OWATC BDO BAY 2 IMPROVEMENT PROGRAM

BUILDING PROGRAM

DFCM PROJECT NUMBER: 12286240
FEBRUARY 12, 2013

BOTT PANTONE ARCHITECTS

OGDEN-WEBER TECH COLLEGE

ACKNOWLEDGEMENTS

STATE OF UTAH DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

Darrell Hunting	Project Manager

OGDEN-WEBER APPLIED TECHNOLOGY CENTER

Collette Mercier	President
James Taggart	VP Instructional Services
Patrick Dean	Facilities
Curtis Nielsen	Program Director
Dana Slaughter	Program Director
Jim Hatch	Lead Instructor
Christy Scow	Custom Fit Training Mgr.

Ogden_Weber Applied Technology College
BDO Bay 2 Improvement Program
DFCM Project No. 12286240

We have reviewed the OWATC BDO Bay 2 Improvement Program and warrant that it adequately represents our request for a facility to fulfill our mission and programmatic needs. All appropriate parties representing OWATC have reviewed it for completeness and accuracy.

STATE OF UTAH DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

Darrell Hunting, Project Manager Date

OGDEN-WEBER APPLIED TECHNOLOGY CENTER

Collette Mercier, President Date

James Taggart, V.P. Instructional Services Date

Patrick Dean, Director - Facilities Date

Curtis Nielsen, Program Director Date

Dana Slaughter, Program Director Date

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1 EXECUTIVE SUMMARY

BDO FACILITY HISTORY

Building 10A, at the Defense Depot - Ogden (BDO), is one of a number of similar facilities on this campus, which was constructed in the 1940's as an army defense depot for World War II. The facilities are no longer needed or used by the Department of Defense and have subsequently been managed by a developer for use by private industry. The southern two bays of the six bay facility have been given, without cost, to the State of Utah for use of the OWATC with a commitment from the agency that the facility is to be used in various programs for the training of students for the next 30 years. The other four bays are under the control of the Weber School District.

In the winter of 2001, during a demolition contract, the southernmost bay, "Bay 1" burned to the ground. All that was left was the foundation and a damaged concrete floor slab. The "area separation wall" between bays 1 and 2, for the most part, contained the fire in Bay 1.

Bay 1 was rebuilt as a pre-fabricated metal building in 2003 and is currently occupied by the OWATC. Portions of Bay 1 have been analyzed in this study for potential reconfiguration of spaces to meet the future needs of the OWATC and it's programs.

FACILITY DESCRIPTION

Building 10A is comprised of six bays (one lost to the fire), each bay containing approximately 45,000 s.f. Fire-rated area separation walls divide each bay. The building's overall width is approximately 188 feet and the length of each individual bay is 240 feet. The overall length of the entire building is approximately 1,440 feet.

The construction of the building is Type V-N (combustible with no fire rating of various elements). Each bay is divided into thirds by two rows of 10" X 10" wood timber columns. Please refer to the existing facility drawings found in this report for existing floor plans, elevations and building sections. The outer bays have approximately 20' ceilings while the middle bay has approximately 30' ceilings with clerestory windows along the east and west high walls. The columns support large wooden trusses spaced at approximately 10' on center, which span each third of the bay. 2 X 12 roof joists span between the trusses.

PROJECT HISTORY AND JUSTIFICATION

The Composites Program is currently housed within the Manufacturing Building on the OWATC main campus. This program has experienced significant growth in recent years and is predicted to grow substantially in future years. As the automotive, aviation and outdoor industries continue to increase the implementation of composites technologies, this program is expected to experience significant growth. The OWATC has determined to relocate the Composites Program to the BDO facility in order to provide adequate space for current needs and future growth projections.

In order to meet the needs of future programs and changing program needs, the OWATC has also determined to program and allocate space at the BDO facility for a future, undetermined program (Flex Program). This program could be an existing program relocated to the BDO for strategic purposes, or a future undetermined program created to meet the demands and needs of local employers.

The MITC program (Manufacturer Innovation Training Center) is currently housed within the north end of Bay1 in the high bay area. This program currently consists of 3 flexible spaces which are leased to startup manufacturing companies to assist them in developing and testing new manufacturing processes. These spaces are each served with individual electrical meters, gas service, and compressed air. The lessors are responsible to furnish and configure the spaces according to their needs. The MITC Program will require reconfiguration due to the improvements which will occur in Bay 2.

The Forklift Training Program is also currently housed in the north end of Bay 1 in the high bay area. The Program also utilizes Bay 2 for forklift training. This program will need to be condensed and relocated to Bay 1 due to the Bay 2 improvements.

VISION AND PLANNING

Following are the goals and objectives for the proposed BDO Bay 2 Improvement project:

Organizational Goals:

- The tech college is a leader in developing a world-class, technically educated work force. We are committed to meeting the needs of employers and strengthening business and industry competitiveness, while providing an excellent return on taxpayer investments. Through partnerships with employers, students, educators, and sponsors, we continually improve programs and services to meet their needs for technical education. The tech college is a pathway for students as they prepare for a new career, advancement opportunities, or further education.
- The proposed facility will assist the college in its goal of meeting the needs of local employers.
- The proposed facility will emphasize and capitalize on its location in the center of “industrial action”.

Functional Goals:

- The exterior of the proposed facility will be compatible with the existing Bay 1 aesthetics.
- The finish level shall be equivalent to that of existing Bay 1.
- The architecture of the proposed facility will create a bright, clean, warm and inviting atmosphere.
- The proposed facility shall promote human health and comfort through the utilization of natural daylight and noise control.
- The proposed facility shall express a clean, high-tech and innovative aesthetic.

