ConditionAssessmentOldFlaglerHospital, FlaglerCounty

CONFORMING REPORT

DJ Project #02218.02

July 26, 2013

In Association with

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List of Abbreviations

ACI .... American Concrete Institute
AHU .... Air Handling Unit
AISC .... American Institute of Steel Construction
ASCE .... American Society of Civil Engineers
ASHRAE .... American Society of Heating, Refrigerating, and Air Conditioning Engineers
C&C .... Components and Cladding
CMU .... Concrete Masonry Units
DL .... Dead Load
DX .... Direct Expansion
EIFS .... Exterior Insulation Finishing System
FDC .... Fire Department Connection
GPR .... Ground Penetrating Radar
kVA .... kilovolt-ampere
kW .... kilowatt
LL .... Live Load
MWFRS .... Main Wind Force Resisting System
NCMA .... National Concrete Masonry Association
o.c. .... on center
PCF .... Pounds per Cubic Foot
PLF .... Pounds per Linear Foot
PSF .... Pounds per Square Foot
PSI .... Pounds per Square Inch
PTAC .... Packaged Terminal Air Conditioner
SF .... Safety Factor
V .... Volts
VRF .... Variable Refrigerant Flow
WL .... Wind Load

List of Applicable Codes and Standards

The following is a list of technical codes that are applicable for the condition assessment:

- 2010 FloridaBuilding Code, Building, FBC 2010
- American Society of Civil Engineers Standard 7 – Minimum Design Loads for Buildings and Other Structures, ASCE 7-10
- American Concrete Institute – Building Code Requirements for Structural Concrete and Commentary, ACI 318-08
- American Concrete Institute – Building Code Requirements for and Specification for Masonry Structures and Related Commentaries, ACI 530/530.1-08
- American Institute of Steel Construction – Steel Construction Manual 14^{th} Edition, AISC 325
- American Institute of Steel Construction – Specification for Structural Steel Buildings, AISC 360, Allowable Stress Design
- 2010 FloridaBuilding Code, Mechanical, FMC 2010
- 2010 FloridaBuilding Code, Plumbing, FPC 2010
- 2010 FloridaBuilding Code, Fuel Gas, FGC 2010
- American Society of Heating Refrigerating and Air Conditioning Engineers, ASHRAE
- National Electrical Code, NEC 2011
- National Fire Protection Association, NFPA

Part 1: PROJECT INFORMATION

1.1 Project Description

DJ Design, Inc. was engaged by the **Flagler County Board of County Commissioners** to investigate the former **Flagler County Hospital** located at 901 E. Moody Blvd, Bunnell, Florida and to assess the general condition of the building and to determine the relative cost of returning the building to functionality. **DJd** consulted with **Cape Design Engineering, Co.** (CDE) for the structural, mechanical, and electrical condition assessments of the facility.

The original facility was built in 1979 as the Bunnell General Hospital and later became Florida Hospital Flagler. It continued in operation until 2003 when the hospital moved to its current location in Palm Coast. The building and approximately 6.34 acres of developed land were sold to a private development group that still owns the property.

The facility has been the subject of several studies and activities over the years. These include:

- "Limited Access Survey for Asbestos Containing Materials" by **PbO3** Environmental Testing & Service Company, September 2000;
- "Report of the Building Construction/Renovation Study for FlaglerCounty" By **Gibraltar Design**, 2002;
- Letter of Abated Asbestos, **Bradco Abatement Contactors, Inc**, 2006;
- Site and Building Drawings for possible Redevelopment, 2006;
- Land Appraisal Report, **Hamilton & Jacobs, LLC**, September 2012.
- "Report of Professional Consulting Services" by **Universal Engineering Sciences**, July 17, 2013

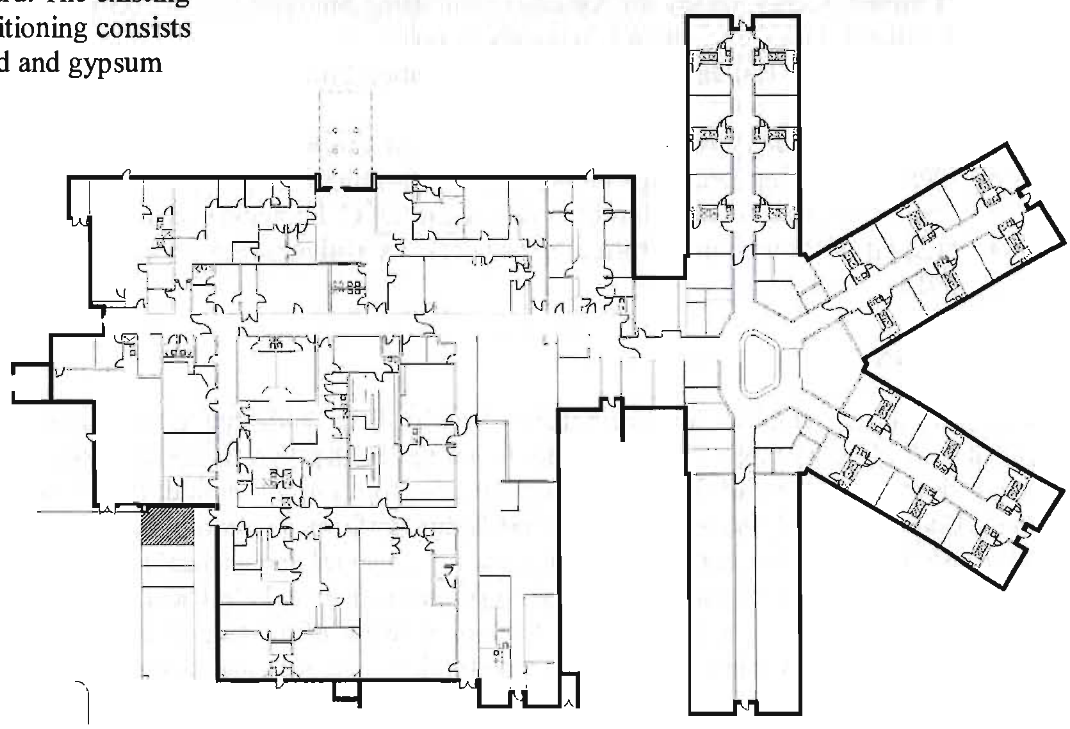
1.2 Site Visits

On May 7, 2013, architects Jim Wachtel and Dana Smith of **DJdesign** accompanied by Faith Alkhatib, PE, County Engineer and Richard Gordon, PE, Deputy County Engineer, performed an initial, visual assessment of the building. On June 5, 2013, Philip Thomas, PE, Joanna Monge EI and Victor Diaz, PE from **CDE** with the aid of **DJdesign** performed a more thorough visual assessment of the hospital and on the conditions of the existing structural, mechanical and electrical building components. Evidence of vandalism and theft of mechanical and electrical equipment were observed upon arrival to the project site. Additional details of the current conditions of the facility are outlined in the following architectural, structural, mechanical, and electrical sections.

Part 2: Architectural System

2.1 Existing Building Description

The existing building is divided into two distinct areas; the main building encompasses approximately 35,000 gross square feet (GSF) and the four-winged patient room area contains approximately 21,800 GSF. The building is of non-combustible construction consisting of unreinforced CMU bearing-walls, steel columns, steel beams and bar joists with metal roof-decking and light weight insulating concrete and a low-slope roof. There is no fireproofing on the roof-structure, but several steel columns are protected with gypsum-board. The existing interior partitioning consists of metal stud and gypsum board.



