2977 | 38.5353 | 0.2977 | 38.5353 | 0.2977 | 38.5353 | 0.2977 | 38.5353 | 0.2977 | 38.5353 | 0.2976 |
| 40.3702 | 0.2967 | 40.3702 | 0.2967 | 40.3702 | 0.2967 | 40.3702 | 0.2967 | 40.3702 | 0.2967 | 40.3702 | 0.2967 | 40.3702 | 0.2966 |
| 42.2924 | 0.2958 | 42.2924 | 0.2958 | 42.2924 | 0.2958 | 42.2924 | 0.2958 | 42.2924 | 0.2958 | 42.2924 | 0.2958 | 42.2924 | 0.2958 |
| 44.3062 | 0.295 | 44.3062 | 0.295 | 44.3062 | 0.295 | 44.3062 | 0.295 | 44.3062 | 0.295 | 44.3062 | 0.295 | 44.3062 | 0.295 |
| 46.4159 | 0.2943 | 46.4159 | 0.2943 | 46.4159 | 0.2943 | 46.4159 | 0.2943 | 46.4159 | 0.2943 | 46.4159 | 0.2943 | 46.4159 | 0.2943 |
| 48.626 | 0.2936 | 48.626 | 0.2936 | 48.626 | 0.2936 | 48.626 | 0.2937 | 48.626 | 0.2937 | 48.626 | 0.2937 | 48.626 | 0.2937 |
| 50.9414 | 0.293 | 50.9414 | 0.293 | 50.9414 | 0.293 | 50.9414 | 0.293 | 50.9414 | 0.293 | 50.9414 | 0.293 | 50.9414 | 0.2931 |

PTWW022.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 22 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.1098 | 0.0375 | 0.1098 | 0.0344 | 0.1098 | 0.0327 | 0.1098 | 0.0312 | 0.1098 | 0.0298 | 0.1098 | 0.0274 | 0.1098 | 0.0252 |
| 0.115 | 0.0375 | 0.115 | 0.0344 | 0.115 | 0.0327 | 0.115 | 0.0312 | 0.115 | 0.0299 | 0.115 | 0.0277 | 0.115 | 0.0258 |
| 0.1204 | 0.0375 | 0.1204 | 0.0344 | 0.1204 | 0.0332 | 0.1204 | 0.0322 | 0.1204 | 0.0312 | 0.1204 | 0.0294 | 0.1204 | 0.0269 |
| 0.1262 | 0.0431 | 0.1262 | 0.0397 | 0.1262 | 0.0378 | 0.1262 | 0.036 | 0.1262 | 0.0343 | 0.1262 | 0.0314 | 0.1262 | 0.0278 |
| 0.1322 | 0.0504 | 0.1322 | 0.045 | 0.1322 | 0.042 | 0.1322 | 0.0393 | 0.1322 | 0.0369 | 0.1322 | 0.0328 | 0.1322 | 0.0281 |
| 0.1385 | 0.0559 | 0.1385 | 0.0488 | 0.1385 | 0.0448 | 0.1385 | 0.0414 | 0.1385 | 0.0384 | 0.1385 | 0.0344 | 0.1385 | 0.0304 |
| 0.1451 | 0.058 | 0.1451 | 0.0509 | 0.1451 | 0.0475 | 0.1451 | 0.0446 | 0.1451 | 0.0419 | 0.1451 | 0.0375 | 0.1451 | 0.0326 |
| 0.152 | 0.0615 | 0.152 | 0.0545 | 0.152 | 0.0506 | 0.152 | 0.0472 | 0.152 | 0.0441 | 0.152 | 0.0391 | 0.152 | 0.0338 |
| 0.1592 | 0.0621 | 0.1592 | 0.0545 | 0.1592 | 0.0506 | 0.1592 | 0.0472 | 0.1592 | 0.0442 | 0.1592 | 0.0397 | 0.1592 | 0.0352 |
| 0.1668 | 0.064 | 0.1668 | 0.056 | 0.1668 | 0.0518 | 0.1668 | 0.0482 | 0.1668 | 0.0451 | 0.1668 | 0.0404 | 0.1668 | 0.0357 |
| 0.1748 | 0.064 | 0.1748 | 0.056 | 0.1748 | 0.0518 | 0.1748 | 0.0482 | 0.1748 | 0.0451 | 0.1748 | 0.0404 | 0.1748 | 0.0357 |
| 0.1831 | 0.064 | 0.1831 | 0.056 | 0.1831 | 0.0518 | 0.1831 | 0.0482 | 0.1831 | 0.0451 | 0.1831 | 0.0404 | 0.1831 | 0.0369 |
| 0.1918 | 0.0642 | 0.1918 | 0.0562 | 0.1918 | 0.0518 | 0.1918 | 0.0495 | 0.1918 | 0.0478 | 0.1918 | 0.0446 | 0.1918 | 0.0404 |
| 0.2009 | 0.0642 | 0.2009 | 0.0583 | 0.2009 | 0.0558 | 0.2009 | 0.0535 | 0.2009 | 0.0514 | 0.2009 | 0.0474 | 0.2009 | 0.0425 |
| 0.2105 | 0.0665 | 0.2105 | 0.0603 | 0.2105 | 0.0575 | 0.2105 | 0.0549 | 0.2105 | 0.0525 | 0.2105 | 0.049 | 0.2105 | 0.0448 |
| 0.2205 | 0.0781 | 0.2205 | 0.0647 | 0.2205 | 0.062 | 0.2205 | 0.0596 | 0.2205 | 0.0573 | 0.2205 | 0.0533 | 0.2205 | 0.0484 |
| 0.231 | 0.0935 | 0.231 | 0.0775 | 0.231 | 0.0695 | 0.231 | 0.0631 | 0.231 | 0.0599 | 0.231 | 0.0556 | 0.231 | 0.0504 |
| 0.242 | 0.0935 | 0.242 | 0.0775 | 0.242 | 0.0723 | 0.242 | 0.0679 | 0.242 | 0.0638 | 0.242 | 0.0567 | 0.242 | 0.0514 |
| 0.2535 | 0.0935 | 0.2535 | 0.0818 | 0.2535 | 0.0772 | 0.2535 | 0.073 | 0.2535 | 0.0693 | 0.2535 | 0.063 | 0.2535 | 0.0555 |
| 0.2656 | 0.0935 | 0.2656 | 0.084 | 0.2656 | 0.0796 | 0.2656 | 0.0756 | 0.2656 | 0.0719 | 0.2656 | 0.0655 | 0.2656 | 0.0577 |
| 0.2783 | 0.0955 | 0.2783 | 0.0848 | 0.2783 | 0.0796 | 0.2783 | 0.0756 | 0.2783 | 0.0719 | 0.2783 | 0.0655 | 0.2783 | 0.0582 |
| 0.2915 | 0.1189 | 0.2915 | 0.0989 | 0.2915 | 0.0892 | 0.2915 | 0.0815 | 0.2915 | 0.0755 | 0.2915 | 0.0671 | 0.2915 | 0.0594 |
| 0.3054 | 0.1507 | 0.3054 | 0.1237 | 0.3054 | 0.1099 | 0.3054 | 0.0987 | 0.3054 | 0.0896 | 0.3054 | 0.076 | 0.3054 | 0.0634 |
| 0.3199 | 0.1507 | 0.3199 | 0.1237 | 0.3199 | 0.1099 | 0.3199 | 0.0987 | 0.3199 | 0.0896 | 0.3199 | 0.0803 | 0.3199 | 0.0708 |
| 0.3352 | 0.1507 | 0.3352 | 0.1237 | 0.3352 | 0.1099 | 0.3352 | 0.0987 | 0.3352 | 0.0933 | 0.3352 | 0.0859 | 0.3352 | 0.0765 |
| 0.3511 | 0.1507 | 0.3511 | 0.129 | 0.3511 | 0.1173 | 0.3511 | 0.1071 | 0.3511 | 0.0998 | 0.3511 | 0.0896 | 0.3511 | 0.0788 |
| 0.3678 | 0.168 | 0.3678 | 0.1439 | 0.3678 | 0.1304 | 0.3678 | 0.1187 | 0.3678 | 0.1121 | 0.3678 | 0.1018 | 0.3678 | 0.0898 |
| 0.3853 | 0.168 | 0.3853 | 0.1439 | 0.3853 | 0.1347 | 0.3853 | 0.128 | 0.3853 | 0.1219 | 0.3853 | 0.1116 | 0.3853 | 0.0992 |
| 0.4037 | 0.1945 | 0.4037 | 0.1602 | 0.4037 | 0.1429 | 0.4037 | 0.1308 | 0.4037 | 0.126 | 0.4037 | 0.1171 | 0.4037 | 0.1057 |
| 0.4229 | 0.2372 | 0.4229 | 0.1909 | 0.4229 | 0.1723 | 0.4229 | 0.1559 | 0.4229 | 0.1417 | 0.4229 | 0.122 | 0.4229 | 0.1096 |
| 0.4431 | 0.3089 | 0.4431 | 0.2194 | 0.4431 | 0.1882 | 0.4431 | 0.1671 | 0.4431 | 0.1497 | 0.4431 | 0.1276 | 0.4431 | 0.11 |
| 0.4642 | 0.3419 | 0.4642 | 0.2528 | 0.4642 | 0.2142 | 0.4642 | 0.1857 | 0.4642 | 0.1641 | 0.4642 | 0.1349 | 0.4642 | 0.1216 |
| 0.4863 | 0.3419 | 0.4863 | 0.2563 | 0.4863 | 0.2211 | 0.4863 | 0.193 | 0.4863 | 0.1703 | 0.4863 | 0.1414 | 0.4863 | 0.1328 |
| 0.5094 | 0.353 | 0.5094 | 0.2661 | 0.5094 | 0.233 | 0.5094 | 0.2059 | 0.5094 | 0.1835 | 0.5094 | 0.1502 | 0.5094 | 0.1397 |

