ELLENZWEIG iDS

THE MSU STORY

This is a story about a new STEM project coming to completion at Michigan State University.

- The project creates a new learning ecosystem, bringing together several discrete but synergistic components.
- The project houses new learning labs for Chemistry, Biology, Physics, Computer Science, and Material Science in an inter-disciplinary configuration.
- The learning labs feature a cutting-edge system for flexibility, permitting total reconfiguration of the spaces for varying uses over time; this flexibility has already been utilized to address concerns associated with the COVID-19 pandemic.
- The project also houses MSU's Hub for Innovation in Learning and Technology, a campus-wide resource to support new directions in learning.
- The project includes flexible labs for student research and maker spaces for independent student projects.
- The project incorporates a decommissioned power plant, re-imagined for new learning goals and joined to new construction for STEM learning labs in an integrated complex. This combination speaks to the broader need to maximize the use of existing space on campus.
- The project utilizes laminated timber construction to reduce its carbon footprint and support numerous sustainability goals.

Renovated power plant houses MSU's Hub for Innovation in Learning and Technology

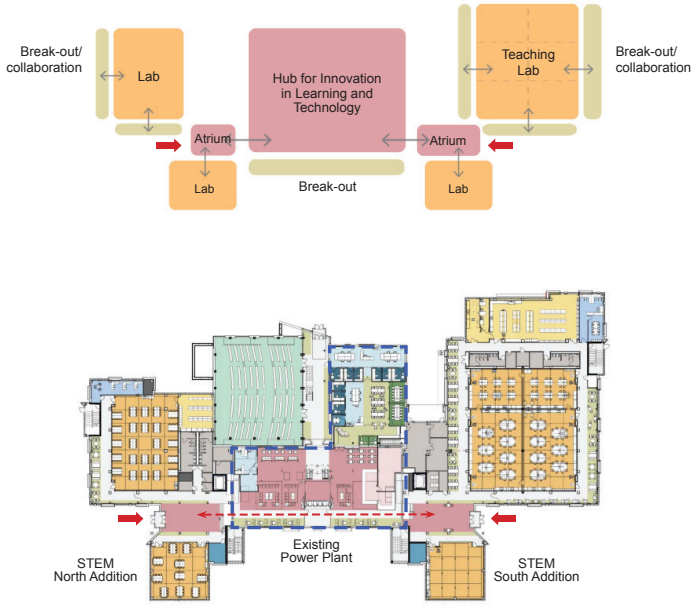
The project is a new STEM teaching facility on the East Lansing campus, comprised of new construction and the renovation of a decommissioned power plant. It has not yet welcomed students to its labs and collaboration spaces, but it will come on line this spring, still in the middle of the pandemic. Thus, the University's ambition for the project combines the initial planning and design goals with the need to address new challenges posed by COVID-19.

The project brings together teaching labs for a number of science and engineering disciplines, formerly located in disparate buildings across campus, thus creating an *interdisciplinary teaching and learning center.* Teaching labs were designed in concert with faculty developing *new pedagogies* for their disciplines. The programming and design process was characterized by a totally fresh and forward-looking exploration of science learning and how teaching labs can and should work.

In addition to multiple teaching labs, the project houses MSU's *Hub for Innovation in Learning and Technology,* an independent, campus-wide resource created to support innovation; its location in the new STEM building is intended to support ongoing exploration of new pedagogies in the science and engineering disciplines (as well as all other learning spaces across campus); in this context the new building can be seen as a laboratory in itself for new learning approaches.

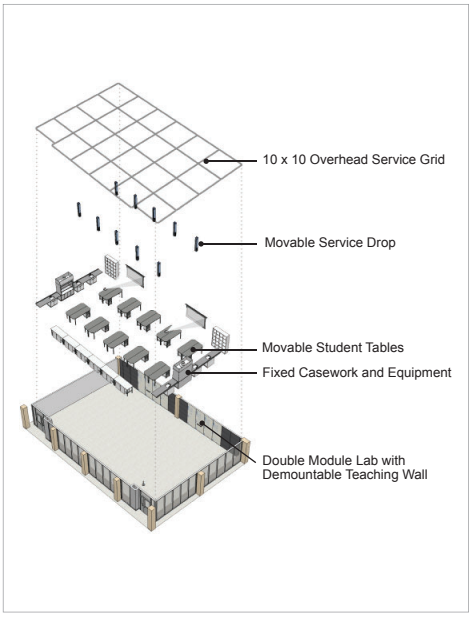
Flexible collaboration space in the Hub for Innovation in Learning and Technology

The project was designed to maximize flexibility at several scales. The overall building plan is organized with broad open areas for lab spaces, in a kind of “ballroom” plan; this openness allows for *long-term flexibility* with the potential for wholesale plan re-configurations.



Conceptual layout (top) and First Floor Plan, former power plant in center, STEM additions to right and left

At the scale of the individual labs, the project utilizes a novel overhead distribution system for electrical and plumbing services, thus providing *total flexibility within each lab:* the overhead service system permits the complete and relatively easy reconfiguration of lab tables, and all benches, except sink cabinets and fume hoods, are movable. This flexibility has enabled the University to create low-density lab layouts in response to COVID-19 concerns, thus utilizing the project’s inherent flexibility even before initial occupancy.



Flexible overhead service grid

Finally, lab assignments can change over time from one discipline to another due to the availability of multiple services in the overhead distribution system. As one example, the project contains two flexible research labs, designed with a full set of piped services to permit their use by a variety of disciplines, and to accommodate a full range of experimental activities.

Biology lab, with flexible overhead service grid

The project is *highly student centric* in the variety and quantity of its student support areas. The program includes specific spaces to support *student research and maker activities;* as noted above, research space is open and flexible, and not assigned to any specific discipline. Student collaboration spaces are located throughout the building, and, in particular, adjacent to the teaching labs to support interaction and out-of-lab student learning. The project includes

a central student commons with food service to allow students to inhabit the building throughout the day. The building contains almost no faculty offices, thus avoiding any sense of departmental ownership or territoriality. Finally, the building includes a high degree of *transparency* among its various student spaces and labs to create an open environment and to celebrate the learning activities taking place throughout.

The building embraces several important *sustainability* strategies. The building utilizes Cross-Laminated Timber (CLT), a naturally renewable resource, for building structure. CLT framing has a dramatically lower carbon footprint than a traditional steel frame: compared with a CLT structure, structural steel fabrication requires 24 times the energy and carbon output per ton. Further, re-using the existing power plant is a sustainable strategy in itself, saving the energy and materials that would have been used to manufacture and transport new building materials to accommodate the activities housed within.

Architecturally, the renovation of the power plant acknowledges and affirms the ongoing evolution of the historic MSU campus. The re-imagination of the power plant interiors into new spaces for innovation and learning is a testament to the University's commitment to architectural innovation in support of innovation in learning. The new STEM lab wings, designed as additions to the power plant, are aesthetically sympathetic to the original 1940's brick architecture while balancing the more traditional brick massing with more contemporary elements. This approach is meant to support campus continuity and coherence while also conveying a sense of the new and bold program contained within.

CREDITS: Ellenzweig served as overall design architect and laboratory planner for the project; IDS served as Architect-of-Record and designer of the power plant renovations.