Much of the interior finishes, fixtures and equipment as well as salvageable metals (aluminum, copper, and lead) have been removed over the years. However, the egress corridors and other fire partitions have been retained. While there are numerous holes in the walls, they are largely intact and remained sealed to the structure above and to the exterior walls.

2.2 Existing Conditions

a. Roof

The existing roof is a gravel-ballasted asphalt roof membrane over lightweight insulating concrete poured over a vented deck with polystyrene for the slopes. **R & R Industries** of Daytona Beach inspected the roof on June 12, 2013 and found that the lightweight "seemed in fairly good condition and seemed durable enough to hold fasteners…". Pending a pull-test, **R & R** felt that a **GAF Drill Tek**locking impact nail should provide plenty of holding power against uplift. The roof shows numerous areas of distress although there appear to be few areas of active water penetration below. The existing roof has numerous roof curbs with mechanical equipment (fans and vents) sitting on them and most of these are no longer water-tight. The existing flashing, gravel-stops and gutters are deteriorated and pulling away from roof substrate.

b. Exterior Walls

The exterior walls are CMU covered with a 1" Exterior Insulating and Finishing (EIFS) system. The Styrofoam shows evidence of de-lamination from the CMU substrate in several areas. We found no evidence of insulation in the CMU cavities or attached to the interior surfaces. On June 17, 2013, **GeoTek Services, LLC** performed a Ground Penetrating Radar (GPR) survey of various exterior walls within the building and those results are contained in Appendix 'A'. On the same day, **CDE** also took further field notes on the condition of the existing structural framing. Details of the current conditions of the facility are outlined in the following structural, mechanical, and electrical sections.



c. Exterior doors and Windows

Exterior windows in the main building are operable aluminum-sash units and aluminum storefront entries. Most glazed openings are broken, missing and/or covered with plywood. Exterior windows in the patient wings are also operable aluminum-sash. Exterior doors are hollow-metal doors and frames, most are damaged, corroded or missing.

d. Interior walls and doors

Interior walls are generally metal stud and gypsum board. There are some partitions of CMU in selective areas. Egress corridor walls and other fire walls have remained in place and remain sealed to the structure above and to the exterior walls. Other interior walls placed in response to the layout of the hospital functions remain mostly intact.

e. Interior finishes

Interior wall finishes (wall-coverings) on the exterior perimeter walls have been removed from the building in many places. Some interior surfaces of exterior walls were surfaced with GWB applied directly to the CMU. Most floor coverings have also been removed, but there are existing areas of carpet and ceramic or quarry tile.


Part 3: Structural

3.1 Design Loads

The facility was analyzed for the loads described in the following paragraphs.

Dead Loads Dead loads are defined as all permanent structural and non-structural components of the building.

- 46 psf – Roof (assumed based on field observations)
  - 1.0 psf Three-Ply Ready Roofing
  - 1.5 psf 2" Rigid Insulation, 0.75 psf per ½"
  - 5.5 psf Waterproofing Membrane - Bituminous, gravel-covered
  - 1.5 psf 24 gage 1.5" Galvanized Roof Deck
  - 10.0 psf 2" Lightweight Insulating Concrete
  - 2.0 psf Suspended Ceiling
  - 8.5 psf Misc. (Lights, Mech., etc.)

Live Loads The following are the live loads that the building will be analyzed for:

- 20 psf (non-reducible) – Roof

Wind Loads Wind load calculations are based on FBC 2010 and computed per ASCE 7-10 with the following parameters:

- Basic Wind Speed, V = 141 MPH (3-second gust)
  - Per Applied Technology Council (ATC) Wind Speed Website based on ASCE 7 wind maps.
- Risk Category – IV
- Exposure Category – B
- Building Enclosure – Enclosed

Load Combinations Load combinations are per the following (based on ASCE 7-10, Allowable Stress Design):

1. DL
2. LL
3. DL + LL
4. DL + 0.75LL
5. DL + 0.6WL
6. DL + 0.75LL + 0.45WL
7. 0.6DL + 0.6WL

3.2 *Design Analysis Assumption(s)*

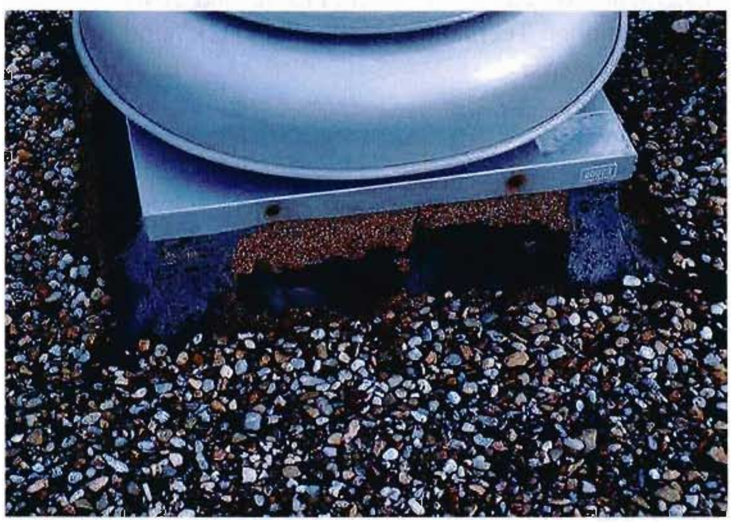
As-built structural drawings of the existing building were not available to CDE, so the following assumptions were made for the structural condition assessment:

A. The steel joist manufacturer could not be identified from the joist tags retrieved. As such, the existing H- and LH-series steel joist systems are assumed to be capable of supporting the roof loads outlined in Section 3.1 of this report. The findings discussed in the report by **Gibraltar** also confirm the adequacy of the roof structure.
B. Structural steel yield strength is assumed to be 36,000 psi.
C. A select number of wide flange steel beams within the facility were analyzed. The results are assumed to be representative of the facility's structural steel framing capacity as a whole.
D. The existing concrete and steel columns are assumed to be capable of supporting the roof loads outlined in Section 3.1 of this report.

3.3 *Existing Conditions*

a. Roof and Exterior Walls

The facility is a 56,800 sq. ft. single story building with a gable roof at a 1/2:12 slope. The ridge line of the facility is off center from the centerline of the building by approximately 35'-0". The main facility has an approximate eave height of 13'-8". The east area of the facility branches into four (4) separate wings with an approximate eave height of 11'-8". The rooftop is a bituminous gravel layer, and according to the report by **Gibraltar**, underneath is 2" lightweight insulating concrete and 2" rigid insulation supported by a 24 gauge galvanized ventilated steel deck.



Built-Up Roof with Ballast

A gutter system was utilized around the perimeter of the roof edge. The deterioration of the bituminous gravel membrane resulted in buildup of gravel in the gutters.

Gutter Filled with Gravel from Roof Membrane

The exterior concrete masonry walls are 8" thick and are finished with an exterior insulation finishing system (EIFS). Slight damage to the surface finish was observed but appears to be cosmetic. There are openings in the CMU walls for wall-mounted air conditioning units throughout the facility. Currently, some openings still support air conditioning units while others are boarded with plywood. Windows around the facility are mostly broken; some are covered with plywood. What appears to be settlement cracking is observed on the southwest CMU walls of the facility as well as in the concrete beam of the canopy structure over the doctor's parking lot.

