Swing Spaces: Helping Academic Institutions Keep Their Campus Together During Construction Projects and Programs

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As today's institutions of higher learning expand and renovate their facilities to accommodate the latest in instruction and research technologies and tools, they often encounter a specific challenge: maintaining their academic programs at the high level their students and faculty expect while construction is underway. Careful planning and management of "swing spaces" can help universities meet this challenge without major disruptions to campus activities. The University of Rhode Island (URI) College of Engineering's recent experience exemplifies the successful planning and management of a construction project requiring swing space.

Ten years ago, the Dean of the College of Engineering launched a mission to replace the College's outdated buildings and update its academic paradigm. The first successful product of that mission is the new Fascitelli Center for Advanced Engineering. The project commenced in January 2016. After the demolition of five older engineering buildings, construction of the new 186,350 SF, $132 million facility began. The new building was occupied in September 2019, in time to be used by the students and faculty of the University during the 2019-2020 academic year.

Part of the Dean's program on a parallel track was the renovation of Bliss Hall. Bliss is one of the original historic stone buildings on the URI quadrangle. The 35,000 SF building completed in 1928 has always been the historic center of the College of Engineering. The $27 million project included a "gut" renovation down to bare structure and a 15,000 SF addition facing the new Fascitelli Center. This project began construction in the spring of 2018 and was occupied by the University in December 2019.

Finding the Swing Space

Delivering these projects while maintaining the University's academic programs required a creative approach to providing temporary space when the construction was underway.

About 135,000 SF of programs and offices in six existing buildings (the five to be demolished for the Fascitelli Center as well as Bliss Hall) had to be relocated into spaces capable of hosting classes, housing staff, and keeping existing research underway. As an extension of the University's Office of Campus Planning and Design and the Office of Capital Projects, Hill International, Inc. (Hill), served as the project manager responsible for managing the design and construction efforts.

When the Hill team began working for URI in January 2016, the first challenge was to manage the development of these temporary swing spaces. Occupants of six buildings had to be moved to new quarters so the buildings could be vacated and demolished or gutted. This was not an insignificant effort, and at the end, the cost of the swing space totaled around $7 million.

URI was fortunate that it had just completed construction of a new chemistry building on the edge of campus and had vacated Pastore-Morrill Hall in the center of campus. These facilities provided about half of the swing space needed for the College.

To fill the gap, URI found space in five other buildings and then leased about 40,000 SF of space in an electronic assembly plant owned by Schneider Electric about one mile from campus. This housed the electrical engineering program, faculty offices, capstone spaces, the Dean of the College, and support staff. On campus, the "University Faculty Club" was adapted for classroom and student lounge use. In the Memorial Union building, a space was modified into a general classroom and was also set up to be quickly converted into a dance studio.

URI's engineering program also includes a full professional machine shop. It was permanently moved into an underutilized space in another engineering building, Kirk Hall. In all, spaces in five buildings had to be designed, fit up, and occupied before the main projects could begin.

Swing Space on Schedule

From a dead start in January 2016, the team had to develop a phasing plan, execute swing space designs, buy the work from contractors, and then move the College into the swing spaces by May 2017. Moving mid-semester was not an option, so all moves were timed to the summer and winter breaks. Phase 1 was to be done by January 2017, Phase 2 by May 2017, and Phase 3 and other spaces by September 2017.

Immediately, Hill and the University developed a list of initial tasks to accomplish:

- Execute the off-campus lease and vacate the spaces in the on-campus buildings.
- Contract the designers needed to prepare bid documents for these spaces.
- Do an equipment inventory. (The College of Engineering had a huge amount of equipment to move and set up. Hill performed an inventory of all the equipment and usable furniture, including such information as dimensions, electrical and water requirements, data requirements, heat generation, and condition. Over 5,000 items were inventoried. This was used by the design team to complete the swing space drawings, plan for furniture needs in the swing spaces, and create the new and renovated building plans.)

Machine Shop Equipment to be Relocated.

