



## Restoring Pre-Engineered Metal Buildings After a Fire

### Components and Definitions

**Main Frame** – is the frame that is installed first, to which the wall girts and purlins are attached.

**Wall Girt**-is the “Z” shaped channel (usually 8”) that is run horizontally between the “main frame” and to which the exterior wall siding is attached.

**Roof Purlin**-is the same “Z” shape as the wall girt, connected to the main frame in the same manner, only it is used to hold the roof sheeting.

**Base Angle**-is the angle iron fastened to the concrete and the exterior wall sheeting is connected to.

**Eave Strut**-is installed at the junction of the roof and wall as a transitional piece bent at the angle to match the roof pitch.

**R-Panel**-is short for “Roof Panel” and is a specific profile of rolled sheeting that is most popular on PEMB’s due to the fact that it is relatively inexpensive and has a life expectancy of 15-25 years. This metal panel profile is what most people associate with a metal building since most people only understand finishes.

**Vinyl Insulation**-generally is 5’ wide with an R value of 11-16 with R-13 being the most popular. In a metal building this insulation is usually installed on the outside of the wall girts and purlins, between the R-Panel and the purlin or girt.

**Bay**-is an area from column line to column line, or frame to frame.

### Restoration

First, in any fire I always recommend that a Structural Engineer be employed to review the structure. A Structural Engineer (PE) has many tools available to him to check for deformation in the steel, check heat indicators, and determine likelihood of damage. Like any trade, there are Engineers experienced in fire, and know them well, and there are others that will only know theory. It is important to find one that is experienced in fire damage and that can write a good report of the findings and recommend appropriate action. I generally ask either the customer or the insurance company to enter into the contractual agreement with the Engineering firm and offer to assist them in finding an Engineer capable of supplying an appropriate report. By having a 3rd party enter into the contractual agreement it helps eliminate any thoughts of impropriety.

In general there are some things you can determine yourself fairly easily. If a component has fallen to the ground, it is obviously damaged and should be replaced. Often the damage is much less obvious and the component should be inspected for deformation. If deformation of a component exists, it is generally less expensive to replace it than it is to repair or shore it up in another way, unless it will interrupt the business, and then the cost of such has to be considered. In any event, safety should never be compromised.

Do not assume that just because the paint is irregular that the building component is deformed. Many times people assume that the color variations are deformations, look closely, don’t assume anything.



This “Frame” has obviously been heated to a point that the “Flange” has deformed, most of the time the deformation is not this obvious. The building did not fall so it is still holding the load. Sometimes a customer will wish to get back in business quickly and ask you to Clean, Seal, and Paint something like this. I would recommend, in writing, replacement of this component unless there is good reason not to remove it and the Engineer has developed an alternative to replacement.

In the background you can see light coming through the roof sheathing like little stars all in a row. This is where the neoprene washers used to seal the screws holding the R-panel down melted away allowing light to enter. Most of the time damage to the neoprene washers is not this obvious and the building needs to be inspected from the outside to determine if there is damage to the washers.

## 2 Primary Methods of Restoration

### 1. Remove and Replace All Heat and Smoke Damaged Metal Building Components.

(Frame, Insulation, Roof and Wall Panels)

#### Pros:

- This is “Like Type and Kind” repair, which can be an important consideration.
- Often, if there are no interior considerations, this is the most cost effective solution.

#### Cons:

- Physical replacement of the components will expose all interior finishes and building operations to the elements.



- Lead Time to start repairs could be from a few days to several weeks depending upon the component manufacturer, regional availability etc.

2. **Replace only “Heat Damaged” Insulation, Components and Clean Seal and Paint Smoke Damaged Components.**

**Pros:**

- Minimizes the exposure of the interior to the exterior elements.
- Allows a nearly immediate start.
- Painting all components, the same color often makes the building look much better.
- Can get the business within back in business more quickly.

**Cons:**

- Can be more costly than physical replacement.
- If the building is insulated, and insulation must be removed, care must be taken to protect the integrity of the neoprene washers, on the screws, that secures the exterior panels and sandwiches the insulation.
- Re-Insulation where roof panels have not been removed, requires the use of an insulation suspension system.

3. **Often the best method is a combination of the above restoration methods.**

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