Form Goals:

- The lab spaces shall imitate the scale and flow of industry.
- The design of the proposed facility shall promote connection/visibility between lab spaces, computer labs and instructor offices.
- The proposed facility will encourage collaboration and cross-fertilization by providing social interaction spaces for programs, employers, students and faculty.
- The design of the proposed facility will be flexible and provide the ability to adapt to a variety of program types.
- The design shall provide a local, safe, functional and efficient connection to existing Bay 1.
- Building spaces and systems to function as training opportunities.
- The building design shall provide for safe, controlled observation opportunities for local employers, businesses, students, etc.

BUILDING PROGRAM SUMMARY

General/Shared Spaces	3,400 NSF
Composites Program	15,970 NSF
Flex Program	10,610 NSF
MITC Program	4,200 NSF
Forklift Training Program	11,080 NSF
Total Net Square Feet	45,260 NSF
Grossing Factor	.20
Subtotal Gross Square Feet	54,312 GSF

Based on limited funding options, the Steering Committee determined to evaluate phasing options for the Bay 2 improvements.

Phase 1 would include the Composites Program which would be located at the south end of Bay 2 as well as the Entrance Lobbies and Student Commons areas which would serve as circulation and egress in the east and west directions.

The Forklift Training Program would be relocated and reconfigured in the existing north end of Bay 1. The existing MITC spaces in the north end of existing Bay 1 will be demolished and relocated to the west side of Bay 1. Two of the four MITC spaces will be located in the existing classrooms at the northwest end of Bay 1 which will be remodeled as required (please reference the "preferred building configuration" located in this report).

Phase 2 would include the Flex Program which would be located in the north end of Bay 2 and would complete the project as currently programmed.

BUILDING COST SUMMARY

Phase 1 (43,605 SF)	$5,609,287	($128.64 / SF)
Phase 2 (14,333 SF)	$1,821,117	($127.06 / SF)
Subtotal (57,938 SF)	$7,430,404*	($128.25 / SF)

*Cost before mark-ups:
General Conditions (6%)
Overhead & Profit (4%)
Design Contingency (15%)

General Conditions	$ 445,824
Overhead & Profit	$ 297,216
Design Contingency	$1,114,561
Total Construction Cost	$9,288,005

2 SITE ANALYSIS

SUMMARY

The Site Analysis component of the Program identifies the affects of the site on the program, project cost and schedule. It also describes the physical characteristics of the proposed site and vicinity. The Site Analysis incorporates maps, photographs, and diagrams, illustrating the location, functional uses adjacent to the site, vehicular and pedestrian circulation and the physical boundaries of the site.

The Site Analysis information is programmatic and should serve as an outline for a more detailed site analysis to be done in the design phase.

Ogden-Weber Applied Technology College's main campus is located in Ogden, Utah. The BDO campus is a satellite campus for the OWATC and is located in Business Depot Ogden which is an industrial park recently purchased from Ogden City by a local developer. The BDO campus is located directly west of the main OWATC campus.

The campus is located in a mainly industrial/manufacturing zone with some residential zones located directly to the east of the BDO campus.

