

AN ARMKO INDUSTRIES, INC. ROOF SURVEY
FOR
3100 MAIN ADMINISTRATION BUILDING
FOR
HOUSTON COMMUNITY COLLEGE SYSTEM
HOUSTON, TX

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SUBJECT: ROOF SURVEY FOR ADMINISTRATION BUILDING 3100 MAIN EYEBROWS

The enclosed report is based on our inspection of the subject facility. Its purpose is to identify problem areas on the subject roof areas, and recommend solutions to these problems. In addition, the potential effect each condition can have on the facility has been described.

The multiple floor landings eyebrow roof area survey included:

- A. Interior and exterior examination of roof-related sheet metal, parapets, copings, flashings, roof mat, deck system, and penetrations and/or projections through the roof system.
- B. Cross-section analysis of core samples of the roof membrane.
- C. Analysis of insulation and top side of deck system.
- D. Bitumen chemical analysis.
- E. Analysis of waterproofing requirements.

Based upon the existing conditions of the facility, we are providing recommendations and realistic long-term solutions to your roofing problems, taking into consideration suitable alternatives.

After establishing which alternative best meets your requirements, we are prepared to provide you with the information necessary to receive quotations for the project from contractors. This would include CAD roof plans and details, specifications, necessary bidding conferences, assistance in contractor and bid evaluations, and follow-through of the project to completion. All of these services will be coordinated with your input in order to achieve a completed package tailor-made to meet your specific requirements.

When you are ready to proceed, please be assured we are ready to be of service.

Sincerely,

Mike Perry

Mike Perry
Building Envelope Consultant
ARMKO Industries Inc.

Enclosures

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Part 1 - General Information and Existing Conditions

Part 2 - Recommendations

NOTE: The existing conditions will dictate our recommendations
to resolve the problems

Photographs

Roof Plan

PART 1 - GENERAL INFORMATION AND EXISTING CONDITIONS

Size and Reported Age:

There are 11 floors included in this report. Each floor has an eyebrow roof that is approximately 8,800 square feet of roof area on the eyebrows per floor. All levels included equate to approximately 96,868 square feet of roofing. The roofing appears to be the original installed when the facility was built. Below is the typical nomenclature of each floor eyebrow.

1.00 EXISTING CONDITIONS

1.01 Nomenclature:

Deck: Poured in place structural concrete substrate/deck.

Vapor Barrier: No vapor barrier noted in the nomenclature core.

Insulating Fill: No insulating fill noted in the nomenclature core.

Insulating Board: No insulation found in the core. This is unoccupied space and does not require insulation.

Attachment: Adhesion was accomplished with torch applied materials.

Roof Membrane: There are two heavy plies of modified bitumen, adhered directly to the structural concrete.

Surfacing: Granulated glass crystals embedded in the modified bitumen cap.

1.02 Specific Conditions:

1.02.1 Deck: At the core area, the deck appears to be in good condition and acceptable. There is minimal slope to the interior drains, modification to the slope is not possible due to the design and build of these roof areas.

1.02.2 Roof Membranes: The membrane roof appears to be the original install. In the area which the core sample was taken the roof plies appear to be brittle and cracking in multiple areas.

1.02.3 Flashing: The original flashing is intact, several areas of cracking and open flashings were noted in the inspection.

1.02.4 Repairs: Several areas have been repaired over the years. The repairs are beginning to fail, thus possible water entry to occur in those areas.

- 1.02.5 Perimeters: The perimeter edge of the eyebrow roof is terminated in the granite fascia with sealant and a plastic insert. The insert is loose or missing in many places.
- 1.02.6 Field of Roof: In the area in which the core was taken the field of the roof is intact, however evidence of previous moisture was noted.
- 1.02.6 Drains: Surface drains are the primary drainage for the eyebrows, several of the drains are blocked with debris and appear to have been that way for some time. Recommendation is to clear the drains and verify they are functioning properly.

