ISSUED BY RPP-WTP PDC

MECHANICAL DATA SHEET
SHELL AND TUBE HEAT EXCHANGER

PLANT ITEM No.
24590-PTF-ME-CNP-HX-00004 5

Data Sheet No.
24590-PTF-MED-CNP-00004

R11105811

Project:	***RPP-WTP***	Description:	***Cesium Evaporator After-Condenser***
Project No:	***24590***	P&ID:	***24590-PTF-M6-CNP-00010, 24590-QL-POA-MEVV-00002-07-24*** 5
Site:	***Hanford***	Process Data: 5	***24590-PTF-MVC-CNP-00015*** 5
Process flow diagram:	***24590-PTF-M5-V17T-00014***	Manufacturer Name:	***Framatome ANP / Graham Corporation***

General Data

Quality Level	***Q (Note 1 & 7)*** 5	TEMA (Class/Type)		***B***
Seismic Category	***SC-I (Note 7)*** 5	Flow Type (Counter current, etc)		***N/A***
Design Code	***ASME VIII Div 1***	Heat Exchanger Duty	Btu/hr	***167,838***
Code Stamp	***Yes***	Heat Exchanger Area	ft^2	***14.9***
NB Registration	***Yes***	ΔT (LMTD/Corrected LMTD)	°F	***111***

Thermal/Hydraulic Data

		Shell Side		Tube Side	
Fluid Name		***In Steam***	***Out***	***In Cooling Water***	***Out***
Fluid Quantities: Total	lbm/hr	***200.4***		***15,000***	
Condensable Vapor (In/Out)		***156.7***	***3.4***	***N/A***	***N/A***
Liquid		***N/A***	***153.3***	***15,000***	***15,000***
Noncondensable		***43.7***	***43.7***	***N/A***	***N/A***
Temperature (In/Out)	°F	***248.9***	***120***	5 ***80 ****	5 ***92 ****
Specific Gravity		***N/A***	***N/A***	***1.000***	***0.999***
Viscosity	Cp	***N/A***	***N/A***	***2.209***	***1.924***
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***	*	***0.350***	***0.356***
Latent Heat	Btu/lbm @ °F	***N/A***		***N/A***	
Inlet pressure	psia	***810.0 Torr***		5 ***84.7 ****	
Tube side Velocity	ft/s	***N/A***		***3.4***	
Pressure Drop (Allowed)	psi	***25 mmHg***		***0.8***	
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***	***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	***6 5/8 OD***		Overall Dimensions (H x W x L) inch	***18 x 11 x 69***
Total Number of Tubes		***19***		Tube OD inch	***0.750***

Material Data (Note 10) 5

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 316L Seamless SS*** 5	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*** 5	Forgings (Channel)	***SA 182 F316L***

Please note that source, special nuclear, and byproduct materials, as defined in the Atomic Energy Act of 1954 (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 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.

MECHANICAL DATA SHEET

SHELL AND TUBE HEAT EXCHANGER

PLANT ITEM No.
24590-PTF-ME-CNP-HX-00004

Data Sheet No.
24590-PTF-MED-CNP-00004

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 ρV^2	*	Bundle Entrance ρV^2	*	Bundle Exit ρV^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.*** 5

5

(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. 5

(6) Please note that source, special nuclear and byproduct materials, as defined in the Atomic Energy Act of 1954 (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. 5

(7) For commercial reasons, safety and seismic classification may be higher than elsewhere documented, and therefore conservative. 5

(8) Allowable nozzle loads shall be per SC-I stainless steel nozzle design loads of 24590-WTP-3PS-MV00-T0001. 5

(9) Design to include 7,001,950 normal process expansion cycles (24590-QL-MRA-MEVV-00002-T0001). 5

(10) 304SS (max. carbon 0.030%) originally specified; 316L SS used due to availability. 5

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
5	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 8/29/09	J. Julyk	8/29/09
4	Incorporated Vendor Design Changes and Equipment Qualification data	R. Rickenbach	S. Thakkar	S. Woolfolk	J. Julyk	07/15/2008
3	Issued for Purchase. Updates Corrosion Allowance	J. Hickman	K Sadler	N/A	J. Julyk	09/29/2004
2	Issued for Purchase, incorporates updated vendor data	J. Hickman	K. Sadler	N/A	J. Julyk	08/11/2004
1	Issued for Purchase	J. Hickman	E. Le	N/A	J. Julyk	02/12/2004
0	Issued for Purchase	M. Pratt	J. Hickman	N/A	S. Kirk	07/24/2002