As the spaces were secured, the team had to overcome additional challenges in the on-campus buildings:

- Prepare and manage a detailed and workable schedule that all the team members bought into.
- Confirm with users that the designs met their program and academic needs.
- Coordinate the efforts of the contractors to avoid interference with the University's operations.
- Manage the design and construction costs.
- Plan, purchase, and execute the moving services to pack and relocate contents of labs, the equipment, and staff.
- Educate the faculty and staff on the challenges ahead and get them working on cleaning up and preparing to move. Decades of accumulated academic materials had to be removed.

- Prepare Pastore-Morrill, an 80-year-old former chemistry building for alterations. The building had to be thoroughly cleaned out, including decontamination of fume hoods and labs. Abandoned equipment and furniture had to be removed and disposed of following guidelines for state-owned property.
- Relocate the Kirk Hall occupants so the machine shop construction could proceed.
- Get approval for the on- and off-campus swing space plans from the building department, fire department, campus police, the University fire alarm manager, and the University IT department.

At the space leased from Schneider Electric, there were specific challenges:

- Arrange for building security in the new spaces. The URI section had to have its own access card system.
- Provide new CCTV and blue light devices at the building.
- Arrange for new fiber-optic feeds and provide a data network and URI servers for the facility.
- Arrange for expanded shuttle bus services for students and staff to and from the main campus.
- Create signage and branding for the space so visitors could easily find and access the College.
- Arrange for parking.

On campus, several critical transportation and utility issues had to be resolved:

- Compensate for the over 80 on-campus parking spaces removed by the project.
- Adjust the campus shuttle bus routes around the construction areas.
- Develop tree protection plans for significant trees on and around the site.
- Work with the gas utility to relocate the campus steam plant gas line away from Bliss Hall and the future Fascitelli Center before winter.
- Help ensure the educational programs were adjusted to match the capabilities of the swing spaces.
- Develop site utilization plans so the bidders knew the “rules of the road” across campus.

All spaces had to be set up to support the College of Engineering’s specific research and teaching needs. Labs had to be fitted up with required engineering MEP infrastructure. Classrooms needed new AV systems installed. Many spaces had to have walls removed and spaces modified to accommodate larger labs and classrooms. The keying and locks had become so modified after 40 years, the entire system had to be reworked. Hill’s Project Coordinator Patrick Lydon spent more than three weeks resolving the keying and lock issues.

Sometimes, the reconfigured spaces did not meet campus classroom standards. For example, URI requires a certain number of linear feet of marker boards in classrooms. The designs for one of the swing spaces did not meet those standards and this was discovered just three weeks before occupancy. To fill the gaps, Hill inventoried all the marker boards in the buildings to be demolished, selected the ones that would achieve the campus standards, and worked with the contractor to relocate existing boards.

At the Schneider Electric site, the entire space had to be adapted to its new use. Schneider Electric provided a design-build contractor (New England Construction) to work with URI to design and build out the spaces as needed for the electrical engineering and computer science labs, student capstone areas, and faculty offices. Hill's support was critical in helping to ensure that the design met the needs of the University. For instance, a new fiber optic cable was required to tie the University to this space. Hill identified this as an early critical path item and worked with the URI technology group, Verizon, and Schneider to find the best path into the building, select a data closet, and bring required power and AC to the space.

Schneider Electric Space

Altogether, design efforts were proceeding on parallel tracks for Kirk, Pastore-Morrill, the Memorial Union, the old University Club, Schneider Electric, the new Fascitelli Center, and the renovations to Bliss Hall. There were two phases of construction in Pastore-Morrill, a third at Kirk, a fourth in the smaller swing spaces, and a fifth at Schneider Electric. At one point, swing space construction was occurring in four disperse areas at the same time. Careful project management oversight was critical to monitoring the schedules of this work while helping to ensure that the University's goals were being met.

