NuScale Power

RAIO-1217-57508

December 06, 2017

Docket No. 52-048

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

SUBJECT: NuScale Power, LLC Supplemental Response to NRC Request for Additional Information No. 136 (eRAI No. 8933) on the NuScale Design Certification Application

REFERENCES:
1. U.S. Nuclear Regulatory Commission, "Request for Additional Information No. 136 (eRAI No. 8933)," dated August 05, 2017
2. NuScale Power, LLC Response to NRC "Request for Additional Information No. 136 (eRAI No.8933)," dated October 03, 2017

The purpose of this letter is to provide the NuScale Power, LLC (NuScale) supplemental response to the referenced NRC Request for Additional Information (RAI).

The Enclosure to this letter contains NuScale's supplemental response to the following RAI Questions from NRC eRAI No. 8933:

- 03.07.02-19
- 03.07.02-20

This letter and the enclosed response make no new regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions on this response, please contact Marty Bryan at 541-452-7172 or at mbryan@nuscalepower.com.

Sincerely,

Zackary W. Rad
Director, Regulatory Affairs
NuScale Power, LLC

Distribution: Gregory Cranston, NRC, OWFN-8G9A
Samuel Lee, NRC, OWFN-8G9A
Marieliz Vera, NRC, OWFN-8G9A

Enclosure 1: NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 8933

Enclosure 1:

NuScale Supplemental Response to NRC Request for Additional Information eRAI No. 8933

Response to Request for Additional Information
Docket No. 52-048

eRAI No.: 8933
Date of RAI Issue: 08/05/2017

NRC Question No.: 03.07.02-19

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

a. On Page 3.7-33 of the FSAR, in the middle paragraph, the applicant states, “In the calculation of the structural frequencies for comparison, the structure is assumed to be surface founded in both the SAP2000 and SASSI2010 analyses. In the SASSI2010 analysis, the backfill soil was also assumed to be seated on top of a rigid halfspace with the structure.” On Page 3.7-33, second paragraph from the bottom, the applicant states, “However, the effect of backfill soil is more accurately captured in the SASSI2010 transfer functions than in the modal analysis of SAP2000.” The structure is assumed to be surface founded. The applicant is requested to explain how the backfill soil is incorporated into the model for both SAP2000 and SASSI2010 analyses.
b. Tables 3.7.2-10 and 11 in the FSAR provide the results of SAP2000 and SASSI2010 model comparison for the reactor building and control building, respectively. In Table 3.7.2-11, comparisons are presented only for higher mode numbers (N>72). The applicant is requested to explain why comparisons for lower mode numbers are not made or provided in the table.

NuScale Response:

As discussed, during a public meeting with the staff on November 7, 2017, the information provided in NuScale’s original response to RAI 8933 03.07.02-19 will be added to FSAR Tier 2, Section 3.7.2.1.2.6.

Impact on DCA:

FSAR Tier 2, Section 3.7.2.1.2.6 has been revised as described in the response above and as shown in the markup provided in this response.

55. In the SASSI2010 analysis, the properties of the backfill soil are assumed those of Soil Type 11.

Figure 3.7.2-56 shows the SASSI2010 solid elements modeling the concrete basemat. Figure 3.7.2-57 show the shell and beam elements of the CRB SASSI2010 model. Figure 3.7.2-58 shows all beam elements in the SASSI2010 model, which are identical to those shown in Figure 3.7.2-51.

The CRB and backfill soil is modeled surrounded by the free-field soil. The connectivity between the CRB with backfill and the free-field is achieved by connecting the skin nodes of the embedded model of the CRB and backfill soil with the skin nodes of the free-field soil model using soil springs. The skin nodes of the excavated soil model, and the skin nodes of the CRB and backfill model have identical coordinates and are in matching pairs.

The springs have a zero length and have a large stiffness value to simulate rigid connection. The large stiffness used is arbitrarily chosen as 10^{10} lbs/inch, in the three global directions. This high stiffness value does not cause numerical instability and keeps the displacements of two connected nodes to be the same.

The model dimensions, the quantities of elements and masses, and structural damping ratios used for the SASSI2010 model are summarized in Table 3.7.2-9.