EQUIPMENT QUALIFICATION DATASHEET (EQD)

Equipment Identification

Component Tag Number	24590-PTF-ME-CNP-HX-00004	Safety Classification	☒ SC ☐ SS ☐ APC ☐ SDC ☐ SDS ☐ RRC Note 12 5
Manufacturer / Supplier	GRAHAM CORPORATION / AREVA NP, INC.		
Requisition Number	24590-QL-POA-MEVV-00002		
Model	NOTE 1	Seismic Category	☒ SC-I ☐ SC-II ☐ SC-III ☐ SC-IV Note 12 5
Description (Include descriptive text [e.g., location, elevation])	CESIUM EVAPORATOR AFTER-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. 5		

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: 5	☐ During Seismic Event 5	☐ 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 5
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 5	NOTE 1
Vibration Frequency (Hz)	N/A	N/A	N/A	N/A 5	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)	5 115	8	hr/yr	24590-PTF-U0D-W16T-00001, Note 8 5	NOTE 1
Abnormal Low Temperature (°F)	5 Note 10 40	8	hr/yr	24590-PTF-U0D-W16T-00001, Notes 8 & 10 5	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 5	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	5 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 5	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	5 hrs	24590-PTF-U0D-W16T-00001	NOTE 1
DBE Low Relative Humidity (%RH)	5 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	5 N/A	5 N/A	5 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 5 0.5M NITRIC ACID 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.)	ANCHOR BOLTS, CNP-SKID-00002, 24590-PTF-DD-S13T-00167
Auxiliary Devices	N/A

Equipment Seismic Qualification (ESQ)

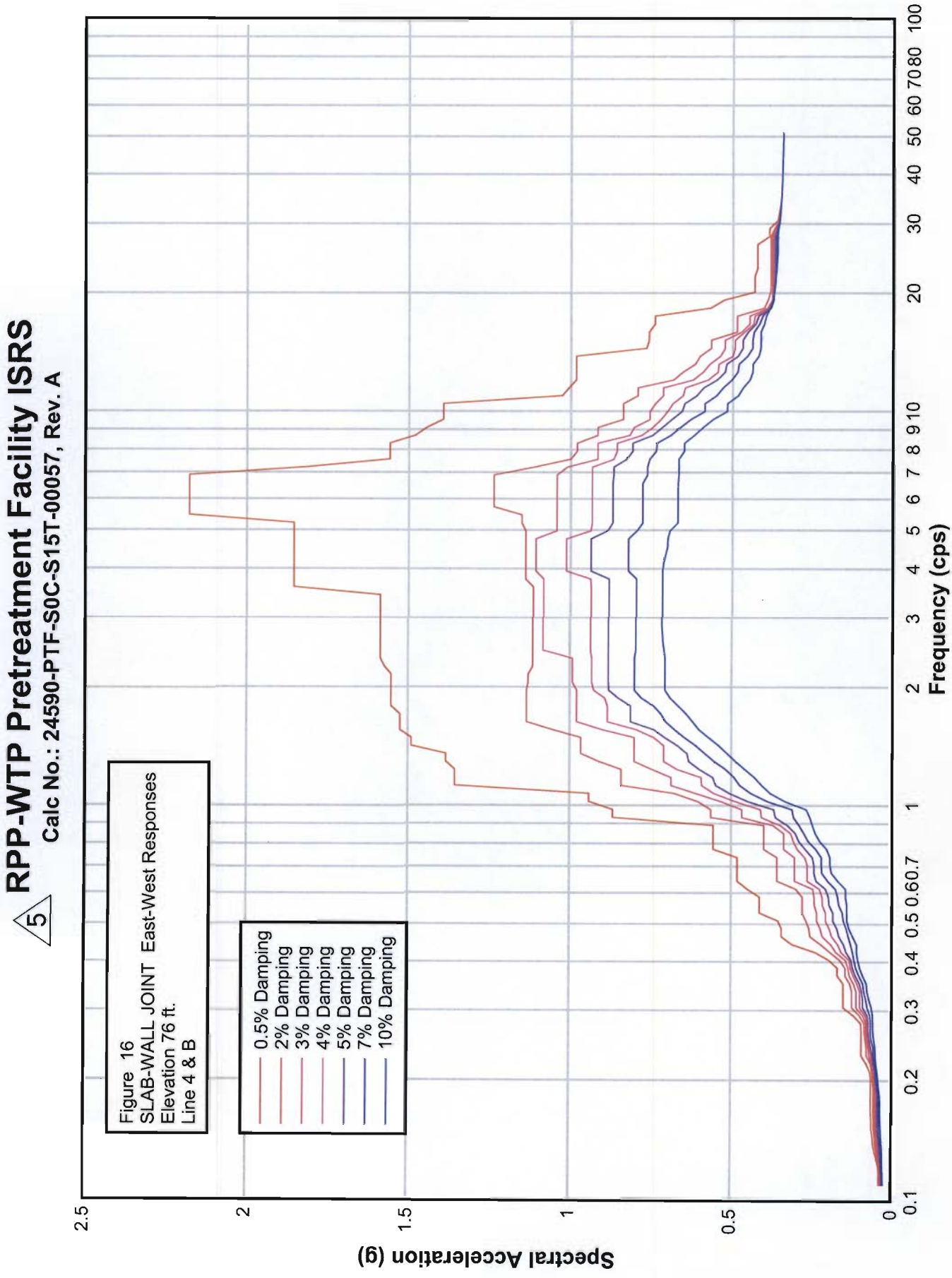
Parameter	Title	Reference/Document Number	Version / Revision	Remarks
WTP Seismic Design Specification (BUYER)	Engineering Specification for Seismic Qualification of Seismic Category I/II Equipment and Tanks.	24590-WTP-3PS-SS90-T0001	001 5	N/A
Specified Seismic Load (BUYER)	Seismic Analysis of Pretreatment Building - WSGM In-Structure Response Spectre (ISRS) 5	24590-PTF-S0C-S15T-00057 5	00A 5	Calculation is not included in MR, see attached figures 16, 17, 22, 23 and 144 per CCN 185267. 5
Design Seismic Load (SELLER	5	5	5	Note 1 5
Qualification Method (SELLER)	5	5	5	Note 1 5
Qualification Report Number (SELLER)	5	5	5	Note 1 5
Submittal Number (BUYER)	TBD 5	TBD 5	TBD 5	None 5

