PMSTPCOL PEmails

From: STPCOL
Sent: Wednesday, September 28, 2011 4:50 PM
To: PMSTPCOL PEmails
Subject: FW: Transmittal of Letter U7-C-NINA-NRC-110116
Attachments: U7-C-NINA-NRC-110116.pdf

From: Tai, Tom
Sent: Tuesday, September 13, 2011 9:06 AM
To: Chakrabarti, Samir
Cc: Chakravorty, Manas; Thomas, Brian; STPCOL; Wunder, George
Subject: FW: Transmittal of Letter U7-C-NINA-NRC-110116

Samir,

Attached for your review are supplemental responses to RAI 03.08.04-30 (Supplement 6) and 03.08.04-34 (Supplement 1), including FSAR markup.

03.08.04-30 S6 addresses punch-list items 110 and 122, with markup to Table 3H.6-6 and Figures 3H.6-212, -213, and -248.

03.08.04-34 S1 addresses punch-list item 56. FSAR markup include:

Sections (3H.6.6.3.1 and 3H.7.5.3.1);
Tables (3H.6-7, 3H.6-8, 3H.6-9, and 3H.7-1), and
Figures (3H.6-51, 3H.6-54 to 3H.6-74 and -74A, 3H.6-75 to 3H.6-78 and -78A, 3H.6-116 and -116A, 3H.6-117 to 3H.6-120 and -120A, 3H.6-121 to 3H.6-122 and -122A, 3H.6-123 to 3H.6-126 and 126A, 3H.6-127 to 3H.6-134 and 134A, 3H.6-135 to 3H.6-136A, -136B, and -136C) in the FSAR are also revised.

Regards

Tom Tai
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From: Elton, Loree [mailto:leelton@STPEGS.COM]
Sent: Tuesday, September 13, 2011 8:20 AM
To: Muniz, Adrian; Casto, Chuck; Wunder, George; Tonacci, Mark; Eudy, Michael; Anand, Raj; Foster, Rocky; Joseph, Stacy; Govan, Tekia; Tai, Tom
Subject: Transmittal of Letter U7-C-NINA-NRC-110116

Please find attached a courtesy copy of letter number U7-C-NINA-NRC-110116 which provides supplemental responses to NRC Request for Additional Information (RAI) Questions 03.08.04-30 and 03.08.04-34 related to the Combined License Application (COLA) Part 2, Tier 2, Section 3.8.

Note that the attachment has been compressed in .zip format in order to meet NRC incoming e-mail size limitations.

The official version of this correspondence will be placed in the mail. Please call John Price at 972-754-8221 if you have any questions concerning this letter.

Loree Elton
Licensing, STP 3 & 4
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Hearing Identifier: SouthTexas34Public_EX
Email Number: 3082

Mail Envelope Properties (377CB97DD54F0F4FAAC7E9FD88BCA6D0805095FB12)

Subject: FW: Transmittal of Letter U7-C-NINA-NRC-110116
Sent Date: 9/28/2011 4:49:44 PM
Received Date: 9/28/2011 4:50:30 PM
From: STPCOL

Created By: STP.COL@nrc.gov

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"PMSTPCOL PEmails" <PMSTPCOL.PEmails@nrc.gov>
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Files	**Size**	**Date & Time**
MESSAGE	2068	9/28/2011 4:50:30 PM
U7-C-NINA-NRC-110116.pdf	6536563	

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Priority: Standard
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Recipients Received:

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September 12, 2011
U7-C-NINA-NRC-110116

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville MD 20852-2738

South Texas Project
Units 3 and 4
Docket Nos. 52-012 and 52-013
Supplemental Response to Request for Additional Information

Attached are Nuclear Innovation North America LLC (NINA) supplemental responses to NRC Request for Additional Information (RAI) Questions 03.08.04-30 and 03.08.04-34 related to the Combined License Application (COLA) Part 2, Tier 2, Section 3.8.

Where there are COLA markups, they will be made at the first routine COLA update following NRC acceptance of the RAI response.

There are no commitments in this letter.

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

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

Executed on 9/12/11

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

jep

Attachments:

1. RAI 03.08.04-30, Supplement 6
2. RAI 03.08.04-34, Supplement 1

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

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Richard Peña
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L. D. Blaylock
CPS Energy

RAI 03.08.04-30, Supplement 6

QUESTION:

Follow-up to Question 03.08.04-23

In response to staff question requesting additional information (Letter U7-C-STP-NRC-100036, dated February 10, 2010) about how various steel and concrete elements of site-specific structures are designed, and the design results, the applicant provided some analysis and design information. The applicant also referred to the Supplement 2 response to Question 03.07.01-13 (Letter U7-C-STP-NRC-090230, dated 12/30/09) for pertinent design summary information. In order for the staff to conclude that the design of site-specific structures meet the requirements of GDC 2 by meeting the guidance provided in SRP 3.8.4 and 3.8.5, or otherwise, the applicant is requested to provide the following additional information:

1. The applicant states in the response that a three dimensional finite element analysis (FEA) is used for structural analysis and design of the UHS/RSW Pump House. FSAR Section 3H.6.6.1 states that analysis for the seismic loads was performed using equivalent static loads and the induced forces due to X, Y, and Z seismic excitations were combined using the SRSS method of combination. However, the applicant did not describe how the equivalent static loads due to seismic excitation were determined and applied to the static FEA model from the results of soil structure interaction (SSI) analysis used for determination of seismic response. Therefore, the applicant is requested to provide details of how seismic response analysis results from dynamic SSI analysis were transferred to the static FEA model, including how the effects of accidental torsion were included in the analysis and design of UHS/RSW Pump house. Please also update FSAR with the information, as appropriate.

2. The applicant stated in its response that the modulus of subgrade reaction for static loading was calculated as the average of the local values at nine locations under the foundation. The applicant is requested to provide these nine values, and explain why it is considered appropriate to use the average value. Please also explain how the foundation subgrade modulus was used for calculating nodal springs for the FEA model, and how the effect due to coupling of soil springs was considered in the analysis.

3. For seismic loading, the applicant has outlined a hand-calculated procedure that utilizes published formulas and charts to estimate the foundation spring constants. According to this procedure, the equivalent modulus and Poisson's ratio of a layered soil system are first estimated using the cumulative strain energy method. The resulting values are then used in the equations for computation of the spring constants for a rigid foundation of an arbitrary shape embedded in a uniform half-space. The shear moduli used for individual layers are strain compatible values, and include the mean, upper bound, and lower bound soil cases. The approximate procedure outlined above for developing the foundation spring constants does not take into account the pressure distribution under the base slab. Furthermore, this procedure does not account for the

frequency dependence of these springs. As such, the applicant is requested to provide a justification for not considering the effects of pressure distribution and system frequency in developing the foundation dynamic springs including describing the impact on the calculated results.

4. The applicant's response does not provide details as to how the soil springs calculated under static and seismic loadings are inputted to the 3-D static FEA model to calculate the design stresses. Therefore, the applicant is requested to describe in detail how the static and seismic soil springs are inputted into the FEA model, and how the results are obtained for stress evaluations. Specifically, the applicant is requested to explain if the two sets of springs were used in a single model, and how the two sets were combined to a single set of springs. Otherwise, if the two sets of springs were applied to separate FEA models, describe how the load combinations were performed. The applicant is also requested to provide sufficient detail to assist staff in understanding how static and seismic soil springs are used in the FEA model and results combined for stress evaluations.

5. In the FSAR mark-up of Sections 3H.6.6.3.1 and 3H.6.6.3.2 provided with the response, the applicant identifies the method used by the applicant for combining forces and moments. In this method, for each reinforcing zone, the maximum force or moment is coupled with the corresponding moment or force for design for the same load combination. It is not clear if this method of combining forces and moments for design will envelop the worst combination of forces and moments for all elements in a reinforcing zone. Therefore, the applicant is requested to describe the method of combining forces and moments used by the applicant with a typical example of a reinforcing zone, and demonstrate that this method of combination will yield the worst combination of forces and moments that should be considered for design.

6. The staff notes that in the FSAR mark-up of Section 3H.6.6.3.1 provided with the response, the reported values of soil springs for the RSW Pump House are significantly larger than those for the UHS basin. The applicant is requested to confirm these values, and explain the reason for the large difference.

7. The response did not include any information about the maximum static and dynamic bearing pressures under the foundations of UHS/RSW Pump House. The applicant is requested to provide the maximum static and dynamic bearing pressure under the foundations of UHS/RSW Pump House, compare these values with the maximum allowable static and dynamic bearing pressures, and include this information in the FSAR.

8. In its response to Question 03.07.01-19 (letter U7-C-STP-NRC-100129, dated June 7, 2010), the applicant provided analysis and design information for the seismic category I Diesel Generator Fuel Oil Storage Vault (DGFOSV) a which was not previously included in the FSAR. The information included in the response does not describe how structural analysis and design of the structure was performed. Also, reference is made to FSAR

Section 3H.6.4 for design loads. FSAR Section 3H.6.4 has been updated several times in various responses, and it is not clear where this information can be found. Therefore, the applicant is requested to provide complete structural analysis and design information for the DGFOSV to ensure it meets acceptance criteria 1 through 7 of SRP 3.8.4 and 3.8.5. The staff needs this information to conclude that the DGFOSV is designed to withstand seismic loads and meet GDC 2. Include in the response an updated version of Appendix 3H where structural analysis and design information for all seismic category I structures can be found.

9. While reviewing this response, and other responses referenced in this response, the staff noted that the applicant has used different values of coefficient of friction for sliding stability evaluation; e.g., the value 0.3 was used for the RSW Pump House, 0.4 was used for UHS basin, 0.58 was used DGFOSV, and for the Reactor Building (RB) and the Control Building (CB), it was stated to be more than 0.47. It is not clear if these values are the required coefficient of friction, or the minimum coefficient of friction available. The applicant is requested to clearly specify the minimum coefficient of friction at various locations of the site, if they are different, and explain how these values were determined. Please also clarify this information in the FSAR.

10. The staff noted references to Diesel Generator Fuel Oil Tunnel (DGFOT) in several RAI responses. Please confirm that DGFOT is not a seismic category I structure, and if it is seismic category I, include the analysis and design information to show how the design of the DGFOT meets the acceptance criteria 1 through 7 in the SRP 3.8.4 and 3.8.5 in the FSAR.

SUPPLEMENTAL RESPONSE:

The Supplement 5 response to this RAI was submitted with Nuclear Innovation North America (NINA) letter U7-C-NINA-NRC-110099, dated July 12, 2011. This supplement provides the response to the following action items discussed in the NRC audits performed during the weeks of May 23, 2011 and July 25, 2011.

Punch List Item 110
From the July 12, 2011 submittal in NINA letter 110099 (RAI 03.08.04-30):
(a) Table 3H.6-6, "Results of RSW Piping Tunnel Design", discuss the small differences between Required vs. Provided Reinforcement (0.7 versus 0.79 or 0.97 versus 1.00) or non-existent (1.56 for both).
(b) Check see if Note 3 in Table 3H.6-6 is clear as written.
(c) Determine if there is a sketch defining the reinforcing zones in the RSWPT
(d) In Figure 3H.6-247, is the passive pressure shown applicable to the entire RSWPT design?

Punch List Item 122
Provide SSI soil pressures for the RSW Tunnel

Response to Punch List Item 110:

Part a) In all cases the provided reinforcement equals or exceeds the required reinforcement. This meets the code requirements. Also, in determining the required reinforcement for RSW Piping Tunnel shown in Table 3H.6-6, in order to provide additional margin, the calculated moments and axial forces were divided by 0.9 (i.e. increased by 1/0.9 = 1.11). Therefore, as a minimum a margin of 11% is available.

Part b) The notes of Table 3H.6-6 will be revised to further clarify this table (see Enclosure).

Part c) Figure 3H.6-248 (see Enclosure) provides the RSW Piping Tunnel layout and reinforcement zones.

Part d) The passive pressure shown in Figure 3H.6-247 is applicable to the entire RSW Piping Tunnel design (i.e. main tunnel segments, north portion, and access regions 1, 2, and 3)

Response to Punch List Item 122:

Figures 03.08.04-30 S6.1 and 03.08.04-30 S6.2 provide SSI and SSSI soil pressures on RSW Piping Tunnel east and west walls, respectively. Also shown in these figures are the seismic soil pressures used for the design of these walls. As shown in these figures, the seismic soil pressures used for design envelope all SSI and SSSI soil pressures except for a small portion along the wall height where SSI soil pressure from separated soil case is higher. The tunnel wall design was controlled by passive pressure. Based on the following this local exceedance is found acceptable.

Due to total out-of-plane load including SSI soil pressure from separated soil case:

Maximum calculated out-of-plane shear, V1 = 28.07 kips/ft
Maximum calculated out-of-plane moment, M1 = 124.53 kips-ft/ft

Due to controlling total out-of-plane load:

Calculated out-of-plane shear, V2 = 36.52 kips/ft
Calculated out-of-plane moment, M2 = 226.78 kips-ft/ft

As shown above, V1 = 28.07 kips/ft is less than V2 = 36.52 kips/ft and M1 = 124.53 kips-ft/ft is less than M2 = 226.78 kips-ft/ft. Thus, the design is conservative for separated soil case.

As a result of this response COLA Part 2, Tier 2, Appendix 3H will be revised as shown in the Enclosure.

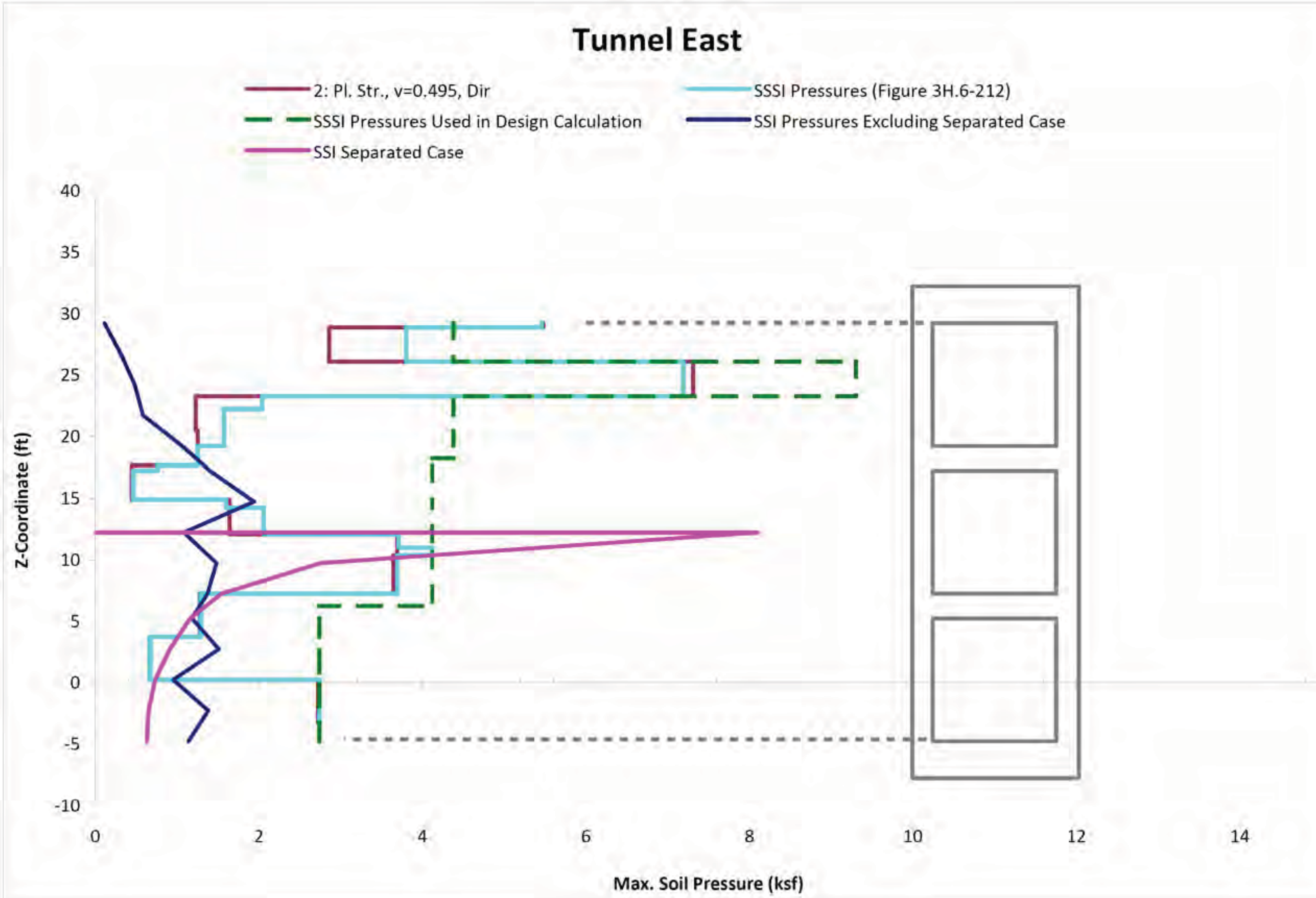

Figure 03.08.04-30 S6.1

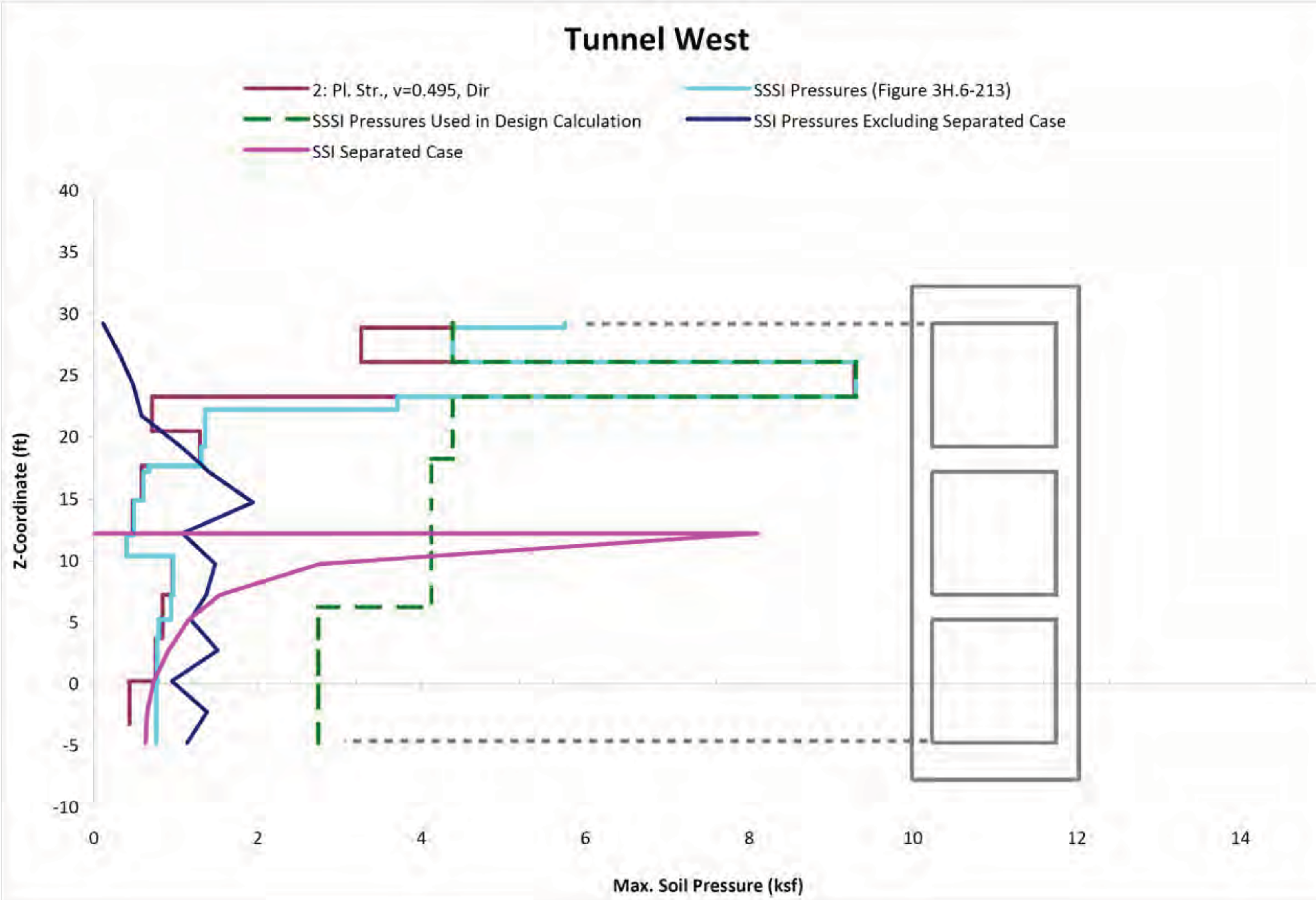

Figure 03.08.04-30 S6.2

Enclosure 1

COLA MARK-UPS

Table 3H.6-6: Results of RSW Piping Tunnel Design

~~Location~~ Location[4]	Item	Thickness (ft)	Governing Load Combination	Design Moment (kip-ft/ft)	Design Shear (kip/ft)	Area of Reinforcement (in^2/ft)			
						Moment Reinforcement [1]		Shear Reinforcement	
						Required	Provided (both faces)	Required	Provided
Main Tunnel	Exterior Wall	3'-0"	D+Lo+F+H'+E'	226.78	36.52	1.56 (vertical)	1.56 (vertical)	None	None
	Roof Slab	3'-0"	1.4D+1.7L+1.4F+1.7H	55.90	11.29	0.7 (east-west)	0.79 (east-west)	None	None
	Interior Slab	2'-0"	D+Lo+F+H'+E' [2]	95.22	13.16	1.13 (east-west)	1.27 (east-west)	None	None
	Basemat	3'-0"	D+Lo+F+H'+E' [2]	123.94	19.10	0.97 (east-west)	1.00 (east-west)	None	None
~~North End of Main Tunnel (near Control Building)~~ North End of Main Tunnel (West of Control Building)	Exterior Wall	3'-0"	D+Lo+F+H'+E'	543.34	59.39	4.27 (east-west)	4.68 (east-west)	0.19	0.20
	Interior Wall	2'-0"	D+Lo+F+H'+E' [2]	152.15	19.96	1.69 (east-west)	2.25 (east-west)	None	None
	Roof Slab	3'-0"	1.4D+1.7L+1.4F+1.7H	86.64	15.29	0.70 (east-west)	0.79 (east-west)	None	None
	Interior Slab	2'-0"	D+Lo+F+H'+E' [2]	136.30	18.03	1.49 (east-west)	2.25 (east-west)	None	None
	Basemat	3'-0"	1.4D+1.7L+1.4F+1.7H	70.42	28.27	0.36 (north-south)	0.79 (north-south)	None	None
			1.4D+1.7L+1.4F+1.7H	155.74	36.39	1.16 (east-west)	1.27 (east-west)	None	None
~~Main Tunnel (near Access Region 1)~~ Main Tunnel (in Access Region 1)	Basemat	3'-0"	1.4D+1.7L+1.4F+1.7H	46.60	20.54	0.70 (north-south)	0.79 (north-south)	None	None

Table 3H.6-6: Results of RSW Piping Tunnel Design (Continued)

~~Location~~ Location[4]	Item	Thickness (ft)	Governing Load Combination	Design Moment (kip-ft/ft)	Design Shear (kip/ft)	Area of Reinforcement (in^2/ft)			
						Moment Reinforcement [1]		Shear Reinforcement	
						Required	Provided (both faces)	Required	Provided
~~Main Tunnel (near Access Region 2)~~ Main Tunnel (in Access Region 2)	Exterior Wall	3'-0"	D+Lo+F+H'+E'	321.96	29.22	2.21 (vertical)	2.25 (vertical)	None	None
				214.84	29.22	1.40 (horizontal)	1.56 (horizontal)	None	None
	Basemat	6'-0"	D+Lo+F+H'+E' [2]	530.76	66.74	1.66 (east-west)	2.25 (east-west)	None	None
			1.4D+1.7L+1.4F+1.7H / D+Lo+F+H'+E' [2]	500.50	66.74	1.78 (north-south)	2.25 (north-south)	None	None
~~Main Tunnel (near Access Region 3) North of Pump House~~ Main Tunnel (in Access Region 3) North of Pump House	Exterior Wall	3'-0"	D+Lo+F+H'+E'	245.29	36.52	1.76 (vertical)	3.12 (vertical)	None	None
	Roof Slab	3'-0"	1.4D+1.7L+1.4F+1.7H	344.53	37.20	2.56 (north-south)	4.68 (north-south)	None	None
	Interior Slab	2'-0"	D+Lo+F+H'+E' [2]	150.97	19.29	1.70 (north-south)	3.12 (north-south)	None	None
	Basemat	3'-0"	1.4D+1.7L+1.4F+1.7H	236.52	38.12	1.74 (north-south)	3.12 (north-south)	0.18	0.20

Table 3H.6-6: Results of RSW Piping Tunnel Design (Continued)

Notes:

1) Unless noted otherwise, the required reinforcement in the direction not reported in the table is controlled by the minimum required reinforcement. The minimum required reinforcement for 2'-0" thick and 3'-0" thick elements is 0.36 in2/ft and 0.54 in2/ft. For such cases the provided reinforcement is 0.79 in2/ft.

2) The loading also includes loads due to internal flooding.

~~(3) The following additional reinforcement is required due to SSE Wave Propagation:~~
~~– For the Main Tunnel, #8 bars at 12" o.c. in the longitudinal direction of the Main Tunnel for 84'-0 (measured north from the centerline of the Main Tunnel and Access Region 3)~~
~~– For Access Region 3 from 0'-0" to 56'-0" (measured east from the centerline of the intersection of the Main Tunnel and Access Region 3)~~
~~(i) Second layer of #11 bars at 12" o.c. in the transverse direction applied to both faces of the roof~~
~~(ii) Second layer of #11 bars at 12" o.c. in the transverse direction applied to both faces of the interior slab~~
~~(iii) Second layer of #11 bars at 12" o.c. in the transverse direction applied to both faces of the basemat~~
~~– For Access Region 3 from 56'-0" to 103'-0" (measured east from the centerline of the intersection of the Main Tunnel and Access Region 3)~~
~~(i) Second layer of #11 bars at 12" o.c. in the transverse direction applied to both faces of the roof~~
~~(ii) Second layer of #11 bars at 12" o.c. in the transverse direction applied to both faces of the basemat~~

3) In addition to the reinforcement shown within this table, the following reinforcement is required due to SSE Wave Propagation:
- For the Main Tunnel, 0.79 in^2/ft (applied to both faces of the walls and slabs) in the north-south direction of the Main Tunnel for 84'-0" (measured north from the centerline of the intersection of the Main Tunnel and Access Region 3)
- For Access Region 3 from 0'-0" to 56'-0" (measured east from the centerline of the intersection of the Main Tunnel and Access Region 3), 1.56 in^2/ft (applied to both faces of the roof, interior slab, and basemat) in the north-south direction
- For Access Region 3 from 56'-0" to 103'-0" (measured east from the centerline of the intersection of the Main Tunnel and Access Region 3), 1.56 in^2/ft (applied to both faces of the roof and basemat) in the north-south direction

4) Refer to Figure 3H.6-248 for plan view of the RSW Tunnel

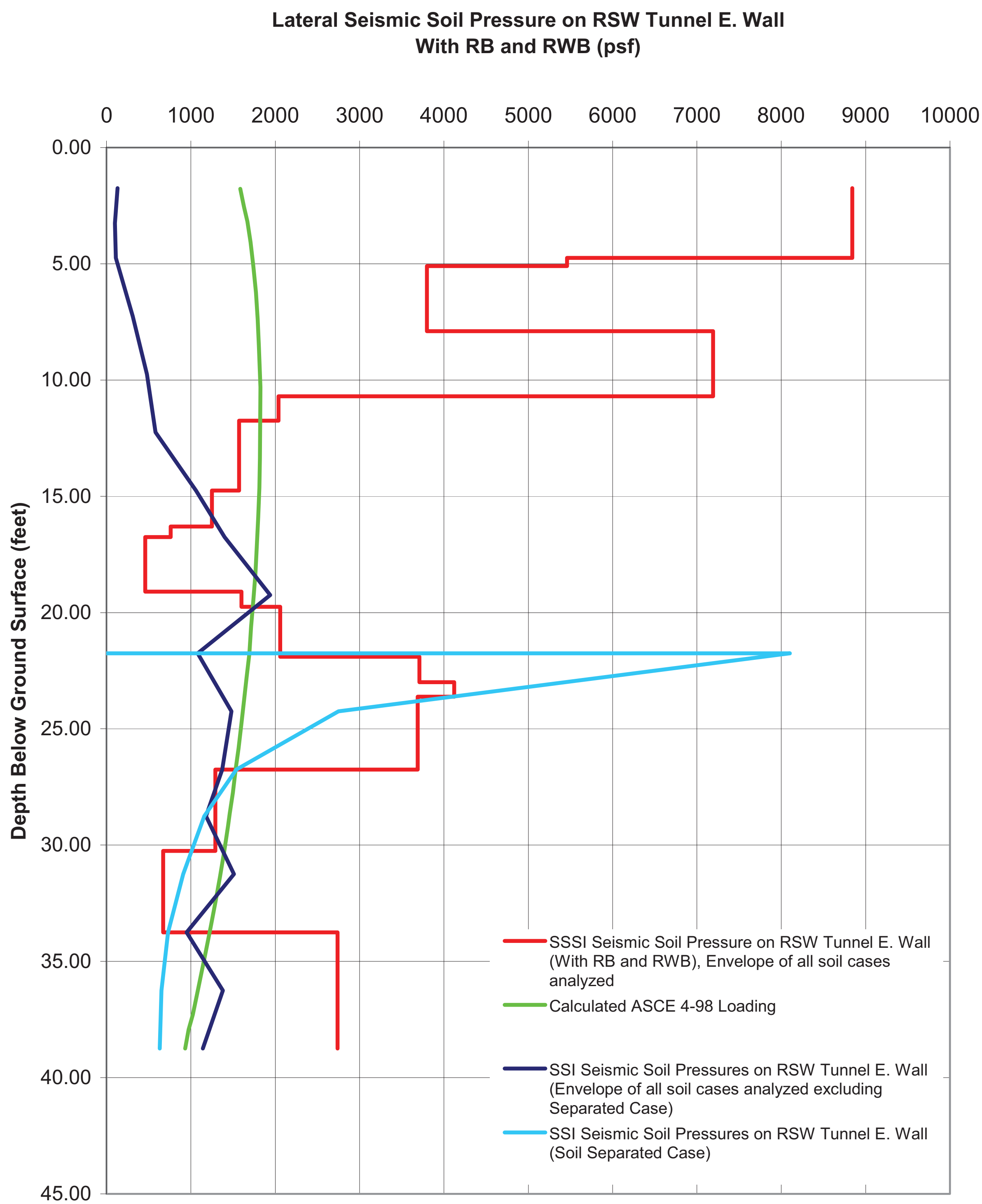

Figure 3H.6-212: Lateral Seismic Soil Pressure (psf) on RSW Piping Tunnel East Wall (Main Cross Section of RSW Piping Tunnel)

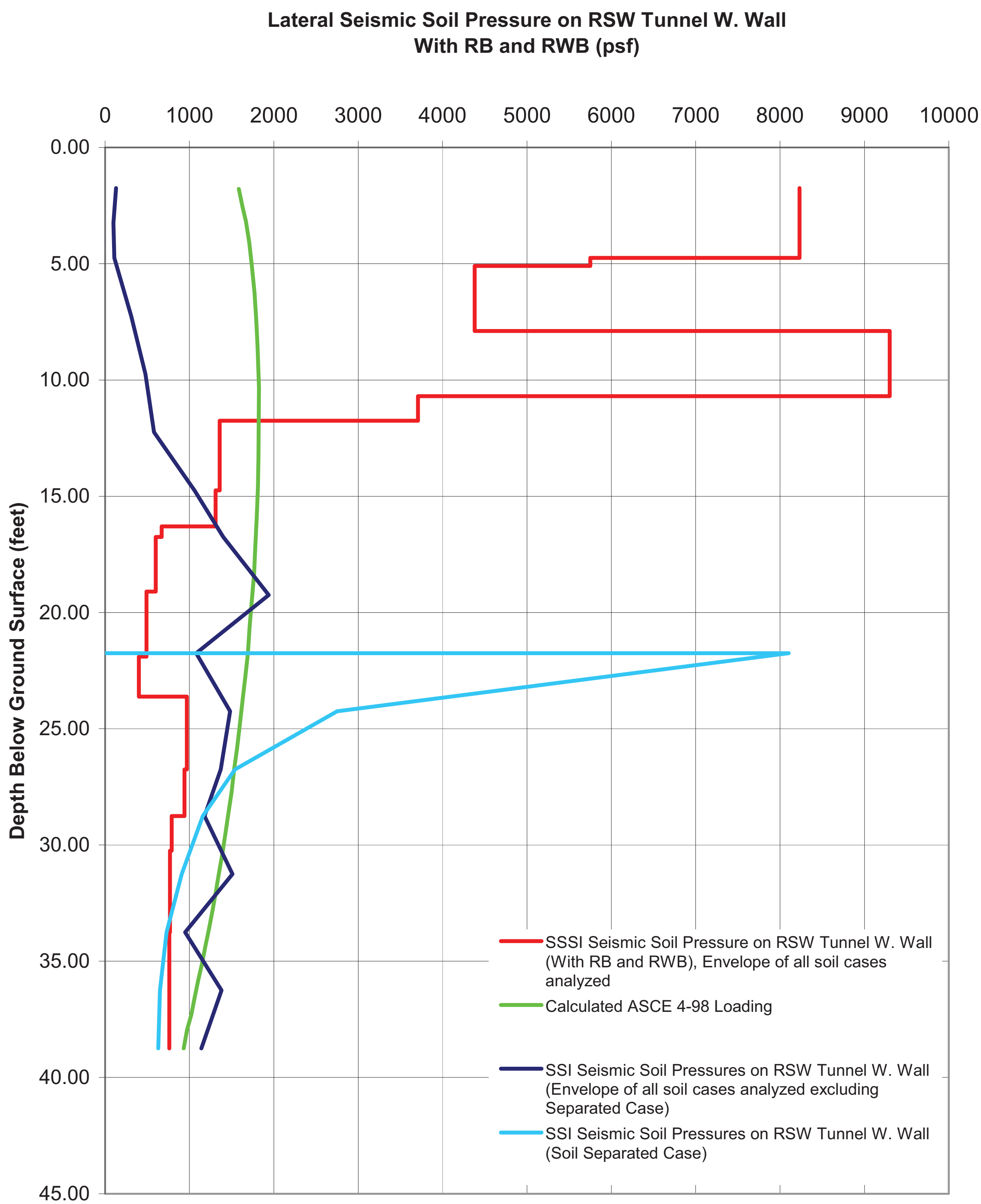

Figure 3H.6-213: Lateral Seismic Soil Pressure (psf) on RSW Piping Tunnel West Wall (Main Cross Section of RSW Piping Tunnel)

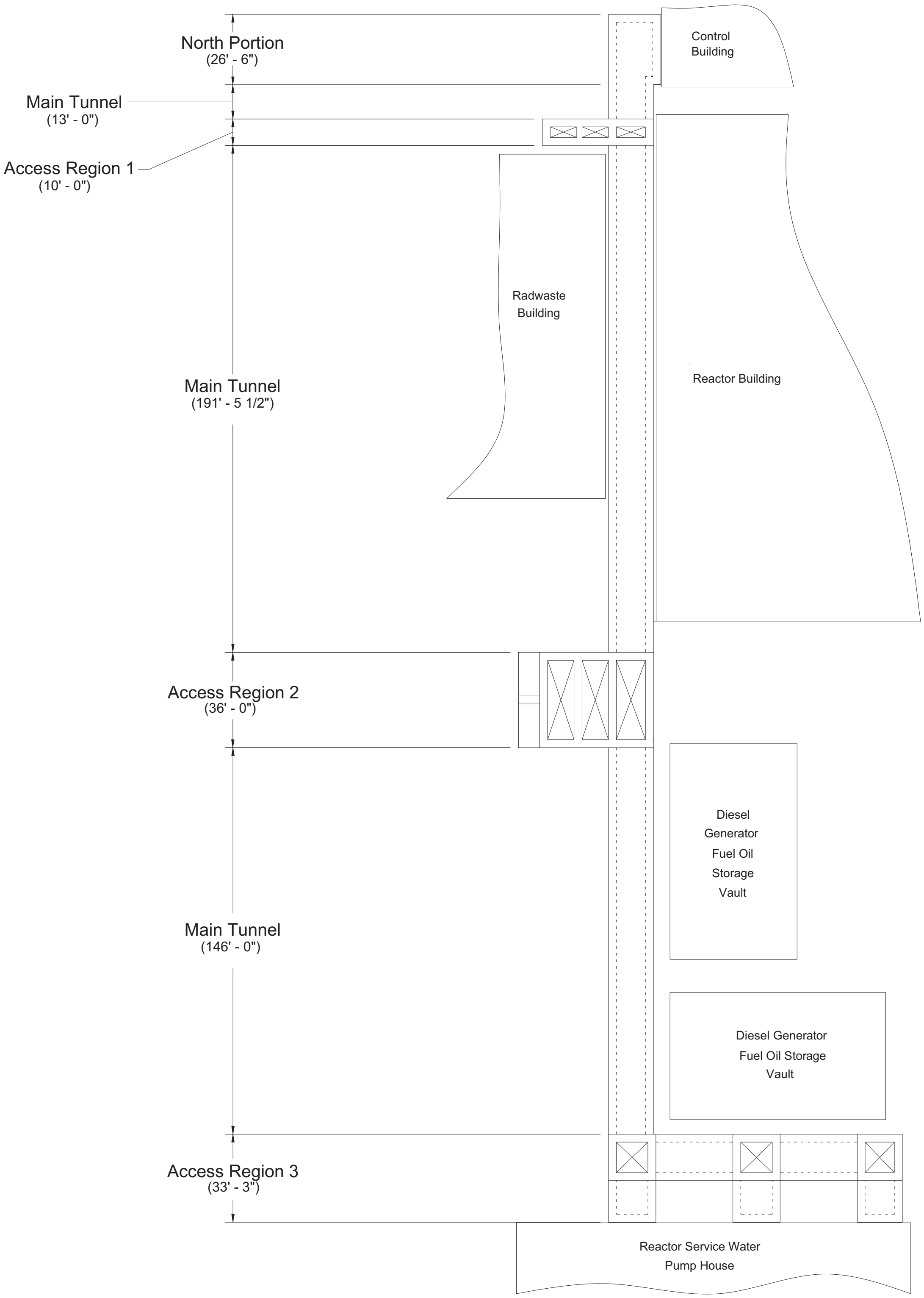

Figure 3H.6-248: RSW Tunnel Plan View

RAI 03.08.04-34, Supplement 1

<u>QUESTION:</u>

10 CFR 50, Appendix A, GDC 2, requires that structures important to safety shall be designed to withstand the effects of natural phenomena with appropriate combination of the effects of normal and accident conditions. To meet this requirement, all seismic category I structures must be designed for required strength at all locations in the structure. During the October 2010 Audit the applicant presented the procedures to verify the concrete sections of the UHS/PH structural members resulting from the code-required load combinations. The internal forces (i.e. shear, moment, axial force, torsion, etc.) used to determine the required strength of the structural members (i.e. walls, slabs, beam, columns, etc.) of the UHS/PH building are generated by the applicant with the help of SAP2000 models simulating the building's static and dynamic behavior. These element forces are subsequently processed by the applicant with a number of in-house developed programs for design of concrete sections. It was noted that concrete slabs and walls were designed for out-of-plane shear by averaging the element shear forces across cut lines that extended along the entire width of the walls and slabs. The staff considers that averaging of out of plane shear along the entire cut line of a slab or wall could lead to unconservative estimate of shear stress in slabs. The subject was discussed with the applicant during the audit. Although the applicant explained the procedure by referencing to ACI 349-97, Section 11.12, "Special provisions for slabs and footings," it did not provide the staff with a sufficient interpretation of the provision of the ACI code, which appears to be intended for shear strength of slabs and footings in the vicinity of columns, concentrated loads, or reactions, to close this issue. ACI 349-97, Section 13.3.1, states that a slab system may be designed by any procedure satisfying conditions of equilibrium and geometric compatibility, if shown that the design strength at every section is at least equal to the required strength. Averaging of out-of-plane shear across the entire width of a slab may not show that the design strength at every section is at least equal to the required strength. Therefore, in order for the staff to conclude that the site-specific structures are adequately designed for out-of plane shear, the staff requests STP to demonstrate that use of average shear force across the entire width of slab, instead of the shear force demand at every section obtained from analysis may be considered acceptable by any or more of the following:

- Obtain clarification from the ACI regarding validity of use of Section 11.12 of ACI 349-87 for the situations where the provisions of the code were used,
- Provide examples of any precedence where similar methodology was accepted by the staff,
- Provide detailed justification using industry accepted standards, technical references, experimental results, etc., to justify redistribution of the shear forces obtained from finite element analysis.