PTWW022.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 22 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping Freq. | 0.50% Accel. | Freq. | 2% Accel. | Freq. | 3% Accel. | Freq. | 4% Accel. | Freq. | 5% Accel. | Freq. | 7% Accel. | Freq. | 10% Accel. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.5337 | 0.4106 | 0.5337 | 0.2779 | 0.5337 | 0.233 | 0.5337 | 0.2059 | 0.5337 | 0.1835 | 0.5337 | 0.1544 | 0.5337 | 0.1404 |
| 0.5591 | 0.4106 | 0.5591 | 0.2779 | 0.5591 | 0.2404 | 0.5591 | 0.2154 | 0.5591 | 0.1953 | 0.5591 | 0.1658 | 0.5591 | 0.1404 |
| 0.5857 | 0.4106 | 0.5857 | 0.2779 | 0.5857 | 0.241 | 0.5857 | 0.2165 | 0.5857 | 0.1978 | 0.5857 | 0.1688 | 0.5857 | 0.1445 |
| 0.6136 | 0.4488 | 0.6136 | 0.2977 | 0.6136 | 0.2451 | 0.6136 | 0.2241 | 0.6136 | 0.2057 | 0.6136 | 0.1756 | 0.6136 | 0.1445 |
| 0.6428 | 0.4791 | 0.6428 | 0.3556 | 0.6428 | 0.3014 | 0.6428 | 0.2618 | 0.6428 | 0.2352 | 0.6428 | 0.1994 | 0.6428 | 0.1686 |
| 0.6734 | 0.4791 | 0.6734 | 0.3556 | 0.6734 | 0.3014 | 0.6734 | 0.2618 | 0.6734 | 0.2421 | 0.6734 | 0.2173 | 0.6734 | 0.188 |
| 0.7055 | 0.4791 | 0.7055 | 0.3556 | 0.7055 | 0.3014 | 0.7055 | 0.2618 | 0.7055 | 0.2421 | 0.7055 | 0.2195 | 0.7055 | 0.1931 |
| 0.7391 | 0.4791 | 0.7391 | 0.3556 | 0.7391 | 0.3014 | 0.7391 | 0.2701 | 0.7391 | 0.2472 | 0.7391 | 0.2195 | 0.7391 | 0.1931 |
| 0.7743 | 0.5541 | 0.7743 | 0.3973 | 0.7743 | 0.3347 | 0.7743 | 0.2931 | 0.7743 | 0.2689 | 0.7743 | 0.2358 | 0.7743 | 0.2025 |
| 0.8111 | 0.5541 | 0.8111 | 0.3973 | 0.8111 | 0.3347 | 0.8111 | 0.3047 | 0.8111 | 0.2886 | 0.8111 | 0.2598 | 0.8111 | 0.2246 |
| 0.8497 | 0.5541 | 0.8497 | 0.3973 | 0.8497 | 0.3347 | 0.8497 | 0.3132 | 0.8497 | 0.2998 | 0.8497 | 0.2736 | 0.8497 | 0.2386 |
| 0.8902 | 0.5541 | 0.8902 | 0.3973 | 0.8902 | 0.3675 | 0.8902 | 0.345 | 0.8902 | 0.3244 | 0.8902 | 0.2889 | 0.8902 | 0.2477 |
| 0.9326 | 0.8648 | 0.9326 | 0.5613 | 0.9326 | 0.4653 | 0.9326 | 0.4044 | 0.9326 | 0.3621 | 0.9326 | 0.3063 | 0.9326 | 0.256 |
| 0.977 | 0.8648 | 0.977 | 0.5613 | 0.977 | 0.4653 | 0.977 | 0.4068 | 0.977 | 0.3663 | 0.977 | 0.3097 | 0.977 | 0.2664 |
| 1.0235 | 0.9377 | 1.0235 | 0.6004 | 1.0235 | 0.529 | 1.0235 | 0.4839 | 1.0235 | 0.4459 | 1.0235 | 0.3855 | 1.0235 | 0.3313 |
| 1.0723 | 0.9377 | 1.0723 | 0.6734 | 1.0723 | 0.6074 | 1.0723 | 0.5507 | 1.0723 | 0.5031 | 1.0723 | 0.4376 | 1.0723 | 0.3769 |
| 1.1233 | 1.3513 | 1.1233 | 0.8372 | 1.1233 | 0.6837 | 1.1233 | 0.5879 | 1.1233 | 0.5445 | 1.1233 | 0.4714 | 1.1233 | 0.403 |
| 1.1768 | 1.3513 | 1.1768 | 0.8372 | 1.1768 | 0.6837 | 1.1768 | 0.5898 | 1.1768 | 0.5538 | 1.1768 | 0.4886 | 1.1768 | 0.4271 |
| 1.2328 | 1.3513 | 1.2328 | 0.8372 | 1.2328 | 0.7428 | 1.2328 | 0.6644 | 1.2328 | 0.5968 | 1.2328 | 0.5156 | 1.2328 | 0.4567 |
| 1.2916 | 1.3513 | 1.2916 | 0.9066 | 1.2916 | 0.7979 | 1.2916 | 0.7068 | 1.2916 | 0.63 | 1.2916 | 0.5518 | 1.2916 | 0.4861 |
| 1.353 | 1.3513 | 1.353 | 0.9591 | 1.353 | 0.7979 | 1.353 | 0.7068 | 1.353 | 0.6351 | 1.353 | 0.5804 | 1.353 | 0.5117 |
| 1.4175 | 1.4799 | 1.4175 | 0.9591 | 1.4175 | 0.7979 | 1.4175 | 0.7068 | 1.4175 | 0.665 | 1.4175 | 0.609 | 1.4175 | 0.5377 |
| 1.485 | 1.4799 | 1.485 | 0.9591 | 1.485 | 0.7979 | 1.485 | 0.7368 | 1.485 | 0.7041 | 1.485 | 0.6435 | 1.485 | 0.5691 |
| 1.5557 | 1.5088 | 1.5557 | 1.0439 | 1.5557 | 0.892 | 1.5557 | 0.7863 | 1.5557 | 0.7357 | 1.5557 | 0.6723 | 1.5557 | 0.5965 |
| 1.6298 | 1.5088 | 1.6298 | 1.1255 | 1.6298 | 0.9707 | 1.6298 | 0.8769 | 1.6298 | 0.8063 | 1.6298 | 0.699 | 1.6298 | 0.6152 |
| 1.7074 | 1.5088 | 1.7074 | 1.1255 | 1.7074 | 0.9707 | 1.7074 | 0.8769 | 1.7074 | 0.8063 | 1.7074 | 0.7147 | 1.7074 | 0.6346 |
| 1.7887 | 1.5088 | 1.7887 | 1.1255 | 1.7887 | 0.9707 | 1.7887 | 0.8769 | 1.7887 | 0.8063 | 1.7887 | 0.7339 | 1.7887 | 0.6585 |
| 1.8738 | 1.5088 | 1.8738 | 1.1255 | 1.8738 | 0.9707 | 1.8738 | 0.882 | 1.8738 | 0.8424 | 1.8738 | 0.7711 | 1.8738 | 0.6831 |
| 1.963 | 1.5088 | 1.963 | 1.1255 | 1.963 | 0.9707 | 1.963 | 0.9172 | 1.963 | 0.8715 | 1.963 | 0.7938 | 1.963 | 0.6992 |
| 2.0565 | 1.5088 | 2.0565 | 1.1158 | 2.0565 | 0.9661 | 2.0565 | 0.9247 | 2.0565 | 0.8739 | 2.0565 | 0.7938 | 2.0565 | 0.6992 |
| 2.1544 | 1.5088 | 2.1544 | 1.1158 | 2.1544 | 0.9661 | 2.1544 | 0.9247 | 2.1544 | 0.8739 | 2.1544 | 0.7938 | 2.1544 | 0.6992 |
| 2.257 | 1.5515 | 2.257 | 1.0506 | 2.257 | 0.9661 | 2.257 | 0.9247 | 2.257 | 0.8739 | 2.257 | 0.7938 | 2.257 | 0.6992 |
| 2.3645 | 1.569 | 2.3645 | 1.0506 | 2.3645 | 0.9661 | 2.3645 | 0.9247 | 2.3645 | 0.8739 | 2.3645 | 0.7938 | 2.3645 | 0.6992 |
| 2.4771 | 1.569 | 2.4771 | 1.0506 | 2.4771 | 0.9467 | 2.4771 | 0.9247 | 2.4771 | 0.8739 | 2.4771 | 0.7899 | 2.4771 | 0.6957 |
| 2.595 | 1.569 | 2.595 | 1.0506 | 2.595 | 0.9467 | 2.595 | 0.9247 | 2.595 | 0.8664 | 2.595 | 0.7597 | 2.595 | 0.6957 |

PTWW022.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 22 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping Freq. | 0.50% Accel. | Freq. | 2% Accel. | Freq. | 3% Accel. | Freq. | 4% Accel. | Freq. | 5% Accel. | Freq. | 7% Accel. | Freq. | 10% Accel. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.7186 | 1.569 | 2.7186 | 1.0506 | 2.7186 | 0.9467 | 2.7186 | 0.9247 | 2.7186 | 0.8664 | 2.7186 | 0.7597 | 2.7186 | 0.6957 |
| 2.848 | 1.569 | 2.848 | 1.0506 | 2.848 | 0.9467 | 2.848 | 0.9247 | 2.848 | 0.8664 | 2.848 | 0.7597 | 2.848 | 0.6957 |
| 2.9836 | 1.569 | 2.9836 | 1.0506 | 2.9836 | 0.9467 | 2.9836 | 0.9247 | 2.9836 | 0.8664 | 2.9836 | 0.7597 | 2.9836 | 0.6957 |
| 3.1257 | 1.569 | 3.1257 | 1.0506 | 3.1257 | 0.9467 | 3.1257 | 0.9247 | 3.1257 | 0.8664 | 3.1257 | 0.7597 | 3.1257 | 0.6957 |
| 3.2745 | 1.569 | 3.2745 | 1.0506 | 3.2745 | 0.9467 | 3.2745 | 0.9247 | 3.2745 | 0.8664 | 3.2745 | 0.7597 | 3.2745 | 0.6957 |
| 3.4305 | 1.569 | 3.4305 | 1.0506 | 3.4305 | 0.9467 | 3.4305 | 0.9247 | 3.4305 | 0.8664 | 3.4305 | 0.7597 | 3.4305 | 0.6957 |
| 3.5938 | 1.6861 | 3.5938 | 1.0506 | 3.5938 | 0.9467 | 3.5938 | 0.9247 | 3.5938 | 0.8664 | 3.5938 | 0.7597 | 3.5938 | 0.6957 |
| 3.7649 | 1.6861 | 3.7649 | 1.1653 | 3.7649 | 0.9467 | 3.7649 | 0.9247 | 3.7649 | 0.8664 | 3.7649 | 0.7597 | 3.7649 | 0.6927 |
| 3.9442 | 1.6861 | 3.9442 | 1.1653 | 3.9442 | 0.955 | 3.9442 | 0.9362 | 3.9442 | 0.8664 | 3.9442 | 0.7597 | 3.9442 | 0.6927 |
| 4.132 | 1.6861 | 4.132 | 1.1653 | 4.132 | 0.955 | 4.132 | 0.9362 | 4.132 | 0.8664 | 4.132 | 0.7597 | 4.132 | 0.6862 |
| 4.3288 | 1.6861 | 4.3288 | 1.1653 | 4.3288 | 0.955 | 4.3288 | 0.9362 | 4.3288 | 0.8664 | 4.3288 | 0.7597 | 4.3288 | 0.6787 |
| 4.5349 | 1.6861 | 4.5349 | 1.1653 | 4.5349 | 0.955 | 4.5349 | 0.9362 | 4.5349 | 0.8664 | 4.5349 | 0.7597 | 4.5349 | 0.6657 |
| 4.7508 | 1.6861 | 4.7508 | 1.1423 | 4.7508 | 0.955 | 4.7508 | 0.9362 | 4.7508 | 0.8664 | 4.7508 | 0.7597 | 4.7508 | 0.6479 |
| 4.977 | 1.6861 | 4.977 | 1.1193 | 4.977 | 0.9483 | 4.977 | 0.8597 | 4.977 | 0.8132 | 4.977 | 0.7328 | 4.977 | 0.642 |
| 5.214 | 1.6861 | 5.214 | 1.1193 | 5.214 | 0.9483 | 5.214 | 0.8597 | 5.214 | 0.8132 | 5.214 | 0.7297 | 5.214 | 0.6348 |
| 5.4623 | 2.0932 | 5.4623 | 1.1193 | 5.4623 | 0.9483 | 5.4623 | 0.8597 | 5.4623 | 0.8132 | 5.4623 | 0.7297 | 5.4623 | 0.6348 |
| 5.7224 | 2.0932 | 5.7224 | 1.1193 | 5.7224 | 0.9483 | 5.7224 | 0.8597 | 5.7224 | 0.8132 | 5.7224 | 0.7297 | 5.7224 | 0.6348 |
| 5.9948 | 2.0932 | 5.9948 | 1.1193 | 5.9948 | 0.9483 | 5.9948 | 0.8597 | 5.9948 | 0.8132 | 5.9948 | 0.7297 | 5.9948 | 0.6348 |
| 6.2803 | 2.0932 | 6.2803 | 1.1193 | 6.2803 | 0.9483 | 6.2803 | 0.8597 | 6.2803 | 0.8132 | 6.2803 | 0.7297 | 6.2803 | 0.6348 |
| 6.5793 | 2.0932 | 6.5793 | 1.1193 | 6.5793 | 0.9483 | 6.5793 | 0.8597 | 6.5793 | 0.8132 | 6.5793 | 0.7297 | 6.5793 | 0.6316 |
| 6.8926 | 2.0932 | 6.8926 | 1.1193 | 6.8926 | 0.9483 | 6.8926 | 0.8564 | 6.8926 | 0.793 | 6.8926 | 0.7028 | 6.8926 | 0.6276 |
| 7.2208 | 1.7932 | 7.2208 | 1.1022 | 7.2208 | 0.9239 | 7.2208 | 0.8428 | 7.2208 | 0.7865 | 7.2208 | 0.6959 | 7.2208 | 0.6276 |
| 7.5646 | 1.3461 | 7.5646 | 0.9535 | 7.5646 | 0.851 | 7.5646 | 0.7985 | 7.5646 | 0.758 | 7.5646 | 0.6959 | 7.5646 | 0.6276 |
| 7.9248 | 1.2781 | 7.9248 | 0.9188 | 7.9248 | 0.851 | 7.9248 | 0.7913 | 7.9248 | 0.7507 | 7.9248 | 0.6862 | 7.9248 | 0.6173 |
| 8.3022 | 1.2719 | 8.3022 | 0.9188 | 8.3022 | 0.851 | 8.3022 | 0.7909 | 8.3022 | 0.7422 | 8.3022 | 0.6675 | 8.3022 | 0.6003 |
| 8.6975 | 1.0732 | 8.6975 | 0.8155 | 8.6975 | 0.7297 | 8.6975 | 0.6993 | 8.6975 | 0.6707 | 8.6975 | 0.6168 | 8.6975 | 0.5555 |
| 9.1116 | 1.0732 | 9.1116 | 0.8155 | 9.1116 | 0.7297 | 9.1116 | 0.6674 | 9.1116 | 0.6426 | 9.1116 | 0.594 | 9.1116 | 0.5293 |
| 9.5455 | 1.0632 | 9.5455 | 0.8155 | 9.5455 | 0.7297 | 9.5455 | 0.665 | 9.5455 | 0.6109 | 9.5455 | 0.548 | 9.5455 | 0.5075 |
| 10 | 1.0632 | 10 | 0.8155 | 10 | 0.7297 | 10 | 0.665 | 10 | 0.6109 | 10 | 0.5416 | 10 | 0.4824 |
| 10.4762 | 1.0632 | 10.4762 | 0.8155 | 10.4762 | 0.7297 | 10.4762 | 0.665 | 10.4762 | 0.6109 | 10.4762 | 0.5374 | 10.4762 | 0.4716 |
| 10.975 | 0.9814 | 10.975 | 0.7906 | 10.975 | 0.7235 | 10.975 | 0.665 | 10.975 | 0.6109 | 10.975 | 0.5256 | 10.975 | 0.4557 |
| 11.4976 | 0.9814 | 11.4976 | 0.7906 | 11.4976 | 0.7215 | 11.4976 | 0.6575 | 11.4976 | 0.603 | 11.4976 | 0.5189 | 11.4976 | 0.4453 |
| 12.045 | 0.8026 | 12.045 | 0.6724 | 12.045 | 0.6069 | 12.045 | 0.558 | 12.045 | 0.5202 | 12.045 | 0.4674 | 12.045 | 0.4231 |
| 12.6186 | 0.7876 | 12.6186 | 0.6185 | 12.6186 | 0.566 | 12.6186 | 0.5184 | 12.6186 | 0.5012 | 12.6186 | 0.4674 | 12.6186 | 0.4231 |
| 13.2194 | 0.7876 | 13.2194 | 0.6185 | 13.2194 | 0.566 | 13.2194 | 0.5166 | 13.2194 | 0.4839 | 13.2194 | 0.4493 | 13.2194 | 0.4086 |

