

GYPSUM ROOF DECKING

1. Various types of roof decking are used to cover open web steel bar joists. A type of roof decking that will be discussed is called Gypsum Roof Decking.

2. **GYPSUM ROOF DECKING**
 - 2.1 GYPSUM PLANK ROOF DECKING (Figure 1)
 - 2.1.1 Gypsum planks are normally 2 inches thick, 2 feet wide and 8 feet long and are factory-laminated of two gypsum panels. Each plank weighs approximately 135 lbs.

Note: Gypsum planks also come in other sizes. Weights vary with the dimensions of the plank.
 - 2.1.2 The decking is usually installed in the following manner:
 - A. Sub-purlins (lightweight steel) are welded at right angles to the steel bar joists. Gypsum planks are then installed and placed on sub-purlin flanges. Cross tees are placed to support the end joints of the planks.
 - B. Grout is poured into voids between the plank edges and sub-purlins. The gypsum roof decking is then allowed to set and covered with a water tight roofing material.
 - 2.2 GYPSUM CONCRETE ROOF DECKING (Figure 2)
 - 2.2.1 Gypsum concrete is mill formulated and composed of calcined gypsum and wood chips or shavings. It is usually poured to a 2 inch thickness and weighs approximately 17.5 lbs. per square foot.
 - 2.2.2 The decking is installed in the following manner:
 - A. Sub-purlins, which vary in size, weight and shape and are selected according to required span and loading, are spaced approximately 32 inches on center and are welded at right angles to the top cord of the open web bar joist.

- B. Formboards are laid on the flanges of the sub-purlins and serve as a form and remain in place to provide a functional underside of the roof deck. Formboards are gypsum sheetrock 1/2 inch thick, 32 inches wide with a maximum length of 12 feet.
- C. Reinforcing wire mesh is placed over the formboards at right angles to the sub-purlins which helps to distribute the load.
- D. Gypsum concrete is then poured over this assembly to a thickness of about 2 inches. After setting, a water tight roofing material is then applied to cover the deck.

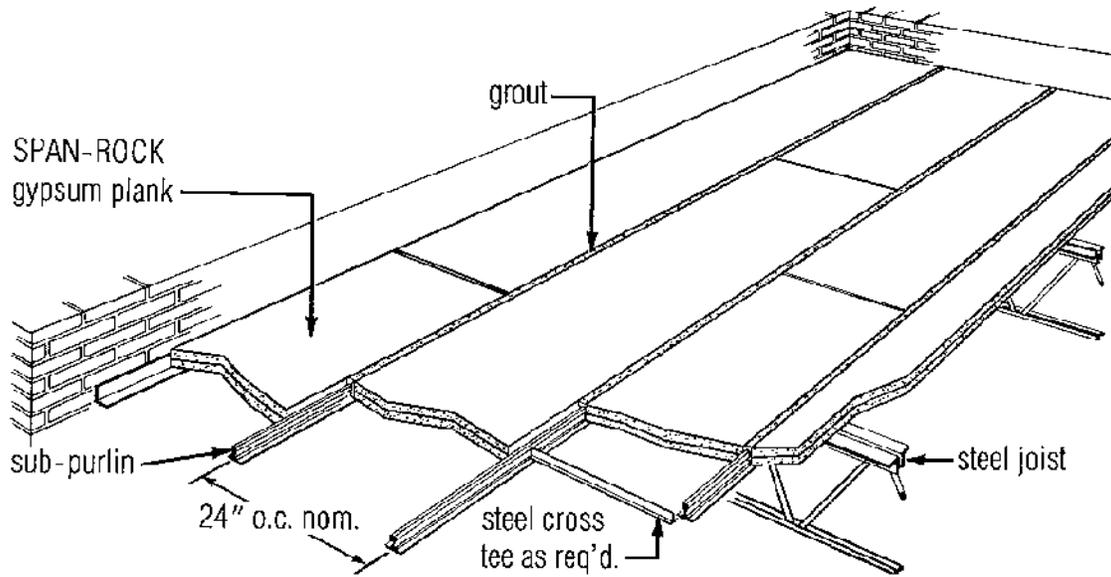
3. SAFETY OPERATING PRECAUTIONS REINFORCED