The applicant is also requested to update the FSAR as necessary.

SUPPLEMENTAL RESPONSE:

The original response to this RAI was submitted with Nuclear Innovation North America (NINA) letter U7-C-NINA-NRC-110050, dated April 5, 2011. This supplement provides the response to the following action item discussed in the NRC audits performed during the weeks of May 23, 2011 and July 25, 2011.

Beam shear discussion (Audit Action Item 3.8-21, Punch List Item 56):

Calculations will be revised and FSAR tables will be updated as a Confirmatory Action

COLA updates reflecting the results of the hydrodynamic mass effect on the columns will be included in this response (Punch List No. 17)

Finite element analysis was used for design of the following structures:

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

As noted in the original response, unless noted otherwise, design of these structures for out-of-plane shear have been conservatively revised based on finite element analysis results for each element without averaging the shear over several elements. This supplemental response provides the summary of results for UHS/RSW Pump House and DGFOT. The summary of results for DGFOSV and RWB will be provided in RAI 03.08.04-34, Supplement 2 currently scheduled for submittal in October 2011.

UHS/RSW Pump House:

No averaging has been used for out-of-plane shear design except at four locations within the UHS basin basemat at the junction of basin buttresses with the basin basemat. At these four locations, the out-of-plane shear was averaged over a total length of twice the baseemat thickness (i.e. 2 x 10 = 20 ft, basemat thickness = 10 ft). This averaging of shear is justified for the following reasons:

- The local shear concentration is due to excessively refined mesh for a 10 ft thick mat. As can be seen from Figure 03.08.04-34 S1.1, the width of the basemat elements is only 5.88 ft.
- The basin buttresses are 6 ft thick walls. Considering a load distribution of 45^{o} through the basemat thickness will yield an effective strip of 26 ft (i.e. 6 ft + 2 x 10 ft = 26 ft) which exceeds the 20 ft used for shear averaging.

Tables 3H.6-7 through 3H.6-9 and Figures 3H.6-51 through 3H.6-74, 3H.6-74A, 3H.6-75 through 3H.6-78, 3H.6-78A, 3H.6-79 through 3H.6-116, 3H.6-116A, 3H.6-117 through 3H.6-120, 3H.6-120A, 3H.6-121 through 3H.6-122, 3H.6-122A, 3H.6-123 through 3H.6-126, 3H.6-126A, 3H.6-127 through 3H.6-134, 3H.6-134A, 3H.6-135, and 3H.6-136A through 3H.6-136C (see enclosure) have been revised to reflect the results of this analysis. In addition, these revised tables also reflect the results of the hydrodynamic mass effect on the UHS basin columns and beams considering the scaled column accelerations discussed in RAI 03.08.04-30, Supplement 4.

DGFOT:

No averaging has been used for out-of-plane shear design. Tables 3H.7-1 and Figures 3H.7-10A, 3H.7-14A, 3H.7-17, and 3H.7-19A (see Enclosure) have been revised to reflect the results of this analysis.

As a result of this response COLA Part 2, Tier 2, Appendix 3H will be revised as shown in the Enclosure.

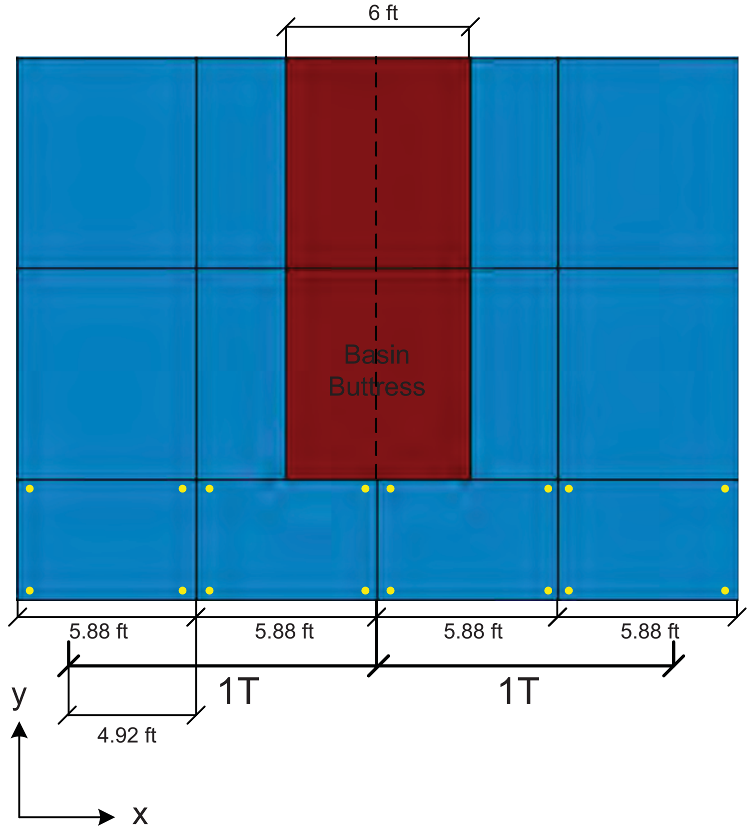

Figure 03.08.04-34 S1.1: Partial Plan View of UHS Basin Basemat Mesh
Out-of-plane Shear Averaged over 2T
T = Basemat Thickness, 10 ft

ENCLOSURE

COLA MARK-UPS

3H.6.6.3.1 UHS Basin/UHS Cooling Tower/RSW Pump House Concrete Wall and Slab Design

For each reinforcement zone, the~~ following~~ in-plane ~~and transverse ~~shear~~s~~ with the corresponding load combination are reported in Tables 3H.6-7 and 3H.6-8~~:~~. The in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

The shell forces from every element for every load combination in the finite element model were evaluated to determine the required transverse reinforcement. The transverse shear and axial force reported in Tables 3H.6-7 and 3H.6-8 correspond to the maximum required transverse reinforcement for an element within that transverse reinforcement zone.

- ~~The in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.~~

- ~~The transverse shear is the maximum average transverse shear along a plane in that transverse reinforcement zone.~~

3H.7.5.3.1 Reinforced Concrete Elements

For each surface, the~~ following~~ in-plane ~~and transverse ~~shear~~s~~ with the corresponding load combination are reported in Table 3H.7-1 when the governing forces, moments and reinforcement is from the SAP2000 models~~:~~. The in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

The shell forces from every element for every load combination in the finite element model were evaluated to determine the required transverse reinforcement. The transverse shear and axial force reported in Table 3H.7-1 correspond to the maximum required transverse reinforcement for an element within that transverse reinforcement zone.

- ~~The in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.~~

~~The transverse shear is the maximum average transverse shear along a plane in that transverse reinforcement zone.~~

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House North Wall	6	North (outside)	Horizontal	3H.6-51	1-H-L	MTCM	2923	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	371	-413	D + L + F + H' + T + E'	32	7.8	-	-	-	-	-	-	-
						MCCM	2914	D + L + F + H' + T + E'	-179	-25										
						MMAT	2921	D + L + F + H' + T + E'	128	-548										
						MMAC	2945	D + L + F + H' + T + E'	-56	-528										
					2-H-L	MTCM	5425	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	149	-16	D + L + F + H' + T + E'	118	4.68	-	-	-	-	-	-	-
						MCCM	5482	D + L + F + H' + T + E'	-297	-615										
						MMAT	4082	D + L + F + H' + T + E'	0	-734										
						MMAC	5580	D + L + F + H' + T + E'	-131	-774										
			Vertical	3H.6-52	1-V-L	MTCM	5586	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	186	-199	D + L + F + H' + T + E'	126	4.68	-	-	-	-	-	-	-
						MCCM	3650	D + L + F + H' + T + E'	-244	-180										
						MMAT	5555	D + L + F + H' + T + E'	3	-490										
						MMAC	5555	D + L + F + H' + T + E'	-63	-499										
					2-V-L	MTCM	5570	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	271	-539	D + L + F + H' + T + E'	126	7.8	-	-	-	-	-	-	-
						MCCM	3642	D + L + F + H' + T + E'	-281	-382										
						MMAT	5541	D + L + F + H' + T + E'	3	-1198										
						MMAC	4101	D + L + F + H' + T + E'	-149	-1229										
		South (inside)	Horizontal	3H.6-53	1-H-L	MTCM	2902	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	324	126	D + L + F + H' + T + E'	33	6.24	-	-	-	-	-	-	-
						MCCM	5481	D + L + F + H' + T + E'	-288	108										
						MMAT	2914	D + L + F + H + To + Wt	86	348										
						MMAC	3708	D + L + F + H' + T + E'	-139	360										
					2-H-L	MTCM	5262	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	114	13	D + L + F + H' + T + E'	118	3.12	-	-	-	-	-	-	-
						MCCM	5477	D + L + F + H' + T + E'	-239	151										
						MMAT	3707	D + L + F + H' + T + E'	9	324										
						MMAC	3653	D + L + F + H' + T + E'	-70	441										
			Vertical	3H.6-54	1-V-L	MTCM	3642	D + L + F + H' + T + E'	207	55	D + L + F + H' + T + E'	126	4.68	-	-	-	-	-	-	-
						MCCM	3642	D + L + F + H' + T + E'	-281	56										
						MMAT	5435	D + L + F + H' + T + E'	6	468										
						MMAC	3689	D + L + F + H' + T + E'	-147	481										
		-	Transverse (Horizontal and Vertical)	3H.6-55	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-11	15	-121	-46	0.20	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-65	437	-4	77	0.31	
					3-T	-	-	-	-	-	-	-	-	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	38	218	-118	446	0.44	
Pump House East Wall	6	East (outside)	Horizontal	3H.6-56	1-H-L	MTCM	3222	D + L + F + H' + T + E'	657	-170	D + L + F + H' + T + E'	155	12.48	-	-	-	-	-	-	(8)
						MCCM	3222	D + L + F + H' + T + E'	-750	-67										
						MMAT	3222	D + L + F + H' + T + E'	657	-816										
						MMAC	3222	D + L + F + H' + T + E'	-337	-816										
					2-H-L	MTCM	3079	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	246	-20	D + L + F + H' + T + E'	155	4.68	-	-	-	-	-	-	-
						MCCM	3079	D + L + F + H' + T + E'	-352	-31										
						MMAT	3121	D + L + F + H' + T + E'	61	-271										
						MMAC	3121	D + L + F + H' + T + E'	-51	-404										
					3-H-L	MTCM	8893	D + L + F + H' + T + E'	163	-65	D + L + F + H' + T + E'	263	6.24	-	-	-	-	-	-	-
						MCCM	8827	D + L + F + H' + T + E'	-645	-77										
						MMAT	8829	D + L + F + H' + T + E'	62	-678										
						MMAC	8823	D + L + F + H' + T + E'	-112	-906										
			Vertical	3H.6-57	1-V-L	MTCM	3221	D + L + F + H' + T + E'	484	-197	D + L + F + H' + T + E'	308	10.92	-	-	-	-	-	-	(8)
						MCCM	8825	D + L + F + H' + T + E'	-884	-159										
						MMAT	8813	D + L + F + H' + T + E'	120	-681										
						MMAC	8814	D + L + F + H' + T + E'	-144	-705										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House East Wall (Cont'd)	6	East (outside)	Vertical	3H.6-57	2-V-L	MTCM	3226	D + L + F + H' + T + E'	215	-134	D + L + F + H' + T + E'	247	6.24	-	-	-	-	-	-	-
						MCCM	8853	D + L + F + H' + T + E'	-521	-162										
						MMAT	8854	D + L + F + H' + T + E'	62	-531										
						MMAC	8854	D + L + F + H' + T + E'	-349	-842										
					3-V-L	MTCM	6526	D + L + F + H' + T + E'	76	-30	D + L + F + H' + T + E'	175	3.12	-	-	-	-	-	-	-
						MCCM	6359	D + L + F + H' + T + E'	-306	-61										
						MMAT	3097	D + L + F + H' + T + E'	36	-299										
						MMAC	6491	D + L + F + H' + T + E'	-112	-344										
					4-V-L	MTCM	6556	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	190	-97	D + L + F + H' + T + E'	115	6.24	-	-	-	-	-	-	-
						MCCM	6528	D + L + F + H' + T + E'	-264	-92										
						MMAT	6568	D + L + F + H' + T + E'	109	-229										
						MMAC	6547	D + L + F + H' + T + E'	-50	-221										
					5-V-L	MTCM	6520	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	242	-411	D + L + F + H' + T + E'	247	6.24	-	-	-	-	-	-	-
						MCCM	6349	D + L + F + H' + T + E'	-440	-653										
						MMAT	6518	D + L + F + H' + T + E'	9	-536										
						MMAC	8869	D + L + F + H' + T + E'	-251	-884										
		West (inside)	Horizontal	3H.6-58	1-H-L	MTCM	3222	D + L + F + H' + T + E'	605	40	D + L + F + H' + T + E'	155	12.48	-	-	-	-	-	-	(8)
						MCCM	3222	D + L + F + H' + T + E'	-814	868										
						MMAT	3222	D + L + F + H' + T + E'	180	868										
						MMAC	3222	D + L + F + H' + T + E'	-814	868										
					2-H-L	MTCM	3088	D + L + F + H' + T + E'	262	129	D + L + F + H' + T + E'	155	4.68	-	-	-	-	-	-	-
						MCCM	3088	D + L + F + H' + T + E'	-301	46										
						MMAT	3100	D + L + F + H' + T + E'	27	357										
						MMAC	3100	D + L + F + H' + T + E'	-92	357										
					3-H-L	MTCM	8894	D + L + F + H' + T + E'	168	179	D + L + F + H' + T + E'	194	4.68	-	-	-	-	-	-	-
						MCCM	8829	D + L + F + H' + T + E'	-514	502										
						MMAT	8922	D + L + F + H' + T + E'	57	415										
						MMAC	8829	D + L + F + H' + T + E'	-493	582										
					4-H-L	MTCM	8827	1.4D + 1.4F + 1.7H + 1.7W	62	65	D + L + F + H' + T + E'	263	6.24	-	-	-	-	-	-	-
						MCCM	8827	D + L + F + H' + T + E'	-645	204										
						MMAT	8851	D + L + F + H' + T + E'	6	617										
						MMAC	8881	D + L + F + H' + T + E'	-470	982										
			Vertical	3H.6-59	1-V-L	MTCM	3222	D + L + F + H' + T + E'	640	146	D + L + F + H' + T + E'	308	15.6	-	-	-	-	-	-	(8)
						MCCM	8825	D + L + F + H' + T + E'	-884	1232										
						MMAT	8825	D + L + F + H' + T + E'	-	-										
						MMAC	8825	D + L + F + H' + T + E'	-283	1815										
					2-V-L	MTCM	3226	D + L + F + H' + T + E'	199	51	D + L + F + H' + T + E'	247	9.36	-	-	-	-	-	-	-
						MCCM	8853	D + L + F + H' + T + E'	-535	833										
						MMAT	8854	D + L + F + H' + T + E'	2	1176										
						MMAC	8853	D + L + F + H' + T + E'	-491	1604										
					3-V-L	MTCM	3241	D + L + F + H' + T + E'	60	40	D + L + F + H' + T + E'	234	6.24	-	-	-	-	-	-	-
						MCCM	8900	D + L + F + H' + T + E'	-367	62										
						MMAT	6397	D + L + F + H' + T + E'	1	590										
						MMAC	8880	D + L + F + H' + T + E'	-294	651										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House East Wall (Cont'd)	6	West (inside)	Vertical	3H.6-59	4-V-L	MTCM	6444	D + L + F + H' + T + E'	46	202	D + L + F + H' + T + E'	175	4.68	-	-	-	-	-	-	-
						MCCM	6355	D + L + F + H' + T + E'	-328	20										
						MMAT	6456	D + L + F + H' + T + E'	1	533										
						MMAC	3097	D + L + F + H' + T + E'	-86	551										
					5-V-L	MTCM	6526	D + L + F + H' + T + E'	76	35	D + L + F + H' + T + E'	120	3.12	-	-	-	-	-	-	-
						MCCM	6522	D + L + F + H' + T + E'	-244	217										
						MMAT	6503	D + L + F + H' + T + E'	4	308										
						MMAC	3106	D + L + F + H' + T + E'	-46	321										
					6-V-L	MTCM	6520	D + L + F + H' + T + E'	211	118	D + L + F + H' + T + E'	115	4.68	-	-	-	-	-	-	-
						MCCM	6520	D + L + F + H' + T + E'	-300	164										
						MMAT	6520	D + L + F + H' + T + E'	2	222										
						MMAC	6520	D + L + F + H' + T + E'	-239	228										
		-	Transverse (Horizontal and Vertical)	3H.6-60	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	41	34	154	542	0.60	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-130	-205	-354	-47	1.24	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	49	23	78	476	0.44	
					4-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	43	32	37	436	0.31	
					5-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	327	-118	328	-308	1.76	
					6-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-58	363	2	89	0.20	
Pump House South Wall	6	North (inside)	Horizontal	3H.6-61	1-H-L	MTCM	5788	D + L + F + H' + T + E'	249	-63	D + L + F + H' + T + E'	235	6.24	-	-	-	-	-	-	-
						MCCM	5611	D + L + F + H' + T + E'	-1115	-117										
						MMAT	5784	D + L + F + H' + T + E'	6	-639										
						MMAC	5784	D + L + F + H' + T + E'	-89	-639										
			Vertical	3H.6-62	1-V-L	MTCM	5784	D + L + F + H' + T + E'	149	-192	D + L + F + H' + T + E'	222	6.24	-	-	-	-	-	-	-
						MCCM	5607	D + L + F + H' + T + E'	-767	-238										
						MMAT	5783	D + L + F + H' + T + E'	0	-492										
						MMAC	5783	D + L + F + H' + T + E'	-230	-663										
					2-V-L	MTCM	5786	D + L + F + H' + T + E'	243	-611	D + L + F + H' + T + E'	222	9.36	-	-	-	-	-	-	-
						MCCM	5609	D + L + F + H' + T + E'	-1036	-801										
						MMAT	5786	D + L + F + H' + T + E'	126	-1204										
						MMAC	5786	D + L + F + H' + T + E'	-605	-1401										
		South (outside)	Horizontal	3H.6-63	1-H-L	MTCM	5783	D + L + F + H' + T + E'	97	205	D + L + F + H' + T + E'	235	6.24	-	-	-	-	-	-	-
						MCCM	5608	D + L + F + H' + T + E'	-628	192										
						MMAT	5784	D + L + F + H' + T + E'	25	712										
						MMAC	5784	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-163	785										
			Vertical	3H.6-64	1-V-L	MTCM	5607	D + L + F + H' + T + E'	164	186	D + L + F + H' + T + E'	222	6.24	-	-	-	-	-	-	-
						MCCM	5607	D + L + F + H' + T + E'	-722	17										
						MMAT	5774	D + L + F + H' + T + E'	0	578										
						MMAC	5757	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-281	1198										
		-	Transverse (Horizontal and Vertical)	3H.6-65	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	42	-178	142	51	0.31	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	13	-145	126	46	0.20	
Pump House West Wall	6	West (outside)	Horizontal	3H.6-66	1-H-L	MTCM	3273	D + L + F + H' + T + E'	462	-106	D + L + F + H + To + Wt	124	6.24	-	-	-	-	-	-	-
						MCCM	6229	D + L + F + H' + T + E'	-252	-58										
						MMAT	3028	D + L + F + H' + T + E'	59	-407										
						MMAC	6169	D + L + F + H' + T + E'	-122	-704										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House West Wall (Cont'd)	6	West (outside)		3H.6-66	2-H-L	MTCM	3291	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	974	-529	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	98	14.04	-	-	-	-	-	-	-
						MCCM	3291	D + L + F + H' + T + E'	-360	-356										
						MMAT	3291	D + L + F + H' + T + E'	712	-743										
						MMAC	3290	D + L + F + H' + T + E'	-19	-591										
					3-H-L	MTCM	9052	D + L + F + H' + T + E'	84	-34	D + L + F + H' + T + E'	129	3.12	-	-	-	-	-	-	-
						MCCM	9052	D + L + F + H' + T + E'	-309	-59										
						MMAT	6125	D + L + F + H' + T + E'	4	-200										
						MMAC	6145	D + L + F + H' + T + E'	-158	-742										
					4-H-L	MTCM	3280	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	429	-56	D + L + F + H' + T + E'	129	6.24	-	-	-	-	-	-	-
						MCCM	9136	D + L + F + H' + T + E'	-735	-468										
						MMAT	9138	D + L + F + H' + T + E'	7	-803										
						MMAC	9138	D + L + F + H' + T + E'	-171	-900										
			Vertical	3H.6-67	1-V-L	MTCM	6125	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	317	-384	D + L + F + H' + T + E'	75	7.8	-	-	-	-	-	-	-
						MCCM	6157	D + L + F + H' + T + E'	-233	-26										
						MMAT	6126	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	69	-458										
						MMAC	6126	D + L + F + H' + T + E'	-41	-341										
					2-V-L	MTCM	6151	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	84	-75	D + L + F + H' + T + E'	132	3.12	-	-	-	-	-	-	-
						MCCM	9042	D + L + F + H' + T + E'	-202	-8										
						MMAT	3073	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	19	-348										
						MMAC	6321	D + L + F + H' + T + E'	-127	-408										
					3-V-L	MTCM	6131	D + L + F + H' + T + E'	64	-101	D + L + F + H' + T + E'	132	4.68	-	-	-	-	-	-	-
						MCCM	9037	D + L + F + H' + T + E'	-315	-206										
						MMAT	6127	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	26	-528										
						MMAC	6293	D + L + F + H' + T + E'	-165	-696										
					4-V-L	MTCM	3283	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	222	-188	D + L + F + H' + T + E'	115	4.68	-	-	-	-	-	-	-
						MCCM	9110	D + L + F + H' + T + E'	-285	-315										
						MMAT	9105	D + L + F + H' + T + E'	5	-694										
						MMAC	9105	D + L + F + H' + T + E'	-92	-704										
					5-V-L	MTCM	3290	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	549	-213	D + L + F + H' + T + E'	144	9.36	-	-	-	-	-	-	-
						MCCM	9134	D + L + F + H' + T + E'	-780	-364										
						MMAT	9134	D + L + F + H' + T + E'	256	-916										
						MMAC	9138	D + L + F + H' + T + E'	-340	-1271										
		East (inside)	Horizontal	3H.6-68	1-H-L	MTCM	3276	D + L + F + H' + T + E'	485	49	D + L + F + H + To + Wt	124	6.24	-	-	-	-	-	-	-
						MCCM	9089	D + L + F + H' + T + E'	-315	97										
						MMAT	3268	D + L + F + H' + T + E'	2	261										
						MMAC	9061	D + L + F + H' + T + E'	-145	292										
					2-H-L	MTCM	3291	D + L + F + H' + T + E'	922	153	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	98	12.48	-	-	-	-	-	-	-
						MCCM	3291	D + L + F + H' + T + E'	-360	217										
						MMAT	3291	D + L + F + H' + T + E'	226	820										
						MMAC	3291	D + L + F + H' + T + E'	-126	820										
					3-H-L	MTCM	9087	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	135	57	D + L + F + H' + T + E'	129	3.12	-	-	-	-	-	-	-
						MCCM	9079	D + L + F + H' + T + E'	-422	175										
						MMAT	9077	D + L + F + H' + T + E'	0	267										
						MMAC	9077	D + L + F + H' + T + E'	-355	288										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House West Wall (Cont'd)	6	East (inside)	Horizontal	3H.6-68	4-H-L	MTCM	3280	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	424	17	D + L + F + H' + T + E'	129	6.24	-	-	-	-	-	-	-
						MCCM	9134	D + L + F + H' + T + E'	-607	222										
						MMAT	9134	D + L + F + H' + T + E'	21	359										
						MMAC	9134	D + L + F + H' + T + E'	-408	377										
			Vertical	3H.6-69	1-V-L	MTCM	6125	D + L + F + H' + T + E'	209	33	D + L + F + H' + T + E'	75	4.68	-	-	-	-	-	-	-
						MCCM	6161	D + L + F + H' + T + E'	-199	12										
						MMAT	3029	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	7	122										
						MMAC	3029	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-1	121										
					2-V-L	MTCM	6134	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	126	55	D + L + F + H' + T + E'	132	3.12	-	-	-	-	-	-	-
						MCCM	9067	D + L + F + H' + T + E'	-244	68										
						MMAT	6285	D + L + F + H' + T + E'	0	402										
						MMAC	3073	D + L + F + H' + T + E'	-54	425										
					3-V-L	MTCM	9116	D + L + F + H' + T + E'	125	57	D + L + F + H' + T + E'	115	4.68	-	-	-	-	-	-	-
						MCCM	9102	D + L + F + H' + T + E'	-295	308										
						MMAT	9105	D + L + F + H' + T + E'	13	437										
						MMAC	9106	D + L + F + H' + T + E'	-218	739										
					4-V-L	MTCM	3291	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	664	95	D + L + F + H' + T + E'	144	9.36	-	-	-	-	-	-	-
						MCCM	9134	D + L + F + H' + T + E'	-866	1406										
						MMAT	9134	D + L + F + H' + T + E'	4	1105										
						MMAC	9134	D + L + F + H' + T + E'	-866	1406										
		-	Transverse (Horizontal and Vertical)	3H.6-70	1-T	-	-	-	-	-	-	-	-	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-58	69	77	330	0.20	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	16	100	204	1	0.44	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-61	343	-92	1213	0.60	
Pump House Internal East Wall	4	East (top)	Horizontal	3H.6-71	1-H-L	MTCM	3246	D + L + F + H' + T + E'	351	-94	D + L + F + H' + T + E'	109	6.24	-	-	-	-	-	-	-
						MCCM	3246	D + L + F + H' + T + E'	-477	-19										
						MMAT	3246	D + L + F + H' + T + E'	194	-119										
						MMAC	3246	D + L + F + H' + T + E'	-304	-119										
					2-H-L	MTCM	3251	D + L + F + H' + T + E'	130	-23	D + L + F + H' + T + E'	186	3.12	-	-	-	-	-	-	-
						MCCM	8939	D + L + F + H' + T + E'	-545	-19										
						MMAT	7016	D + L + F + H (Internal Flood)	5	-147										
						MMAC	6984	D + L + F + H (Internal Flood)	-28	-205										
			Vertical	3H.6-72	1-V-L	MTCM	3246	D + L + F + H' + T + E'	188	-7	D + L + F + H' + T + E'	236	6.24	-	-	-	-	-	-	-
						MCCM	3246	D + L + F + H' + T + E'	-487	-14										
						MMAT	3246	D + L + F + H' + T + E'	58	-21										
						MMAC	8925	D + L + F + H' + T + E'	-191	-199										
					2-V-L	MTCM	3248	D + L + F + H' + T + E'	100	-10	D + L + F + H' + T + E'	199	3.12	-	-	-	-	-	-	-
						MCCM	6800	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-409	-24										
						MMAT	6968	D + L + F + H' + T + E'	38	-99										
						MMAC	6800	D + L + F + H (Internal Flood)	-226	-343										
		West (bottom)	Horizontal	3H.6-73	1-H-L	MTCM	3246	D + L + F + H' + T + E'	333	8	D + L + F + H' + T + E'	109	6.24	-	-	-	-	-	-	-
						MCCM	3246	D + L + F + H' + T + E'	-477	74										
						MMAT	3246	D + L + F + H' + T + E'	198	95										
						MMAC	3246	D + L + F + H' + T + E'	-310	95										
					2-H-L	MTCM	3254	D + L + F + H' + T + E'	126	10	D + L + F + H' + T + E'	186	3.12	-	-	-	-	-	-	-
						MCCM	8937	D + L + F + H' + T + E'	-565	102										
						MMAT	7016	D + L + F + H (Internal Flood)	9	121										
						MMAC	6984	D + L + F + H (Internal Flood)	-21	197										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number [(1)]	Reinforcement Zone Number [(2)]	Maximum Forces [(3)]	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial [(4)] (kips / ft)	Flexure [(4)] (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear [(5)] (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House Internal East Wall (Cont'd)	4	West (bottom)	Vertical	3H.6-74	1-V-L	MTCM	3246	D + L + F + H' + T + E'	188	7	D + L + F + H' + T + E'	236	6.24	-	-	-	-	-	-	-
						MCCM	3246	D + L + F + H' + T + E'	-467	5										
						MMAT	3245	D + L + F + H' + T + E'	74	16										
						MMAC	8937	D + L + F + H' + T + E'	-244	146										
					2-V-L	MTCM	3248	D + L + F + H' + T + E'	98	4	D + L + F + H' + T + E'	199	3.12	-	-	-	-	-	-	-
						MCCM	8946	D + L + F + H' + T + E'	-392	16										
						MMAT	6968	D + L + F + H' + T + E'	15	54										
						MMAC	6853	D + L + F + H (Internal Flood)	-109	327										
		-	Transverse (Horizontal and Vertical)	3H.6-74A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-8	100	-26	377	0.20	
Pump House Internal West Wall	4	East (top)	Horizontal	3H.6-75	1-H-L	MTCM	3294	D + L + F + H' + T + E'	275	-46	D + L + F + H' + T + E'	94	4.68	-	-	-	-	-	-	-
						MCCM	3294	D + L + F + H' + T + E'	-410	-57										
						MMAT	3171	D + L + F + H' + T + E'	12	-130										
						MMAC	3171	D + L + F + H' + T + E'	-6	-130										
					2-H-L	MTCM	3299	D + L + F + H' + T + E'	99	-8	D + L + F + H' + T + E'	161	3.12	-	-	-	-	-	-	-
						MCCM	9163	D + L + F + H' + T + E'	-552	-25										
						MMAT	6792	D + L + F + H (Internal Flood)	8	-127										
						MMAC	6760	D + L + F + H (Internal Flood)	-20	-201										
			Vertical	3H.6-76	1-V-L	MTCM	3294	D + L + F + H' + T + E'	139	-16	D + L + F + H' + T + E'	206	4.68	-	-	-	-	-	-	-
						MCCM	9165	D + L + F + H' + T + E'	-465	-29										
						MMAT	3294	D + L + F + H' + T + E'	93	-21										
						MMAC	9161	D + L + F + H' + T + E'	-112	-181										
					2-V-L	MTCM	3296	D + L + F + H' + T + E'	70	-7	D + L + F + H' + T + E'	173	3.12	-	-	-	-	-	-	-
						MCCM	9168	D + L + F + H' + T + E'	-393	-7										
						MMAT	6601	D + L + F + H' + T + E'	1	-57										
						MMAC	6576	D + L + F + H (Internal Flood)	-103	-333										
		West (bottom)	Horizontal	3H.6-77	1-H-L	MTCM	3294	D + L + F + H' + T + E'	275	42	D + L + F + H' + T + E'	94	4.68	-	-	-	-	-	-	-
						MCCM	3294	D + L + F + H' + T + E'	-410	17										
						MMAT	3171	D + L + F + H' + T + E'	12	101										
						MMAC	3171	D + L + F + H' + T + E'	-176	113										
					2-H-L	MTCM	3299	D + L + F + H' + T + E'	99	7	D + L + F + H' + T + E'	161	3.12	-	-	-	-	-	-	-
						MCCM	9161	D + L + F + H' + T + E'	-576	104										
						MMAT	6792	D + L + F + H (Internal Flood)	1	137										
						MMAC	6760	D + L + F + H (Internal Flood)	-28	203										
			Vertical	3H.6-78	1-V-L	MTCM	3294	D + L + F + H' + T + E'	139	6	D + L + F + H' + T + E'	206	4.68	-	-	-	-	-	-	-
						MCCM	9165	D + L + F + H' + T + E'	-465	84										
						MMAT	3294	D + L + F + H' + T + E'	24	23										
						MMAC	9161	D + L + F + H' + T + E'	-325	201										
					2-V-L	MTCM	3296	D + L + F + H' + T + E'	70	6	D + L + F + H' + T + E'	173	3.12	-	-	-	-	-	-	-
						MCCM	9168	D + L + F + H' + T + E'	-394	33										
						MMAT	6744	D + L + F + H' + T + E'	44	89										
						MMAC	6576	D + L + F + H (Internal Flood)	-220	343										
		-	Transverse (Horizontal and Vertical)	3H.6-78A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	6	93	15	399	0.20	