Settlement Cracking in CMU Wall and Concrete Beam

b. Interior Conditions

The facility is framed with H-series and LH-series steel joists ranging from 14" to 24" deep spaced at approximately 4'-0" o.c. with 5" joist seats. The steel joists are bearing on wide flange steel beams supported by steel and concrete columns throughout the facility.

No excessive deterioration or corrosion was observed on the steel framing within the building.


Steel Decking and Joist attached to Steel Beams

Roof Deck

The existing roof deck is observed to be 1.5" Type B ventilated deck. The report by **Gibraltar** indicates that the roof deck is 24 gauge. The attachment of the roof deck to the steel joists did not appear to be typical of current standards and practices. CDE could not verify or qualify the deck attachment to the steel joists. Therefore, CDE is not able to render an opinion regarding its adequacy in accordance with current building standards and wind load requirements.

Additional reinforcements of the roof deck attachment to the steel joists should be added to insure that the roof deck can support the roof diaphragm shear that is anticipated from the current wind load requirements. Discussion for reinforcing the roof deck attachment to the steel joists is included in Part 6 of the report.

Steel Joists

The main area of the facility is framed with steel joists including but not limited to: 24" deep LH-series, 14" deep H-series, 18" deep H-series, and 24" deep H-series. The four (4) wings on the east side of the facility are framed with 24" deep top chord double pitched under-slung steel joists spanning between exterior concrete masonry walls. All joists are observed to be spaced approximately at 4'-0" o.c. It shall be assumed that the steel joists are adequate to support the roof dead and live loads outlined in Section 3.1 of this report for the lack of any additional information on the load capacities of the joists. The findings discussed in the report by **Gibraltar** also confirm the adequacy of the steel joists.

Beam Splice Connection of Dissimilar Beams

Wide Flange Beams

Due to the unavailability of the as-built structural drawings, field measurements of the wide flange steel beams were taken. Based on the field measurements, the wide flange steel beam members throughout the facility are approximated to be W16x67, W18x40, W21x44, W21x50, W21x55, W21x57, and W24x76. Intermediate beam splices between columns were observed, with beam cantilevers ranging from 3'-0" to 9'-0" long. One of the steel beam splices is shown in the photo above. It was observed that no bottom flange bracing is provided. The bracing is required to reduce the unbraced length of the bottom compression flange of the steel beam due to wind uplift loads.

A select number of wide flange beams within the facility were analyzed for load reactions from the steel joists due to the roof dead and live loads outlined in Section 3.1 of the report. Assuming the structural steel yield strength is 36,000 psi, analysis indicates that the steel beams are adequate to support the indicated roof loads. See Appendix B for calculations.

Columns

The interior steel columns are 6" diameter steel pipe columns while the concrete columns within the load-bearing masonry walls (exterior and interior) are approximately 8" x 16". Rebar reinforcements of the concrete columns are unknown. The ends of the wide flange steel beams are connected to the interior faces of the concrete columns. The existing steel and concrete columns are assumed to be adequate to support the roof dead and live loads summarized in Section 3.1 of this report. The findings discussed in the report by **Gibraltar** also confirm the adequacy of the existing column framing.

Wide Flange Beam Connection to a Concrete Column

Masonry Walls

As noted in the previous study done by **Gibraltar**, the exterior 8" thick CMU walls are the lateral support system for the facility. The masonry walls are not reinforced except at building corners and at wall openings, as confirmed by the GPR survey by GeoTek Services LLC performed on June 17, 2013.

The masonry wall lateral wind load analysis assumes the masonry walls are unreinforced due to the lack of vertical reinforcement within the masonry walls. The following table summarizes the maximum wind speed and its equivalent wind pressure (3-sec gust and sustained) per ASCE 7-10 that can be supported by the unreinforced masonry walls at eave and ridge heights of the main building and hospital wings. The ridge heights of the main building and hospital wings are approximately 20'-4" and 12'-5", respectively, due to the 2:12 roof slope. See Appendix B for calculations.

Table 1 Maximum Wind Speed for Unreinforced Masonry Walls per ASCE 7-10

	Wall Height*	Wind Speed (3-sec gust)	Wind Speed (sustained)	Wind Pressure (due to 3-sec gust)
Main Building (Eave)	12'-4"	95 mph	80 mph	16 psf
Main Building (Ridge)	19'-0"	65 mph	52 mph	8 psf
Hospital Wings (Eave)	10'-4"	115 mph	99 mph	24 psf
Hospital Wings (Ridge)	11'-1"	110 mph	94 mph	21 psf

* excludes 16" concrete tie beam at the top of the masonry walls

Although different areas of the facility can support different wind speed ratings, the assessment of the facility in accordance to current codes and standards should be based on the worst case scenario. As such, it is concluded that the facility, with unreinforced masonry walls, can support a sustained wind speed of 52 mph. Two wall reinforcement methods are available if it is desired to provide additional lateral support to the masonry walls so that they are in accordance with the current building code and wind code requirements. These options are discussed in the Part 6 of this report.

Chapter 8 Section 807.4 of the 2010 Florida Building Code for Existing Buildings for Level 3 alteration states that "*The minimum design loads on existing elements of a structure that do not support additional loads as a result of an alternation shall be the loads applicable at the time the building was constructed.*"

Part 4: Mechanical

4.1 Existing Conditions

The mechanical systems that remains includes a rooftop packaged air conditioner by McQuay that appears to be past its useful reliable life. It is located above the northeast patient room wing.

McQuay Rooftop Packaged Unit

The chillers have been stripped of most components and vandalized such that they are unrecoverable.

The existing AHU motors have been removed and the cabinets are in poor condition. They are single wall and the mechanical room unit floor has corroded past the ability of repair.

Typical AHU and Coil

Photo 1 – AHU Interior in Mechanical Room

The boilers appear to be near operational; however none of the pumps are operational. Some pumps (and all pump motors) have been removed. The remaining pumps show signs of corrosion.

Existing Boilers

Missing Chilled Water Pumps

There is insulated carbon steel piping feeding into the existing mechanical rooms. The piping is in poor condition due to interior corrosion at this time.

Typical Insulation and Pipe Conditions

The PTAC units that have not been removed are beyond their useful life. None of the equipment was operational during the site visit.

Condition of PTAC Units

The water service to the building was through a 4" line feeding from the west end of the building. It appeared to need corrosion control performed on it but otherwise appeared operational. This line also fed the fire suppression system in 1/4 of the patient wings. Generally the building is not sprinkled other than a few specific areas that appeared to have been renovated near the end of the facilities use. There is a fire department connection on the East and West ends of the building.

Potable Water Entrance

Potable Water Check Valve (left) FDC and Entrance (right)

Plumbing fixtures have been vandalized to access plumbing piping in the building so that it could be salvaged. Most, if not all, of the copper has been removed, destructively damaging waste and vent piping in the process in addition to wet walls and fixtures.

Typical Plumbing Conditions

All observable sanitary sewer lines appeared to be clogged with debris and floor drain traps were clogged or have dried.

Typical Floor Drain

There were kitchen hoods on site that appeared to be in fair condition. The roof top fans however were not in good condition and at the end of their useful life. The kitchen equipment in the building was corroded past renovation. One **Ansul** fire suppression hood system appeared to be pressurized. The larger system has been discharged.