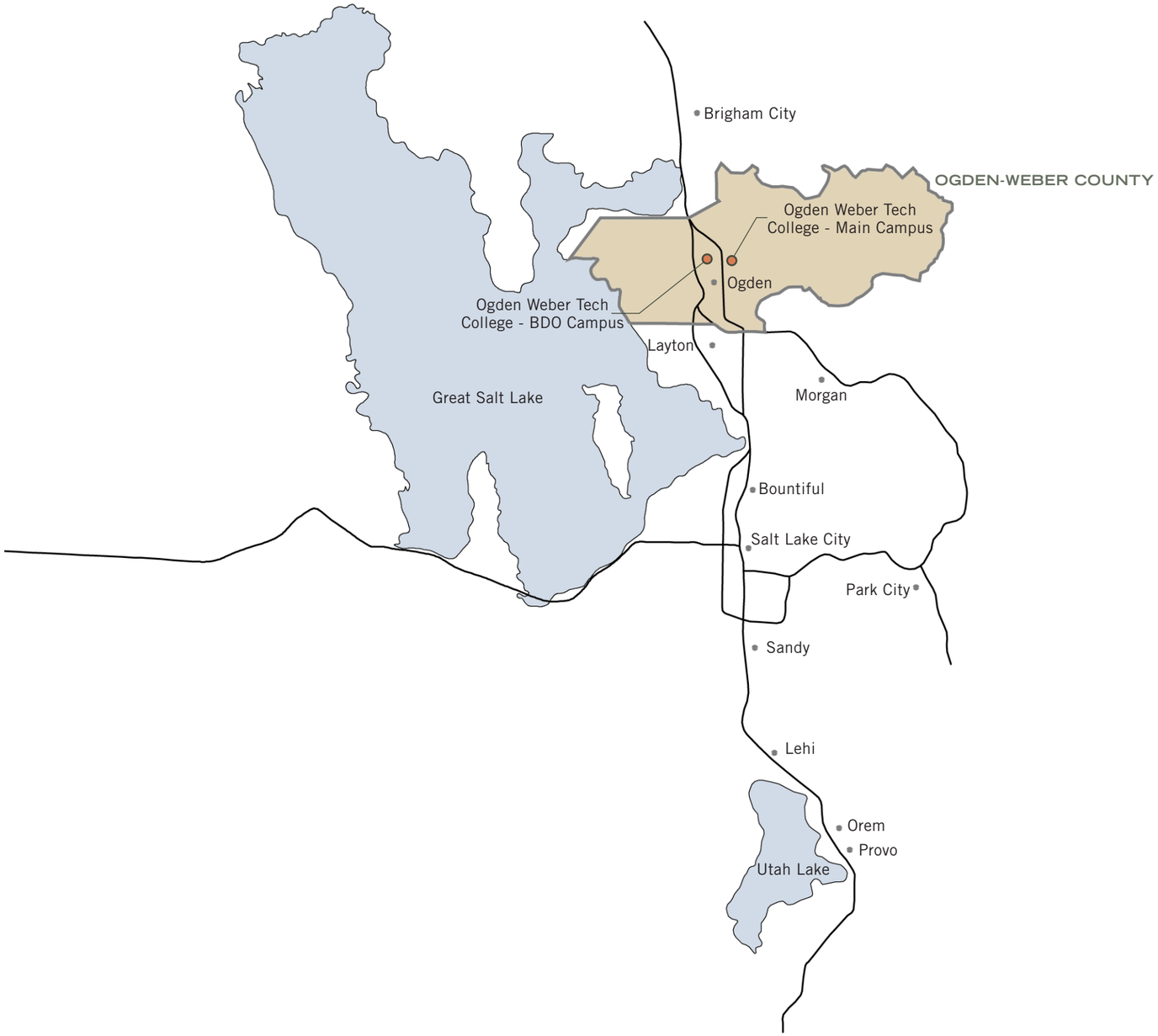
SITE FUNCTIONS AND RELATIONSHIPS

The OWATC BDO campus can be accessed from Wall Avenue to the east, 2nd Street to the south, or from 1200 West to the west. the campus is easily accessed from the I-15 corridor and there are several bus routes which serve the campus as well.

The OWATC maintains a parking lot to the south of the facility which is owned by the developer. There is minimal parking utilized along the west side of the existing building. Additional parking will need to be created along the east and west sides of the existing building, providing a minimum of 166 new stalls, including ADA accessible stalls.

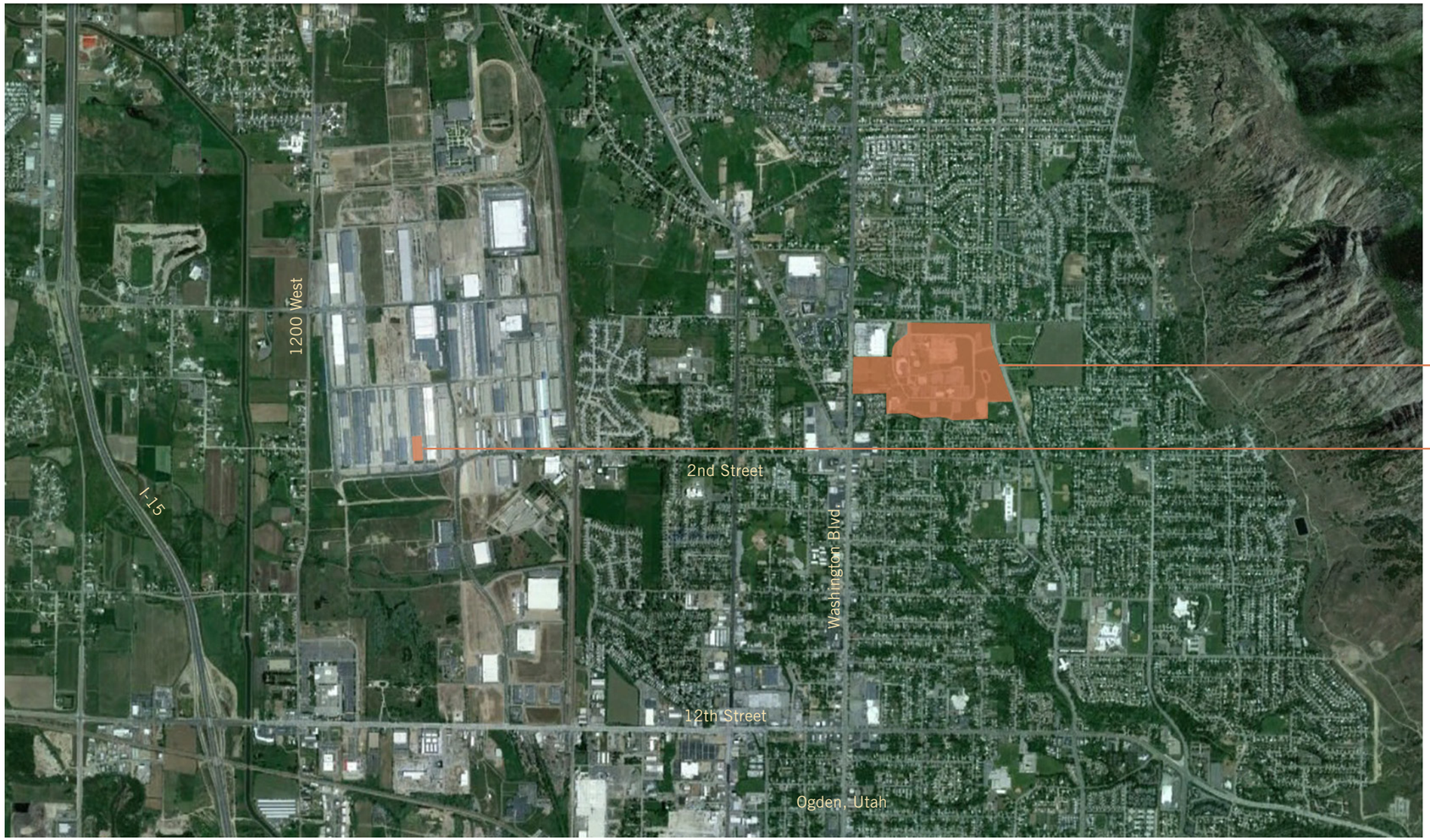
The existing road at the east side of the existing building is in very poor condition and will need to be replaced/upgraded in order to add parking to that side of the building. These road improvements will need to be coordinated with the developer during subsequent design phases.