PTWW022.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 22 ~ SLAB-WALL JOINT East-West Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 13.8489 | 0.7876 | 13.8489 | 0.5849 | 13.8489 | 0.5168 | 13.8489 | 0.473 | 13.8489 | 0.458 | 13.8489 | 0.43 | 13.8489 | 0.3946 |
| 14.5083 | 0.7113 | 14.5083 | 0.5199 | 14.5083 | 0.4734 | 14.5083 | 0.4593 | 14.5083 | 0.4453 | 14.5083 | 0.4196 | 14.5083 | 0.3874 |
| 15.1991 | 0.7113 | 15.1991 | 0.4913 | 15.1991 | 0.4581 | 15.1991 | 0.4351 | 15.1991 | 0.4191 | 15.1991 | 0.3992 | 15.1991 | 0.3844 |
| 15.9228 | 0.7113 | 15.9228 | 0.4804 | 15.9228 | 0.433 | 15.9228 | 0.4151 | 15.9228 | 0.4052 | 15.9228 | 0.3955 | 15.9228 | 0.3844 |
| 16.681 | 0.7113 | 16.681 | 0.4804 | 16.681 | 0.433 | 16.681 | 0.4067 | 16.681 | 0.3923 | 16.681 | 0.3827 | 16.681 | 0.3771 |
| 17.4753 | 0.7113 | 17.4753 | 0.4804 | 17.4753 | 0.433 | 17.4753 | 0.4067 | 17.4753 | 0.3916 | 17.4753 | 0.3767 | 17.4753 | 0.3679 |
| 18.3074 | 0.6514 | 18.3074 | 0.4041 | 18.3074 | 0.3855 | 18.3074 | 0.3753 | 18.3074 | 0.367 | 18.3074 | 0.3555 | 18.3074 | 0.3535 |
| 19.1791 | 0.6514 | 19.1791 | 0.4041 | 19.1791 | 0.3855 | 19.1791 | 0.3753 | 19.1791 | 0.367 | 19.1791 | 0.3553 | 19.1791 | 0.3456 |
| 20.0923 | 0.5299 | 20.0923 | 0.4041 | 20.0923 | 0.3855 | 20.0923 | 0.3753 | 20.0923 | 0.367 | 20.0923 | 0.3553 | 20.0923 | 0.3452 |
| 21.049 | 0.5299 | 21.049 | 0.4041 | 21.049 | 0.3747 | 21.049 | 0.3613 | 21.049 | 0.3553 | 21.049 | 0.3481 | 21.049 | 0.3452 |
| 22.0513 | 0.5299 | 22.0513 | 0.3915 | 22.0513 | 0.3712 | 22.0513 | 0.3613 | 22.0513 | 0.3553 | 22.0513 | 0.3481 | 22.0513 | 0.3444 |
| 23.1013 | 0.5299 | 23.1013 | 0.3915 | 23.1013 | 0.3712 | 23.1013 | 0.3613 | 23.1013 | 0.3553 | 23.1013 | 0.3481 | 23.1013 | 0.3443 |
| 24.2013 | 0.4644 | 24.2013 | 0.3604 | 24.2013 | 0.357 | 24.2013 | 0.354 | 24.2013 | 0.3517 | 24.2013 | 0.348 | 24.2013 | 0.3443 |
| 25.3536 | 0.4644 | 25.3536 | 0.359 | 25.3536 | 0.3564 | 25.3536 | 0.354 | 25.3536 | 0.3517 | 25.3536 | 0.348 | 25.3536 | 0.3443 |
| 26.5609 | 0.4644 | 26.5609 | 0.3553 | 26.5609 | 0.3521 | 26.5609 | 0.3495 | 26.5609 | 0.3474 | 26.5609 | 0.3447 | 26.5609 | 0.3427 |
| 27.8256 | 0.3574 | 27.8256 | 0.3553 | 27.8256 | 0.3521 | 27.8256 | 0.3495 | 27.8256 | 0.3474 | 27.8256 | 0.3447 | 27.8256 | 0.3422 |
| 29.1505 | 0.3464 | 29.1505 | 0.3425 | 29.1505 | 0.3411 | 29.1505 | 0.3414 | 29.1505 | 0.3414 | 29.1505 | 0.341 | 29.1505 | 0.34 |
| 30.5386 | 0.3447 | 30.5386 | 0.3414 | 30.5386 | 0.3407 | 30.5386 | 0.3401 | 30.5386 | 0.3398 | 30.5386 | 0.3394 | 30.5386 | 0.3388 |
| 31.9927 | 0.3401 | 31.9927 | 0.3414 | 31.9927 | 0.3407 | 31.9927 | 0.3401 | 31.9927 | 0.3396 | 31.9927 | 0.3389 | 31.9927 | 0.3381 |
| 33.516 | 0.3388 | 33.516 | 0.3387 | 33.516 | 0.3386 | 33.516 | 0.3384 | 33.516 | 0.3381 | 33.516 | 0.3377 | 33.516 | 0.3372 |
| 35.1119 | 0.3367 | 35.1119 | 0.3367 | 35.1119 | 0.3367 | 35.1119 | 0.3366 | 35.1119 | 0.3365 | 35.1119 | 0.3364 | 35.1119 | 0.3361 |
| 36.7838 | 0.3355 | 36.7838 | 0.3355 | 36.7838 | 0.3354 | 36.7838 | 0.3354 | 36.7838 | 0.3354 | 36.7838 | 0.3353 | 36.7838 | 0.3352 |
| 38.5353 | 0.3346 | 38.5353 | 0.3345 | 38.5353 | 0.3345 | 38.5353 | 0.3345 | 38.5353 | 0.3345 | 38.5353 | 0.3344 | 38.5353 | 0.3343 |
| 40.3702 | 0.3338 | 40.3702 | 0.3338 | 40.3702 | 0.3338 | 40.3702 | 0.3337 | 40.3702 | 0.3337 | 40.3702 | 0.3337 | 40.3702 | 0.3336 |
| 42.2924 | 0.3331 | 42.2924 | 0.3331 | 42.2924 | 0.3331 | 42.2924 | 0.3331 | 42.2924 | 0.3331 | 42.2924 | 0.333 | 42.2924 | 0.333 |
| 44.3062 | 0.3325 | 44.3062 | 0.3325 | 44.3062 | 0.3325 | 44.3062 | 0.3324 | 44.3062 | 0.3324 | 44.3062 | 0.3324 | 44.3062 | 0.3324 |
| 46.4159 | 0.3319 | 46.4159 | 0.3319 | 46.4159 | 0.3319 | 46.4159 | 0.3319 | 46.4159 | 0.3319 | 46.4159 | 0.3319 | 46.4159 | 0.3319 |
| 48.626 | 0.3314 | 48.626 | 0.3314 | 48.626 | 0.3314 | 48.626 | 0.3314 | 48.626 | 0.3314 | 48.626 | 0.3314 | 48.626 | 0.3314 |
| 50.9414 | 0.3309 | 50.9414 | 0.3309 | 50.9414 | 0.3309 | 50.9414 | 0.3309 | 50.9414 | 0.3309 | 50.9414 | 0.3309 | 50.9414 | 0.3309 |