Kitchen Equipment

The sprinkler pump appeared to be near the end of its useful life; the electrical had been stripped feeding the pump along with the wiring to zone control valves. One valve appeared new but it was not indicative of the system and was not connected to a controller.

Irrigation Pump and Typical Zone Control Valve

Part 5: Electrical

5.1 Existing Conditions

The majority of the components of the electrical system of the building have been vandalized and/or removed. In our opinion none of what remains in place is reusable due to age or non-working condition. Below is a description of the major components of the electrical system:

a. Utility Service Entrance

- The building still has a medium voltage drop from the power company (FPL) that terminates in a 700KVA pad-mounted sub-station type transformer located in an enclosed yard. The primary cables and secondary cables are still active.

FPL Service

b. Emergency Generator

- The building had a 300 kW diesel fueled emergency generator. Most of the electrical components of the generator have been vandalized and/or removed. The remaining engine and enclosure have deteriorated, apparently due to weather and non-use.

Existing Generators

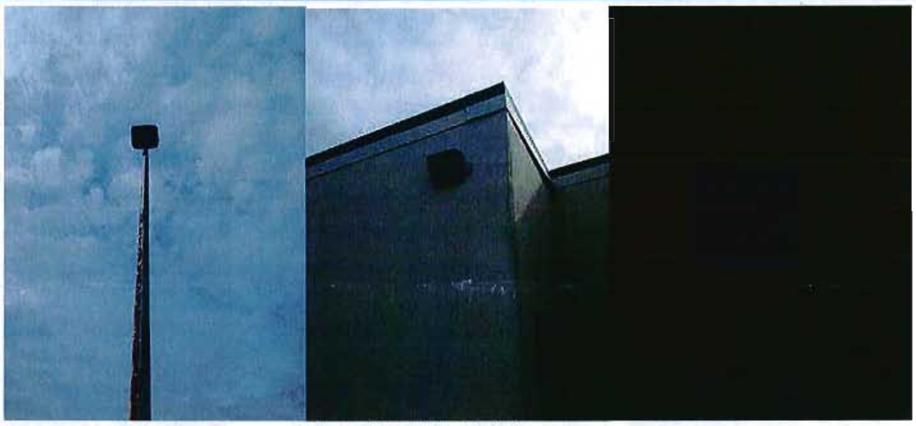
c. Generator Fuel Tank and Pump

- The emergency generator was fueled from a ground mounted 2,000 gal. Convault tank and a fuel pump. Both the tank and pump have deteriorated, apparently due to weather and non-use.

Generator Fuel Tank and Pump

d. Exterior Lighting

- The parking lot of the facility has only about four (4) pole mounted lights, these appear deteriorated and the cables have been removed. The building also has lighting mounted on the exterior walls which is also deteriorated.



Exterior Lighting

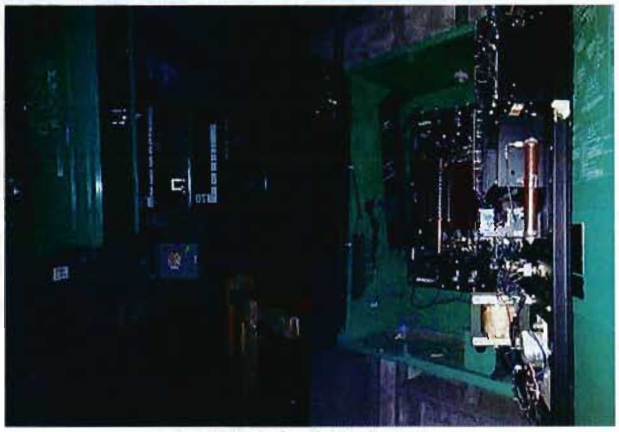
e. Main Distribution Switchboard

- The building had a 277/480V, 3-phase, 4000 amps service via a floor mounted switchboard located in the main mechanical/electrical room of the facility. This switchboard has been vandalized and most of its major components removed. What remains of this is outdated equipment.

Main Distribution Switchboard

f. Transfer Switches

- The building had four (4) automatic transfer switches for the critical and emergency loads commonly found in a hospital building. These transfer switches have been vandalized and most of its major components removed. What remains of these is outdated equipment.



Transfer Switches

g. Sub-Panelboards

- Most of the building's sub-panelboards were located throughout the facility at strategic locations to serve the different areas. As with most other equipment, these have been vandalized and most of its major components removed. Very little remains of all these sub-panelboards, and the remains are outdated and unusable.

Sub-panelboards

h. Interior Lighting

- There is no interior lighting left in this facility.

i. Interior wiring and devices

- The majority of the interior wiring has been removed. Most of the interior wiring devices such as receptacles, switches, etc. have also been removed or vandalized. The rooms in the four bedroom wings do not have any devices on them.

Interior Wiring and Devices

j. Telephone, Data

- The building had a main telephone/data room which brought in the provider's incoming services. The room has plywood backboards and the components that remain are mounted to these. Similarly to other systems, the majority of the cabling has been removed, and the devices that remain are vandalized and/or outdated.

Existing Telephone and Data

k. Fire Alarm

- The building had a fire detection and alarm system. Similarly to other systems, the majority of the cabling has been removed, and the devices that remain are vandalized and/or outdated.

Part 6 Conclusions and Recommendations

6.1 Architectural

Existing Building Layout

We believe that the existing structure would be classified as Type 2B by the **2010 Florida Building Code.** It is anticipated that the future occupancy of the building will be as an office area and be viewed as a Business Occupancy by the Building and Fire Codes. A Business Occupancy in a Type 2B Construction type has an allowable area of 23,000 square feet.
An area increase because of open areas around the building is allowed to a maximum of 75% of the allowable for a total of 40,250 square feet. There is currently a fire-separation between the main building and the patient wings rendering each exempt from being sprinkled.

Section 507.3 of the 2010 Florida Building Code allows unlimited area for a Business Occupancy, no more than one story tall of a building of Type 2B construction if an Automatic Sprinkler System is provided. From the standpoint of public safety and insurability, we recommend and have budgeted for a new fire-sprinkler system for both areas.

Architectural Systems

a. Roof

We found little evidence of complete roofing failures, but due to its age and condition, we recommend that the entire existing roofed-area be replaced with a new system prior to commencing any interior remodeling. Most of the existing roof penetrations will no longer be necessary, but there may be additional, new penetrations to accommodate a new user/group. There are several re-roofing and budget options offered:

Option 1:
Provide a ½" **Dens Deck** or **Securerock** base, mechanically fastened and a fully-adhered, .060 thermoplastic polyolefin (TPO) roof, wall and curb flashing with edge metal, new gutter, and downspouts. Budget cost: $495,000.

Option 2: Same base system as Option 1 using a Modified Bitumen 2-Ply system roof.
Budget cost: $595,000.

Option 3: Tear off the existing roof, nail a base sheet, fully adhere 2" Isocyanurate insulation, fully adhere a 1/4" **Dens Deck** or **Securerock** base and a fully-adhered .060 TPO roof, wall and curb flashing with edge metal, new gutter, and downspouts. Budget cost: $495,000.

Option 4: Tear off the existing, nail base sheet, fully adhere 2" Isocyanurate insulation, fully adhere a 1/4" **Dens deck** or **Securerock** and a fully-adhered 2-ply Modified Bitumen system.
Budget cost: $595,000.

