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### Legend

- **X**: Subject
- **<**: Photograph number and camera angle
- **#**: Leak Area
- **•**: Area of Roof Drain Test—Pass
- **•**: Area of Roof Drain Test—Fail

### Report Definitions

**Service Life**
The period during which a building is structural sound and not vulnerable to water infiltration.

**Poor Condition**
Vulnerable to next wind and/or rain event. Needs attention now.

**Fair Condition**
Service life should survive 5 years with yearly inspections and normal maintenance.

**Good Condition**
Service life should survive 5 years with no action. *Based on age and Gulf Coast Exposure, this particular building should still be inspected yearly.*

### Abbreviations

- ACM  | Aluminum Composite Material
- AVB  | Air Vapor Barrier
- BUR  | Built Up Roof
- BW   | Barrier Wall
- CIP  | Cast in Place Concrete
- CW   | Glazed Aluminum Curtain-wall
- IBC  | International Building Code
- MB   | Modified Bitumen
- MP   | Metal Panels
- MV   | Masonry Veneer
- PC   | Pre-cast Concrete Panels
- PW   | Punched Windows
- SI   | Structural Integrity
- SF   | Storefront Glazing System
- UBC  | Uniform Building Code
- WB   | Weather Barrier
- WI   | Water Infiltration
- WL   | Wind Loading
Project Data

General Information

Project: University Center II
Address: UTSA
          San Antonio, Texas 78249
Owner: University of Texas at San Antonio
Client: University of Texas at San Antonio

Construction Team
Project Manager: UT OFPC
Architect: Phelps Garza Bomberger
Contractor: Vaughn

ZSC Field Crew: Bill Coltzer, Jr., AIA
Floyd Carrier
Report Author: Bill Coltzer, Jr., AIA

Design Code: UBC
Wind Speed: 90 MPH (assumed)
Importance Factor: 1 (assumed)
Exposure: C (assumed)
Year Built: 1995
Building Use: Student Center
Storm Damage: No.
Fire Damage: No
Levels above grade: 2
High Rise by Code: No
Levels below grade: 0
Approximate SF: 98,557

Event Area—Rise Wall at East Side of Barrel Vault Roof

- During rain events water infiltration has been observed along the east rise wall of the barrel vaulted roof area. Water infiltration has been most significant along the storefront window at the second floor information desk.
The project is the University Center II (UC II) located on the campus of the University of Texas at San Antonio. UC II is a two story structure with primarily pre-cast concrete walls, glazed aluminum curtain-walls, modified bitumen built up roofing and standing seam metal roofs. UC II is a 17 year old, 98,000 SF + addition to the original University Center.

Zero/Six Consulting L.L.C (ZSC) has been commissioned by UTSA to determine the causes of water infiltration along the east rise wall of UC II and provide direction as to “next steps” for remediating causes of water infiltration.

Upon arrival on site, three areas where water infiltration had been previously observed were pointed out to Zero/Six personnel by UC II building staff. These areas were all in the level two information area and are labeled “1” through “3” on the attached Key plan on page 7 of this report. Three other areas were identified as being suspect by Zero/Six and those areas are also identified on the Key plan and labeled “4” through “6”.

Leak Area 1: Leak Area 1 was marked by stained ceiling tile under what appeared to be roof drain related piping. From the roof top, Zero/Six was able to observe that the pipe was actually a collector for a downspout related to the barrel roof gutter. The bonnet installed at the downspout penetration was not positively attached and the sealant had torn. Water testing proved that this tear would allow for water infiltration during simulated rain events. Recommendation: install new bonnets with draw bands and caulk troughs similar to that illustrated on page 18. Note: Zero/Six suggest further inspection after removal of bonnet.

Leak Area 2: Leak Area 2 was marked by missing ceiling tiles, stained ceiling tiles, damaged drywall above ceiling, water catch buckets and water streaks on adjacent interior storefront system. From the roof top Zero/Six was able to observe that the sealant joint interface between the sheet metal sill flashing and the round concrete columns was not adhered to both bonding surfaces. Water testing of this area produced immediate and significant water infiltration. Recommendation: Remove and re-install all joints at sill flashing and round columns per details on page 19. Joints observed at these conditions are typically in poor condition and will continue to fail.

Leak Area 3: Leak Area 3 was marked by a stained ceiling tile under roof drain related piping. Water testing and roof drain testing suggested that the leak was not associated with the roof drain, but rather traveling down the piping from leak area 1. Recommendation: Seal all-thread connections at roof drain to drain body at all roof drain conditions over UC II. Although roof drain did not leak when tested, this particular drain design has a history of leaking through the all-threads that penetrate through the drain body. See page 20.