PTWW023.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 23 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping Freq. | 0.50% Accel. | Freq. | 2% Accel. | Freq. | 3% Accel. | Freq. | 4% Accel. | Freq. | 5% Accel. | Freq. | 7% Accel. | Freq. | 10% Accel. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1098 | 0.0405 | 0.1098 | 0.0365 | 0.1098 | 0.0342 | 0.1098 | 0.0322 | 0.1098 | 0.0303 | 0.1098 | 0.0272 | 0.1098 | 0.0237 |
| 0.115 | 0.0405 | 0.115 | 0.0365 | 0.115 | 0.0342 | 0.115 | 0.0322 | 0.115 | 0.0303 | 0.115 | 0.0273 | 0.115 | 0.0262 |
| 0.1204 | 0.0405 | 0.1204 | 0.0365 | 0.1204 | 0.0342 | 0.1204 | 0.0322 | 0.1204 | 0.0311 | 0.1204 | 0.0299 | 0.1204 | 0.0284 |
| 0.1262 | 0.0405 | 0.1262 | 0.0365 | 0.1262 | 0.0353 | 0.1262 | 0.0344 | 0.1262 | 0.0336 | 0.1262 | 0.032 | 0.1262 | 0.0302 |
| 0.1322 | 0.0405 | 0.1322 | 0.0383 | 0.1322 | 0.0371 | 0.1322 | 0.0361 | 0.1322 | 0.0351 | 0.1322 | 0.0337 | 0.1322 | 0.0321 |
| 0.1385 | 0.0413 | 0.1385 | 0.0394 | 0.1385 | 0.0384 | 0.1385 | 0.0375 | 0.1385 | 0.0366 | 0.1385 | 0.0351 | 0.1385 | 0.0332 |
| 0.1451 | 0.0418 | 0.1451 | 0.04 | 0.1451 | 0.0389 | 0.1451 | 0.038 | 0.1451 | 0.0371 | 0.1451 | 0.0355 | 0.1451 | 0.0336 |
| 0.152 | 0.0439 | 0.152 | 0.0401 | 0.152 | 0.0389 | 0.152 | 0.038 | 0.152 | 0.0371 | 0.152 | 0.0355 | 0.152 | 0.0336 |
| 0.1592 | 0.0462 | 0.1592 | 0.0417 | 0.1592 | 0.0396 | 0.1592 | 0.038 | 0.1592 | 0.0371 | 0.1592 | 0.0355 | 0.1592 | 0.0336 |
| 0.1668 | 0.0585 | 0.1668 | 0.0506 | 0.1668 | 0.0463 | 0.1668 | 0.0427 | 0.1668 | 0.0396 | 0.1668 | 0.0355 | 0.1668 | 0.0336 |
| 0.1748 | 0.0645 | 0.1748 | 0.0567 | 0.1748 | 0.0523 | 0.1748 | 0.0485 | 0.1748 | 0.0451 | 0.1748 | 0.0395 | 0.1748 | 0.0336 |
| 0.1831 | 0.0669 | 0.1831 | 0.0583 | 0.1831 | 0.0542 | 0.1831 | 0.0505 | 0.1831 | 0.0472 | 0.1831 | 0.0416 | 0.1831 | 0.0355 |
| 0.1918 | 0.0679 | 0.1918 | 0.0586 | 0.1918 | 0.0544 | 0.1918 | 0.0508 | 0.1918 | 0.0476 | 0.1918 | 0.0419 | 0.1918 | 0.0382 |
| 0.2009 | 0.0698 | 0.2009 | 0.0597 | 0.2009 | 0.0545 | 0.2009 | 0.0516 | 0.2009 | 0.049 | 0.2009 | 0.0443 | 0.2009 | 0.0414 |
| 0.2105 | 0.0723 | 0.2105 | 0.0622 | 0.2105 | 0.0584 | 0.2105 | 0.055 | 0.2105 | 0.0518 | 0.2105 | 0.0484 | 0.2105 | 0.045 |
| 0.2205 | 0.082 | 0.2205 | 0.0711 | 0.2205 | 0.0653 | 0.2205 | 0.0602 | 0.2205 | 0.0577 | 0.2205 | 0.0535 | 0.2205 | 0.0484 |
| 0.231 | 0.0961 | 0.231 | 0.0794 | 0.231 | 0.0704 | 0.231 | 0.0665 | 0.231 | 0.0631 | 0.231 | 0.0585 | 0.231 | 0.0537 |
| 0.242 | 0.0988 | 0.242 | 0.0847 | 0.242 | 0.0776 | 0.242 | 0.0728 | 0.242 | 0.069 | 0.242 | 0.0628 | 0.242 | 0.0563 |
| 0.2535 | 0.1063 | 0.2535 | 0.0917 | 0.2535 | 0.0836 | 0.2535 | 0.0767 | 0.2535 | 0.0707 | 0.2535 | 0.0628 | 0.2535 | 0.0563 |
| 0.2656 | 0.1141 | 0.2656 | 0.0947 | 0.2656 | 0.0842 | 0.2656 | 0.0767 | 0.2656 | 0.0707 | 0.2656 | 0.0628 | 0.2656 | 0.0563 |
| 0.2783 | 0.1141 | 0.2783 | 0.0947 | 0.2783 | 0.0842 | 0.2783 | 0.0782 | 0.2783 | 0.0745 | 0.2783 | 0.0685 | 0.2783 | 0.0622 |
| 0.2915 | 0.1141 | 0.2915 | 0.1015 | 0.2915 | 0.0954 | 0.2915 | 0.09 | 0.2915 | 0.0852 | 0.2915 | 0.0773 | 0.2915 | 0.0688 |
| 0.3054 | 0.1186 | 0.3054 | 0.1064 | 0.3054 | 0.0994 | 0.3054 | 0.0934 | 0.3054 | 0.0881 | 0.3054 | 0.0794 | 0.3054 | 0.0724 |
| 0.3199 | 0.1186 | 0.3199 | 0.1064 | 0.3199 | 0.0994 | 0.3199 | 0.0935 | 0.3199 | 0.0908 | 0.3199 | 0.0861 | 0.3199 | 0.0806 |
| 0.3352 | 0.1186 | 0.3352 | 0.1112 | 0.3352 | 0.107 | 0.3352 | 0.1032 | 0.3352 | 0.0998 | 0.3352 | 0.0939 | 0.3352 | 0.0869 |
| 0.3511 | 0.1662 | 0.3511 | 0.1299 | 0.3511 | 0.1149 | 0.3511 | 0.109 | 0.3511 | 0.1051 | 0.3511 | 0.0982 | 0.3511 | 0.0901 |
| 0.3678 | 0.2421 | 0.3678 | 0.1836 | 0.3678 | 0.1568 | 0.3678 | 0.137 | 0.3678 | 0.1222 | 0.3678 | 0.1018 | 0.3678 | 0.0901 |
| 0.3853 | 0.2561 | 0.3853 | 0.1879 | 0.3853 | 0.1604 | 0.3853 | 0.14 | 0.3853 | 0.1286 | 0.3853 | 0.1111 | 0.3853 | 0.0931 |
| 0.4037 | 0.2561 | 0.4037 | 0.1879 | 0.4037 | 0.1604 | 0.4037 | 0.14 | 0.4037 | 0.1295 | 0.4037 | 0.1181 | 0.4037 | 0.1058 |
| 0.4229 | 0.2561 | 0.4229 | 0.1879 | 0.4229 | 0.1659 | 0.4229 | 0.1491 | 0.4229 | 0.1363 | 0.4229 | 0.1255 | 0.4229 | 0.1134 |
| 0.4431 | 0.3305 | 0.4431 | 0.236 | 0.4431 | 0.2057 | 0.4431 | 0.183 | 0.4431 | 0.1656 | 0.4431 | 0.1411 | 0.4431 | 0.1189 |
| 0.4642 | 0.3305 | 0.4642 | 0.236 | 0.4642 | 0.2057 | 0.4642 | 0.183 | 0.4642 | 0.1656 | 0.4642 | 0.1411 | 0.4642 | 0.1191 |
| 0.4863 | 0.3305 | 0.4863 | 0.236 | 0.4863 | 0.2057 | 0.4863 | 0.183 | 0.4863 | 0.1656 | 0.4863 | 0.1434 | 0.4863 | 0.1257 |
| 0.5094 | 0.3305 | 0.5094 | 0.236 | 0.5094 | 0.2057 | 0.5094 | 0.183 | 0.5094 | 0.1656 | 0.5094 | 0.1478 | 0.5094 | 0.1307 |

PTWW023.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 23 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.5337 | 0.3378 | 0.5337 | 0.2419 | 0.5337 | 0.2105 | 0.5337 | 0.192 | 0.5337 | 0.1816 | 0.5337 | 0.1635 | 0.5337 | 0.142 |
| 0.5591 | 0.4058 | 0.5591 | 0.2801 | 0.5591 | 0.2478 | 0.5591 | 0.2214 | 0.5591 | 0.2006 | 0.5591 | 0.1739 | 0.5591 | 0.1574 |
| 0.5857 | 0.4058 | 0.5857 | 0.2915 | 0.5857 | 0.2621 | 0.5857 | 0.2377 | 0.5857 | 0.2172 | 0.5857 | 0.1878 | 0.5857 | 0.1747 |
| 0.6136 | 0.4058 | 0.6136 | 0.2915 | 0.6136 | 0.2621 | 0.6136 | 0.2377 | 0.6136 | 0.2172 | 0.6136 | 0.2028 | 0.6136 | 0.1889 |
| 0.6428 | 0.4058 | 0.6428 | 0.2915 | 0.6428 | 0.2621 | 0.6428 | 0.2377 | 0.6428 | 0.2257 | 0.6428 | 0.2153 | 0.6428 | 0.201 |
| 0.6734 | 0.4176 | 0.6734 | 0.2915 | 0.6734 | 0.2621 | 0.6734 | 0.2496 | 0.6734 | 0.2424 | 0.6734 | 0.229 | 0.6734 | 0.2118 |
| 0.7055 | 0.4176 | 0.7055 | 0.3079 | 0.7055 | 0.2812 | 0.7055 | 0.2691 | 0.7055 | 0.2585 | 0.7055 | 0.2404 | 0.7055 | 0.2196 |
| 0.7391 | 0.6488 | 0.7391 | 0.4251 | 0.7391 | 0.3472 | 0.7391 | 0.3008 | 0.7391 | 0.2825 | 0.7391 | 0.2517 | 0.7391 | 0.2204 |
| 0.7743 | 0.6488 | 0.7743 | 0.4251 | 0.7743 | 0.3472 | 0.7743 | 0.3112 | 0.7743 | 0.2928 | 0.7743 | 0.2621 | 0.7743 | 0.2275 |
| 0.8111 | 0.6742 | 0.8111 | 0.456 | 0.8111 | 0.398 | 0.8111 | 0.3532 | 0.8111 | 0.3182 | 0.8111 | 0.2686 | 0.8111 | 0.2275 |
| 0.8497 | 0.6742 | 0.8497 | 0.456 | 0.8497 | 0.4173 | 0.8497 | 0.3854 | 0.8497 | 0.3578 | 0.8497 | 0.3131 | 0.8497 | 0.2643 |
| 0.8902 | 0.6985 | 0.8902 | 0.456 | 0.8902 | 0.4173 | 0.8902 | 0.3854 | 0.8902 | 0.3632 | 0.8902 | 0.3306 | 0.8902 | 0.2863 |
| 0.9326 | 0.7612 | 0.9326 | 0.5383 | 0.9326 | 0.474 | 0.9326 | 0.427 | 0.9326 | 0.3916 | 0.9326 | 0.3416 | 0.9326 | 0.2945 |
| 0.977 | 1.0292 | 0.977 | 0.6621 | 0.977 | 0.5476 | 0.977 | 0.4756 | 0.977 | 0.4268 | 0.977 | 0.3654 | 0.977 | 0.3149 |
| 1.0235 | 1.0292 | 1.0235 | 0.6621 | 1.0235 | 0.5897 | 1.0235 | 0.5355 | 1.0235 | 0.4903 | 1.0235 | 0.4219 | 1.0235 | 0.3545 |
| 1.0723 | 1.0292 | 1.0723 | 0.7033 | 1.0723 | 0.6314 | 1.0723 | 0.5714 | 1.0723 | 0.5209 | 1.0723 | 0.4434 | 1.0723 | 0.372 |
| 1.1233 | 1.3137 | 1.1233 | 0.8999 | 1.1233 | 0.7545 | 1.1233 | 0.6502 | 1.1233 | 0.5729 | 1.1233 | 0.4678 | 1.1233 | 0.3909 |
| 1.1768 | 1.3137 | 1.1768 | 0.8999 | 1.1768 | 0.7545 | 1.1768 | 0.6502 | 1.1768 | 0.5729 | 1.1768 | 0.4701 | 1.1768 | 0.3999 |
| 1.2328 | 1.3137 | 1.2328 | 0.9857 | 1.2328 | 0.8645 | 1.2328 | 0.7685 | 1.2328 | 0.691 | 1.2328 | 0.5723 | 1.2328 | 0.4547 |
| 1.2916 | 1.3137 | 1.2916 | 1.0916 | 1.2916 | 0.9479 | 1.2916 | 0.8357 | 1.2916 | 0.746 | 1.2916 | 0.6124 | 1.2916 | 0.4829 |
| 1.353 | 1.4089 | 1.353 | 1.0916 | 1.353 | 0.9479 | 1.353 | 0.8357 | 1.353 | 0.746 | 1.353 | 0.6124 | 1.353 | 0.4909 |
| 1.4175 | 1.729 | 1.4175 | 1.213 | 1.4175 | 1.0369 | 1.4175 | 0.9214 | 1.4175 | 0.8354 | 1.4175 | 0.709 | 1.4175 | 0.5885 |
| 1.485 | 1.729 | 1.485 | 1.213 | 1.485 | 1.0369 | 1.485 | 0.9542 | 1.485 | 0.8918 | 1.485 | 0.778 | 1.485 | 0.6506 |
| 1.5557 | 2.0447 | 1.5557 | 1.2726 | 1.5557 | 1.0865 | 1.5557 | 0.9691 | 1.5557 | 0.8918 | 1.5557 | 0.789 | 1.5557 | 0.6724 |
| 1.6298 | 2.0861 | 1.6298 | 1.4394 | 1.6298 | 1.2876 | 1.6298 | 1.162 | 1.6298 | 1.057 | 1.6298 | 0.8882 | 1.6298 | 0.7096 |
| 1.7074 | 2.1771 | 1.7074 | 1.5528 | 1.7074 | 1.397 | 1.7074 | 1.2648 | 1.7074 | 1.1508 | 1.7074 | 0.9654 | 1.7074 | 0.7705 |
| 1.7887 | 2.7163 | 1.7887 | 1.7697 | 1.7887 | 1.4137 | 1.7887 | 1.2648 | 1.7887 | 1.1508 | 1.7887 | 0.9665 | 1.7887 | 0.8229 |
| 1.8738 | 2.7163 | 1.8738 | 1.7697 | 1.8738 | 1.4137 | 1.8738 | 1.2648 | 1.8738 | 1.1545 | 1.8738 | 1.0307 | 1.8738 | 0.8752 |
| 1.963 | 2.7163 | 1.963 | 1.7697 | 1.963 | 1.4137 | 1.963 | 1.296 | 1.963 | 1.2176 | 1.963 | 1.0825 | 1.963 | 0.9154 |
| 2.0565 | 2.7163 | 2.0565 | 1.7697 | 2.0565 | 1.4137 | 2.0565 | 1.332 | 2.0565 | 1.2549 | 2.0565 | 1.1146 | 2.0565 | 0.9373 |
| 2.1544 | 2.7163 | 2.1544 | 1.7697 | 2.1544 | 1.5305 | 2.1544 | 1.4116 | 2.1544 | 1.3081 | 2.1544 | 1.1549 | 2.1544 | 1.0039 |
| 2.257 | 2.6722 | 2.257 | 1.7165 | 2.257 | 1.5315 | 2.257 | 1.4444 | 2.257 | 1.3645 | 2.257 | 1.2229 | 2.257 | 1.0568 |
| 2.3645 | 2.6722 | 2.3645 | 1.7165 | 2.3645 | 1.5867 | 2.3645 | 1.4923 | 2.3645 | 1.409 | 2.3645 | 1.2586 | 2.3645 | 1.0784 |
| 2.4771 | 2.6722 | 2.4771 | 1.7165 | 2.4771 | 1.6824 | 2.4771 | 1.5289 | 2.4771 | 1.409 | 2.4771 | 1.2586 | 2.4771 | 1.0784 |
| 2.595 | 2.6722 | 2.595 | 1.7165 | 2.595 | 1.6824 | 2.595 | 1.5289 | 2.595 | 1.409 | 2.595 | 1.2586 | 2.595 | 1.0784 |

