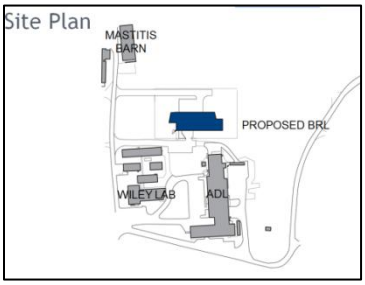
BIOLOGICAL RESEARCH LABORATORY

Michael Carbonara

Construction Management



Building Name	Biological Research Laboratory
Location	University Park, Pennsylvania
Occupant Type	Business (B); Research Facility
Gross Building Area	20,000 SF
Total Number of Stories	3 Stories: Including Basement and Mechanical Penthouse
Total Building Cost	Approx. $23,000,000
Project Delivery Method	Design-Bid-Build (CM at Risk)
Period of Construction	8/27/11- 1/31/13

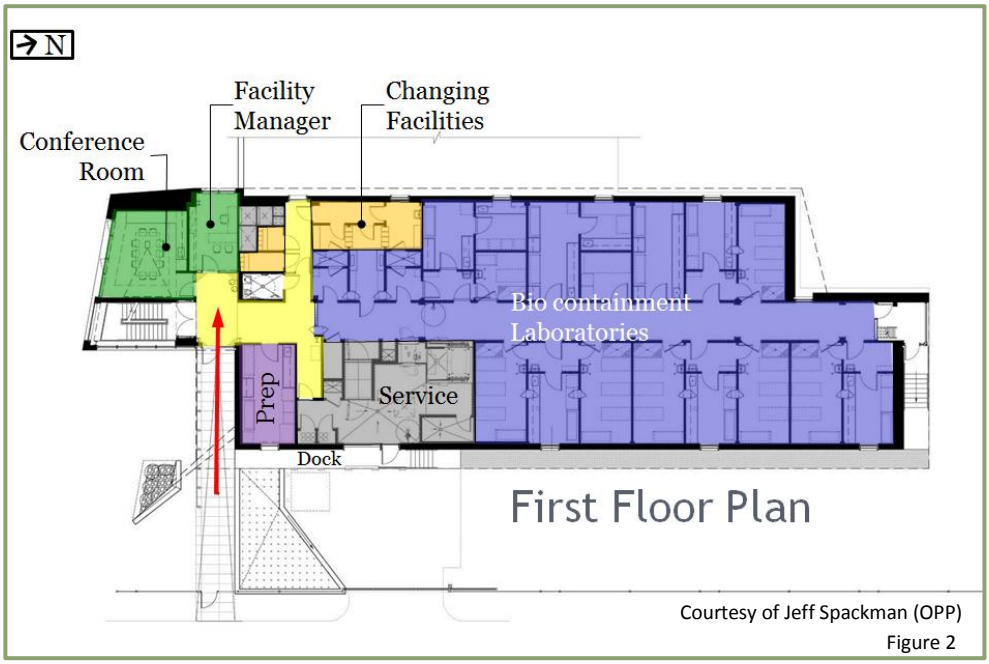
Project Team	
Owner	The Pennsylvania State University
Architect	Payette Associates Inc.
Construction Manager	Torcon Inc.
MEP & Structural Engineer	Merrick & Co.
Landscape Architect	Payette Associates Inc.
Civil Engineer	Sweetland Engineering & Associates Inc.
Owner Representative	PSU Office of Physical Plant

Architecture

The Biological Research Laboratory went through a lot of different designs due to the source of funding as well as taking into account the complex and one of a kind facility. Many BSL-3 facilities (Biological Safety Laboratory) across the country are modular built making it easier to construct the redundant mechanical systems required to carry out testing. Payette Associates the architect chosen for the project wanted to incorporate the surrounding buildings into the architecture of the building. Since the BRL facility was to be located on the agricultural part of the Pennsylvania State University Campus, Payette Associates created a unique design that received the nickname "The Biological Barn" as seen below, figure 1, is courtesy of Payette Associates.