VICINITY MAP



NORTH

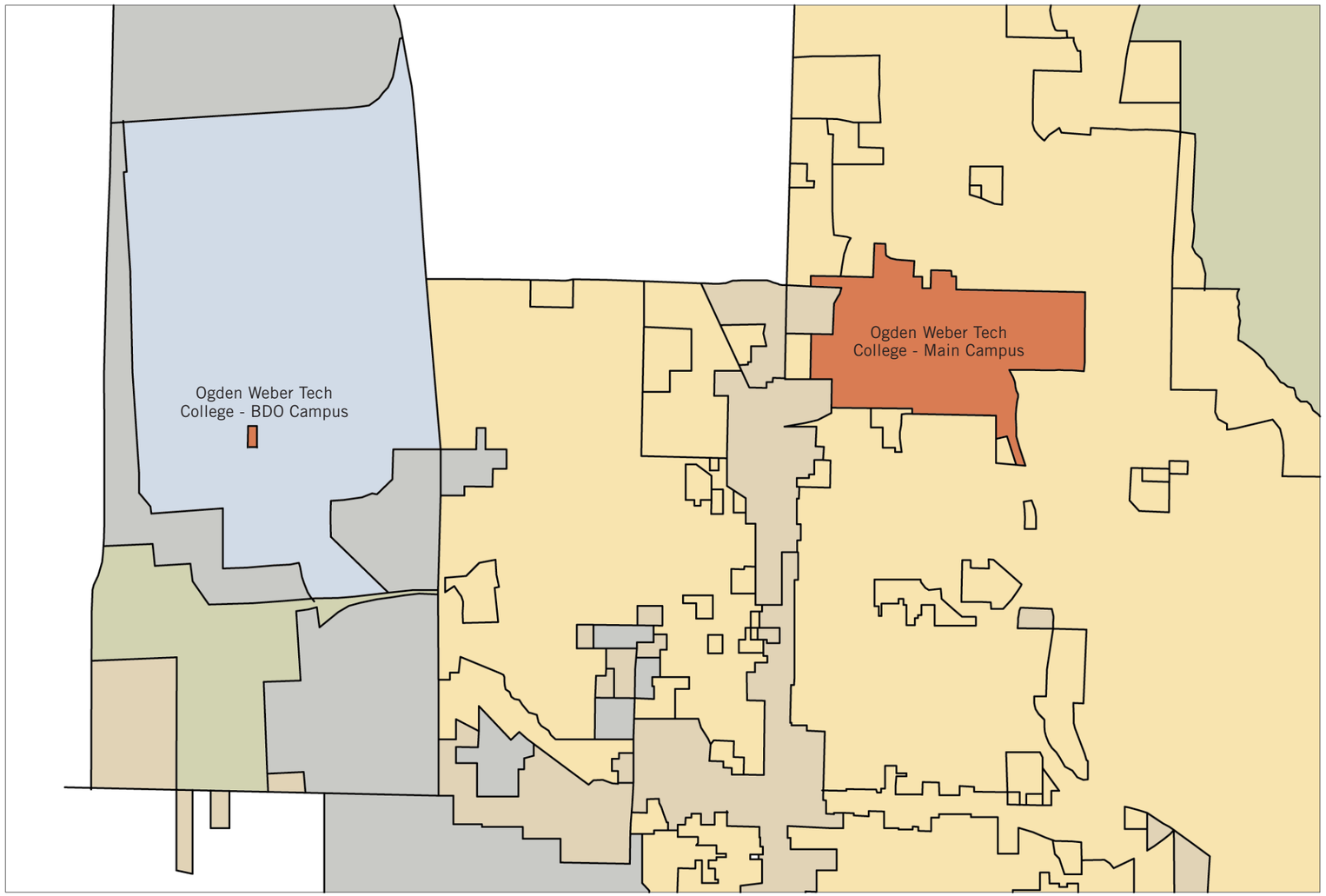
AERIAL VIEW MAP



Ogden Weber Tech College - Main Campus

Ogden Weber Tech College - BDO Campus

NORTH



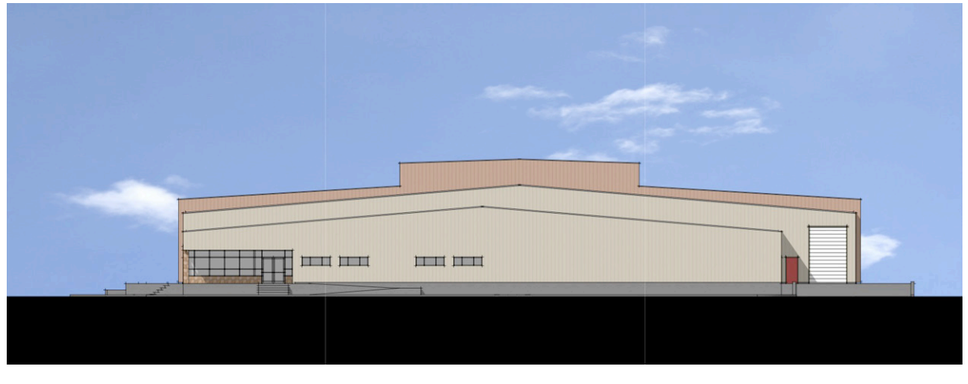
- Ogden Weber Tech College
- Commercial
- Manufacturing/Industrial
- Residential
- Business Depot Ogden
- Open Space

