Project Description/Narrative

The Binghamton Science II building originally constructed in 1969, predating health/safety, energy and ADA guidelines. The facility had not seen any major renovations since its construction. This project brought the facility into the 21st century and provided the building occupants a healthy environment that is energy efficient and designed to meet LEED Silver.

Energy efficient studies occurred to determine the most effective building envelope. It was determined to remove the existing hollow metal single glazed window system in its entirety and provide a rain screen system with punched openings of thermally broken energy efficient windows, in-lieu of a curtain wall system. The reduced glazing from the punched openings had a minimal impact on natural light but had a significant impact on energy savings. New insulation along the envelope exceeded the energy code. Special detailing occurred at all transitions between the new rainscreen system and the existing exterior masonry walls.

Due to building system upgrades, program changes, and hazardous materials, the interior was fully renovated, providing a design that considers future use of the space and providing opportunities for program changes. Centralized accessible toilet rooms new labs, and accessible entrances were designed to support building occupants.

To combat the age of the building, all its systems were upgraded and designed for energy efficiency. The exhaust system was completely redesigned from an individualized exhaust system to a central heat recovery exhaust system, reducing energy consumption. Modeling was utilized to evaluate the impacts of the surrounding buildings exhaust system on the new physics mechanical systems. LED lighting with daylighting controls designed specifically for the spaces were implemented throughout the building.

The occupants' needs were taken into consideration, both while in the learning spaces and during their transition between spaces. The design provided the building occupants collaboration spaces, outside of the learning spaces, with natural light and views of the exterior green courtyards to enhance the occupants' experience.

Material, color, and furniture selection was selected to optimize the building occupants work/study conditions. The use of natural materials like wood and soft colors, with a mixture of seating options, contributed to the optimal needs of the occupants.

AIA's Framework for Design Excellence

As we are less than a decade away from the AIA 2030 Commitment, AIA Rochester continues to include a focus on sustainability in our annual Design Awards this year and into the future.

Please choose a minimum of **three** of the ten measures of the AIA's Framework for Design Excellence. In 300-500 words, please explain how your project addresses these three measures. You may duplicate this slide to accommodate your responses. **(The minimum font size should be 10pt/Arial**.) **DO NOT change the background of this slide.**

The name of the project can be mentioned generically. For example entrants can say "The education center was designed for the university." Instead of "the John Johnson Educational Research Center was designed for the university."

The ten measures in the Framework for Design Excellence are:

1. Design for Integration: What is the big idea behind this project and how did sustainability inform the design concept?
2. Design for Equitable Communities: How does this project contribute to creating a walkable, human-scaled community inside and outside the property lines?
3. Design for Ecology: In what ways does the design respond to the ecology of its place?
4. Design for Water: How does the project relate to the regional watershed?
5. **Design for Economy: How does the project efficiently meet the program and design challenges and provide "more with less"?**
6. **Design for Energy: Is the project energy-efficient and sustainable while improving building performance, function, comfort, and enjoyment?**
7. **Design for Wellness: How does the design promote the health of the occupants?**
8. Design for Resources: How did the design team optimize the amount and makeup of material used on the project?
9. Design for Change: Is the building resilient, and able to easily accommodate other uses in 50-100 years?
10. Design for Discovery: What lessons for better design have been learned through the process of project design, construction, and occupancy, and how have these been incorporated in subsequent projects?

AIA's Framework for Design Excellence

Design for Economy - Due to the age of the facility, many upgrades were required to enhance the occupants experience and meet the program needs. The design team needed to balance energy requirements, program needs, and the construction budget. To do this, a review of the project goals was undertaken, including providing a curtain wall system. The team studied several options and ultimately decided to provide a rain screen system with punched openings. In order to maintain low costs, strong design considerations were imperative, including utilizing the campus centralized chilled water system. The team worked with the client to determine areas that could utilize more cost effective materials and design while providing select locations with the design goals required for the program.