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Pump House Buttresses (6)	6	North (top) South (bottom)	Horizontal	3H.6-79	1-H-L	MTCM	13330	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	220	9	D + L + F + H' + T + E'	218	4.68	-	-	-	-	-	-	-
						MCCM	13461	D + L + F + H' + T + E'	-276	53										
						MMAT	13445	D + L + F + H' + T + E'	89	198										
						MMAC	13451	D + L + F + H' + T + E'	-50	142										
			Vertical	3H.6-80	1-V-L	MTCM	13320	D + L + F + H' + T + E'	188	-90	D + L + F + H' + T + E'	92	4.68	-	-	-	-	-	-	-
						MCCM	13420	D + L + F + H' + T + E'	-281	-99										
						MMAT	13414	D + L + F + H' + T + E'	103	145										
						MMAC	13414	D + L + F + H' + T + E'	-48	143										
					2-V-L	MTCM	13410	D + L + F + H' + T + E'	471	72	D + L + F + H' + T + E'	92	7.8	-	-	-	-	-	-	-
						MCCM	13437	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-321	288										
						MMAT	13437	D + L + F + H' + T + E'	7	475										
						MMAC	13437	D + L + F + H' + T + E'	-127	477										
		-	Transverse (Horizontal and Vertical)	3H.6-81	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	38	470	0	76	0.20	-
UHS Basin North Wall	6	North (outside)	Horizontal	3H.6-82	1-H-L	MTCM	6177	D + L + F + H' + T + E'	1005	-246	D + L + F + H' + T + E'	42	12.48	-	-	-	-	-	-	-
						MCCM	5873	D + L + F + H' + T + E'	-294	-499										
						MMAT	5801	D + L + F + H' + T + E'	57	-1311										
						MMAC	5801	D + L + F + H' + T + E'	-133	-1311										
					2-H-L	MTCM	6006	1.4D + 1.7F + 1.3H + 1.4To	648	-139	D + L + F + H' + T + E'	176	9.36	-	-	-	-	-	-	-
						MCCM	2678	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-512	-182										
						MMAT	3939	D + L + F + H' + T + E'	39	-968										
						MMAC	3939	D + L + F + H' + T + E'	-190	-1036										
					3-H-L	MTCM	5796	1.4D + 1.7F + 1.3H + 1.4To	282	-335	D + L + F + H' + T + E'	153	6.24	-	-	-	-	-	-	-
						MCCM	3600	D + L + F + H' + T + E'	-608	-86										
						MMAT	5975	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	66	-533										
						MMAC	3574	1.4D + 1.7F + 1.3H + 1.4To	-48	-477										
			Vertical	3H.6-83	1-V-L	MTCM	2977	D + L + F + H' + T + E'	248	-129	D + L + F + H' + T + E'	139	4.68	-	-	-	-	-	-	-
						MCCM	6108	D + L + F + H' + T + E'	-334	-101										
						MMAT	6108	D + L + F + H' + T + E'	26	-664										
						MMAC	6108	D + L + F + H' + T + E'	-200	-664										
					2-V-L	MTCM	2980	D + L + F + H' + T + E'	259	-190	D + L + F + H' + T + E'	175	6.24	-	-	-	-	-	-	-
						MCCM	6109	D + L + F + H' + T + E'	-320	-41										
						MMAT	6113	D + L + F + H' + T + E'	0	-713										
						MMAC	6113	D + L + F + H' + T + E'	-144	-713										
					3-V-L	MTCM	3004	D + L + F + H' + T + E'	313	-184	D + L + F + H' + T + E'	258	7.8	-	-	-	-	-	-	-
						MCCM	6116	D + L + F + H' + T + E'	-332	-149										
						MMAT	6116	D + L + F + H' + T + E'	76	-736										
						MMAC	6116	D + L + F + H' + T + E'	-189	-736										
					4-V-L	MTCM	3027	D + L + F + H' + T + E'	473	-599	D + L + F + H' + T + E'	249	12.48	-	-	-	-	-	-	-
						MCCM	5998	D + L + F + H' + T + E'	-507	-205										
						MMAT	6124	D + L + F + H' + T + E'	133	-800										
						MMAC	6124	D + L + F + H' + T + E'	-49	-800										
					5-V-L	MTCM	6003	D + L + F + H' + T + E'	281	-59	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	214	6.24	-	-	-	-	-	-	-
						MCCM	6003	D + L + F + H' + T + E'	-284	-61										
						MMAT	4149	D + L + F + H' + T + E'	133	-372										
						MMAC	4149	D + L + F + H' + T + E'	-5	-303										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin North Wall (Cont'd)	6	North (outside)	Vertical	3H.6-83	6-V-L	MTCM	6005	D + L + F + H' + T + E'	373	-744	D + L + F + H' + T + E'	222	9.36	-	-	-	-	-	-	-
						MCCM	2469	D + L + F + H' + T + E'	-602	-352										
						MMAT	6005	D + L + F + H' + T + E'	373	-744										
						MMAC	6005	D + L + F + H' + T + E'	-189	-744										
					7-V-L	MTCM	2859	1.4D + 1.7F + 1.3H + 1.4To	143	-152	D + L + F + H' + T + E'	222	6.24	-	-	-	-	-	-	-
						MCCM	2460	D + L + F + H' + T + E'	-558	-157										
						MMAT	3624	D + L + F + H' + T + E'	3	-589										
						MMAC	3600	D + L + F + H' + T + E'	-272	-597										
		South (inside)	Horizontal	3H.6-84	1-H-L	MTCM	2959	1.4D + 1.7F + 1.3H + 1.4To	350	326	D + L + F + H' + T + E'	113	9.36	-	-	-	-	-	-	-
						MCCM	3942	D + L + F + H' + T + E'	-255	368										
						MMAT	2950	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	172	1113										
						MMAC	3938	D + L + F + H' + T + E'	-3	1062										
					2-H-L	MTCM	6177	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	1025	209	D + L + F + H' + T + E'	42	14.04	-	-	-	-	-	-	-
						MCCM	5873	D + L + F + H' + T + E'	-294	193										
						MMAT	7021	D + L + F + H' + T + E'	108	1219										
						MMAC	7021	D + L + F + H' + T + E'	-77	1219										
					3-H-L	MTCM	4005	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	525	417	D + L + F + H' + T + E'	93	9.36	-	-	-	-	-	-	-
						MCCM	3963	D + L + F + H' + T + E'	-344	210										
						MMAT	3002	1.4D + 1.7F + 1.3H + 1.4To	224	900										
						MMAC	3002	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-4	895										
					4-H-L	MTCM	5847	1.4D + 1.7F + 1.3H + 1.4To	175	227	D + L + F + H' + T + E'	149	6.24	-	-	-	-	-	-	-
						MCCM	3600	D + L + F + H' + T + E'	-608	182										
						MMAT	5992	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	58	943										
						MMAC	5992	1.4D + 1.7F + 1.3H + 1.4To	-128	975										
					5-H-L	MTCM	6005	1.4D + 1.7F + 1.3H + 1.4To	664	777	D + L + F + H' + T + E'	176	12.48	-	-	-	-	-	-	-
						MCCM	2610	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-495	99										
						MMAT	3027	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	127	1401										
						MMAC	3027	D + L + F + H' + T + E'	-94	1347										
					6-H-L	MTCM	6093	1.4D + 1.7F + 1.3H + 1.4To	522	61	D + L + F + H' + T + E'	176	12.48	-	-	-	-	-	-	-
						MCCM	3641	D + L + F + H' + T + E'	-384	263										
						MMAT	6964	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	149	1296										
						MMAC	4150	D + L + F + H' + T + E'	-9	1163										
			Vertical	3H.6-85	1-V-L	MTCM	2977	D + L + F + H' + T + E'	248	53	D + L + F + H' + T + E'	139	4.68	-	-	-	-	-	-	-
						MCCM	5846	D + L + F + H' + T + E'	-268	141										
						MMAT	5856	D + L + F + H' + T + E'	28	341										
						MMAC	5828	1.4D + 1.7F + 1.3H + 1.4To	-87	358										
					2-V-L	MTCM	3001	D + L + F + H' + T + E'	309	35	D + L + F + H' + T + E'	211	6.24	-	-	-	-	-	-	-
						MCCM	5918	D + L + F + H' + T + E'	-269	183										
						MMAT	5900	1.4D + 1.7F + 1.3H + 1.4To	23	423										
						MMAC	5900	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-87	476										
					3-V-L	MTCM	3027	D + L + F + H' + T + E'	473	411	D + L + F + H' + T + E'	258	10.92	-	-	-	-	-	-	-
						MCCM	5998	D + L + F + H' + T + E'	-507	713										
						MMAT	5998	D + L + F + H' + T + E'	39	713										
						MMAC	5998	D + L + F + H' + T + E'	-507	713										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin North Wall (Cont'd)	6	South (inside)	Vertical		4-V-L	MTCM	5916	D + L + F + H' + T + E'	243	338	D + L + F + H' + T + E'	258	9.36	-	-	-	-	-	-	-
						MCCM	6101	D + L + F + H' + T + E'	-352	451										
						MMAT	6112	1.4D + 1.7F + 1.3H + 1.4To	35	1265										
						MMAC	6112	1.4D + 1.7F + 1.3H + 1.4To	-12	1298										
					5-V-L	MTCM	6003	D + L + F + H' + T + E'	281	138	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	214	6.24	-	-	-	-	-	-	-
						MCCM	6003	D + L + F + H' + T + E'	-284	114										
						MMAT	7017	D + L + F + H' + T + E'	19	350										
						MMAC	4149	D + L + F + H' + T + E'	-83	366										
					6-V-L	MTCM	6005	D + L + F + H' + T + E'	373	523	D + L + F + H' + T + E'	222	9.36	-	-	-	-	-	-	-
						MCCM	2469	D + L + F + H' + T + E'	-602	591										
						MMAT	6005	D + L + F + H' + T + E'	39	793										
						MMAC	6005	D + L + F + H' + T + E'	-506	793										
					7-V-L	MTCM	2859	1.4D + 1.7F + 1.3H + 1.4To	142	50	D + L + F + H' + T + E'	222	6.24	-	-	-	-	-	-	-
						MCCM	2460	D + L + F + H' + T + E'	-558	147										
						MMAT	3636	D + L + F + H' + T + E'	19	450										
						MMAC	3615	1.4D + 1.7F + 1.3H + 1.4To	-277	945										
		-	Transverse (Horizontal and Vertical)	3H.6-86	1-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-5	-19	101	138	0.20	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	16	35	74	362	0.31	
					3-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-103	238	-100	429	0.80	
UHS Basin South Wall	6	South (outside)	Horizontal	3H.6-87	1-H-L	MTCM	4473	D + L + F + H' + T + E'	607	-301	D + L + F + H' + T + E'	33	10.92	-	-	-	-	-	-	-
						MCCM	4382	D + L + F + H' + T + E'	-329	-544										
						MMAT	4318	D + L + F + H' + T + E'	61	-1117										
						MMAC	4318	D + L + F + H' + T + E'	-128	-1117										
					2-H-L	MTCM	3815	D + L + F + H' + T + E'	275	-187	D + L + F + H' + T + E'	68	6.24	-	-	-	-	-	-	-
						MCCM	3557	D + L + F + H' + T + E'	-362	-250										
						MMAT	3528	D + L + F + H' + T + E'	28	-844										
						MMAC	3528	D + L + F + H' + T + E'	-31	-844										
					3-H-L	MTCM	2201	1.4D + 1.7F + 1.3H + 1.4To	399	-230	D + L + F + H' + T + E'	98	7.8	-	-	-	-	-	-	-
						MCCM	1067	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-237	-110										
						MMAT	2198	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	185	-608										
						MMAC	1741	1.4D + 1.7F + 1.3H + 1.4To	-19	-530										
			Vertical	3H.6-88	1-V-L	MTCM	3551	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	199	-102	D + L + F + H' + T + E'	131	4.68	-	-	-	-	-	-	-
						MCCM	1770	D + L + F + H' + T + E'	-354	-76										
						MMAT	1771	D + L + F + H' + T + E'	3	-508										
						MMAC	1773	D + L + F + H' + T + E'	-176	-616										
					2-V-L	MTCM	3593	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	212	-91	D + L + F + H' + T + E'	169	6.24	-	-	-	-	-	-	-
						MCCM	1844	D + L + F + H' + T + E'	-326	-14										
						MMAT	1844	D + L + F + H' + T + E'	49	-283										
						MMAC	1844	D + L + F + H' + T + E'	-164	-587										
					3-V-L	MTCM	2139	D + L + F + H' + T + E'	238	-111	D + L + F + H' + T + E'	149	4.68	-	-	-	-	-	-	-
						MCCM	1864	D + L + F + H' + T + E'	-388	-69										
						MMAT	1864	D + L + F + H' + T + E'	29	-656										
						MMAC	1864	D + L + F + H' + T + E'	-211	-656										
					4-V-L	MTCM	2142	D + L + F + H' + T + E'	240	-164	D + L + F + H' + T + E'	174	6.24	-	-	-	-	-	-	-
						MCCM	1865	D + L + F + H' + T + E'	-388	-85										
						MMAT	1865	D + L + F + H' + T + E'	26	-655										
						MMAC	1865	D + L + F + H' + T + E'	-216	-655										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin South Wall (Cont'd)	6	South (outside)	Vertical	3H.6-88	5-V-L	MTCM	2163	D + L + F + H' + T + E'	217	-103	D + L + F + H' + T + E'	148	4.68	-	-	-	-	-	-	-
						MCCM	1873	D + L + F + H' + T + E'	-365	-38										
						MMAT	1872	D + L + F + H' + T + E'	7	-637										
						MMAC	1868	D + L + F + H' + T + E'	-175	-661										
					6-V-L	MTCM	1880	D + L + F + H' + T + E'	227	-308	D + L + F + H' + T + E'	88	6.24	-	-	-	-	-	-	-
						MCCM	1880	D + L + F + H' + T + E'	-237	-125										
						MMAT	1880	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	165	-370										
						MMAC	1880	D + L + F + H' + T + E'	-52	-355										
		North (inside)	Horizontal	3H.6-89	1-H-L	MTCM	2032	1.4D + 1.7F + 1.3H + 1.4To	351	424	D + L + F + H' + T + E'	98	10.92	-	-	-	-	-	-	-
						MCCM	3531	D + L + F + H' + T + E'	-249	438										
						MMAT	4318	D + L + F + H' + T + E'	108	1408										
						MMAC	4318	D + L + F + H' + T + E'	-79	1408										
					2-H-L	MTCM	4473	D + L + F + H' + T + E'	607	384	D + L + F + H' + T + E'	33	9.36	-	-	-	-	-	-	-
						MCCM	4382	D + L + F + H' + T + E'	-329	339										
						MMAT	4497	D + L + F + H' + T + E'	70	698										
						MMAC	4497	D + L + F + H' + T + E'	-99	698										
					3-H-L	MTCM	3815	D + L + F + H' + T + E'	275	280	D + L + F + H' + T + E'	64	6.24	-	-	-	-	-	-	-
						MCCM	3557	D + L + F + H' + T + E'	-362	193										
						MMAT	4436	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	98	713										
						MMAC	4436	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-37	729										
					4-H-L	MTCM	2188	1.4D + 1.7F + 1.3H + 1.4To	360	154	D + L + F + H' + T + E'	76	9.36	-	-	-	-	-	-	-
						MCCM	2118	1.4D + 1.7F + 1.3H + 1.4To	-191	671										
						MMAT	2140	1.4D + 1.7F + 1.3H + 1.4To	286	848										
						MMAC	2092	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-21	852										
					5-H-L	MTCM	1705	1.4D + 1.7F + 1.3H + 1.4To	232	69	D + L + F + H' + T + E'	98	6.24	-	-	-	-	-	-	-
						MCCM	1066	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-244	214										
						MMAT	1687	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	64	720										
						MMAC	1687	1.4D + 1.7F + 1.3H + 1.4To	-83	728										
					6-H-L	MTCM	2204	1.4D + 1.7F + 1.3H + 1.4To	386	568	D + L + F + H' + T + E'	98	10.92	-	-	-	-	-	-	-
						MCCM	3836	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-246	38										
						MMAT	4505	D + L + F + H' + T + E'	111	1546										
						MMAC	4505	D + L + F + H' + T + E'	-76	1546										
			Vertical	3H.6-90	1-V-L	MTCM	3550	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	187	42	D + L + F + H' + T + E'	131	4.68	-	-	-	-	-	-	-
						MCCM	1014	D + L + F + H' + T + E'	-273	120										
						MMAT	4317	D + L + F + H' + T + E'	12	328										
						MMAC	1119	1.4D + 1.7F + 1.3H + 1.4To	-127	451										
					2-V-L	MTCM	3587	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	204	15	D + L + F + H' + T + E'	169	6.24	-	-	-	-	-	-	-
						MCCM	1197	D + L + F + H' + T + E'	-290	142										
						MMAT	4375	D + L + F + H' + T + E'	24	255										
						MMAC	1197	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-239	308										
					3-V-L	MTCM	2139	D + L + F + H' + T + E'	238	25	D + L + F + H' + T + E'	149	4.68	-	-	-	-	-	-	-
						MCCM	1536	D + L + F + H' + T + E'	-324	170										
						MMAT	1380	D + L + F + H' + T + E'	6	344										
						MMAC	1291	1.4D + 1.7F + 1.3H + 1.4To	-129	447										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin South Wall (Cont'd)	6	North (inside)	Vertical		4-V-L	MTCM	2142	D + L + F + H' + T + E'	240	67	D + L + F + H' + T + E'	174	6.24	-	-	-	-	-	-	-
						MCCM	1553	D + L + F + H' + T + E'	-323	183										
						MMAT	1553	D + L + F + H' + T + E'	5	263										
						MMAC	1553	D + L + F + H' + T + E'	-311	263										
					5-V-L	MTCM	2163	D + L + F + H' + T + E'	217	32	D + L + F + H' + T + E'	148	4.68	-	-	-	-	-	-	-
						MCCM	1700	D + L + F + H' + T + E'	-299	137										
						MMAT	4504	D + L + F + H' + T + E'	14	375										
						MMAC	3838	D + L + F + H' + T + E'	-75	402										
					6-V-L	MTCM	1880	D + L + F + H' + T + E'	227	38	D + L + F + H' + T + E'	174	7.8	-	-	-	-	-	-	-
						MCCM	1864	D + L + F + H' + T + E'	-388	568										
						MMAT	1868	D + L + F + H' + T + E'	27	937										
						MMAC	1781	1.4D + 1.7F + 1.3H + 1.4To	-130	1307										
		-	Transverse (Horizontal and Vertical)	3H.6-91	1-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-10	-29	-103	128	0.20	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-41	-2	-91	260	0.31	
UHS Basin East Wall	6	East (outside)	Horizontal	3H.6-92	1-H-L	MTCM	5234	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	410	-98	D + L + F + H' + T + E'	40	12.48	-	-	-	-	-	-	-
						MCCM	5235	D + L + F + H' + T + E'	-311	-1619										
						MMAT	5241	D + L + F + H' + T + E'	64	-2078										
						MMAC	5241	D + L + F + H' + T + E'	-222	-2130										
					2-H-L	MTCM	2611	1.4D + 1.7F + 1.3H + 1.4To	216	-508	D + L + F + H' + T + E'	71	6.24	-	-	-	-	-	-	-
						MCCM	3504	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-348	-25										
						MMAT	3936	D + L + F + H' + T + E'	27	-968										
						MMAC	3936	D + L + F + H' + T + E'	-190	-1033										
					3-H-L	MTCM	2300	1.4D + 1.7F + 1.3H + 1.4To	393	-216	D + L + F + H' + T + E'	78	7.8	-	-	-	-	-	-	-
						MCCM	2822	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-230	-136										
						MMAT	1995	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	103	-658										
						MMAC	1998	D + L + F + H' + T + E'	-21	-578										
					4-H-L	MTCM	2649	1.4D + 1.7F + 1.3H + 1.4To	275	-248	D + L + F + H' + T + E'	106	6.24	-	-	-	-	-	-	-
						MCCM	2820	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-192	-111										
						MMAT	2649	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	162	-505										
						MMAC	2627	D + L + F + H' + T + E'	-101	-489										
			Vertical	3H.6-93	1-V-L	MTCM	2375	D + L + F + H' + T + E'	266	-222	D + L + F + H' + T + E'	129	6.24	-	-	-	-	-	-	-
						MCCM	2832	D + L + F + H' + T + E'	-460	-157										
						MMAT	4295	D + L + F + H' + T + E'	0	-983										
						MMAC	5234	D + L + F + H' + T + E'	-283	-1073										
		West (inside)	Horizontal	3H.6-94	1-H-L	MTCM	4266	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	410	107	D + L + F + H' + T + E'	40	15.6	-	-	-	-	-	-	-
						MCCM	5235	D + L + F + H' + T + E'	-311	471										
						MMAT	5235	D + L + F + H' + T + E'	209	2186										
						MMAC	5235	D + L + F + H' + T + E'	-67	2124										
					2-H-L	MTCM	2297	1.4D + 1.7F + 1.3H + 1.4To	386	546	D + L + F + H' + T + E'	106	10.92	-	-	-	-	-	-	-
						MCCM	3893	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-255	96										
						MMAT	3890	D + L + F + H' + T + E'	128	1469										
						MMAC	3890	D + L + F + H' + T + E'	-7	1413										
					3-H-L	MTCM	2528	1.4D + 1.7F + 1.3H + 1.4To	204	101	D + L + F + H' + T + E'	71	6.24	-	-	-	-	-	-	-
						MCCM	3507	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-346	20										
						MMAT	2494	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	81	801										
						MMAC	5236	D + L + F + H' + T + E'	-59	756										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
UHS Basin East Wall (Cont'd)	6	West (inside)	Horizontal	3H.6-94	4-H-L	MTCM	2327	1.4D + 1.7F + 1.3H + 1.4To	348	247	D + L + F + H' + T + E'	77	9.36	-	-	-	-	-	-	-
						MCCM	2414	D + L + F + H' + T + E'	-128	124										
						MMAT	1980	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	75	885										
						MMAC	1980	1.4D + 1.7F + 1.3H + 1.4To	-65	800										
					5-H-L	MTCM	2693	1.4D + 1.7F + 1.3H + 1.4To	239	164	D + L + F + H' + T + E'	106	6.24	-	-	-	-	-	-	-
						MCCM	2879	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-240	233										
						MMAT	2492	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	58	749										
						MMAC	2492	1.4D + 1.7F + 1.3H + 1.4To	-94	707										
					6-H-L	MTCM	2436	1.4D + 1.7F + 1.3H + 1.4To	341	334	D + L + F + H' + T + E'	106	9.36	-	-	-	-	-	-	-
						MCCM	3933	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-256	74										
						MMAT	2441	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	176	1101										
						MMAC	3935	D + L + F + H' + T + E'	-1	1070										
			Vertical	3H.6-95	1-V-L	MTCM	2328	D + L + F + H' + T + E'	195	173	D + L + F + H' + T + E'	100	4.68	-	-	-	-	-	-	-
						MCCM	2689	D + L + F + H' + T + E'	-338	277										
						MMAT	5208	D + L + F + H' + T + E'	13	546										
						MMAC	5208	D + L + F + H' + T + E'	-4	546										
					2-V-L	MTCM	2349	D + L + F + H' + T + E'	251	166	D + L + F + H' + T + E'	129	6.24	-	-	-	-	-	-	-
						MCCM	2690	D + L + F + H' + T + E'	-375	254										
						MMAT	4267	D + L + F + H' + T + E'	25	1097										
						MMAC	4267	D + L + F + H' + T + E'	-188	1138										
					3-V-L	MTCM	2375	D + L + F + H' + T + E'	266	136	D + L + F + H' + T + E'	128	4.68	-	-	-	-	-	-	-
						MCCM	2707	D + L + F + H' + T + E'	-366	242										
						MMAT	4295	D + L + F + H' + T + E'	20	795										
						MMAC	4295	D + L + F + H' + T + E'	-180	798										
					4-V-L	MTCM	2825	D + L + F + H' + T + E'	232	138	D + L + F + H' + T + E'	129	7.8	-	-	-	-	-	-	-
						MCCM	2832	D + L + F + H' + T + E'	-460	679										
						MMAT	2955	D + L + F + H' + T + E'	9	1176										
						MMAC	2955	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-185	1331										
		-	Transverse (Horizontal and Vertical)	3H.6-96	1-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-9	-33	99	130	0.20	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-39	-2	89	263	0.31	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-204	105	-294	428	1.76	
UHS Basin West Wall	6	West (outside)	Horizontal	3H.6-97	1-H-L	MTCM	5176	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	402	-124	D + L + F + H' + T + E'	37	14.04	-	-	-	-	-	-	-
						MCCM	5171	D + L + F + H' + T + E'	-416	-857										
						MMAT	5177	D + L + F + H' + T + E'	52	-2201										
						MMAC	5177	D + L + F + H' + T + E'	-137	-2201										
					2-H-L	MTCM	4514	1.4D + 1.7F + 1.3H + 1.4To	368	-286	D + L + F + H' + T + E'	64	7.8	-	-	-	-	-	-	-
						MCCM	3477	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-356	-143										
						MMAT	3866	D + L + F + H' + T + E'	32	-864										
						MMAC	3866	D + L + F + H' + T + E'	-275	-909										
					3-H-L	MTCM	2222	1.4D + 1.7F + 1.3H + 1.4To	846	-208	D + L + F + H' + T + E'	117	12.48	-	-	-	-	-	-	(8)
						MCCM	2220	D + L + F + H' + T + E'	-156	-195										
						MMAT	2329	D + L + F + H' + T + E'	240	-517										
						MMAC	2329	D + L + F + H' + T + E'	-113	-416										
					4-H-L	MTCM	1956	1.4D + 1.7F + 1.3H + 1.4To	431	-402	D + L + F + H' + T + E'	117	7.8	-	-	-	-	-	-	-
						MCCM	1953	D + L + F + H' + T + E'	-150	-259										
						MMAT	1923	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	109	-651										
						MMAC	2167	D + L + F + H' + T + E'	-17	-634										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin West Wall (Cont'd)	6	West (outside)	Horizontal	3H.6-97	5-H-L	MTCM	2315	1.4D + 1.7F + 1.3H + 1.4To	466	-360	D + L + F + H' + T + E'	141	7.8	-	-	-	-	-	-	-
						MCCM	2314	D + L + F + H' + T + E'	-271	-337										
						MMAT	2314	D + L + F + H' + T + E'	3	-614										
						MMAC	2314	D + L + F + H' + T + E'	-40	-614										
					6-H-L	MTCM	2582	1.4D + 1.7F + 1.3H + 1.4To	290	-295	D + L + F + H' + T + E'	141	6.24	-	-	-	-	-	-	-
						MCCM	2458	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-214	-44										
						MMAT	1903	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	72	-514										
						MMAC	1903	1.4D + 1.7F + 1.3H + 1.4To	-49	-481										
			Vertical	3H.6-98	1-V-L	MTCM	2219	1.4D + 1.7F + 1.3H + 1.4To	617	-67	D + L + F + H' + T + E'	190	9.36	-	-	-	-	-	-	-
						MCCM	2596	D + L + F + H' + T + E'	-172	-183										
						MMAT	2596	D + L + F + H' + T + E'	73	-904										
						MMAC	2596	D + L + F + H' + T + E'	-32	-904										
					2-V-L	MTCM	2604	D + L + F + H' + T + E'	238	-115	D + L + F + H' + T + E'	133	6.24	-	-	-	-	-	-	-
						MCCM	2406	D + L + F + H' + T + E'	-278	-99										
						MMAT	2604	D + L + F + H' + T + E'	40	-704										
						MMAC	3860	D + L + F + H' + T + E'	-75	-725										
					3-V-L	MTCM	2239	D + L + F + H' + T + E'	284	-236	D + L + F + H' + T + E'	162	7.8	-	-	-	-	-	-	-
						MCCM	2606	D + L + F + H' + T + E'	-379	-150										
						MMAT	2320	D + L + F + H' + T + E'	75	-791										
						MMAC	5170	D + L + F + H' + T + E'	-296	-1069										
					4-V-L	MTCM	2242	D + L + F + H' + T + E'	254	-203	D + L + F + H' + T + E'	151	6.24	-	-	-	-	-	-	-
						MCCM	2607	D + L + F + H' + T + E'	-463	-63										
						MMAT	4263	D + L + F + H' + T + E'	4	-1011										
						MMAC	5176	D + L + F + H' + T + E'	-286	-1036										
					5-V-L	MTCM	2246	D + L + F + H' + T + E'	195	-211	D + L + F + H' + T + E'	116	4.68	-	-	-	-	-	-	-
						MCCM	2612	D + L + F + H' + T + E'	-370	-110										
						MMAT	5184	D + L + F + H' + T + E'	1	-646										
						MMAC	5178	D + L + F + H' + T + E'	-73	-770										
		East (inside)	Horizontal	3H.6-99	1-H-L	MTCM	4262	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	404	132	D + L + F + H' + T + E'	37	15.6	-	-	-	-	-	-	-
						MCCM	5171	D + L + F + H' + T + E'	-416	1733										
						MMAT	5171	D + L + F + H' + T + E'	288	2357										
						MMAC	5171	D + L + F + H' + T + E'	-100	2283										
					2-H-L	MTCM	4515	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	228	128	D + L + F + H' + T + E'	61	7.8	-	-	-	-	-	-	-
						MCCM	3857	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-353	60										
						MMAT	3842	D + L + F + H' + T + E'	108	1263										
						MMAC	3887	D + L + F + H' + T + E'	-73	1233										
					3-H-L	MTCM	2220	1.4D + 1.7F + 1.3H + 1.4To	868	1126	D + L + F + H' + T + E'	120	15.6	-	-	-	-	-	-	(8)
						MCCM	2314	D + L + F + H' + T + E'	-271	402										
						MMAT	2329	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	732	1286										
						MMAC	2329	D + L + F + H' + T + E'	-33	1199										
					4-H-L	MTCM	2236	1.4D + 1.7F + 1.3H + 1.4To	521	332	D + L + F + H' + T + E'	120	10.92	-	-	-	-	-	-	-
						MCCM	2183	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	-226	276										
						MMAT	2293	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	183	1221										
						MMAC	2291	D + L + F + H' + T + E'	-18	854										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin West Wall (Cont'd)	6	East (inside)	Horizontal		5-H-L	MTCM	2311	1.4D + 1.7F + 1.3H + 1.4To	244	275	D + L + F + H' + T + E'	141	6.24	-	-	-	-	-	-	-
						MCCM	2310	D + L + F + H' + T + E'	-193	242										
						MMAT	2310	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	130	729										
						MMAC	2577	D + L + F + H' + T + E'	-2	534										
			Vertical	3H.6-100	1-V-L	MTCM	2219	1.4D + 1.7F + 1.3H + 1.4To	655	61	D + L + F + H' + T + E'	190	10.92	-	-	-	-	-	-	-
						MCCM	2596	D + L + F + H' + T + E'	-172	310										
						MMAT	2596	D + L + F + H' + T + E'	85	775										
						MMAC	2596	D + L + F + H' + T + E'	-21	775										
					2-V-L	MTCM	2237	D + L + F + H' + T + E'	228	144	D + L + F + H' + T + E'	133	4.68	-	-	-	-	-	-	-
						MCCM	2410	D + L + F + H' + T + E'	-247	174										
						MMAT	3848	D + L + F + H' + T + E'	2	380										
						MMAC	5168	D + L + F + H' + T + E'	-79	440										
					3-V-L	MTCM	2239	D + L + F + H' + T + E'	284	145	D + L + F + H' + T + E'	162	7.8	-	-	-	-	-	-	-
						MCCM	5170	D + L + F + H' + T + E'	-315	130										
						MMAT	4235	D + L + F + H' + T + E'	8	1073										
						MMAC	4235	D + L + F + H' + T + E'	-204	1160										
					4-V-L	MTCM	1834	D + L + F + H' + T + E'	220	244	D + L + F + H' + T + E'	83	4.68	-	-	-	-	-	-	-
						MCCM	2173	D + L + F + H' + T + E'	-293	212										
						MMAT	4251	D + L + F + H' + T + E'	2	394										
						MMAC	4239	D + L + F + H' + T + E'	-112	763										
					5-V-L	MTCM	2242	D + L + F + H' + T + E'	254	113	D + L + F + H' + T + E'	151	6.24	-	-	-	-	-	-	-
						MCCM	2455	D + L + F + H' + T + E'	-359	174										
						MMAT	4263	D + L + F + H' + T + E'	25	839										
						MMAC	4263	D + L + F + H' + T + E'	-173	841										
					6-V-L	MTCM	2246	D + L + F + H' + T + E'	195	138	D + L + F + H' + T + E'	116	4.68	-	-	-	-	-	-	-
						MCCM	2456	D + L + F + H' + T + E'	-309	219										
						MMAT	5185	D + L + F + H' + T + E'	7	486										
						MMAC	5179	D + L + F + H' + T + E'	-21	538										
					7-V-L	MTCM	2320	D + L + F + H' + T + E'	255	681	D + L + F + H' + T + E'	162	9.36	-	-	-	-	-	-	-
						MCCM	2607	D + L + F + H' + T + E'	-463	708										
						MMAT	2324	1.4D + 1.7F + 1.3H + 1.4To	24	1235										
						MMAC	2324	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-139	1298										
		-	Transverse (Horizontal and Vertical)	3H.6-101	1-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-10	-73	-100	143	0.20	
					2-T	-	-	-	-	-	-			D + L + F + H' + T + E'	-208	80	-307	306	1.76	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	98	315	71	-73	0.31	
					4-T	-	-	-	-	-	-	-	-	1.4D + 1.7F + 1.3H + 1.4To	-50	600	81	746	0.79	
UHS Basin North-South Buttresses (8)	6	East and West	Horizontal	3H.6-102	1-H-L	MTCM	7788	D + L + F + H' + T + E'	638	-1066	D + L + F + H' + T + E'	331	15.6	-	-	-	-	-	-	(8)
						MCCM	7788	D + L + F + H' + T + E'	-408	-981										
						MMAT	7812	D + L + F + H' + T + E'	350	-1240										
						MMAC	7812	D + L + F + H' + T + E'	-112	-1240										
					2-H-L	MTCM	7417	D + L + F + H' + T + E'	603	-466	D + L + F + H' + T + E'	369	9.36	-	-	-	-	-	-	-
						MCCM	7417	D + L + F + H' + T + E'	-534	-275										
						MMAT	7650	D + L + F + H' + T + E'	188	974										
						MMAC	7650	D + L + F + H' + T + E'	-149	954										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin North-South Buttresses (Cont'd) (8)	6	East and West	Vertical	3H.6-103	1-V-L	MTCM	7424	D + L + F + H' + T + E'	742	-114	D + L + F + H' + T + E'	237	9.36	-	-	-	-	-	-	-
						MCCM	7212	D + L + F + H' + T + E'	-897	103										
						MMAT	7845	D + L + F + H' + T + E'	124	-1010										
						MMAC	7845	D + L + F + H' + T + E'	-122	-1010										
					2-V-L	MTCM	7032	D + L + F + H' + T + E'	991	397	D + L + F + H' + T + E'	237	15.6	-	-	-	-	-	-	(8)
						MCCM	7032	D + L + F + H' + T + E'	-692	412										
						MMAT	7032	D + L + F + H' + T + E'	964	555										
						MMAC	7032	D + L + F + H' + T + E'	-411	555										
		-	Transverse (Horizontal and Vertical)	3H.6-104	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-30	433	-4	47	0.20	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	19	107	68	445	0.31	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	209	138	205	739	1.76	
UHS Basin East-West Buttresses (8)	6	North and South	Horizontal	3H.6-105	1-H-L	MTCM	7674	D + L + F + H' + T + E'	599	274	D + L + F + H' + T + E'	278	9.36	-	-	-	-	-	-	-
						MCCM	7674	D + L + F + H' + T + E'	-1110	-475										
						MMAT	7681	D + L + F + H' + T + E'	246	607										
						MMAC	7681	D + L + F + H' + T + E'	-527	607										
					2-H-L	MTCM	7511	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	166	189	D + L + F + H' + T + E'	243	6.24	-	-	-	-	-	-	-
						MCCM	7491	D + L + F + H' + T + E'	-96	155										
						MMAT	7856	D + L + F + H' + T + E'	116	-486										
						MMAC	7865	D + L + F + H' + T + E'	-42	298										
					3-H-L	MTCM	7066	D + L + F + H' + T + E'	417	-74	D + L + F + H' + T + E'	332	9.36	-	-	-	-	-	-	-
						MCCM	7065	D + L + F + H' + T + E'	-382	114										
						MMAT	7335	D + L + F + H' + T + E'	125	351										
						MMAC	7276	D + L + F + H' + T + E'	-3	-277										
			Vertical	3H.6-106	1-V-L	MTCM	7489	D + L + F + H' + T + E'	418	-98	D + L + F + H' + T + E'	284	6.24	-	-	-	-	-	-	-
						MCCM	7674	D + L + F + H' + T + E'	-692	108										
						MMAT	7489	D + L + F + H' + T + E'	29	-251										
						MMAC	7489	D + L + F + H' + T + E'	-675	-251										
					2-V-L	MTCM	7345	D + L + F + H' + T + E'	674	165	D + L + F + H' + T + E'	284	9.36	-	-	-	-	-	-	-
						MCCM	7289	D + L + F + H' + T + E'	-897	213										
						MMAT	7289	D + L + F + H' + T + E'	251	276										
						MMAC	7289	D + L + F + H' + T + E'	-834	276										
					3-V-L	MTCM	7067	D + L + F + H' + T + E'	974	-421	D + L + F + H' + T + E'	284	15.6	-	-	-	-	-	-	(8)
						MCCM	7065	D + L + F + H' + T + E'	-916	502										
						MMAT	7065	D + L + F + H' + T + E'	626	587										
						MMAC	7065	D + L + F + H' + T + E'	-700	587										
		-	Transverse (Horizontal and Vertical)	3H.6-107	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	22	889	1	35	0.20	
Cooling Tower North and South Walls	2	North (outside of North Wall) and South (outside of South Wall)	Horizontal	3H.6-108	1-H-L	MTCM	1147	D + L + F + H' + T + E'	220	-8	D + L + F + H' + T + E'	31	6.24	-	-	-	-	-	-	-
						MCCM	1127	D + L + F + H' + T + E'	-171	-34										
						MMAT	468	D + L + F + H' + T + E'	77	-169										
						MMAC	468	D + L + F + H' + T + E'	-12	-169										
					BEAM 1	MTCM	-	D + L + F + H' + T + E'	360	-103	D + L + F + H' + T + E'	28	7.49	-	-	-	-	-	-	(8)
						MCCM	-	D + L + F + H' + T + E'	-547	-107										
						MMAT	-	D + L + F + H' + T + E'	99	-239										
						MMAC	-	D + L + F + H' + T + E'	-151	-239										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Cooling Tower North and South Walls (Cont'd)	2	North (outside of North Wall) and South (outside of South Wall)	Vertical	3H.6-109	1-V-L	MTCM	580	D + L + F + H' + T + E'	282	-23	D + L + F + H' + T + E'	87	6.24	-	-	-	-	-	-	-
						MCCM	580	D + L + F + H' + T + E'	-297	-32										
						MMAT	580	D + L + F + H' + T + E'	124	-45										
						MMAC	580	D + L + F + H' + T + E'	-242	-45										
					2-V-L	MTCM	615	D + L + F + H' + T + E'	52	-3	D + L + F + H' + T + E'	59	1.56	-	-	-	-	-	-	-
						MCCM	552	D + L + F + H' + T + E'	-40	-4										
						MMAT	444	D + L + F + H' + T + E'	1	-21										
						MMAC	356	D + L + F + H' + T + E'	-16	-24										
					3-V-L	MTCM	644	D + L + F + H' + T + E'	167	-56	D + L + F + H' + T + E'	59	4.68	-	-	-	-	-	-	-
						MCCM	459	D + L + F + H' + T + E'	-239	-67										
						MMAT	651	D + L + F + H' + T + E'	143	-117										
						MMAC	452	D + L + F + H' + T + E'	-96	-112										
					4-V-L	MTCM	523	D + L + F + H' + T + E'	292	-38	D + L + F + H' + T + E'	92	6.24	-	-	-	-	-	-	-
						MCCM	523	D + L + F + H' + T + E'	-303	-12										
						MMAT	1135	D + L + F + H' + T + E'	285	-39										
						MMAC	1135	D + L + F + H' + T + E'	-88	-39										
		South (inside of North Wall) and North (inside of South Wall)	Horizontal	3H.6-110	1-H-L	MTCM	1147	D + L + F + H' + T + E'	220	18	D + L + F + H' + T + E'	31	4.68	-	-	-	-	-	-	-
						MCCM	1127	D + L + F + H' + T + E'	-171	62										
						MMAT	667	D + L + F + H' + T + E'	48	175										
						MMAC	667	D + L + F + H' + T + E'	-44	175										
					BEAM 1	MTCM	-	D + L + F + H' + T + E'	360	-103	D + L + F + H' + T + E'	28	7.49	-	-	-	-	-	-	(8)
						MCCM	-	D + L + F + H' + T + E'	-547	107										
						MMAT	-	D + L + F + H' + T + E'	99	-239										
						MMAC	-	D + L + F + H' + T + E'	-151	-239										
			Vertical	3H.6-111	1-V-L	MTCM	580	D + L + F + H' + T + E'	282	24	D + L + F + H' + T + E'	87	6.24	-	-	-	-	-	-	-
						MCCM	580	D + L + F + H' + T + E'	-297	44										
						MMAT	1	D + L + F + H' + T + E'	110	48										
						MMAC	1	D + L + F + H' + T + E'	-263	48										
					2-V-L	MTCM	1164	D + L + F + H' + T + E'	54	5	D + L + F + H' + T + E'	59	1.56	-	-	-	-	-	-	-
						MCCM	552	D + L + F + H' + T + E'	-38	3										
						MMAT	795	D + L + F + H' + T + E'	1	22										
						MMAC	683	D + L + F + H' + T + E'	-19	24										
					3-V-L	MTCM	392	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	168	5	D + L + F + H' + T + E'	59	4.68	-	-	-	-	-	-	-
						MCCM	459	D + L + F + H' + T + E'	-239	81										
						MMAT	860	D + L + F + H' + T + E'	108	131										
						MMAC	860	D + L + F + H' + T + E'	-186	136										
					4-V-L	MTCM	523	D + L + F + H' + T + E'	292	47	D + L + F + H' + T + E'	92	6.24	-	-	-	-	-	-	-
						MCCM	523	D + L + F + H' + T + E'	-303	26										
						MMAT	1135	D + L + F + H' + T + E'	249	50										
						MMAC	1135	D + L + F + H' + T + E'	-124	50										
		-	Transverse (Horizontal and Vertical)	3H.6-112	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-2	17	-15	153	0.80	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	34	118	41	178	1.12	
Cooling Tower East Wall	6	East (outside)	Horizontal	3H.6-113	1-H-L	MTCM	289	D + L + F + H' + T + E'	41	-304	D + L + F + H' + T + E'	33	3.12	-	-	-	-	-	-	-
						MCCM	294	D + L + F + H + To + Wt	-60	-19										
						MMAT	273	D + L + F + H' + T + E'	1	-395										
						MMAC	273	D + L + F + H' + T + E'	-42	-395										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number [1]	Reinforcement Zone Number [2]	Maximum Forces [3]	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial [4] (kips / ft)	Flexure [4] (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane [5] Shear (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Cooling Tower East Wall (Cont'd)	6	East (outside)	Horizontal	3H.6-113	2-H-L	MTCM	239	D + L + F + H' + T + E'	143	-481	D + L + F + H' + T + E'	37	9.36	-	-	-	-	-	-	-
						MCCM	231	D + L + F + H' + T + E'	-146	-744										
						MMAT	287	D + L + F + H' + T + E'	26	-1246										
						MMAC	287	D + L + F + H' + T + E'	-103	-1287										
			Vertical	3H.6-114	1-V-L	MTCM	291	D + L + F + H' + T + E'	31	-171	D + L + F + H' + T + E'	118	3.12	-	-	-	-	-	-	-
						MCCM	291	D + L + F + H' + T + E'	-115	-74										
						MMAT	283	D + L + F + H' + T + E'	7	-195										
						MMAC	275	D + L + F + H' + T + E'	-42	-197										
					2-V-L	MTCM	289	D + L + F + H' + T + E'	121	-799	D + L + F + H' + T + E'	118	6.24	-	-	-	-	-	-	-
						MCCM	233	D + L + F + H' + T + E'	-297	-152										
						MMAT	287	D + L + F + H' + T + E'	1	-1099										
						MMAC	287	D + L + F + H' + T + E'	-197	-1110										
		West (inside)	Horizontal	3H.6-115	1-H-L	MTCM	270	D + L + F + H' + T + E'	39	189	D + L + F + H' + T + E'	33	3.12	-	-	-	-	-	-	-
						MCCM	233	D + L + F + H' + T + E'	-62	256										
						MMAT	289	D + L + F + H' + T + E'	3	295										
						MMAC	289	D + L + F + H' + T + E'	-61	295										
					2-H-L	MTCM	239	D + L + F + H' + T + E'	143	343	D + L + F + H' + T + E'	37	9.36	-	-	-	-	-	-	-
						MCCM	231	D + L + F + H' + T + E'	-146	239										
						MMAT	231	D + L + F + H' + T + E'	126	1397										
						MMAC	231	D + L + F + H' + T + E'	-9	1394										
			Vertical	3H.6-116	1-V-L	MTCM	291	D + L + F + H' + T + E'	31	151	D + L + F + H' + T + E'	118	3.12	-	-	-	-	-	-	-
						MCCM	235	D + L + F + H' + T + E'	-120	71										
						MMAT	283	D + L + F + H' + T + E'	3	243										
						MMAC	275	D + L + F + H' + T + E'	-35	288										
					2-V-L	MTCM	289	D + L + F + H' + T + E'	121	486	D + L + F + H' + T + E'	118	6.24	-	-	-	-	-	-	-
						MCCM	233	D + L + F + H' + T + E'	-297	309										
						MMAT	231	D + L + F + H' + T + E'	6	1173										
						MMAC	232	D + L + F + H' + T + E'	-160	1212										
		-	Transverse (Horizontal and Vertical)	3H.6-116A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	177	-75	125	5	0.60	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-131	239	-32	43	0.44	
Cooling Tower West Wall	6	West (outside)	Horizontal	3H.6-117	1-H-L	MTCM	193	D + L + F + H' + T + E'	42	-266	D + L + F + H' + T + E'	31	3.12	-	-	-	-	-	-	-
						MCCM	225	D + L + F + H + To + Wt	-60	-23										
						MMAT	204	D + L + F + H' + T + E'	6	-388										
						MMAC	204	D + L + F + H' + T + E'	-49	-391										
					2-H-L	MTCM	210	D + L + F + H' + T + E'	133	-283	D + L + F + H' + T + E'	35	7.8	-	-	-	-	-	-	-
						MCCM	29	D + L + F + H' + T + E'	-172	-706										
						MMAT	218	D + L + F + H' + T + E'	10	-1296										
						MMAC	218	D + L + F + H' + T + E'	-117	-1306										
			Vertical	3H.6-118	1-V-L	MTCM	222	D + L + F + H' + T + E'	35	-173	D + L + F + H' + T + E'	112	3.12	-	-	-	-	-	-	-
						MCCM	222	D + L + F + H' + T + E'	-118	-53										
						MMAT	214	D + L + F + H' + T + E'	7	-198										
						MMAC	206	D + L + F + H' + T + E'	-45	-200										
					2-V-L	MTCM	220	D + L + F + H' + T + E'	123	-770	D + L + F + H' + T + E'	112	6.24	-	-	-	-	-	-	-
						MCCM	220	D + L + F + H' + T + E'	-295	-148										
						MMAT	218	D + L + F + H' + T + E'	8	-1083										
						MMAC	218	D + L + F + H' + T + E'	-193	-1094										