PTWW023.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 23 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 2.7186 | 2.6722 | 2.7186 | 1.7165 | 2.7186 | 1.6824 | 2.7186 | 1.5289 | 2.7186 | 1.409 | 2.7186 | 1.2586 | 2.7186 | 1.0784 |
| 2.848 | 2.6722 | 2.848 | 1.7165 | 2.848 | 1.6824 | 2.848 | 1.5289 | 2.848 | 1.409 | 2.848 | 1.2586 | 2.848 | 1.0784 |
| 2.9836 | 2.6722 | 2.9836 | 1.7165 | 2.9836 | 1.6824 | 2.9836 | 1.5289 | 2.9836 | 1.4086 | 2.9836 | 1.2312 | 2.9836 | 1.0531 |
| 3.1257 | 2.6722 | 3.1257 | 1.7165 | 3.1257 | 1.4081 | 3.1257 | 1.249 | 3.1257 | 1.1684 | 3.1257 | 1.0862 | 3.1257 | 0.9782 |
| 3.2745 | 2.6722 | 3.2745 | 1.5912 | 3.2745 | 1.3838 | 3.2745 | 1.249 | 3.2745 | 1.1419 | 3.2745 | 0.9784 | 3.2745 | 0.8937 |
| 3.4305 | 2.4258 | 3.4305 | 1.3157 | 3.4305 | 1.2378 | 3.4305 | 1.1421 | 3.4305 | 1.0837 | 3.4305 | 0.977 | 3.4305 | 0.843 |
| 3.5938 | 2.4258 | 3.5938 | 1.3154 | 3.5938 | 1.2378 | 3.5938 | 1.1238 | 3.5938 | 1.0502 | 3.5938 | 0.961 | 3.5938 | 0.8401 |
| 3.7649 | 2.4258 | 3.7649 | 1.3154 | 3.7649 | 1.2378 | 3.7649 | 1.1238 | 3.7649 | 1.0494 | 3.7649 | 0.9359 | 3.7649 | 0.8192 |
| 3.9442 | 2.4258 | 3.9442 | 1.3154 | 3.9442 | 1.2378 | 3.9442 | 1.1098 | 3.9442 | 1.0413 | 3.9442 | 0.9304 | 3.9442 | 0.8192 |
| 4.132 | 2.4258 | 4.132 | 1.3154 | 4.132 | 1.2378 | 4.132 | 1.1098 | 4.132 | 1.0413 | 4.132 | 0.9304 | 4.132 | 0.8192 |
| 4.3288 | 2.4258 | 4.3288 | 1.3154 | 4.3288 | 1.2378 | 4.3288 | 1.069 | 4.3288 | 0.9785 | 4.3288 | 0.8739 | 4.3288 | 0.7783 |
| 4.5349 | 2.4258 | 4.5349 | 1.3154 | 4.5349 | 1.1837 | 4.5349 | 1.0539 | 4.5349 | 0.9618 | 4.5349 | 0.8274 | 4.5349 | 0.6979 |
| 4.7508 | 1.9701 | 4.7508 | 1.0977 | 4.7508 | 1.0417 | 4.7508 | 0.9199 | 4.7508 | 0.872 | 4.7508 | 0.7786 | 4.7508 | 0.6734 |
| 4.977 | 1.9701 | 4.977 | 1.0977 | 4.977 | 1.0417 | 4.977 | 0.8879 | 4.977 | 0.839 | 4.977 | 0.7604 | 4.977 | 0.6667 |
| 5.214 | 1.9701 | 5.214 | 1.0977 | 5.214 | 0.9918 | 5.214 | 0.8856 | 5.214 | 0.8097 | 5.214 | 0.7297 | 5.214 | 0.6413 |
| 5.4623 | 1.4677 | 5.4623 | 0.9173 | 5.4623 | 0.8237 | 5.4623 | 0.7835 | 5.4623 | 0.7434 | 5.4623 | 0.6763 | 5.4623 | 0.5975 |
| 5.7224 | 1.3373 | 5.7224 | 0.8915 | 5.7224 | 0.8183 | 5.7224 | 0.7788 | 5.7224 | 0.7416 | 5.7224 | 0.6761 | 5.7224 | 0.5967 |
| 5.9948 | 1.186 | 5.9948 | 0.8915 | 5.9948 | 0.8073 | 5.9948 | 0.7595 | 5.9948 | 0.7218 | 5.9948 | 0.6568 | 5.9948 | 0.5793 |
| 6.2803 | 1.186 | 6.2803 | 0.8742 | 6.2803 | 0.7554 | 6.2803 | 0.7165 | 6.2803 | 0.6807 | 6.2803 | 0.6166 | 6.2803 | 0.5424 |
| 6.5793 | 1.1682 | 6.5793 | 0.7476 | 6.5793 | 0.6961 | 6.5793 | 0.6558 | 6.5793 | 0.6206 | 6.5793 | 0.564 | 6.5793 | 0.5054 |
| 6.8926 | 1.1682 | 6.8926 | 0.6278 | 6.8926 | 0.5979 | 6.8926 | 0.5695 | 6.8926 | 0.5433 | 6.8926 | 0.5064 | 6.8926 | 0.4688 |
| 7.2208 | 1.1682 | 7.2208 | 0.6161 | 7.2208 | 0.5433 | 7.2208 | 0.5063 | 7.2208 | 0.4825 | 7.2208 | 0.4512 | 7.2208 | 0.4513 |
| 7.5646 | 1.1682 | 7.5646 | 0.6161 | 7.5646 | 0.5366 | 7.5646 | 0.5063 | 7.5646 | 0.4825 | 7.5646 | 0.4512 | 7.5646 | 0.4437 |
| 7.9248 | 1.1682 | 7.9248 | 0.5885 | 7.9248 | 0.535 | 7.9248 | 0.5063 | 7.9248 | 0.4825 | 7.9248 | 0.4463 | 7.9248 | 0.4346 |
| 8.3022 | 1.1682 | 8.3022 | 0.5885 | 8.3022 | 0.535 | 8.3022 | 0.5063 | 8.3022 | 0.4825 | 8.3022 | 0.4463 | 8.3022 | 0.4294 |
| 8.6975 | 0.9253 | 8.6975 | 0.5885 | 8.6975 | 0.535 | 8.6975 | 0.5063 | 8.6975 | 0.4825 | 8.6975 | 0.4463 | 8.6975 | 0.4203 |
| 9.1116 | 0.9253 | 9.1116 | 0.5885 | 9.1116 | 0.5144 | 9.1116 | 0.4908 | 9.1116 | 0.4754 | 9.1116 | 0.4448 | 9.1116 | 0.4063 |
| 9.5455 | 0.9253 | 9.5455 | 0.5885 | 9.5455 | 0.5144 | 9.5455 | 0.4844 | 9.5455 | 0.4667 | 9.5455 | 0.4352 | 9.5455 | 0.3996 |
| 10 | 0.7548 | 10 | 0.5609 | 10 | 0.5124 | 10 | 0.4745 | 10 | 0.4536 | 10 | 0.4198 | 10 | 0.3951 |
| 10.4762 | 0.7548 | 10.4762 | 0.5609 | 10.4762 | 0.5124 | 10.4762 | 0.4741 | 10.4762 | 0.444 | 10.4762 | 0.4021 | 10.4762 | 0.3892 |
| 10.975 | 0.7267 | 10.975 | 0.5609 | 10.975 | 0.5124 | 10.975 | 0.4741 | 10.975 | 0.444 | 10.975 | 0.4021 | 10.975 | 0.3809 |
| 11.4976 | 0.6866 | 11.4976 | 0.5132 | 11.4976 | 0.4705 | 11.4976 | 0.4496 | 11.4976 | 0.4297 | 11.4976 | 0.3972 | 11.4976 | 0.3755 |
| 12.045 | 0.6015 | 12.045 | 0.4763 | 12.045 | 0.4518 | 12.045 | 0.4317 | 12.045 | 0.415 | 12.045 | 0.3892 | 12.045 | 0.3696 |
| 12.6186 | 0.6015 | 12.6186 | 0.41 | 12.6186 | 0.3905 | 12.6186 | 0.381 | 12.6186 | 0.372 | 12.6186 | 0.3644 | 12.6186 | 0.3629 |
| 13.2194 | 0.6015 | 13.2194 | 0.41 | 13.2194 | 0.3885 | 13.2194 | 0.3742 | 13.2194 | 0.365 | 13.2194 | 0.3591 | 13.2194 | 0.3578 |

PTWW023.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 23 ~ SLAB-WALL JOINT North-South Responses ~ Elevation 76 ft. ~ Line 13 H