Design for Energy – The client's goals were to meet LEED Silver and NYS Executive Order 99. The design team looked at the facility as a whole, including the building envelope and systems, to provide a design that was energy efficient. Envelope upgrades included increased insulation on the roof and a new rain screen system with high efficient punched window openings. The design team paid special attention to the dew point location of the wall and the transition of the thermal continuation between the new rainscreen and the existing masonry walls, ensuring no thermal gap between the two systems and insulation types. The existing 60 year old mechanical systems were removed and new systems were installed, utilizing centralized systems that would benefit from energy recovery on the exhaust systems. These enhancements provide the building occupant an environment that enhances learning by not distracting them through loud mechanical systems or drafts through the un-insulated wall systems.

Design for Wellness – Renovation of the interior removed all hazardous materials throughout the building. Once removed the design team took consideration to ensure that no future hazards would occur, utilizing materials that do not promote mold in the wall cavity and providing proper moisture barriers. On the interior, the windows were located to provide views of the campuses courtyards and provide natural light into the building without increasing energy consumption. Material textures and colors on the interior of the building were selected to provide the building occupants an environment that promotes mental stimulation. This includes the use of wood in select locations, fabric on furniture throughout the public spaces, and utilizing colors to promote the overall health of the occupants while in the facility.

AIA Rochester Community Impact Award

As a building that belongs to a college campus, the Science II building is not just part of one community, but two: as a college, and as part of the overall city. Thus, the impact of renovation to the building has different and similar implications for both communities.

Undoubtedly, the biggest effect of renovating the building would be to attract new students to the college. This single impact affects both the academic community and the city. Attracting more students increases the overall value of both communities by providing a positive living experience and producing good results with their graduates. In the future, those graduates will work to strengthen other communities.

As a result, the college receives positive feedback from the overall community. With each newly renovated building, the property value of surrounding buildings/homes increases. And the larger the campus population grows, the more revenue is brought to the city, expanding the existing development and further increasing positive feedback.

However, there is more to the community benefits of renovating the Science II building than just community expansion. The building is one of the first buildings that are seen when entering the campus from the North and melds with the surrounding community. In its own way, this facility can be marketed and used to attract numbers to the campus and city population a neighborhood anchoring point. A sense of pride is installed as a result. How the building is renovated and maintains that historic value is imperative in its design and construction.

One can delve deeper into the renovation value even further, focusing on more technical aspects of mental, physical, and environmental health of the population. With the renovation came increased access to those who bear the burden of disability and are unable to access the same features in the same manner as those without a disability. Additionally, the updating of safety conditions and infrastructure was imperative. Aspects of the building that could have significant implications had it gone left unchecked and grew too outdated. These safety conditions affect not only the students and teachers who use the building, but the community members who use the campus. Hence the importance the renovation of the science II building bears toward the college and city by setting an example to the community and educational design.