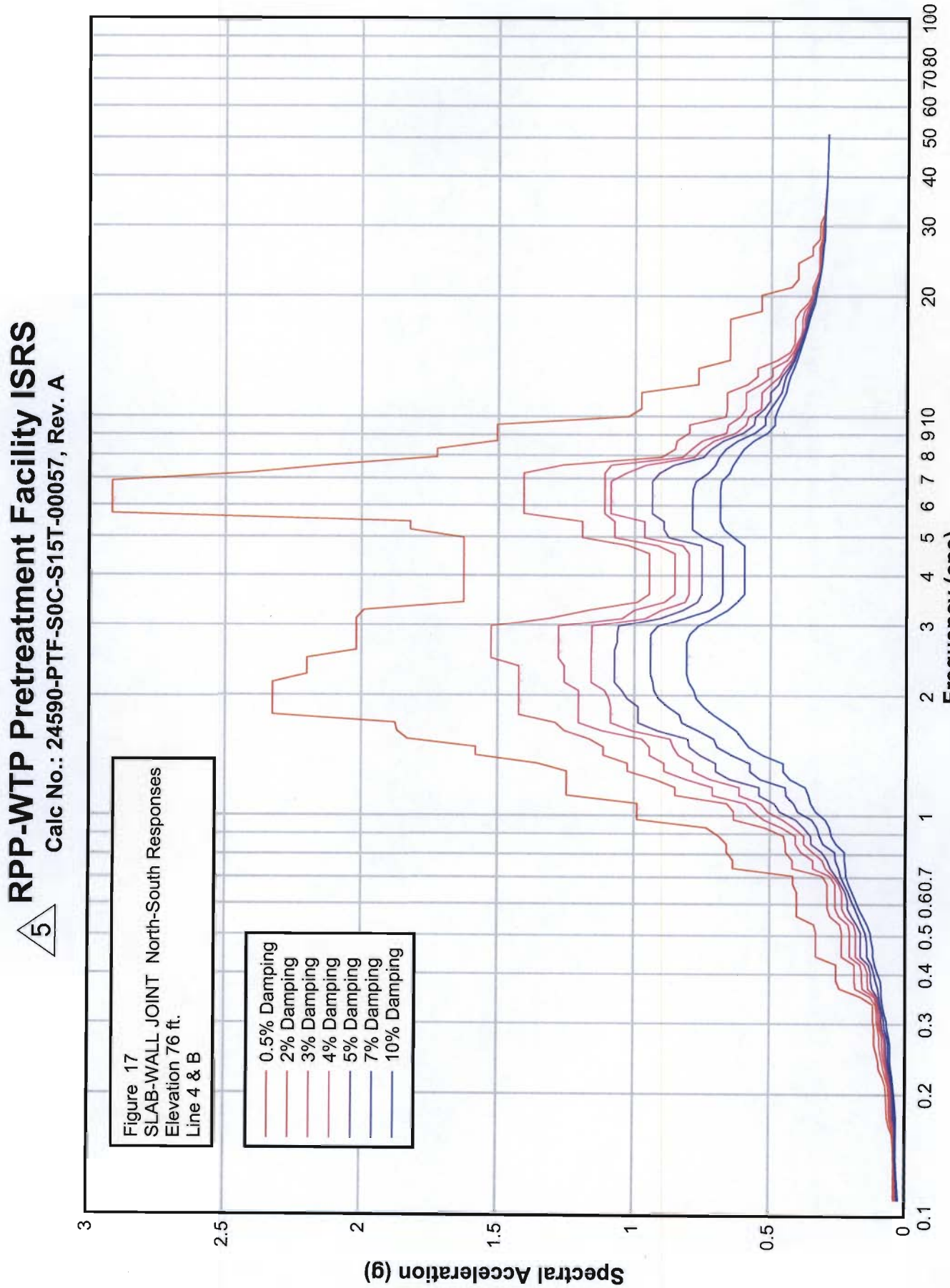
Notes and Additional Information

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. 5
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 (TID).
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 datasheet 24590-PTF-U0D-W16T-00001 is for room environment only.
8. For application of AISC N690, 5 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. 5
9. See DBE Chemical Exposure Details. 5
10. Abnormal minimum temperature is set equal to the normal minimum temperature (59F) for the purposes of seismic 5 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 5 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 5 conservative.
13. Facility design life is 40 years. Seller will determine equipment design life and required maintenance / replacement 5 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 5 Authorization; PT Facility Specific Information.
2. deleted. 5
3. 24590-PTF-M6-CNP-00010, Rev. 2, P&ID - PTF Cesium Nitric Acid Recovery Process System Rectifier and 5 Condensers.
4. 24590-PTF-U0D-W16T-00001, Rev. 0, PTF Room Environment Datasheet [5 Including DCNs: 24590-PTF-U0N-W16T-00001, 24590-PTF-U0N-W16T-00003, & 24590-PTF-U0N-W16T-00004].
5. 24590-WTP-DB-ENG-01-001, Rev. 1N, Basis Of Design. 5
6. 24590-QL-POA-MEVV-00002-07-00092, Rev. 00B, DRAWING - AFTERCONDENSER (MODEL 6 X 4' BEM). 5
7. 24590-PTF-M6X-CNP-00037 Rev. 002, MS LINE LIST FOR P&ID 24590-PTF-M6-CNP-00010, REV. 2 5

