

Sioux Steel Company - Sentry Building Series

Building Specifications

References and Standards:

- A. The following are some of the publications used in the design of the Sentry Building Series:
1. International Code Council (ICC)
 - i. International Building Code 2006
 2. American Institute of Steel Construction (AISC):
 - i. ANSI/AISC 360-05 Specification for Structural Steel Buildings
 - ii. AISC 348-04 Specification for Structural Joints Using ASTM A325 or A490 Bolts – Prepared by RCSC
 3. American Society for Testing and Materials (ASTM)
 - i. ASTM A36-08 Standard Specification for Carbon Structural Steel
 - ii. ASTM A325-09 Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
 - iii. ASTM A500-09 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
 - iv. ASTM A1011-09b Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
 4. American Society of Civil Engineers (ASCE)
 - i. ASCE 7-05 Minimum Design Loads for Buildings and Other Structures
 5. American Welding Society (AWS)
 - i. AWS D1.1-2004 Structural Welding Code – Steel

Engineering Design Specifications:

- A. General:** ASCE 7-05 specifications are used for the design of all of the Sentry building series. Dead, Wind and Snow loads are calculated and applied to the structure. Staad.Pro V8i structural software is used to analyze the truss system. An entire building is modeled, not an individual arch. That ensures that force transfer between trusses, cables, and lateral bracing (purlins), are incorporated together. LRFD design of the building is used in accordance with AISC 360-05. Excel design spreadsheets are used in the remainder of the design for bolted and welded connections, cables, truss member design, base plates, and tension pipes. Work is always verified by a second engineer to ensure accuracy in the design calculations.
- B. Wind Loads:** The Sentry building series is classified as partially enclosed with a wind speed of 90mph. This enclosure classification requires the use of .55 and -.55 internal pressure coefficients for positive and negative internal pressure. These are the highest coefficients that are required for any of the enclosure classification. It allows for a building to have three closed walls and one open wall. Pressure relief panels are not used to lower the enclosure classification.
- C. Snow Loads:** The standard building series is designed to 30psf, 40psf, and 50psf ground snow. The trusses are spaced closer together as the snow load increases, 16ft, 12ft, and 10ft respectively. Both balanced and unbalanced snow is applied to the model as service load cases.
- D. Design Load Combinations:** Service loads are factored and combined in accordance with ASCE 7-05. Applying the load cases to the entire building system is essential in the design of this type of building. Loading a single frame of the building is not an accurate depiction of the actual conditions that a building would be under in its' intended environment.