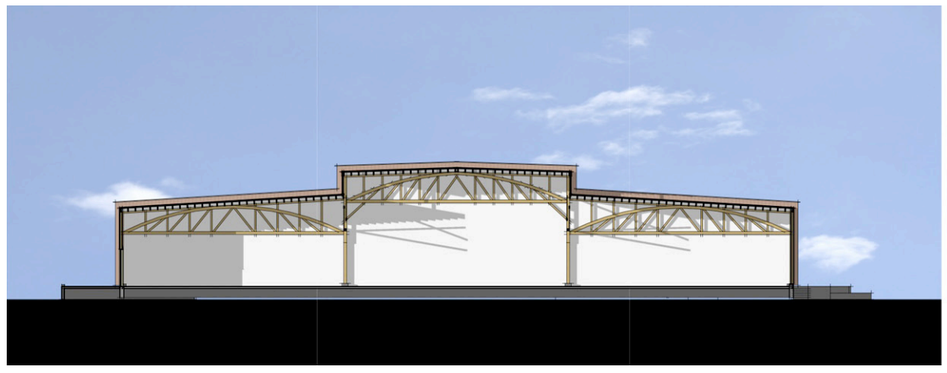
NORTH

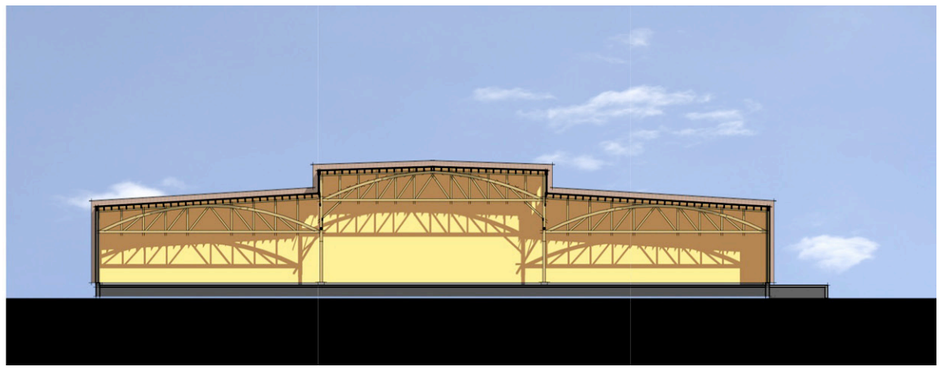
BDO TENANT DIRECTORY:

1 Ogden-Weber Tech College
2 AAR
3 BDO Outlet
4 ICON Health & Fitness
5 Fresenius
6 Flying J
7 G.L. Enterprises
8 JDH Group
9 Kenco
10 Lofthouse Foods
11 Nutraceuticals
12 PW Mackenzie
13 Edge Products
14 Scott USA
15 TCR Composites
16 Weber School District

EXISTING BUILDING 10A FLOOR PLAN







3 BUILDING REQUIREMENTS

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VISION AND PLANNING

Early in the programming process, Bott Pantone Architects facilitated a Vision Workshop with the OWATC Steering Committee. The participants developed and listed the key goals and objectives for the project and developed a "vision" for the future facility.

Following are the goals and objectives for the proposed BDO Bay 2 Improvement project:

Organizational Goals:

- The tech college is a leader in developing a world-class, technically educated work force. We are committed to meeting the needs of employers and strengthening business and industry competitiveness, while providing an excellent return on taxpayer investments. Through partnerships with employers, students, educators, and sponsors, we continually improve programs and services to meet their needs for technical education. The tech college is a pathway for students as they prepare for a new career, advancement opportunities, or further education.
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Based upon the key goals and objectives and "vision" developed by the Steering Committee, the following text in this section summarizes the essence of the project. In addition to the following Architectural Design Criteria, please reference the Structural, Mechanical - Plumbing, Electrical and Sustainable Design sections for related narratives.

PROJECT SUMMARY

The proposed OWATC BDO Bay 2 Improvement Project will be new construction within an existing shell which will be structurally and seismically upgraded to meet current codes and structural requirements. The project will provide the OWATC with approximately 60,000 GSF, and over 47,000 NSF of usable space.

The proposed improvement project will provide the OWATC with a structurally sound, accessible, and energy efficient facility suitable for a cutting-edge, safe and comfortable teaching and learning environment.

The interior of the facility will provide cutting edge lab and classroom spaces purposefully designed for the Composites, Flex and Forklift Training programs. State of the art mechanical, electrical and communications systems will provide a healthy, safe, energy efficient space and will maximize human comfort. Lab spaces will express a clean, high-tech and innovative aesthetic and shall utilize natural daylighting to provide a bright, clean and inviting atmosphere.

The "Preferred Building Configuration" located in section 4 of this report is a result of several studies conducted with the OWATC Steering Committee and reflects their preferred configuration for the future project.

PHASING OPTIONS

Due to potential budget constraints as well as programming flexibility, the Steering Committee directed the Programming Team to develop options for phasing of the improvement project. The "Preferred Building Configuration" located in section 4 of this report includes the preferred option for phasing. This phasing option would allow the Composites Program to be constructed in the south end of Bay 2 with the future Flex Program being constructed in the north end of the bay.

FUNCTIONAL RELATIONSHIPS

The connection between Bay 1 and Bay 2 will be critical to the efficient and functional flow of people between bays. The administrative functions of the facility will be largely contained within the existing administrative spaces at the south end of Bay 1. The existing corridor at the west side of Bay 1 should be extended to provide a logical connection between bays in the north-south direction.

In order to meet parking requirements, parking stalls will be required along the east and west sides of the facility. It is desired that the current main building entry at the south end of the building be maintained as the main entry. The Steering Committee determined that secondary entrances on both the east and the west sides of Bay 2 will be required to provide direct entrance options from those parking areas. The east side of the facility currently has an elevated dock that runs the full length of the building. There is currently no existing stair or ramp system to provide an accessible entrance from the east dock. Therefore, a new stair/ramp system will be required as part of the Bay 2 improvements.

A Student Commons should be used to link the east and west entries/lobbies and will serve as circulation in the east-west direction. The Student Commons will serve as a gathering and collaborative space for students and faculty and should be located within the high bay area where natural daylighting can be utilized from the existing clerestory windows. Interior windows should be utilized between the Student Commons and the Composites Lab to create a visual connection to the lab spaces and provide for safe, controlled observation for local employers, businesses, students, etc.