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 13.8489 | 0.6015 | 13.8489 | 0.41 | 13.8489 | 0.3885 | 13.8489 | 0.3742 | 13.8489 | 0.365 | 13.8489 | 0.3547 | 13.8489 | 0.3535 |
| 14.5083 | 0.6015 | 14.5083 | 0.41 | 14.5083 | 0.3885 | 14.5083 | 0.3742 | 14.5083 | 0.365 | 14.5083 | 0.3547 | 14.5083 | 0.3503 |
| 15.1991 | 0.6015 | 15.1991 | 0.41 | 15.1991 | 0.3885 | 15.1991 | 0.3742 | 15.1991 | 0.365 | 15.1991 | 0.3547 | 15.1991 | 0.3482 |
| 15.9228 | 0.6015 | 15.9228 | 0.41 | 15.9228 | 0.3885 | 15.9228 | 0.3742 | 15.9228 | 0.365 | 15.9228 | 0.3547 | 15.9228 | 0.3479 |
| 16.681 | 0.6015 | 16.681 | 0.41 | 16.681 | 0.3885 | 16.681 | 0.3742 | 16.681 | 0.365 | 16.681 | 0.3547 | 16.681 | 0.3479 |
| 17.4753 | 0.6015 | 17.4753 | 0.41 | 17.4753 | 0.3885 | 17.4753 | 0.3742 | 17.4753 | 0.365 | 17.4753 | 0.3547 | 17.4753 | 0.3479 |
| 18.3074 | 0.5419 | 18.3074 | 0.3695 | 18.3074 | 0.363 | 18.3074 | 0.3584 | 18.3074 | 0.3547 | 18.3074 | 0.3494 | 18.3074 | 0.3448 |
| 19.1791 | 0.5419 | 19.1791 | 0.3591 | 19.1791 | 0.352 | 19.1791 | 0.348 | 19.1791 | 0.3453 | 19.1791 | 0.3436 | 19.1791 | 0.3423 |
| 20.0923 | 0.5419 | 20.0923 | 0.3591 | 20.0923 | 0.352 | 20.0923 | 0.348 | 20.0923 | 0.3453 | 20.0923 | 0.3422 | 20.0923 | 0.3402 |
| 21.049 | 0.521 | 21.049 | 0.3591 | 21.049 | 0.352 | 21.049 | 0.348 | 21.049 | 0.3453 | 21.049 | 0.3422 | 21.049 | 0.3398 |
| 22.0513 | 0.3887 | 22.0513 | 0.3591 | 22.0513 | 0.352 | 22.0513 | 0.348 | 22.0513 | 0.3453 | 22.0513 | 0.3422 | 22.0513 | 0.3398 |
| 23.1013 | 0.3887 | 23.1013 | 0.3591 | 23.1013 | 0.352 | 23.1013 | 0.348 | 23.1013 | 0.3453 | 23.1013 | 0.3422 | 23.1013 | 0.3398 |
| 24.2013 | 0.3887 | 24.2013 | 0.3591 | 24.2013 | 0.352 | 24.2013 | 0.348 | 24.2013 | 0.3453 | 24.2013 | 0.3422 | 24.2013 | 0.3398 |
| 25.3536 | 0.3465 | 25.3536 | 0.3405 | 25.3536 | 0.3398 | 25.3536 | 0.3398 | 25.3536 | 0.34 | 25.3536 | 0.3397 | 25.3536 | 0.3389 |
| 26.5609 | 0.3465 | 26.5609 | 0.3401 | 26.5609 | 0.3394 | 26.5609 | 0.339 | 26.5609 | 0.3387 | 26.5609 | 0.3384 | 26.5609 | 0.3378 |
| 27.8256 | 0.3465 | 27.8256 | 0.3401 | 27.8256 | 0.3394 | 27.8256 | 0.3389 | 27.8256 | 0.3385 | 27.8256 | 0.3378 | 27.8256 | 0.337 |
| 29.1505 | 0.3442 | 29.1505 | 0.3397 | 29.1505 | 0.3388 | 29.1505 | 0.3383 | 29.1505 | 0.3378 | 29.1505 | 0.3372 | 29.1505 | 0.3367 |
| 30.5386 | 0.3442 | 30.5386 | 0.3397 | 30.5386 | 0.3388 | 30.5386 | 0.3383 | 30.5386 | 0.3378 | 30.5386 | 0.3372 | 30.5386 | 0.3366 |
| 31.9927 | 0.3385 | 31.9927 | 0.3371 | 31.9927 | 0.3371 | 31.9927 | 0.337 | 31.9927 | 0.3369 | 31.9927 | 0.3366 | 31.9927 | 0.3363 |
| 33.516 | 0.3362 | 33.516 | 0.3361 | 33.516 | 0.3361 | 33.516 | 0.3361 | 33.516 | 0.3361 | 33.516 | 0.336 | 33.516 | 0.3358 |
| 35.1119 | 0.3356 | 35.1119 | 0.3356 | 35.1119 | 0.3356 | 35.1119 | 0.3355 | 35.1119 | 0.3355 | 35.1119 | 0.3354 | 35.1119 | 0.3353 |
| 36.7838 | 0.3351 | 36.7838 | 0.3351 | 36.7838 | 0.335 | 36.7838 | 0.335 | 36.7838 | 0.335 | 36.7838 | 0.335 | 36.7838 | 0.3349 |
| 38.5353 | 0.3346 | 38.5353 | 0.3346 | 38.5353 | 0.3346 | 38.5353 | 0.3346 | 38.5353 | 0.3346 | 38.5353 | 0.3345 | 38.5353 | 0.3345 |
| 40.3702 | 0.3342 | 40.3702 | 0.3342 | 40.3702 | 0.3342 | 40.3702 | 0.3342 | 40.3702 | 0.3342 | 40.3702 | 0.3342 | 40.3702 | 0.3342 |
| 42.2924 | 0.334 | 42.2924 | 0.3339 | 42.2924 | 0.3339 | 42.2924 | 0.3339 | 42.2924 | 0.3339 | 42.2924 | 0.3339 | 42.2924 | 0.3338 |
| 44.3062 | 0.3336 | 44.3062 | 0.3336 | 44.3062 | 0.3336 | 44.3062 | 0.3336 | 44.3062 | 0.3336 | 44.3062 | 0.3336 | 44.3062 | 0.3336 |
| 46.4159 | 0.3333 | 46.4159 | 0.3333 | 46.4159 | 0.3333 | 46.4159 | 0.3333 | 46.4159 | 0.3333 | 46.4159 | 0.3333 | 46.4159 | 0.3333 |
| 48.626 | 0.3331 | 48.626 | 0.3331 | 48.626 | 0.3331 | 48.626 | 0.3331 | 48.626 | 0.3331 | 48.626 | 0.3331 | 48.626 | 0.3331 |
| 50.9414 | 0.3328 | 50.9414 | 0.3328 | 50.9414 | 0.3328 | 50.9414 | 0.3328 | 50.9414 | 0.3328 | 50.9414 | 0.3328 | 50.9414 | 0.3329 |

PTWW144.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 144 ~ SLAB ONLY Vertical Responses ~ Elevation 77 ft. ~ EL77_C-E-9-12

| Damping Freq. | 0.50% Accel. | Freq. | 2% Accel. | Freq. | 3% Accel. | Freq. | 4% Accel. | Freq. | 5% Accel. | Freq. | 7% Accel. | Freq. | 10% Accel. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.1098 | 0.0291 | 0.1098 | 0.0261 | 0.1098 | 0.0245 | 0.1098 | 0.0231 | 0.1098 | 0.0223 | 0.1098 | 0.0216 | 0.1098 | 0.0208 |
| 0.115 | 0.0308 | 0.115 | 0.0261 | 0.115 | 0.0245 | 0.115 | 0.0235 | 0.115 | 0.0231 | 0.115 | 0.0225 | 0.115 | 0.0216 |
| 0.1204 | 0.0313 | 0.1204 | 0.0263 | 0.1204 | 0.0247 | 0.1204 | 0.0243 | 0.1204 | 0.0238 | 0.1204 | 0.0231 | 0.1204 | 0.0222 |
| 0.1262 | 0.0313 | 0.1262 | 0.027 | 0.1262 | 0.0257 | 0.1262 | 0.0247 | 0.1262 | 0.0243 | 0.1262 | 0.0235 | 0.1262 | 0.0225 |
| 0.1322 | 0.0313 | 0.1322 | 0.0271 | 0.1322 | 0.0258 | 0.1322 | 0.0248 | 0.1322 | 0.0244 | 0.1322 | 0.0236 | 0.1322 | 0.0228 |
| 0.1385 | 0.0313 | 0.1385 | 0.0277 | 0.1385 | 0.0266 | 0.1385 | 0.0256 | 0.1385 | 0.0246 | 0.1385 | 0.0237 | 0.1385 | 0.0229 |
| 0.1451 | 0.0316 | 0.1451 | 0.0295 | 0.1451 | 0.0282 | 0.1451 | 0.0271 | 0.1451 | 0.026 | 0.1451 | 0.0241 | 0.1451 | 0.0229 |
| 0.152 | 0.0321 | 0.152 | 0.03 | 0.152 | 0.0287 | 0.152 | 0.0275 | 0.152 | 0.0264 | 0.152 | 0.0244 | 0.152 | 0.0229 |
| 0.1592 | 0.0331 | 0.1592 | 0.0312 | 0.1592 | 0.0301 | 0.1592 | 0.029 | 0.1592 | 0.028 | 0.1592 | 0.0266 | 0.1592 | 0.0247 |
| 0.1668 | 0.0367 | 0.1668 | 0.0325 | 0.1668 | 0.0315 | 0.1668 | 0.0306 | 0.1668 | 0.0297 | 0.1668 | 0.0282 | 0.1668 | 0.0261 |
| 0.1748 | 0.0508 | 0.1748 | 0.0427 | 0.1748 | 0.0386 | 0.1748 | 0.0351 | 0.1748 | 0.0322 | 0.1748 | 0.0288 | 0.1748 | 0.0268 |
| 0.1831 | 0.0587 | 0.1831 | 0.0493 | 0.1831 | 0.0443 | 0.1831 | 0.0399 | 0.1831 | 0.0363 | 0.1831 | 0.0306 | 0.1831 | 0.0273 |
| 0.1918 | 0.0587 | 0.1918 | 0.0493 | 0.1918 | 0.0443 | 0.1918 | 0.0399 | 0.1918 | 0.0363 | 0.1918 | 0.0306 | 0.1918 | 0.0279 |
| 0.2009 | 0.0587 | 0.2009 | 0.0493 | 0.2009 | 0.0443 | 0.2009 | 0.0399 | 0.2009 | 0.0363 | 0.2009 | 0.0331 | 0.2009 | 0.0302 |
| 0.2105 | 0.0587 | 0.2105 | 0.0493 | 0.2105 | 0.0443 | 0.2105 | 0.0404 | 0.2105 | 0.0389 | 0.2105 | 0.0364 | 0.2105 | 0.0329 |
| 0.2205 | 0.0587 | 0.2205 | 0.0493 | 0.2205 | 0.0457 | 0.2205 | 0.0431 | 0.2205 | 0.041 | 0.2205 | 0.038 | 0.2205 | 0.0341 |
| 0.231 | 0.0587 | 0.231 | 0.0493 | 0.231 | 0.046 | 0.231 | 0.044 | 0.231 | 0.0422 | 0.231 | 0.0389 | 0.231 | 0.0357 |
| 0.242 | 0.0587 | 0.242 | 0.0509 | 0.242 | 0.0487 | 0.242 | 0.0466 | 0.242 | 0.0447 | 0.242 | 0.0413 | 0.242 | 0.0372 |
| 0.2535 | 0.065 | 0.2535 | 0.0574 | 0.2535 | 0.053 | 0.2535 | 0.049 | 0.2535 | 0.0455 | 0.2535 | 0.0413 | 0.2535 | 0.0388 |
| 0.2656 | 0.0733 | 0.2656 | 0.0587 | 0.2656 | 0.0535 | 0.2656 | 0.049 | 0.2656 | 0.0455 | 0.2656 | 0.0438 | 0.2656 | 0.0418 |
| 0.2783 | 0.0818 | 0.2783 | 0.06 | 0.2783 | 0.0535 | 0.2783 | 0.0509 | 0.2783 | 0.0496 | 0.2783 | 0.0471 | 0.2783 | 0.044 |
| 0.2915 | 0.0818 | 0.2915 | 0.062 | 0.2915 | 0.0583 | 0.2915 | 0.0549 | 0.2915 | 0.052 | 0.2915 | 0.0487 | 0.2915 | 0.0449 |
| 0.3054 | 0.0818 | 0.3054 | 0.0666 | 0.3054 | 0.0624 | 0.3054 | 0.0586 | 0.3054 | 0.0551 | 0.3054 | 0.05 | 0.3054 | 0.0464 |
| 0.3199 | 0.0818 | 0.3199 | 0.0705 | 0.3199 | 0.0662 | 0.3199 | 0.0624 | 0.3199 | 0.0595 | 0.3199 | 0.0545 | 0.3199 | 0.0485 |
| 0.3352 | 0.0876 | 0.3352 | 0.0771 | 0.3352 | 0.0711 | 0.3352 | 0.0669 | 0.3352 | 0.0636 | 0.3352 | 0.058 | 0.3352 | 0.0513 |
| 0.3511 | 0.0909 | 0.3511 | 0.0809 | 0.3511 | 0.0752 | 0.3511 | 0.0701 | 0.3511 | 0.0656 | 0.3511 | 0.058 | 0.3511 | 0.0513 |
| 0.3678 | 0.1218 | 0.3678 | 0.0952 | 0.3678 | 0.0823 | 0.3678 | 0.0721 | 0.3678 | 0.0656 | 0.3678 | 0.058 | 0.3678 | 0.0513 |
| 0.3853 | 0.1363 | 0.3853 | 0.1059 | 0.3853 | 0.0921 | 0.3853 | 0.081 | 0.3853 | 0.0722 | 0.3853 | 0.0592 | 0.3853 | 0.0513 |
| 0.4037 | 0.1363 | 0.4037 | 0.1059 | 0.4037 | 0.0921 | 0.4037 | 0.0824 | 0.4037 | 0.0764 | 0.4037 | 0.0665 | 0.4037 | 0.0575 |
| 0.4229 | 0.1363 | 0.4229 | 0.1059 | 0.4229 | 0.0921 | 0.4229 | 0.0855 | 0.4229 | 0.0804 | 0.4229 | 0.0715 | 0.4229 | 0.0617 |
| 0.4431 | 0.1363 | 0.4431 | 0.1059 | 0.4431 | 0.094 | 0.4431 | 0.0891 | 0.4431 | 0.0845 | 0.4431 | 0.0764 | 0.4431 | 0.0665 |
| 0.4642 | 0.1376 | 0.4642 | 0.1059 | 0.4642 | 0.0981 | 0.4642 | 0.0923 | 0.4642 | 0.0869 | 0.4642 | 0.0774 | 0.4642 | 0.0681 |
| 0.4863 | 0.1484 | 0.4863 | 0.1248 | 0.4863 | 0.1118 | 0.4863 | 0.1006 | 0.4863 | 0.091 | 0.4863 | 0.0833 | 0.4863 | 0.0742 |
| 0.5094 | 0.1825 | 0.5094 | 0.1398 | 0.5094 | 0.1233 | 0.5094 | 0.11 | 0.5094 | 0.0992 | 0.5094 | 0.0876 | 0.5094 | 0.0762 |

