



Using the Protected Membrane System for Thermal Up-Grading

The first and most important step is to obtain professional assurance that the original structure will be strong enough to support the additional weight and that the building design will lend itself to the proposal. If the roofing contractor is dealing directly with the owner, the owner should have this assurance in writing from a consultant before any work is done. Remember -while the conventional roof has approximately 400 lbs. of gravel per square the protected membrane roof may have over 1000 lbs. per square depending upon the design.

Let us assume ultra-violet degradation of the insulation is not acceptable. Let us also assume that painting of the insulation surface and counterweighting by patio slabs at the intersecting insulation corners is not being used. Then practical field experience suggests that, while 1000 lbs./sq. is reportedly sufficient to prevent ultra-violet degradation of the insulation, a more practical spreadable minimum is an average of 1200 lbs. per square of graded crushed stone. This would be sufficient ballast against flotation for up to 2" of foam insulation. For greater thicknesses of insulation the weight may have to be adjusted depending upon the slope. As most older roofs have very little if any slope and drains are often in high spots, there may be areas where the ballast would be at least partially submerged for prolonged periods. If so then, in those areas, the weight of ballast may have to be increased still further to prevent flotation of the insulation. It is CRCA's opinion that the roof membranes should not be subjected to possible weakening by using it as an anchor against flotation of the insulation. This is a function of the ballast.

While structural strength of the building is the most vital consideration, there are other design factors to consider:

- 1) The fire rating of the roof deck assembly could be altered thus changing the insurance rating.
- 2) If there is no vapour barrier wet insulation under normal occupancy can be expected to dry out from below, at least partially. If there is a good vapour barrier consideration should be given to removing and replacing those areas of wet insulation as a first step.
- 3) Flashing heights may have to be increased. The bituminous flashings must be raised and the sheet metal revised.
- 4) Plastic pans may have to be replaced by curbs with bituminous flashings and metal counterflashing.
- 5) Screens on drains must have openings too small to allow ballast to pass through into the soil pipe.
- 6) Each job requires special consideration by an experienced CRCA member. The degree of slope and danger of sliding must be considered. A decision must be made on the treatment of the existing surface. If there are serious low areas, they may require special handling.