Georgia State Financing and Investment Commission
Design Review Group

Pre-Engineered Metal Buildings (PEMB): Design Guidelines and Submittal Requirements White Paper – May 10, 2022

INTRODUCTION:

The GSFIC Design Review Group (DRG) provides this Guideline to summarize the design recommendations and requirements for submittal, review, and approval of pre-engineered metal buildings (PEMB). The goal of this guideline is to clarify requirements and provide assistance to architects and engineers, contractors, campuses, and Using Agencies when planning for new metal buildings, and to increase the rate of these project approvals for construction.

BACKGROUND AND SUMMARY:

As the Authority Having Jurisdiction (AHJ) for State projects, GSFIC DRG provides State Fire Marshal reviews for both GSFIC and non-GSFIC managed projects, plus constructability reviews for GSFIC projects. This office receives a number of PEMB for review and approval. Several entities have requested clarification or written policies for PEMB submittals. Due to the unique nature of the supply of these structures (delegated design where the final design is not available until after purchase of the structural system), the design and construction industry has a misconception that metal buildings can be approved by the AHJ with minimal documentation. **Our office states that PEMB are still buildings and subject to the same submittal, review, approval, and code compliance requirements for the issuance of construction permits that other buildings require.**

The summary below includes typical PEMB requirements for submittal. All submittals shall include the full scope of work for the project's construction. This summary is general and may not cover all specific conditions. There may be additional requirements, due to the unique nature of each design or location.

- Electronic (PDF) versions of drawings and specifications submitted to the SFMO Citizenserve portal and GSFIC Project Management e-Builder software. Drawings shall be to scale.
- All documents shall be signed and sealed by the responsible design professional. Per O.C.G.A. 25-2-14.(a)(1), the State Fire Marshal's Office requires that all submitted drawings "shall bear the seal and Georgia registration number of the drafting architect or engineer…" for approval, including any disciplines which are included in the scope of work.
- All permit documents shall be the final construction documents and shall be indicated "Issued for Construction" or similar note on all documents / sheet borders.
- All scope of work for the project shall be included in the documents.

- A list of current adopted codes and Georgia amendments shall be included on the documents.
- Architectural – Provide basic elevations, sections, and details for review. Plans shall describe the basic design and layout.
- Life Safety – Provide basic life safety plans, and more comprehensive plans for any structure beyond a simple open floor plan, with sufficient data to fully explain the project. Provide occupancy classification, construction type, height and area, sprinkler status, occupant load, travel distances, egress capacities, planned use or activities or items stored within, etc.
- Comply with the 2010 ADA Standards for accessible routes, site, entrance, fixtures, features, etc.
- Structural – establish and indicate all loads and capacities as required in Chapter 16, Section 1603.1, of the IBC. Provide slab / foundations design including a listing or table of the expected column reactions used in the foundation design. List these column reactions by basic load cases that allows a reviewer to use IBC Section 1605 to combine the loads and check the foundation design. The PEMB specification, SECTION 13 34 19 METAL BUILDING SYSTEMS, is required in the Project Manual and must require AC472 accreditation from the International Accreditation Service, Inc. (IAS).
- Civil documents – a site survey of existing conditions, a site plan of new conditions, new and existing utilities, fire hydrant locations, an accessible site (route and entrance), distance to adjacent buildings, adjacent roads and sidewalks, property lines, etc. If the building is to be sprinklered, then additional required information includes FDC's and PIV's, new and existing water lines and sizes, backflow preventors, fire pumps, etc.
- Mechanical / Electrical / Plumbing documents (including fire alarm and fire sprinklers, where applicable).

ADDITIONAL TECHNICAL / DESIGN COMMENTS:

- PEMB is a delegated design. The Design Professional and consultants are responsible for actively ensuring that the delivered product meets the project's requirements.
- Have Geotechnical Report prepared prior to foundation design. If no report has been prepared, assumptive values are found in Table 1806.2 of 2018 International Building Code (IBC).
- Positively indicate the location of either the required portal frames or the required cross bracing.
- If the slab is used to resolve the frame kick-out forces provide a full structural slab design; the slab is no longer a usual slab-on-grade. A hairpin diagram is required and the Design Team must discuss with the Using Agency the resulting requirements and restrictions on future slab penetrations.
- Unless the final PEMB drawing package accompanies the submittal, include a note with the listing or table of expected column reactions (see above) that the Structural Engineer of Record (SER) must review the reactions provided by the PEMB supplier and redesign footings if the design foundation loads exceed those listed.
- Headed anchor rods provide the best capacities for PEMB column uplift and resulting pull out forces.

- Specify deflection limits to match the Architectural cladding. Use L/600 when brick is used per the Brick Institute and follow IBC 1604.3 for all other materials.
- When reviewing the PEMB shop drawings ensure that any light gage metal members have adequate bracing per AISI code.
- All Mechanical loads, bearing or hung, must be included in the construction documents provided to the PEMB.
- The deflection limits for the PEMB roof structure can have tremendous impact on suspended ceiling systems.
- The compression flanges of steel sections with bending must be braced. On PEMB this will be the inner flanges. Design drawings must clearly state whether angle braces from the inner flange back to a wall girt are acceptable. If unacceptable, the inner flanges can be designed as an unbraced element at an additional cost.

RECOMMENDATIONS:

Subject to schedule, our office is willing to meet to discuss upcoming projects and provide assistance. We anticipate that this Guideline will define our office's expectations for PEMB submittals.