

BUILDING CONSTRUCTION TECHNOLOGY LAB

SPACE DESCRIPTION

The Building Construction Lab is a dedicated space used to train students in the primary trades of the construction industry while preparing them to work on a jobsite. This is a large room with high ceilings, open floor space, and flexible utilities to accommodate various tools and equipment. The best laboratories are designed to mimic live construction sites with a constant rotation of tools and materials. Mobile tool trainers, job-boxes and saw horses shall be employed in lieu of fixed equipment and workstations.

The Lab requires direct access to a Mock House, which is frequently used in conjunction with the HVAC program, a Tool Crib and a Storage room.

The layout shown is illustrative of basic concepts and spatial needs for 14 students; but should be adjusted according to each campus' specific requirements. The lab is also illustrated as part of a larger "construction trades" lab – co-located with the HVAC program.

Depending on Service Area needs, the following areas of study may practice in the Building Construction Technology Lab:

- Carpentry
- Concrete & Masonry
- Construction Management
- Maintenance
- Electrical Technology
- Applied Sciences
- OSHA

As all programs in the AMEAS field quickly evolve and expand, so too, must the space they occupy. The Lab, the site, and all infrastructure shall be planned with flexibility and reconfiguration in mind. Buildings Construction Labs are most successful when located at the rear of campus property, outside the common path of travel, and with area for future building additions.

Outdoor facilities shall include an overhead door for movement of large equipment and a gravel area with hose bib for tool cleaning tools. A fenced service yard with concrete pad is required for outdoor instruction, deliveries, and storage of materials. A covered area for work and storage is preferred. Consideration should be given to roof-mounted solar panels, which may serve as educational tools, in addition to offsetting some energy use.

SUCCESS FACTORS

Safety: Due to the hazardous nature of this work, Building Construction Labs must be designed with safety as a top priority. The Labs must be outfitted with safety equipment, such as tie-offs in the ceiling, and must comply with all relevant safety regulations and standards. Walkways through the space should be clearly marked, and equipment should be properly located to prevent harm.

Flexibility: The Lab shall be designed as a "sandbox" allowing easy movement of tools, materials, and job boxes around the Lab and Mock House to allow a variety of configurations for flexibly teaching skills. Garage doors, open floor space, overhead utilities, and equipment on rollers all lend to a flexible space.

Materials and equipment will regularly be erected and demolished, moved and rearranged, as construction progresses and technology evolves.

Noise Control: Building Construction Labs shall be designed to reduce noise levels, as they are loud spaces by nature creating poor sound quality for instruction. Sound absorption shall be provided on wall and ceiling surfaces, and walls shall be constructed to reduce sound transmission to adjacent spaces. This lab should be located away from acoustically sensitive spaces.

GENERAL

All perimeter walls shall be full height to deck.

ADJACENCIES

Separate but adjacent space is required for the following: **Mock House, Computer Lab, Tool Crib, and Storage.**

Ideally, the Building Construction Technology Lab adjoins an HVAC Lab for shared use of the Mock House and cross-training between programs.

ACOUSTICS

Building Construction technology Labs are naturally very loud spaces due to the activities in the space. Provide absorbent panels on walls and ceilings for noise reduction and to decrease sound transmission to adjacent spaces. Consider durability for panels mounted lower than 8' A.F.F, and ease of cleaning for all panels.

Where HVAC labs border acoustically sensitive spaces, exterior walls should have a minimum STC rating of 50.

MECHANICAL

Electrical power shall be provided in overhead bus bars to allow for future flexibility. Compressed Air, Gas, and Water are likely to be best distributed overhead to allow for reconfiguration. Verify specific needs on a project-by-project basis while planning for flexibility in the future.

- Outside ventilation and exhaust fans (plastic and metal) are required.
- Fire protection is required due to the activities and combustible nature of construction materials.
- Provide plumbed natural gas to outside tanks. No tanks inside the Lab. Verify gases with the program.
- Provide a sink with sand/ cement trap and emergency shower with eye wash.
- Provide floor drains in locations as required for certain equipment. Drains become clogged with saw dust and other construction detritus. Sediment buckets and cleanouts are required.
- Provide a grease interceptor for the building.

ELECTRICAL & DATA

- High voltage service is required. Provide flexibility for 120/208V 3-Phase and 480/277V 3-Phase, standard. Verify required voltages with planned and future equipment.
- Provide twist-lock plugs for trainers, similar to Hubbell HBL2511 and HBL2513.
- Emergency shut-off switches are required.

Provide power and data at 6' intervals along perimeter walls at locations which may be used for desktop computer workstations and/or lab equipment.

LIGHTING

- In high-bay areas, provide LED lighting in warm, soft white color.

TECHNOLOGY

All utilities shall be provided overhead, including Internet.

- Provide Wireless capability throughout FLEX Labs with Wireless Access device.
- Provide telephone service.
- Provide high-speed internet throughout, with each machine connected via CAT-6 cable from bus bar overhead (min. 13' clear below). Verify specific requirements.
- PSEP cameras are required at high security locations.

ACCESSORIES AND EQUIPMENT

Equipment needs should be determined on a project-by-project basis while planning for flexibility in the future. The hands-on nature of this training requires specific machinery as a minimum:

- Provide guardrails with removable sections to define walkways. Removable sections allow for movement between spaces.
- Equipment on rollers for flexibility (trainers, job boxes)
- Dust recovery collector
- Air compressors
- Fire extinguishers
- Wall-mounted tack boards and marker boards

FURNITURE

Provide the following standard furnishings for Building Construction Labs:

- Work benches and job boxes on rollers for flexibility and mobility.
- Wall shelving and storage racks on perimeter walls.

FINISHES

Ceilings

Recommended Height: 18' clear with exposed structure for future reconfiguration of unistrut systems to support utility lines. Provide tie-offs in the ceiling. Provide acoustic panels for sound absorption.

Floors

Polished or sealed concrete slab (6" min. thickness). Verify specific needs on a project-by-project basis while planning for flexibility in the future.

DOORS AND WINDOWS

Provide overhead doors to allow large equipment and materials to move in and out of the lab.

Clerestory windows with E/W exposure, preferred. Place windows above 6'-0" high to reduce damage; or provide reinforced glazing/ window film.

STORAGE

SPACE DESCRIPTION

Building Construction Technology requires ample storage space for the various tools and materials that are constantly rotated around the space. A Storage room shall be located adjacent to the lab for the storage, loading and delivery of these tools and materials. For flexibility and ease of movement, equipment shall be on rollers for transfer between spaces. Size double doors

Provide overhead coiling doors for direct access to the Exterior.

TOOL CRIB

SPACE DESCRIPTION

Directly adjacent to the Storage room, the Tool Crib provides a secure location for the storage of tools and supplies. The crib should be secured by walls, or a guardrail with locked gate, and PSEP camera coverage.

Additional equipment includes tool chests, shelves and cabinets as determined by the program.

Provide double doors with key fob access or locked gate.