3.7.2.1.2.6 Comparison of SAP2000 and SASSI2010 Models

The SASSI2010 model data were obtained by converting the data of the SAP2000 models. To verify that the SAP2000 model has been converted accurately into the SASSI2010 model, the total weights of the two models and the fixed base modal frequencies of the two models are compared.

The model frequencies and mode shapes of the fixed base SAP2000 model were calculated by a modal frequency analysis. The SASSI2010 analysis does not perform modal analysis. However, the major vibration frequencies of a certain location can be obtained to be those of the major amplitudes in the acceleration response transfer functions of the location.

RAI 03.07.02-19S1

In the calculation of the structural frequencies for comparison, the structure is assumed to be surface founded in both the SAP2000 and SASSI2010 analyses. In the SASSI2010 analysis, the backfill soil was also assumed to be seated on top of a rigid halfspace with the structure. For both the SAP2000 and SASSI2010 fixed-base analyses, the backfill soil is included as solid elements surrounding the buildings. The backfill soil is free around the perimeter and fixed at the bottom. The backfill soil is measured 25 ft outward from the exterior walls and extends from the bottom of the RWB, RXB, and CRB basemats to the ground surface. Properties of the Soil Type 11 are used to model the backfill soil. Soil Type 11 is chosen because it has an average shear wave velocity of 768 ft/sec for the upper 85 feet of soil, which is close to a typical backfill soil shear velocity

of 800 ft/sec. Each layer of soil depth is assigned a different set of material properties, which include Young's modulus, Poisson's ratio, and damping coefficient.

RAI 03.07.02-19S1

Table 3.7.2-10 provides modal frequency comparisons at several locations in the RXB. Table 3.7.2-11 provides similar information for the CRB. These comparisons are made for critical locations where maximum displacements are expected to occur. These critical locations are listed in the Table 3.7.2-11. Note that SASSI2010 does not perform modal analysis; therefore, frequencies corresponding to peaks of transfer functions at the critical locations are compared with the SAP2000 modal analysis. For example, at the center of the roof in the CRB model, SASSI output is compared with 72nd mode whose modal frequency matches the frequency at the peak of transfer function.

RAI 03.07.02-19S1

As can be seen from the tables, the SAP2000 modal frequencies are close to the corresponding SASSI2010 frequencies estimated from the transfer function peaks with a maximum difference of about 6 percent. This implies that the mass and stiffness of the structures in the SAP2000 have been closely duplicated in the SASSI2010 model. However, the effect of backfill soil is more accurately captured in the SASSI2010 transfer functions than in the modal analysis of SAP2000. because the SASSI2010 transfer functions include the effects of structural damping while the SAP2000 modal frequencies are independent of the structural damping.

3.7.2.1.2.7 Triple Building Model

The standalone SAP2000 RXB and CRB models (discussed above) were combined with a SAP2000 model of the RWB to make a single CRB-RXB-RWB SAP2000 model. The combined, or triple, building model is shown in Figure 3.7.2-59 which includes the three buildings with the backfill. Figure 3.7.2-60, Figure 3.7.2-61 and Figure 3.7.2-62 show isometric views of the three buildings without the backfill soil elements from three viewpoints. The backfill soil, which is modeled using solid elements, is shown in Figure 3.7.2-63. All beam elements in the combined model are shown in Figure 3.7.2-64. The spring or link elements are shown in Figure 3.7.2-65. The elevation view showing separation between the three buildings is shown in Figure 3.7.2-66.

SASSI2010 Triple Building Model

Figure 3.7.2-67 shows an isometric view of the SASSI2010 triple building model. This model includes the three buildings, backfill soil, and the excavated soil.

Figure 3.7.2-68 shows the north half of the triple building model. The interiors of the three buildings and six NPMs, which are modeled using beam elements can be seen in red.