Leak Area 4: Leak Area 4 was marked by a stained ceiling tile under roof drain related piping. Roof drain testing above this area produced immediate and significant water infiltration. Recommendation: Remove and re-install roof drain ensuring roof membrane is tightly secured within clamping ring and that all connection are sealed consistent with the protocol referenced at Leak Area 3. Adjacent roof area (around roof drain) should also be inspected for water related damage once drain is disassembled.

Leak Area 5: Leak Area 5 was marked by water stains on the face of the round concrete column. From the roof top Zero/Six was able to observe that the roof overhang at the inside corner condition of two barrel roof sections made it nearly impossible to seal/maintain the curtain-wall related joinery. Water testing of this area produced moderate water infiltration after a few minutes of testing. Recommendation: re-detail roof corner such that curtain-wall joinery can be maintained.
Leak Area 6: Leak Area 6 was marked by water damaged plaster. From the roof top Zero/Six was able to observe that the sealant joint interface between the sheet metal sill flashing and the round concrete columns was not adhered to both bonding surfaces. Water testing of this area produced immediate and significant water infiltration. **Recommendation:** Remove and reinstall all joints at sill flashing and round columns per details on page 19. Joints observed at these conditions are typically in poor condition and will continue to fail.

Other observations:
1. Sheet metal gutters at barrel vaulted standing seam roof areas are in poor condition. Gutters have deteriorated (rusted) similar to those installed in a more harsh environment such as salt exposure. Additionally, during our field work Zero/Six personnel was shocked via an electrical phenomenon at a roof drain. Zero/Six believes that the corrosion of the gutters is the result of electrolysis related to an electrical defect. **Recommendation:** Engage electrical engineer to evaluate electrical systems.
2. Trapped water was observed within translucent, double paned, glazed panels at curtain-wall systems. Additionally, UV rays appear to impacting the panels such that their wind resistance may be compromised. **Recommendation:** Pressure test translucent panels to verify if structural integrity has been compromised. If panels pass pressure testing, then replaced damaged units with like products. If panels fail pressure testing, then a replacement strategy for the panels must be developed.

Additional detail is included on the following pages.

**End of Executive Summary**
L2 Key Plan
University Center
UTSA
2012 02 24

Floor Plan is an excerpt from Phelps Garza Bomberger documents dated 1994 10 17.
Roof drain locations shown on this plan do not represent "as built" conditions exactly.

Dotted blue line represents area of glazed rise walls.
<table>
<thead>
<tr>
<th>Photo of Roof</th>
<th>1</th>
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<tbody>
<tr>
<td>Glazed rise wall over areas of water infiltration.</td>
<td></td>
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<tr>
<td>Roof drain</td>
<td></td>
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<tr>
<td>Skylight</td>
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<table>
<thead>
<tr>
<th>Leak Area No. 1</th>
<th>2</th>
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<tbody>
<tr>
<td>Water test in progress at downspout collector.</td>
<td></td>
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<tr>
<td>Bonnet over collector</td>
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<thead>
<tr>
<th>Leak Area No. 1</th>
<th>3</th>
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<tbody>
<tr>
<td>Water bleeding through insulation from water test.</td>
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Sealant joints at heal bead installations are not installed in a condition that supports long life (i.e. lack of bond breaker in corner and lack of primer). This is a typical condition at round columns.

Previous water damage.
Water cascading down corridor face of storefront from water testing on roof.

Photos
<table>
<thead>
<tr>
<th>Leak Area No. 2</th>
<th>Photos</th>
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<tr>
<td>Water from water testing on roof accumulating on floor.</td>
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<thead>
<tr>
<th>Leak Area No. 5</th>
<th>Photos</th>
</tr>
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<tbody>
<tr>
<td>Roof design at this corner may need to be modified as shown (i.e. cut back) to allow proper repair and maintenance of glazed aluminum curtain-wall.</td>
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<table>
<thead>
<tr>
<th>Leak Area No. 5</th>
<th>Photos</th>
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Water testing in progress at roof.

Water running down face of column from water testing on roof.

Water from water testing on roof accumulating on floor.
Discolored double glazed units are typically the result of water trapped between the panes.

Area of Water infiltration

Leak Area No. 6

Water from testing at roof level running down face of column.

Photo

Water from testing on roof accumulating on floor.

Photo
Roof drain testing apparatus in place on roof.

Water infiltration from roof drain test.

Wet ceiling tile from roof drain test.
A new performance sealant joint must be established between the flange of the steel beam and the face of round column.

A new heal bead sealant joint must be installed at all flashing to round column interfaces.

Detail is an excerpt from Phelps Garza Bomberger documents dated 1994 10 17.
Typical Draw Band Bonnet Detail at Penetration Pocket
Proposed joint between steel beam and sheet metal flashing.

Proposed joint at interface of round columns and sheet metal flashing.

Ratio of A:B should be about 2:1

Corner Joint

Excerpt from Dow Corning Weather Proofing Sealant Guide
Seal all-threads to roof drain body

All-thread connections ...typical

Typical Roof Drain