Courtesy of Payette Associates

The central design of the lab allows for a single corridor down the center of the building with the conference room utilizing the large window for natural daylight in figure 2 below. As in early stages of design the Bio containment laboratories were stacked next to each other to allow for future expansion on the north side of the building. There is no historical requirements f



Courtesy of Jeff Spackman (OPP)
Figure 2

National Code Models

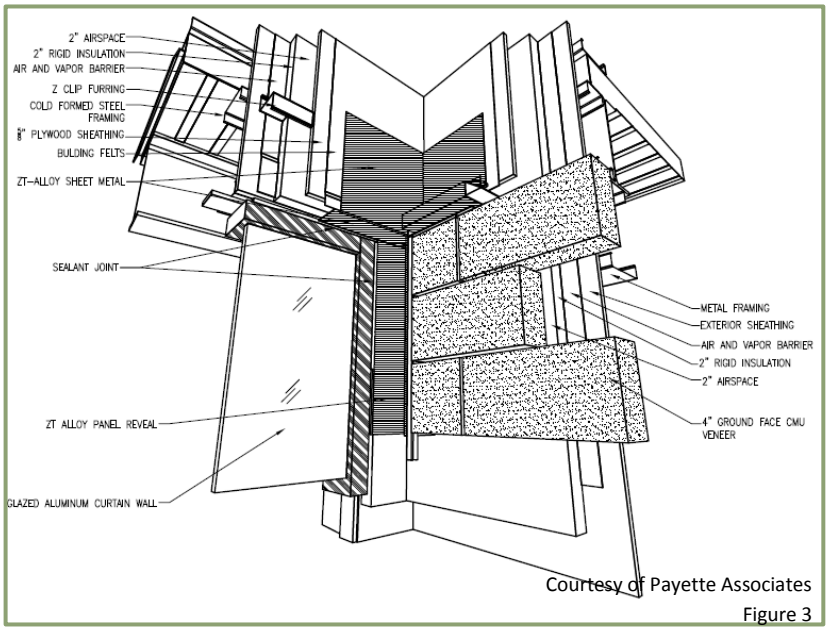
Code Type	Applicable Code (Model Code Basis)
Building	**2006 International Building Code**
Energy	**2006 International energy Conservation Code**
Mechanical	**2006 International Mechanical Code w/Pa Amendments**
Plumbing	**2006 International Plumbing Code w/Pa Amendments**
Electrical	**2005 National Electric Code**
Fire Protection	**2006 International Fire Code**
Accessibility	**2003 ICC / ANSI A117. 1-2003**

Zoning Requirements

The zoning codes for the new facility falls under The Pennsylvania State University's "University Planned District" agreement with the surrounding boroughs and townships to resolve many issues involving local ordinances and taxation claims. The BRL building footprint is in "University Planned District 11" on the north east part of campus which was obtained on the State College Borough's website.

Building Enclosure

The Pennsylvania State University's Biological Research Lab is comprised of a number of materials to make up the outside of the structure as seen in figure 3 to the right. The basic wall structure of the Lab is a CMU block wall with metal framing and exterior sheathing. A 4" ground face CMU veneer is placed on the exterior which can be seen on the right. The laboratory has a significant amount of glazing as well as alloy panels as accents on parts of the building.



Courtesy of Payette Associates

Figure 3

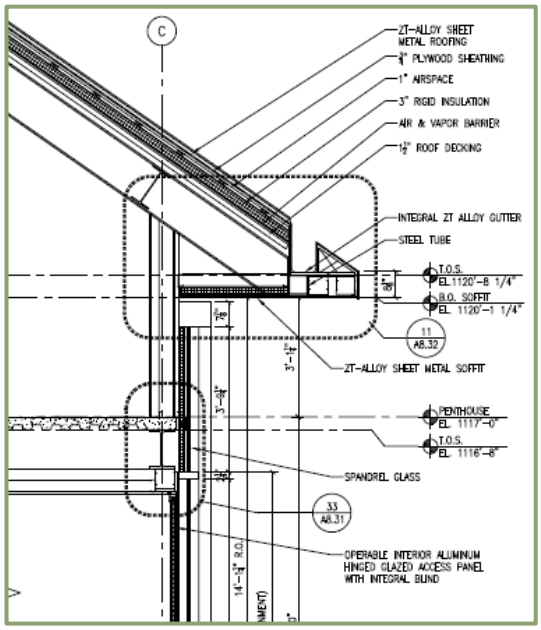
LEED Certification

The U.S. Green Building Council is organization as seen in figure 4 to the left that promotes sustainability in how buildings are designed and constructed. The new Bio-Research Lab is currently seeking the level of LEED Silver just above LEED Certified which is mandatory for all new construction on The Pennsylvania State University campus. The new facility will achieve this rating through concepts such as utilizing recycled materials and local materials to construct the new building.

Courtesy of USGBC
Figure 4

Roofing

The composition of the roof from Payette associates in figure 5 includes 24" metal alloy cladding which is the finishing material. The roof consists of a layered system which utilizes 3 inches of rigid insulation and 1 in airspaceThe metal alloy comes in two types depending on where the panel is being placed on the building for architectural purposes.



Courtesy of Payette Associates
Figure 5