Table 3H.6-7: Results of UHS/RSW Pump House Concrete Wall Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
Cooling Tower West Wall (Cont'd)	6	East (inside)	Horizontal	3H.6-119	1-H-L	MTCM	193	D + L + F + H' + T + E'	42	228	D + L + F + H' + T + E'	31	3.12	-	-	-	-	-	-	-
						MCCM	220	D + L + F + H' + T + E'	-62	299										
						MMAT	220	D + L + F + H' + T + E'	3	299										
						MMAC	220	D + L + F + H' + T + E'	-62	299										
					2-H-L	MTCM	210	D + L + F + H' + T + E'	133	139	D + L + F + H' + T + E'	35	7.8	-	-	-	-	-	-	-
						MCCM	29	D + L + F + H' + T + E'	-172	979										
						MMAT	29	D + L + F + H' + T + E'	94	1484										
						MMAC	29	D + L + F + H' + T + E'	-16	1484										
			Vertical	3H.6-120	1-V-L	MTCM	222	D + L + F + H' + T + E'	35	164	D + L + F + H' + T + E'	112	3.12	-	-	-	-	-	-	-
						MCCM	33	D + L + F + H' + T + E'	-119	56										
						MMAT	214	D + L + F + H' + T + E'	3	248										
						MMAC	206	D + L + F + H' + T + E'	-37	280										
					2-V-L	MTCM	220	D + L + F + H' + T + E'	123	544	D + L + F + H' + T + E'	112	6.24	-	-	-	-	-	-	-
						MCCM	220	D + L + F + H' + T + E'	-295	421										
						MMAT	29	D + L + F + H' + T + E'	7	1187										
						MMAC	30	D + L + F + H' + T + E'	-166	1251										
		-	Transverse (Horizontal and Vertical)	3H.6-120A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	177	-70	124	5	0.60	
					2-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-123	239	-42	40	0.31	
Cooling Tower Internal Wall	2	East and West	Horizontal	3H.6-121	1-H-L	MTCM	2427	D + L + F + H' + T + E'	83	-116	D + L + F + H' + T + E'	30	3.12	-	-	-	-	-	-	-
						MCCM	1387	D + L + F + H + To + Wt	-117	-11										
						MMAT	2427	D + L + F + H' + T + E'	19	-139										
						MMAC	2427	D + L + F + H' + T + E'	-9	-139										
					2-H-L	MTCM	2633	D + L + F + H' + T + E'	378	89	D + L + F + H' + T + E'	44	6.24	-	-	-	-	-	-	(8)
						MCCM	2633	D + L + F + H' + T + E'	-232	-90										
						MMAT	2426	D + L + F + H' + T + E'	61	-125										
						MMAC	2426	D + L + F + H' + T + E'	-4	-125										
			Vertical	3H.6-122	1-V-L	MTCM	2428	D + L + F + H' + T + E'	31	23	D + L + F + H' + T + E'	44	1.56	-	-	-	-	-	-	-
						MCCM	2428	D + L + F + H' + T + E'	-67	-20										
						MMAT	2451	D + L + F + H' + T + E'	2	-64										
						MMAC	1568	D + L + F + H' + T + E'	-40	-66										
					2-V-L	MTCM	2587	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	211	2	D + L + F + H' + T + E'	44	4.68	-	-	-	-	-	-	-
						MCCM	2633	D + L + F + H' + T + E'	-220	-54										
						MMAT	1520	D + L + F + H' + T + E'	31	-147										
						MMAC	1520	D + L + F + H' + T + E'	-63	-147										
		-	Transverse (Horizontal and Vertical)	3H.6-122A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	15	128	11	270	0.80	

Notes:

(1) The reinforcement layout drawings show the various zones used to define the minimum reinforcement that will be provided based on finite element analysis results. Actual provided reinforcement based on final rebar layout may exceed the reported provided reinforcement and the zones with higher reinforcement may be extended beyond their reported boundaries.

(2) Each reinforcement layout drawing is divided into reinforcement zones. The reinforcement zone naming convention is as follows: "H" = horizontal, "V" = vertical, "L" = longitudinal reinforcement, "T" = transverse reinforcement.

(3) The maximum tension (MTCM) and compression (MCCM) axial forces are provided with the corresponding moment from the same load combination. The maximum moment that has a corresponding tension (MMAT) in the same load combination and the maximum moment that has a corresponding compression (MMAC) in the same load combination are also provided. For zones where either axial tension or axial compression does not occur for any load combination, dashes are input into the corresponding cell.

(4) Negative axial load is compression and positive axial load is tension. Negative moment applies tension to the top face of the shell element and positive moment applies tension to the bottom face of the shell element.

(5) The reported in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

(6) NOT USED.

(7) The Pump House Operating Floor and Roof slab thickness includes the metal decking (2.5 inches).

(8) For certain areas of the structure, the standard element post-processing methods were too conservative. For such cases, detailed manual design was performed and the design forces determined by the detailed manual design are provided in the table.

(9) The transverse reinforcement for the UHS Basin and RSW Pump House Buttresses is spaced with a maximum center-to-center spacing of 4".

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
Pump House Foundation Mat	10	Top	East-West	3H.6-123	1-H-L	MTCM	9644	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	330	-17	D + L + F + H' + T + E'	33	7.8	-	-	-	-	-	-	-
						MCCM	9637	D + L + F + H' + T + E'	-95	-79										
						MMAT	13467	D + L + F + H' + T + E'	7	-950										
						MMAC	13467	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-16	-1027										
					2-H-L	MTCM	13481	D + L + F + H' + T + E'	227	-30	D + L + F + H' + T + E'	138	6.24	-	-	-	-	-	-	-
						MCCM	13549	D + L + F + H' + T + E'	-181	-175										
						MMAT	10584	1.4D + 1.4F + 1.7H + 1.7W	1	-776										
						MMAC	10553	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-104	-1213										
			North-South	3H.6-124	1-V-L	MTCM	13535	D + L + F + H' + T + E'	303	-113	D + L + F + H' + T + E'	35	7.8	-	-	-	-	-	-	-
						MCCM	13490	D + L + F + H' + T + E'	-135	-39										
						MMAT	13467	D + L + F + H' + T + E'	10	-1256										
						MMAC	13467	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-31	-1355										
					2-V-L	MTCM	9651	D + L + F + H' + T + E'	40	-265	D + L + F + H' + T + E'	124	6.24	-	-	-	-	-	-	-
						MCCM	9659	D + L + F + H' + T + E'	-197	-206										
						MMAT	9614	D + L + F + H' + T + E'	9	-953										
						MMAC	9614	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-23	-1101										
					3-V-L	MTCM	13550	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	318	-102	D + L + F + H' + T + E'	50	7.8	-	-	-	-	-	-	-
						MCCM	13470	D + L + F + H' + T + E'	-155	-434										
						MMAT	13470	D + L + F + H' + T + E'	16	-817										
						MMAC	13470	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-41	-1046										
		Bottom	East-West	3H.6-125	1-H-L	MTCM	9645	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	373	142	D + L + F + H' + T + E'	33	7.8	-	-	-	-	-	-	-
						MCCM	9637	D + L + F + H' + T + E'	-79	23										
						MMAT	13470	1.4D + 1.4F + 1.7H + 1.7W	15	1047										
						MMAC	13470	D + L + F + H' + T + E'	-24	938										
					2-H-L	MTCM	10645	D + L + F + H' + T + E'	64	357	D + L + F + H' + T + E'	53	6.24	-	-	-	-	-	-	-
						MCCM	13549	D + L + F + H' + T + E'	-181	377										
						MMAT	10633	1.4D + 1.4F + 1.7H + 1.7W	0	1068										
						MMAC	10633	D + L + F + H' + T + E'	-150	1935										
					3-H-L	MTCM	13564	D + L + F + H' + T + E'	74	519	D + L + F + H' + T + E'	97	7.8	-	-	-	-	-	-	-
						MCCM	10617	D + L + F + H' + T + E'	-199	2116										
						MMAT	10615	1.4D + 1.4F + 1.7H + 1.7W	0	1399										
						MMAC	10617	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-164	2525										
					4-H-L	MTCM	10776	D + L + F + H' + T + E'	61	484	D + L + F + H' + T + E'	115	6.24	-	-	-	-	-	-	-
						MCCM	10699	D + L + F + H' + T + E'	-154	123										
						MMAT	10833	1.4D + 1.4F + 1.7H + 1.7W	1	1113										
						MMAC	10833	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-130	1927										
					5-H-L	MTCM	13481	D + L + F + H' + T + E'	227	288	D + L + F + H' + T + E'	138	7.8	-	-	-	-	-	-	-
						MCCM	10695	D + L + F + H' + T + E'	-113	67										
						MMAT	13646	D + L + F + H' + T + E'	132	926										
						MMAC	13646	1.4D + 1.4F + 1.7H + 1.7W	-8	1191										
			North-South	3H.6-126	1-V-L	MTCM	13535	D + L + F + H' + T + E'	303	200	D + L + F + H' + T + E'	35	7.8	-	-	-	-	-	-	-
						MCCM	13490	D + L + F + H' + T + E'	-136	135										
						MMAT	13549	D + L + F + H' + T + E'	225	621										
						MMAC	13467	1.4D + 1.4F + 1.7H + 1.7W	-54	685										
					2-V-L	MTCM	10517	D + L + F + H' + T + E'	62	449	D + L + F + H' + T + E'	124	6.24	-	-	-	-	-	-	-
						MCCM	9659	D + L + F + H' + T + E'	-197	282										
						MMAT	10775	D + L + F + H' + T + E'	1	915										
						MMAC	10791	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-143	1959										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads					Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads					Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
								Axial and Flexure Loads			In-Plane Shear Loads			Load Combination	Horizontal Section		Vertical Section			
								Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	Load Combination	In-plane (5) Shear (kips / ft)			Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)	Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)		
Pump House Foundation Mat (Cont'd)	10	Bottom	North-South	3H.6-126	3-V-L	MTCM	13552	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	315	288	D + L + F + H' + T + E'	50	7.8	-	-	-	-	-	-	-
						MCCM	13470	D + L + F + H' + T + E'	-155	965										
						MMAT	13470	D + L + F + H' + T + E'	9	892										
						MMAC	13470	1.4D + 1.4F + 1.7H + 1.7W	-65	1192										
		-	Transverse (East-West and North-South)	3H.6-126A	1-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-155	-37	199	-31	0.31	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	254	-147	-6	-35	0.2	
Pump House Floor EL. 15'-2" (7)	1.75	Top	East-West	3H.6-127	1-H-L	MTCM	13046	D + L + F + H' + T + E'	49	-16	D + L + F + H' + T + E'	98	3.81	-	-	-	-	-	-	-
						MCCM	13105	D + L + F + H' + T + E'	-332	-1										
						MMAT	12434	1.4D + 1.4F + 1.7H + 1.7W	4	-64										
						MMAC	12434	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-34	-68										
			North-South	3H.6-128	1-V-L	MTCM	13129	D + L + F + H' + T + E'	31	-3	D + L + F + H' + T + E'	87	2.54	-	-	-	-	-	-	-
						MCCM	12660	D + L + F + H' + T + E'	-294	-6										
						MMAT	12389	1.4D + 1.4F + 1.7H + 1.7W	0	-32										
						MMAC	13046	D + L + F + H' + T + E'	-126	-36										
		Bottom	East-West	3H.6-129	1-H-L	MTCM	12649	D + L + F + H (Internal Flood)	74	7	D + L + F + H' + T + E'	98	2.54	-	-	-	-	-	-	-
						MCCM	13105	D + L + F + H' + T + E'	-332	0										
						MMAT	12907	1.4D + 1.4F + 1.7H + 1.7W	1	18										
						MMAC	12970	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-42	19										
			North-South	3H.6-130	1-V-L	MTCM	13129	D + L + F + H' + T + E'	31	5	D + L + F + H' + T + E'	87	2.54	-	-	-	-	-	-	-
						MCCM	12660	D + L + F + H' + T + E'	-294	4										
						MMAT	13052	D + L + F + H (Internal Flood)	1	15										
						MMAC	13052	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-103	25										
UHS Basin Foundation Mat	10	Top	East-West	3H.6-131	1-H-L	MTCM	13149	D + L + F + H' + T + E'	381	-399	D + L + F + H' + T + E'	187	8	-	-	-	-	-	-	-
						MCCM	13149	D + L + F + H' + T + E'	-281	-241										
						MMAT	13149	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	42	-1286										
						MMAC	13147	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-80	-1134										
					2-H-L	MTCM	13197	1.4D + 1.7F + 1.3H + 1.4To	926	-377	D + L + F + H' + T + E'	63	16	-	-	-	-	-	-	(8)
						MCCM	13251	D + L + F + H' + T + E'	-701	-1499										
						MMAT	13251	D + L + F + H' + T + E'	402	-2467										
						MMAC	13251	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-93	-2443										
					3-H-L	MTCM	11989	1.4D + 1.7F + 1.3H + 1.4To	562	-572	D + L + F + H' + T + E'	101	12	-	-	-	-	-	-	-
						MCCM	12117	D + L + F + H' + T + E'	-858	-542										
						MMAT	11319	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	77	-3055										
						MMAC	11319	D + L + F + H' + T + E'	-17	-3014										
					4-H-L	MTCM	11961	1.4D + 1.7F + 1.3H + 1.4To	447	-1446	D + L + F + H' + T + E'	104	16	-	-	-	-	-	-	-
						MCCM	12124	D + L + F + H' + T + E'	-229	-351										
						MMAT	11317	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	166	-4436										
						MMAC	11317	D + L + F + H' + T + E'	-44	-3565										
					5-H-L	MTCM	11465	1.4D + 1.7F + 1.3H + 1.4To	200	-880	D + L + F + H' + T + E'	104	8	-	-	-	-	-	-	-
						MCCM	11467	D + L + F + H' + T + E'	-112	-121										
						MMAT	11463	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	171	-1140										
						MMAC	11933	D + L + F + H' + T + E'	-25	-979										
					6-H-L	MTCM	11958	1.4D + 1.7F + 1.3H + 1.4To	662	-2670	D + L + F + H' + T + E'	104	24	-	-	-	-	-	-	-
						MCCM	11958	D + L + F + H' + T + E'	-310	-1252										
						MMAT	11958	D + L + F + H' + T + E'	410	-4583										
						MMAC	11958	D + L + F + H' + T + E'	-17	-4200										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin Foundation Mat (Cont'd)	10	Top	East-West	3H.6-131	7-H-L	MTCM	11511	1.4D + 1.7F + 1.3H + 1.4To	344	-1199	D + L + F + H' + T + E'	78	16	-	-	-	-	-	-	-
						MCCM	11511	D + L + F + H' + T + E'	-146	-724										
						MMAT	11500	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	187	-2818										
						MMAC	11510	D + L + F + H' + T + E'	-9	-2432										
					8-H-L	MTCM	11764	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	534	-3021	D + L + F + H' + T + E'	77	24	-	-	-	-	-	-	-
						MCCM	11764	D + L + F + H' + T + E'	-307	-1268										
						MMAT	11764	D + L + F + H' + T + E'	337	-4002										
						MMAC	11764	D + L + F + H' + T + E'	-19	-3665										
					9-H-L	MTCM	11539	1.4D + 1.7F + 1.3H + 1.4To	247	-502	D + L + F + H' + T + E'	104	8	-	-	-	-	-	-	-
						MCCM	10977	D + L + F + H' + T + E'	-172	-508										
						MMAT	10971	D + L + F + H' + T + E'	90	-1467										
						MMAC	10971	D + L + F + H' + T + E'	-49	-1467										
					10-H-L	MTCM	11407	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	538	-3374	D + L + F + H' + T + E'	104	24	-	-	-	-	-	-	-
						MCCM	11407	D + L + F + H' + T + E'	-340	-1048										
						MMAT	11407	D + L + F + H' + T + E'	335	-4724										
						MMAC	11407	D + L + F + H' + T + E'	-10	-4724										
					11-H-L	MTCM	11004	1.4D + 1.7F + 1.3H + 1.4To	233	-745	D + L + F + H' + T + E'	77	12	-	-	-	-	-	-	-
						MCCM	11004	D + L + F + H' + T + E'	-160	-918										
						MMAT	11005	D + L + F + H' + T + E'	101	-2779										
						MMAC	11005	D + L + F + H' + T + E'	-2	-2616										
					12-H-L	MTCM	11245	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	505	-3592	D + L + F + H' + T + E'	77	24	-	-	-	-	-	-	-
						MCCM	11245	D + L + F + H' + T + E'	-310	-1643										
						MMAT	11245	D + L + F + H' + T + E'	326	-4418										
						MMAC	11245	D + L + F + H' + T + E'	-4	-4418										
					13-H-L	MTCM	11050	1.4D + 1.7F + 1.3H + 1.4To	190	-731	D + L + F + H' + T + E'	104	8	-	-	-	-	-	-	-
						MCCM	11048	D + L + F + H' + T + E'	-118	-343										
						MMAT	11050	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	187	-1179										
						MMAC	11048	D + L + F + H' + T + E'	-6	-986										
					14-H-L	MTCM	11776	1.4D + 1.7F + 1.3H + 1.4To	262	-1079	D + L + F + H' + T + E'	72	16	-	-	-	-	-	-	-
						MCCM	11776	D + L + F + H' + T + E'	-127	-643										
						MMAT	11854	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	209	-3554										
						MMAC	11158	D + L + F + H' + T + E'	-4	-2709										
					15-H-L	MTCM	11771	1.4D + 1.7F + 1.3H + 1.4To	174	-178	D + L + F + H' + T + E'	69	8	-	-	-	-	-	-	-
						MCCM	11718	D + L + F + H' + T + E'	-114	-569										
						MMAT	11773	D + L + F + H' + T + E'	58	-1791										
						MMAC	11773	D + L + F + H' + T + E'	-5	-1791										
					16-H-L	MTCM	11914	1.4D + 1.7F + 1.3H + 1.4To	244	-538	D + L + F + H' + T + E'	69	12	-	-	-	-	-	-	-
						MCCM	11139	D + L + F + H' + T + E'	-105	-137										
						MMAT	11852	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	103	-2315										
						MMAC	11156	D + L + F + H' + T + E'	-5	-1943										
					17-H-L	MTCM	11157	1.4D + 1.7F + 1.3H + 1.4To	164	-705	D + L + F + H' + T + E'	69	8	-	-	-	-	-	-	-
						MCCM	11205	D + L + F + H' + T + E'	-98	-81										
						MMAT	11157	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	66	-1269										
						MMAC	11205	D + L + F + H' + T + E'	-24	-1222										
					18-H-L	MTCM	11225	1.4D + 1.7F + 1.3H + 1.4To	232	-751	D + L + F + H' + T + E'	72	12	-	-	-	-	-	-	-
						MCCM	11263	D + L + F + H' + T + E'	-165	-756										
						MMAT	11222	D + L + F + H' + T + E'	106	-2950										
						MMAC	11222	D + L + F + H' + T + E'	-9	-2868										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
UHS Basin Foundation Mat (Cont'd)	10	Top	East-West	3H.6-131	19-H-L	MTCM	11635	1.4D + 1.7F + 1.3H + 1.4To	930	-199	D + L + F + H' + T + E'	21	16	-	-	-	-	-	-	-
						MCCM	10961	D + L + F + H' + T + E'	-674	-88										
						MMAT	11041	1.4D + 1.7F + 1.3H + 1.4To	442	-966										
						MMAC	11041	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-100	-1191										
			North-South	3H.6-132	1-V-L	MTCM	4577	1.4D + 1.7F + 1.3H + 1.4To	899	-105	D + L + F + H' + T + E'	39	16	-	-	-	-	-	-	-
						MCCM	8336	D + L + F + H' + T + E'	-740	-67										
						MMAT	13146	D + L + F + H' + T + E'	125	-1388										
						MMAC	13146	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-648	-1840										
					2-V-L	MTCM	11956	1.4D + 1.4F + 1.7H + 1.7W	213	-40	D + L + F + H' + T + E'	51	8	-	-	-	-	-	-	-
						MCCM	11940	D + L + F + H' + T + E'	-179	-950										
						MMAT	11944	D + L + F + H' + T + E'	94	-1261										
						MMAC	11746	D + L + F + H' + T + E'	-36	-1236										
					3-V-L	MTCM	13246	D + L + F + H' + T + E'	250	-523	D + L + F + H' + T + E'	184	8	-	-	-	-	-	-	-
						MCCM	13246	D + L + F + H' + T + E'	-539	-748										
						MMAT	13246	D + L + F + H' + T + E'	53	-1003										
						MMAC	13246	D + L + F + H' + T + E'	-150	-1003										
					4-V-L	MTCM	12085	1.4D + 1.4F + 1.7H + 1.7W	261	-341	D + L + F + H' + T + E'	184	8	-	-	-	-	-	-	-
						MCCM	12117	D + L + F + H' + T + E'	-304	-780										
						MMAT	12097	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	95	-1609										
						MMAC	12117	1.4D + 1.7F + 1.3H + 1.4To	-186	-1592										
					5-V-L	MTCM	12060	1.4D + 1.4F + 1.7H + 1.7W	552	-2087	D + L + F + H' + T + E'	117	16	-	-	-	-	-	-	-
						MCCM	12060	D + L + F + H' + T + E'	-450	-629										
						MMAT	12060	D + L + F + H' + T + E'	262	-2862										
						MMAC	12060	D + L + F + H' + T + E'	-22	-2756										
					6-V-L	MTCM	12109	1.4D + 1.4F + 1.7H + 1.7W	494	-2535	D + L + F + H' + T + E'	184	24	-	-	-	-	-	-	-
						MCCM	12109	D + L + F + H' + T + E'	-475	-724										
						MMAT	12109	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	398	-3394										
						MMAC	12109	D + L + F + H' + T + E'	-6	-3043										
					7-V-L	MTCM	11317	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	696	-4489	D + L + F + H' + T + E'	148	24	-	-	-	-	-	-	-
						MCCM	11332	D + L + F + H' + T + E'	-322	-512										
						MMAT	11317	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	696	-4489										
						MMAC	11317	D + L + F + H' + T + E'	-3	-3949										
					8-V-L	MTCM	11395	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	274	-1481	D + L + F + H' + T + E'	60	16	-	-	-	-	-	-	-
						MCCM	11393	D + L + F + H' + T + E'	-158	-771										
						MMAT	11245	D + L + F + H' + T + E'	99	-3775										
						MMAC	11407	D + L + F + H' + T + E'	-2	-3520										
					9-V-L	MTCM	11776	1.4D + 1.7F + 1.3H + 1.4To	257	-1507	D + L + F + H' + T + E'	61	16	-	-	-	-	-	-	-
						MCCM	11974	D + L + F + H' + T + E'	-191	-231										
						MMAT	11958	D + L + F + H' + T + E'	133	-3670										
						MMAC	11958	D + L + F + H' + T + E'	-54	-3326										
					10-V-L	MTCM	11794	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	324	-824	D + L + F + H' + T + E'	88	12	-	-	-	-	-	-	-
						MCCM	11975	D + L + F + H' + T + E'	-211	-36										
						MMAT	11779	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	274	-2157										
						MMAC	11779	D + L + F + H' + T + E'	-24	-1771										
					11-V-L	MTCM	11775	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	520	-2762	D + L + F + H' + T + E'	88	24	-	-	-	-	-	-	-
						MCCM	11775	D + L + F + H' + T + E'	-282	-590										
						MMAT	11790	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	494	-3795										
						MMAC	11775	D + L + F + H' + T + E'	-22	-3398										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads					Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads					Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
								Axial and Flexure Loads			In-Plane Shear Loads				Horizontal Section		Vertical Section			
								Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	Load Combination	In-plane Shear (5) (kips / ft)		Load Combination	Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)	Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)		
UHS Basin Foundation Mat (Cont'd)	10	Top	North-South	3H.6-132	12-V-L	MTCM	11602	1.4D + 1.4F + 1.7H + 1.7W	251	-245	D + L + F + H' + T + E'	67	8	-	-	-	-	-	-	-
						MCCM	11608	D + L + F + H' + T + E'	-202	-52										
						MMAT	11602	D + L + F + H' + T + E'	65	-953										
						MMAC	11602	D + L + F + H' + T + E'	-81	-953										
					13-V-L	MTCM	11842	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	342	-1802	D + L + F + H' + T + E'	67	16	-	-	-	-	-	-	-
						MCCM	11842	D + L + F + H' + T + E'	-173	-432										
						MMAT	11838	D + L + F + H' + T + E'	95	-2785										
						MMAC	11838	D + L + F + H' + T + E'	-8	-2785										
					14-V-L	MTCM	11858	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	447	-474	D + L + F + H' + T + E'	117	16	-	-	-	-	-	-	-
						MCCM	12054	D + L + F + H' + T + E'	-231	-43										
						MMAT	11858	D + L + F + H' + T + E'	161	-2066										
						MMAC	11858	D + L + F + H' + T + E'	-30	-2066										
					15-V-L	MTCM	11854	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	687	-5307	D + L + F + H' + T + E'	117	28	-	-	-	-	-	-	-
						MCCM	11839	D + L + F + H' + T + E'	-303	-311										
						MMAT	11854	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	675	-5331										
						MMAC	11839	D + L + F + H' + T + E'	-4	-3967										
					16-V-L	MTCM	11311	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	330	-343	D + L + F + H' + T + E'	184	8	-	-	-	-	-	-	-
						MCCM	12118	D + L + F + H' + T + E'	-264	-43										
						MMAT	10846	D + L + F + H' + T + E'	75	-992										
						MMAC	11702	D + L + F + H' + T + E'	-121	-1085										
					17-V-L	MTCM	11859	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	354	-1316	D + L + F + H' + T + E'	96	16	-	-	-	-	-	-	-
						MCCM	11861	D + L + F + H' + T + E'	-177	-326										
						MMAT	11855	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	227	-3419										
						MMAC	11855	D + L + F + H' + T + E'	-4	-3071										
					18-V-L	MTCM	11918	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	724	-5436	D + L + F + H' + T + E'	184	28	-	-	-	-	-	-	-
						MCCM	11903	D + L + F + H' + T + E'	-307	-559										
						MMAT	11918	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	720	-5506										
						MMAC	11903	D + L + F + H' + T + E'	-3	-4321										
					19-V-L	MTCM	11326	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	361	-686	D + L + F + H' + T + E'	120	12	-	-	-	-	-	-	-
						MCCM	11326	D + L + F + H' + T + E'	-176	-159										
						MMAT	11390	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	260	-1488										
						MMAC	10996	D + L + F + H' + T + E'	-21	-1322										
					20-V-L	MTCM	10922	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	308	-419	D + L + F + H' + T + E'	96	12	-	-	-	-	-	-	-
						MCCM	11210	D + L + F + H' + T + E'	-124	-648										
						MMAT	11206	D + L + F + H' + T + E'	107	-2552										
						MMAC	11206	D + L + F + H' + T + E'	0	-2085										
					21-V-L	MTCM	11222	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	524	-2690	D + L + F + H' + T + E'	85	24	-	-	-	-	-	-	-
						MCCM	11222	D + L + F + H' + T + E'	-262	-1058										
						MMAT	11222	D + L + F + H' + T + E'	308	-3746										
						MMAC	11222	D + L + F + H' + T + E'	-16	-3617										
					22-V-L	MTCM	11801	1.4D + 1.7F + 1.3H + 1.4To	192	-884	D + L + F + H' + T + E'	184	8	-	-	-	-	-	-	-
						MCCM	11880	D + L + F + H' + T + E'	-91	-215										
						MMAT	11248	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	71	-1393										
						MMAC	11737	D + L + F + H' + T + E'	-3	-1024										
					23-V-L	MTCM	11423	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	171	-242	D + L + F + H' + T + E'	42	8	-	-	-	-	-	-	-
						MCCM	11263	D + L + F + H' + T + E'	-158	-822										
						MMAT	11253	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	3	-1518										
						MMAC	11251	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-2	-1482										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
UHS Basin Foundation Mat (Cont'd)	10	Top	North-South	3H.6-132	24-V-L	MTCM	5064	1.4D + 1.7F + 1.3H + 1.4To	856	-118	D + L + F + H' + T + E'	29	16	-	-	-	-	-	-	-
						MCCM	5041	D + L + F + H' + T + E'	-647	-76										
						MMAT	8318	1.4D + 1.7F + 1.3H + 1.4To	427	-1051										
						MMAC	8318	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-109	-1322										
		Bottom	East-West	3H.6-133	1-H-L	MTCM	13149	D + L + F + H' + T + E'	381	843	D + L + F + H' + T + E'	187	12	-	-	-	-	-	-	-
						MCCM	13149	D + L + F + H' + T + E'	-281	564										
						MMAT	13149	D + L + F + H' + T + E'	250	1101										
						MMAC	8344	1.4D + 1.4F + 1.7H + 1.7W	-10	919										
					2-H-L	MTCM	13205	1.4D + 1.7F + 1.3H + 1.4To	936	447	D + L + F + H' + T + E'	63	16	-	-	-	-	-	-	(8)
						MCCM	13251	D + L + F + H' + T + E'	-701	606										
						MMAT	13150	1.4D + 1.4F + 1.7H + 1.7W	23	1666										
						MMAC	13150	1.4D + 1.7F + 1.3H + 1.4To	-74	1537										
					3-H-L	MTCM	12004	1.4D + 1.7F + 1.3H + 1.4To	585	74	D + L + F + H' + T + E'	104	12	-	-	-	-	-	-	-
						MCCM	12117	D + L + F + H' + T + E'	-858	600										
						MMAT	11981	D + L + F + H' + T + E'	13	2884										
						MMAC	11981	D + L + F + H' + T + E'	-86	2884										
					4-H-L	MTCM	11325	1.4D + 1.7F + 1.3H + 1.4To	201	651	D + L + F + H' + T + E'	101	8	-	-	-	-	-	-	-
						MCCM	12130	D + L + F + H' + T + E'	-237	109										
						MMAT	8549	1.4D + 1.4F + 1.7H + 1.7W	33	1417										
						MMAC	8549	1.4D + 1.7F + 1.3H + 1.4To	-70	1320										
					5-H-L	MTCM	12123	1.4D + 1.7F + 1.3H + 1.4To	229	665	D + L + F + H' + T + E'	104	12	-	-	-	-	-	-	-
						MCCM	12124	D + L + F + H' + T + E'	-230	1608										
						MMAT	11317	D + L + F + H' + T + E'	14	2464										
						MMAC	11317	D + L + F + H' + T + E'	-69	2464										
					6-H-L	MTCM	11464	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	197	210	D + L + F + H' + T + E'	104	8	-	-	-	-	-	-	-
						MCCM	11486	D + L + F + H' + T + E'	-113	509										
						MMAT	11944	D + L + F + H' + T + E'	26	1268										
						MMAC	11944	D + L + F + H' + T + E'	-29	1268										
					7-H-L	MTCM	11958	D + L + F + H' + T + E'	429	947	D + L + F + H' + T + E'	104	16	-	-	-	-	-	-	-
						MCCM	11958	D + L + F + H' + T + E'	-310	2798										
						MMAT	11958	D + L + F + H' + T + E'	223	3328										
						MMAC	11958	D + L + F + H' + T + E'	-102	3328										
					8-H-L	MTCM	11531	1.4D + 1.7F + 1.3H + 1.4To	337	278	D + L + F + H' + T + E'	78	12	-	-	-	-	-	-	-
						MCCM	11511	D + L + F + H' + T + E'	-146	1171										
						MMAT	11546	D + L + F + H' + T + E'	60	2167										
						MMAC	11546	D + L + F + H' + T + E'	-57	2167										
					9-H-L	MTCM	11764	D + L + F + H' + T + E'	345	1776	D + L + F + H' + T + E'	77	16	-	-	-	-	-	-	-
						MCCM	11764	D + L + F + H' + T + E'	-307	2660										
						MMAT	11764	D + L + F + H' + T + E'	229	3272										
						MMAC	11764	D + L + F + H' + T + E'	-82	3272										
					10-H-L	MTCM	11775	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	210	1506	D + L + F + H' + T + E'	72	12	-	-	-	-	-	-	-
						MCCM	11763	D + L + F + H' + T + E'	-170	1119										
						MMAT	11762	D + L + F + H' + T + E'	87	2273										
						MMAC	11762	D + L + F + H' + T + E'	-11	2273										
					11-H-L	MTCM	11993	1.4D + 1.7F + 1.3H + 1.4To	372	357	D + L + F + H' + T + E'	104	12	-	-	-	-	-	-	-
						MCCM	10977	D + L + F + H' + T + E'	-172	156										
						MMAT	11143	D + L + F + H' + T + E'	30	2215										
						MMAC	11143	D + L + F + H' + T + E'	-44	2215										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads: Load Combination	Horizontal Section: Transverse Shear Force (kip / ft)	Horizontal Section: Corresponding Axial Force (kip / ft)	Vertical Section: Transverse Shear Force (kip / ft)	Vertical Section: Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
UHS Basin Foundation Mat (Cont'd)	10	Bottom	East-West	3H.6-133	12-H-L	MTCM	11407	D + L + F + H' + T + E'	343	2208	D + L + F + H' + T + E'	104	16	-	-	-	-	-	-	-
						MCCM	11407	D + L + F + H' + T + E'	-340	3102										
						MMAT	11407	D + L + F + H' + T + E'	238	3436										
						MMAC	11407	D + L + F + H' + T + E'	-103	3436										
					13-H-L	MTCM	10994	1.4D + 1.7F + 1.3H + 1.4To	217	454	D + L + F + H' + T + E'	78	12	-	-	-	-	-	-	-
						MCCM	11014	D + L + F + H' + T + E'	-173	1025										
						MMAT	10990	D + L + F + H' + T + E'	59	1891										
						MMAC	10990	D + L + F + H' + T + E'	-34	1891										
					14-H-L	MTCM	11245	D + L + F + H' + T + E'	333	1780	D + L + F + H' + T + E'	77	16	-	-	-	-	-	-	-
						MCCM	11245	D + L + F + H' + T + E'	-310	2419										
						MMAT	11245	D + L + F + H' + T + E'	212	3412										
						MMAC	11245	D + L + F + H' + T + E'	-114	3412										
					15-H-L	MTCM	11051	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	192	543	D + L + F + H' + T + E'	104	8	-	-	-	-	-	-	-
						MCCM	11048	D + L + F + H' + T + E'	-121	461										
						MMAT	5042	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	1	1244										
						MMAC	8324	1.4D + 1.4F + 1.7H + 1.7W	-12	1514										
					16-H-L	MTCM	11912	1.4D + 1.7F + 1.3H + 1.4To	233	119	D + L + F + H' + T + E'	60	8	-	-	-	-	-	-	-
						MCCM	11263	D + L + F + H' + T + E'	-165	115										
						MMAT	8118	1.4D + 1.4F + 1.7H + 1.7W	42	1701										
						MMAC	8118	1.4D + 1.7F + 1.3H + 1.4To	-33	1636										
					17-H-L	MTCM	11616	1.4D + 1.7F + 1.3H + 1.4To	933	486	D + L + F + H' + T + E'	21	16	-	-	-	-	-	-	-
						MCCM	11555	D + L + F + H' + T + E'	-684	223										
						MMAT	4586	1.4D + 1.4F + 1.7H + 1.7W	21	1827										
						MMAC	5036	1.4D + 1.7F + 1.3H + 1.4To	-20	1769										
			North-South	3H.6-134	1-V-L	MTCM	4576	1.4D + 1.7F + 1.3H + 1.4To	904	132	D + L + F + H' + T + E'	39	16	-	-	-	-	-	-	-
						MCCM	8336	D + L + F + H' + T + E'	-740	124										
						MMAT	4586	1.4D + 1.4F + 1.7H + 1.7W	9	1902										
						MMAC	4586	1.4D + 1.7F + 1.3H + 1.4To	-23	1848										
					2-V-L	MTCM	11956	1.4D + 1.4F + 1.7H + 1.7W	219	157	D + L + F + H' + T + E'	51	8	-	-	-	-	-	-	-
						MCCM	11940	D + L + F + H' + T + E'	-162	222										
						MMAT	11456	1.4D + 1.4F + 1.7H + 1.7W	23	1784										
						MMAC	11456	1.4D + 1.7F + 1.3H + 1.4To	-56	1723										
					3-V-L	MTCM	11957	1.4D + 1.4F + 1.7H + 1.7W	256	30	D + L + F + H' + T + E'	117	8	-	-	-	-	-	-	-
						MCCM	12110	D + L + F + H' + T + E'	-264	1522										
						MMAT	12111	D + L + F + H' + T + E'	25	1690										
						MMAC	12111	D + L + F + H' + T + E'	-162	1792										
					4-V-L	MTCM	13246	D + L + F + H' + T + E'	250	506	D + L + F + H' + T + E'	184	12	-	-	-	-	-	-	-
						MCCM	13246	D + L + F + H' + T + E'	-539	165										
						MMAT	11319	D + L + F + H' + T + E'	101	2223										
						MMAC	11319	D + L + F + H' + T + E'	-23	2223										
					5-V-L	MTCM	11373	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	202	415	D + L + F + H' + T + E'	96	8	-	-	-	-	-	-	-
						MCCM	11353	D + L + F + H' + T + E'	-95	537										
						MMAT	13208	1.4D + 1.4F + 1.7H + 1.7W	2	1481										
						MMAC	13206	1.4D + 1.4F + 1.7H + 1.7W	-9	1498										
					6-V-L	MTCM	11981	1.4D + 1.4F + 1.7H + 1.7W	394	751	D + L + F + H' + T + E'	88	12	-	-	-	-	-	-	-
						MCCM	11996	D + L + F + H' + T + E'	-389	1947										
						MMAT	11958	D + L + F + H' + T + E'	68	3269										
						MMAC	11958	D + L + F + H' + T + E'	-26	3269										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Load Combination	In-plane Shear (5) (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Loads – Load Combination	Horizontal Section – Transverse Shear Force (kip / ft)	Horizontal Section – Corresponding Axial Force (kip / ft)	Vertical Section – Transverse Shear Force (kip / ft)	Vertical Section – Corresponding Axial Force (kip / ft)	Transverse Shear Reinforcement Provided (in²/ft²)	Remarks
UHS Basin Foundation Mat (Cont'd)	10	Bottom	North-South	3H.6-134	7-V-L	MTCM	11332	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	566	860	D + L + F + H' + T + E'	184	16	-	-	-	-	-	-	-
						MCCM	12109	D + L + F + H' + T + E'	-475	2095										
						MMAT	11317	D + L + F + H' + T + E'	249	3608										
						MMAC	11317	D + L + F + H' + T + E'	-82	3608										
					8-V-L	MTCM	10936	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	316	1268	D + L + F + H' + T + E'	96	12	-	-	-	-	-	-	-
						MCCM	11376	D + L + F + H' + T + E'	-153	758										
						MMAT	10923	D + L + F + H' + T + E'	134	1979										
						MMAC	10937	D + L + F + H' + T + E'	-1	1778										
					9-V-L	MTCM	11396	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	433	721	D + L + F + H' + T + E'	85	16	-	-	-	-	-	-	-
						MCCM	11396	D + L + F + H' + T + E'	-305	2430										
						MMAT	11407	D + L + F + H' + T + E'	103	3498										
						MMAC	11396	D + L + F + H' + T + E'	-47	3039										
					10-V-L	MTCM	11799	1.4D + 1.7F + 1.3H + 1.4To	187	246	D + L + F + H' + T + E'	184	8	-	-	-	-	-	-	(8)
						MCCM	11853	D + L + F + H' + T + E'	-118	862										
						MMAT	11220	D + L + F + H' + T + E'	94	1660										
						MMAC	11220	D + L + F + H' + T + E'	-2	1449										
					11-V-L	MTCM	11423	1.4D + 1.7F + 1.3H + 1.4To	191	124	D + L + F + H' + T + E'	42	8	-	-	-	-	-	-	-
						MCCM	11263	D + L + F + H' + T + E'	-146	33										
						MMAT	11041	1.4D + 1.4F + 1.7H + 1.7W	39	1625										
						MMAC	11041	1.4D + 1.7F + 1.3H + 1.4To	-41	1557										
					12-V-L	MTCM	5048	1.4D + 1.7F + 1.3H + 1.4To	870	293	D + L + F + H' + T + E'	29	16	-	-	-	-	-	-	-
						MCCM	5063	D + L + F + H' + T + E'	-657	208										
						MMAT	5036	1.4D + 1.4F + 1.7H + 1.7W	11	1867										
						MMAC	5036	1.4D + 1.7F + 1.3H + 1.4To	-18	1834										
		-	Transverse (East-West and North-South)	3H.6-134A	1-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-274	391	45	22	0.44	
					2-T	-	-	-	-	-	-	-	-	1.4D + 1.4F + 1.7H + 1.7W	-199	19	-197	35	0.31	
					3-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-455	143	-481	627	1.76	
					4-T	-	-	-	-	-	-	-	-	D + L + F + H' + T + E'	-171	311	-78	103	0.2	
					5-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-270	157	-231	127	0.79	
					6-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-273	427	-17	74	0.6	
					7-T	-	-	-	-	-	-	-	-	1.4D + 1.7L + 1.7F + 1.7H + 1.7W	-235	309	350	147	2.4	
Pump House Roof (7)	1.75	Top	East-West	3H.6-135	1-H-L	MTCM	9892	D + L + F + H' + T + E'	130	-3	D + L + F + H' + T + E'	69	3.81	-	-	-	-	-	-	-
						MCCM	10495	D + L + F + H' + T + E'	-121	-20										
						MMAT	9849	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	24	-65										
						MMAC	10508	D + L + F + H' + T + E'	-38	-68										
			North-South	3H.6-136A	1-V-L	MTCM	10495	D + L + F + H' + T + E'	311	-104	D + L + F + H' + T + E'	67	3.81	-	-	-	-	-	-	-
						MCCM	10495	D + L + F + H' + T + E'	-337	-26										
						MMAT	10495	D + L + F + H' + T + E'	286	-105										
						MMAC	10495	D + L + F + H' + T + E'	-198	-105										
		Bottom	East-West	3H.6-136B	1-H-L	MTCM	10317	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	149	36	D + L + F + H' + T + E'	69	3.81	-	-	-	-	-	-	-
						MCCM	9824	D + L + F + H' + T + E'	-123	4										
						MMAT	10318	1.05D + 1.3L + 1.05F + 1.3H + 1.2T + 1.3W	91	54										
						MMAC	10496	D + L + F + H' + T + E'	-1	45										
			North-South	3H.6-136C	1-V-L	MTCM	10495	D + L + F + H' + T + E'	311	44	D + L + F + H' + T + E'	67	3.81	-	-	-	-	-	-	-
						MCCM	10495	D + L + F + H' + T + E'	-330	107										
						MMAT	10495	D + L + F + H' + T + E'	132	112										
						MMAC	10495	D + L + F + H' + T + E'	-297	112										