The additional cost of adding insulation as in Options 3 and 4 will be offset by long-term energy savings and a possible lower first-time cost for mechanical equipment.

b. ***Exterior Wall***

We recommend that all of the existing EIFS be safely removed from the walls, including the 'framed-out' perimeter fascia and be replaced with a new 1-1/2" (minimum) EIFS system similar to **StoTherm** by **Sto Corporation**. This new system will provide improved thermal insulation as well as improved resistance to water-vapor intrusion.

c. ***Exterior Doors and windows***

Along with the new EIFS system, new exterior-grade, hollow-metal doors and frames with new security hardware and weather-stripping should be provided. All existing glazed openings should be replaced with energy-efficient, fixed windows and a new storefront at the main entry portal.

d. ***Interior walls and doors***

New interior partitions should be, at minimum, 5/8" gypsum wallboard (GWB) over 3-1/2" 25-gauge steel studs. The interior surfaces of the exterior walls should be 5/8" GWB over 1-1/2" self-furring rigid insulation. All new interior doors should be 1-3/4" solid-core flush wood in 16-gauge hollow-metal frames.

e. ***Interior Finishes***

New flooring should be a combination of vinyl-composition tile (VCT) in high-traffic and public areas and carpet tile similar to **Shaw Carpet** - *Abstract Edge* in the non-public administrative areas. All of the interior wall surfaces should be painted with an acrylic egg-shell finish and the ceilings should be 2'-0" X 2'-0"acoustical panels in a suspended aluminum grid.

f. ***Abatement***

Based upon the findings in the July 17, 2013 **Universal Engineering Sciences** (UES) report, some asbestos-containing materials (ACMs) were observed and identified. Each of these was found to be non-friable and in "generally good" condition. If the ACMs are scheduled to be disturbed by renovation or demolition activities, they should first be removed by qualified abatement personnel.

6.2 Structural

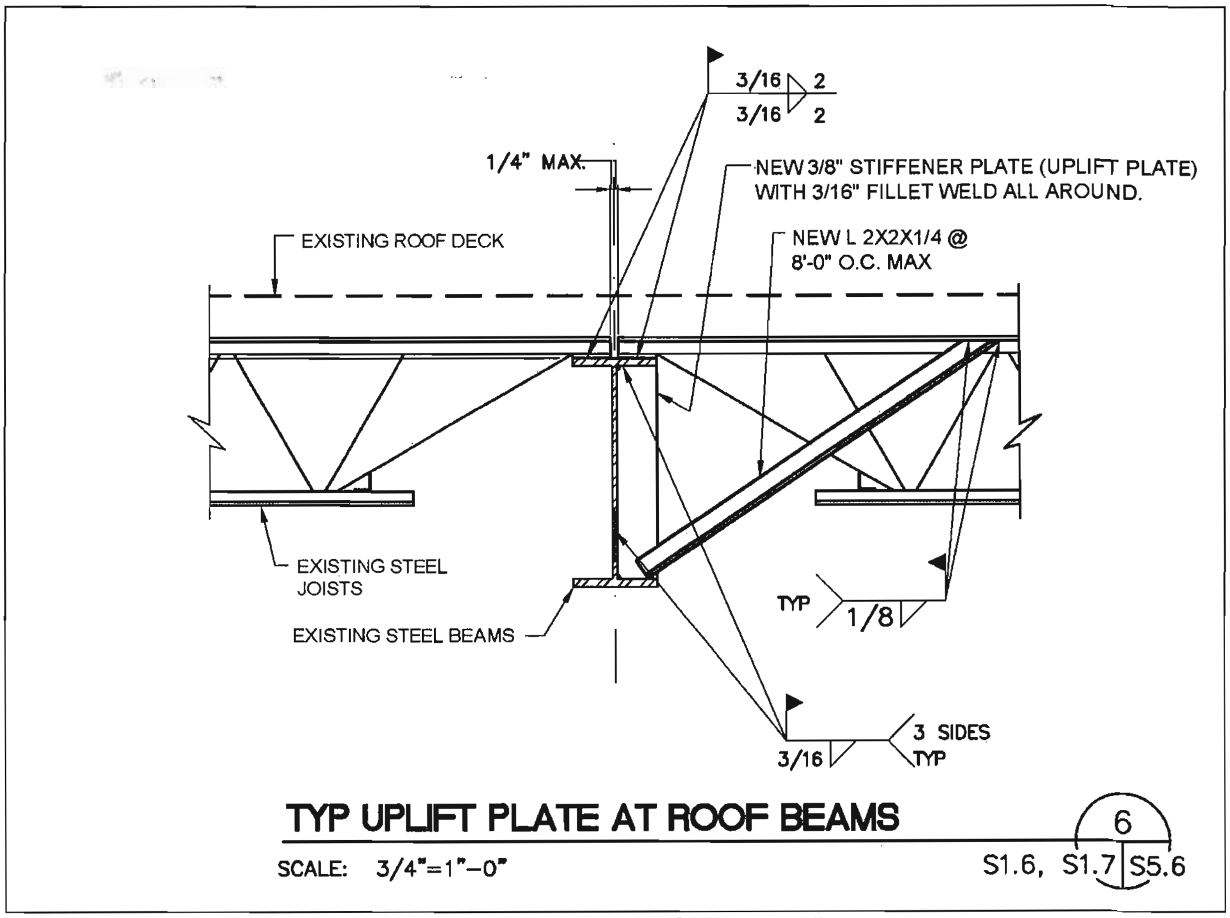
Based on the field observations from site visits, cursory calculations and information provided in the 2002 assessment report by **Gibraltar**, it is **CDE**'s opinion that structural systems within the facility range from fair to good condition, provided that there are no hidden defects, damage, or degradation within the structure that were not visible at the time of the site visits, except for the following:

- Lack of bottom flange bracing of the steel beams
- Roof deck attached to steel joists
- Lack of vertical reinforcement within perimeter masonry walls

The lack of vertical reinforcement within the perimeter masonry walls reduces the masonry walls' capacity to resist lateral loads due to C&C wind pressures. Roof uplift due to wind load subjects the bottom flange of the steel beams to compressive stress. The lack of bottom flange bracing reduces the steel beams' capacity to support the compressive stresses due to roof wind uplift and may cause the steel beams to buckle if overstressed.

Steel Beam Bottom Flange Bracing

It is required that new L2x2x1/4 angle bracing from the bottom flange of the steel beams to the top chord of the steel joists for roof wind uplift support, as shown in the following figure:



Typical Uplift Plate at Roof Beams Detail

Recommended structural reinforcements of the facility to meet current building code and wind code requirements are outlined in the following sections.

Reinforce Steel Deck Attachment to Steel Joists

Though not required, it is recommended that additional reinforcements of the roof deck attachment to the steel joists be added to insure that the roof deck can support the roof diaphragm shear that is anticipated from the current wind load requirements.

The roof deck attachment to the steel joists can be reinforced by welding 1/8" thick bent plates to the steel joists and roof deck to increase the number of deck to steel joist attachment points. Doing so will increase the diaphragm shear capacity of the roof deck.

Option 1 – Additional Vertical Wall Reinforcement

As noted in Section 3.1 of this report, the applicable wind speed for this facility is 141 mph (3-sec gust) per ASCE 7-10, which generates an equivalent wind pressure of 36 psf. In order to meet ASCE 7-10 wind load requirements, minimum #5 vertical, reinforcing bars spaced at 48" o.c. are required for masonry wall heights up to 15'-9" Additionally, minimum #5 vertical reinforcing bars spaced at 8" o.c. are required for wall heights greater than 15'-9".

