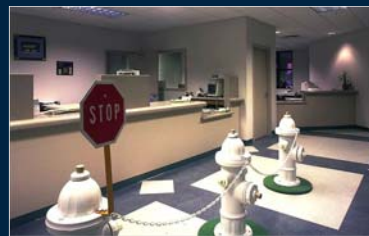
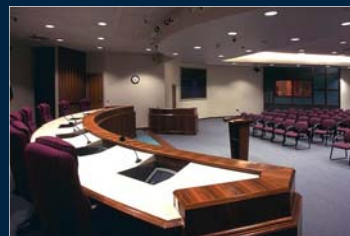




EXISTING FACILITIES NEEDS ASSESSMENT FOR The South Padre Island Convention Center

For the
City of South Padre Island, Texas
June 1, 2012



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architects

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Assessment Parameters

On March 1, 2012, ROFA Architects, Inc. entered into an Existing Facilities Needs Assessment Contract with The City of South Padre Island. This assessment is to study the current condition of The Convention Center. It is to become a tool by which City leadership will determine viability, expansion and long term goals for The Convention Center.

The Architect agreed to perform the following services:

1. **Existing Facility Need Assessment;** including but not limited to a Facilities Condition overview. In said overview, The Architect shall document the condition of the existing facility and determine the viability and integrity of the following systems:
 - a. Site Conditions
 - b. Structural
 - c. Architectural
 - d. Mechanical
 - e. Electrical
 - f. Plumbing
2. The Assessment shall include a list of facility deficiencies and suggested remedies.

The finding will be delivered in a formal written report.

This document is a collaborative effort. ROFA Architects, Inc., Green Rubiano, Assoc., and TTG Goetting, Assoc. co-authored this assessment.

Questions regarding this report can be directed to:

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Existing Facilities Needs
Assessment for The South Padre
Island Convention Center



A1.1

South Padre Island Convention Center

General Information

- Date of Construction:
 - Main building: 1992
 - Full kitchen install around 1993
 - Extensive hurricane remediation after the Hurricane Dolly 2008
- Location: 30 acre tract of Cameron County land known as Andy Bowie Park on the northern city limits of South Padre Island, Texas
- Lead Architects: Loschky, Marquardt and Nesholm- Seattle, Washington
- Associates Architects: Reitzer, Cruz Architects, Inc.- San Antonio, Texas
- Original Construction cost: \$12,750,000
- Building Square Footage:
 - Exhibit space – 23,135 sf (with 36' ceiling clearance)
 - Meeting space – 9,055 sf
 - Theater – 3,272 sf
 - Lobby and circulation space- 15,880 sf
 - Administration space – 2,524 sf
 - Kitchen space- 2,681sf
 - Restroom and other support spaces- 14,941sf
 - Total square footage – 75,986 sf
- Meeting Capacities (from CVB)

Convention Centre Meeting Capacities:						
Room	Capacity by Arrangement					
	Reception	Classroom	Theater	Banquet	Exhibits	Ovals
Lobby	1,000	300	500	400	35-10'x10'	56(8)
Exhibit Hall	3,200	1,552	2,200	1,440	130-10'x10'	100(8)
Entire Facility						
	Theater	Classroom	U-Shape	Hollow Square	Banquet (Ovals)	
Theater	230	150	55	70	180	16(8)
Room #101	100	48	32	30	70	7(8)
Room #102	100	48	32	30	70	7(8)
Room #103	100	48	32	30	70	7(8)
Room #104	100	48	32	30	70	7(8)
Room #201	100	48	32	30	70	7(8)
Room #202	250	125	64	80	170	16(8)
Room #203	100	48	32	30	60	7(8)
Sun Terrace					200	20(8)



- On-site Parking Spaces- 527 spaces
- General Construction Characteristics:
 - Foundation: Cast in place concrete slab on concrete piers
 - Structure: class a structural steel – columns, bar joists, beams, purlins, and deck
 - Exterior building envelope:
 - Walls: hard shell, synthetic stucco on exterior insulated finish system on galvanized steel studs with painted sheet rock interior
 - Roof: coal tar elastomeric roofing system (CTEM) on rigid board insulation
 - Windows: 1" insulated glass (non-impact resistant) "Vista Wall" storefront. Interior film/tint was applied just after Dolly. Code does not recognize this as impact resistant glazing.
 - Front and rear exterior canopies are exposed steel (painted)



