REFRIGERATION REVIEW

FLOOR EXPANSION JOINTS

As you may or may not know, in designing freezers and coolers, consideration has to be given to contraction of the wearing slabs. In freezers, the wearing slab is basically a floating slab placed on top of insulation with a polyfilm slip sheet between the concrete and the top of the insulation. The slip sheet also serves as a stop for the concrete so it won't run down in the cracks of the insulation.

The big concern is the contraction of the concrete when it is pulled down to temperature. It will contract approximately ½" per 100'. Over the years we have tried several ways to minimize the number of concrete joints in the wearing slabs and have been very successful in our latest techniques. If concrete was separated with a simple joint with no interconnection, as a fork truck runs over the joint with high-density urethane wheels, the concrete will flex down and the fork truck wheels will chip off the leading edge of the concrete. This is most prevalent in doorway and in aisles. The techniques we have developed include the following.

An armored isolation slab at doorways in which we normally use 6" channel iron mated together in a rectangle frames the width of the door, 3' to 4' in depth. Both forward and rear edges of the frame are doweled to the slabs of concrete (i.e., the dock concrete and the freezer wearing slab). One side is welded and the other is a slip joint formed by greasing the dowel. No dowels are placed on the sides of the

frame so the miniature slab can adjust to the level of the floor to which it is attached.

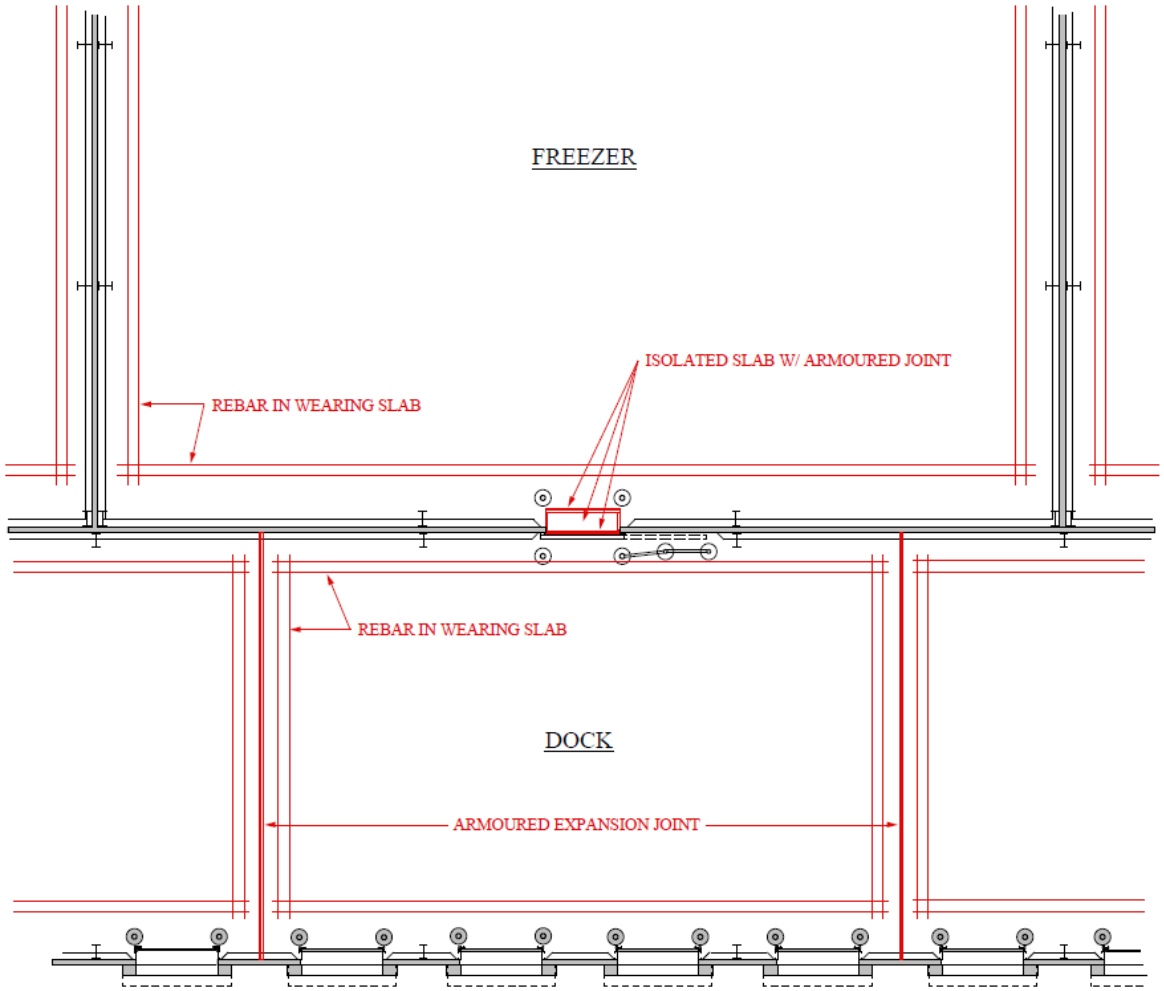
In the larger picture, floor slabs always settle a little bit, and especially after you put millions of pounds of product into storage, and this slight differential is compensated with the firm “ramp” slab. We also will quite often add heat to this independent doorway slab which keeps ice from forming on the floor.