Response to Request for Additional Information
Docket No. 52-048

eRAI No.: 8933
Date of RAI Issue: 08/05/2017

NRC Question No.: 03.07.02-20

10 CFR 50 Appendix S requires that the safety functions of structures, systems, and components (SSCs) must be assured during and after the vibratory ground motion associated with the Safe Shutdown Earthquake (SSE) through design, testing, or qualification methods.

a. In Figure 3.7.2-28 in the FSAR, the note at the bottom states that the NPM is restrained from horizontal and vertical movements. However, in FSAR Subsection 3.7.2.1.2.2, second paragraph, it is stated that the NPM is allowed to move freely in the upward direction. The applicant is requested to clarify this apparent discrepancy. Also, clarify if vertical lift-off (under tension) of the bottom of an NPM from the pool floor is allowed and, if lift-off is allowed, the applicant is requested to address the effect of potential impact load of the NPM on the liner plate of the pool floor due to vertical seismic motion.
b. In FSAR Subsection 3.7.2.1.2.2, last paragraph, it is stated that twist about the vertical axis is released at the base of the NPM model. The applicant is requested to provide detailed description of the interface boundary conditions (preferably in a tabular form) at the NPM top and bottom supports and how they are implemented in ANSYS and SASSI2010 system model, respectively.

NuScale Response:

As discussed, during a public meeting with the staff on November 7, 2017, the following information supplements NuScale's original response to RAI 8933 03.07.02-20.

Calculations of NPM lift-off and the floor support design for potential NPM impact loading are provided through the Containment and Ventilation audit.

The NPM floor support design is described in the revised FSAR Tier 2, Appendix 3B.2.7.3 and Figures 3B-48 to 3B-50.

The tables included in the original RAI response, showing interface boundary conditions, are added to Tier 2 of the FSAR as Tables 3.7.2-36 and 3.7.2-37.

NUSCALE POWER™

Impact on DCA:

FSAR Tier 2, Appendix 3B.2.7.3, Tables 3.7.2-36 and 3.7.2-37, and Figures 3B-48 to 3B-50 have been revised as described in the response above and as shown in the markup provided in this response.

direction. In other words, the lug and restraint provides only horizontal restraint in the in-plane direction for the supporting wall.

The lug and lug restraint combination is shown in Figure 3.7.2-22. Figure 3.7.2-23 shows the top view of a restrained NPM. The placement of the twelve NPMs in the model of the RXB is shown in Figure 3.7.2-24. An enlarged view of the NPM pool region is shown in Figure 3.7.2-25.

Figure 3.7.2-26 shows a view of the RXB model with twelve NPMs within the support walls. The lug restraints can be seen near the mid-height of the NPMs in the figure. Figure 3.7.2-27 shows a single NPM. In this figure, the lug restraint can be seen at the upper part of the NPM and the support skirt can be seen at the base of the NPM.

NuScale Power Module Model Included in the Reactor Building SASSI2010 Model

RAI 03.07.02-20, RAI 03.07.02-20S1

Within the SASSI2010 building model, the NPM is represented by a beam model as shown in Figure 3.7.2-28. The skirt support at the base of the containment restricts horizontal and vertical movements ~~but permits the NPM to twist about the vertical axis~~. Eight rigid beams arranged like the legs of a spider are modeled to connect the NPM model containment skirt to nodes in the building model located at the interface of the skirt and pool floor. ~~Twist about the vertical axis is released at the base of the NPM model.~~ The RXB analysis produces local acceleration time histories that are used as input to the NPM seismic analysis. The seismic analysis of the NPM is discussed in Appendix 3A. Table 3.7.2-36 and Table 3.7.2-37 outline the NPM beam model to RXB model interface boundary conditions for the SASSI2010 and ANSYS models, respectively.

3.7.2.1.2.3 Reactor Building Crane

The RBC is a bridge crane used to transport modules between the operating locations and the refueling and disassembly area and the drydock. The RBC travels on rails on the top of the reactor pool walls at EL. 145'-6". When not in use, the RBC is parked over the refueling pool with the trolley at the north end near the dry dock gate. In this position, the RBC is not above either the SFP or the NPMs. The RBC is described in Section 9.1.5.