PTWW144.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 144 ~ SLAB ONLY Vertical Responses ~ Elevation 77 ft. ~ EL77_C-E-9-12

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 0.5337 | 0.2221 | 0.5337 | 0.1614 | 0.5337 | 0.1351 | 0.5337 | 0.1155 | 0.5337 | 0.1031 | 0.5337 | 0.0876 | 0.5337 | 0.0762 |
| 0.5591 | 0.2221 | 0.5591 | 0.1614 | 0.5591 | 0.1351 | 0.5591 | 0.1155 | 0.5591 | 0.1031 | 0.5591 | 0.0896 | 0.5591 | 0.0765 |
| 0.5857 | 0.2221 | 0.5857 | 0.1614 | 0.5857 | 0.1351 | 0.5857 | 0.1155 | 0.5857 | 0.1037 | 0.5857 | 0.096 | 0.5857 | 0.0844 |
| 0.6136 | 0.2221 | 0.6136 | 0.1614 | 0.6136 | 0.1351 | 0.6136 | 0.1189 | 0.6136 | 0.1123 | 0.6136 | 0.1017 | 0.6136 | 0.0888 |
| 0.6428 | 0.2266 | 0.6428 | 0.1631 | 0.6428 | 0.1365 | 0.6428 | 0.1189 | 0.6428 | 0.1143 | 0.6428 | 0.1052 | 0.6428 | 0.0925 |
| 0.6734 | 0.2266 | 0.6734 | 0.1631 | 0.6734 | 0.1399 | 0.6734 | 0.1301 | 0.6734 | 0.1222 | 0.6734 | 0.1096 | 0.6734 | 0.0952 |
| 0.7055 | 0.2266 | 0.7055 | 0.1631 | 0.7055 | 0.1399 | 0.7055 | 0.1301 | 0.7055 | 0.1222 | 0.7055 | 0.1116 | 0.7055 | 0.0981 |
| 0.7391 | 0.2266 | 0.7391 | 0.1631 | 0.7391 | 0.143 | 0.7391 | 0.1345 | 0.7391 | 0.1261 | 0.7391 | 0.1118 | 0.7391 | 0.0981 |
| 0.7743 | 0.3193 | 0.7743 | 0.2152 | 0.7743 | 0.1824 | 0.7743 | 0.16 | 0.7743 | 0.144 | 0.7743 | 0.1231 | 0.7743 | 0.1049 |
| 0.8111 | 0.3193 | 0.8111 | 0.2152 | 0.8111 | 0.1824 | 0.8111 | 0.16 | 0.8111 | 0.144 | 0.8111 | 0.1231 | 0.8111 | 0.107 |
| 0.8497 | 0.3193 | 0.8497 | 0.2152 | 0.8497 | 0.1824 | 0.8497 | 0.1667 | 0.8497 | 0.154 | 0.8497 | 0.1353 | 0.8497 | 0.1176 |
| 0.8902 | 0.3193 | 0.8902 | 0.2152 | 0.8902 | 0.1916 | 0.8902 | 0.1759 | 0.8902 | 0.1631 | 0.8902 | 0.1433 | 0.8902 | 0.1231 |
| 0.9326 | 0.4908 | 0.9326 | 0.3016 | 0.9326 | 0.248 | 0.9326 | 0.2165 | 0.9326 | 0.1943 | 0.9326 | 0.165 | 0.9326 | 0.1395 |
| 0.977 | 0.4908 | 0.977 | 0.3016 | 0.977 | 0.248 | 0.977 | 0.2165 | 0.977 | 0.1943 | 0.977 | 0.1747 | 0.977 | 0.1534 |
| 1.0235 | 0.4908 | 1.0235 | 0.3016 | 1.0235 | 0.248 | 1.0235 | 0.2165 | 1.0235 | 0.1945 | 1.0235 | 0.1819 | 1.0235 | 0.1618 |
| 1.0723 | 0.4908 | 1.0723 | 0.3016 | 1.0723 | 0.2621 | 1.0723 | 0.2405 | 1.0723 | 0.2228 | 1.0723 | 0.1964 | 1.0723 | 0.1694 |
| 1.1233 | 0.5832 | 1.1233 | 0.3442 | 1.1233 | 0.2717 | 1.1233 | 0.2405 | 1.1233 | 0.2228 | 1.1233 | 0.1964 | 1.1233 | 0.1694 |
| 1.1768 | 0.5832 | 1.1768 | 0.383 | 1.1768 | 0.3194 | 1.1768 | 0.2821 | 1.1768 | 0.2518 | 1.1768 | 0.2159 | 1.1768 | 0.1892 |
| 1.2328 | 0.5832 | 1.2328 | 0.3885 | 1.2328 | 0.3512 | 1.2328 | 0.3199 | 1.2328 | 0.2945 | 1.2328 | 0.2544 | 1.2328 | 0.2149 |
| 1.2916 | 0.5832 | 1.2916 | 0.422 | 1.2916 | 0.3725 | 1.2916 | 0.3349 | 1.2916 | 0.3073 | 1.2916 | 0.2656 | 1.2916 | 0.2265 |
| 1.353 | 0.641 | 1.353 | 0.422 | 1.353 | 0.3725 | 1.353 | 0.3349 | 1.353 | 0.3156 | 1.353 | 0.2834 | 1.353 | 0.2456 |
| 1.4175 | 0.641 | 1.4175 | 0.422 | 1.4175 | 0.3743 | 1.4175 | 0.354 | 1.4175 | 0.3356 | 1.4175 | 0.3035 | 1.4175 | 0.2655 |
| 1.485 | 0.641 | 1.485 | 0.4469 | 1.485 | 0.4167 | 1.485 | 0.3896 | 1.485 | 0.3647 | 1.485 | 0.3228 | 1.485 | 0.2776 |
| 1.5557 | 0.641 | 1.5557 | 0.4762 | 1.5557 | 0.4448 | 1.5557 | 0.4175 | 1.5557 | 0.3928 | 1.5557 | 0.3511 | 1.5557 | 0.3012 |
| 1.6298 | 0.7619 | 1.6298 | 0.4978 | 1.6298 | 0.4567 | 1.6298 | 0.4269 | 1.6298 | 0.4034 | 1.6298 | 0.3639 | 1.6298 | 0.3171 |
| 1.7074 | 0.8123 | 1.7074 | 0.641 | 1.7074 | 0.5693 | 1.7074 | 0.5131 | 1.7074 | 0.4665 | 1.7074 | 0.3982 | 1.7074 | 0.3348 |
| 1.7887 | 0.9259 | 1.7887 | 0.7593 | 1.7887 | 0.678 | 1.7887 | 0.6117 | 1.7887 | 0.5548 | 1.7887 | 0.4723 | 1.7887 | 0.3909 |
| 1.8738 | 0.974 | 1.8738 | 0.7878 | 1.8738 | 0.708 | 1.8738 | 0.6465 | 1.8738 | 0.6002 | 1.8738 | 0.5234 | 1.8738 | 0.4347 |
| 1.963 | 1.1341 | 1.963 | 0.8565 | 1.963 | 0.7538 | 1.963 | 0.6879 | 1.963 | 0.6337 | 1.963 | 0.5452 | 1.963 | 0.4471 |
| 2.0565 | 1.2264 | 2.0565 | 0.8865 | 2.0565 | 0.7941 | 2.0565 | 0.7185 | 2.0565 | 0.6577 | 2.0565 | 0.5616 | 2.0565 | 0.4596 |
| 2.1544 | 1.2264 | 2.1544 | 0.8865 | 2.1544 | 0.7941 | 2.1544 | 0.7185 | 2.1544 | 0.6577 | 2.1544 | 0.5616 | 2.1544 | 0.4626 |
| 2.257 | 1.2264 | 2.257 | 0.8865 | 2.257 | 0.8031 | 2.257 | 0.7429 | 2.257 | 0.6869 | 2.257 | 0.5894 | 2.257 | 0.49 |
| 2.3645 | 1.9612 | 2.3645 | 1.0488 | 2.3645 | 0.8406 | 2.3645 | 0.7656 | 2.3645 | 0.7007 | 2.3645 | 0.5944 | 2.3645 | 0.5058 |
| 2.4771 | 2.3059 | 2.4771 | 1.2401 | 2.4771 | 0.9963 | 2.4771 | 0.8264 | 2.4771 | 0.721 | 2.4771 | 0.6253 | 2.4771 | 0.5241 |
| 2.595 | 2.9123 | 2.595 | 1.4466 | 2.595 | 1.0857 | 2.595 | 0.885 | 2.595 | 0.7616 | 2.595 | 0.6332 | 2.595 | 0.5408 |

PTWW144.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 144 ~ SLAB ONLY Vertical Responses ~ Elevation 77 ft. ~ EL77_C-E-9-12