In a freezer and cooler area we have, by and large, gone to picture-framing large slabs with rebar and wire mesh. Steel contracts slightly more than the concrete, so it puts a nice post-tension on the concrete slab. We try to break the wearing floor up in such a way that the slabs are nearly square, and if the slab joint is in an aisle, we would use an armored doweled expansion joint.

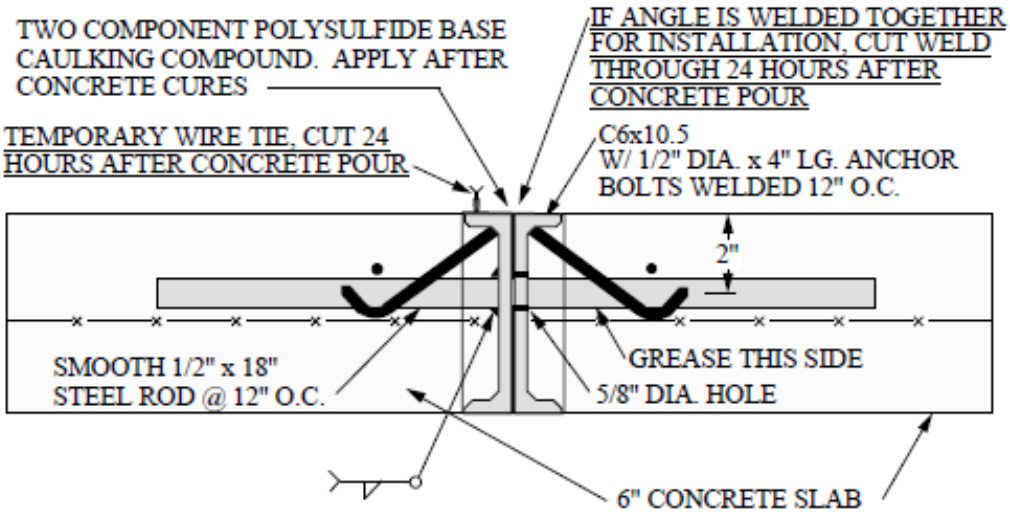
These armored joints all require special attention after installation. To facilitate installation, they are all often tack-welded, but just as soon as the second slab is poured, the tack welds need to be cut immediately. I remember so well the time I was inspecting a floor joint at a doorway, and I noticed that one of the tack welds hadn’t been completely cut. I exuberantly jumped up and down on it, and when I did, you would have thought a shotgun had gone off. The weld released, giving proof to the need to cut these joints.

Non-armored joints can be doweled without armored plates or channel, if placed under the rack system where they will not see the wear of fork truck wheels.

Dock slabs are the ultimate challenge because they are an integral part of the foundation wall and column footings. While we expect to get some hairline cracks, we would normally try to isolate docks with armored joints as well, typically in the 40’ to 50’ length, depending on the width of the dock.