Table 3H.6-8: Results of UHS/RSW Pump House Concrete Slab Design (Continued)

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads					Longitudinal Reinforcement Provided (in^2/ ft)	Transverse Shear Design Loads					Transverse Shear Reinforcement Provided (in^2/ft^2)	Remarks
								Axial and Flexure Loads			In-Plane Shear Loads				Horizontal Section		Vertical Section			
								Load Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	Load Combination	In-plane Shear (5) (kips / ft)		Load Combination	Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)	Transverse Shear Force (kip / ft)	Corresponding Axial Force (kip / ft)		

Notes:

(1) The reinforcement layout drawings show the various zones used to define the minimum reinforcement that will be provided based on finite element analysis results. Actual provided reinforcement based on final rebar layout may exceed the reported provided reinforcement and the zones with higher reinforcement may be extended beyond their reported boundaries.

(2) Each reinforcement layout drawing is divided into reinforcement zones. The reinforcement zone naming convention is as follows: "H" = horizontal, "V" = vertical, "L" = longitudinal reinforcement, "T" = transverse reinforcement.

(3) The maximum tension (MTCM) and compression (MCCM) axial forces are provided with the corresponding moment from the same load combination. The maximum moment that has a corresponding tension (MMAT) in the same load combination and the maximum moment that has a corresponding compression (MMAC) in the same load combination are also provided. For zones where either axial tension or axial compression does not occur for any load combination, dashes are input into the corresponding cell.

(4) Negative axial load is compression and positive axial load is tension. Negative moment applies tension to the top face of the shell element and positive moment applies tension to the bottom face of the shell element.

(5) The reported in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

(6) NOT USED.

(7) The Pump House Operating Floor and Roof slab thickness includes the metal decking (2.5 inches).

(8) For certain areas of the structure, the standard element post-processing methods were too conservative. For such cases, detailed manual design was performed and the design forces determined by the detailed manual design are provided in the table.

(9) The transverse reinforcement for the UHS Basin and RSW Pump House Buttresses is spaced with a maximum center-to-center spacing of 4".

Table 3H.6-9: Results of UHS/RSW Pump House Beams and Columns Design

Location	Item	Critical Element Number	Load Combination	Maximum Forces	Design Loads: Axial (kips) P	Design Loads: Moments (ft-kips) M2	Design Loads: Moments (ft-kips) M3	Design Loads: Moments (ft-kips) Torsion	Design Loads: Shear (kips) V2	Design Loads: Shear (kips) V3	Reinforcement: Longitudinal Provided (in^2)	Reinforcement: Transverse Provided x-direction	Reinforcement: Transverse Provided y-direction	Remarks
UHS Basin	5' x 5' Columns	516	1.4D+1.7L+1.7F+1.7H+1.7W	Maximum axial compression with corresponding forces	-2687	-1473	904	-	-	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		487	D+Lo+F+H'+To+E'	Maximum axial tension with corresponding forces	348	1148	465	-	-	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		510	D+Lo+F+H'+To+E'	Maximum M2 moment with corresponding forces	-1066	-9127	1990	-	-	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	Local Axis definition: 1 = vertical 2 = east-west 3 = north-south Transverse reinforcement includes one closed loop which accounts for two legs in each direction.
		506	D+Lo+F+H'+To+E'	Maximum M3 moment with corresponding forces	-630	834	7298	-	-	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		506	D+Lo+F+H'+To+E'	Maximum V2	-	-	-	-	212	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		510	D+Lo+F+H'+To+E'	Maximum V3	-	-	-	-	-	-278	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		505	D+Lo+F+H'+To+E'	Maximum Torsion	-	-	-	-652	-	-	148.5	7 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
	5' x 12' Columns	518	1.4D+1.7L+1.7F+1.7H+1.7W	Maximum axial compression with corresponding forces	-4746	-2484	822	-	-	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		497	D+Lo+F+H'+To+E'	Maximum axial tension with corresponding forces	645	2639	2900	-	-	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		496	D+Lo+F+H'+To+E'	Maximum M2 moment with corresponding forces	-2509	-13456	-10148	-	-	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	Local Axis definition: 1 = vertical 2 = east-west 3 = north-south Transverse reinforcement includes one closed loop which accounts for two legs in each direction.
		518	D+Lo+F+H'+To+E'	Maximum M3 moment with corresponding forces	-3435	3346	30990	-	-	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		518	D+Lo+F+H'+To+E'	Maximum V2	-	-	-	-	453	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		496	D+Lo+F+H'+To+E'	Maximum V3	-	-	-	-	-	-398	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
		497	D+Lo+F+H'+To+E'	Maximum Torsion	-	-	-	-980	-	-	175.5	13 # 5 @ 4" O.C	7 # 5 @ 4" O.C	
	4' x 4'-6" Beams	16	D+Lo+F+H'+To+E'	Maximum axial compression with corresponding forces	-3313	-2968	-3215	-	-	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	
		16	D+Lo+F+H'+To+E'	Maximum axial tension with corresponding forces	5158	1054	2155	-	-	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	
		36	D+Lo+F+H'+To+E'	Maximum M2 moment with corresponding forces	947	-6596	44	-	-	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	Local Axis definition: 1 = north-south 2 = vertical 3 = east-west Transverse reinforcement includes one closed loop which accounts for two legs in each direction.
		16	D+Lo+F+H'+To+E'	Maximum M3 moment with corresponding forces	-1848	2332	6486	-	-	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	
		16	D+Lo+F+H'+To+E'	Maximum V2	-	-	-	-	663	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	
		36	D+Lo+F+H'+To+E'	Maximum V3	-	-	-	-	-	798	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	
		403	D+Lo+F+H'+To+E'	Maximum Torsion	-	-	-	698	-	-	155.16	8 # 5 @ 4" O.C.	6 # 5 @ 4" O.C.	

Table 3H.7-1: Results of DGFOT Concrete Design

Location	Thickness (ft)	Face	Direction	Reinforcement Layout Drawing Number (1,8)	Reinforcement Zone Number (2)	Maximum Forces (3)	Element	Longitudinal Reinforcement Design Loads – Axial and Flexure Loads – Loads (11) Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads – Loads (11) Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Forces – Load Combination	Horizontal Section – Transverse Shear Force (kips / ft)	Horizontal Section – Corresponding Axial Force (kips / ft)	Vertical Section – Transverse Shear Force (kips / ft)	Vertical Section – Corresponding Axial Force (kips / ft)	Transverse Shear (7) Reinforcement Provided (in²/ft²)	Remarks
Tunnel Walls	2	Near Side	Horizontal	3H.7-11	1-H-L	Max Tension w/ corresponding moment	951	D + L + H' +E' (WP)	130	-28	D + L + H' +E' (WP)	26	4.68	-				-	-	
						Max Compression w/ corresponding moment	932	D + L + H' +E' (WP)	-66	-1										
						Max Moment with axial tension	952	D + L + H' +E' (WP)	48	-32										
						Max Moment with axial compression	953	D + L + H' +E' (WP)	-1	-28										
					2-H-L	Max Tension w/ corresponding moment	153	D + L + H' +E' (WP)	89	-11	D + L + H' +E' (WP)	21	3.12	-				-	-	
						Max Compression w/ corresponding moment	854	D + L + H' +E' (WP)	-77	-1										
						Max Moment with axial tension	265	D + L + H' +E' (WP)	62	-17										
						Max Moment with axial compression	706	D + L + H' +E' (WP)	-8	-16										
					3-H-L	Max Tension w/ corresponding moment	149	D + L + H' +E' (WP)	108	-28	D + L + H' +E' (WP)	26	4.68	-				-	-	
						Max Compression w/ corresponding moment	149	D + L + H' +E' (WP)	-123	-6										
						Max Moment with axial tension	149	D + L + H' +E' (WP)	104	-28										
						Max Moment with axial compression	141	D + L + H' +E' (WP)	-9	-28										
		Far Side	Horizontal	3H.7-12	1-H-L	Max Tension w/ corresponding moment	284	D + L + H +Wt	109	0	D + L + H' +E' (WP)	26	3.12	-				-	-	
						Max Compression w/ corresponding moment	149	D + L + H' +E' (WP)	-129	25										
						Max Moment with axial tension	634	D + L + H' +E' (WP)	4	28										
						Max Moment with axial compression	277	D + L + H' +E' (WP)	-72	30										
		Near Side	Vertical	3H.7-13	1-V-L	Max Tension w/ corresponding moment	953	D + L + H' +E'	35	-6	D + L + H + Wt	59	3.12	-				-	-	
						Max Compression w/ corresponding moment	918	D + L + H +Wt	-96	-16										
						Max Moment with axial tension	902	D + L + H' +E' (WP)	14	-86										
						Max Moment with axial compression	902	D + L + H' +E' (WP)	-10	-86										
		Far Side	Vertical	3H.7-14	1-V-L	-	-	D + L + H +Wt	-	17	D + L + H + Wt	59	3.12	-				-	-	
				3H.7-14A	1-T	-	-	-	-	-	-	-	-	D + F + L + H' + E'	26	3	10	146	0.44	
Access Region Walls	2	Near Side	Horizontal	3H.7-9	1-H-L	-	-	D + L + H + Wt	See Note (9)		D + L + H' +E' (WP)	34	3.12	-				-	-	
		Far Side	Horizontal	3H.7-9	1-H-L	-	-	D + L + H + Wt			D + L + H' +E' (WP)	34	3.12	-				-	-	
		Near Side	Vertical	3H.7-10	1-V-L	-	-	D + L + H + Wt			D + L + H + Wt	182	3.12	-				-	-	
		Far Side	Vertical	3H.7-10	1-V-L	-	-	D + L + H + Wt			D + L + H + Wt	182	3.12	-						
				3H.7-10A	1-T	-	-	-	-	-	-	-	-	D + F + L + H + Wt	-6	-102	28	86	0.44	

Table 3H.7-1: Results of DGFOT Concrete Design (Continued)

Location	Thickness (ft)	Face	Direction	orcement Layout ing Number (1,8)	ment Zone Number (2)	imum Forces (3)	Element	Longitudinal Reinforcement Design Loads: Axial and Flexure Loads: Loads (11) Combination	Axial (4) (kips / ft)	Flexure (4) (ft-kips / ft)	In-Plane Shear Loads: Loads (11) Combination	In-plane (5) Shear (kips / ft)	Longitudinal Reinforcement Provided (in²/ ft)	Transverse Shear Design Forces: Load Combination	Horizontal Section		Vertical Section		Transverse Shear (7) Reinforcement Provided (in²/ft²)	Remarks
Basemat	2	Near Side	Horizontal	3H.7-15	1-H-L	-	-	D + L + H + Wt	See Note (10)		D + L + H' +E' (WP)	27	3.12	-				-	-	
		Far Side	Horizontal	3H.7-15	1-H-L	Max Tension w/ corresponding moment	2584	D + L + H' +E' (WP)	95	8	D + L + H' +E' (WP)	27	3.12	-				-	-	
						Max Compression w/ corresponding moment	309	D + L + H' +E' (WP)	-117	12										
						Max Moment with axial tension	2351	D + L + H' +E' (WP)	12	21										
						Max Moment with axial compression	2316	D + L + H +Wt	-13	32										
		Near Side	Vertical	3H.7-16	1-V-L	Max Tension w/ corresponding moment	2425	D + L + H' +E' (WP)	20	-60	D + L + H' +E' (WP)	47	3.12	-				-	-	
						Max Compression w/ corresponding moment	301	D + L + H' +E' (WP)	-23	0										
						Max Moment with axial tension	2433	D + L + H' +E' (WP)	16	-74										
						Max Moment with axial compression	2554	D + L + H' +E' (WP)	-2	-72										
		Far Side	Vertical	3H.7-16	1-V-L	Max Tension w/ corresponding moment	2315	D + L + H +Wt	13	2	D + L + H' +E' (WP)	47	3.12	-				-	-	
						Max Compression w/ corresponding moment	309	D + L + H' +E' (WP)	-35	79										
						Max Moment with axial tension	2438	D + L + H' +E' (WP)	1	56										
						Max Moment with axial compression	2496	D + L + H' +E' (WP)	-29	87										
				3H.7-17	1-T	-	-	-	-	-	-	-	-	1.4D + 1.4F + 1.7L + 1.7H + 1.7W	52	12	12	1	0.44	
Roof of Tunnel	2	Near Side	Horizontal	3H.7-18	1-H-L	Max Tension w/ corresponding moment	174	D + L + H + Wt	124	-11	D + L + H' +E' (WP)	34	3.12	-				-	-	
						Max Compression w/ corresponding moment	1703	D + L + H' +E' (WP)	-117	-4										
						Max Moment with axial tension	1688	D + L + H + Wt	53	-38										
						Max Moment with axial compression	1694	D + L + H' +E' (WP)	-9	-30										
		Far Side	Horizontal	3H.7-18	1-H-L	Max Tension w/ corresponding moment	1710	D + L + H' +E' (WP)	118	7	D + L + H' +E' (WP)	34	3.12	-				-	-	
						Max Compression w/ corresponding moment	1703	D + L + H' +E' (WP)	-117	12										
						Max Moment with corresponding axial tension	1695	D + L + H + Wt	10	41										
						Max Moment with corresponding axial compression	1840	D + L + H + Wt	-10	53										
		Near Side	Vertical	3H.7-19	1-V-L	Max Tension w/ corresponding moment	1694	D + L + H + Wt	17	-20	D + L + H' +E' (WP)	53	3.12	-				-	-	
						Max Compression w/ corresponding moment	1694	D + L + H' +E' (WP)	-28	-45										
						Max Moment with corresponding axial tension	1710	D + L + H' +E' (WP)	0	-65										
						Max Moment with corresponding axial compression	174	D + L + H' +E' (WP)	-14	-70										
		Far Side	Vertical	3H.7-19	1-V-L	Max Tension w/ corresponding moment	1694	D + L + H + Wt	16	9	D + L + H' +E' (WP)	53	3.12	-				-	-	
						Max Compression w/ corresponding moment	1839	D + L + H' +E' (WP)	-23	6										
						Max Moment with corresponding axial tension	209	D + L + H' +E' (WP)	2	54										
						Max Moment with corresponding axial compression	209	D + L + H' +E' (WP)	-5	54										
				3H.7-19A	1-T	-	-	-	-	-	-	-	-	D + F + L + H + Wt	-7	21	33	22	0.44	

Notes:

(1) The reinforcement layout drawings show the various zones used to define the minimum reinforcement that will be provided based on finite element analysis results. Actual provided reinforcement based on final rebar layout and including development length may exceed the reported provided reinforcement and the zones with higher reinforcement may be extended beyond their reported boundaries. The dimensions in the reinforcement drawings are based on the dimensions of the 2D SAP2000 shell elements, which are modeled at the centerline of the walls and slabs.

(2) Each reinforcement layout drawing is divided into reinforcement zones. The reinforcement zone naming convention is as follows: "H" = horizontal, "V" = vertical, "L" = longitudinal reinforcement, "T" = transverse reinforcement. For slabs, vertical corresponds to Y-axis and horizontal corresponds to X-axis as shown on Figure 3H.7-1.

(3) The maximum tension and compression axial forces are provided with the corresponding moment from the same load combination. The maximum moment that has a corresponding tension in the same load combination and the maximum moment that has a corresponding compression in the same load combination are also provided.

(4) Negative axial load is compression and positive axial load is tension. Negative moment applies tension to the top face of the shell element and positive moment applies tension to the bottom face of the shell element. For walls or slabs where the same reinforcement is provided on both faces, the moment is shown as absolute value.

(5) The reported in-plane shear is the maximum average in-plane shear along a plane that crosses the longitudinal reinforcement zone.

(6) Not used.

(7) In areas where horizontal and vertical transverse shear zones overlap, the total transverse shear reinforcement to be supplied in the overlapping area is the sum of the transverse reinforcement required from the horizontal and vertical zones.

(8) Openings in the Access Regions have not been included in the Reinforcement Layout Drawings.

(9) The Access Region is governed by the tornado load combination. The outside layer of transverse torsional reinforcement (all 4 near sides horizontal) in conjunction with the near side vertical longitudinal reinforcement are utilized to resist a torsional moment of 1438 kip*ft due to an eccentric tornado missile load. The far side horizontal reinforcement is utilized to resist an axial force of 805 kip due to a concentric tornado missile load as well as a tornado wind pressure of 294 psf. The remaining capacity of the near side vertical longitudinal reinforcement in conjunction with the far side vertical longitudinal reinforcement are utilized to resist a moment of 10076 kip*ft due to the tornado load combination.

(10) The basemat near side horizontal reinforcement is governed by the tornado load combination. The outside layer of transverse torsional reinforcement is composed of near side vertical reinforcement (tunnel walls in Z-direction and roof and basemat in Y-direction) in conjunction with the near side horizontal reinforcement (2 tunnel walls, roof, and basemat in X-direction) are utilized to resist a torsional moment of 8085 kip*ft due to tornado load combination.

(11) The "E ' (WP)" designation in the load combination column indicates seismic SSE loading including wave propagation effects.