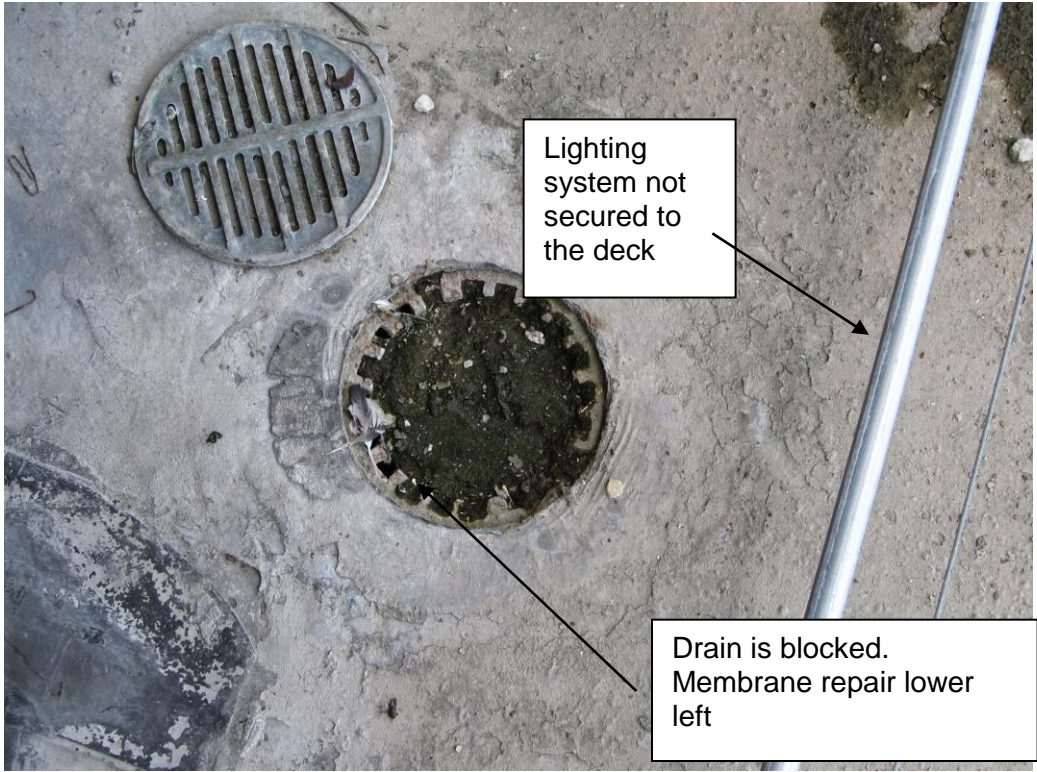
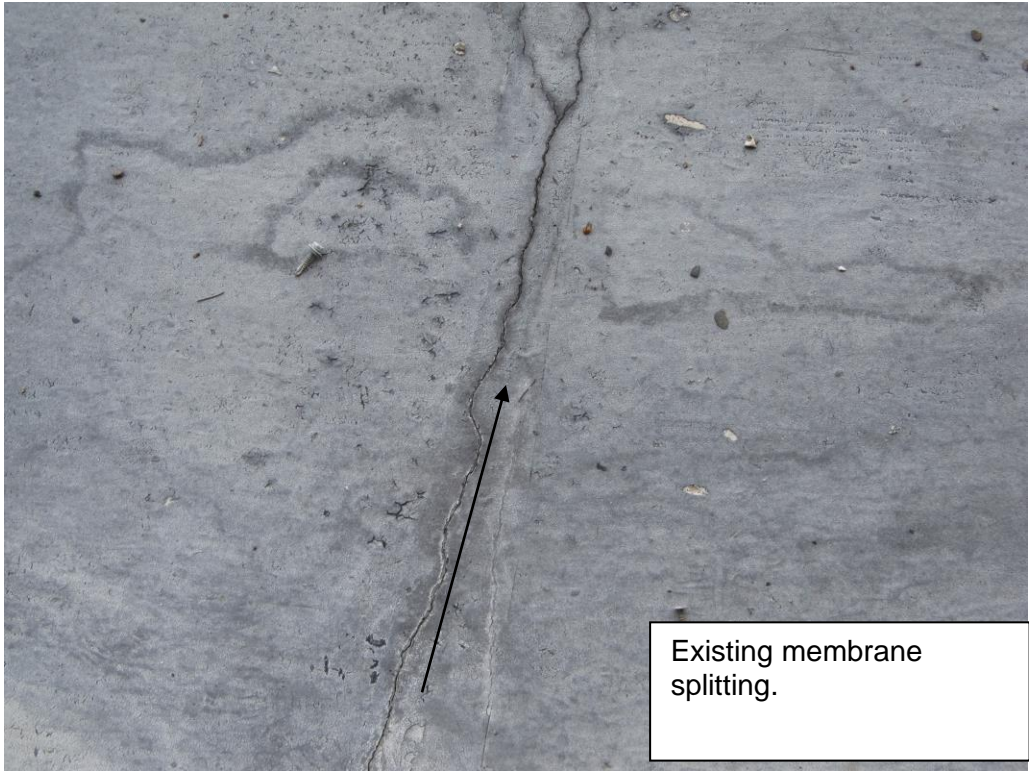
PART 2 - RECOMMENDATIONS