Reactor Building Crane Model Included in the Reactor Building SASSI2010 Model

RAI 03.07.03-1

Figure 3.7.2-29 shows the beam and spring model used to represent the RBC. For the analysis of the RXB, the RBC is unloaded (i.e., no suspended NPM) and located in the middle of the reactor pool area as shown in Figure 3.7.2-24. The RXB analysis produces in-structure response spectra (ISRS) that are used as

RAI 03.07.02-20S1

Table 3.7.2-36: SASSI2010 3D Equivalent Stick Model

		Interface Boundary Conditions					
Location	**Support**	**X (East-West)**	**Y (North - South)**	**Z (Vertical)**	**RX**	**RY**	**RZ**
Top of RXM	CNV Pool Wall Lug	Restrained	Free	Free	Free	Free	Free
	CNV West Side Lug	Free	Restrained	Free	Free	Free	Free
	CNV East Side Lug	Free	Restrained	Free	Free	Free	Free
Base of RXM Skirt Support (2 Node Link Elements)	End of rigid beam 1	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 2	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 3	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 4	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 5	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 6	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 7	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 8	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free

RAI 03.07.02-20S1

Table 3.7.2-37: ANSYS 3D Finite Element Beam Model

		Interface Boundary Conditions					
Location	**Support**	**X (East-West)**	**Y (North - South)**	**Z (Vertical)**	**RX**	**RY**	**RZ**
Top of RXM	CNV Pool Wall Lug	Spring with high stiffness	Free	Free	Free	Free	Free
	CNV West Side Lug	Free	Spring with high stiffness	Free	Free	Free	Free
	CNV East Side Lug	Free	Spring with high stiffness	Free	Free	Free	Free
Base of RXM Skirt Support (2 node link element)	End of rigid beam 1	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 2	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 3	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 4	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 5	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 6	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 7	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
	End of rigid beam 8	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free
RXM Base to Base of RXM Skirt Support	Spider Center(1)	Spring with high stiffness	Spring with high stiffness	Spring with high stiffness	Free	Free	Free

Note (1): Two nodes are included at this location (nodes 101 and 600 in TR-0916-51502). Only translation is transferred between these two nodes; that is, the NPM is free to twist.

A summary table of the element-based design check results for the wall at grid line B is presented in Table 3B-23. This summary table shows the maximum D/C ratios within each design check zone and highlights the YZ plane shear exceedance. Table 3B-24 shows the element averaging for that exceedance. Table 3B-25 provides a summary of D/C ratios after averaging.

ER-F010-4170, Rev 1

RAI 03.07.02-20, RAI 03.08.04-31

3B.2.7.3 NuScale Power Module Passive Support SkirtRing Assembly

CP-0008, CP-0478

N/A - Title

RAI 03.07.02-20

The base of the NPM is located at the bottom of the RXB pool at EL. 25′-0″. There are up to 12 NPMs located in the RXB pool in their respective bays. The pool floor liner in the NPM bay is made of half-inch thick stainless steel where aswhereas the wall liner is made of quarter-inch stainless steel.

CP-0008

RAI 03.07.02-20

The NPM is vertically supported for the dead load and seismic loads acting downwards at the base, but free to move up vertically for any uplifting forces (such as seismic load acting upwards and buoyant forces due to the water in the reactor pool). The NPM is also laterally restrained against seismic forces at the base.

CP-0008

RAI 03.07.02-20

The details of the NPM base support are shown in Figure 3B-48 through Figure 3B-50. The NPM base support is comprisedincludes of the following:

CP-0008

RAI 03.07.02-20, RAI 03.08.04-31

- The skirt of the NPM is supported on thea 14.5 ft square, 4 in. 1′-2″ wide 3″ thick bearing plate ringembedded in the basemat. This plate is made of carbonaustenitic stainless steel, whichthat is anchored to the concrete base mat throughvia 36 concrete anchors welded to the bottom of the plate. The liner plate is discontinuous in the area around the NPM. A leaktight boundary is ensured by a seal weld between the liner plate and the embedded plate. a pair of 1-1/2″ diameter headed studs placed at 10 degree centers. Figure 3B-48 through Figure 3B-50 shows the details of the 3″4 in. thick bearing plate. Since tThe NPM is free to move upupward vertically, and the vertical NPM load is transferred to the concrete basemat in bearing., and the headed studs do not carry any tensile loads.