This option will require saw-cutting the CMU blocks to expose the cavities, anchoring the new vertical bars to the footings and bond beams using epoxy adhesive, and then repairing and filling the masonry block cells with grout. Due to the size of the facility, saw-cutting the CMU blocks to install the additional vertical wall reinforcement will be labor intensive.

Option 2 – Additional Steel Beams and Columns

Alternatively, horizontal steel beams can be installed along the interior face of the masonry walls, spanning between new vertical steel columns to meet the current building code and wind code requirements. The horizontal steel beams should be located at mid-height of the masonry walls between the finished floor and bottom of the concrete tie beams. The horizontal steel beams reduce the vertical unsupported masonry wall span and tributary wind load applied, which in turn increases the flexural strength of the walls. Based on the field observations, the existing perimeter concrete columns and interior steel columns appear to be spaced approximately 30'-0" to 35'-0" apart. To remain consistent with the existing column grid, it is recommended to install the new steel columns around the perimeter of the facility spaced approximately 30'-0" to 35'-0" apart. The new horizontal beams and vertical columns require a minimum structural steel member size of W10x33 to support the lateral wind loads per current building code and wind code requirements.

It should be noted that since the new steel beams and columns will be installed against the interior face of the perimeter masonry walls, the interior footprint of the facility will be reduced by at least 10" around the facility perimeter. Installing new steel beams and columns is expected to be less labor-intensive than Option 1 and requires less demolition, but the cost of materials is far greater.

Structural Construction Budget

The budget estimate for reinforcing the roof deck attachment to the steel joists is $146,000. The budget estimate for installing bottom flange bracing to the steel beams is $163,433 and is listed as a required cost. The budget estimate for Option 1 wall reinforcement is $306,088. The budget estimate for Option 2 wall reinforcement is $894,941.00. See Appendix C for structural budget breakdown.

6.3 Mechanical

The mechanical systems in the building are a complete loss. Equipment that has not been vandalized or salvaged is beyond its useful life or would not be used in the recommended system. Although ductwork and piping inside the building only needs to be removed to the extent necessary for the new work and could be abandoned in place, it might be more cost effective to include their demolition when the building is gutted.

The renovation of the building should include new mechanical and plumbing systems. The mechanical system recommended is a DX Variable Refrigerant Flow (VRF) with condensers located in the existing chiller yard and terminal units located in each zone. This system is recommended based on energy efficiency at the tonnage estimated for the space. Outside air would be provided at each zone conditioned to a space-neutral temperature with low humidity.

The load of the space was estimated based on 400 SF/ton assuming it is a general office space without significant specialty areas such as a firing range or multiple meeting / training rooms or large operation center for the county. If it is to be renovated, the single story will be required to be upgraded with insulation in the walls and ASHRAE minimum insulation in the roof.

Plumbing will require new fixtures to be tied into existing waste vent and water lines. The water meter and backflow preventer should be tested and possibly replaced if found lacking. The waste lines will need to be cleaned out to the closest manhole outside the building. New restrooms will be provided and regardless of the location will require the floor to be removed to tie into existing waste lines. Abandoned waste lines should be filled and capped to prevent future issues.

Mechanical Construction Budget

The budget estimate for the mechanical construction is $676,816.00. This budget assumes that the facility will be used as a general office space with no firing range or more than one training classroom serving greater than 30 people. See Appendix C for mechanical budget breakdown.

6.4 Electrical

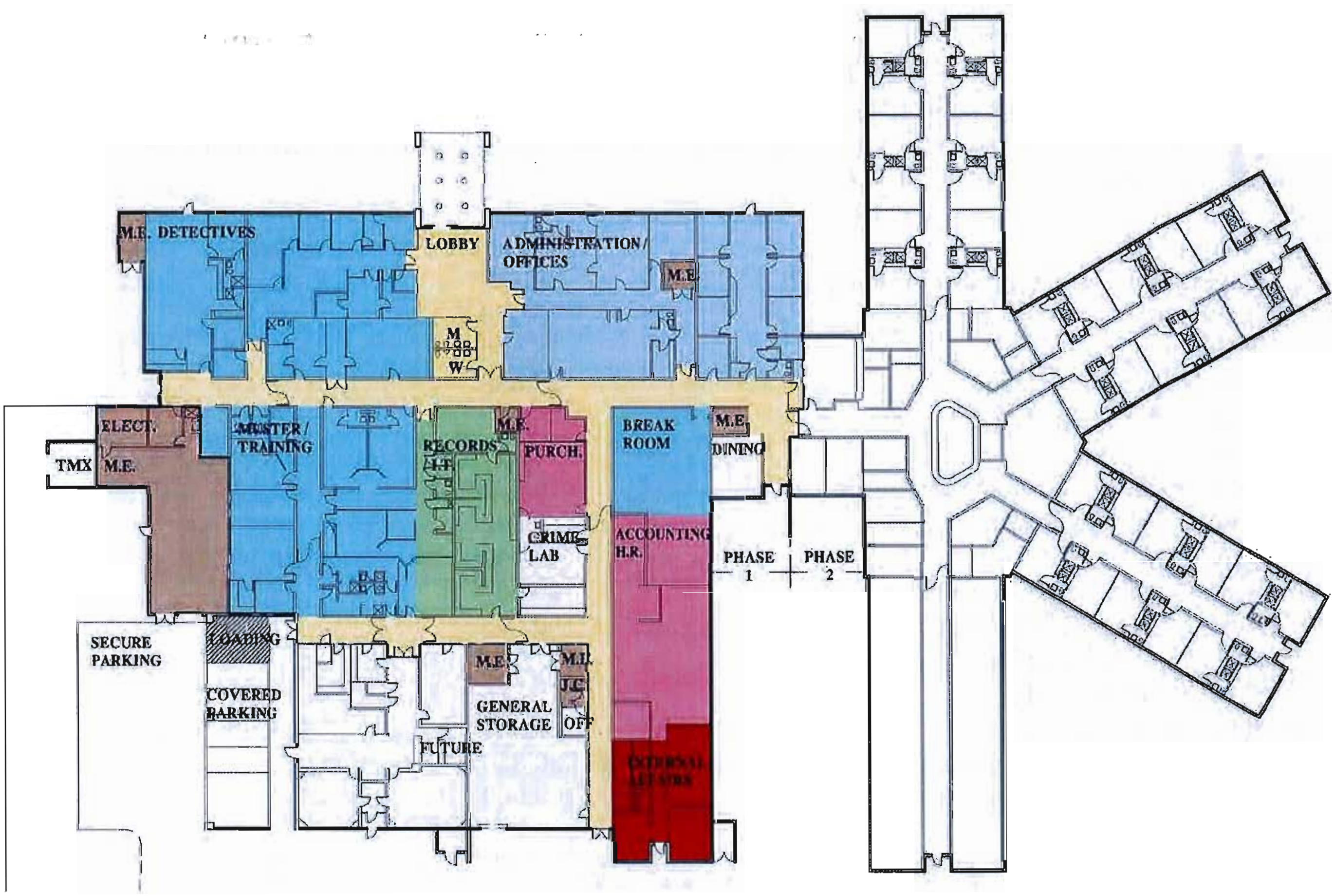
As stated in Section 5.1, there is nothing of the existing electrical system that is of any value and/or can be reused. Our recommendation to the new Owner is to install new electrical systems including fire alarm, voice/data cabling, generator, transfer switches, security systems, etc.