- 3.1 Gypsum plank and concrete decking is of lightweight construction which spans large wide spaces. The main drawback, from a firefighting operational stand point, is that this type of construction is extremely vulnerable to moisture causing a deterioration of the system.
- 3.2 The above characteristic, along with truss construction, are conducive to an early collapse under fire operations. Members shall not be committed to roof operations when this type of roof construction is found.
- 3.3 Interior firefighting operations shall be conducted from areas of safety due to the weight of such decking materials (gypsum plank - 135 lbs. each, gypsum concrete - 17.5 lbs. per sq. foot). Hose streams should be operated well in advance of members.
- 3.4 The presence of a Gypsum Roof Deck will be indicated by a white powdery residue during saw operations. Upon this observation, members shall make immediate notification to the Incident Commander and proceed to evacuate the roof.

4. CONCLUSION

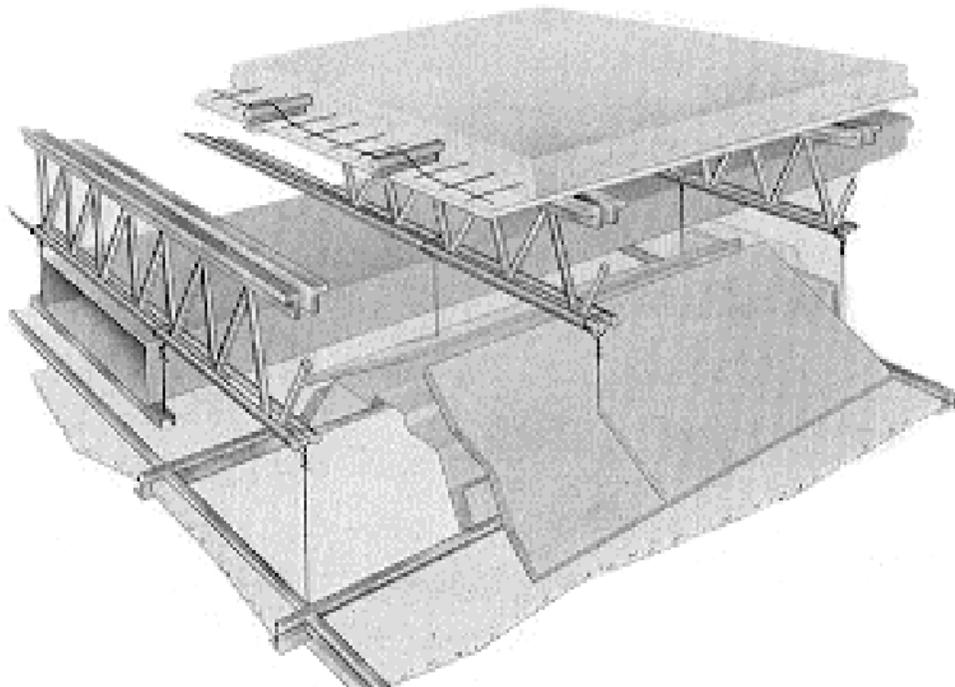
- 4.1 When operating on thin, flimsy roofs, members should always be aware of the possibilities of sudden failure.
- 4.2 When units are performing outside activities, all members shall note the building construction features within their response districts. Members should suspect truss construction on all new or renovated taxpayer/commercial structures as well as all large span building spaces. When found, these structures must be entered into the CIDS program.

FIGURE 1 - GYPSUM PLANK DECKING SYSTEM



Construction Details/Flat Roofs

FIGURE 2 - GYPSUM CONCRETE ROOF SYSTEM



Deck With Ceiling