Site Conditions



The Convention Center is located on the Northern end of the City of South Padre island and is vehicular accessible via a west entrance off of Highway 100. The Building is surrounded by native vegetation and wetlands. To the North, the building is bound by a large expanse of tidal flats. To the South, the site looks upon an intricate weave of estuaries and boardwalks that are part of the Birding and Nature Center. From The Convention Center, the southbound boardwalk connects to The Birding Center. The Convention Center overlooks the Laguna Madre to the West. Across Highway 100, lies a county park and beyond that is The Gulf of Mexico. The greatest opportunity for expansion is to the North.





The finish floor of the Convention Center is adequately elevated above mean sea level. The building has not experienced rising flood water. Native vegetation surrounds the building but is most punctuated to the South and within the drop off entrance. On the west side, an observation deck provides an 180deg. view of the Laguna Madre. The parking is predominately asphalt with a few concrete turning aprons. The drives and parking drain properly and have moderate wear but, do not require immediate maintenance. Parking striping needs new paint.

Building Envelope : Preface

In the summer 2008, Hurricane Dolly destroyed and/or brought to light many building envelope deficiencies. The existing built-up roof for the entire building was destroyed. This roof had been in place of nearly 20 years and had outlived its use.

An exterior wall had collapsed which exposed serious structural erosion that was evident at all exterior walls. The skylights above the main concourse (having always been problematic) leaked profusely. The exterior insulating finishing system (EFIS) time and time again had yet to perform in severe weather conditions. Flying debris easily damages this exterior finish. All of the building's glazing is not impact resistant.

To remediate the damage from Dolly, The City initially hired Cotton Construction, Inc. out of Houston, Texas. A month into repairs, it became apparent that the damage was severe and repairs complicated. As a practical measure, The City hired ROFA Architects, Inc. to address performance concerns and oversight during construction.

Because the building envelope was compromised at both the roof and the exterior walls, the recommendations for the roof were accepted and are now in place. The exterior wall repairs have not been done.



ROOF

Windstorm provisions affected by Building codes and insurance requirements have changed drastically since this building was originally built. The new roof as proposed by Cotton did not reflect and understanding of fastening patterns, membrane elongation and flashing fundamentals. It was our recommendation (and later accepted) that a Coal Tar Elastomeric Membrane (CTEM) roofing system be installed. A marine grade stainless steel parapet cap was also added to waterproof the tops of all parapet walls.

After 4 years of wear, the new roof is holding up well. As shown in the photos below, there are some signs of membrane delaminating and water ponding. This is covered by the roof warranty and efforts should be made to contact the roof manufacturer to remedy these conditions.



EXTERIOR WALLS

Our observations led us to believe that the exterior walls of the facility lack an important vapor or water barrier membrane(s) within the wall. Pictures show this deficiency in the wall that collapsed and other perimeter walls. All these wall show significant corrosion to the vertical metal studs and bottom track. In some cases, the bottom track has completely corroded and is nothing more than metal dust. No vapor barrier, base flashing, or weep hole are visible. These are very important components that belong in the cavity of the wall for they allow the intruding moisture a way to weep out of the wall. It's very possible that more walls will collapse if you do not repair the bottoms of these exterior metal stud walls. Furthermore, we recommend installing vapor barriers, base flashing and weep holes. This will be a very intrusive repair.



It is our recommendation that the highest priority in any renovation effort should be to replace all exterior wall studs with new stud walls or concrete block. In lieu of the existing EFIS system, a convention stucco exterior should be installed. In this way, the wall would have an integral vapor barrier that work in concert with through and base wall flashing. Weep holes at the bottom of the wall will ensure that any moisture is wicked out of the walls.

GLASS AND GLAZING

This building does not meet today's code requirements for impact resistant glazing. It is our understanding that sometime after Hurricane Dolly, a tinted film was applied to all exterior glazing. This was done with the hope that it would provide the required impact resistance to the glazing. It is our opinion that this will not meet those requirements. If and when The City chooses to meet those requirements, all exterior glazing will have to be replaced with impact resistant glazing.