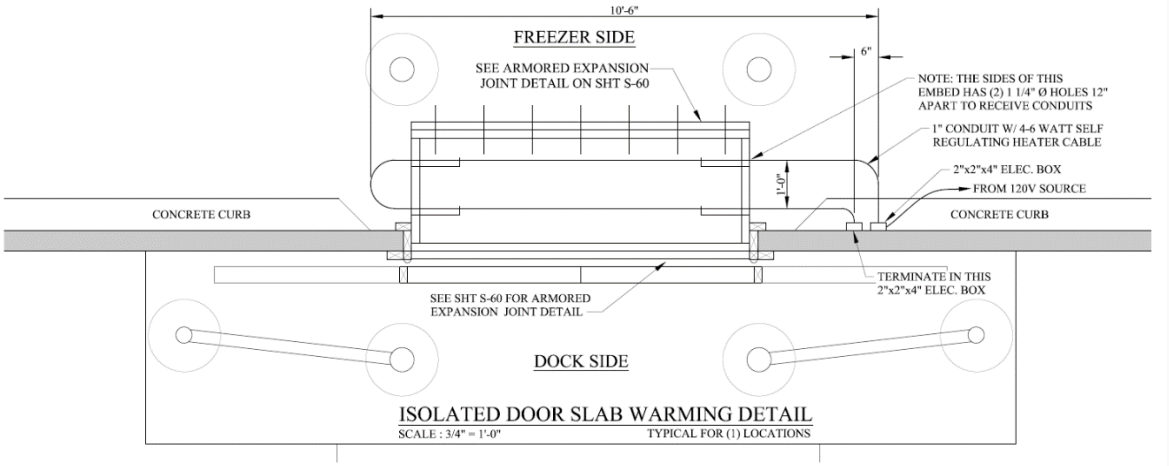


PARTIAL FLOOR PLAN



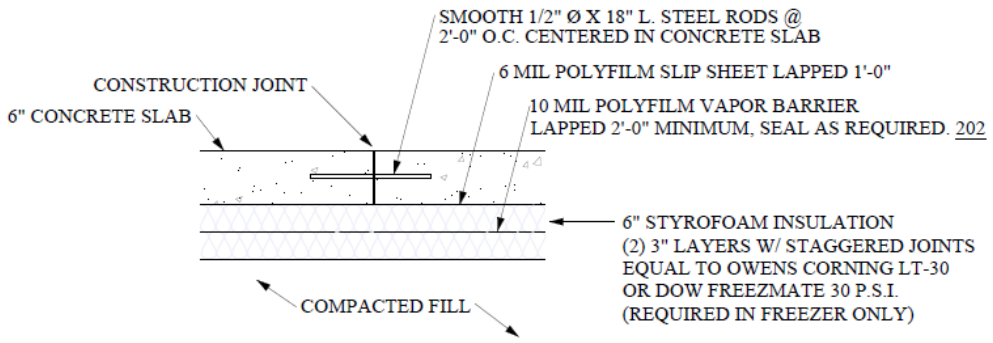
ARMORED EXPANSION JOINT DETAIL

SCALE: 3"= 1'-0"



ISOLATED DOOR SLAB WARMING DETAIL

SCALE : 3/4" = 1'-0" TYPICAL FOR (1) LOCATIONS



TYPICAL CONSTRUCTION JOINT

SCALE: 1"=1'-0"

(639)1/2"Ø x 18" LONG RODS REQUIRED

PROCEDURE FOR FREEZER FLOORS ON INSULATION:

* PRE-DRILL HOLES IN FORM BOARDS TO RECEIVE RODS.

* SET FORMS & PLACE LOOSE FIT RODS IN HOLES.

* AS SLAB IS BEING POURED INSURE RODS ARE LEVEL, PERPENDICULAR TO THE FORM & CENTERED IN THE SLAB.

* AS SLAB IS BEING FINISHED & CONCRETE IS SETTING ROTATE RODS BY HAND TO PREVENT SETTING OF THE DOWELS IN THE CONCRETE SLAB THIS PROCEDURE IS REPEATED AS REQUIRED TO ENABLE THE REMOVAL OF THE RODS AFTER THE CONCRETE IS SET.

* AFTER CONCRETE IS SET REMOVE THE RODS BY HAND TO ALLOW REMOVAL OF THE FORMS.

* REMOVE FORMS. * APPLY GREASE TO HALF OF THE ROD & RE-INSERT INTO HOLES IN THE EXISTING SLAB.