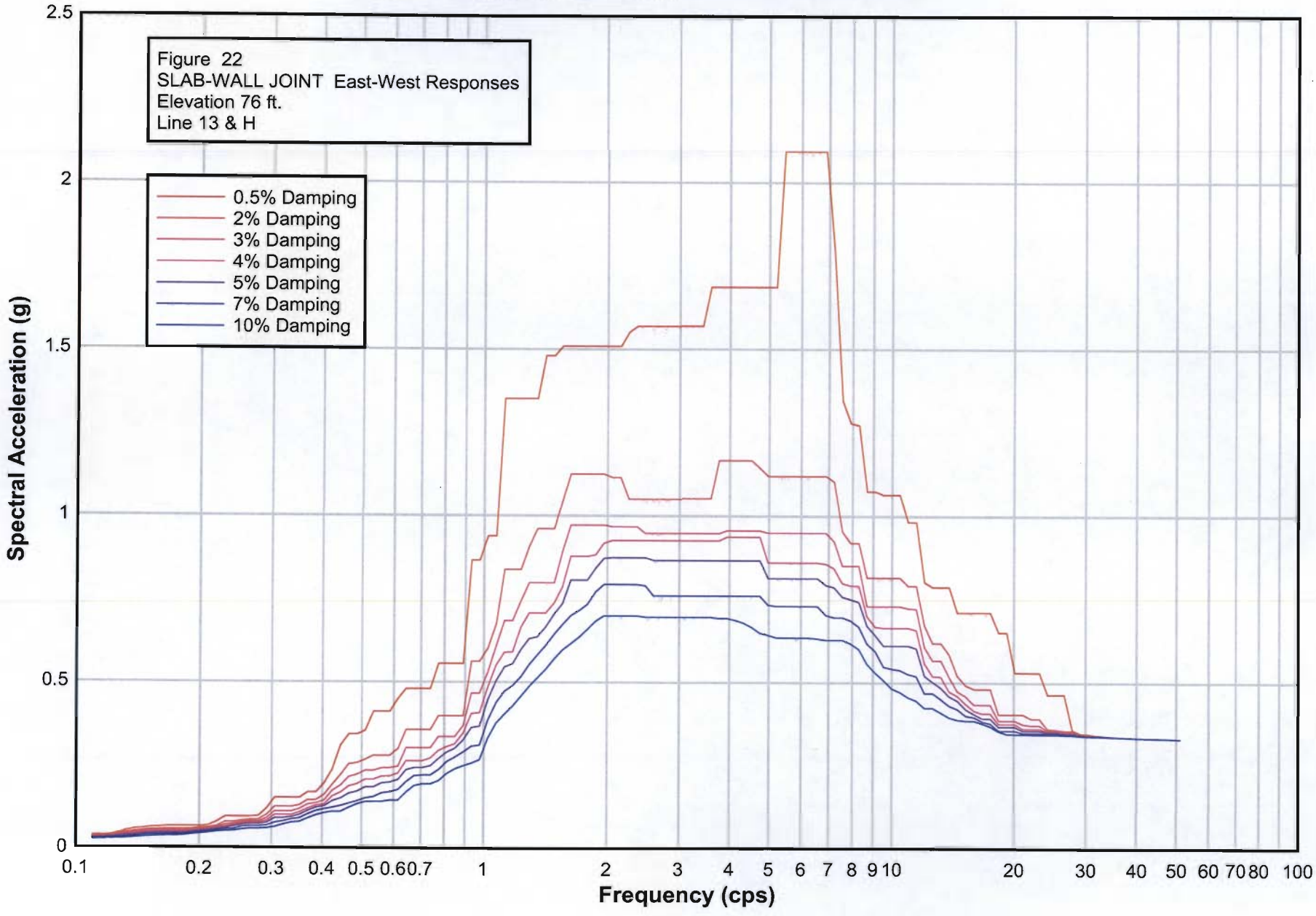

RPP-WTP Pretreatment Facility ISRS
5
Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A
Figure 16
SLAB-WALL JOINT East-West Responses
Elevation 76 ft.
Line 4 & B
0.5% Damping
2% Damping
3% Damping
4% Damping
5% Damping
7% Damping
10% Damping
Spectral Acceleration (g)
2.5
2
1.5
1
0.5
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
1
2
3
4
5
6
7
8
9
10
20
30
40
50
60
70
80
100
Frequency (cps)


RPP-WTP Pretreatment Facility ISRS
5
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

