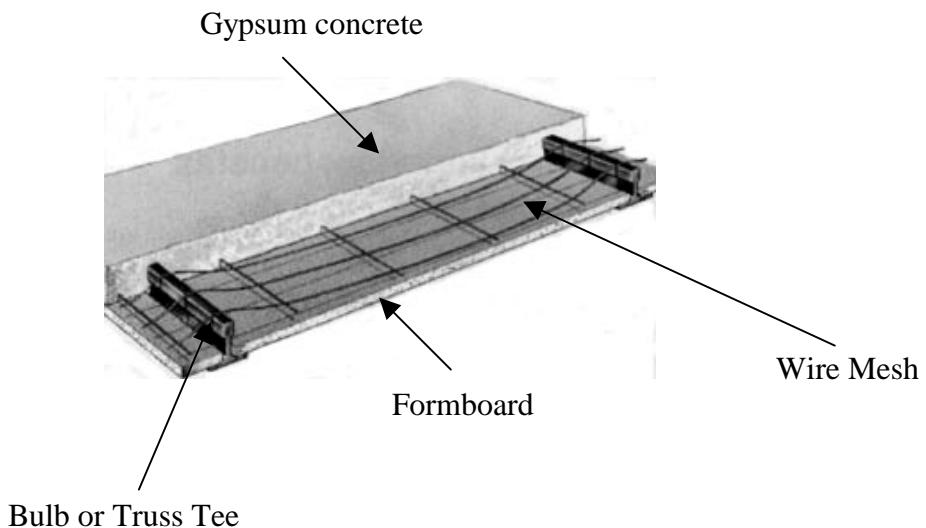




NRDCA 500 – “Gypsum Roof Deck Replacement Procedures”*



History

Gypsum cast over formboards and structurally supported by bulb tees or truss tees was introduced as a roof deck substrate in the 1940's. This system provides fire resistance, seismic and wind load diaphragm values in addition to an economical roofing membrane substrate.

The gypsum roof deck system is supported by bulb tees generally spaced from 24" to 32" on center. Formboards placed between the bulb tees contain the fast-setting, poured gypsum roof deck. Special galvanized wire mesh, draped over the bulb tees, distribute vertical loads to the bulb tee system and resist diaphragm loads. For this system to properly perform, it is critical that the wire mesh maintain its integrity and continuity throughout the life of the roof deck system and any subsequent repairs.

**This Document provides best practices available to the industry, however a licensed structural engineer must review and approve of any modifications to an existing gypsum roof deck system.*

Formboards used with gypsum roof decks include, fiberglass formboards, mineral fiber formboards, and asbestos panel formboards. TAKE PROPER SAFETY PRECAUTIONS WHEN REMOVING OR WORKING WITH ASBESTOS PANEL FORMBOARDS.

Gypsum poured over formboards has been used as a substrate for roofing materials since the 1940's. Its use increased since it provided roof deck fire protection, diaphragm values, and an economical substrate for roofing. Gypsum decks incorporated the placement of bulb tees generally spaced 24 to 32 inches on center, a fiberglass formboard, galvanized wire mesh, and fast setting poured gypsum.

The bulb tees provided structural support for the formboards. The formboards provide acoustical values for the system and support for the poured gypsum. The galvanized wire mesh provides reinforcement for the system to resist both downward loads and diaphragm loads. The gypsum provided fire protection properties and a surface for attachment of roofing materials. Critical to performance of the gypsum system is maintaining integrity of the wire mesh. Without wire mesh the system has little to no load support for imposed loads due to snow, water, workmen installing roofing, and maintenance workers.

Replacement

Re-roofing many of the gypsum systems is now occurring for the first time. Therefore, owners and roofers are just now being introduced to this system. Determining the correct action that is required during the re-roofing process is a new learning process for many.

CAUTION: The existing roofing membrane provides an element of support and safety for workers on a badly deteriorated gypsum deck. After removing the roofing membrane, the added safety provided by the membrane is lost and workmen become exposed to the increased hazard of falling through the roof. **COMPLY WITH ALL OSHA SAFETY REQUIREMENTS.**

The first step is to determine the sections requiring replacement. Conduct a moisture survey to determine high levels of moisture. Survey the deck underside for sagging formboard and areas of moisture staining and wetness. These are areas where the wire mesh may have rusted no longer provide adequate load support. Look for areas of structural damage such as broken form boards or excessively cracked gypsum concrete. Based on the survey results, mark off the top surface of the roofing membrane to denote possible areas of concern.

When removing the roofing in the marked areas, install 3/4 inch minimum thickness plywood over the marked areas. Each 4'x 8' plywood sheet must span over three bulb tees to provide a safe walking surface.

Starting with the wettest gypsum area, remove the top surface of gypsum to expose wire mesh. Wires of mesh rusted through are cause for panel replacement. Continue removing the gypsum

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top surface in all directions down to the wire mesh until wire mesh that has not rusted through is found. Replace all formboard panels inside the rusted sections.

Replacement Procedures

Carefully take the following steps to replace a gypsum deck area.

Remove the existing gypsum fill from inside one complete formboard panel. Cut the wire mesh and remove both the wire mesh and formboard. LEAVE AT LEAST A THREE-INCH LENGTH OF WIRE MESH NEXT TO THE BULB TEES. This length of wire is required to tie in the new wire mesh after reinstalling the new formboard.

Replace existing formboards with new 6-pound minimum density sheet rock sprayed on both sides with Clorox or minimum 1-inch thick fiberglass formboard. Install galvanized cross tees at the end of formboards that do not fall on joists for support.

Tie new Keydeck 2160-2-1619 galvanized wire mesh into the existing three-inch wire mesh at each bulb tee. DO NOT LEAVE OUT THE WIRE MESH. Wire mesh provides structural reinforcement for the new panel and the adjacent panels. Without the wire mesh, a worker could fall through the adjacent panel.

Mix United States Gypsum manufactured PYROFILL gypsum that comes in an 80-lb. bag with 6-7 gallons of water. Install the formboards. Install gypsum slurry on all flanges of bulb tees and cross tees. Add a 2-inch wide line of gypsum across the diagonals of each formboard.

After the slurry and diagonal pattern of gypsum has set, mix a new bag of PYROFILL with water as described above. Gypsum should set in approximately 30-60 minutes. SLOWLY pour the wet mix of gypsum onto the new formboard and screed off to the desired thickness. Always maintain a minimum gypsum pour of 2-inches above the formboard.

New roofing operations may begin as soon as the gypsum has set. Attach the base sheet to the gypsum with fasteners designed for this application. Contact fastener suppliers listed in the NRDCA Web Site at www.nrdca.org for further information.

Need Help

Many NRDCA contractor members provide gypsum roof deck replacement services. Please contact the NRDCA web site at www.nrdca.org for further information.

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