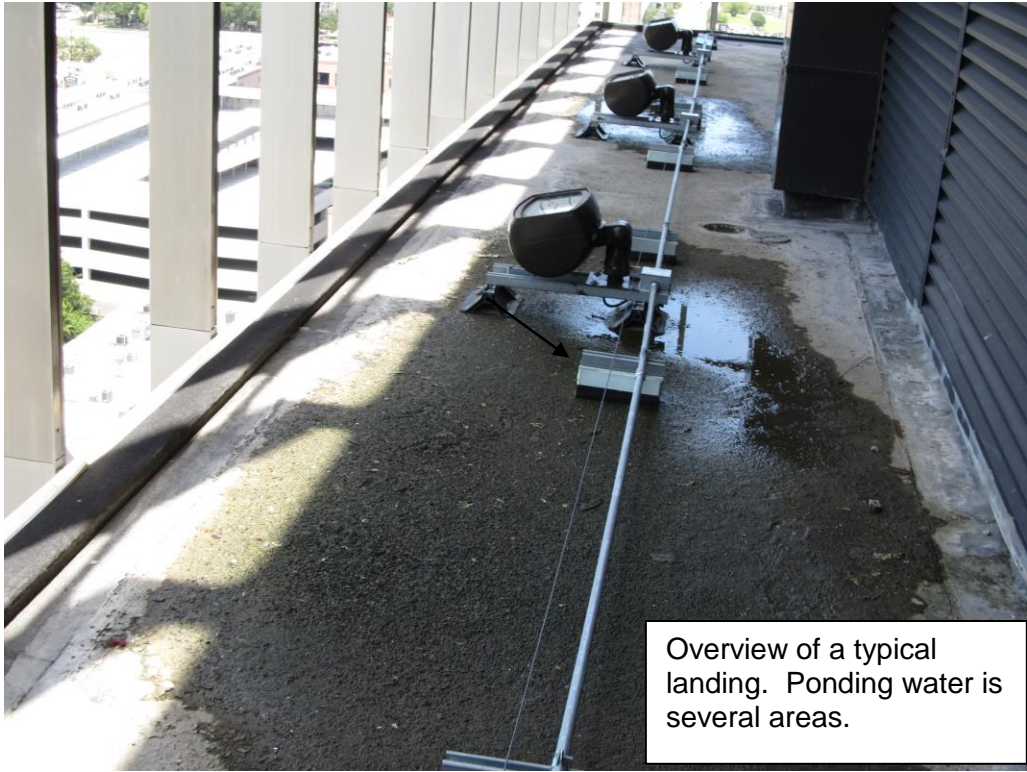
2.01 Recommended Procedures: Removal of the existing roof system should be considered due to the conditions found. Removal to the concrete deck substrate and placing a torch applied membrane directly to the concrete deck. Then a new roof system specified and installed per the College Systems standards. The new roof should be designed to meet all current International Building Code. Installation should be installed per the current ASCE uplift guidelines. Slip resistance should be a major consideration when replacing the roof in these areas due to the open eyebrows. There is minimal traffic on these areas. Fall protection was added previously but application of the new system should have the highest slip resistance possible. Apply a system which is impervious to moisture and chemicals and serve the College System for at least 20 years.

GENERAL CONCLUSIONS FOR ALL ROOF AREAS

The roof area identified in this report is in need of replacement due to age and condition. Consideration for systems which are impervious to moisture and chemical abrasion will provide a quality roof system. The staging of this project will be complicated due to the site conditions, access and height of the building. It will be important that the contractor understand all the requirements to install the roof system correctly.

Given the existing conditions listed above the roof system will be continual in allowing moisture to enter and remain on the deck system. There is no remaining manufacturer's warranty and the roof system should be considered for replacement.





Overview of a typical landing. Ponding water is several areas.



