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**Permit Number:** C22-1820  
**Permit Type:** Commercial Building Permit - None BldgNew  
**Address:** 4531 ELMORE RD Anchorage  
**Location:**  
 NEW 27,018 SQ FT BUILDING - TYPE IIB CONSTRUCTION - B = 11,263 SQ FT R1 = 15,755 SQ FT - BWP  
**Work Description:** FILL/GRADE IS C22-1713  
 \*\*PAID BY MOA ACCOUNTING STRING\*\*  
**Status:** Open  
**Project Name:** NAVIGATION CENTER  
**Review Type:** Structural  
**Result:** Correction  
**Result Date:** 9/20/2022 1:03:00 PM

**Comments:**

Code Section	Review Comment Status
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**Advisory Information:**

PERMIT STATUS

8/23/22 - Permit reviewed. Comments issued.

9/14/2022 - No response to comments 1 through 7 provided. Other responses reviewed. Comments issued. Comments 1, 2, 3, 4 and 9 need to be resolved for F&F approval.

9/20/2020 - No new information regarding the issued comments has been provided.

**10/14/2022 - Responses reviewed. Comments issued.**

1. SEISMIC DESIGN

The calculations appear to indicate the seismic system as a system not specifically detailed for seismic. This is not permitted in the Seismic Design Category of this site. Please clarify. While this structure is likely control by wind for lateral loads, IBC section 1604.10. Please note that there are no approved aluminum seismic systems in ASCE 7-16. Per pre-agreements with the engineer of record and Building Official the seismic design will be done using an R=0.67 as an alternate means and methods. Please submit this for approval.

Please also note that no snow load has been included in the seismic mass as required by ASCE 7-16 section 12.7.2. Per agreement with the engineer of record and the Building Official this will be approved using an alternate means and methods with anecdotal evidence that the structure sheds nearly all of the snow load. Please submit this for approval.

**Comment remains. No alternate means and methods has been provided. Two alternate means and methods must be provided. One for the use of an seismic system not recognized by ASCE 7-16 and the second for not including any snow load in the seismic weight. Please provide. WAB - 10/12/2022**

2. WIND LOADS

The wind loads have been generated using a wind tunnel test. The wind tunnel test was reviewed and the following comments apply:

A. The model was made from 1/4" acrylic sheets. This does not seem to model the fabric or frames used in these structures. This seems to be a major issue given the rigidity of 1/4" acrylic sheets compared to the plastic fabric used as the covering on these structures. Membrane-type structures are also specifically mentioned in ASCE 49 section C5.1 as structures that may be subject to additional aeroelastic effects, with the model required to achieve dynamic similarity in section 5.2.1. It doesn't seem that this approach would comply. Please justify the use of this material to model the structure.

**Item remains. Response not accepted. The response provided does not justify the model using 1/4" acrylic sheets to model the plastic fabric these structures use. The response also does not address the aeroelastic effects caused by the plastic fabric. WAB - 10/12/2022**

B. The report mentions ribs like what would be seen in metal deck. It seems the report was produced with a different type of structure in mind (we've seen those cold-form steel A-frame/arch structures and this kind of sounds like that). This might refer to the frames of the structure but it's not really clear. Please clarify this portion of the report.

**Item remains. The response seems to describe something that is different than the model. The report only indicates the structure being modeled with 1/4" acrylic sheets. There is no mention of aluminum frames and purlins in section 2.2 or Appendix 1 of the report. Section 2.2 of the report mentioned "the pressure holes are displaced on the model about 2 mm in the clockwise direction perpendicular to the rib." This is were the rib confusion stems. It is not clear what is meant by rib here, but apparent it is not referring to a rib as one would get in metal deck. In any regards MOA does not accept that acrylic sheets is the appropriate material for modeling this structure. WAB - 10/12/2022**

C. The scale used must meet the requirements of ASCE 49-21 section 2.2. Please provide substantiating data showing this is met.

**Item remains. It is not clear in the report what size prototype was used when scaled to 1:96. The response indicates it was for a 50' wide structure (with no indications of heights, lengths, roof slope, etc. The proposed structure is 90' wide. There is nothing in the report describing the wind tunnel chamber length. Also based on the response since the width of the model is 50 feet and the width of the structure in this case is 90 feet equation 2-2 is not necessarily met. Please show section 2.2. is met. WAB - 10/14/2022**

D. The report must contain the information required by ASCE 49-21 section 1.2. There could also be additional requirements for the report. As an example, ASCE 49-21 section C3.4 indicates "the list of measurement techniques is not exhaustive, and specialized measurement techniques may be applied for unique wind tunnel tests. In these cases, the details of the model and measurement techniques should be included in the report." Please provide a report with all the information required by the referenced section.

**Item remains. Much of the setup is not clear from the report. As indicated previously the wind tunnel chamber and other aspects of the wind tunnel have not been described. Where is the target upwind exposure, terrain and proximity features described? No information for items 3 or 5 of section 1.2 appear to have been provided. Please provide. WAB - 10/14/2022**

E. It must be shown that the Atmospheric Boundary Layer Simulation meets the requirements of ASCE 49-21 section C2.3. Please provide substantiating data showing the requirements of the referenced section are met.

**Item remains. The response to Item 2A does not discuss this. WAB - 10/14/2022**

F. It is not clear if these structures are rigid or flexible (this can be determined by ASCE 7-16, flexible is defined as a structure with a frequency of less than 1 Hz...see definitions in Chapter 26). Where rigid the requirements of chapter C3 would apply. Where flexible the requirements of chapter C4 would apply. These chapters deal with measuring techniques and it is not clear from the report if these chapters are met. See also comment 1. Please clarify this and ensure the measurement methods used are appropriate.