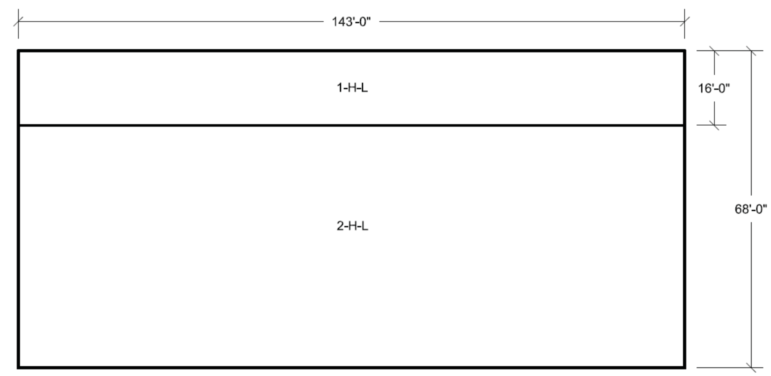

FIGURE 3H.6-51: PUMP HOUSE NORTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

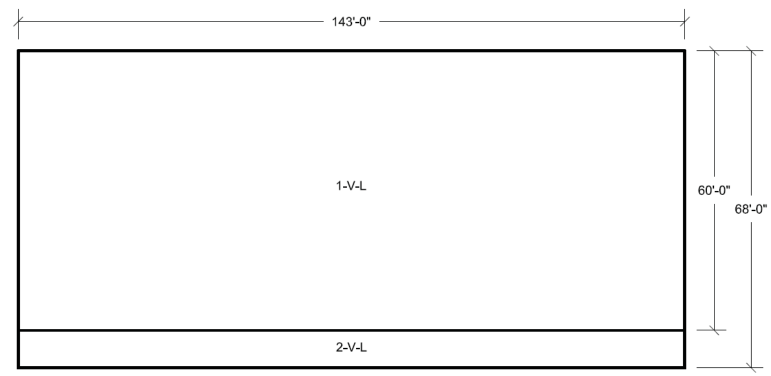

FIGURE 3H.6-52: PUMP HOUSE NORTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

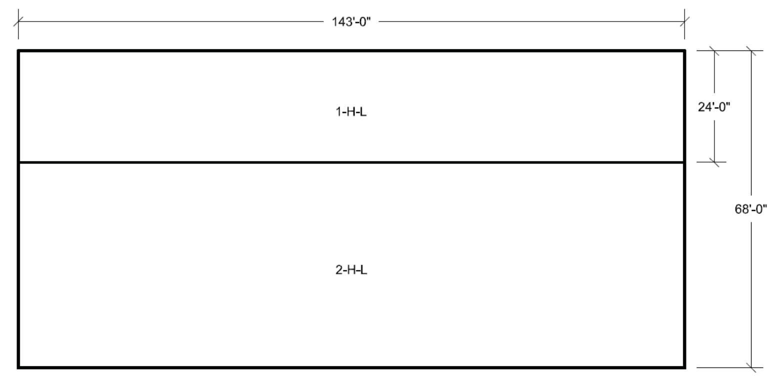

FIGURE 3H.6-53: PUMP HOUSE NORTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

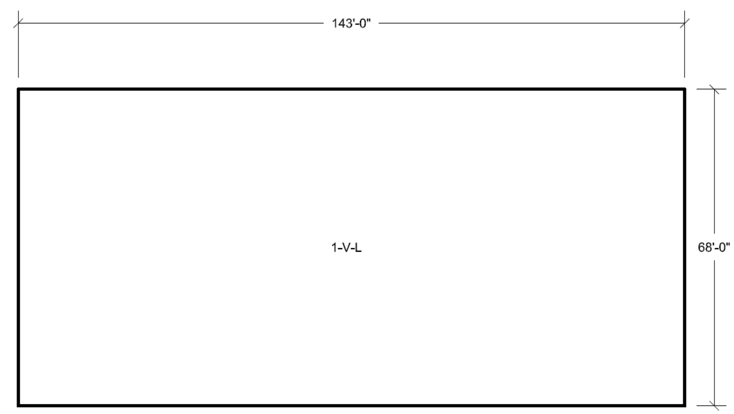

FIGURE 3H.6-54: PUMP HOUSE NORTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

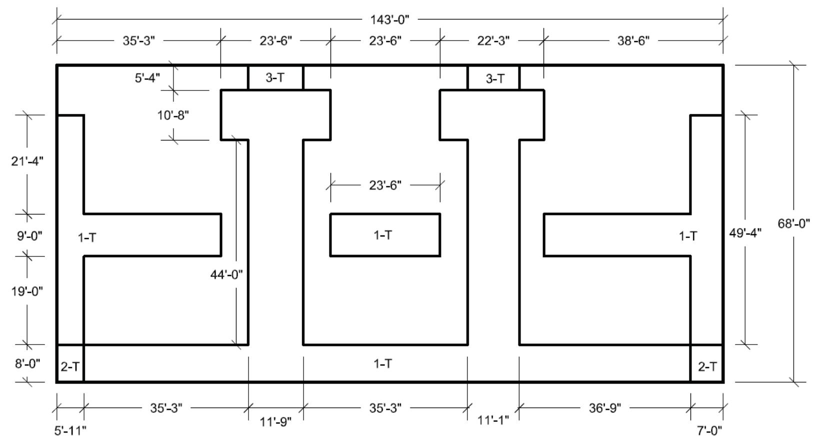

FIGURE 3H.6-55: PUMP HOUSE NORTH WALL LOOKING SOUTH
TRANSVERSE REINFORCEMENT ZONES

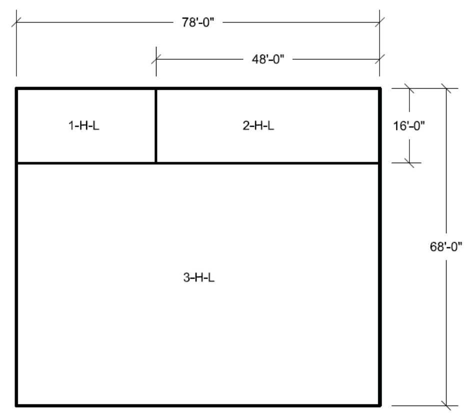

FIGURE 3H.6-56: PUMP HOUSE EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

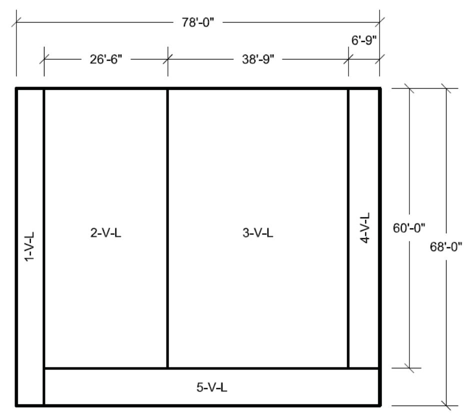

FIGURE 3H.6-57: PUMP HOUSE EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

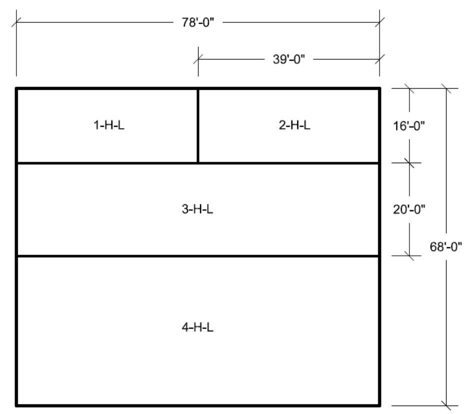

FIGURE 3H.6-58: PUMP HOUSE EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

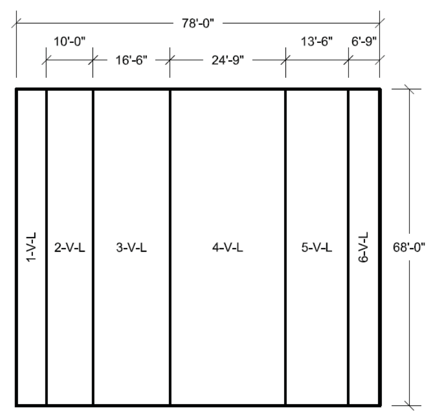

FIGURE 3H.6-59: PUMP HOUSE EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

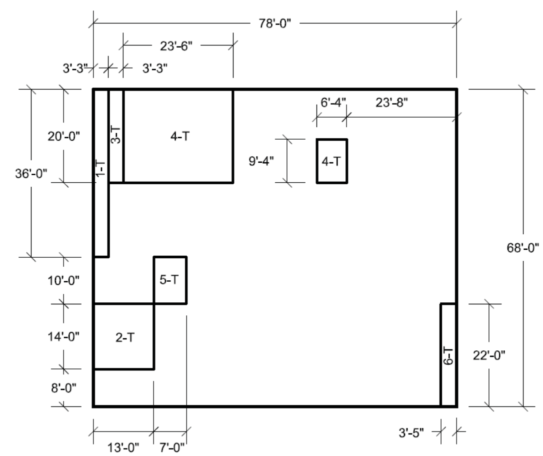

FIGURE 3H.6-60: PUMP HOUSE EAST WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

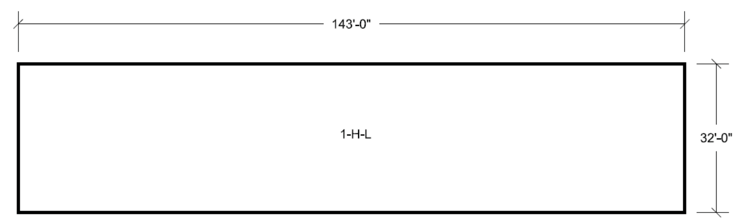

FIGURE 3H.6-61: PUMP HOUSE SOUTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

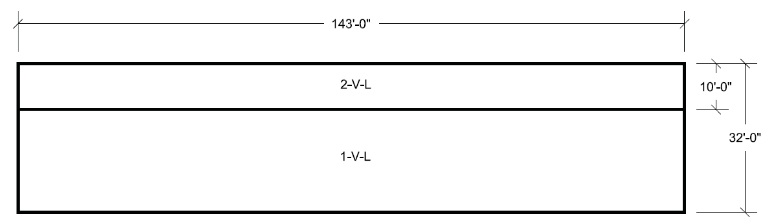

FIGURE 3H.6-62: PUMP HOUSE SOUTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

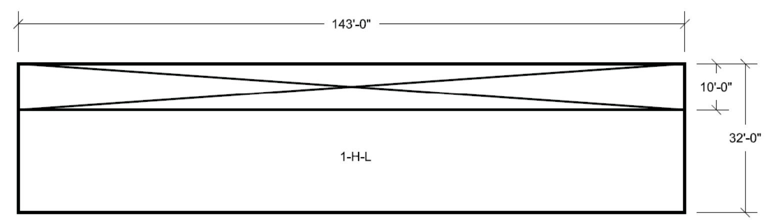

FIGURE 3H.6-63: PUMP HOUSE SOUTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

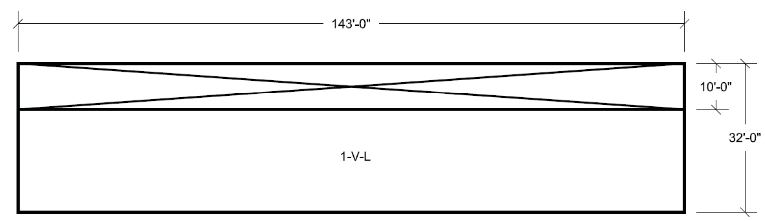

FIGURE 3H.6-64: PUMP HOUSE SOUTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

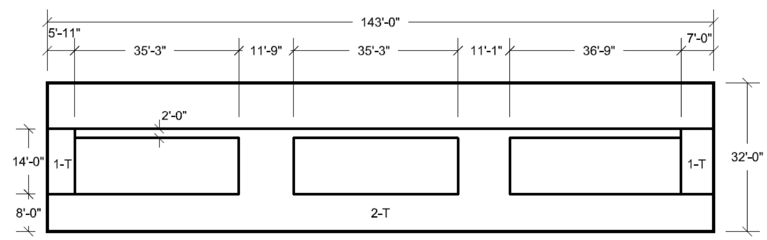

FIGURE 3H.6-65: PUMP HOUSE SOUTH WALL LOOKING SOUTH
TRANSVERSE REINFORCEMENT ZONES

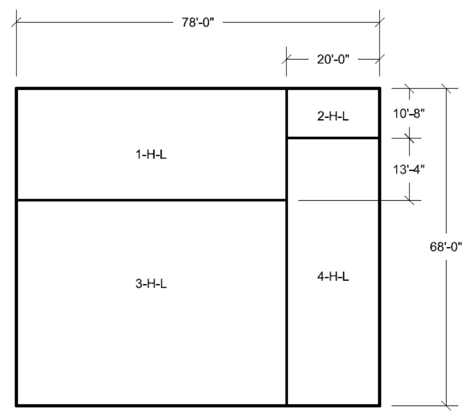

FIGURE 3H.6-66: PUMP HOUSE WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

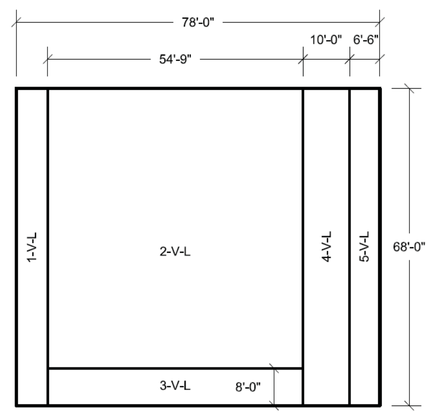

FIGURE 3H.6-67: PUMP HOUSE WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

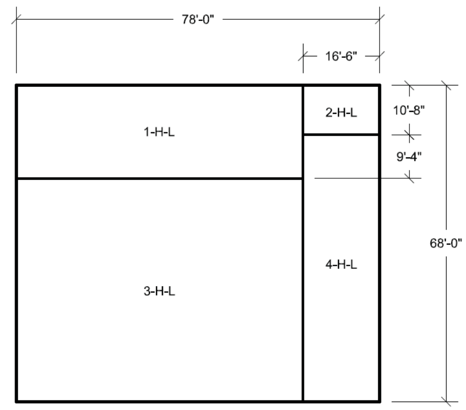

FIGURE 3H.6-68: PUMP HOUSE WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

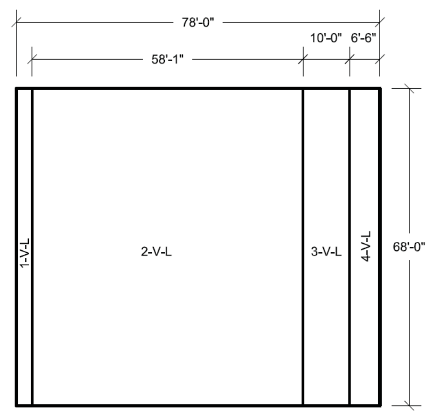

FIGURE 3H.6-69: PUMP HOUSE WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

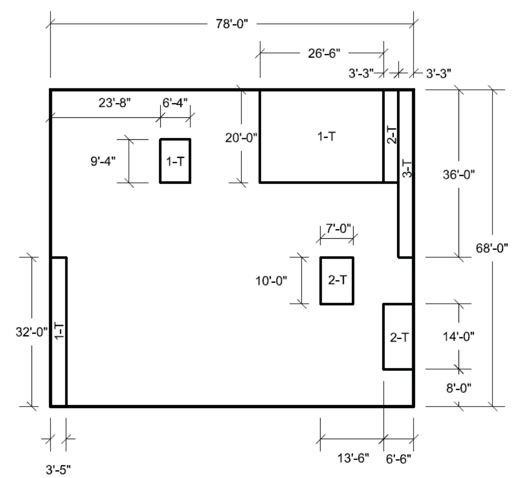

FIGURE 3H.6-70: PUMP HOUSE WEST WALL LOOKING EAST
TRANSVERSE REINFORCEMENT ZONES

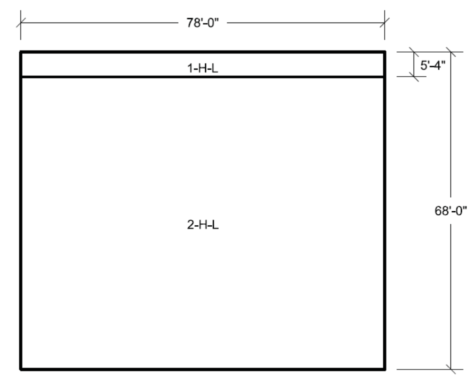

FIGURE 3H.6-71: PUMP HOUSE INTERNAL EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

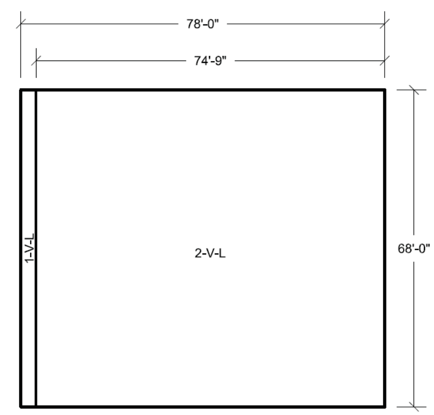

FIGURE 3H.6-72: PUMP HOUSE INTERNAL EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

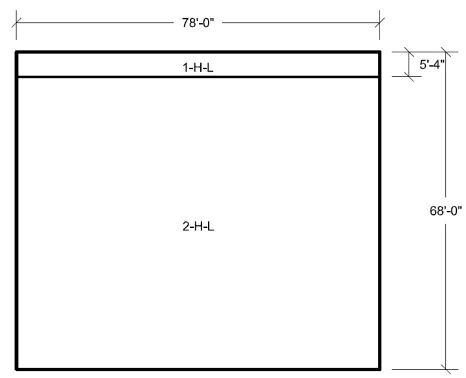

FIGURE 3H.6-73: PUMP HOUSE INTERNAL EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

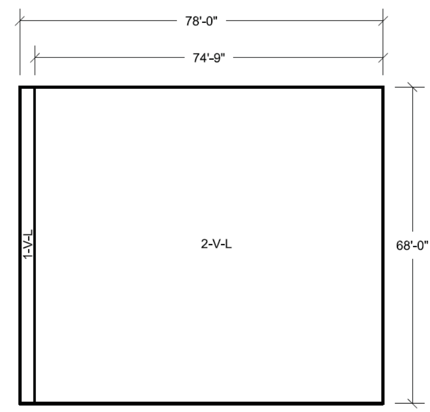

FIGURE 3H.6-74: PUMP HOUSE INTERNAL EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

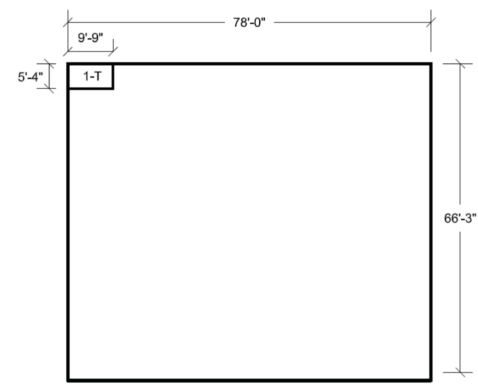

FIGURE 3H.6-74A: PUMP HOUSE INTERNAL EAST WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

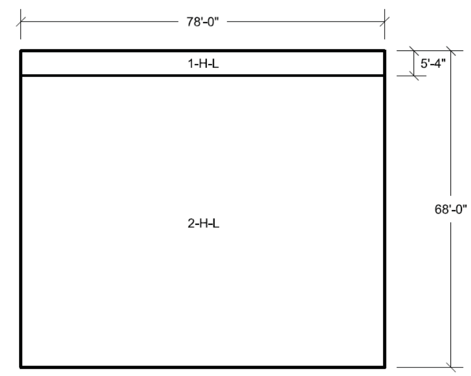

FIGURE 3H.6-75: PUMP HOUSE INTERNAL WEST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

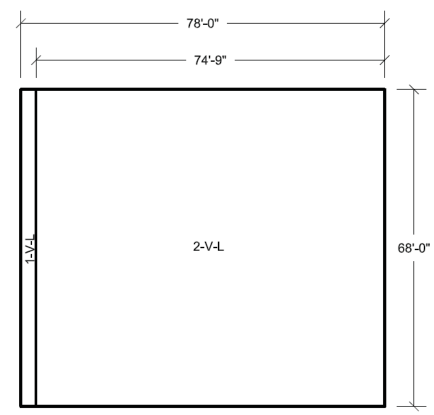

FIGURE 3H.6-76: PUMP HOUSE INTERNAL WEST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

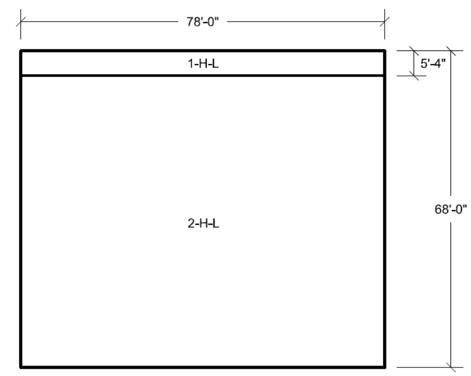

FIGURE 3H.6-77: PUMP HOUSE INTERNAL WEST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

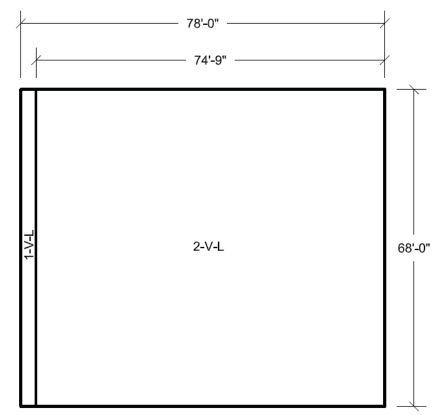

FIGURE 3H.6-78: PUMP HOUSE INTERNAL WEST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

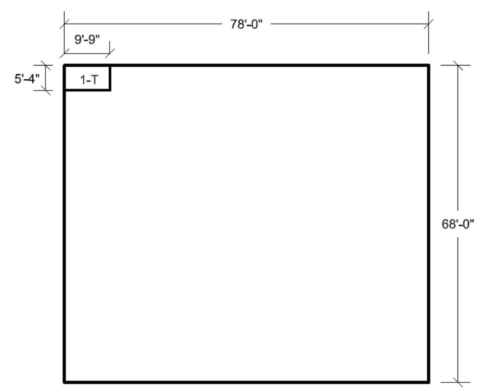

FIGURE 3H.6-78A: PUMP HOUSE INTERNAL WEST WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

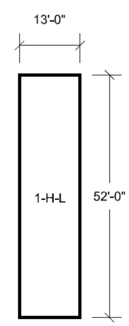

FIGURE 3H.6-79: PUMP HOUSE EAST BUTTRESS LOOKING NORTH & PUMP HOUSE WEST BUTTRESS LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

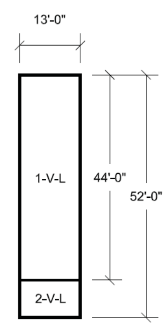

FIGURE 3H.6-80: PUMP HOUSE EAST BUTTRESS LOOKING NORTH & PUMP HOUSE WEST BUTTRESS LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

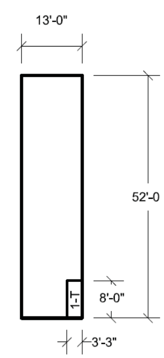

FIGURE 3H.6-81: PUMP HOUSE EAST BUTTRESS LOOKING NORTH & PUMP HOUSE WEST BUTTRESS LOOKING SOUTH
TRANSVERSE REINFORCEMENT ZONES

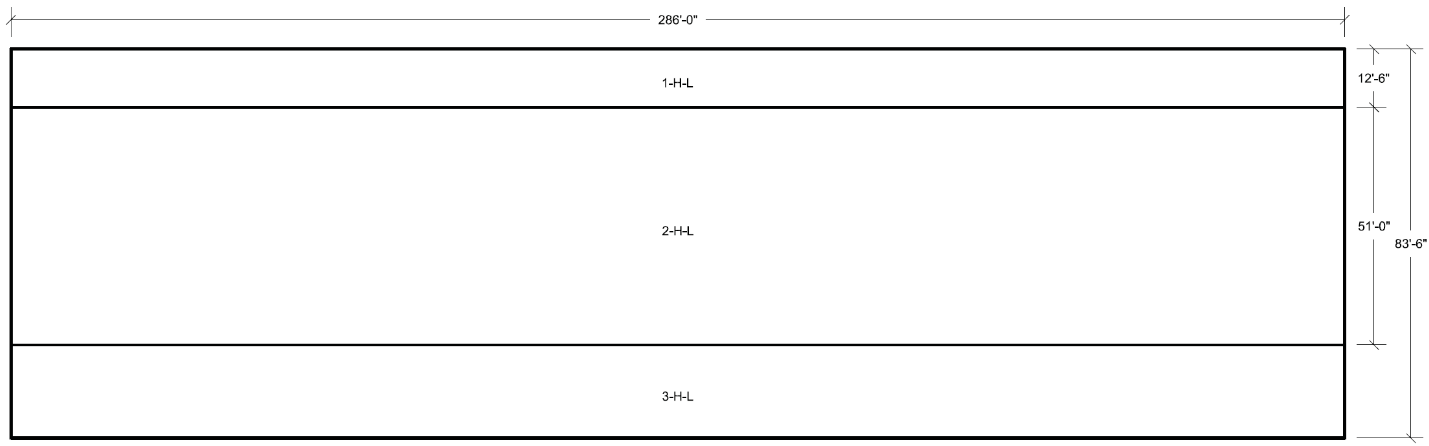

FIGURE 3H.6-82: UHS BASIN NORTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

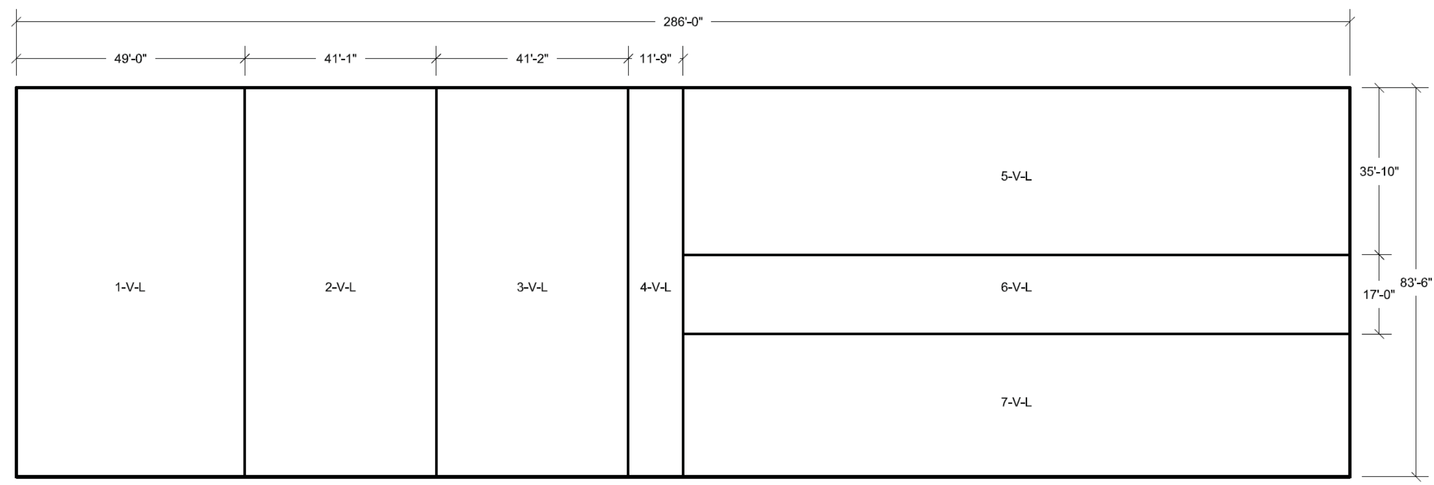

FIGURE 3H.6-83: UHS BASIN NORTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

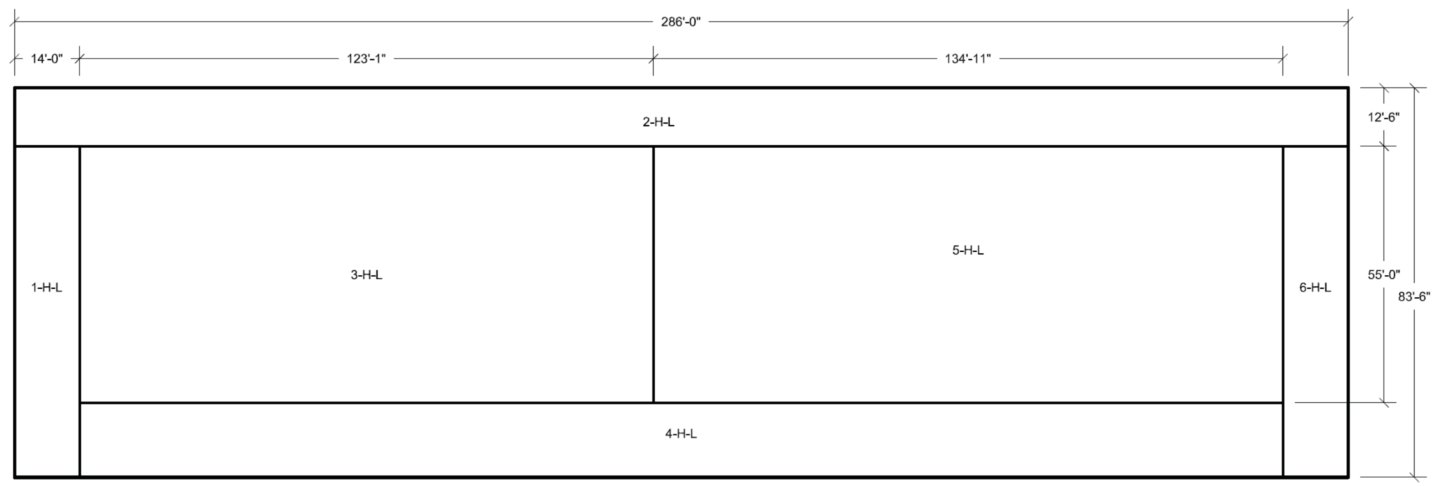

FIGURE 3H.6-84: UHS BASIN NORTH WALL LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

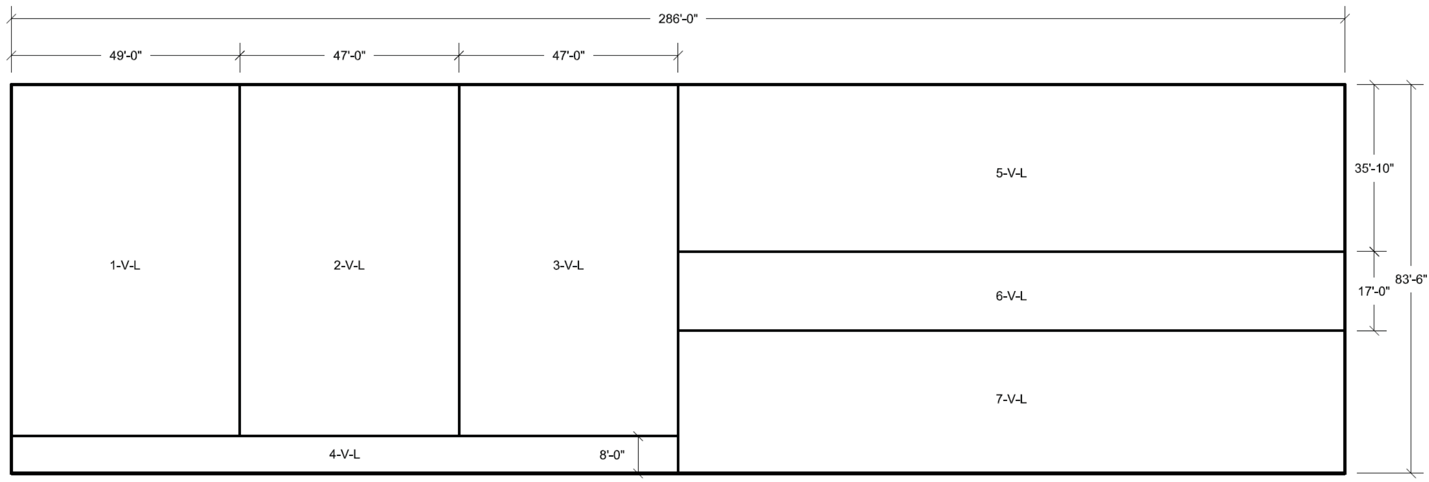

FIGURE 3H.6-85: UHS BASIN NORTH WALL LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