SUNY BINGHAMTON SCIENCE II

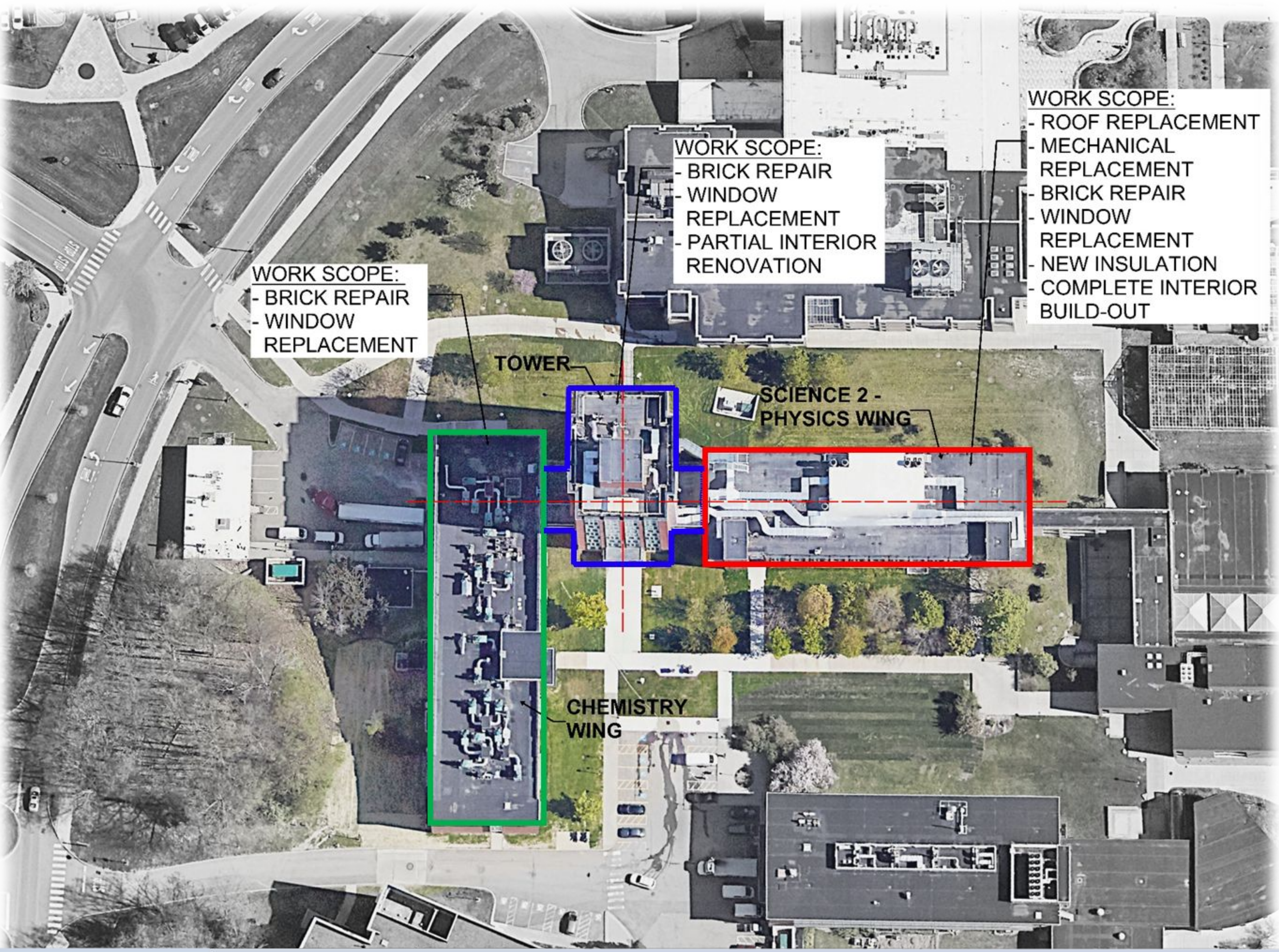
Photo By: In House

EXISTING BUILDING

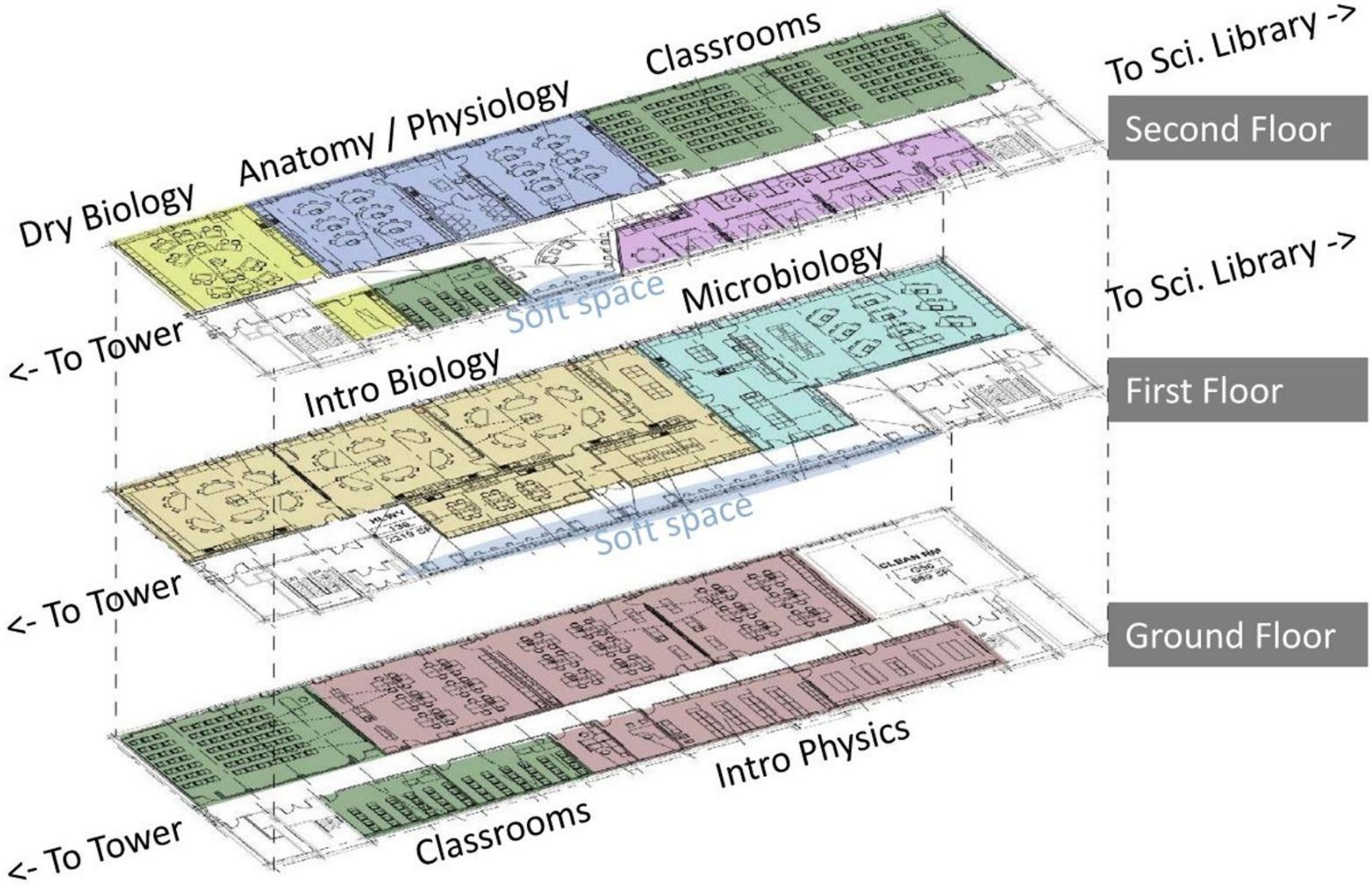
Photo By: In House

Photo By: In House

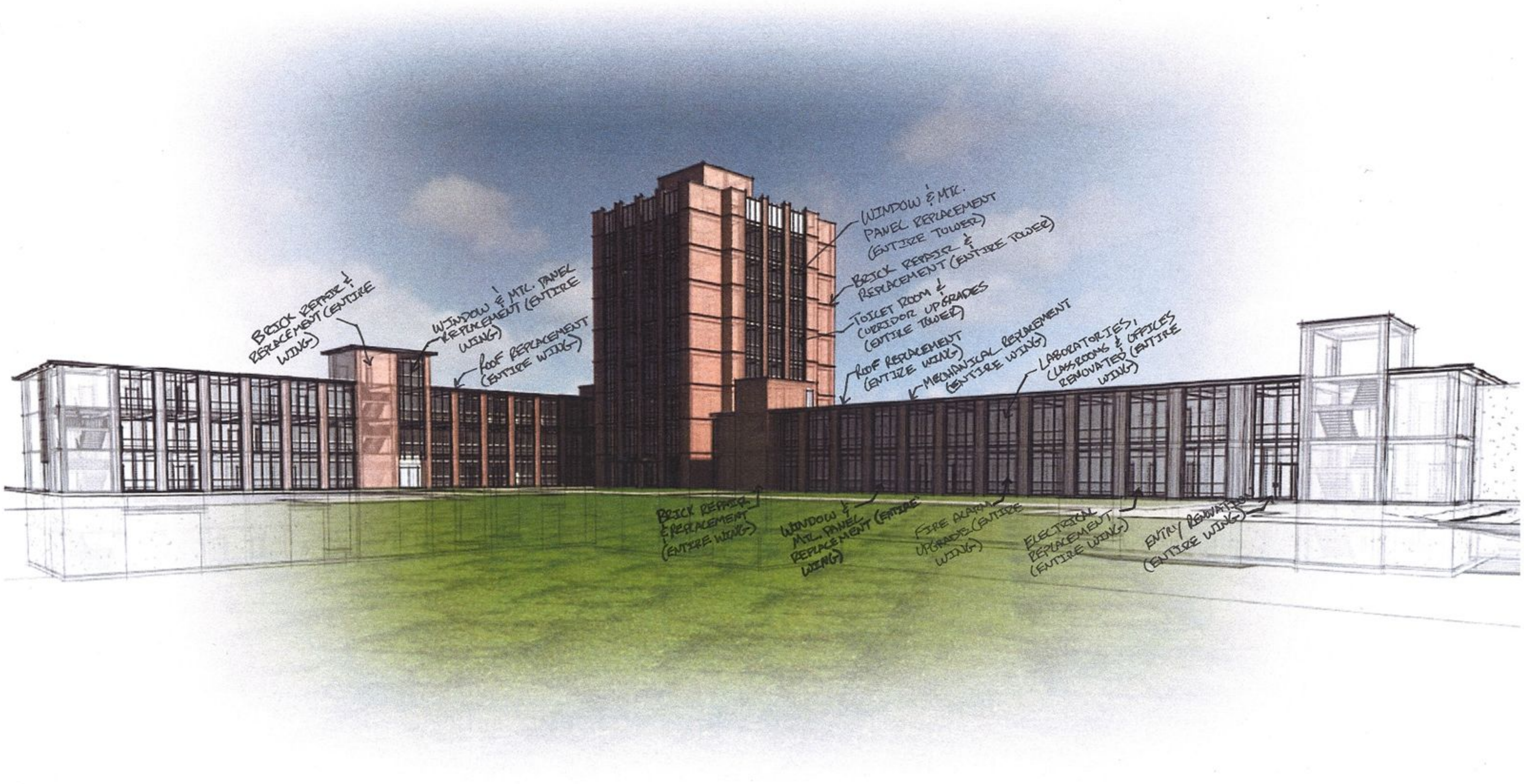
EXISTING BUILDING



PROJECT SCOPE DIAGRAM



PROJECT SCOPE DIAGRAM



CONCEPT SKETCH

Photo By: In House

Photo By: In House