The sky light at the main lobby has and does leak. Visual inspection shows wear at the gaskets. Replacing all gaskets should illuminate the problem. As reported by Convention Center staff, this is a constant problem.



Green Rubiano & Associates (GRA) is pleased to provide this letter report concerning the South Padre Island (SPI) Convention Center Assessment performed for ROFA. The project scope was performed in accordance with the Fee Proposal for Existing Facilities Needs Assessment for the City of South Padre Island Convention Center, dated March 14, 2012.

Background & Scope

During a teleconference call between Mr. Alex and GRA on April 5, 2012, the following project information was discussed. The existing convention center is about 20 years old. During the occurrence of hurricane Dolly in 2008, the convention center experienced significant damage. Repairs to the convention center were performed that same year by Terry Ray Construction and included reconstruction of a northeast side wall and reroofing of the facility.

The purpose of this study was to assess the condition and viability of the structure, exterior envelope and roofing system of the existing facility. GRA's scope included a review of the existing construction documents, a site visit to conduct visual observations and to provide this final letter reporting our findings.

Document Review

GRA performed a document review of the original architectural and structural drawings of the convention center. The drawings reviewed consisted of architectural Sheets A-1.1 to A-11.4 and A-13.1 and 2, by Loschky Marquardt & Nesholm and Reitzer Cruz Architects, and structural Sheets S1.1 to S6.4, by Skilling Ward Magnussen and Barkshire, Inc. All drawings were dated February 13, 1992.

In order to eliminate the need to perform intrusive wall openings, GRA also reviewed three photographs provided by ROFA taken prior to the 2008 repairs. These photographs assisted in providing insight into the condition of the exterior walls.

Building Description

The facility is a single and two-story structure with various roof levels constructed with structural steel framing and light-gauge metal stud exterior walls. The second floor space is limited to mechanical equipment mezzanines. The exterior walls are finished with an Exterior Insulation and Finish System (EIFS). The building has storefront aluminum windows along the front, east lobby. A steel framed canopy system/main lobby corridor traverses through the center of the facility in the east-west direction, which includes a parallel skylight and clerestory window system.

The super structure consists of 1 ½-inch structural metal deck supported by open-webbed steel joists. The steel joists, spaced at approximately 6-foot centers, span between fabricated structural steel trusses over the main exhibit hall and hot rolled steel beams over the remainder of the facility. The roof structure is supported by fabricated steel



columns. The second floor mezzanine is a concrete slab over corrugated metal form deck supported by open-webbed steel joists.

The building slab design is noted on the structural drawings as a 10-inch thick flat slab design. The slab appears to be designed as a two-way slab spanning between 18-inch diameter auger-cast piles bearing at elevation - 82-feet. Finish floor elevation is noted at elevation 10 feet. The drilled piers are spaced on a 15' x 20'-2" grid.

The interior of the structure consists of a large volume exhibit hall at the northeast quadrant of the facility. The northwest quadrant of the facility consists of meeting rooms on the first floor and mechanical rooms on the second floor. The southwest quadrant of the facility is made up of administrative areas, meeting rooms and a conference theater.

The roof system is a modified bitumen roof with rigid board insulation mechanically screwed to the deck with roof drains and scuppers for drainage. A parapet at various elevations is present at most roof perimeters and is finished with metal coping. Mechanical units are present on the roof at various locations including an exterior mechanical area. Adaptor roof curbs were present at the base of mechanical units. Louvers are present at all mechanical openings.

Observations

At the request of our client, GRA conducted a site visit on April 19, 2012 of the existing project site. The purpose of our visit was to conduct visual observations to assist in evaluating the condition of the structure, the roofing system, and the exterior envelope of the building. Site access, including roof access, was provided by Mr. Urbano Gonzalez, Maintenance Supervisor for the SPI Convention Center.

The following items were observed. A photo log is provided at the conclusion of this letter to help in identifying the following items.

