January 7, 2013

Ms. Joni Clarke, City Manager
City of South Padre Island
4601 Padre Boulevard
South Padre Island, TX 78579

Re: South Padre Island Convention Center Skylights

Dear Ms. Clark,

As per our agreement, on Nov. 7, 2012 I visited the above referenced facility *(Photos 01 & 02)* to observe the condition of the existing skylights and to help determine the cause(s) of ongoing water infiltration issues being experienced around them. On November 26, 2012, I visited an additional time, at the request of Diana Bravo Gonzalez, to walk the Roof with Sechrist-Hall and assist them in determining a scope of work for short-term roofing and wall repairs not related to the skylights.

While on site, I directly observed the skylight and roof from the exterior – from roof level - and observed the effects of the water infiltration on the interior – as I was guided through the facility by Urbano Gonzalez. In addition to directly observing the roof and skylight, I reviewed various construction documents that were provided by Ms. Bravo Gonzalez.

My observations of the facility consisted of a visual and practical, non-destructive inspection of the skylight, exterior walls and roof. The inspection did not include the evaluation of any concealed construction, systems or equipment that was not readily visible. The inspection was not a total and complete inspection of the absolute quality or condition of those items inspected, but merely an inspection of the general condition and performance of the indicated items that existed at the time of the inspection.

As a result of my visit, I have been able to identify a number of problem areas and outline recommended maintenance and corrective measures.

OBSERVATIONS

Skylight Observations

The Skylights for the facility consist of 2 sloping ribbons of glazing along the South wall of the Exhibition Hall. The glazing is supported by aluminum framing that is designed and fabricated specifically for skylight systems. The framing members contain integrated external gutters in their extrusions. These gutters collect water that may breach the seals, or condensation that may develop on the frames. Each of the skylights slope to gutters. The gutter for the East Skylight is located directly over air conditioned space, near the mid-line of the Pre Function/Lobby Area, while the gutter for the West Skylight is located outside of the building perimeter away from air conditioned space. The evidence of water infiltration (staining, rust) and a considerable amount of deterioration in the wall finishes was observed

around and under the East gutter. An area of gypsum wall board had been removed adjacent to this gutter - which exposed the metal studs and the gypsum board on the opposite side of the stud *(Photos 03 & 04)*. The studs inside of the wall showed signs of rust and staining was observed internally along the face of the wall board. At the West gutter, rusting structural members were observed, as well as water tracks and sediment.

Along the rake of each skylight, there is evidence that water has breached the glazing seals and has tracked into the frame's gutter system. The gutter system appears to be clear and working properly, except at unsealed butt ends of the skylight frames (where tracks are visible from water that has drained through the gap at the bottom of the integral gutter), and at the base of the East skylight, where polyurethane foam is blocking the integral gutters from discharging into the drainage gutter *(Photos 05)*. Corrosion of the underlying steel support structure is visible along the lower joints in the frame's integral Gutters *(Photos 06 & 07)*.

The amount of water that is leaking through the butt ends of the skylight frame is relatively small and can not explain the amount of damage that is being experienced to the finishes below the skylight, unless the skylight is experiencing significant leakage through the glazing seals. However, little evidence of that exists. Likewise, the amount of water damage observed to the walls below the skylight does not appear to be entirely consistent with the location or intensity of the water tracks that were observed on the skylight frames.

The internal gutter for the East Skylight appears to be the epicenter for most of the observed damage related to the skylight. A review of the area around the gutter reveals that the gutter collects debris and appears to have backed up from time to time and breached the counterflashing of the gutter box. *(Photos 08 & 09)*. Numerous repairs have taken place around the gutter, but none appear to have arrested the water infiltration.

The glazing strips of the skylights are now over 20 years old. Over time they loose their elasticity, become brittle and fail to maintain a seal. A wet seal is usually applied to the glass units from the top to provide a "perfect seal" for the system. It could not be verified how old the sealant is, but assuming that the sealant and glazing strips are from the original construction, based on typical life expectancies, both are nearing or at the end of their useful life expectancy.

EIFS Observations

The Exterior Insulating Finish System (EIFS) used for the primary wall cladding of the facility was installed over metal studs and sheathing was designed as a "Barrier" system. As a "Barrier" system, its protective layers of reinforced polymer modified cement and acrylic surface coating is meant to shed water and keep it from penetrating to the level of the sheathing and studs. This system is generally effective, but is susceptible to breaches causes by impact damage, improper installation, poor workmanship and the failure of sealants around penetrations and other components that make up the wall system, such as windows and doors. All of these conditions were observed in the existing installation.