Blocked drain



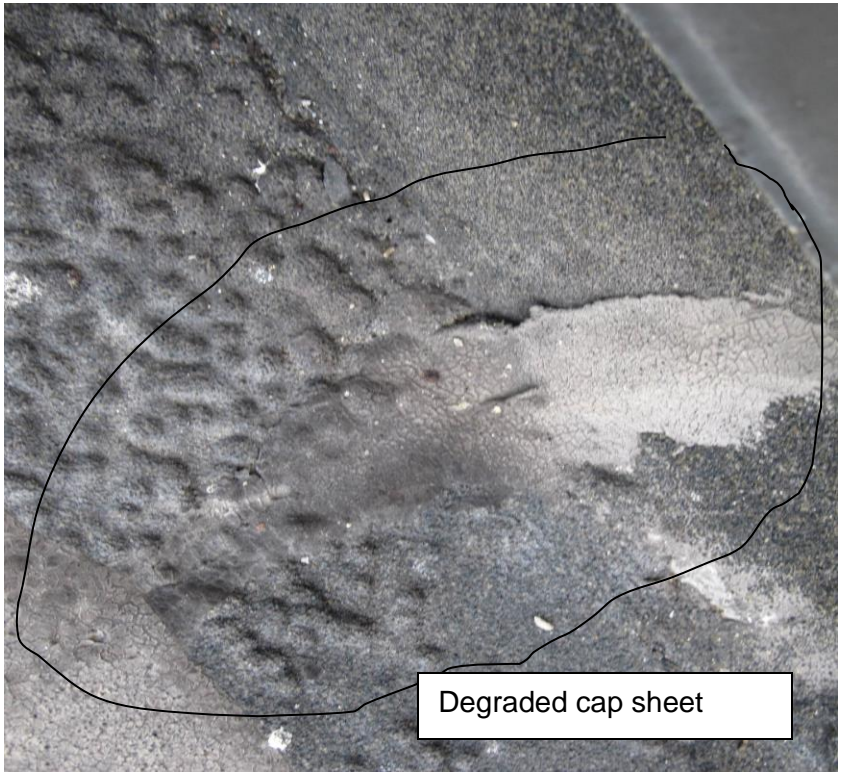
Overview of drain area.