The Steering Committee also expressed a desire for an "Observation Space" which could be used for visiting student and employer groups to safely observe the lab spaces. This "Observation Space" could be located along the window wall at a mezzanine level above the Student Commons which would provide effective viewing/observation opportunities into the lab spaces beyond.

The lab spaces should be primarily located within the high bay areas. This will allow for adequate ceiling heights and also permit the use of natural daylighting from the clerestory windows above. The existing roof trusses and columns in the high bay area provide a repetitive structural and organizing element and have incredible aesthetic potential for the future improvement project. It is desired that these structural elements are maintained and developed into an integral part of the design. New structural elements (trusses, columns, etc.) which are added due to the recommended gravity structural upgrades should be designed to match and complement the existing structure.

The lab support spaces (grind room, clean room, storage rooms, mechanical rooms, etc.) should be located in the low roof areas to the east of the lab spaces. This will allow for direct access to these spaces from the labs and will also provide direct connection to the east dock for the movement of materials. A 20' wide corridor (the width of the existing structural bays) should be provided between the east dock and the lab spaces for the movement of materials and student projects.

The office suite, conference room and classrooms should be located in the low roof area at the west side of the building. This will allow for exterior windows into these spaces as well as a connection to the corridor for direct circulation to the administrative areas in Bay 1. The office suite and classrooms should have a direct visual connection to the lab spaces beyond utilizing interior windows.

EFFICIENCY AND GROWTH FACTORS

The program recommendations contained in this report are based on current and projected future growth as well as existing available space. Space needs have been established using agency and DFCM standards and applying current and long-term student population projections to the spaces required. Space requirements have been developed through the use of population number and furniture/equipment sizes. The design should allow for flexibility and future growth. It is expected that the programs considered will grow and that the spaces in both bays will be fully utilized within 30 years.

ARCHITECTURAL FINISHES

While the aesthetic of the building's exterior and interior will be defined and selected in subsequent design phases, the Steering Committee has indicted it's desire to closely match the finishes and aesthetics of the existing Bay1 facility.

Material characteristics, including color, texture, light reflectance, acoustic properties and durability should be considered relative to the appropriateness and function of each individual space. In addition, sustainable attributes such as recycled content, rapidly renewable materials and regional availability should be given high priority.

Durability of materials will be critical in a lab atmosphere and only durable materials of institutional quality that require minimal maintenance should be considered and specified.

The existing clerestory windows offer a significant opportunity to develop daylighting for the interior lab spaces and to also provide daylight harvesting opportunities to the support spaces in the low roof areas. The existing windows will need to be replaced with insulated units and consideration should be given to increasing the area of the openings to maximize daylight entrance into the building.

The Steering Committee also expressed a desire to add skylights at the high roof between trusses to supplement the clerestory windows.

CODE NARRATIVE

The Governing codes for this project are listed below. The Design Team and Architect of Record – to be determined – needs to verify all required codes, and code requirements at the beginning of the subsequent design phase. It is the Design Team and Architect of Record's responsibility to utilize all latest revisions, editions, and adopted versions. The following analysis represents current applicable code issues, and is not a complete list of applicable codes.

CODE ANALYSIS – BAY 2

International Building Code (IBC)

- 2009

Occupancy classification - IBC Chapter 3

- 'B' Educational above the 12th grade

Type of Construction - IBC Chapter 6

- Type V-B, sprinkled

Building Area and Height for 'B' occupancy - IBC Table 503

- Allowable height = 40 feet
  (60 feet with sprinkler system)
- Allowable number of stories = 2
  (3 stories with sprinkler system)

For 'B'

- Allowable Square Footage = 9,000 sq. ft.
  (table 503)

Increase due to Frontage and Fire sprinklers
2700 sq. ft. + 27,000 sq. ft. = 29,700 sq. ft.

Total allowable Square Footage = 38,700 sq. ft.

- Proposed facility:
  1 story
  Main Level = 39,449 sq. ft.
  Total = 39,458 sq. ft.

Fire Resistive Requirements - IBC Chapter 6, table 601

- Structural Frame 0 hour rating
- Bearing Walls
  Exterior 0 hour rating
  Interior 0 hour rating
- Exterior Nonbearing Walls 0 hour rating
- Interior Nonbearing Walls 0 hour rating
- Floor 0 hour rating
- Roof 0 hour rating
  (Including supporting beam and joists)
- Corridor 0 hour rating
  (table 1018.1)

Occupancy Load Factors - IBC Chapter 10, table 1004.1.1

Description of Occupancy	Occupancy (SF/occupant)
• Accessory (Storage areas, Mechanical, Electrical, Telecom, Janitor)	300 gross
• Business Areas (Offices, Work Rooms, Break Areas)	100 gross
• Educational	
(classroom)	20 net
(vocational room areas)	50 net

Egress width per person served – IBC Chapter 10, table 1005.1 (with sprinkler system)

- Stairways = .20 inches/occ.
- Other = .15 inches/occ.