The deficiencies noted include:

- Unrepaired breaches caused by debris impact (most likely from Hurricane Dolly) *(Photos 10, 11 & 12)*

- Panel edges that were not properly back-wrapped or covered by a base coat, reinforcing or a finish coat *(Photos 13. 14, 15 & 16)*
- Failed Sealant at panel joints *(Photos 17, 18 & 19)*
- Improperly sealed Penetrations *(Photos 20 & 21)*

Because the EIFS system does not employ a Drainage system, water that breaches the surface can not be discharged to the exterior before it enters conditioned space. This condition is resulting in water infiltration at the loading Docks and adding to the water infiltration experienced under the sky lights *(Photos 22 & 23).*

Other Wall and Mechanical Equipment Observations

The Wall surrounding the Cooling tower is has not been designed or installed in a manner that will resist water infiltration. The wall uses wood trim at openings, but joined panels and has improperly flashed penetrations *(Photos 24, 25 & 26)*. All of these conditions are contributing to the water infiltration being experienced in the area. The roll-up access door at the mechanical yard level is designed in a way that allows water infiltration, as does an access door at ground level adjacent to the East parking lot.

The cabinets of several air conditioning units have deteriorated to the point that they contain breaches that are allowing water infiltration into the conditioned space below *(Photos 27 & 28)*.

Roof Observations

The roof has several minor deficiencies. A blister was observed above the hallway to the North Meeting rooms *(Photos 29)*. A water filled blister was observed near the Mechanical yard.*(Photos 30)*. Several roof drain sumps are wrinkled and have been previously repaired *(Photos 31 & 32)*.

DISCUSSION

Over time, the exterior finish (or lamina) of an EIFS wall system develops cracks that allow water to infiltrate the underlying insulation. With no weather resistive barrier behind the insulation, failed "Barrier" systems over studs, or other open framing, allow water infiltration that can damages both interior finishes and the underlying structural make-up of the wall. The water infiltration issues being observed at the building are primarily related to wall penetrations, wall flashings, wall detailing and materials (particularly at and around the mechanical yard and the loading dock areas), wall sealant, the EIFS wall design, the lack of a drainage system at the interface of the wall and roof systems. equipment cabinet breaches (rusted cabinets), the skylight drainage system capacity and the aging condition of the skylight itself. There are a few minor roofing related items, but these are not the primary contributors to the water infiltration being experienced.

CONSLUSION

The remaining useful life of the Roof system is in the range of 10 years. The investigation revealed several areas of questionable application that are not performing as intended, and

areas that require maintenance. All of the roof related leaks can be addressed through a program of regular maintenance that should be followed periodically throughout the remaining expected useful life of the roof system.

Temporary repairs can be made to the other building systems to minimize water infiltration, but these repairs will not address the underlying issues of the walls, skylight and skylight drainage system. Due to the systemic nature of the problems, these issues should be addressed during the renovation work with complete replacement of the skylight, and cladding systems. While the other glazing systems were not addressed in this evaluation, it is possible that these systems warrant total replacement as well.

RECOMMENDATIONS

Roofing

Near-Term

1. On a bi-yearly basis, clean all roof debris and inspect all gutters and drain components to insure they are free of debris and unobstructed.
2. Repair the blisters in the roof membrane and drain sumps.
3. On a bi-yearly basis, inspect of for open laps and loose flashings and repair as needed.

Long-Term

1. Budget for total roof replacement in 10 years.

Equipment

Near-Term

1. Repair the breaches in the Equipment housings with sheet metal patches, covered by a reinforced elastomeric coating.
2. Reinstall the Lightning Protection system. Portions of it are currently missing.

Long-Term

1. Budget for Replace all roof top mechanical Equipment on a regular basis.
2. Properly route and support all roof-top MEP lines.

Walls

Near-Term

1. Repair all wall impact breaches.
2. Install new backer rod and sealant at all panel joints, penetrations and junctions with other materials. Install hoods over all wall penetrations to add an additional level of protection.
3. Properly reinforce and cover all EIFS edges
4. Seal and coat the interior face of the Mechanical Yard Wall.

Long-Term

1. Remove all "Barrier" system EIFS and replace it with a new EIFS system that incorporates a drainage system with properly flashed transitions at openings, penetrations and with the roof systems.
2. Remove the wall cladding around the Mechanical yard and replace it with a properly designed wall cladding system with properly flashed transitions at openings, penetrations and with the roof systems.

Skylight

Near-Term

1. Apply a new wet seal at the skylight glazing.
2. Determine if the drain lines from the gutters are obstructed. If they are, clear them.
3. Reseal the gutter to help minimize water infiltration from inundation.

Long-Term

1. Remove the existing skylight system and replace it with a properly designed and flashed system with impact resistant glazing. (See attached schematic illustrations of such a system.)
2. Rebuild the skylight drainage system to avoid inundation and provide a functioning overflow system that will evacuate water before it can reach a level that infiltrates the building.

Please see the following photos that illustrate the observed conditions.

If you have any questions about these Observations, Conclusions or Recommendations, please do not hesitate to contact me.

Sincerely,

Amtech Building Sciences, Inc.

Michael D. Hovar, AIA, LEED AP

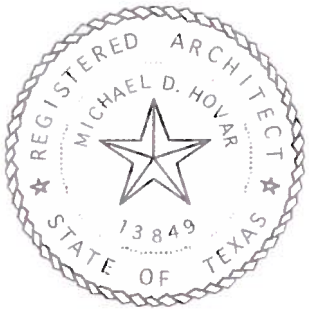


Photo 01 Aeial view of the Convention Center from the West.	
Photo 02 Aerial View of the Convention Center from the East.	
Photo 03 Damage at the gutter for the East Skylight.	