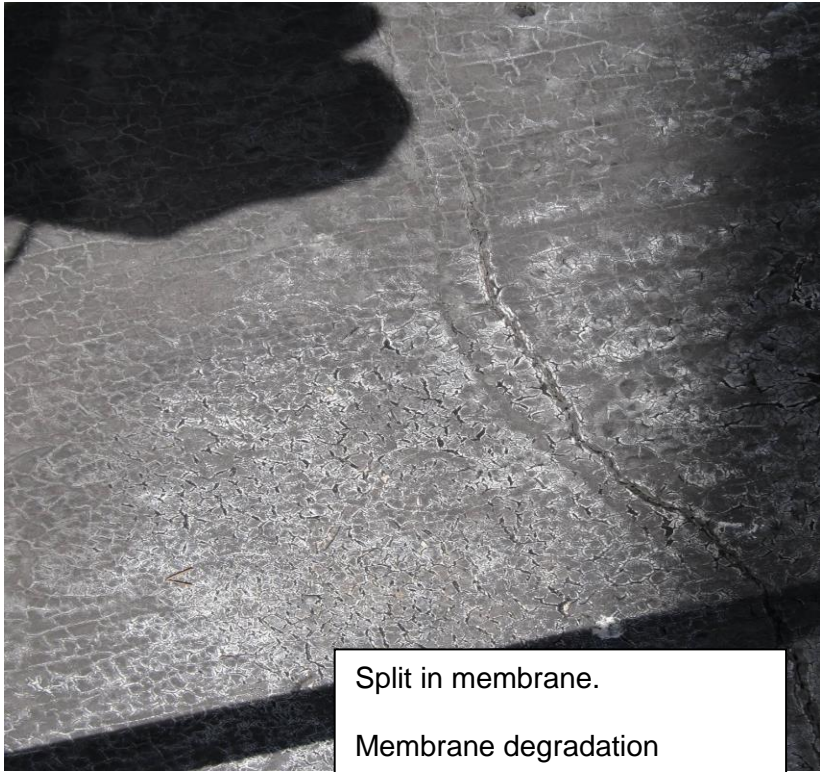
Degrading membrane



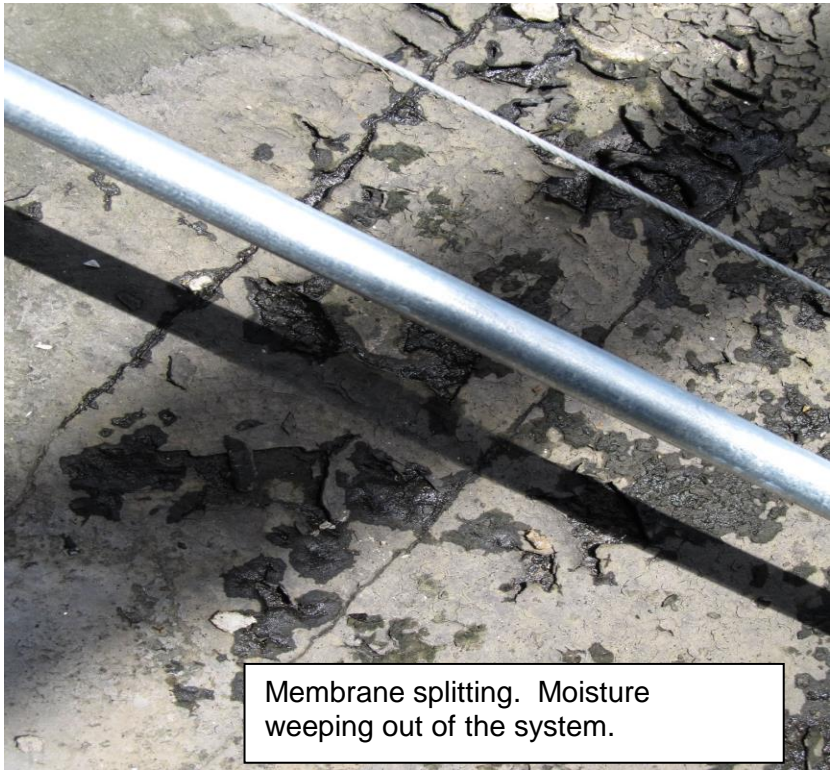
Debris in drain bowl



Degraded cap sheet



Split in membrane.
Membrane degradation



Membrane splitting. Moisture weeping out of the system.



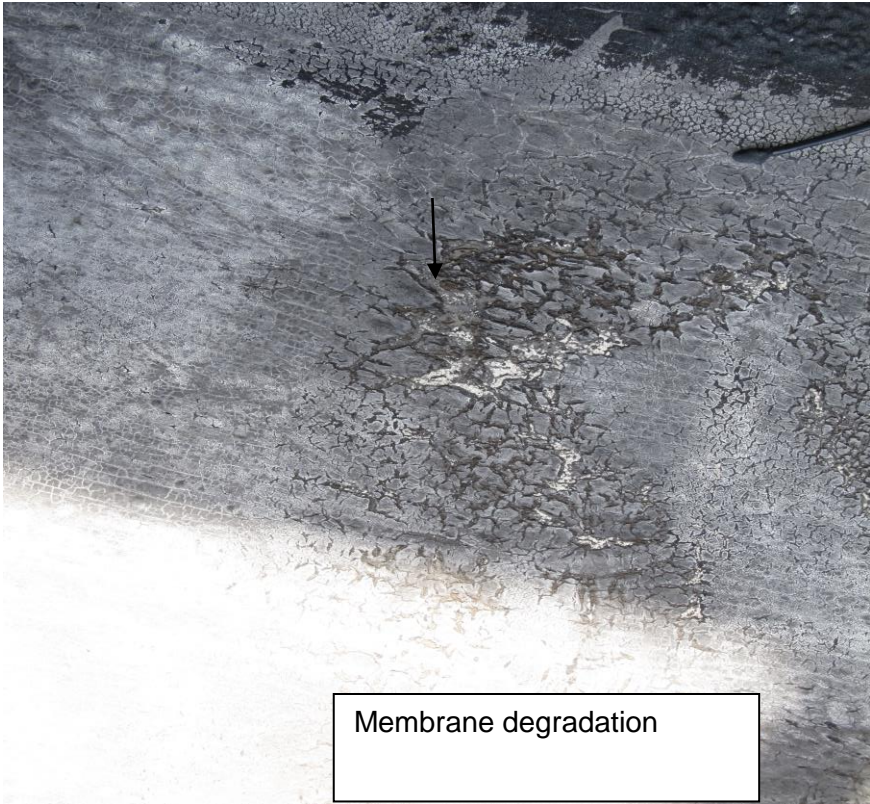
Water at a membrane spit



Membrane split at the drain



Light system supports not attached.



Membrane degradation



Exposed base flashing and termination bar loose



Damaged light fixture



Missing plastic insert at
perimeter edge