1. Some punctures present in the exterior EIFS. (Photo #1)
2. Column base cracks present at west side walkway. (Photo #2)
3. Some evidence of movement visible in the form of cracks and separation of expansion joints at the west side walkway. (Photo #3)
4. Blistering of the roof cap sheet was observed at the base of flashing in several areas. (Photo #4)
5. Secondary drainage of the roof system is not present near the entrance of the Exhibit Storage area. (Photo #5)
6. Loss of fasteners and moderate to severe corrosion was observed at the support of the chiller unit located within the exterior mechanical room. Moderate corrosion was observed at some mechanical units. (Photo #6 and #7)



7. The storefront system located at the east lobby elevation consists of double-paned, glazed glass units meeting ANSI Z97.1 – 1984. This system does not meet the current standards set in IBC 2006 for Hurricane-Prone Regions. The same may be true for the louvers present at mechanical openings and the glazing at the canopy/main lobby skylight. (Photo #8 and #14)
8. Evidence of ponding is present at various locations of the central canopy/main lobby. (Photo #9)
9. Degradation of sheet rock and metal studs observed below door to cooling tower. (Photo #10)
10. Failed sealant and damaged mullion was observed at the aluminum window assembly at the canopy/main lobby clerestory windows. The rubber compression gaskets appear weathered and may lead to water infiltration in the future. (Photo # 11)
11. Moderate corrosion of exterior mechanical equipment. (Photo #13)
12. Moderate corrosion of the exterior steel members that frame the central canopy system was observed. (Photo #16 and #17)
13. Moderate to severe corrosion of exterior wall metal studs and bottom track as evident in photograph No. 13 provided by ROFA. (Photo #18)

Conclusions & Recommendations

Based on our observations and review of the architectural and structural construction documents, it is the opinion of GRA that the super structure of the convention center facility is in good condition and viable to withstand the loads for which the structure was designed.

Some areas of concern were observed concerning the fenestrations of the building such as wind resistance of the store fronts, glazing at the skylight and clerestory windows of the central canopy/main lobby area, and louvers located at mechanical openings. Although these items may have been designed and specified to the appropriate code at the time of design and construction, these items do not meet the current requirements for wind resistance as defined in International Building Code (IBC) 2006. In addition, the failure of the sealant and damaged mullions located at the clerestory windows of at the canopy/main lobby area may potentially lead to a hazard in the event of high wind events.

Generally, the main structure is in good condition with minimal signs of corrosion. However, several exposed steel features have undergone moderate to severe corrosion.



The exterior steel members used to frame the central canopy have experienced moderate corrosion. The cooling tower unit support at the exterior mechanical area has undergone moderate to severe corrosion and loss of fasteners. Moderate corrosion is used to describe larger scale chipping and delamination of coatings, minor volume expansion and/or minor delamination of the base metal. Severe corrosion is used to describe larger scale volume expansion, delamination of the base metal and/or through-section loss of the base metal.

Moderate to severe corrosion of the exterior wall studs and bottom track is also evident based on documentation provided to GRA. Corrosion of these members is more than likely the result of moisture intrusion due to an inadequate or failed moisture protection system. Loss of these members could potentially result in a wall loss in the event of high wind events.

Generally, the roof system is in good condition with isolated areas of blistering of the cap sheet and some evidence of ponding along the central canopy/main lobby area. The roof near the Exhibit Storage entrance area does not have a secondary drainage system.

Based on our observations, the following remedial measures may be considered to improve the overall condition of the facility:

1. Replace the cooling tower unit support at the exterior mechanical area.
2. Replace steel frame supports at central canopy/main lobby that have undergone more severe corrosion.
3. Replace or repair exterior wall metal studs and bottom tracks that have experienced severe corrosion and minimize the potential for future corrosion by implementing an adequate moisture protection system.
4. Replace the aluminum windows at the clerestory windows located along the central canopy/main lobby area.
5. Replace all storefronts, aluminum windows, glazing at skylight and clerestory, and louvers with those meeting the requirements set forth in IBC 2006.



Closing

The assessment consisted primarily of visual examination of exposed elements and review of existing construction documents from the time of facility design and construction. Hidden conditions may exist or other conditions may develop over time. GRA reserves the right to supplement this report as additional information becomes available.

If desired, GRA is available to provide design phase services to address remedial repairs described in this report if considered. Services will include development of construction documents including drawings, notes and specifications. We can provide a detailed scope and budget upon request.

We appreciate the opportunity to assist you on this project. If you have any questions, please feel free to contact us.