PROGRESS CONSTRUCTION

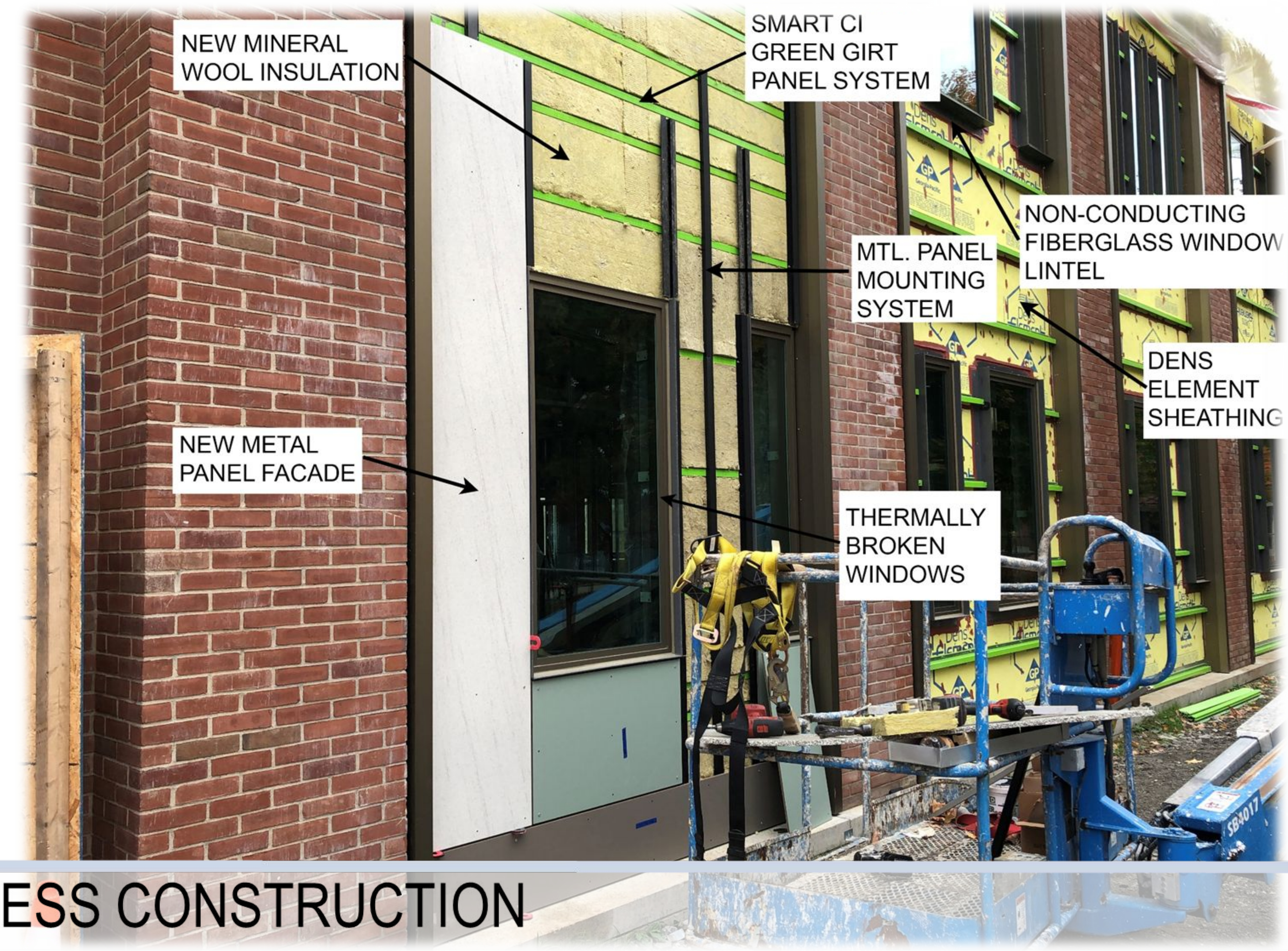


Photo By: In House

PROGRESS CONSTRUCTION

Science II Energy Performance by Building Area and Insulation Strategy						
Rainscreen Insulation		**Percentage Above / Below 2015 IECC for New Construction**				
Rainscreen Cavity Insulation (R8 Cont.)	Rainscreen Cavity R Value	Physics Wing Alone (2" Rigid on block)	Chem & Tower Alone (Unins. block)	Chem & Tower Alone (2" Rigid on block)	Science II Complex (Unins. Block)	Science II Complex (2" Rigid on block)
6" Stone Wool Batt	24	12.90%	-110.40%	15.00%	-82.20%	14.40%
		$ 7,884.00		$ 32,193.00		$ 40,077.00
6" Polyurethane foam	36	15.00%	-107.50%	17.80%	-79.80%	17.00%
		$ 20,376.00		$ 83,202.00		$ 103,578.00
12" Stone Wool batt	48	16.50%	-105.60%	20.00%	-77.90%	18.90%
		$ 15,768.00		$ 64,386.00		$ 80,154.00
12" Polyurethane foam	60	17.50%	-104.20%	21.20%	-76.60%	20.20%
		$ 38,052.00		$ 155,379.00		$ 193,431.00

Values: COMcheck 4.0.6.1

All designs include R32 roof constructions (6" avg polyiso insulation thickness)