Corridors and Doors

- Section 1018.2 –
  Minimum corridor width is 44 inches
- Section 1008.1.1 –
  Minimum door width is 32 inches clear;
  Maximum door leaf is 48 inches
- Section 1018.4.2 –
  'B' occupancy dead end
  Corridors shall not exceed 50 feet
- Section 1018.5.1 – The corridor ceiling may be used as a return air plenum

Number of Exits – IBC Chapter 10, table 1015.1 and 1021.2

- For 'B' occupancies the load that exceeds 49 requires 2 exits

Common path of Egress travel

- Section 1014.3 – Common path of egress travel distance is restricted to 100 feet (sprinkled)

Travel Distance – Chapter 10, table 1016.1

- 'B' occupancy (sprinkler) = 300 feet

Exit Separation – IBC Chapter 1015.2.1, exception 2

- Exit separation in sprinkled buildings = one third (1/3) the diagonal dimension of the building or area

Stairs, Ramps, and Guards – IBC Chapter 10

- Section 1007.3 exception 2 – clear width of 48 inches minimum between handrail is not required (fully sprinkled)
- Section 1009.4 – Stair riser height shall be 7 inches maximum and 4 inches minimum. The stair tread depth shall be 11 inches minimum.
- Section 1009.7 – The maximum distance a stair may rise without a landing is 12 feet.
- Handrail is required on each side
- Section 1012.2 – Handrail height, from nosing, shall be not less than 34" and not more than 38"
- Section 1012.6 – handrail extensions must return to wall, guard, or walking surface. The handrail needs to be continuous to the next run of stairs, (if not) then the handrail must extend 12 inches beyond the riser and slope a distance of one tread beyond the bottom of the stair riser (ADA may require an additional, horizontal extension).

Area of Refuge – Section 1007.6 (Utah code amendment)

- Not required

Guards – IBC Section 1013
- Section 1013.2 – Provide Guard not less than 42 inches high
- Balusters of ornamental pattern shall not let a 4-inch sphere pass through any opening to 36 inches. From 36 inches to 42 inches a 4 3/8-inch sphere cannot pass through; a 6-inch sphere cannot pass through the triangle formed by riser and tread

Accessible – IBC Chapter 11
- Section 1104 – An accessible route required from the accessible paring to the building
- Section 1105 – At least 60% of the public entrances shall be accessible
- Section 1106 – Accessible parking spaces shall be provided in compliance with table 1106.1
- Section 1106.5 – At least one accessible parking stall will be Van accessible; provide 1 van per 6 accessible parking stalls
- Section 1109.2.1 – Unisex toilets are not required
- Section 1109.2.2 – Toilet facilities require that a minimum of one wheelchair accessible water closet compartment be provided
- Section 1109.3 – Each restroom will need to have one accessible sink
- Section 1109.5 – 50 percent of the drinking fountains to be accessible; at least one required
- Section 1110.1 – Required accessible elements shall be identified using the international symbol of accessibility

Based on the use of each space and a defined occupancy factor per square foot, the code establishes the occupancy (Occupancy Load Factors – IBC Chapter 10, table 1004.1.1) of the building. This occupancy load of the building is used to establish: 1) exit and door widths, 2) number of exits from individual space and the building, and 3) number and type of restroom fixtures.

Main level occupancy = 519 occupancy

- 1) Exit and door widths will be determined by IBC Chapter 10, Section 1005.1 (with sprinkler system)
- 2) Number of exits from individual rooms and the building
  Main level requires a minimum of 3 exits
  All of the classrooms require two exits
- 3) Number of Restroom Fixtures
  Main level = 519 occ/2
  = 260 men & 260 women

Interior Finishes - (Table 803.5)
- For sprinkled buildings in B or E occupancy exit enclosures and passageways = Class 'B' fire spread
  Corridors = Class 'C' fire spread
  Rooms and enclosed spaces = Class 'C' fire spread

Automatic Fire Sprinkler System – IBC Chapter 9 and NFPA 13
- Automatic Fire Sprinkler System throughout
- NFPA Chapter 10, Portable Fire Extinguishers

Plumbing Fixtures required – IBC Chapter 29; table 2902.1

FOR 'B'
- Water closets / Urinals
  Male/Female; 1 per 25 for first 50
  1 per 50 for the remainder exceeding 50
- Lavatories
  Male/Female; 1 per 40 for the first 80
  1 per 80 for the remainder exceeding 80
- Drinking Fountain 1 per 100 required (1 for standing and 1 for ADA)
- Service sink (for the building) 1 required

Main Level	Men	Women
Water Closets	7	7
Lavatories	5	5
Drinking Fountains	6 Total (3 for persons in a wheelchair)	

Roof Covering Fire Classification – IBC Table 1505.1
- 'C' Classification

STRUCTURAL NARRATIVE / CONCEPTS

Building 10A at Business Depot Ogden is one of the original wood/timber warehouses constructed as part of the Ogden Army Depot later known as Defense Depot Ogden. ARW is very familiar in general terms with these buildings and facilities due to multiple projects evaluating, renovating and rehabilitating various warehouses during the past 25 years.

There are several important structural considerations that should be noted as any project is contemplated. These buildings were designed with roof live load capacities ranging from 20 – 25 psf, which is below the current code requirement of 30 psf. Potential snow drifting at the clerestory areas was not considered in the original construction. Lateral force resisting design, specifically seismic design issues were not considered and addressed in the original design.

Changing the building use from warehouse space to an educational facility will necessitate the structure complying with life safety requirements. This will require seismic and structural upgrades and rehabilitation. Follow are some suggestions:

SEISMIC DEFICIENCIES / UPGRADES

Deficiency
Incomplete Roof Diaphragm

Upgrade
Provide new diaphragm with plywood overlay below roofing materials.

Deficiency
Inadequate Vertical Lateral Resisting Elements

Upgrade
Provide new vertical lateral load resisting elements such as shear walls or braced frames. Bracing elements will be required in the clerestory elements. Additional upgraded walls and/or braces may be required at perimeter walls if additional new openings are created.

ADDITIONAL STRUCTURAL UPGRADES

Deficiency
Roof Framing Inadequate for Current Code Requited Loads

Upgrade
Add additional roof joists as required adjacent to existing joists to increase the load capacity.
Upgrade truss members, elements and connections to meet the required capacities.

Deficiency
Columns Insufficient for Loads

Upgrade
Provide column upgrades in place to increase capacity and/or repair checking and splits as required.