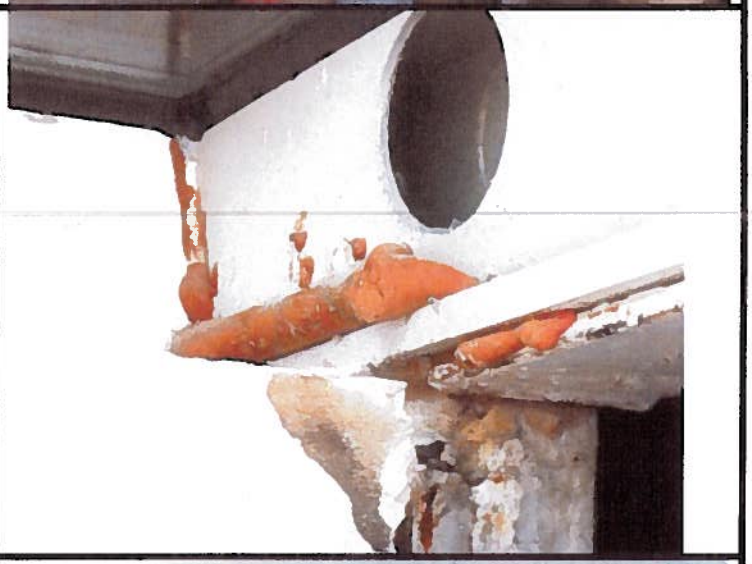
Photo 04 Damage to the interior of the wall near the gutter for the east Skylight.	
Photo 05 The integral drainage gutter is blocked by polyurethane foam.	
Photo 06 The splice is allowing water to contact the underlying steel support and is corroding it.	

Photo 07 Water Damage below the East Skylight.	
Photo 08 View of the gutter box for the east Skylight. This box collects debris and periodically becomes inundated.	
Photo 09 View of the gutter box for the east Skylight. This box collects debris and periodically becomes inundated.	

Photo 10 Breaches in the EIFS caused by debris impace.	
Photo 11 A breach in the EIFS caused by debris impact.	
Photo 12 A chunk of EIFS was removed by debris impact.	

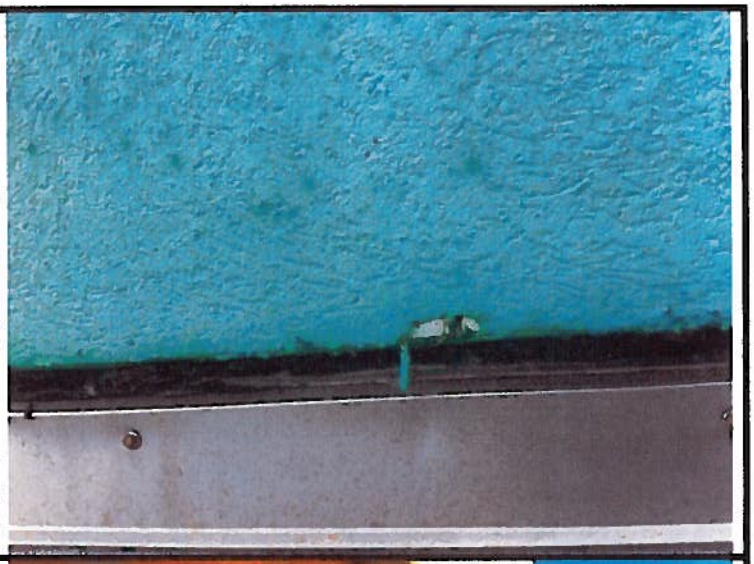
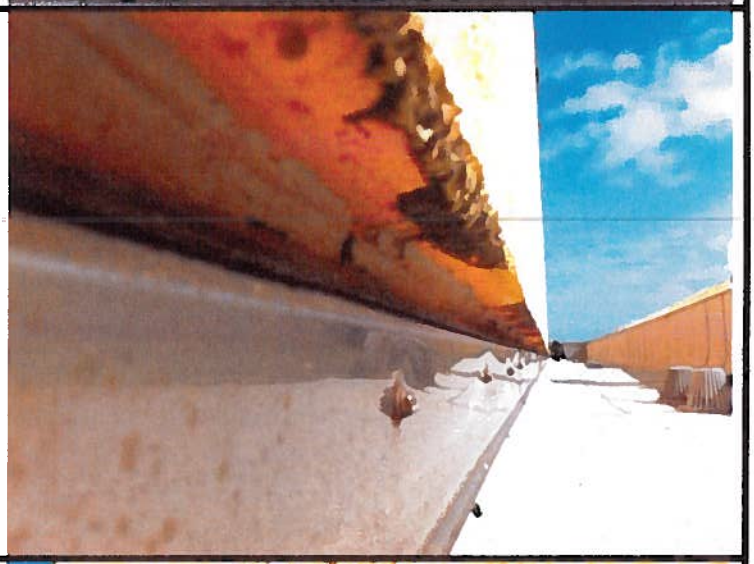
Photo 13 The EIFS was not properly back wrapped. The underlying insulation is visible.	
Photo 14 The edge of the insulation was not properly backwrapped and is exposed. Water that runs down the wall can be drawn into the building along this line.	
Photo 15 The edge of the insulation was not properly backwrapped and is exposed. Water that runs down the wall can be drawn into the building along this line.	

