

**General Description:**

- **Location:**  
Paw Paw, Michigan
- **Profile:**  
High-sloped deck over cold storage freezer facility
- **Project:**  
Roof Reconstruction  
Single-Ply System

**Services Provided:**

- Forensic Evaluation
- Design Development
- Construction Documents
- Negotiations
- Field Quality Assurance

**Challenge:**

- Construction would cause disruption to cold storage unit and operations below
- Early spring project with challenging weather conditions
- Warranty on existing system was voided

**Solution:**

- Extra precautions prescribed to ensure uninterrupted operations of facility
- Field work was closely monitored to ensure quality work despite weather conditions
- Designed reconstruction to conform to manufacturer's requirements



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## Minute Maid Cold Storage Facility

Minute Maid Company was experiencing significant problems with the roof system over their Cold Storage Facility. The roof, a ballasted EPDM system over a steep-sloped deck, was only seven years old but was experiencing failure. As the manufacturer's warranty had been voided, Minute Maid had designated the roof for a complete tear-off and replacement. StructureTec was consulted to assist with this process. Initial observations found that, due to the slope of the roof, the existing stone ballast and concrete walkway pads were migrating toward the lower gutter edge. This downward

migration coupled with the massive weight of the surfacing components caused displacement of the loose laid insulation beneath the EPDM



*Overview of completed reconstruction.*



*Perimeter edge nailers had come loose, migrating from the edge and causing the exterior flashing to come unfastened.*

membrane. The force of these roof system components exerted extreme pressure at the gutter edge termination, which resulted in the failure of perimeter edge nailers and sheet metal flashings. StructureTec was able to determine that the problem had been a design flaw rather than a workmanship error. The main discovery was that the perimeter edging detail was not adequately designed to handle the weight load of the ballasted system in conformance to the sloped requirements of the roof system, and the excess weight load had caused the shifting. During StructureTec's evaluation, it became evident that the membrane overall was intact and in relatively good condition. A reconstruction was scheduled rather than a replacement. Because the roof was over a freezer storage facility, special consideration had to be given to the insu-



*Migrating ballast caused the insulation underneath to become displaced and damaged.*



*Perimeter edge details were reconstructed with adequate structural integrity to support the weight load of the roof.*

### FEATURES

Performed extensive evaluation/condition appraisal

Reviewed existing construction documents - as-built construction

Designed new counterflashing system

Designed new fascia system

Designed new perimeter edge detail with additional wood blocking, structural steel, flashings, and sheet metal

### BENEFITS

Establishes Roof Condition Index for overall condition

Ascertain original construction methods, means, and procedures

Prevents moisture ingress behind flashing detail

Prevents splits and fractures along edge detail

Provides proper support for weight load of sloped roof system

tural support at the perimeter to handle the weight load of the ballast and perimeter pavers, providing the proper ballast at the termination. After designing the reconstruction, StructureTec assembled the construction documents and negotiated with the original contractor to complete the work. The construction was occurring over a very sensitive area and was being completed during questionable early spring weather. Extensive field quality assurance visits were performed by StructureTec to ensure that the project was completed with the highest possible quality standards. StructureTec's reconstruction design and workmanship oversight were completed in such a way that Firestone, the manufacturer who had previously withdrawn warranty coverage, reinstated their original warranty for the remaining service life of the roof system. In conclusion, Minute Maid has

lation. Proper R-values and type were essential because of the internal temperature differentials and potential for condensate and dew point considerations within the roof system. During the evaluation, these considerations were taken into account so that during reconstruction defective or insufficient materials would be replaced. The key design issue during this process was the perimeter edge. A new detail was designed and developed with greater struc-

a long-term, durable, properly designed roof system which will perform and protect their facility for many years. This was accomplished with StructureTec's expertise on the structural details. StructureTec's reconstruction also saved the client significant dollars in that the reconstruction cost roughly one-third of what a full replacement would have cost. This enabled Minute Maid to enjoy the greatest return on investment for their project. ■