CP-0008, CP-0478

RAI 03.07.02-20, RAI 03.08.04-31

- The NPM is laterally restrained by a 5″an 8 in. thick passive support ring made of stainless steel whichthat is bolted to the underlying bearing plate.welded to the ½″ thick pool floor liner plate by a ½″ fillet weld on the inside periphery. At the outsideinside periphery of the passive ring, a beveled edge at the top is provided in order to guide the NPM at initial placement and during theirits

removal and replacement for refueling operation. In addition to the ½" fillet welds, five 2" diameter, ½" plug welds (at 15 degree centers located at the azimuths corresponding to the NPM lugs at the higher elevation) are provided at the outer periphery of the passive ring. These plug welds are intended to ensure prevention of potential lifting of the passive ring during removal and replacement of the NPMs.If the NPM impacts the passive support ring, any resulting upward vertical load will be resisted by the concrete anchors. Figure 3B-48 and Figure 3B-49 show the details of the passive support ring.

CP-0008, CP-0478

RAI 03.08.04-31

Reactor Module Model:

A separate ANSYS model is used to perform a non-linear dynamic analysis of the reactor modules. This model only includes the pool water and one reactor module (1 or 6). The analysis results are based on the envelope of the six runs shown in Table 3B-52. The static reaction force including the dead weight and the static buoyancy, is 1,090.4 kips in the vertical direction. The maximum vertical seismic reaction force, which does not include the static reaction force is 3,231 kips. The maximum uplift displacement of the module from the floor is less than 0.125 inch.

CP-0478

Envelope Loads:

RAI 03.07.02-20, RAI 03.08.04-31

- Vertical downward load, P = 4,5005,227 kips. (Assume this is DL + vertical seismic load). Since the NPM is free to move in the vertical direction there is no upward load.This load includes dead load, fluid pressure load, and seismic load. Dead load is the static buoyancy load described above and is equal to 1.090.4 kips. The fluid pressure load is determined by the product of the baseplate area (14.5' x 14.5'), the fluid density (62.4 pcf), and the normal operating reactor pool depth (69') and is equal to 905.3 kips. The downward seismic load is 3,231 kips, as stated above.

CP-0008, CP-0478

RAI 03.07.02-20

- The vertical displacement is expected to be far less than 1.00.125 inch. For this kind of vertical displacement, since the interfacing lateral load resistance feature offered by the 5 inch thick passive ring is having a thickness of 4" below the bevel,The passive support ring is 4.5" thick below the bevel, therefore, there will always be a lateral support from the passive support ring.

CP-0008

RAI 03.07.02-20

- Lateral load,:
  - P_H = 1,550 kips in any directionEast-West seismic load = 703 kips
  - North-South seismic load = 1,164 kips
  - Square Root Sum of Squares horizontal seismic load = $\sqrt{(703^2 + 1{,}164^2)}$ = 1,360 kips

RAI 03.07.02-20 CP-0008

It is possible for the support ring and anchors to experience an upward vertical force if the NPM were to strike the support ring during a seismic event. Because this force is of extremely short duration and the contact surface small, only a limited amount of force is transferred to the support ring. A coefficient of friction value between wet steel and steel of 0.2 is multiplied by the Square Root Sum of Squares of EW and NS seismic loads to determine this force.

RAI 03.07.02-20 CP-0008

$$V_{uplift} = 0.2 \times 1{,}360 \text{ kips} = 272 \text{ kips}$$

CP-0008

Materials and Material Strength:

- Stainless Steel: The stainless steel used for the liner plate conforms to ASTM A-167 or ASTM A-240 Type 304L and has a 0.2 percent offset yield strength of 25 ksi, and ultimate tensile strength 70 ksi.

RAI 03.07.02-20

- ~~Carbon Steel~~Austenitic Stainless: The ~~carbon~~ steel used for the ~~3"~~4 in. thick bearing plate~~s~~ that supports the NPMs vertically is ~~fabricated from A572 Gr 50~~ASTM A965 Grade F304 with a yield strength of ~~50~~23.6 ksi and ultimate tensile strength of ~~70~~61.4 ksi at a design temperature of 300°F.

CP-0008

- Concrete for Basemat: The concrete strength, f'_c is 5000 psi

RAI 03.07.02-20

A total of 36, 3/4 in. diameter ASTM F1554, Grade 55 concrete anchors are used to anchor the passive support ring and embedded plate assembly. These anchors have a yield strength of 55 ksi and designations of S1 (weldable) and S4 (Charpy test).

RAI 03.07.02-20 CP-0008

A total of 30, 1.5 in. thread diameter ASTM A479 Type UNS S21800 bolts fasten the passive support ring to the embedded plate.