Photo 16 The edge of the insulation was not properly backwrapped and is exposed. Water that runs down the wall can be drawn into the building along this line.	
Photo 17 The sealant joints are failing and are allowing water to infiltrate the EIFS.	
Photo 18 The sealant joints are failing and are allowing water to infiltrate the EIFS.	

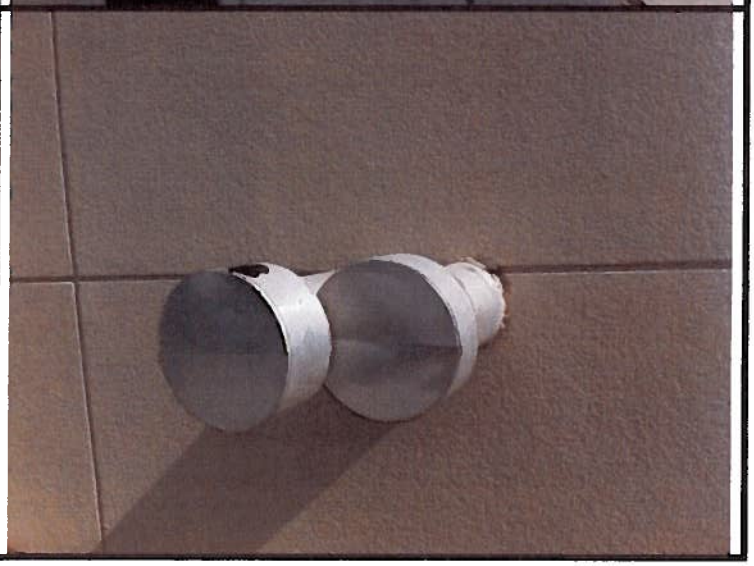
Photo 19 The sealant joints are failing and are allowing water to infiltrate the EIFS.	
Photo 20 This penetration requires a properly flashed hood to keep water out.	
Photo 21 These pipe penetrations are not properly sealed and are allowing water into the EIFS.	

Photo 22 The EIFS above the skylight is contributing to the water infiltration that is taking place below the skylight.	
Photo 23 The EIFS above the skylight is contributing to the water infiltration that is taking place below the skylight.	
Photo 24 The perimeter of these louvers are not properly sealed and are allowing water into the wall.	

Photo 25 The perimeter of these louvers are not properly sealed and are allowing water into the wall.	
Photo 26 The wall panels are not properly sealed and are allowing water into the wall.	
Photo 27 A blister was observed West of the Exhibit Hall.	

Photo 28

The housings of Mechanical equipment have deteriorated to the point that they are allowing water into the air conditioned space below them.

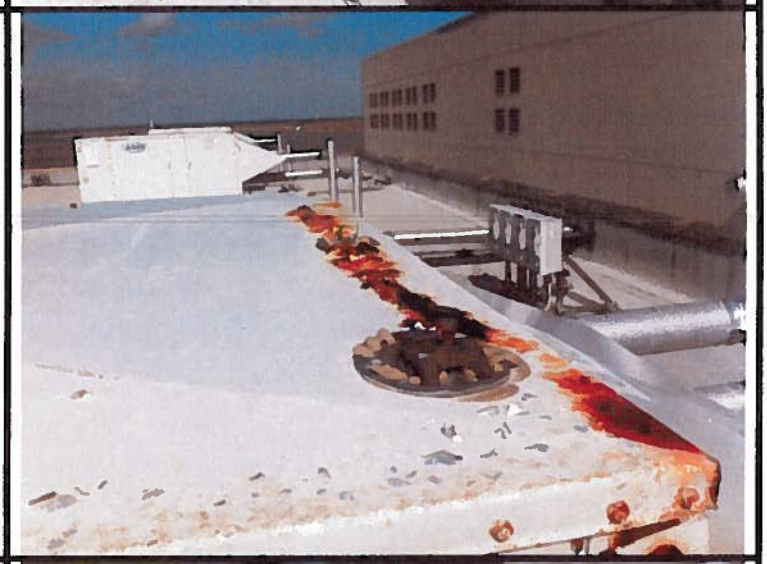


Photo 29

Corrosion has created a breach over most of the length of this A/C Unit.

Photo 30

A water blister was observed in this corner near the mechanical yard.

Photo 31 Many of the drain sumps are wrinkled.	
Photo 32 Repairs have been attempted on this drain, but have not been successful.	
Photo 33 The glazing strips and sealant on the skylights is aging and resulting in breaches.	