Thank you,



Maria O. Scurry, PE
Design Engineer



Rolando R. Rubiano, PE
Principal



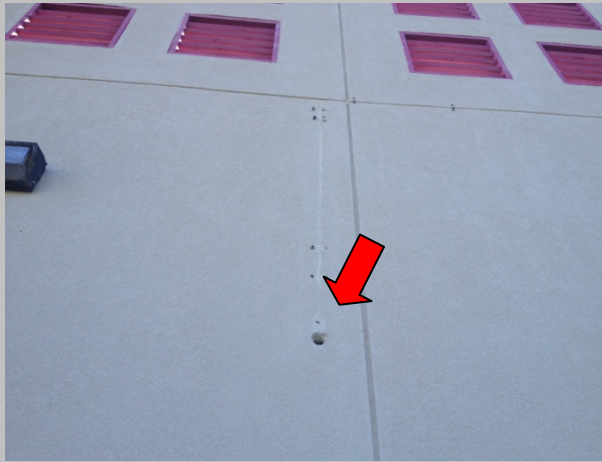


Photo #1 Puncture of EIFS exterior located at west side wall of Exhibit Storage area.



Photo #2 Column base crack at west side walkway.



Photo #3 Separation of expansion joint at west side walkway and building slab.



Photo #4 Blistering of cap sheet at base of flashing near Exhibit Hall and Loading Area.



Photo #5 No secondary drainage; puncture of EIFS exterior near Exhibit Storage entrance.



Photo #6 Moderate to severe corrosion at support of mechanical unit located at the Exterior Mechanical Area.



Photo #7 Loss of fasteners and sever corrosion of support of mechanical unit located at the Exterior Mechanical Room.



Photo #8 Gutter system at central canopy/main lobby skylight.



Photo #9 Evidence of ponding at central canopy/main lobby area.



Photo #10 Degradation of sheet rock and metal studs below door to cooling tower.



Photo #11 Failure of sealant and loss of mullion at aluminum window at central canopy/main lobby area clerestory windows.



Photo #12 Secondary drain dome missing.



Photo #13 Moderate corrosion of mechanical equipment. Adapter roof curbs at base of mechanical equipment.



Photo #14 Louvers at mechanical openings.



Photo #15 West side central canopy



Photo #16 Corrosion of west side central canopy members.



Photo #17 Corrosion of west side central canopy members.



Photo #18 Corrosion at bottom of exterior wall metal studs and track at northeast side of facility. Photo provided by ROFA.

Convention Center Assessment

Electrical Systems Overview

A facility assessment was conducted on the South Padre Island Convention Center on April 19th 2012. A visual inspection of the exterior and interior lighting, electrical gear, and stand-by generator was performed in order to evaluate the condition of the electrical systems. The building is approximately 22 years old. It is fed from a 1500 kVA 480Y/277V transformer. The main switchboard has a rating of 3000 amps and is main lugs only. It utilizes fused switches that serve distribution panels and dry-type transformers. The system contains an emergency back-up generator with an automatic transfer switch. The original design included a 100 kW generator. It has recently been replaced with a new 125 kW generator.

Exterior

The parking lot lighting consists of metal halide fixtures mounted on steel cross arms and secured to concrete poles. The paint is peeling from the light fixtures and the cross arms are rusting. The concrete poles appear to be in operable condition.



Hand-hole covers are also missing at the base of some concrete poles, exposing the lighting branch conductors.



The landscape lighting fixtures are showing signs of oxidation. Metal screws used to secure the lens on these light fixtures are also rusted.



The security lights located near the parking lot are mounted on a wooden pole and appear weathered and rusted. The junction box steel connectors are also rusted and are not watertight. The PVC conduit connected to the junction box is not properly secured to the pole.



The exterior road show panelboard located in the parking lot closest to the convention center is rusted. The panelboard that is secured to the north side of the building is also rusted.



The NEMA 3R disconnect switches located in the loading dock are rusted and weathered.



The fiberglass disconnect switches serving roof top mechanical equipment are fairly new and are in good condition.



The surfaced mounted light fixtures along the walkway of the northwest quadrant are rusted and weathered.