CP-0008

Load Path:

RAI 03.07.02-20

- The vertical load is resisted by the ~~1'- 2"~~14.5 ft square, ~~wide 3"~~4 in. thick bearing ring plate.

RAI 03.07.02-20 CP-0008

- The lateral load is resisted by bolts that connect the passive support ring to the embedded bearing plate. The bolts transfer the lateral load to the bearing

plate, which, in turn, transfers the load, via bearing, to the concrete basemat.the weld capacity of the passive support skirt ring to the ½" thick pool floor liner plate through ½" fillet weld. Furthermore the ½" pool floor liner plate is connected to the pool wall and the cross wall via 3/16" fillet weld where the lateral loads eventually get resisted by the walls.

CP-0008

Evaluation:

Vertical Load Bearing Capacity

RAI 03.07.02-20, RAI 03.08.04-31

- Area of the bearing ring plate,concrete in bearing, A_{brg}, is 57184310 in^2, therefore the bearing pressure (P_V/ A_{brg}) is 0.791.21 ksi

CP-0008, CP-0478

- Allowable bearing pressure = (Φ)(0.85f'c) = 2.76 ksi [Φ = 0.65]

RAI 03.07.02-20, RAI 03.08.04-31

- Vertical bearing D/C Ratio: = 0.290.44

CP-0008, CP-0478

RAI 03.07.02-20

- The maximum D/C ratio of the anchor bolts is due to concrete breakout in tension and is equal to 0.64.

CP-0008

Lateral Load Resistance

RAI 03.07.02-20

- SRSS Lateral Load, P_H = 1550is 1,360 kips

CP-0008

RAI 03.07.02-20

- ½" Fillet weld capacity is 4,012 kips, therefore the D/C ratio: is 0.39The D/C ratio of the bolts in shear and tension is 0.68.

CP-0008

RAI 03.07.02-20, RAI 03.08.04-31

- 3/16" Fillet weld capacity is 3,036 kips, therefore the D/C ratio: is 0.51The maximum D/C ratio for concrete bearing due to lateral load transferred from the bearing plate is 0.71.

CP-0008, CP-0478

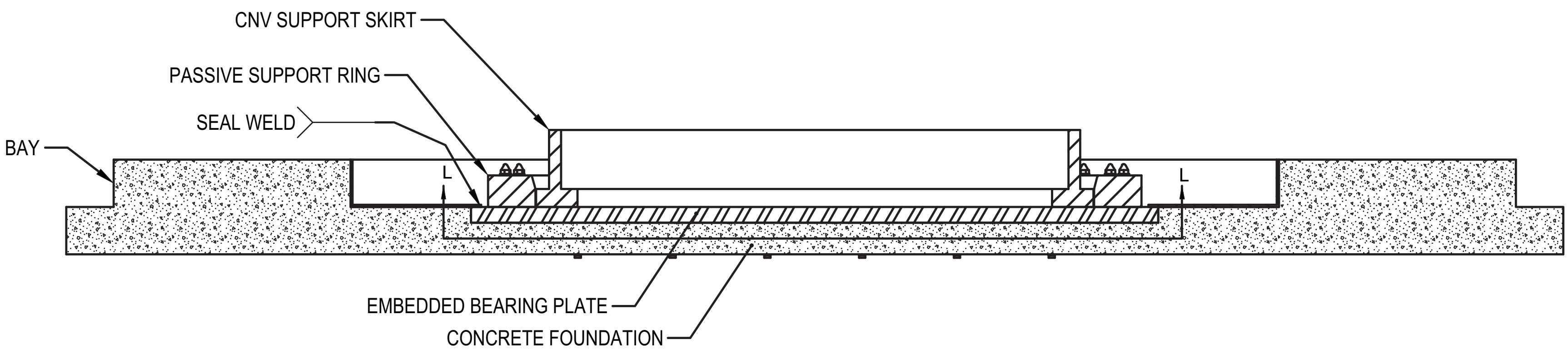
RAI 03.07.02-20

Potential Buckling of Pool Floor Liner Plate

There is a potential for buckling of ½" thick pool floor liner plate while resisting the lateral load. However, the pool is filled with water from EL. 25'-0" to EL. 94'-0" for water column height of 69 feet. The water pressure at the pool floor is approximately 30 psi. This water pressure is always present and acts on the liner plate compressing against concrete base mat. Hence the notion of potential buckling of liner plate while resisting later load is not credible.

