I. General Building Data

Building Name: Perioperative Services Expansion
Location and Site: 1850 E Park Ave #103, State College, PA
Building Occupant Name: Mount Nittany Medical Center
Occupancy: Hospital
Size: 75,925 SF
Number of stories above grade: 4
Primary project team:
  Owner: Mount Nittany Medical Center
  Construction Manager: Alexander Building Construction Company
  Architect: FreemanWhite, Inc.
  Mechanical, Electrical, and Plumbing Engineer: H.F. Lenz Company
  Structural Engineer: O’Donnell & Naccarato
  Civil Engineer: Gannet Flemming Inc.

Dates of Construction:
  Design Development 3/7/12
  Site Utility Relocations 7/2/12
  Foundations 10/15/12
  Completion 12/4/14


Project Delivery Method: Design-Bid-Build, with Design Assist by Construction Manager, Manufactures, and Selected Subcontractors.

II. Architecture

FreemanWhite Inc. took design inspiration for the Perioperative Services Project from many of the recently completed projects at the Mount Nittany Campus. With the large stepped curtain walls encapsulated by undulating masonry piers; the building was designed to mimic the same architectural features of the East Wing Tower directly adjacent to the Perioperative Services Project. Figure 1.1 shows the Perioperative Services Project, towards the right of Figure 1.1, adjacent to East Wing Project, which is shown toward the left side. The Perioperative Services Project is a four-story structure designed to tie directly into, and expand, both the existing sterile support spaces, as well as the existing surgical suite located directly above. Starting at the lowest of the four stories the basement level of the project is to include approximately 15,000 square feet of
mechanical space with exposed air exhaust grills on the eastern façade for the four new air handling units that are to be installed. Directly above the basement, on the ground floor, is to be approximately 17,000 square feet of new sterile processing, and the associated space to store and stage all of the materials to feed the 12 operating rooms on the above floor. The 19,000 square feet of space allotted to the addition of the first floor, is to contain the main part of the surgical suite. Within this space four new operating rooms as well as one hybrid operating room are to be constructed. To support the newly expanded surgical suite, 19 new PostAnesthesia Care Units (PACU’s), 9 preparation/recovery staging areas, as well as nurse workspaces to support the increased patient volumes are to be constructed. Directly above the surgical suite is approximately 16,000 square feet of shell space that is to be left unfinished under the scope of this project.

The project was intended for Hospital use and was designed under numerous stringent guidelines. These guidelines include the 2009 edition of the International Building Code, the 2000 Edition of the National Fire Protection Agency 101 Life Safety Guidelines, the 2010 American Institute of Architects Guidelines for Hospitals, Joint Commission Hospital Accreditation Standards, Pennsylvania Uniform Construction Code, Accessibility Guidelines for Buildings and Facilities, and lastly the 2000 edition of the Guidelines for Design and Construction of Healthcare Facilities. Under the 1-B construction type the building is to have two-hour fire rated exterior walls, floor separation, and structural system. Due to the additional guidelines many more key loadbearing components have also been increased to a minimum of 2 hour fire rating.

The project does not fall under any historical district requirements, but is expected to fit in within the Mount Nittany Medical Center’s Construction Standards and Master Plan.

III. Building Enclosure

The Exterior walls consist of poured in place concrete or concrete masonry units (CMU’s) up to the extent of the waterproofing. Atop of this a cold formed metal stud bottom track is attached to the poured in place concrete or fully grouted CMU via (2) 0.157 diameter Hilti fastener with a minimum embed of 1” with a spacing of no more than 16” on center (O.C.). The bottom track is then fastened via 5/8” pan head fasteners to the 16 gauge structural cold formed metal framing that spans from slab to deck. Vertical studs are spaced at 16” O.C. in central zones and 12” O.C. near the corners. Each story is comprised of similar construction. Fixed to the metal framing is 5/8” DenseGlass FireGuard Sheathing. The sheathing is attached using 2-3/4” Philips flat head fastener. Working toward the outside of the wall the next layer comprises of DuPont’s TyVek CommercialWrap D that serves as an air and moisture infiltration barrier. This is covered by 1-1/2” of Formular’s Extruded Polystyrene Insulation that serves as the rigid insulation and gives the wall a R-value between 5.0 and 5.4 depending on the mean outside
temperature. This is layered with a 2” air space and then on the exterior most face of the wall either split face CMU or modular face brick that is tied back to the sheathing and cold formed metal framing as shown in Figure 1.2. The modular face brick begins at an elevation roughly 18’ above the basement floor level. Below this elevation a beige split face CMU frames six exhaust louvers along the east façade (see Figure 1.1) and one air intake louver along the south facade. The split face CMU is capped with a band of precast that frames the large curtain wall windows that span the remainder of the three stories. Three large undulating masonry piers with aluminum accent tubes also span the entire height of the façade and provide architectural relief between the curtain walls.

The spandrel or opaque glazing of the curtain wall is comprised of ½” argon airspace between ¼” Bronze panel, and ¼” Clear panel. The vision glazing of the curtain wall is comprised of the same ½” argon airspace between ¼” Bronze panel and a ¼” PPG Sungate 500 Clear #3 Panel. Having the exterior panel of both types the same panel will portray an illusion of one solid vision window during the day. It will not be apparent from the outside that some panels are spandrel until the night when light will only be able to be seen behind the vision glass panels. This is due to the vision glass having a light transmission of about 44% while the spandrel panel only has a light transmission of 3%. The spandrel panels are required to hide the backside of the interior walls needed for equipment placement that is to be built in front of the curtain wall in numerous locations.

The roofing is comprised of Firestones Ultraply TPO invisaweld system, which is a type of Thermoplastic Polyolefin rubber membrane roofing. This product was used as no glue or high VOC adhesive is required to fasten the roof membrane to roof structure. With a project site directly adjacent to seven fully functioning operating rooms being fed by 14 rooftop units, having an interruption due to construction related odor could have been catastrophic. The amount of fasteners required to fasten the roofing membrane to the structure is also greatly reduced with this Invisaweld system. This greatly reduced any type of vibration transmission to the existing operating rooms again saving from potential catastrophic interruptions. The fasteners are shot into the slab through the layer of insulation and then joined to the membrane using high voltage electricity. With potential future vertical expansion the roof was only required to be warranted for 20 years, and may not even be required for that long. The TPO membrane itself is an off white color to aid in thermal energy reflection. The TPO material was selected due to uplift concerns caused by prop wash from incoming and outgoing helicopters. As figure 1.3 shows the rooftop helipad for the recently completed Emergency Department is directly adjacent to the project.

Other than the off-white roofing membrane color no other unique sustainability features have been implemented on this project.