Recommendation

All exterior panelboards and light fixtures are experiencing severe deterioration due to the corrosive environment. All exterior panelboards should be replaced with fiberglass enclosures to avoid premature failures. The parking lot lighting fixtures and supports should be replaced and all concrete poles missing hand-hole covers should be provided with appropriate covers. All landscape in-ground lighting fixtures and building-mounted light fixtures should all be replaced due to their weathered and rusted condition. The security light fixtures mounted on the wooden should be replaced and provided with watertight connectors. All steel disconnect switches and mounting hardware serving mechanical rooftop equipment should be replaced with stainless steel disconnect switches. There are some disconnect switches that have recently been replaced with new fiber glass enclosures. We recommend that all mounting hardware be replaced with stainless steel hardware.

Interior

The majority of the interior lighting consists of linear fluorescent T8 and compact fluorescent lamps. The pendant-mounted down lights located in the main lobby utilize incandescent PAR lamps. The indirect lighting in the lobby utilize linear fluorescent T12 lamps. The lighting in the main ballroom consists of linear fluorescent T5HO, 6-lamp, high bay light fixtures in a 2x4 enclosure.



Recommendation

All linear fluorescent T12 lighting fixtures should be replaced with either T8 or T5 lamps since T12 lamps will no longer be manufactured in the near future, and they are less efficient. Incandescent down lights and pendant-mounted lighting fixtures should be replaced with more efficient compact fluorescent or LED lighting fixtures.

Electrical Switchgear

The electrical switchgear's manufacturer is General Electric (GE). The interior distribution panelboards and dry-type transformers appear to be in good condition. Dry-type transformers are approximately 20 years old, and are not as efficient per today's industry standards. Some panelboard directories are missing and the circuit breaker loads are not properly identified.



The main switchboard enclosure, located in the main electrical room, is beginning to show signs of corrosion. This is due to its close proximity to an exterior door, and the electrical room is not air conditioned.



Recommendation

Provide new load description labeling on all distribution and branch panelboards. Replace all dry-type transformers with new efficient, NEMA TP-1, style transformers. All electrical connections in distribution and branch circuit panelboards should be re-torque per the manufacturer's recommendations. In the main electrical room, the main switchboard shall be inspected for rust on internal components. If rust is detected, the switchboard should be replaced. The interior components of the electrical equipment in secondary electrical rooms should also be inspected for rust. Electrical rooms should be properly sealed and air conditioned in order to minimize exposure to the outdoor environment.

Emergency, Stand-by Generator

The emergency, stand-by diesel generator is rated for 125kW/156kVA at 480/277-Volts and was recently installed in 2012. It is installed in a weatherproof and sound attenuated enclosure, and it is located adjacent to the loading dock and main electrical room.



Recommendation

The generator is new and in great condition. If the generator's alternator windings were not coated with a marine epoxy sealant, the owner should contact the generator manufacturer to see if this coating can still be applied. This will prolong the life of the alternator. Space heaters should be installed inside of the generator's enclosure to reduce condensation if it was not initially provided with this accessory.

Fire Alarm System

The existing fire alarm control panel is a Simplex model 4100. It is an addressable system with voice annunciation. This system has the capability of providing 1000 points of addressable input/output devices.



Recommendation

The fire alarm system is in good condition and does not need to be replaced.

Mechanical Assessment

Mechanical Systems Overview

The mechanical systems for the convention center are a combination of chilled water and direct expansion (DX) cooling. The original design included one 300 ton water cooled chiller, one 300 ton two cell cooling tower, two chilled water pumps and one condenser water pump. The central plant provides chilled water to four central station air handling units which serve the large exhibit hall, the lobby and the kitchen. In addition to the chilled water system, there were also eleven DX rooftop units and four (DX) split systems. These units served smaller meeting rooms and office spaces. Six years ago, seven of the DX roof top units were converted to chilled water and are now served by the central plant. All heating is electric resistance.



Central Plant

The original design included one 300 ton water cooled chiller, one 300 ton two cell cooling tower, two chilled water pumps and one condenser water pump. Two years ago the single chiller was replaced with two 300 ton centrifugal chillers obtained from a near by project which was not completed. Only one of these units can run at a time since the piping and pumping is only designed to operate a single unit. Twelve years ago the original cooling tower was replaced with a 300 ton stainless steel tower. Chilled water pump P-1 and condenser water pump P-2 have recently received new electric motors.