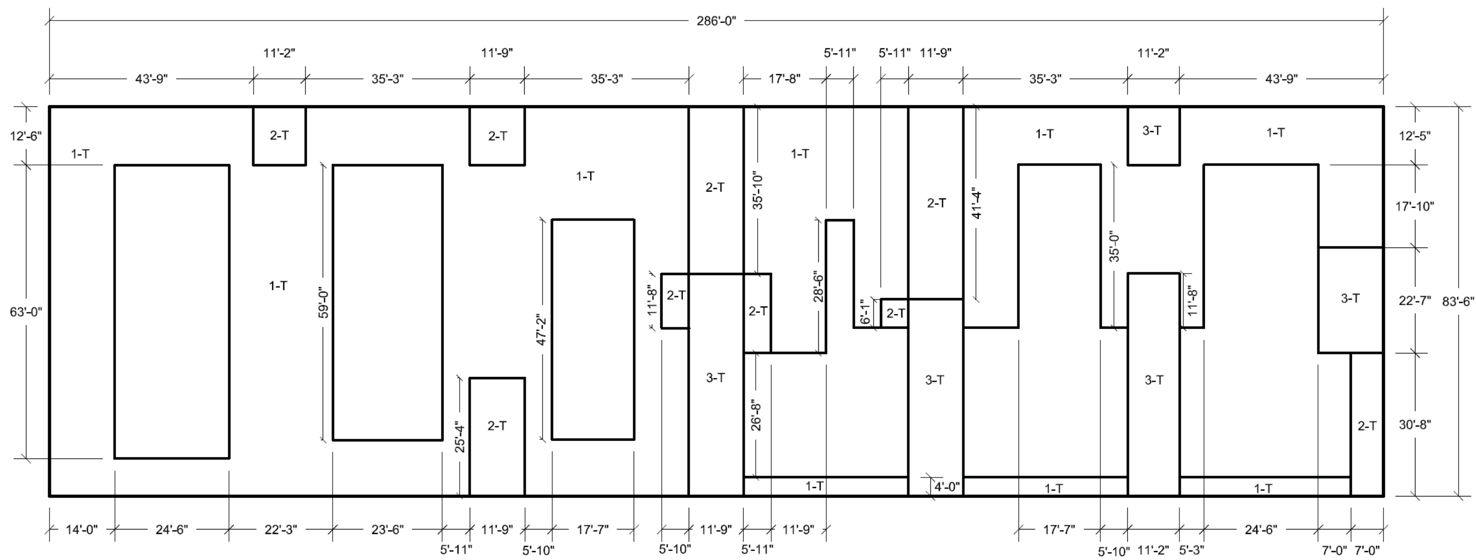

FIGURE 3H.6-86: UHS BASIN NORTH WALL LOOKING SOUTH
TRANSVERSE REINFORCEMENT ZONES

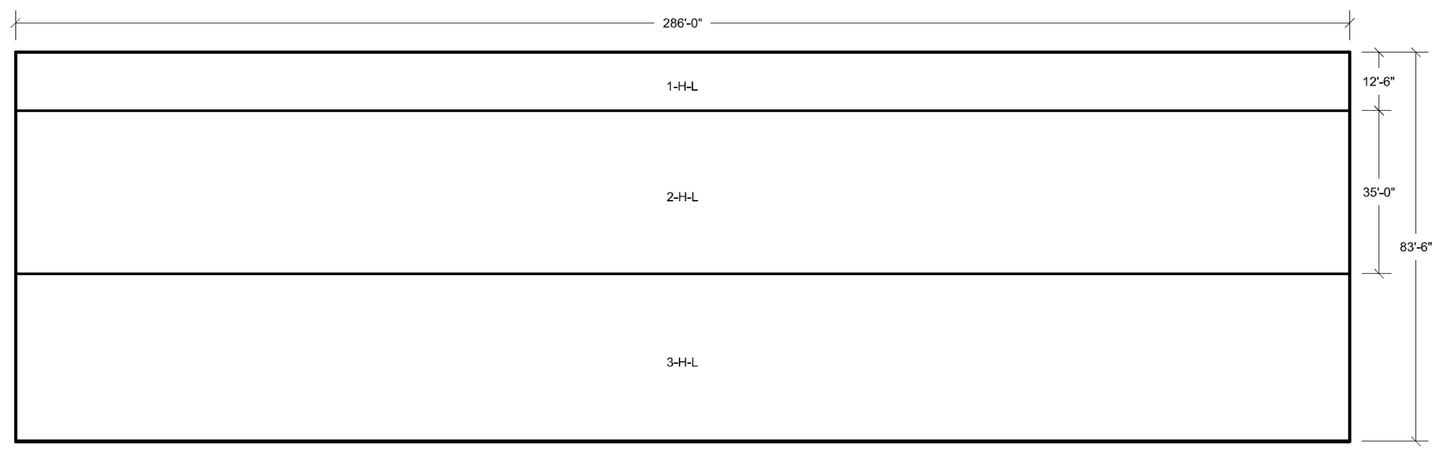

FIGURE 3H.6-87: UHS BASIN SOUTH WALL LOOKING NORTH
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

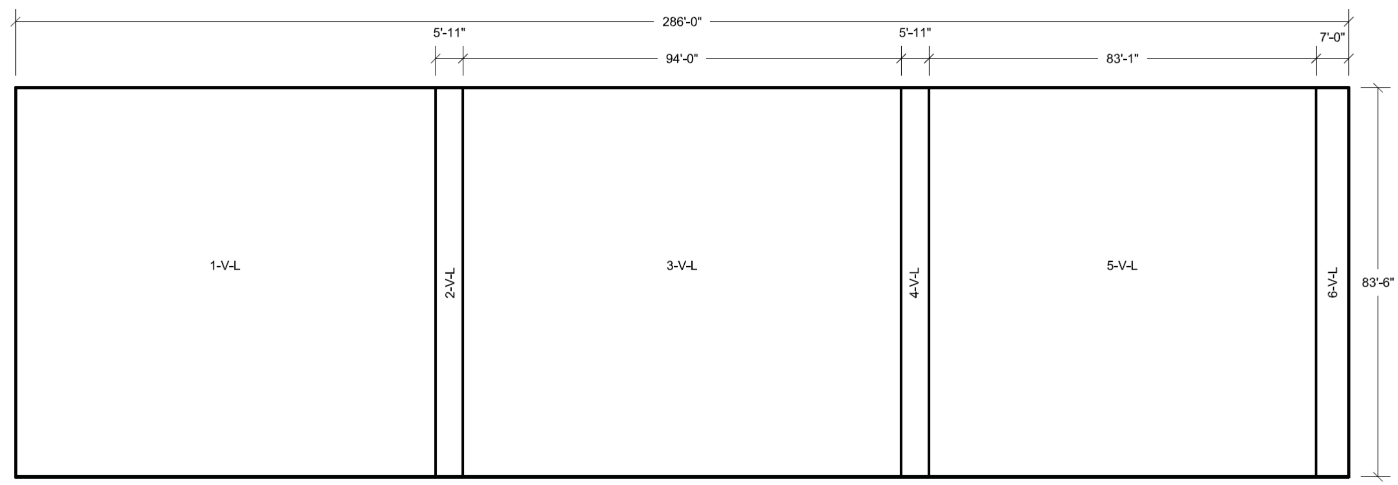

FIGURE 3H.6-88: UHS BASIN SOUTH WALL LOOKING NORTH
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

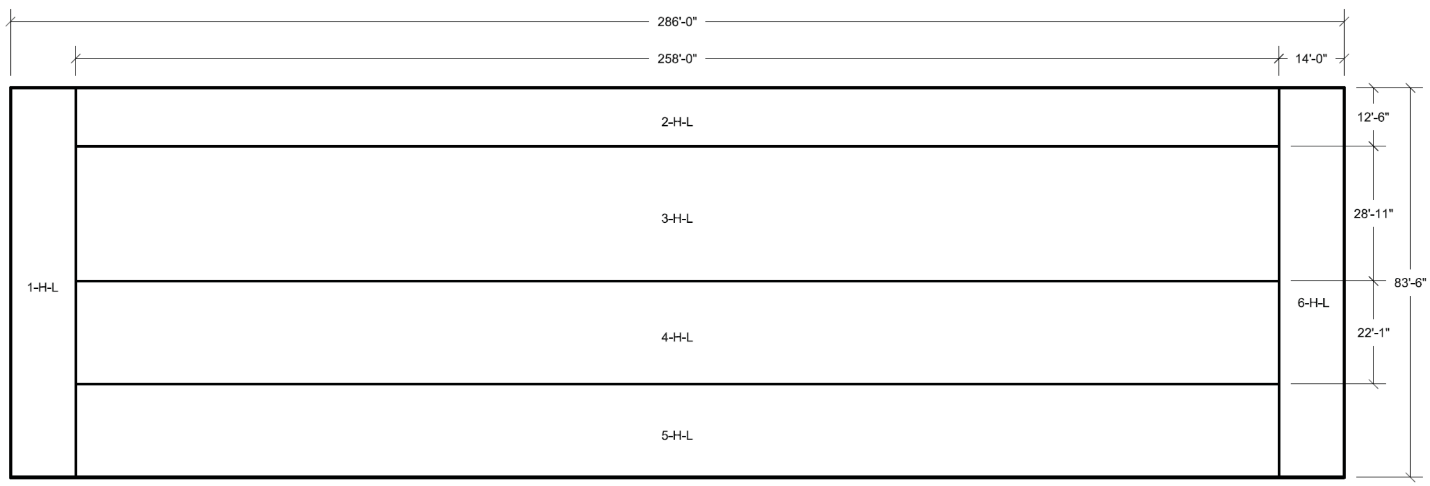

FIGURE 3H.6-89: UHS BASIN SOUTH WALL LOOKING NORTH
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

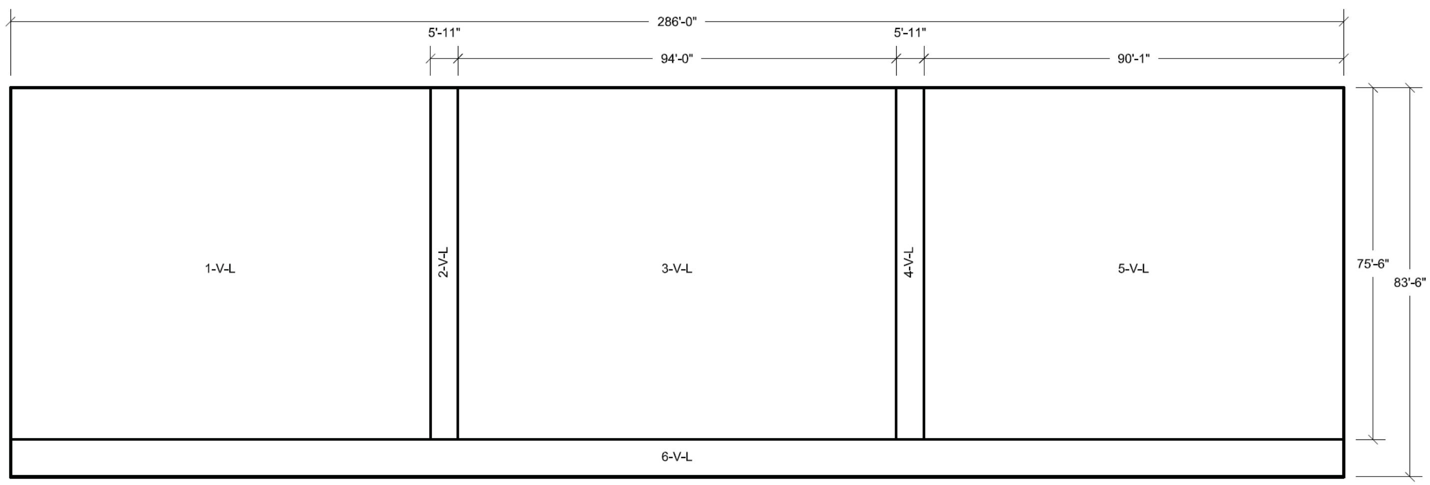

FIGURE 3H.6-90: UHS BASIN SOUTH WALL LOOKING NORTH
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

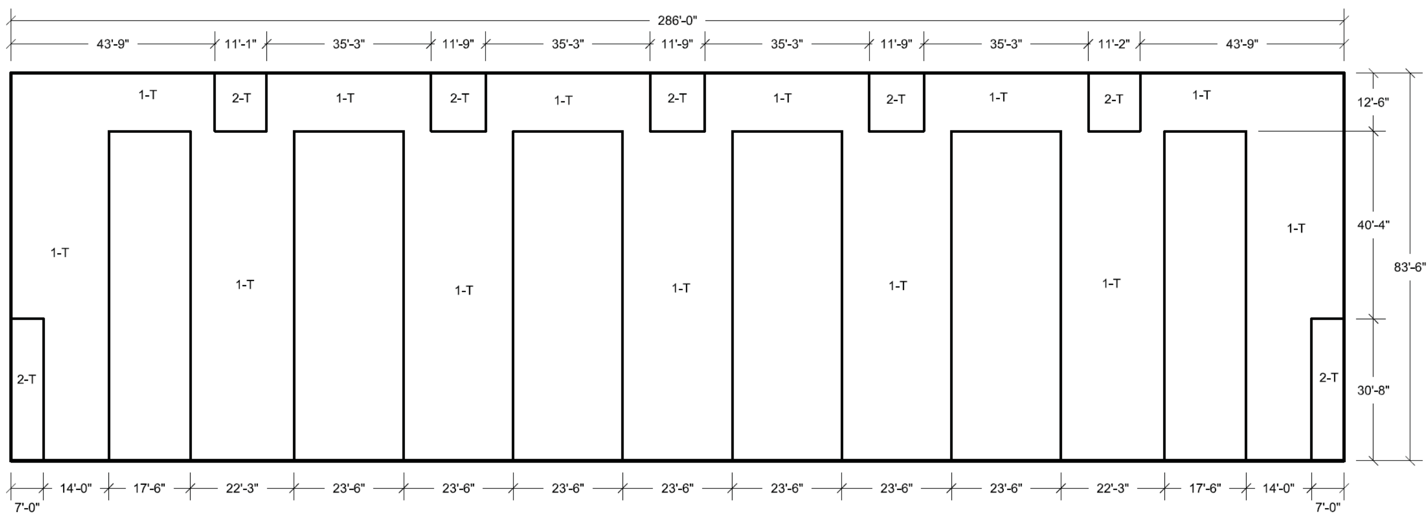

FIGURE 3H.6-91: UHS BASIN SOUTH WALL LOOKING NORTH
TRANSVERSE REINFORCEMENT ZONES

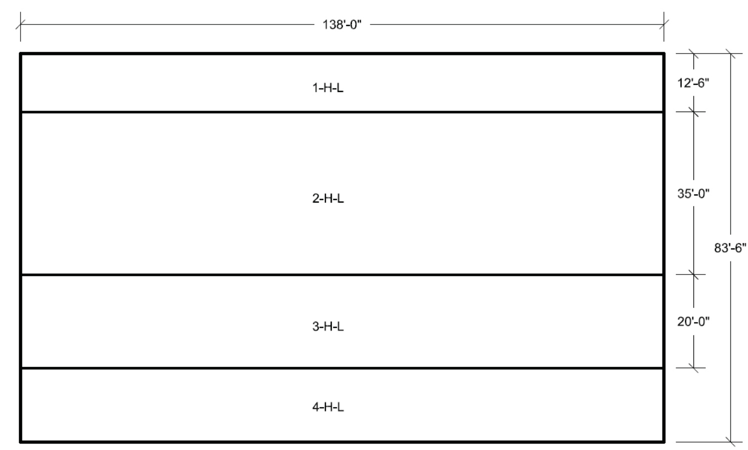

FIGURE 3H.6-92: UHS BASIN EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

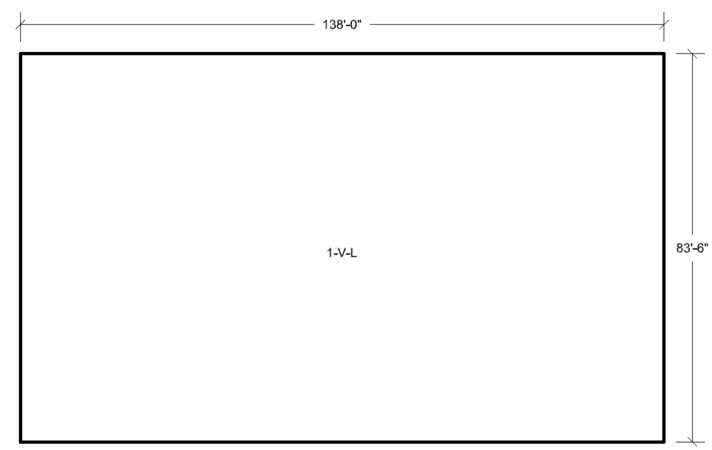

FIGURE 3H.6-93: UHS BASIN EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

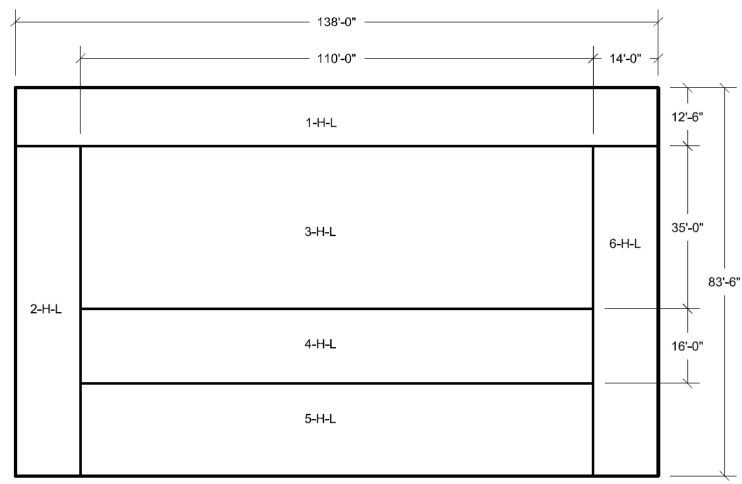

FIGURE 3H.6-94: UHS BASIN EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

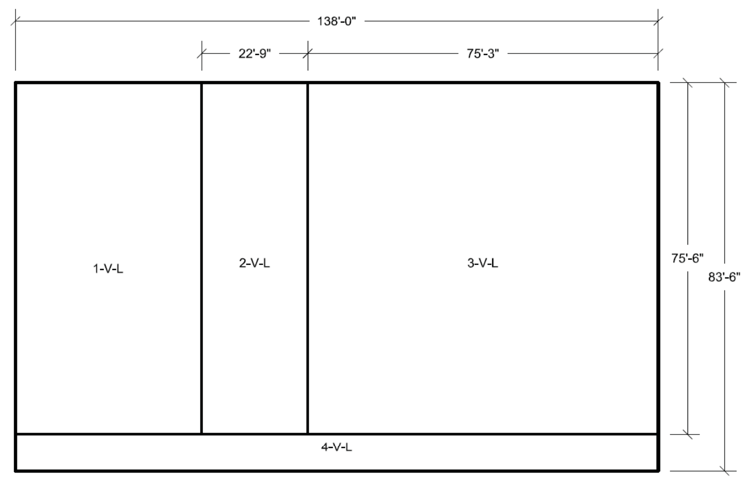

FIGURE 3H.6-95: UHS BASIN EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

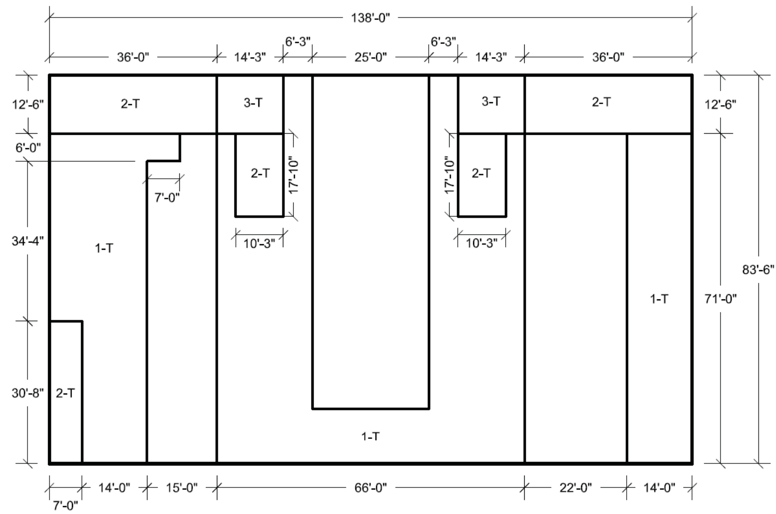

FIGURE 3H.6-96: UHS BASIN EAST WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

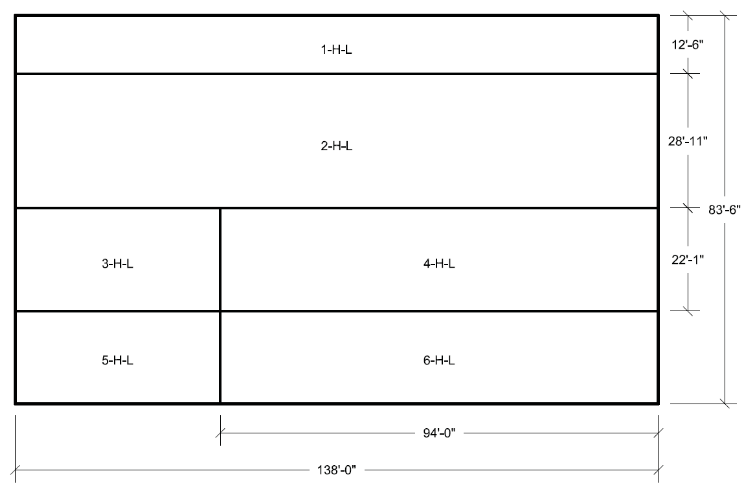

FIGURE 3H.6-97: UHS BASIN WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

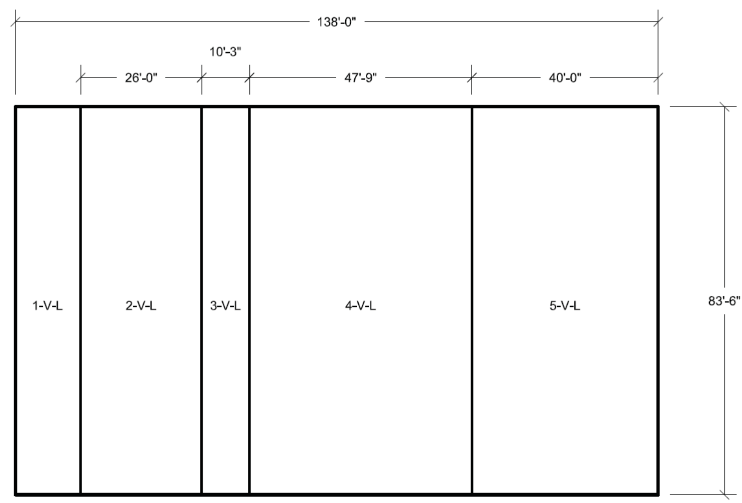

FIGURE 3H.6-98: UHS BASIN WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

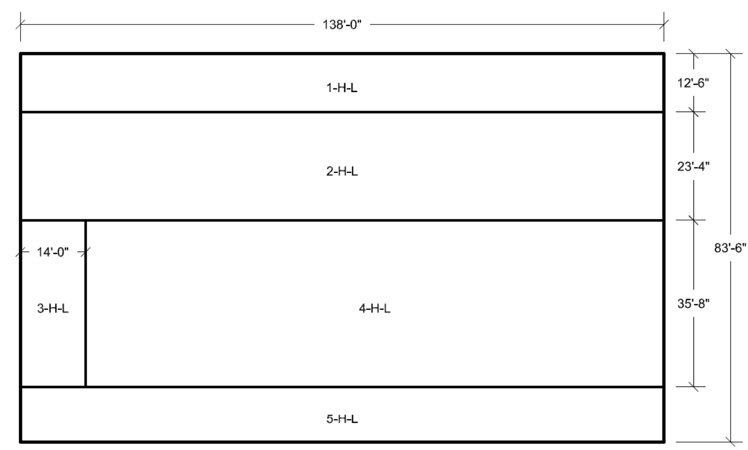

FIGURE 3H.6-99: UHS BASIN WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

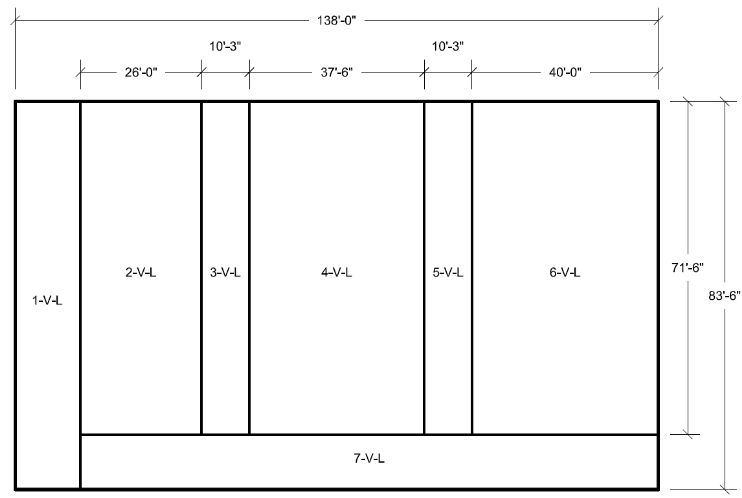

FIGURE 3H.6-100: UHS BASIN WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

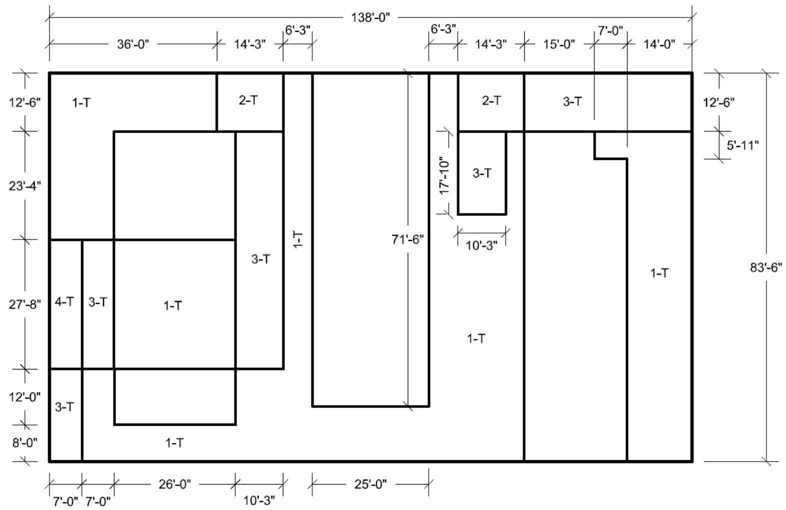

FIGURE 3H.6-101: UHS BASIN WEST WALL LOOKING EAST
TRANSVERSE REINFORCEMENT ZONES

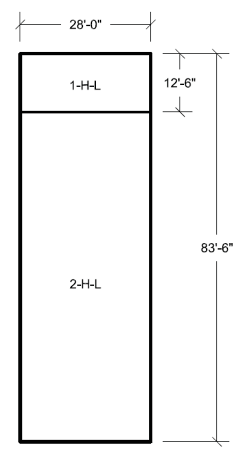

FIGURE 3H.6-102: UHS BASIN NORTH BUTTRESS LOOKING WEST & UHS BASIN SOUTH BUTTRESS LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
NEAR & FAR SIDE FACES

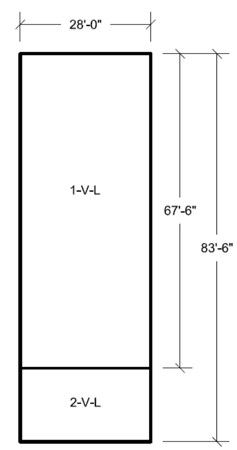

FIGURE 3H.6-103: UHS BASIN NORTH BUTTRESS LOOKING WEST & UHS BASIN SOUTH BUTTRESS LOOKING EAST
VERTICAL REINFORCEMENT ZONES
NEAR & FAR SIDE FACES

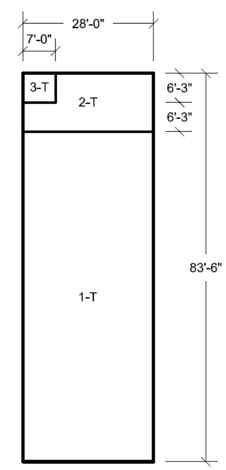

FIGURE 3H.6-104: UHS BASIN NORTH BUTTRESS LOOKING WEST & UHS BASIN SOUTH BUTTRESS LOOKING EAST
TRANSVERSE REINFORCEMENT ZONES

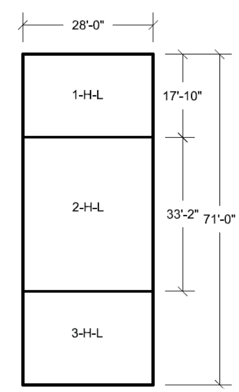

FIGURE 3H.6-105: UHS BASIN EAST BUTTRESS LOOKING NORTH & UHS BASIN WEST BUTTRESS LOOKING SOUTH
HORIZONTAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

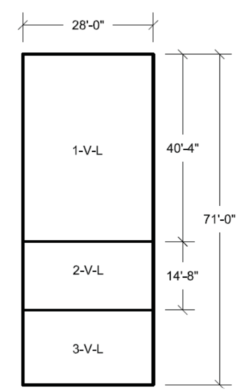

FIGURE 3H.6-106: UHS BASIN EAST BUTTRESS LOOKING NORTH & UHS BASIN WEST BUTTRESS LOOKING SOUTH
VERTICAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

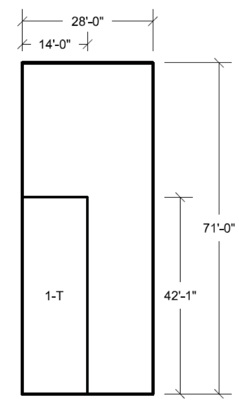

FIGURE 3H.6-107: UHS BASIN EAST BUTTRESS LOOKING NORTH & UHS BASIN WEST BUTTRESS LOOKING SOUTH TRANSVERSE REINFORCEMENT ZONES

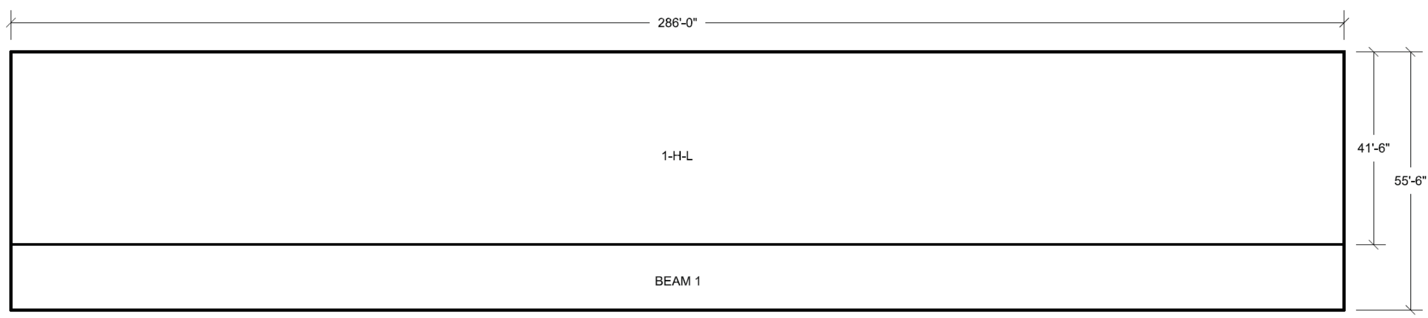

FIGURE 3H.6-108: COOLING TOWER NORTH (AND SOUTH) WALL LOOKING SOUTH (NORTH)
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

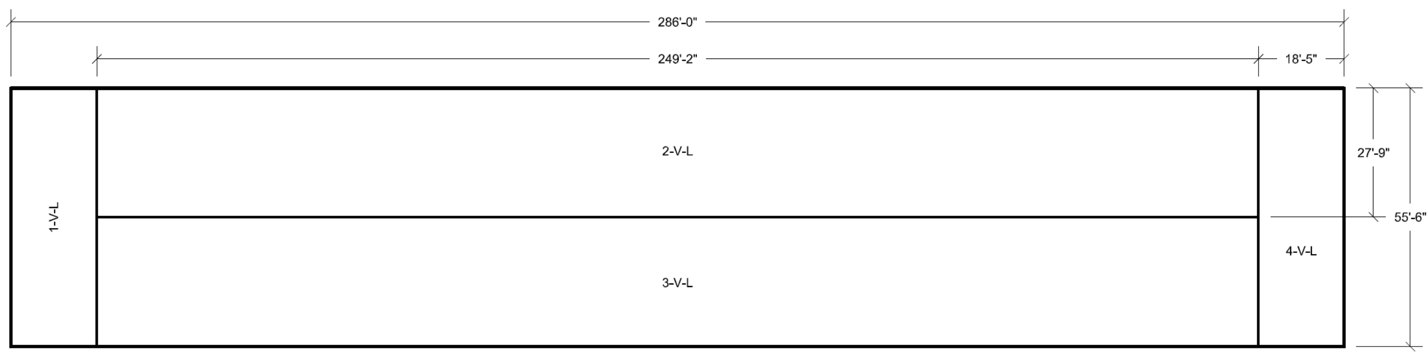

FIGURE 3H.6-109: COOLING TOWER NORTH (AND SOUTH) WALL LOOKING SOUTH (NORTH)
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

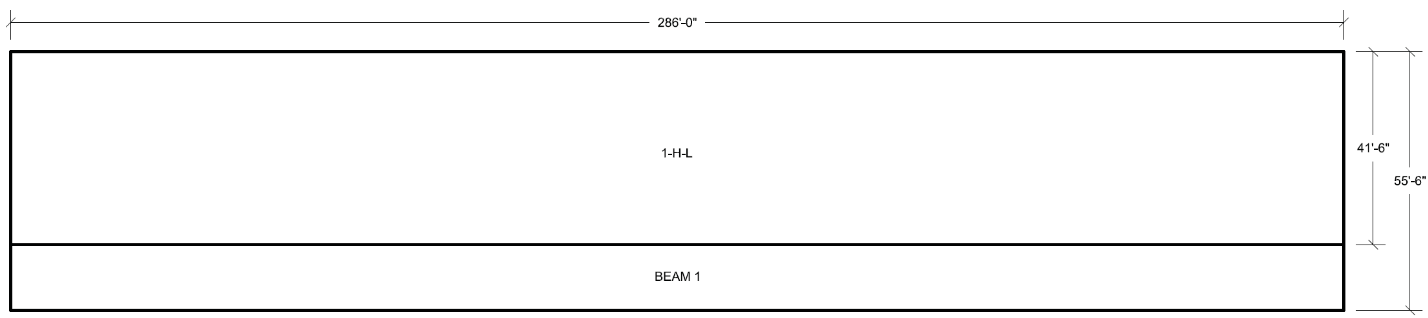

FIGURE 3H.6-110: COOLING TOWER NORTH (AND SOUTH) WALL LOOKING SOUTH (NORTH)
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

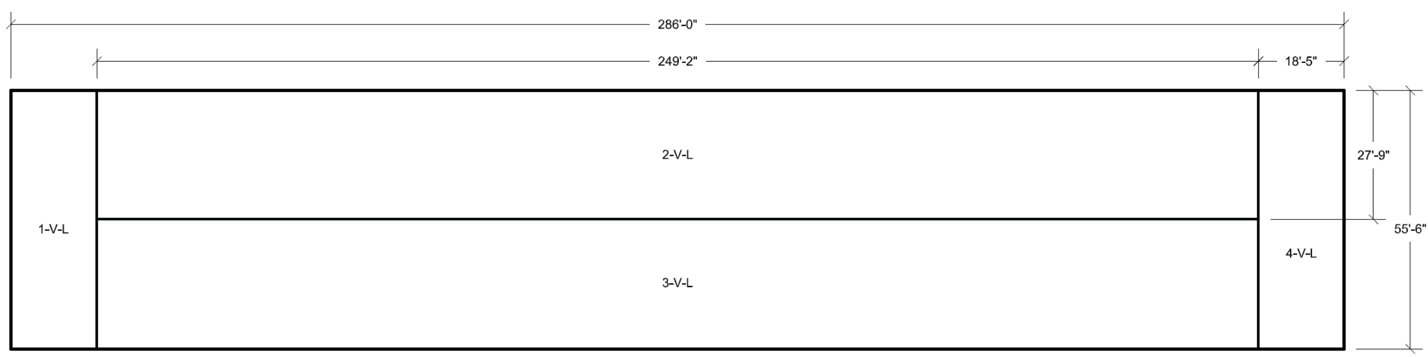

FIGURE 3H.6-111: COOLING TOWER NORTH (AND SOUTH) WALL LOOKING SOUTH (NORTH)
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

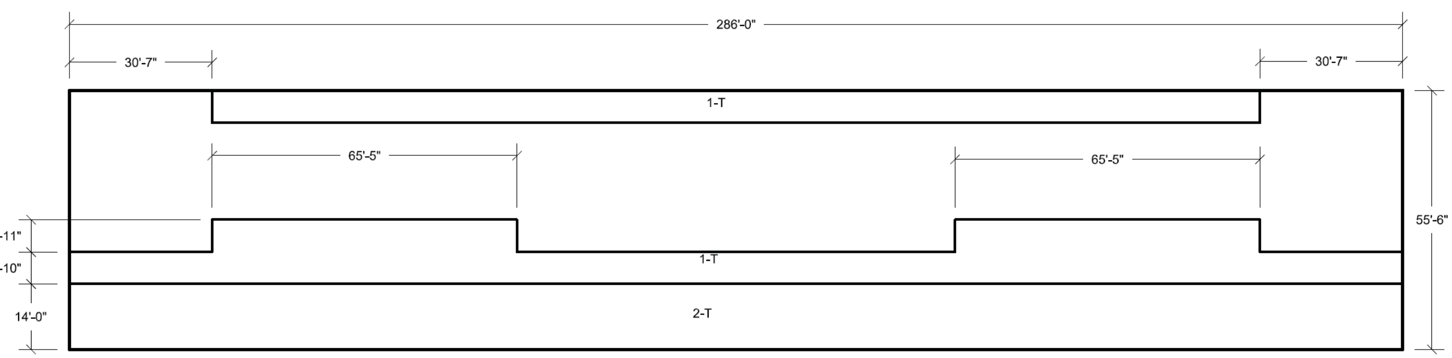

FIGURE 3H.6-112: COOLING TOWER NORTH (AND SOUTH) WALL LOOKING SOUTH (NORTH)
TRANSVERSE REINFORCEMENT ZONES

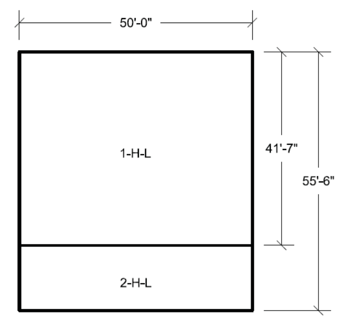

FIGURE 3H.6-113: COOLING TOWER EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

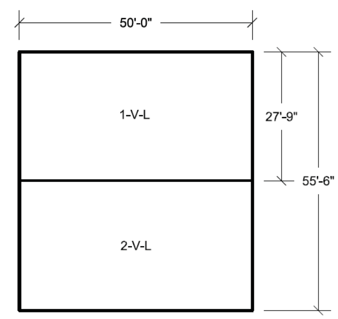

FIGURE 3H.6-114: COOLING TOWER EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

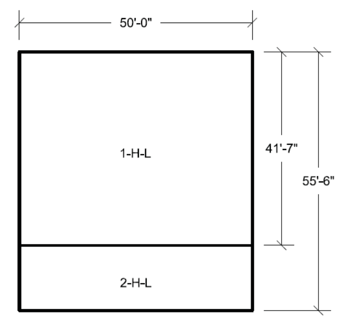

FIGURE 3H.6-115: COOLING TOWER EAST WALL LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

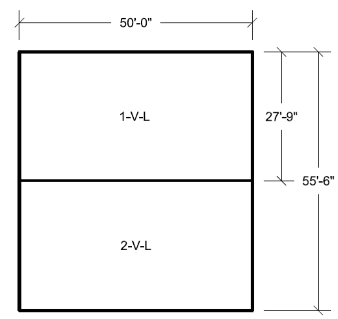

FIGURE 3H.6-116: COOLING TOWER EAST WALL LOOKING WEST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

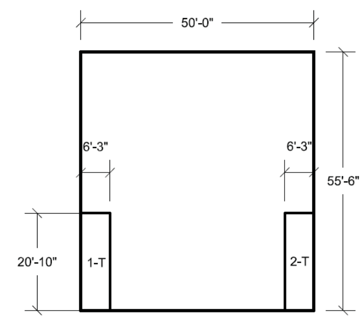

FIGURE 3H.6-116A: COOLING TOWER EAST WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

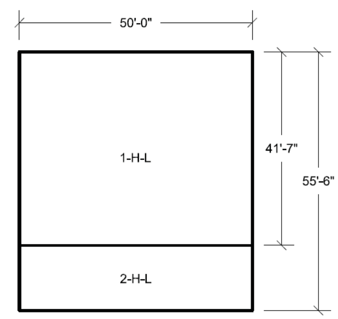

FIGURE 3H.6-117: COOLING TOWER WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
NEAR SIDE FACE

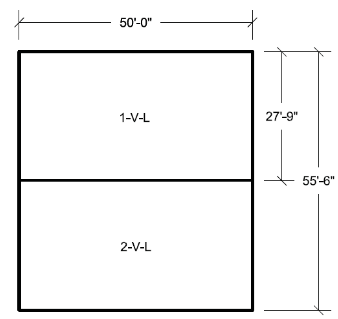

FIGURE 3H.6-118: COOLING TOWER WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
NEAR SIDE FACE

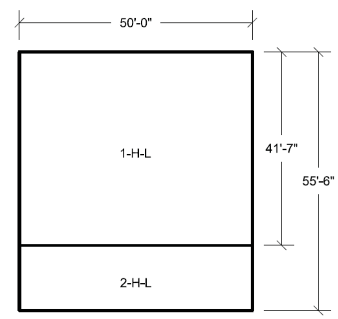

FIGURE 3H.6-119: COOLING TOWER WEST WALL LOOKING EAST
HORIZONTAL REINFORCEMENT ZONES
FAR SIDE FACE

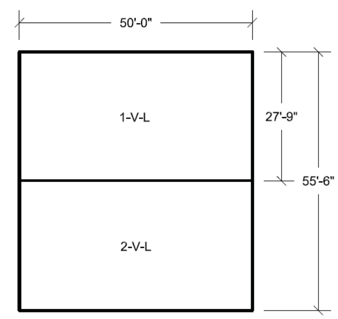

FIGURE 3H.6-120: COOLING TOWER WEST WALL LOOKING EAST
VERTICAL REINFORCEMENT ZONES
FAR SIDE FACE

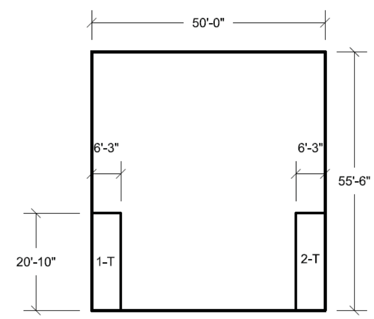

FIGURE 3H.6-120A: COOLING TOWER WEST WALL LOOKING EAST
TRANSVERSE REINFORCEMENT ZONES

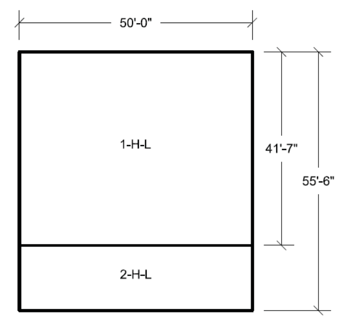

FIGURE 3H.6-121: COOLING TOWER INTERNAL WALLS LOOKING WEST
HORIZONTAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