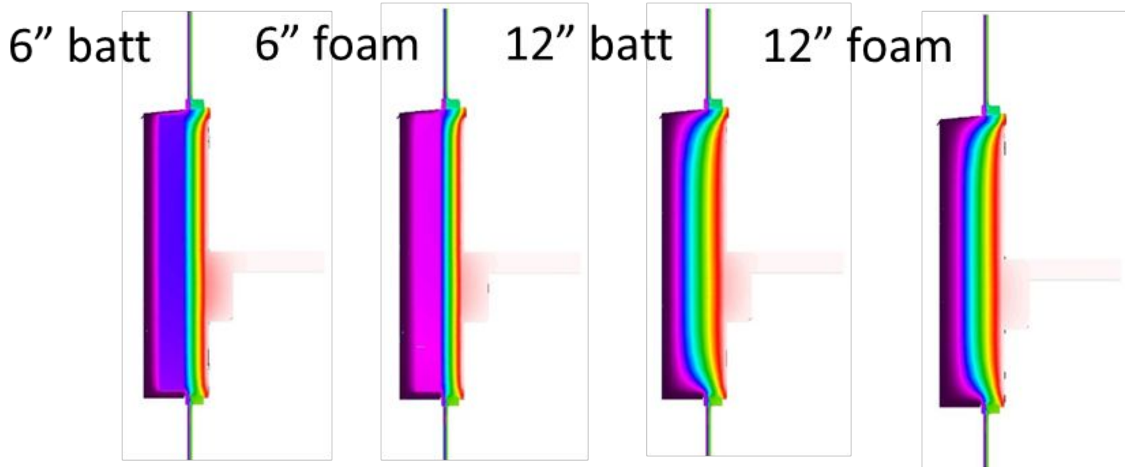
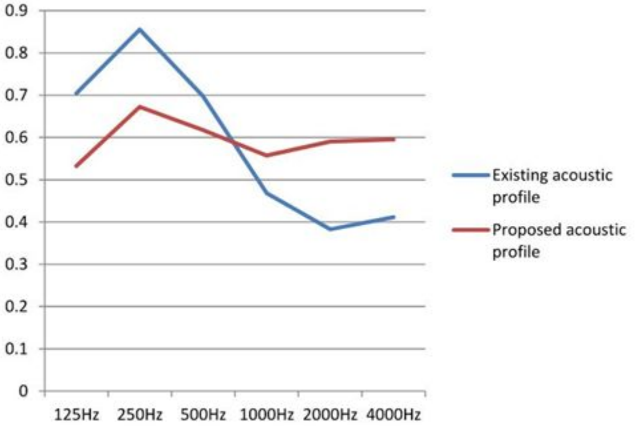
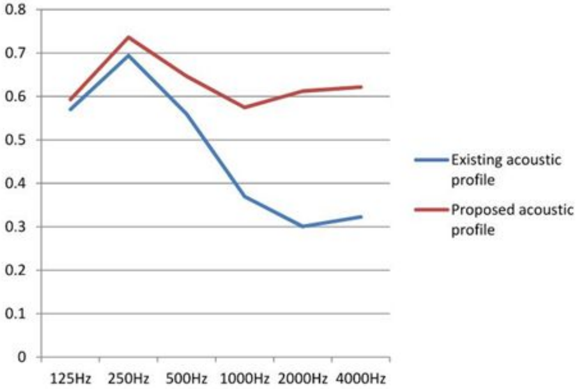


Photo By: In House

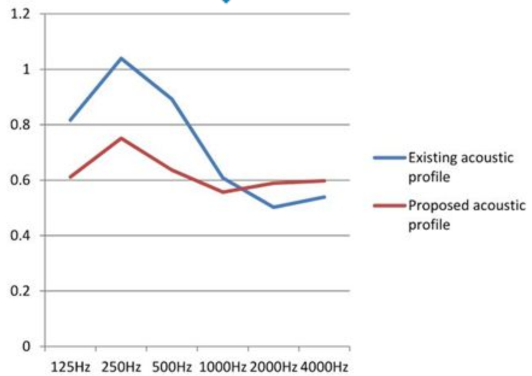
BUILDING ANALYSIS



		125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
Arm - Calla NRC .85	ACT - 1	0.59	0.56	0.82	0.99	0.95	0.94
Arm - Optima NRC 1.00	ACT - 2	0.73	0.95	0.92	1.06	1.03	0.94
Arm - Cermaguard NRC .55	ACT - 3	0.28	0.27	0.43	0.72	0.92	0.86



		125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
Arm - Calla NRC .85	ACT - 1	0.59	0.56	0.82	0.99	0.95	0.94
Arm - Optima NRC 1.00	ACT - 2	0.73	0.95	0.92	1.06	1.03	0.94
Arm - Cermaguard NRC .55	ACT - 3	0.28	0.27	0.43	0.72	0.92	0.86



		125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
Arm - Calla NRC .85	ACT - 1	0.59	0.56	0.82	0.99	0.95	0.94
Arm - Optima NRC 1.00	ACT - 2	0.73	0.95	0.92	1.06	1.03	0.94
Arm - Cermaguard NRC .55	ACT - 3	0.28	0.27	0.43	0.72	0.92	0.86

BUILDING ANALYSIS

COMPLETED CONSTRUCTION

COMPLETED CONSTRUCTION

COMPLETED CONSTRUCTION


Photo By: Gene Avallone

COMPLETED CONSTRUCTION

COMPLETED CONSTRUCTION