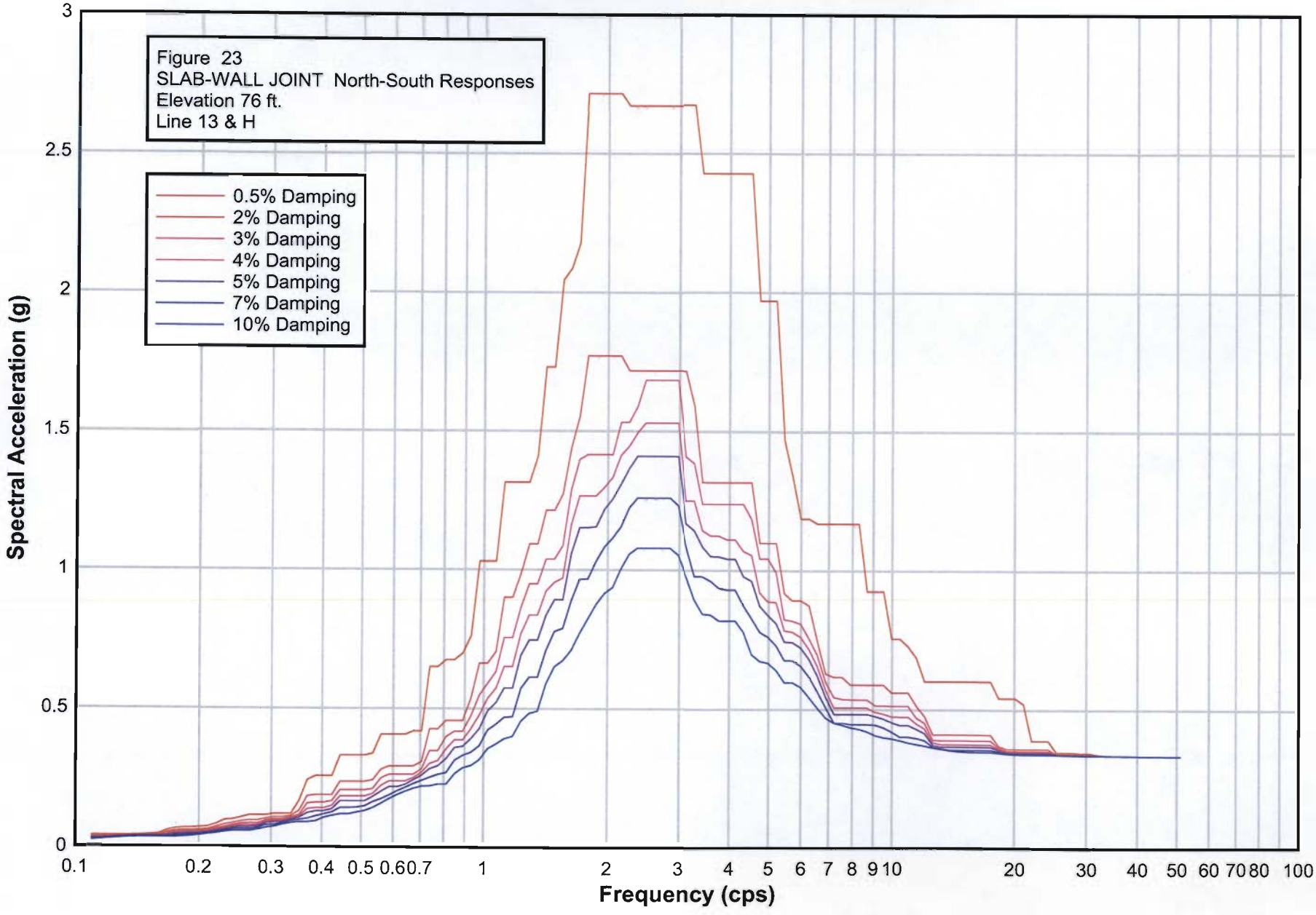
5

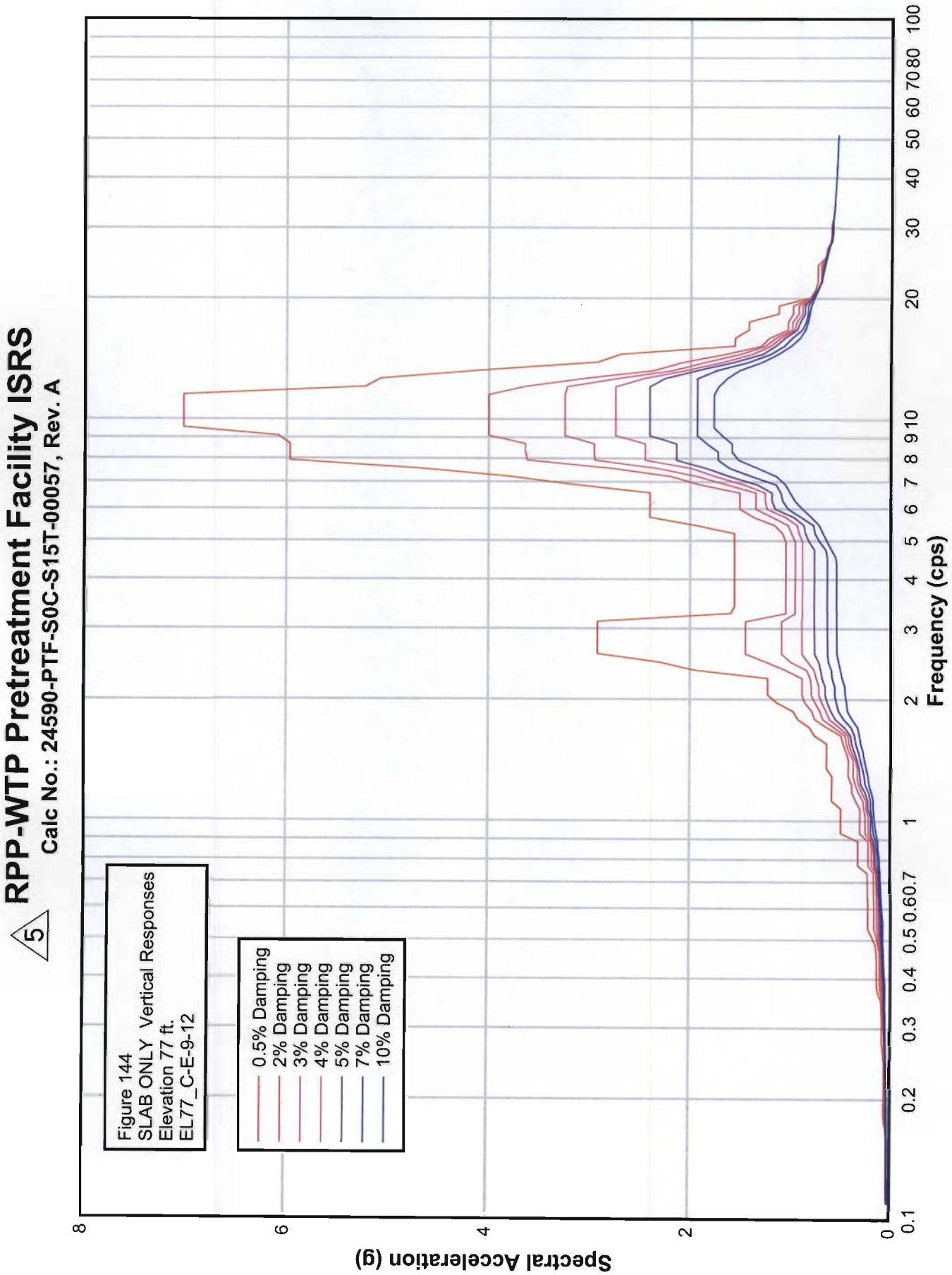
Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A



RPP-WTP Pretreatment Facility ISRS

Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A 5




RPP-WTP Pretreatment Facility ISRS
Calc No.: 24590-PTF-S0C-S15T-00057, Rev. A
5
Figure 144
SLAB ONLY Vertical Responses
Elevation 77 ft.
EL77_C-E-9-12
0.5% Damping
2% Damping
3% Damping
4% Damping
5% Damping
7% Damping
10% Damping
Spectral Acceleration (g)
0
2
4
6
8
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
Frequency (cps)

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

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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 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	0.0321	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 Freq.	0.50% Accel.	Freq.	2% Accel.	Freq.	3% Accel.	Freq.	4% Accel.	Freq.	5% Accel.	Freq.	7% Accel.	Freq.	10% Accel.
0.5337	0.3366	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 Freq.	0.50% Accel.	Freq.	2% Accel.	Freq.	3% Accel.	Freq.	4% Accel.	Freq.	5% Accel.	Freq.	7% Accel.	Freq.	10% 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	0.50%		2%		3%		4%		5%		7%		10%
Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.
0.5337	0.4106	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	0.50%		2%		3%		4%		5%		7%		10%
Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.
2.7186	1.569	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	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	0.0322	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	0.50%		2%		3%		4%		5%		7%		10%
Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.	Freq.	Accel.
0.1098	0.0291	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