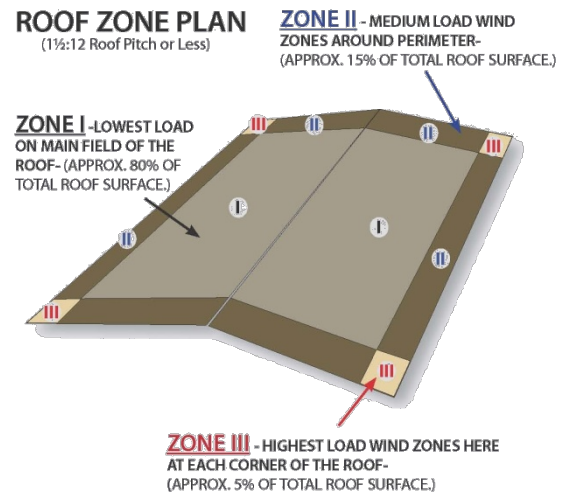


Retrofit Roofing Design Basics

In 2004 most states and municipalities adopted the new “International Building Code” (IBC). This code differs dramatically from the previous building codes in many ways. The most important to you and your project is how it looks at the design load for wind uplift pressures subjected to the roof. Different from years past, the roof is now divided into three zones: The “Field” or central areas of the roof, the “Edge or Perimeter” and the “Corner” zones of the roof. The loads for each “Zone” as shown in the below illustration must now be calculated separately to determine attachment points of the new roof panel system to the Roof Hugger framing system. Essentially, these locations are the same as “Panel Clip” spacing in the case of standing seam metal roofs or fastener placement for thru-fastened metal roofs. It is very important to understand that the required locations of new Roof Huggers on the existing roof will be governed by the new metal roof system’s ASTM E-1592 tested values.

The new roof must withstand the full forces calculated for each of these “Zones” on a per project basis. It is important to understand as well, code based reductions allowed in the past are usually not permitted nowadays. Since no two buildings are exactly alike, the size and shape of these “Zones” vary from building to building and depends on numerous factors. Included in these factors are; height above ground, roof geometry, exposure of the roof to surrounding obstructions, distance from coastal areas, etc. Each building must be considered individually and engineered based on the existing conditions and proposed changes. The basic steps in the evaluation process are as follows:



- **STEP 1:** Collect the basic information needed as requested in our Project Questionnaire. This questionnaire can be emailed to you or you can download it from our website at www.roofhugger.com. Please note that if you are looking to obtain a quotation for Roof Huggers where you will determine the total lineal footage required, then the design of the overall system will fall upon your responsibility. However, Roof Hugger can provide this service where the project is engineered using your selected metal roof. This includes us determining the total lineal footage required plus us providing at your option, installation drawings and Engineer’s design calculations with or without a “Seal” for your specific project.
- **STEP 2:** A professional engineer should calculate the design pressures for each zone of the roof. This can be completed by your roof panel manufacturer when you request them to provide a “Clip Analysis” if the new roof is a standing seam metal roof or fastener placement requirements if using a thru-fastened roof panel system. If necessary, you may ask us to run a preliminary design. However, this is based on our data base records of manufacturer panel systems. We do not have the pressures for all manufacturers, but do have for many of them. If we can provide you an analysis, please understand that this information is preliminary in nature and must be reviewed by an engineer before ordering any materials. It is only to be used to provide a preliminary design and Roof Hugger cannot be responsible for the results. The corner

Retrofit Roofing Design Basics

zone/edge zone dimensions will be listed in our results as well as the intervals that the new roof panel must be attached to the Roof Huggers.

- **STEP 3:** Once the design analysis is completed, the next step is to determine what is required in the Roof Hugger sub-framing system. This is done by comparing the new roof panel maximum allowed pressures (uplift capacity) with the existing building's purlin spacing. If the existing purlin spacing is 5' (typical in older buildings) you would compare the capacity of the new panel on 5' purlin spacing. If the new panel cannot meet the required uplift pressures (PSF) for a 5' purlin spacing, then an additional Roof Hugger will be required between the existing building's purlins. This needed framing can be achieved by adding additional purlins from under the old roof (usually very difficult if not impossible) or by adding additional framing on top of the existing roof.
- **STEP 4:** If additional framing is needed to reduce the purlin spacing, it must be determined what that framing consists of. Roof Hugger, LLC has designed many above roof options for reducing the purlin spacing in the corner and edge zones when needed. The specific design will depend on the existing panel type and rib spacing. If the existing roof is a 12" o.c., "PBR" type panel, Roof Hugger, LLC has several FLORIDA PRODUCT APPROVED Systems that may work in this case. Other existing panels may require special grid framing designs consisting of Hats, Cee's or Zee's or a combination of all.
- **STEP 5:** Once the new roof's sub-framing has been determined and the overall height of the framing is established, the Roof Huggers can be estimated.

PLEASE NOTE ASCE-7 2016 WAS MODIFIED FROM PREVIOUS VERSIONS CURRENTLY IN USE. MANY STATES AND/OR MUNICIPALITIES MAY ADOPT IBC 2016 BEGINNING IN 2018. THE NEW VERSION WILL BE DIFFERENT THAN EARLIER VERSIONS AND IT WILL RAISE WIND LOADING IN COASTAL AREAS AND IT WILL INCREASE THE NUMBER OF ROOF ZONES AND THE MODIFY PRESSURES IN EACH OF THESE ZONES. PLEASE CHECK WITH ROOF HUGGER IF YOUR PROJECT WILL BE PERMITTED UNDER THIS NEW CODE.

If you need assistance with the above process please feel free to call Roof Hugger, LLC (800-771-1711) to discuss your specific project.