Construction

For the on-campus building modifications, URI used the Construction Manager At-Risk approach. Dimeo Construction, the Construction Manager (CM), developed three guaranteed maximum prices (GMPs) for the swing space work, which took far less time to prepare than a more traditional lump-sum bid would have. This helped the team meet the University's tight schedule. Dimeo, who also did the main building, was able to provide the right sized staff to support all the work in the different on-campus buildings. The CM's efforts were well coordinated, and the flexibility to use allowances and contingency to deal quickly with unforeseen conditions in 50- to 80-year-old buildings made the schedule possible.

New England Construction, the design-builder for the off-campus fit up, was also flexible and responsive. They provided a GMP directly to Schneider Electric. Working with URI, Hill managed to included allowances and contingencies that were reasonable and allowed the team to begin construction early. For example, the exterior sign on the building was taking a longer time to develop. An allowance was established, and the team designed to the budget as demolition and construction were already getting underway inside the building. Working closely with Schneider Electric and URI, the design-builder was able to get the 30,000 SF first-phase space ready for occupancy in just four months.

A Renovated Kirk Lab

Temporary Computer Lab Space

Temporary Classroom Space

Temporary Lab Space in Pastore-Morrill

Schneider Electric Capstone Space

The New Machine Shop in Kirk

Clean out of the Abandoned Spaces: Assistance from Interns

Over the course of the project, four interns from the College of Engineering worked for Hill's project management team. Each added significant value to the project. During construction, interns provided project documentation services, verifying equipment specifications if there were questions. During the moves to swing spaces, the interns were in the buildings, helping the movers get items to the right spaces. Because they understood the culture and physical layout of the campus and had relationships with critical faculty stakeholders, they were able to troubleshoot problems that arose and to document the process. They often knew about the equipment that was being moved and how it was used. Also, being students from the College, they were stakeholders themselves.

Emptying buildings that had not been renovated in years meant that there was a lot of junk. Schools in particular tend to accumulate an ample amount of physical debris: notes, assignments, old textbooks, lecture materials, equipment, etc. All of this had to be disposed of appropriately. Months before the moves, the team went through all the equipment with the staff and made it clear that they had to get unwanted items removed from the inventory before the rest of the materials could be moved out. Much of the obsolete equipment and furniture was tagged as state property, which the team could not just toss in a dumpster. Each tagged item had to be untagged and that took time. The Hill interns again assisted by tracking the status of these tagged items.

Beyond equipment and furniture, Hill found decades of academic journals and old departmental files throughout the buildings. Some files could be disposed of, but confidential personnel files had to be disposed of through a shredding process. Weeks before the moves, Hill arranged for recycling/shredding bins to be provided throughout the buildings for the staff to clean out their files. Even after the purge, at Bliss Hall alone, the team filled at least one 30-yard dumpster with old unwanted files, journals, and other papers.

Hill came up with an innovative approach to accomplish the removal of the files. Several of the club sports on campus did "work-a-thons" to raise money to support the student-run teams. To get rid of tons of paper material, the College worked with the University's club rowing team to remove detritus left behind in the building. This helped the club rowing program earn money for expenses and helped the College get decades of trash out of the building.

Moves: Wave Tanks, Wind Tunnels, and a Visit from the Dean

The moves to swing spaces and permanent homes included not only the relocation of the people and their offices, but of hundreds of pieces of equipment. Many were large enough to require special planning and rigging. For instance, a wave tank and a wind tunnel were so long that they had to be moved into their new, permanent home at the Fascitelli Center before the interior walls or exterior glazing were completed and then protected while construction was completed around them. Hill worked with the CM to procure the cranes required to hoist the large equipment through openings in the curtain wall.

In preparation for the moves to and from the swing spaces, several meetings were held with faculty and staff to review the packing and move strategies. One complication was ensuring that professors who left campus for the summers prepared prior to departure. The Dean stepped in and made it clear that all

professors were required to prepare their materials for the move so the project would not be delayed. Packing materials, boxes, and crates were provided in plenty of time for the staff to start cleaning out as much as four months before the moves.

The moves also had to be completed no less than three weeks before school started to allow the staff to unpack and set up. Because the team built this prep time into the schedule, no research or teaching programs were delayed.