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 2.7186 | 2.9123 | 2.7186 | 1.4466 | 2.7186 | 1.0857 | 2.7186 | 0.885 | 2.7186 | 0.7616 | 2.7186 | 0.6332 | 2.7186 | 0.5408 |
| 2.848 | 2.9123 | 2.848 | 1.4466 | 2.848 | 1.0857 | 2.848 | 0.885 | 2.848 | 0.7616 | 2.848 | 0.6332 | 2.848 | 0.5408 |
| 2.9836 | 2.9123 | 2.9836 | 1.4466 | 2.9836 | 1.0857 | 2.9836 | 0.885 | 2.9836 | 0.7616 | 2.9836 | 0.6332 | 2.9836 | 0.5408 |
| 3.1257 | 2.9123 | 3.1257 | 1.4466 | 3.1257 | 1.0857 | 3.1257 | 0.885 | 3.1257 | 0.7616 | 3.1257 | 0.6332 | 3.1257 | 0.5408 |
| 3.2745 | 1.5957 | 3.2745 | 1.0453 | 3.2745 | 0.9516 | 3.2745 | 0.877 | 3.2745 | 0.7616 | 3.2745 | 0.6332 | 3.2745 | 0.5408 |
| 3.4305 | 1.5557 | 3.4305 | 1.0453 | 3.4305 | 0.9516 | 3.4305 | 0.877 | 3.4305 | 0.7616 | 3.4305 | 0.6332 | 3.4305 | 0.5408 |
| 3.5938 | 1.5557 | 3.5938 | 1.0453 | 3.5938 | 0.9516 | 3.5938 | 0.877 | 3.5938 | 0.7616 | 3.5938 | 0.6332 | 3.5938 | 0.5408 |
| 3.7649 | 1.5557 | 3.7649 | 1.0453 | 3.7649 | 0.9516 | 3.7649 | 0.877 | 3.7649 | 0.7616 | 3.7649 | 0.6332 | 3.7649 | 0.5408 |
| 3.9442 | 1.5557 | 3.9442 | 1.0453 | 3.9442 | 0.9516 | 3.9442 | 0.877 | 3.9442 | 0.7616 | 3.9442 | 0.6332 | 3.9442 | 0.5408 |
| 4.132 | 1.5557 | 4.132 | 1.0453 | 4.132 | 0.9516 | 4.132 | 0.877 | 4.132 | 0.7616 | 4.132 | 0.6332 | 4.132 | 0.5408 |
| 4.3288 | 1.5557 | 4.3288 | 1.0453 | 4.3288 | 0.9516 | 4.3288 | 0.877 | 4.3288 | 0.7616 | 4.3288 | 0.6332 | 4.3288 | 0.5408 |
| 4.5349 | 1.5557 | 4.5349 | 1.0453 | 4.5349 | 0.9516 | 4.5349 | 0.877 | 4.5349 | 0.7616 | 4.5349 | 0.6332 | 4.5349 | 0.5497 |
| 4.7508 | 1.5557 | 4.7508 | 1.0453 | 4.7508 | 0.9516 | 4.7508 | 0.877 | 4.7508 | 0.7616 | 4.7508 | 0.6485 | 4.7508 | 0.5929 |
| 4.977 | 1.5557 | 4.977 | 1.0453 | 4.977 | 0.9516 | 4.977 | 0.877 | 4.977 | 0.8145 | 4.977 | 0.7118 | 4.977 | 0.6356 |
| 5.214 | 1.5557 | 5.214 | 1.0774 | 5.214 | 0.9882 | 5.214 | 0.9135 | 5.214 | 0.8523 | 5.214 | 0.7561 | 5.214 | 0.6761 |
| 5.4623 | 1.9438 | 5.4623 | 1.1547 | 5.4623 | 1.0213 | 5.4623 | 0.9313 | 5.4623 | 0.8675 | 5.4623 | 0.7713 | 5.4623 | 0.7153 |
| 5.7224 | 2.3998 | 5.7224 | 1.3627 | 5.7224 | 1.1739 | 5.7224 | 1.0456 | 5.7224 | 0.9654 | 5.7224 | 0.8922 | 5.7224 | 0.7914 |
| 5.9948 | 2.3998 | 5.9948 | 1.5021 | 5.9948 | 1.3429 | 5.9948 | 1.2312 | 5.9948 | 1.1504 | 5.9948 | 1.0241 | 5.9948 | 0.8812 |
| 6.2803 | 2.3998 | 6.2803 | 1.5021 | 6.2803 | 1.3429 | 6.2803 | 1.2512 | 6.2803 | 1.1843 | 6.2803 | 1.0774 | 6.2803 | 0.9578 |
| 6.5793 | 2.3998 | 6.5793 | 1.5021 | 6.5793 | 1.3429 | 6.5793 | 1.2512 | 6.5793 | 1.1843 | 6.5793 | 1.0975 | 6.5793 | 1.0045 |
| 6.8926 | 3.1388 | 6.8926 | 1.9009 | 6.8926 | 1.6283 | 6.8926 | 1.4593 | 6.8926 | 1.3283 | 6.8926 | 1.142 | 6.8926 | 1.0496 |
| 7.2208 | 3.805 | 7.2208 | 2.1966 | 7.2208 | 1.9285 | 7.2208 | 1.7483 | 7.2208 | 1.606 | 7.2208 | 1.3871 | 7.2208 | 1.1403 |
| 7.5646 | 4.7167 | 7.5646 | 2.7844 | 7.5646 | 2.3279 | 7.5646 | 1.9882 | 7.5646 | 1.8385 | 7.5646 | 1.605 | 7.5646 | 1.3242 |
| 7.9248 | 5.9632 | 7.9248 | 3.6137 | 7.9248 | 2.9424 | 7.9248 | 2.4467 | 7.9248 | 2.1357 | 7.9248 | 1.7196 | 7.9248 | 1.5158 |
| 8.3022 | 5.9632 | 8.3022 | 3.6314 | 8.3022 | 2.9505 | 8.3022 | 2.4467 | 8.3022 | 2.1357 | 8.3022 | 1.7196 | 8.3022 | 1.5826 |
| 8.6975 | 5.9632 | 8.6975 | 3.6314 | 8.6975 | 2.9505 | 8.6975 | 2.4467 | 8.6975 | 2.1357 | 8.6975 | 1.8333 | 8.6975 | 1.5826 |
| 9.1116 | 6.0802 | 9.1116 | 3.994 | 9.1116 | 3.2398 | 9.1116 | 2.7398 | 9.1116 | 2.4034 | 9.1116 | 1.9297 | 9.1116 | 1.6805 |
| 9.5455 | 7.0171 | 9.5455 | 3.994 | 9.5455 | 3.2398 | 9.5455 | 2.7398 | 9.5455 | 2.4034 | 9.5455 | 1.9297 | 9.5455 | 1.7636 |
| 10 | 7.0171 | 10 | 3.994 | 10 | 3.2398 | 10 | 2.7398 | 10 | 2.4034 | 10 | 1.9297 | 10 | 1.7636 |
| 10.4762 | 7.0171 | 10.4762 | 3.994 | 10.4762 | 3.2398 | 10.4762 | 2.7398 | 10.4762 | 2.4034 | 10.4762 | 1.9297 | 10.4762 | 1.7636 |
| 10.975 | 7.0171 | 10.975 | 3.994 | 10.975 | 3.2398 | 10.975 | 2.7398 | 10.975 | 2.4034 | 10.975 | 1.9297 | 10.975 | 1.7636 |
| 11.4976 | 7.0171 | 11.4976 | 3.994 | 11.4976 | 3.2398 | 11.4976 | 2.7398 | 11.4976 | 2.4034 | 11.4976 | 1.9297 | 11.4976 | 1.7636 |
| 12.045 | 5.2219 | 12.045 | 3.6403 | 12.045 | 3.2162 | 12.045 | 2.7398 | 12.045 | 2.4034 | 12.045 | 1.9297 | 12.045 | 1.7187 |
| 12.6186 | 5.0673 | 12.6186 | 3.0551 | 12.6186 | 2.7236 | 12.6186 | 2.4671 | 12.6186 | 2.2578 | 12.6186 | 1.9297 | 12.6186 | 1.6337 |
| 13.2194 | 4.0804 | 13.2194 | 2.3646 | 13.2194 | 2.1777 | 13.2194 | 2.0501 | 13.2194 | 1.9348 | 13.2194 | 1.7387 | 13.2194 | 1.5139 |

PTWW144.grf ~ RPP-WTP Pretreatment Facility ISRS ~ Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A ~ Frequency (cps) ~ Spectral Acceleration (g) ~ Figure 144 ~ SLAB ONLY Vertical Responses ~ Elevation 77 ft. ~ EL77_C-E-9-12

| Damping | 0.50% | | 2% | | 3% | | 4% | | 5% | | 7% | | 10% |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. | Freq. | Accel. |
| 13.8489 | 2.9165 | 13.8489 | 2.0669 | 13.8489 | 1.847 | 13.8489 | 1.6801 | 13.8489 | 1.5651 | 13.8489 | 1.4188 | 13.8489 | 1.2854 |
| 14.5083 | 2.6881 | 14.5083 | 1.6507 | 14.5083 | 1.5024 | 14.5083 | 1.3808 | 14.5083 | 1.2797 | 14.5083 | 1.2024 | 14.5083 | 1.1256 |
| 15.1991 | 1.5581 | 15.1991 | 1.2904 | 15.1991 | 1.2517 | 15.1991 | 1.2013 | 15.1991 | 1.1519 | 15.1991 | 1.0646 | 15.1991 | 0.999 |
| 15.9228 | 1.5542 | 15.9228 | 1.2147 | 15.9228 | 1.1521 | 15.9228 | 1.1013 | 15.9228 | 1.0583 | 15.9228 | 0.9867 | 15.9228 | 0.9108 |
| 16.681 | 1.4175 | 16.681 | 1.0273 | 16.681 | 0.9864 | 16.681 | 0.9638 | 16.681 | 0.9391 | 16.681 | 0.889 | 16.681 | 0.8585 |
| 17.4753 | 1.4175 | 17.4753 | 1.0273 | 17.4753 | 0.9836 | 17.4753 | 0.9427 | 17.4753 | 0.9076 | 17.4753 | 0.8505 | 17.4753 | 0.8328 |
| 18.3074 | 1.1231 | 18.3074 | 0.9783 | 18.3074 | 0.923 | 18.3074 | 0.8869 | 18.3074 | 0.8621 | 18.3074 | 0.8332 | 18.3074 | 0.8176 |
| 19.1791 | 1.1231 | 19.1791 | 0.9783 | 19.1791 | 0.923 | 19.1791 | 0.8869 | 19.1791 | 0.8621 | 19.1791 | 0.8298 | 19.1791 | 0.8009 |
| 20.0923 | 0.8104 | 20.0923 | 0.8039 | 20.0923 | 0.8062 | 20.0923 | 0.8037 | 20.0923 | 0.7987 | 20.0923 | 0.7864 | 20.0923 | 0.7691 |
| 21.049 | 0.7585 | 21.049 | 0.7386 | 21.049 | 0.7381 | 21.049 | 0.7388 | 21.049 | 0.7391 | 21.049 | 0.738 | 21.049 | 0.7329 |
| 22.0513 | 0.7383 | 22.0513 | 0.7037 | 22.0513 | 0.6966 | 22.0513 | 0.7001 | 22.0513 | 0.7024 | 22.0513 | 0.7046 | 22.0513 | 0.7037 |
| 23.1013 | 0.7383 | 23.1013 | 0.7037 | 23.1013 | 0.6917 | 23.1013 | 0.685 | 23.1013 | 0.6858 | 23.1013 | 0.6855 | 23.1013 | 0.6829 |
| 24.2013 | 0.7383 | 24.2013 | 0.7037 | 24.2013 | 0.6917 | 24.2013 | 0.6843 | 24.2013 | 0.6792 | 24.2013 | 0.6724 | 24.2013 | 0.666 |
| 25.3536 | 0.657 | 25.3536 | 0.6609 | 25.3536 | 0.6609 | 25.3536 | 0.6593 | 25.3536 | 0.6571 | 25.3536 | 0.6528 | 25.3536 | 0.6477 |
| 26.5609 | 0.6463 | 26.5609 | 0.6367 | 26.5609 | 0.6334 | 26.5609 | 0.6316 | 26.5609 | 0.6306 | 26.5609 | 0.6294 | 26.5609 | 0.6281 |
| 27.8256 | 0.6035 | 27.8256 | 0.592 | 27.8256 | 0.5982 | 27.8256 | 0.6021 | 27.8256 | 0.6048 | 27.8256 | 0.6081 | 27.8256 | 0.6105 |
| 29.1505 | 0.6025 | 29.1505 | 0.5884 | 29.1505 | 0.5872 | 29.1505 | 0.5894 | 29.1505 | 0.5914 | 29.1505 | 0.5947 | 29.1505 | 0.5976 |
| 30.5386 | 0.6025 | 30.5386 | 0.5884 | 30.5386 | 0.5867 | 30.5386 | 0.5865 | 30.5386 | 0.5868 | 30.5386 | 0.5878 | 30.5386 | 0.5891 |
| 31.9927 | 0.5822 | 31.9927 | 0.5848 | 31.9927 | 0.5843 | 31.9927 | 0.5837 | 31.9927 | 0.5832 | 31.9927 | 0.5826 | 31.9927 | 0.5824 |
| 33.516 | 0.5739 | 33.516 | 0.5752 | 33.516 | 0.5756 | 33.516 | 0.5758 | 33.516 | 0.5759 | 33.516 | 0.5759 | 33.516 | 0.5759 |
| 35.1119 | 0.5693 | 35.1119 | 0.5693 | 35.1119 | 0.5694 | 35.1119 | 0.5695 | 35.1119 | 0.5695 | 35.1119 | 0.5697 | 35.1119 | 0.5698 |
| 36.7838 | 0.5638 | 36.7838 | 0.564 | 36.7838 | 0.564 | 36.7838 | 0.5641 | 36.7838 | 0.5641 | 36.7838 | 0.5642 | 36.7838 | 0.5643 |
| 38.5353 | 0.5589 | 38.5353 | 0.5591 | 38.5353 | 0.5591 | 38.5353 | 0.5592 | 38.5353 | 0.5592 | 38.5353 | 0.5593 | 38.5353 | 0.5594 |
| 40.3702 | 0.5545 | 40.3702 | 0.5547 | 40.3702 | 0.5547 | 40.3702 | 0.5547 | 40.3702 | 0.5548 | 40.3702 | 0.5548 | 40.3702 | 0.5549 |
| 42.2924 | 0.5506 | 42.2924 | 0.5506 | 42.2924 | 0.5507 | 42.2924 | 0.5507 | 42.2924 | 0.5507 | 42.2924 | 0.5508 | 42.2924 | 0.5509 |
| 44.3062 | 0.5469 | 44.3062 | 0.5469 | 44.3062 | 0.5469 | 44.3062 | 0.547 | 44.3062 | 0.547 | 44.3062 | 0.5471 | 44.3062 | 0.5472 |
| 46.4159 | 0.5434 | 46.4159 | 0.5435 | 46.4159 | 0.5435 | 46.4159 | 0.5436 | 46.4159 | 0.5436 | 46.4159 | 0.5436 | 46.4159 | 0.5438 |
| 48.626 | 0.5403 | 48.626 | 0.5403 | 48.626 | 0.5403 | 48.626 | 0.5404 | 48.626 | 0.5404 | 48.626 | 0.5404 | 48.626 | 0.5406 |
| 50.9414 | 0.5373 | 50.9414 | 0.5373 | 50.9414 | 0.5373 | 50.9414 | 0.5373 | 50.9414 | 0.5373 | 50.9414 | 0.5374 | 50.9414 | 0.5376 |