Air Handling Systems

1. AHU's-1 & 2 are chilled water units that serve the exhibit hall. Each unit supplies 29,000 CFM and has a total cooling capacity of 1295 MBH (108 tons). The total heating capacity is 115 KW.
2. AHU – 3 is a chilled water unit that serves the lobby. The unit supplies 27,200 CFM and has a total cooling capacity of 666 MBH (55 tons). The total heating capacity is 75 KW.



3. AHU – 4 is a chilled water unit that serves the kitchen. The unit supplies 9,610 CFM and has a total cooling capacity of 340 MBH (28 tons). The total heating capacity is 26 KW.
4. AHU – 5 is a DX spit system that serves the corridors. The unit supplies 4,300 CFM and has a total cooling capacity of 142 MBH (12 tons). The total heating capacity is 20 KW.
5. AHU – 6 is a DX spit system that serves the corridors. The unit supplies 4,825 CFM and has a total cooling capacity of 187 MBH (16 tons). The total heating capacity is 25 KW.

6. AHU – 7 is a DX spit system that serves office space. The unit supplies 5,255 CFM and has a total cooling capacity of 149 MBH (12 tons). The unit serves fan powered terminal units and therefore contains no heat.



7. AHU – 8 is a DX spit system that serves the corridors. The unit supplies 5,900 CFM and has a total cooling capacity of 226 MBH (19 tons). The total heating capacity is 25 KW.
8. RTU's – 1,2,3 and 4 are DX rooftop units that serve the Southwest Quadrant Meeting rooms. The units supply 3000 CFM and have a total cooling capacity of 112 MBH each (9 tons). The total heating capacity of each is 16.5 KW.



9. RTU-s – 5,6,7 and 8 are identical to 1,2,3 and 4 except that they are now served by chilled water coils for cooling in place of DX. These units serve the NW quadrant meeting rooms.
10. RTU-9 is a chilled water rooftop unit that serves office space. The unit supplies 4000 CFM and has a total cooling capacity of 126.5 MBH (10.5 tons). The total heating capacity is 16.5 KW.
11. RTU-10 & 11 are a chilled water rooftop units that serve the storage area. The units supply 1600 CFM and have a total cooling capacity of 50.8 MBH (4 tons). The total heating capacity is 11.5 KW each.

Control System

The automatic temperature control system is by the TRANE Co. The system utilizes direct digital logic and pneumatic actuation of valves and dampers. The system is not equipped for formal humidity control.



Recommendations

1. The centrifugal chillers, pumps and piping are in good repair and have a remaining life of at least 15 years.
2. The stainless steel cooling tower is twelve years old and should last another 8 to 10 years. Unfortunately the I-beam supports are carbon steel and may fail before the tower reaches the end of it's life.



3. All of the rooftop equipment and condensing units have a remaining useful life of 5 years or less due to corrosion.



4. The automatic control system should be upgraded to include formal humidity control.

Plumbing and Fire Protection Assessment

Plumbing and Fire Protection Systems Overview

Domestic hot water for the building is generated by a single electric hot water heater. All hot water is softened prior to heating. Domestic cold water is not softened. All sanitary waste is routed to a duplex sewage ejector pump. The building is fully sprinkled and has a fire pump. The building is served by a 6 inch fire line and a 4 inch domestic water line.



Domestic hot water

Domestic hot water is softened and heated by a 250 gallon, 15 KW electric water heater. The heater was replaced 3 years ago. The water softener is original.



Fire Protection

A 500 GPM, 20 HP fire pump provides pressure to the sprinkler system. A 5 GPM, $\frac{3}{4}$ HP jockey pump provides maintenance pressure.



Sanitary Waste

Sanitary waste is drained by gravity to duplex sewage ejector pump and pit assembly and is then pumped off site. Each pump is 7 $\frac{1}{2}$ HP and was replaced 7 years ago. A 1000 gallon grease trap removes grease from the kitchen waste before it is drained to the ejector pumps.

Recommendations

1. The water softener is 22 years old will need to be replaced in the near future.
2. The remaining systems appear to be in good repair and should last at least another 10 years.