Getting all the empty boxes out of the buildings and the plastic moving crates emptied proved to be a challenge. To get the packing material out, the rowing team was again utilized to gather all the boxes for disposal or storage.

Rented plastic packing crates were invaluable for the moves, but the staff also liked the crates as long-term storage bins. As there was a weekly rental cost from the mover, keeping the crates was not an option. Again, the project team had to make its expectations clear. Hill used the interns to track down the crates and asked the Dean's office to encourage staff to unpack and return their crates as quickly as possible.

Moving into the New Spaces: Last-Minute Surprises

The final moves to the renovated Bliss Hall and the completed Fascitelli Center for Advanced Engineering were accomplished very smoothly three years after the move out began. The staff had become familiar with moving procedures and were pleased to be getting into the long-awaited spaces.

Yet, there were some last-minute surprises. During construction, the College staff purchased new equipment, but failed to notify the construction team. When the final move planning started, Hill found that added infrastructure was required in several areas to support the new equipment. Fortunately, Hill had anticipated this by ensuring that the CM carried an allowance for last-minute MEP hook ups in their GMP. This allowed the team to quickly add the power, compressed air, and plumbing services needed before the moves started.

Before the project could turn the spaces back over to the University, Hill managed the final clean out of the swing spaces. After just three years, a significant amount of materials had accumulated that had to be disposed of, including some equipment, which had become obsolete in just three years. Items the staff thought they would want to keep in the first move were left behind. Hill coordinated the clean out by providing dumpsters and a labor force to get the materials out of the swing spaces and decontaminate all the fume hoods and labs. The result was that the project left the swing space facilities in better conditions than they were when the project started. Immediately after the College moved out, the University was able to reassign other departments to the vacated areas.

Lessons Learned and Cautions

The complications and costs of providing temporary swing space for an entire College should not be overlooked. The cost of the swing space was between 5% and 6% of the total project cost. To plan, build, and move into the swing spaces took about a third of the Fascitelli Center's construction duration. The

College staff even had to adjust their teaching plans to suit the space that was available. Spreading the College across six different buildings created the need for enhanced shuttle transportation and adjustments in class schedules to allow students to get between the remote buildings. To the good, the moves required the staff to sort out their labs and storage closets. The purge of obsolete materials and paperwork left the College in a better position.

Hill had four professionals working full time on the planning and execution of the swing space and the design of the new buildings. Over the long duration, Hill also received assistance from part-time interns from the College of Engineering. This may seem like a large staff, but owners need to consider that a $151 million dollar project in multiple buildings with multiple designers is not simple. Moving more than 90,000 SF of space takes a lot of planning and a lot of monitoring. The short duration allotted to the design and preparation of the swing spaces demanded the four-person staff to work on all of the swing space tasks concurrently with their responsibilities during the Fascitelli Center and Bliss design phases.

The Hill Team Giving a Site Tour to URI Students

Throughout construction, the University did not lose functionality, and the enrollment of students in the College of Engineering went up every year, testifying to the success of the swing space and the promise of the new facility. Any higher-education institution considering the use of swing space during a construction project should dedicate the proper project management staff to plan and coordinate all of the work so they can find the same success.

The Completed Fascitelli Center for Advanced Engineering

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About the Project:

Project: *The University of Rhode Island College of Engineering - Fascitelli Center for Advanced Engineering*

Owner: *For the Design Phase - The Office of Planning and Design*
For Construction - The Office of Capital Projects - Paul DePace Director
The College Faculty Liaison - Dr. Peter Swaszek
Dean of the College - Raymond Wright

Hill's Team: *Jim Devol - Project Manager (swing space and the Fascitelli Center for Advanced Engineering)*
Michael Steinbrecher - Project Manager (Bliss Hall)
Inger Hamre-Foley - Assistant PM
Patrick Lydon - Project Coordinator
Matt Fuller - Project Coordinator (Bliss Hall)
Interns - Four URI students over the duration of the project

Designer: *Ballinger*

Contractors: *Dimeo Construction Company*
New England Construction (Schneider Electric swing space)