**Item remains. The response to Item 2A discusses diaphragm rigidity but does not address this comment. WAB -10/14/2022**

G. The report seems to be limited to main-wind-force-resisting systems pressures. This structure will have elements that must be designed for components and cladding pressures such as the fabric and frames (as well as connections of the fabric to the frames). Where the tributary area exceeds 700 sq. ft. to the element the main-wind-force-resisting system loads can be used (which may be the case for the frames, but the fabric and connections are likely components and cladding). Please justify no wind tunnel testing for components and cladding. Otherwise the components and cladding forces will need to be determined per ASCE 7-16.

**Item resolved. Approval from Miami-Dade indicates the fabric and its connections are approved for the High Velocity Hurricane Zone in the FBC. Approval is good until 4/25/2023. WAB - 10/14/2022**

H. ASCE 7-16 section 31.4.4 has limitations on how much reduction can be taken using wind tunnel testing. It must be shown that pressures have not been reduced by more than what is allowed in this section. Please provide substantiating data showing the minimums have been met.

**Item remains. The response is accepted; however please show that the response is true. If the wind loads currently applied exceed those in ASCE 7-16 then they can be kept as is and no alternate is required for the wind load. If the winds loads are less than those required by ASCE 7 then they cannot be reduced more more than that indicated in section 31.4.4 WAB - 10/14/2022**

The reviewer has been told this would be done as an alternate means and methods; however has not seen anything information on this. Please provide. WAB - 8/23/2022

**There is a letter in the file just states the structure meets the building code. If approval based on this letter is sought this must be done as an alternate means and methods. WAB - 10/14/2022**

### 3. RISA MODEL

The RISA model input for the Sprung structure is not complete. Please provide loading diagrams for dead load, snow load and seismic load or provide the load cases table so that these loads can be verified.

**Item remains. The only loading diagrams provided are for wind loads. No loading diagrams or loading information has been provided for the other load cases. This is what is in the RISA 3D report provided: page 15 is Boundary Conditions, page 16 is an isometric of the structure, pages 17-20 are the wind loading diagrams, pages 21-30 are the joint coordinates, pages 30-57 are the member primary data, page 57 also has Load Combinations, pages 57-59 are the joint envelope reactions, pages 60-113 are envelope member section forces. The DL, SL, EL load cases were not provided.**

### 4. FOUNDATION DESIGN

The foundations for the building have only been reviewed for procedure. Both the seismic load and wind load for this structure are being done as alternate means and methods. These loads have not been approved by the reviewer. The foundation approval for the building will need to be done as an alternate means and methods. The foundations for the the interior framing and mechanical platforms have been reviewed and approved.

### 5. APPROVED FABRICATOR

Please provide the fabricators IAS or similar certification to provide fabrication services without special inspections as required by IBC 1704.2.5.2. The fabricator can also submit their quality control program with the information required by the Aluminum Design Manual section N.2.

**Comment remains. It must be shown that the ISO 9001-15 certification is equivalent to an IAS (International Accreditation Service) certification (in this case probably Metal Building Systems). Please provide substantiating data showing it is. WAB - 10/13/2022**

### 6. STEEL ELEMENTS

There appears to be steel elements being connected to aluminum elements at the foundation and the cross bracing. Please clarify the provisions for aluminum in contact with dissimilar materials.

**Comment remains. The response is accepted; however the drawings do not reflect the information given in the response. The cable bracing is called out as galvanized, but doesn't indicate process or that is it hot dipped zinc galvanized. The baseplates are not even indicated as being galvanized. This can be resolved by providing a general note indicating all steel in contact with aluminum is to be hot dipped zinc coated galvanized per ASTM A153. WAB - 10/13/2022**

#### 7. BUILDING DRAWINGS

Reference the Sprung building drawings. Please provide the following:

A. Please clarify where the end wall columns and purlins have been indicated and designed. If not provided, please provide.

**Item remains. This information must be included on the drawings. WAB - 10/14/2022**

B. No design of the opening framing could be located. Please provide for review.

**Item remains. This design must be provided and the framing information be included on the drawings. WAB - 10/14/2022**

C. Per discussion with the Mechanical Reviewer there are vents that go through the fabric. Please verify these openings are small enough to require framing around them or provide this framing for review.

**Item remains. The response is not clear. Is there framing provided at mechanical openings? Do these openings required reinforcement? If they do please provide this information on the drawings. WAB - 10/14/2022**

#### 8. CRW DRAWINGS

Reference the CRW drawing package. Please provide the following:

A. The concrete pedestal schedule could not be located. Please provide or indicate where this information has been provided.

Item resolved. Please insert the revise sheet into the drawing set. WAB - 9/14/2022

B. Reference details 4 and 8 on sheet S601. ACI 318-16 requires vertical bars to be within 6" of the bend in the ties. The pedestal schedule could not be located so if there are verticals in the pedestals that are not within the 6" please revise the detail to meet this requirement. If there is not this can be verified from the pedestal schedule.

Item resolved. Response accepted. WAB - 9/14/2022

9. The borings shown blow counts of over 50 blows/ft at depths starting around 12 feet. Please verify the Site Class designation prior to building submittal. ASCE 7-16 potentially indicates Site Class C for this which would increase Fa to 1.2.

Please provide a response from the Geotechnical Engineer. WAB - 9/14/2022

**Please provide a response from the Geotechnical Engineer as requested previously. WAB - 10/14/2022**