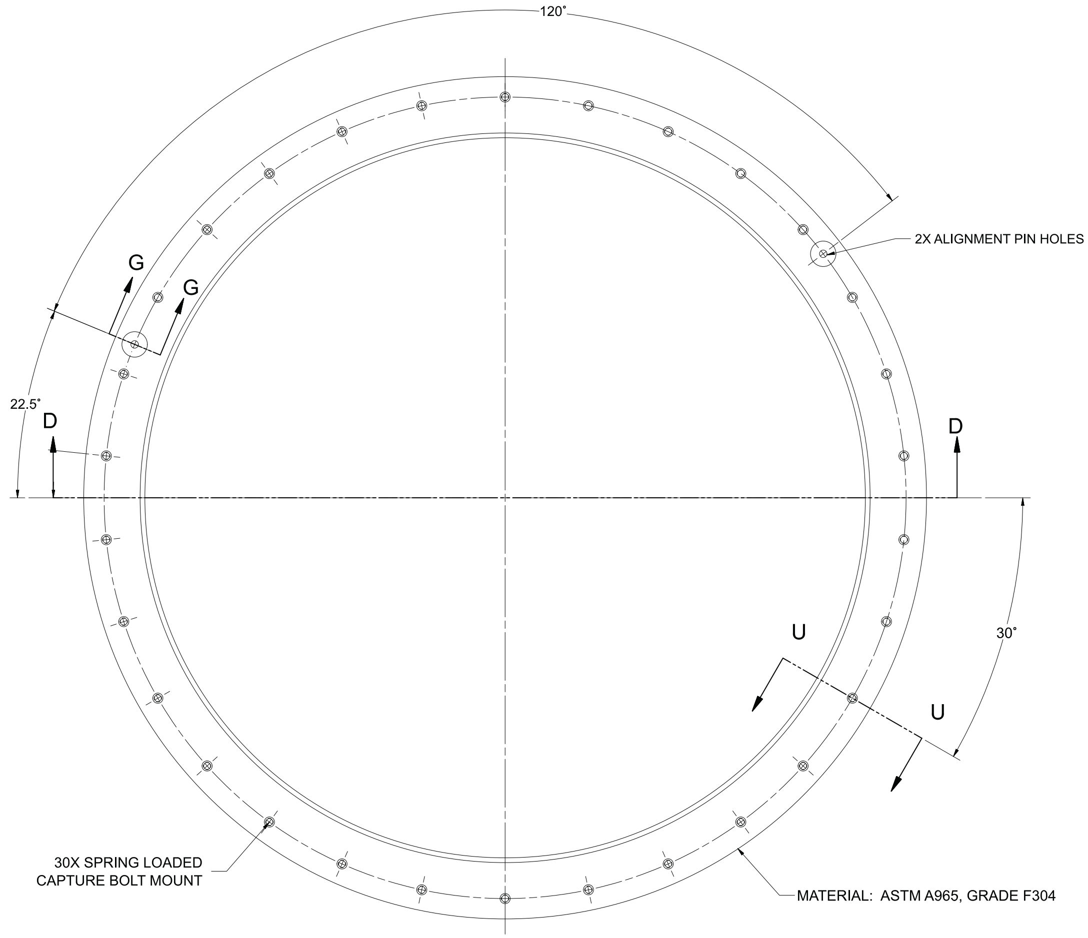
RAI 03.07.02-20, RAI 03.07.02-20S1

Figure 3B-48: Elevation View of the NPM Base Support at RXB Pool Floor



RAI 03.07.02-20

Figure 3B-49: Plan View of NPM Base Support ~~at~~ Passive <u>Support</u> Ring ~~(Section A from Figure 3B-48)~~



PASSIVE SUPPORT RING

<u>CP-0008</u>

ER-F010-4170, Rev 1, Fig 6-154

RAI 03.07.02-20. RAI 03.07.02-20S1

Figure 3B-50: Plan View of NPM Base Support ~~at~~ Bearing ~~Ring~~ Plate ~~(Section B from Figure 3B-48)~~