Photo 34

The glazing strips and sealant on the skylights is aging and resulting in breaches.

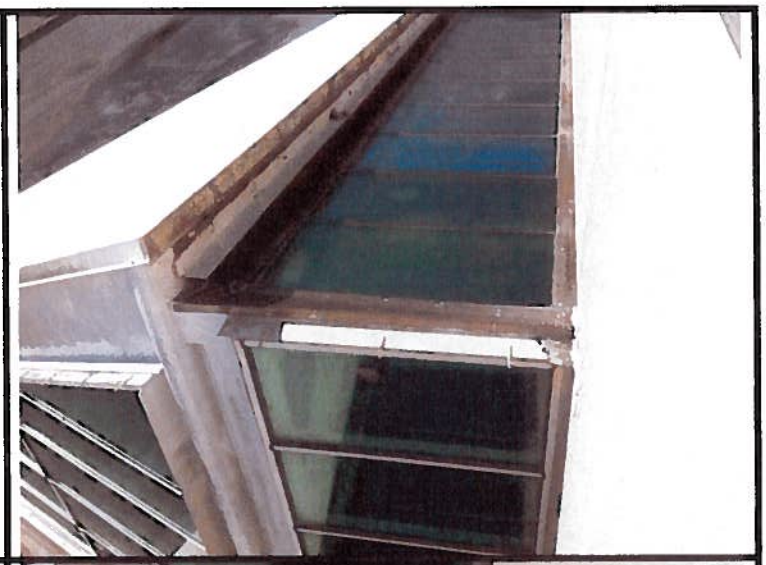
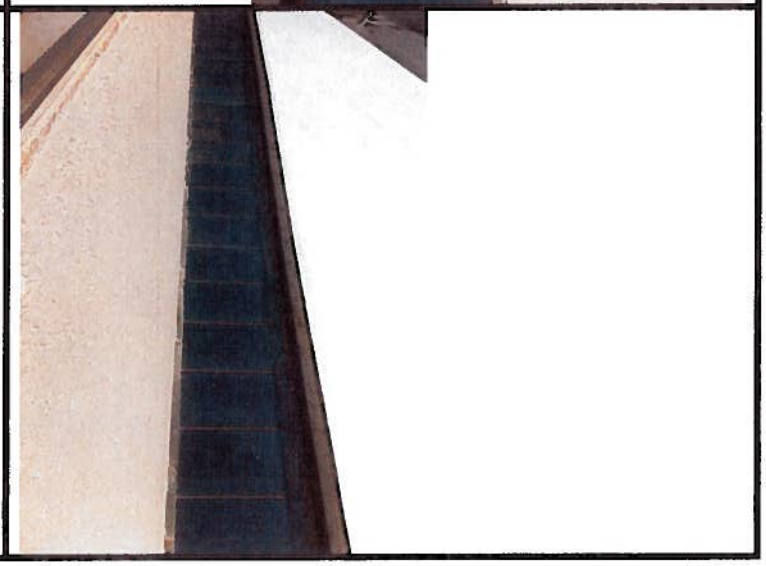