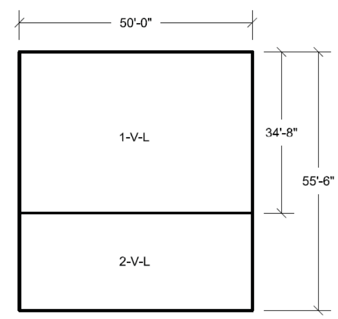

FIGURE 3H.6-122: COOLING TOWER INTERNAL WALLS LOOKING WEST
VERTICAL REINFORCEMENT ZONES
NEAR AND FAR SIDE FACES

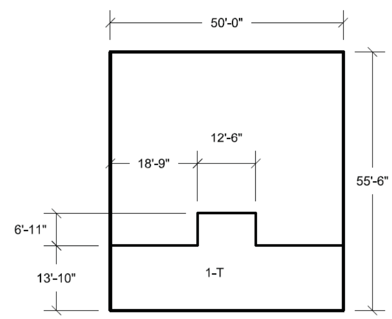

FIGURE 3H.6-122A: COOLING TOWER INTERNAL WALL LOOKING WEST
TRANSVERSE REINFORCEMENT ZONES

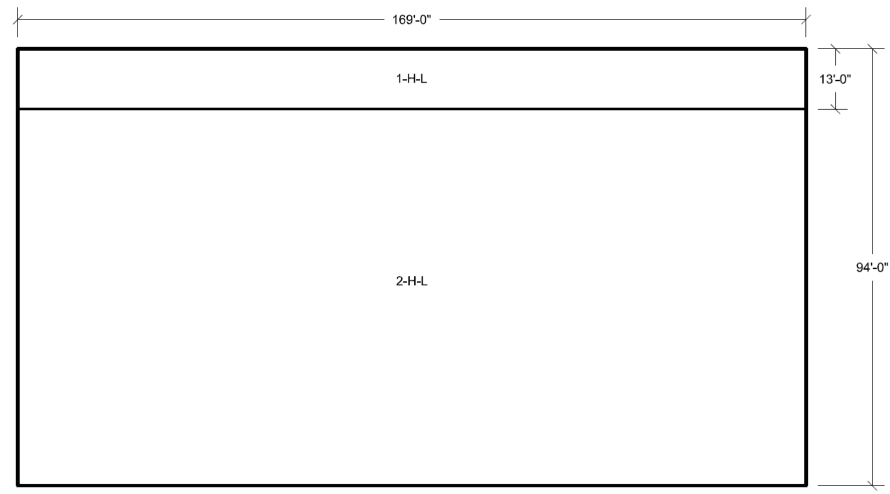

FIGURE 3H.6-123: PUMP HOUSE FOUNDATION MAT
EAST/WEST REINFORCEMENT ZONES
TOP FACE

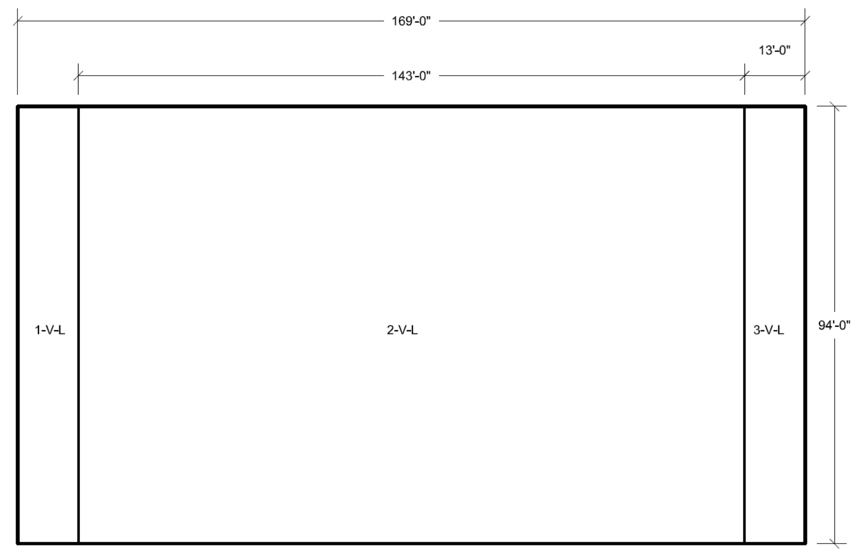

FIGURE 3H.6-124: PUMP HOUSE FOUNDATION MAT
NORTH/SOUTH REINFORCEMENT ZONES
TOP FACE

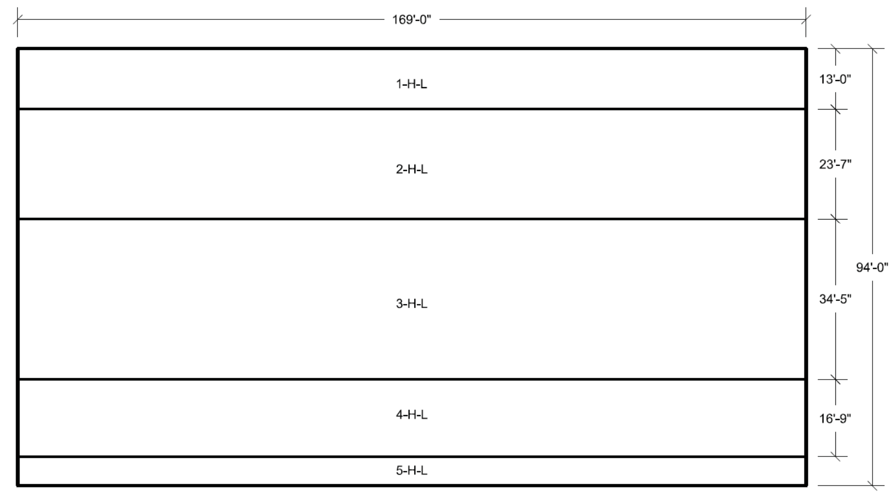

FIGURE 3H.6-125: PUMP HOUSE FOUNDATION MAT
EAST/WEST REINFORCEMENT ZONES
BOTTOM FACE

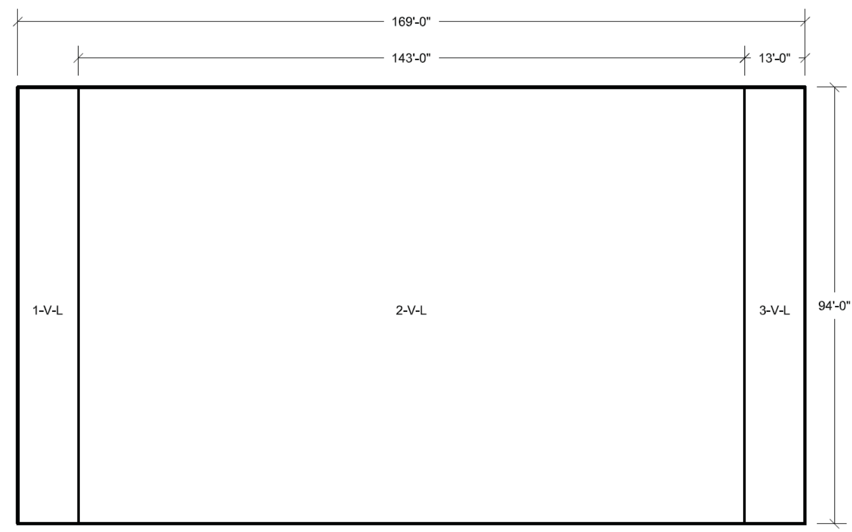

FIGURE 3H.6-126: PUMP HOUSE FOUNDATION MAT
NORTH/SOUTH REINFORCEMENT ZONES
BOTTOM FACE

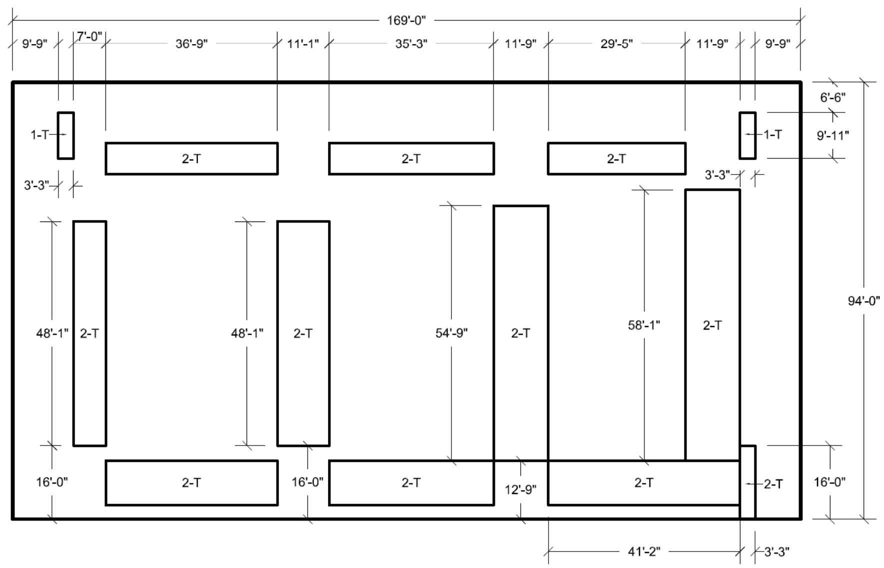

FIGURE 3H.6-126A: PUMP HOUSE FOUNDATION MAT
TRANSVERSE REINFORCEMENT ZONES

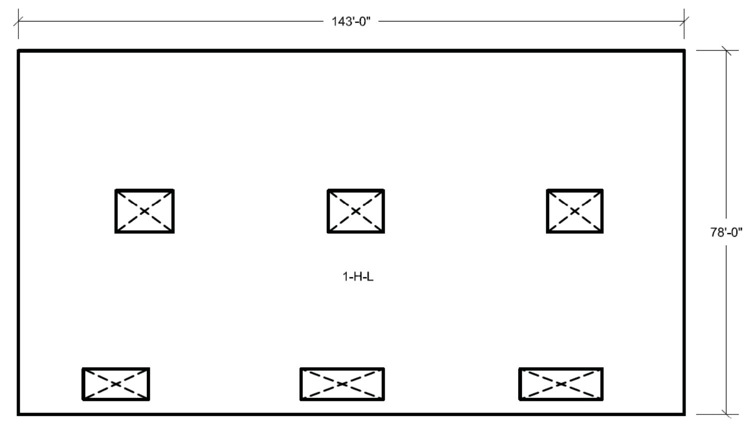

FIGURE 3H.6-127: PUMP HOUSE FLOOR EL. 15'-2"
EAST/WEST REINFORCEMENT ZONES
TOP FACE

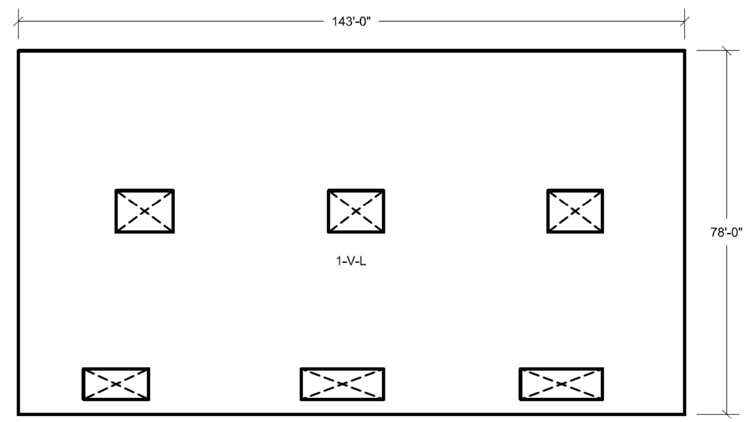

FIGURE 3H.6-128: PUMP HOUSE FLOOR EL. 15'-2"
NORTH/SOUTH REINFORCEMENT ZONES
TOP FACE

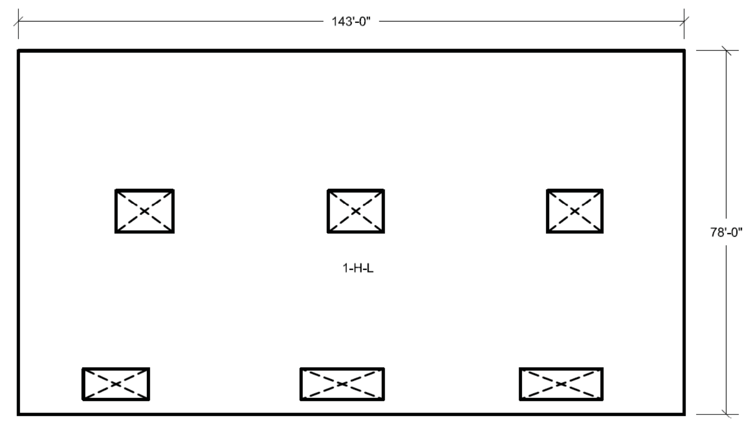

FIGURE 3H.6-129: PUMP HOUSE FLOOR EL. 15'-2"
EAST/WEST REINFORCEMENT ZONES
BOTTOM FACE

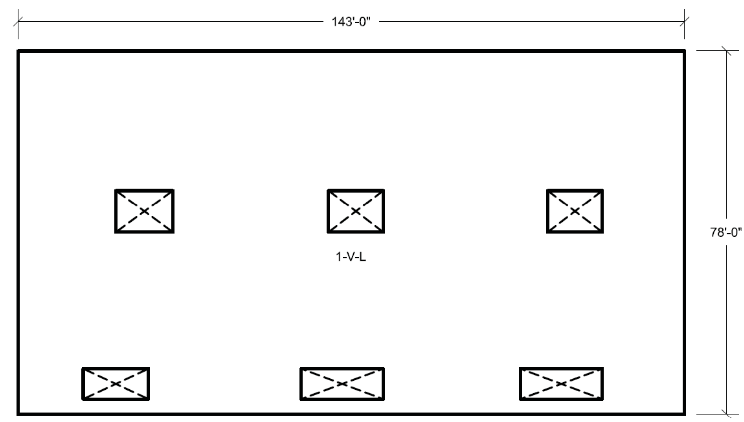

FIGURE 3H.6-130: PUMP HOUSE FLOOR EL. 15'-2"
NORTH/SOUTH REINFORCEMENT ZONES
BOTTOM FACE

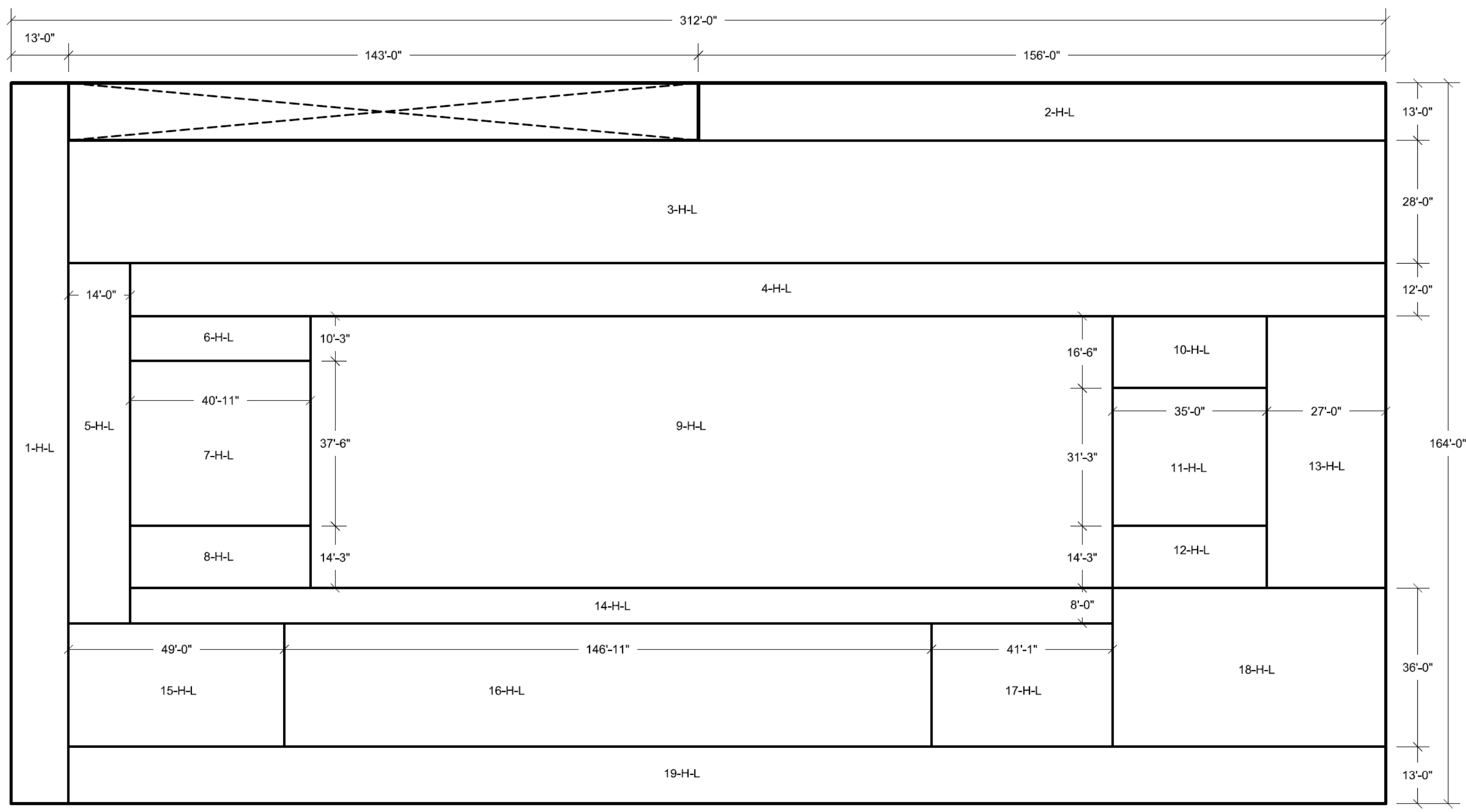

FIGURE 3H.6-131: UHS BASIN FOUNDATION MAT
EAST/WEST REINFORCEMENT ZONES
TOP FACE

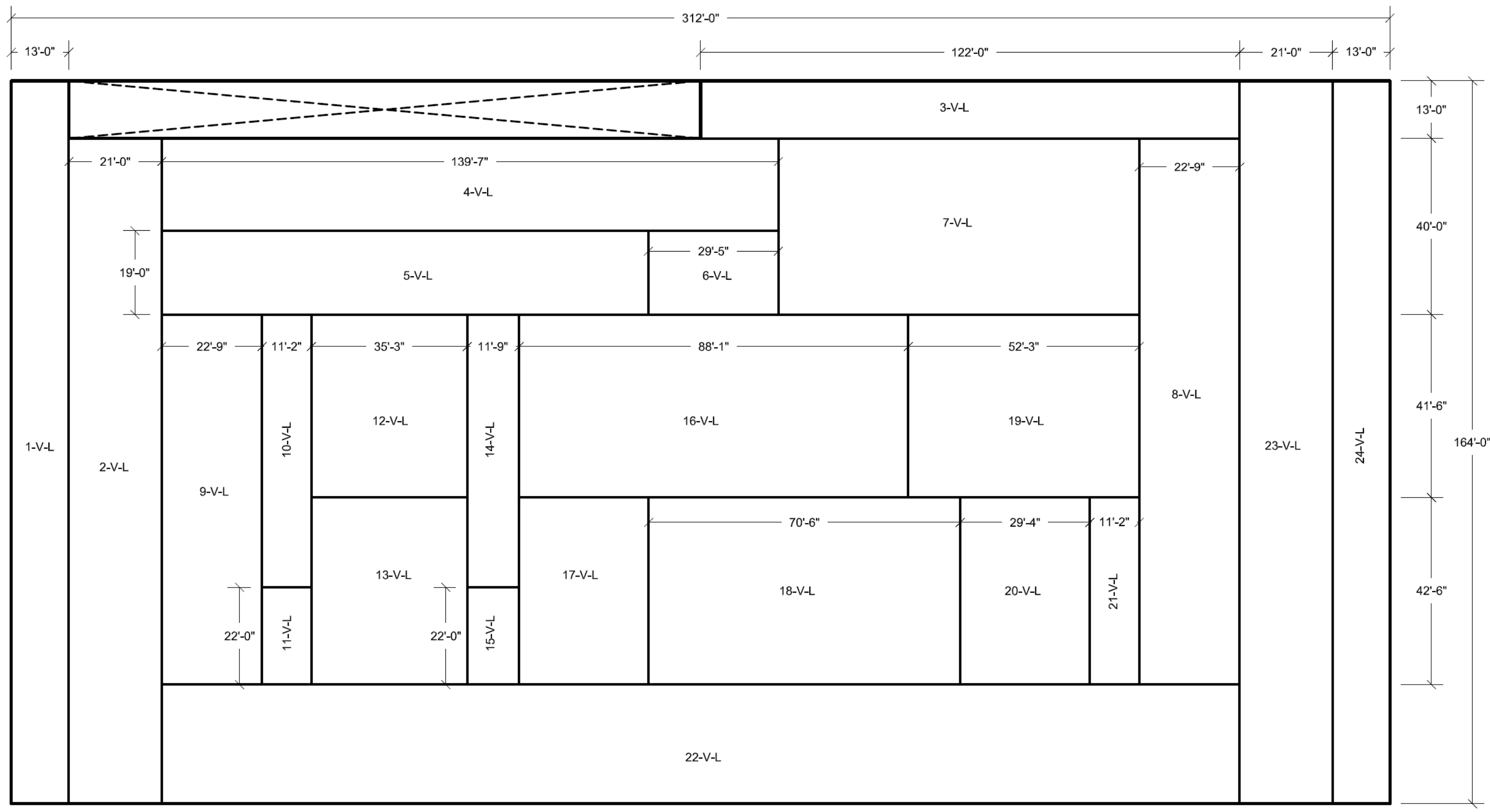

FIGURE 3H.6-132: UHS BASIN FOUNDATION MAT
NORTH/SOUTH REINFORCEMENT ZONES
TOP FACE

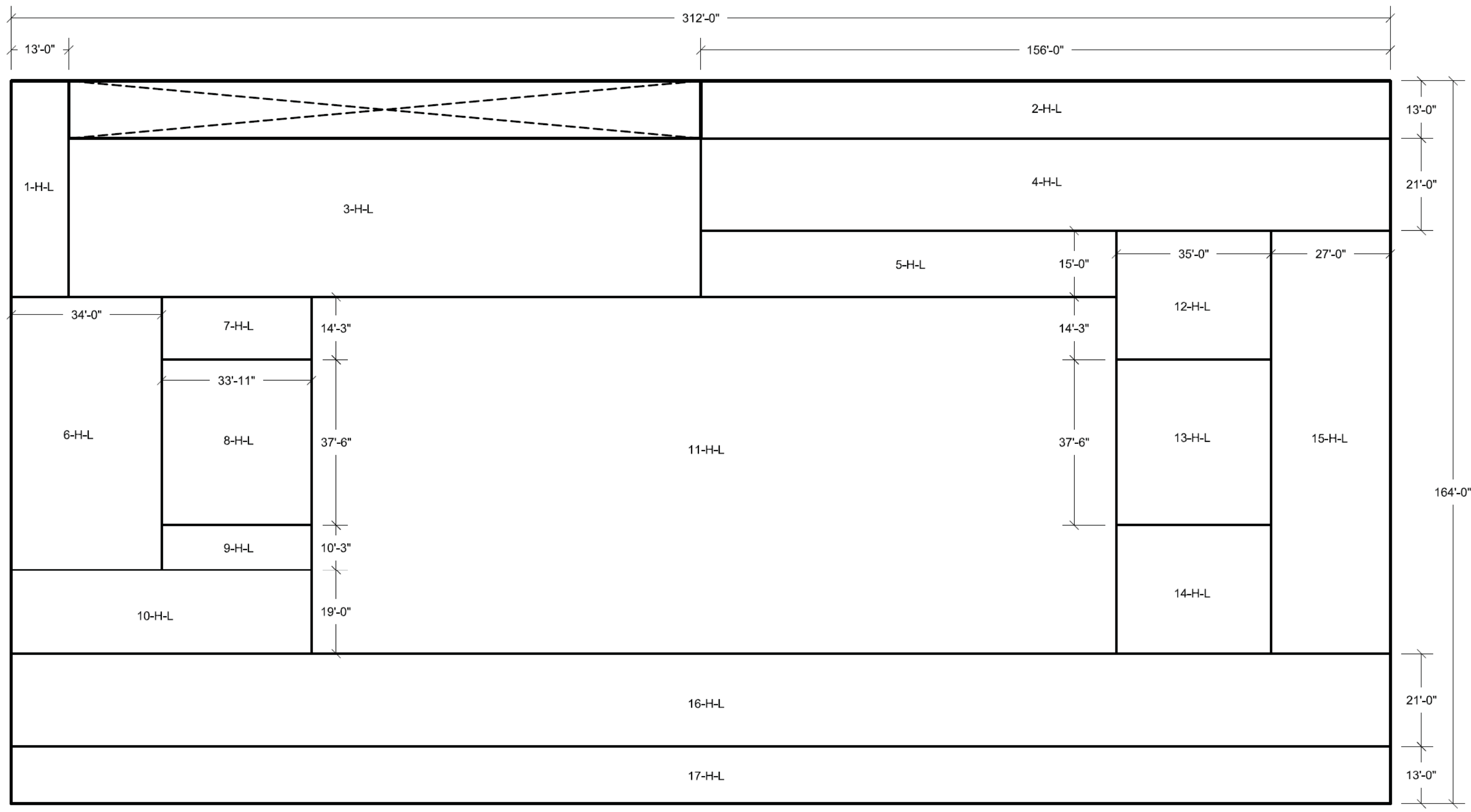

FIGURE 3H.6-133: UHS BASIN FOUNDATION MAT
EAST/WEST REINFORCEMENT ZONES
BOTTOM FACE

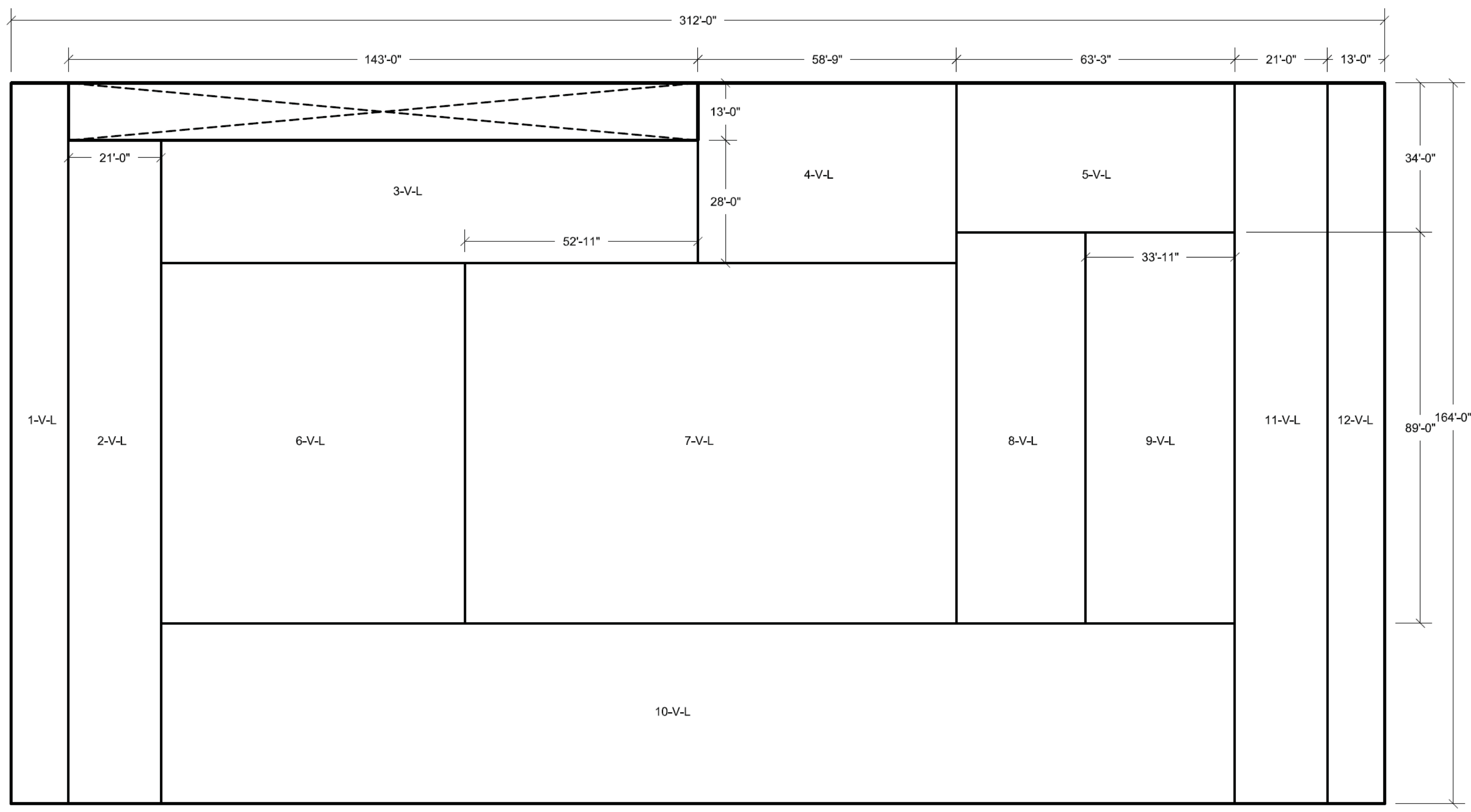

FIGURE 3H.6-134: UHS BASIN FOUNDATION MAT
NORTH/SOUTH REINFORCEMENT ZONES
BOTTOM FACE

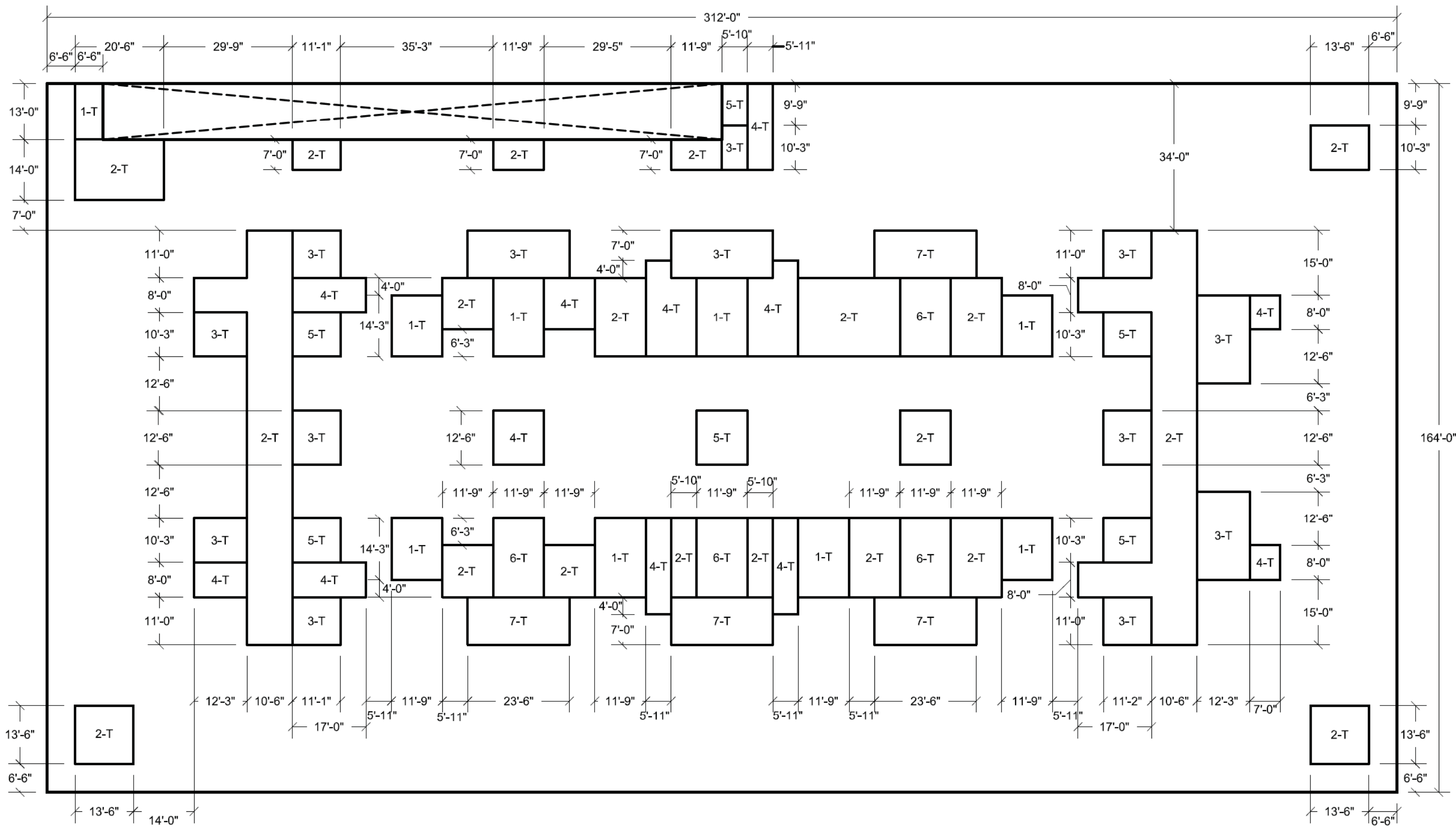

FIGURE 3H.6-134A: UHS BASIN FOUNDATION MAT
TRANSVERSE REINFORCEMENT ZONES

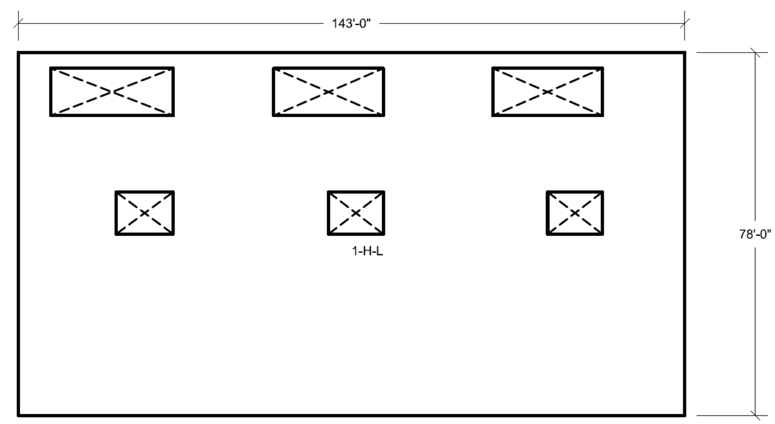

FIGURE 3H.6-135: PUMP HOUSE ROOF
EAST/WEST REINFORCEMENT ZONES
TOP FACE

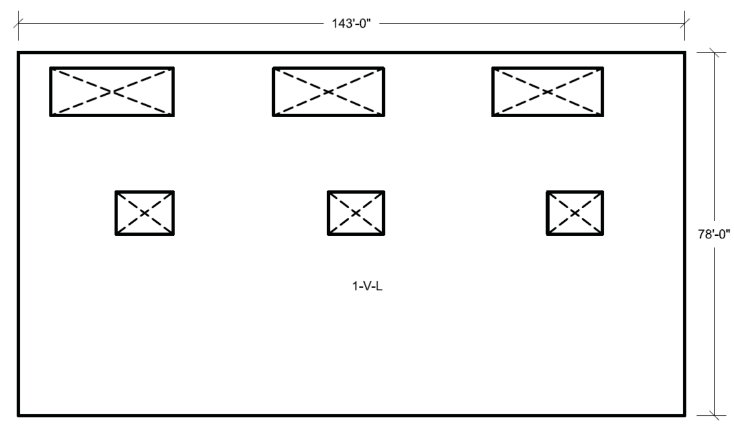

FIGURE 3H.6-136A: PUMP HOUSE ROOF
NORTH/SOUTH REINFORCEMENT ZONES
TOP FACE

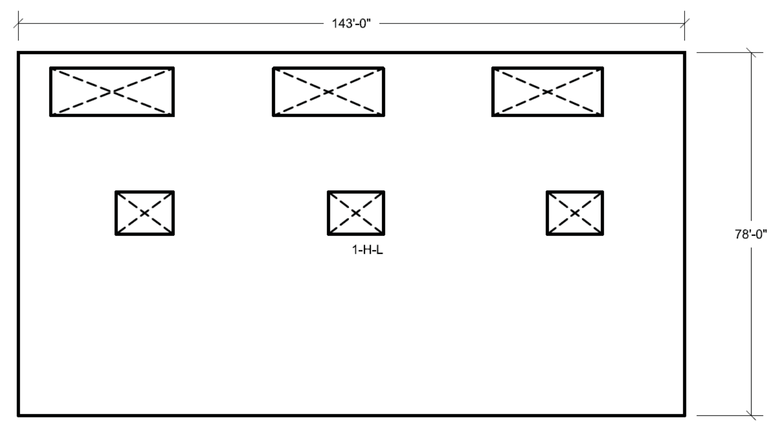

FIGURE 3H.6-136B: PUMP HOUSE ROOF
EAST/WEST REINFORCEMENT ZONES
BOTTOM FACE

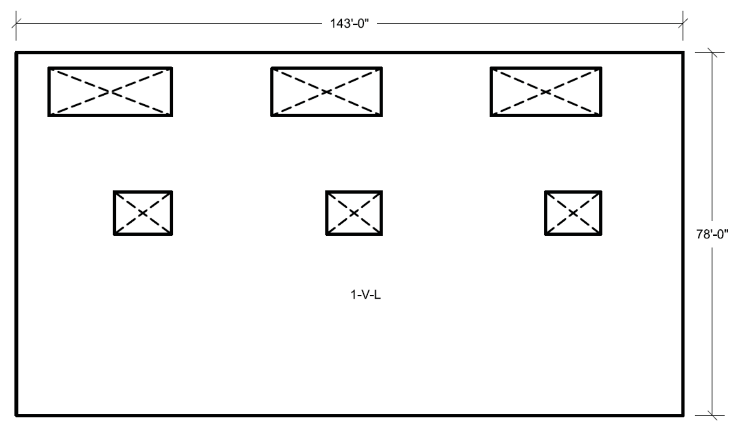

FIGURE 3H.6-136C: PUMP HOUSE ROOF
NORTH/SOUTH REINFORCEMENT ZONES
BOTTOM FACE