**Adding content to the poster**

The PowerPoint template produces a layout with a width of 48 tall x 64 wide (inches). This size is appropriate for most poster presentations and allows for content to be easily viewed from a distance.

**Ruler and Guides**

Handles (dots). For a professional-looking poster, do not distort your images by stretching them disproportionally.

**PICTURES**

Resize images proportionally by holding down the shift key and dragging one of the white corner handles (dots).

**Quick Start Guide**

- Included in this template are commonly used section headers
- Headers and text containers
- 2.1. ..
- To increase its size, click on the white circles and expand to the tallest height
- On the top menu bar click on the VIEW tab and then click on the View tab and then click on the Zoom in and Zoom out buttons.

**Site Location With Structure**

The National Park receives approximately 3.5 million visitors a year, and Cadillac Mountain is the most densely populated area within the park. The location lacked a nearby restaurant and could use with less congestion at the mountain peak. Our structure addresses this issue and gives visitors that chance to soak in the breathtaking views, without obstructing the views from the mountain peak, as well as taking away minimal woodland through its construction. The structure is located between 2 parking lots, giving ease of access to visitors that visit the peak.

**Beam Slab System Load Path:**

- One-way slab (blue) spans between the beams as a distributed load
- Beams (purple) transfer load to the girders as a point load
- Girders (green) transfer load from members to the columns

**Lateral Force Resisting System:**

Composed of 4 steel braced frames, spaced at 90° increments around the perimeter of the restaurant level.

**Inverted King Post Truss:**

Located under the restaurant, the inverted king post is used as a slab support system. It includes a concrete filled steel column and 20 HSS rods in its design. This system is able to withstand the weight of the entire 92 foot wide floor system.

**Diagrid Optimization:**

To pick an optimum diagrid structure, three types of optimization tests were ran. The first being the angular test, where we tested how much weight was required to carry loading was we changed the inclination angle of diagrid members. The second test was to determine the optimum ring stiffener size, as these ring stiffeners were essential in increasing buckling strength. The last test was to determine how many nodes would be suitable for this structure, since this determined how many members would be utilized.

**Diagrid Optimization results:**

**Angular Optimization**

From the ring angular optimization test, we found that the angle which allowed for the least volume required to carry the loading was 67.5 degrees. This was expected because at 35 degrees is the most optimum angle to resist shear (wind) based on published data, and 90 degrees is optimum to carry gravity loads. Therefore, the maximum to carry both would be within the range of both.

**Ring Stiffener Optimization**

From the ring stiffener optimization test, we found an optimum ring stiffener which is highlighted in yellow. This ring allowed for a strength increase from 141 kips to around 713 kips. During the test, we found that there were limiting values in terms of A and Iy and if these limiting value requirements were not met, no increase in other parameters would help increase buckling strength.

**Node Optimization**

From the node optimization test, there were many combinations of ring stiffeners and number of nodes tested. We found that for all the models (10, 20, or 30 nodes) as we increased number of ring stiffeners we were able to drive down the weight required of the structure. This is because ring stiffeners increases the buckling strength exponentially. This is because braces decrease unbraced length and since unbraced length is a squared term in Euler buckling, the change will be exponential. Therefore, we are able to decrease the diagrid members size significantly. This allows for weight to drop significantly enough that even adding the ring stiffener the new weight of the structure will still be lower than the previous (without ring stiffener).