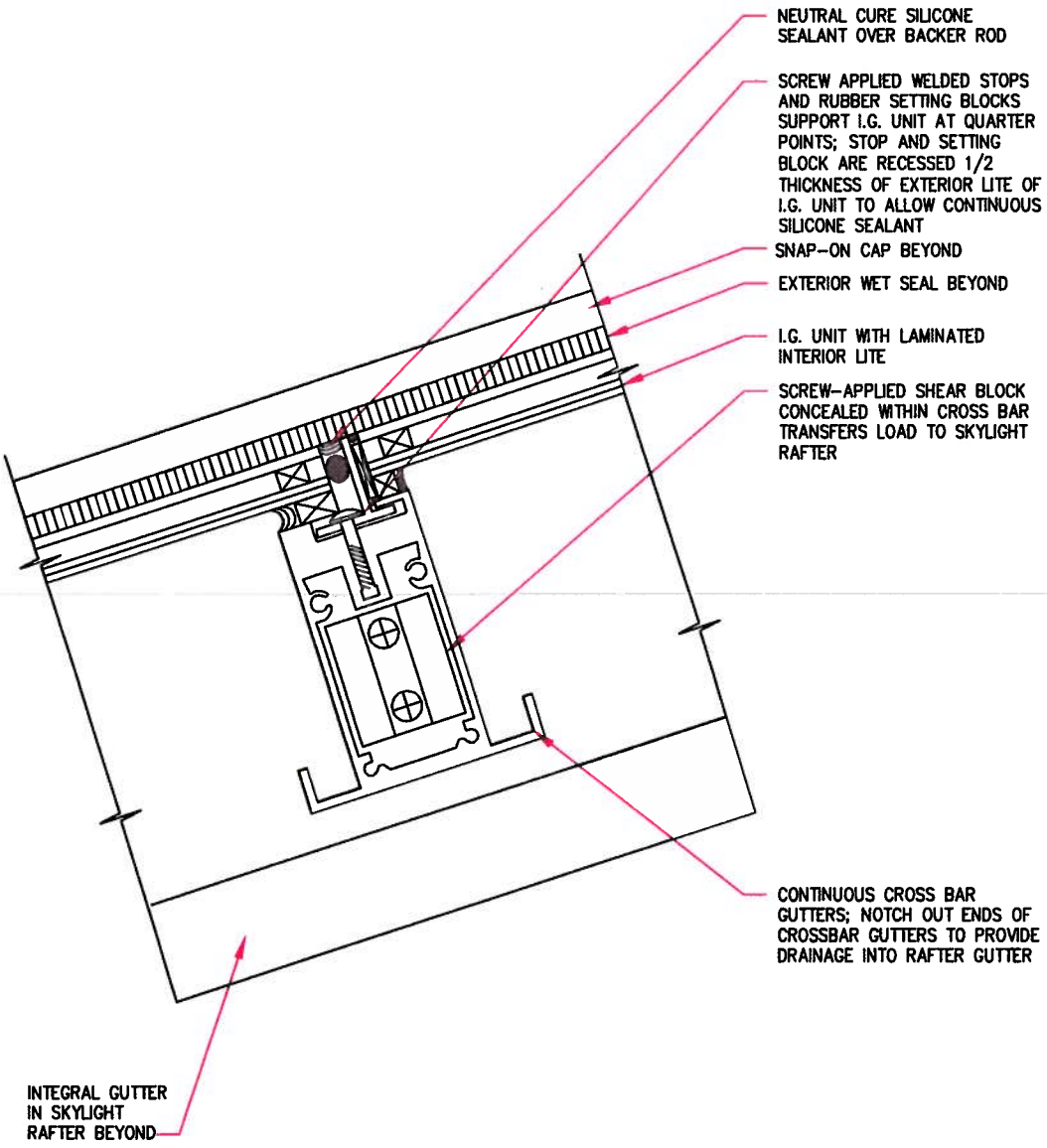
Photo 35

Water that flows to this gutter sometimes inundates the gutter and results in water infiltration.

Photo 36

The glazing strips and sealant on the skylights is aging and resulting in breaches.





CONCEPTUAL – NOT FOR CONSTRUCTION

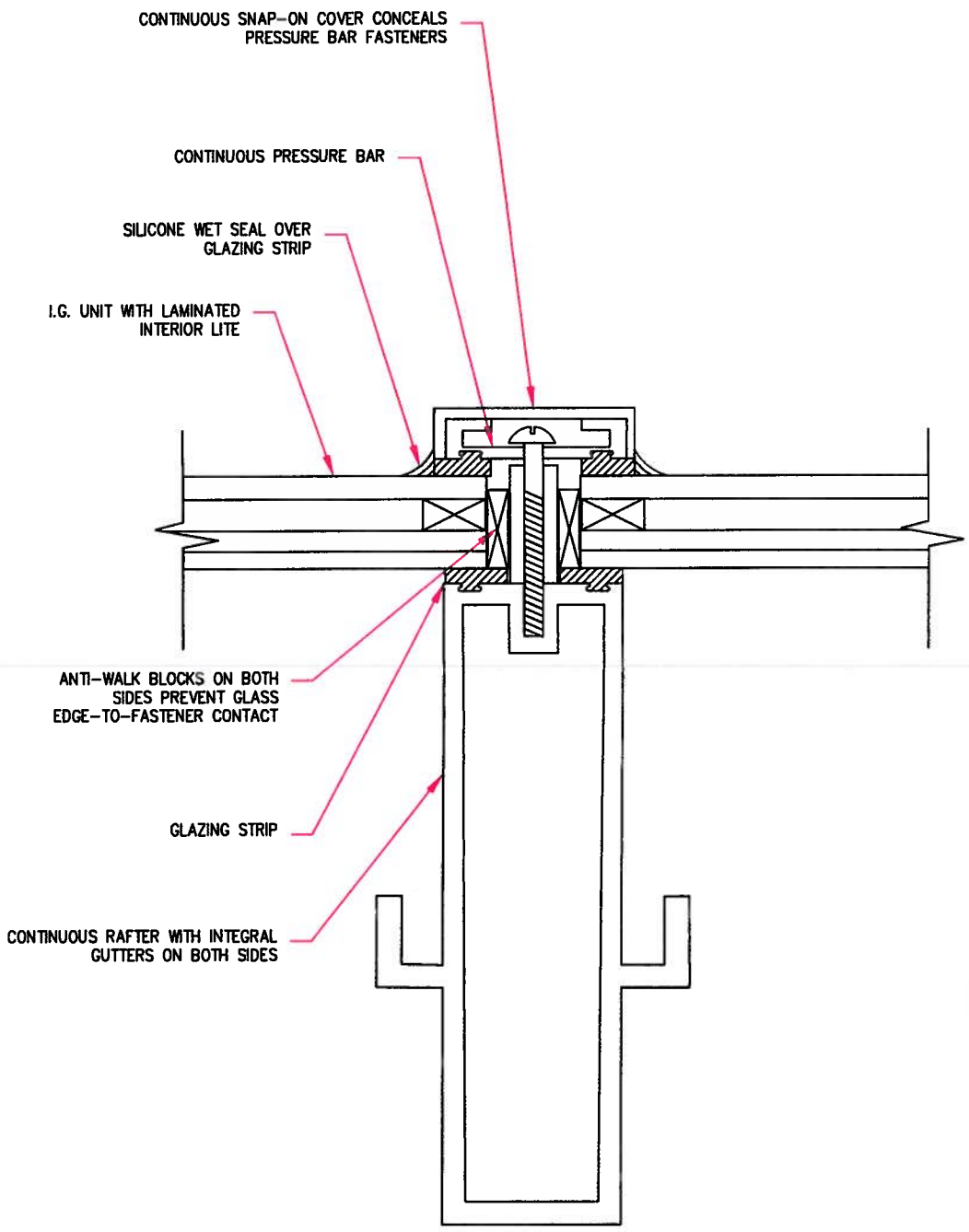
Notes:

1. Follow all manufacturer's instructions for installation.

2. The flush cross bar configuration has better waterproofing and aesthetic performance than horizontal mullions with exposed pressure bars and snap-on caps which buck water.

3.4–4

SLOPED GLAZING-HORIZONTAL MULLION DETAIL



CONCEPTUAL – NOT FOR CONSTRUCTION

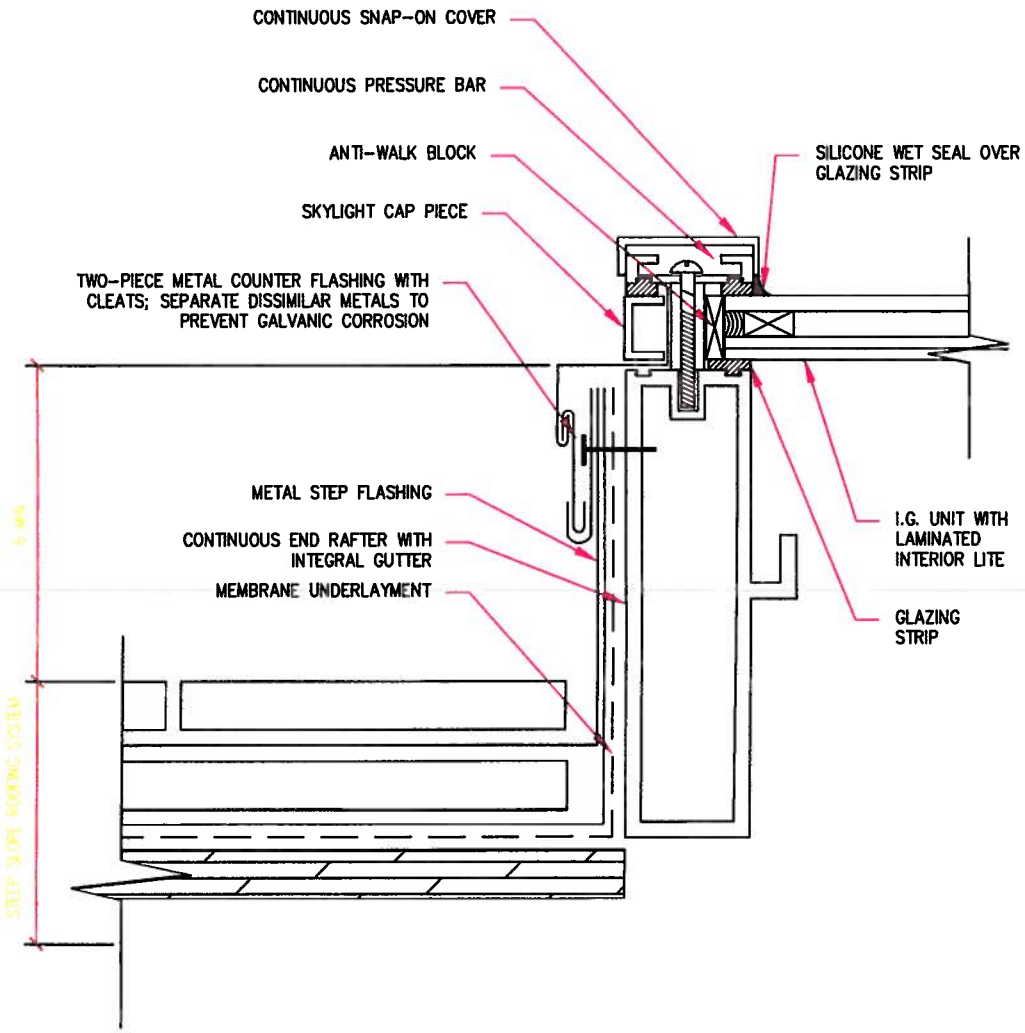
Notes:

1. Follow all manufacturer's instructions for installation

2. Long rafter sections are frequently spliced together, but often leak because the joints in the integral gutters are not reliable. Continuous rafters (typically available in lengths up to 30ft long) have better waterproofing and structural performance but are more difficult to fabricate, ship and install.