Electrical Construction Budget

The budget estimate of the electrical construction is $730,850.00. This budget assumes that the electrical services (switchboard, generator, distribution, fire alarm, voice/data) are sized to handle 100% of the possible square footage of the facility, but initially only about 50% of this area will be utilized. See Appendix C for electrical budget breakdown.

6.5 Potential Uses for Renovated Building

- Sheriff's Operation Center
- Community Services Center
- County Offices



Potential Floor Plan

6.6 *Overall Construction Budget*

Below is a preliminary statement of probable construction cost using a systems-based estimation method separated into Phase 1 (Main Building) and Phase 2 (Patient Wings). This budget assumes that the entire facility will be gutted inside and out leaving only the building shell and the existing fire walls/partitions. The building envelope (roof/walls/doors/windows) will be replaced with new systems and approximately 26,200 SF of the main building, (colored areas), configured for use as an administrative office space. The costs noted under Phase 2 are for stabilizing the building envelope of each wing in anticipation of future tenant build-out. We have also included an estimated cost of $400,000 for site improvements including; storm water management, parking-lot re-paving, security fencing, landscaping and irrigation. Additionally, structural "hardening" to counteract new wind-loading pressures are noted below.

Description	Phase 1	Phase 2
Demolition of existing partitions/drywall	9,550	12,308
Demolition of all existing EIFS	5,130	5,430
Abatement*	18,500	
New EIFS main building	87,686	
New EIFS patient wings		92,800
New windows	8,315	29,930
New exterior doors/frames/hardware	20,432	5,108
New storefront entrance	6,840	
New Roof	366,640	228,360
Beam bottom-flange bracing	100,707	62,726
New interior partitions/doors/frames	190,560	
New walls/floors/ceiling finishes	293,945	
New HVAC/Plumbing	676,816	
New fire sprinkler system	103,950	64,746
New power/lighting/communications	730,850	
Furniture/Fixtures/Equipment**	200,000	
Construction sub-total	$2,819,921	701,408
General conditions/OH&P/Bond	704,980	175,352
A/E Fees 8%	281,992	70,141
Construction total	$3,806,893	$946,901
Site improvements	200,000	200,000
Reinforcing exterior masonry walls (Option 1)	306,088	
Reinforcing roof attachments	146,000	

**Per UES Report, July 17, 2013*

End Report

Appendix A:

GeoTek Ground Penetrating Radar Report

Ground Penetrating Radar Report: Old Flagler Hospital
901 East Moody Boulevard, Bunnell, FL 32110

June 19, 2013

Prepared for:
Dana Smith
DJdesign, Inc.
913 N. Nova Road
Holly Hill, FL 32117

On June 17, 2013 GeoTek Services, LLC performed a Ground Penetrating Radar (GPR) survey at the old Flagler Hospital located at 901 East Moody Boulevard, Bunnell, Florida 32110. The objective of this effort was to determine the possible presence of steel bars located in selected CMU walls of the concrete block structure. This document describes the findings of the Ground Penetrating Radar survey conducted on the subject site. A high-resolution (1600MHz) Geophysical Systems GPR system was employed for this project.

The building under investigation is a CMU structure with a monolithic slab-on-grade concrete floor. The CMU walls are attached to several concrete columns and support a steel beam roof truss system. The client selected three wall areas for the GPR investigation. The GPR system was passed over three vertical concrete walls surfaces in a horizontal direction at approximately "waist-high". GeoTek Services scanned as close as reasonably possible to fixed objects such as outlets, wall studs, piping, and exposed fasteners.

The GPR scan results indicated that most of the CMU cells are empty (contain air voids). A few filled cells containing steel were observed near corner joints and near openings - such as doorways. Steel was noted at semi-regular intervals inside of one interior wall. When steel was observed, it was nominally noted in the "center" of a filled cell. The size of the steel bars is unknown. Horizontally-positioned steel wire was observed in all scanned CMU walls. The horizontal steel wire was observed with a regular spacing of ~16 inches. When scanning one exterior wall in the kitchen area, several electrical conduits were observed running vertically inside empty cells in the CMU wall.

For further questions regarding this survey, please contact GeoTek Services, LLC.

Regards,

Martin Connor
GeoTek Services, LLC

Appendix B:

Building loads, Calculations, and Structural Framing Plan

WINDSPEED BY LOCATION

Applied Technology Council

Search Results

Latitude: 29.4705
Longitude: -81.2531

ASCE 7-10 Wind Speeds
(3-sec peak gust MPH*):

Risk Category I: 122
Risk Category II: 132
Risk Category III-IV: 141
MRI 10 Year:** 77
MRI 25 Year:** 90
MRI 50 Year:** 99
MRI 100 Year:** 109

ASCE 7-05: 119
ASCE 7-93: 95

*MPH(Miles per hour)

**MRI Mean Recurrence Interval (years)

Users should consult with local building officials to determine if there are community-specific wind speed requirements that govern.

WIND SPEED WEB SITE DISCLAIMER:

While the information presented on this web site is believed to be correct, ATC assumes no responsibility or liability for its accuracy. The material presented in the wind speed report should not be used or relied upon for any specific application without competent examination and verification of its accuracy, suitability and applicability by engineers or other licensed professionals. ATC does not intend that the use of this information replace the sound judgment of such competent professionals, having experience and knowledge in the field of practice, nor to substitute for the standard of care required of such professionals in interpreting and applying the results of the wind speed report provided by this web site. Users of the information from this web site assume all liability arising from such use. Use of the output of this web site does not imply approval by the governing building code bodies responsible for building code approval and interpretation for the building site(s) described by latitude/longitude location in the wind speed report.