3.4–5

SLOPED GLAZING-RAFTER DETAIL



CONCEPTUAL – NOT FOR CONSTRUCTION

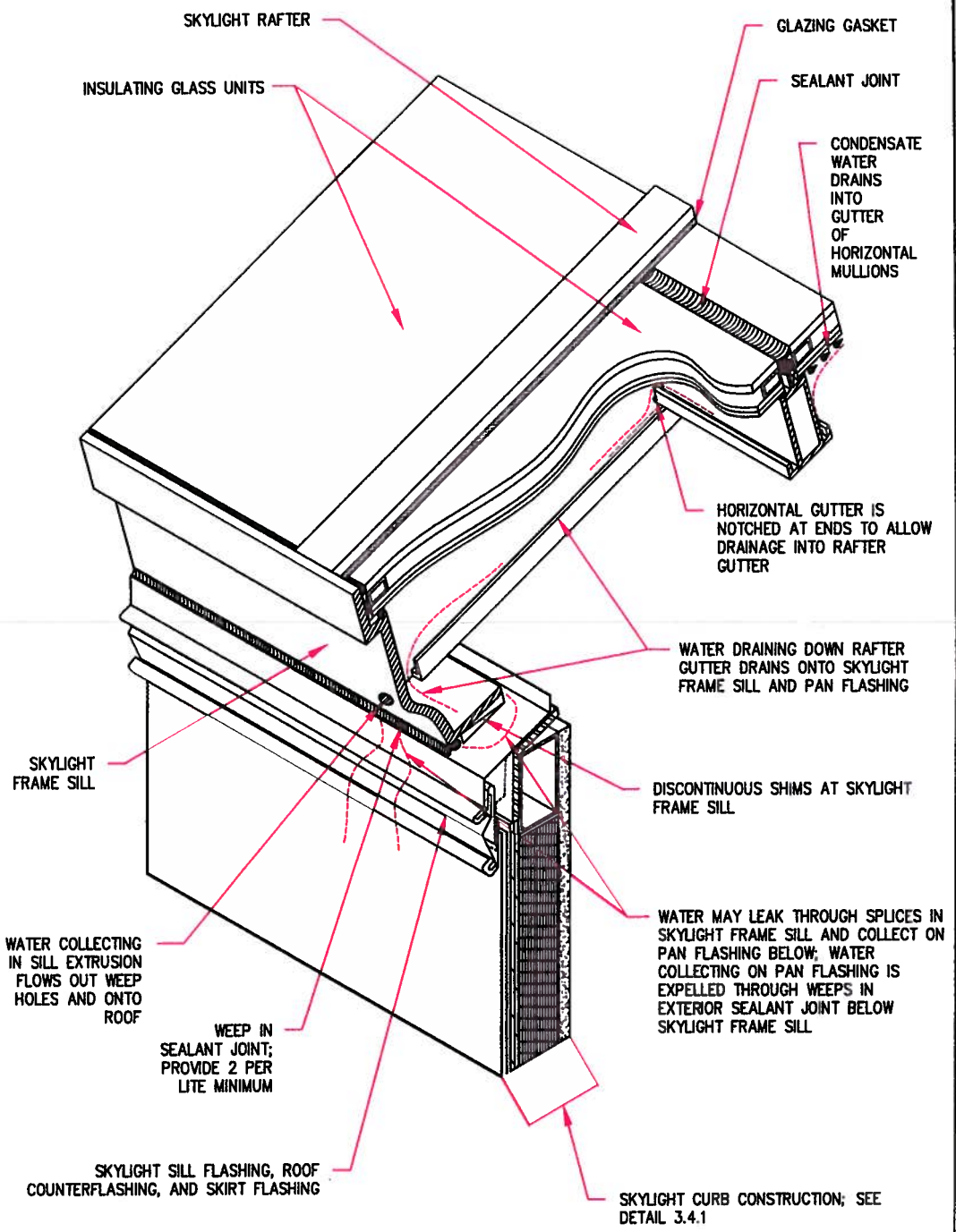
Notes:

1. Follow all manufacturer's instructions for installation

2. Flashing detail between skylight rafter and roofing system may have to be detailed for vertical movement to allow differential deflection between skylight rafter and roof framing

3.4–6

SLOPED GLAZING-VERTICAL MULLION AT TRANSITION TO ROOFING SYSTEM



CONCEPTUAL – NOT FOR CONSTRUCTION

Notes:

1.Follow all manufacturer's instructions for installation

2.Condensate gutters are a means of collecting and expelling condensation water; they are not well configured to control bulk water intrusion through faulty weather seals and should not be relied upon to function as such unless specifically designed to do so.

3.4–7

SLOPED GLAZING-ISOMETRIC OF CONDENSATE FLOW PATH AT GUTTER RAFTER DETAIL