BUILDING LOADS

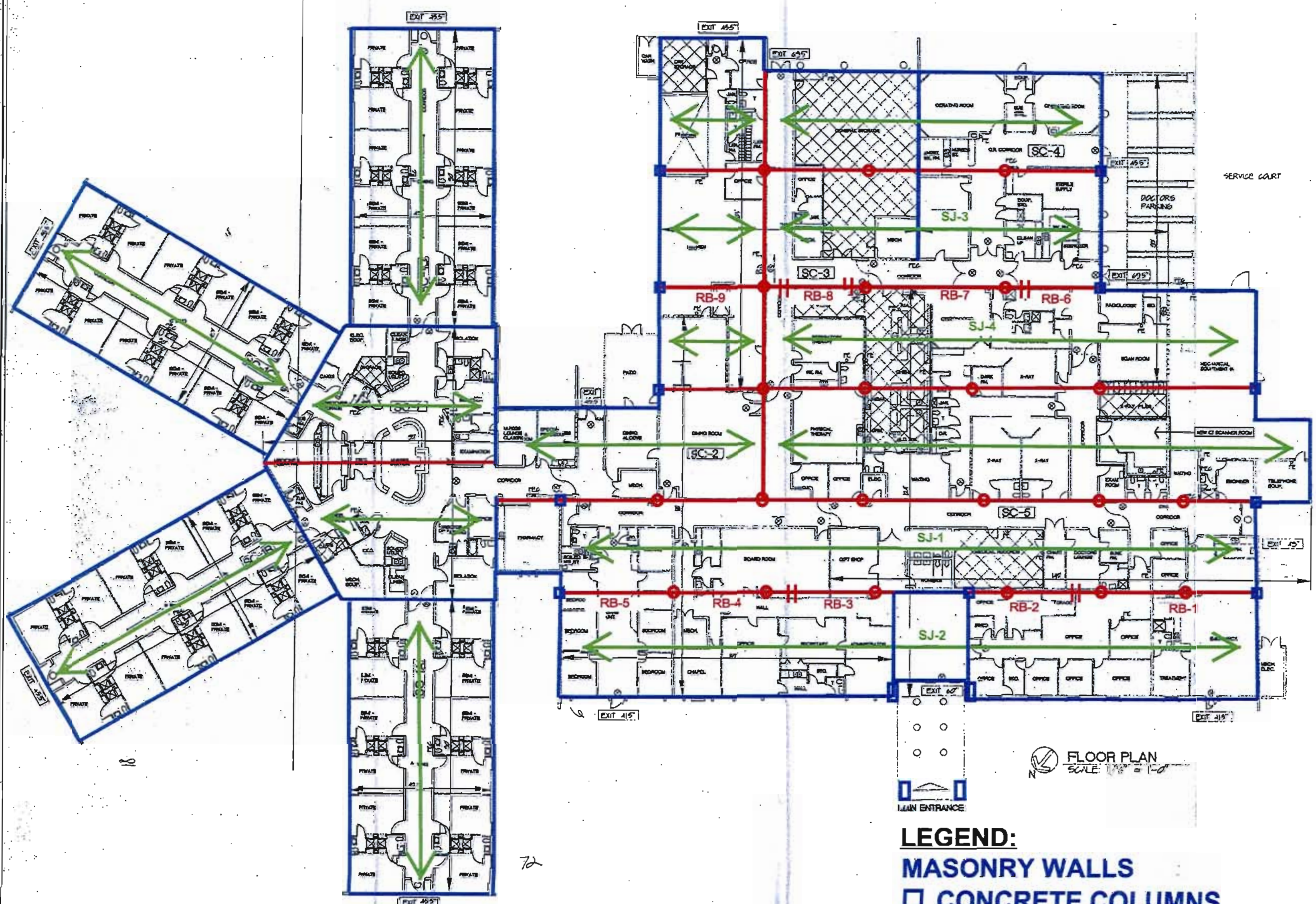
Component		Load	Unit (PSF)
Dead Load, Per ASCE 7-10, Table C3-1			
Roof			
Three-Ply Ready Roofing		1	psf
2 in. Rigid Insulation, (1/2 in. per 0.75 psf)		1.5	psf
Waterproofing Membrane (Bituminous, Gravel-Covered)		5.5	psf
24 gage 1.5 in. Galvanized Roof Deck		1.5	psf
2 in. Lightweight Insulating Concrete		10	psf
Suspended Ceiling		2	psf
Misc. (Lights, mech., etc.)		8.5	psf
	Total	**30**	**psf**
Live Load			
Roofs			
Roof (Gable Roof with 2/12 slope)		**20**	psf

Wind Loads, Per ASCE 7-10, with the following paramaeters:

Wind speed	141	mph
Building Exposure	B	
Building Classification	IV	

Wind Loads will be generated by computer software. Computer output and input are in the sheets to follow.

By: Victor Benziger, E.I.



LEGEND:

MASONRY WALLS
□ CONCRETE COLUMNS
STEEL BEAMS (RB-#)
STEEL JOISTS (SJ-#)
II BEAM SPLICES
○ STEEL COLUMNS

InnerSpace

FACILITY: MEMORIAL HOSP. FLAGLER

PROJECT: FACILITY SURVEY FOR AS-BUILT

ISSUED: CLIENT REVIEW

© InnerSpace

TITLE: BASE PLAN

SHEET NO. 1

Appendix C:

Estimated Budget for Structural, Mechanical and Electrical Items

Structural Budget		
Roof Deck Attachment Reinforcement	**Cost**	**Notes**
Provide 1/8" bent plates welded to the steel deck and steel joists	$146,000.00	The roof deck attachment reinforcement is recommended to insure that the roof deck can support the diaphragm shear anticipated from the current wind load requirements
Steel Beam Bottom Flange Bracing	**Cost**	**Notes**
Provide L2x2x1/4 angle bracing from steel beam bottom flange to steel joist top chord	$163,433.00	The steel beam reinforcement is required regardless of whether or not the masonry walls will be reinforced
Option 1 - Reinforce Masonry Walls	**Cost**	**Notes**
Sawcut existing perimeter exterior masonry walls		Interior wall finishes not included
Epoxy #5 rebars into existing tie beams and footings		Interior wall finishes not included
Grout masonry cells		Interior wall finishes not included
Patch sawcut masonry blocks		Interior wall finishes not included
Option 1 Total =	$306,088.00	
Option 2 - Install New Steel Beams and Columns	**Cost**	**Notes**
Install new steel columns to inside face of masonry walls		Interior wall finishes not included
Install new steel beams spanning between steel columns		Interior wall finishes not included
Option 2 Total =	$894,941.00	

Mechanical Budget		
Description	**Cost**	**Notes**
Demolition of existing mechanical equipment.	$28,000.00	Based on $1/sqft. Includes outdoor equipment and kitchen. None of the existing piping / ductwork will be reused. it may be cost effective to abandon it in place or remove it with interior walls to avoid selective demolition costs.
Mech Demolition Subtotal	$28,000.00	
HVAC		
75 Ton VRF DX Air conditioning system with cassettes located in the ceiling grid.	$450,000.00	Installed cost estimate with controls, piping and cassettes Located in the existing chiller yard.
Dedicated dehumidified space neutral outside air handling unit.	$25,000.00	DX Split with AHU in existing Mechanical room.
Ductwork, diffusers, support of outside air distribution.	$30,000.00	Place holder until plans are developed enough to determine zoning.
Exhaust fans	$18,816.00	Installed cost Based on Exhaust cfm + Ventilation CFM at $1/CFM with a 20% safety factor
HVAC Subtotal	$523,816.00	
Plumbing		
Plumbing - Water, Drain, Waste, Vent	$125,000.00	2 Public Restroom groups and one break room with point of use electric insta hot heaters.
Plumbing Subtotal	$125,000.00	
Fire Protection		
Sprinkler distribution		Budget pending requirements.
Fire Pumps		If a sprinkler system is required booster pumps may be required. Space is available in the mechanical room.
Landscape Irrigation		
Landscape pumping/Zone Control		Not included in budget
Total	**$676,816.00**	

Electrical Budget		
Description	Cost	Notes
Switchboard	$35,000.00	277/480V, 3ϕ, 1600 Amps
Generator	$180,000.00	500KW, 277/480V, 3ϕ, 100% of constructed area
Automatic Transfer Switches	$34,000.00	(2) ATS, one for emergency loads, one for stand-by loads
Interior Electrical Distribution	$45,000.00	
Interior Light Fixtures	$58,800.00	Fluorescent lighting
Exterior Building Fixtures	$6,250.00	Fluorescent lighting
Parking Lot Lighting	$42,000.00	
Raceways/Conduits/Wires	$26,000.00	
Receptacles/Wiring Devices	$14,000.00	
Electronic Security/Access Control	$72,800.00	
Voice/Data Cabling	$112,000.00	
Fire Alarm	$105,000.00	
Total	**$730,850.00**	