Deficiency
Damaged / Deteriorated Elements

Upgrade
Until a full survey of the structure is completed it is not known if there are additional elements requiring upgrades and/or strengthening. These items will be addressed as they are discovered.

MECHANICAL - PLUMBING CODES

- International Building Code, 2009
- International Mechanical Code, 2009
- International Plumbing Code, 2009
- International Fire Code, 2009
- International Energy Conservation Code, 2009
- International Fuel Gas Code, 2009
- NFPA 13
- Utah State Boiler Code
- National Electrical Code, 2008

STANDARDS

- DFCM Design Criteria
- DFCM High Performance Building Rating System (June 2009 amendments)
  - ASHRAE Std 55: Thermal Environmental Conditions for Human Occupancy
  - ASHRAE Std 62: Ventilation for Acceptable Indoor Air Quality
  - ASHRAE Std 90.1: Energy Standard for Buildings
  - USGBC LEED 3.0 New Construction Criteria, Silver
- ASHRAE Guidelines and Standards

HIGH PERFORMANCE BUILDING REQUIREMENTS

This facility will conform to DFCM High Performance Building Rating System as detailed in the June 11, 2009 DFCM Design Requirements.

Basic Requirements:

- Fundamental Building Systems Commissioning. DFCM may engage a Commissioning Agent that is not an individual directly responsible for project design or employed by one of the designers. Commissioning Agent shall ensure that fundamental building components are installed and calibrated to operate as intended.
- Life Cycle Cost Analysis. Designers shall use life-cycle cost analysis in making decisions about their investments in products, services, and construction to lower the State Government's costs and to reduce energy and water consumption.
- CFC Reduction in HVAC and Refrigeration Equipment. Designer shall select HVAC and refrigeration equipment without chlorofluorocarbons (CFC) based refrigerants.
- Ventilation Systems. Designer shall provide mechanical ventilation system according to ASHRAE Standard 62. Mechanical ventilation system shall have the capability to operate continuously during occupancy and designed not to be easily shut-down or otherwise defeated, such as blocked registers.
- Drainage Systems. Designer shall design surface grades, storm drainage system, HVAC system, and other systems to avoid accumulation of standing water around in the building.
- Mold Prevention during Construction. Contractor shall ensure porous type building materials, insulation, and fabric, is kept dry to prevent the growth of mold and bacteria. Materials that have been affected by mold shall be abated or replaced. Building insulation that is damp or wet for 72 hours shall be replaced.
- Filtration Media Replacement before Occupancy. Contractor shall ensure that filtration media is replaced before occupancy.
- Thermal Comfort. Designer shall ensure that thermal comfort requirements are according to ASHRAE Standard 55. Exceptions:
  - Winter humidification is not required;
  - Summer dehumidification is not required; and
  - Upper temperature limit in natural ventilated buildings is not required.

Energy Efficiency Requirements:

- Energy Performance. DFCM may select an integrated system of components to reduce source energy use 10% from what is required by ASHRAE Standard 90.1.

MECHANICAL UTILITIES

Sanitary Sewer:
The sanitary sewer shall extend to existing utilities.

Storm Drainage:
The existing building and site drainage will utilized.

Water:
The existing culinary water supply will be connected and extended to new plumbing fixtures. The domestic water PRV and meter will be upgraded to accommodate the new demand.

Gas Heating:
Building heating and domestic water heating will be accomplished utilizing the existing natural gas infrastructure. The meter will upgraded to accommodate the increased load.

DESIGN TEMPERATURES

	Winter	Summer
Outdoor Temperature	3ºF	94º DB/62º WB
Indoor Temperature - Typ.	68ºF(+/-)4°F	72ºF (+/-)4°F
Mechanical Rooms	60°F	85°F (ventilation only)
Telephone/Data/Comm/ Server Rooms	75°F	75°F (ventilation only)
Unoccupied Spaces		95°F

ACOUSTICAL CRITERIA

HVAC related background sound in rooms will comply with the 2007 ASHRAE HVAC Applications Table 42.

Offices	RC 25 to 35
Conference Rooms	RC 25 to 35
Open Plan Offices	RC 40
Corridors and Lobbies	RC 40 to 45
Classrooms	RC 25 to 30
Composites Lab	RC 35
Larger Lecture Rooms	RC 25
Labs	RC 35
Commons	RC 45
Fork Lift Training	RC 50
Visitor Observation	RC 25 to 35

HEAT SOURCE

The heat source will be condensing 90%+ efficient gas fired hot water boilers. There will be a minimum of two boilers for redundancy. Each boiler will be sized for 60% of the load. Consideration will be given to a low temperature (130°F) hot water system with high efficiency condensing boilers. Domestic hot water will be provided via a high efficiency domestic gas fired water heater.

COOLING SOURCE

The cooling source will be an air cooled chiller. The chiller will reject heat to the outdoors. Chiller will have two compressors and two independent refrigerant circuits for redundancy. The chiller will utilize non-CFC refrigerants. The chiller shall be sized to accommodate the entire building footprint. At a later time, the existing furnaces will be converted to chilled water and tied onto the new high efficiency chiller. Magnetic bearing chillers shall be analyzed with a cost/benefit and ROI analysis.

VENTILATION

Ventilation will be provided in compliance with the ASHRAE Std 62.

- Classrooms: 10 CFM/person + 0.12 CFM/sq.ft.
- Office Space: 5 CFM/person + 0.06 CFM/sq.ft.
- Lecture Classroom – 7.5 CFM/person + 0.06 CFM/sq.ft.
- Commons: 7.5 CFM/person + 0.18 CFM/sq.ft.
- Labs: 6 AC/hr
- Fork Lift Training: 1.5 CFM/sq.ft. (air shall not be recirculated)
- Computer Lab: 10 CFM/person + 0.12 CFM/sq.ft.
- MITC Program: Based on occupancy. If unknown assume 10 CFM/person + 0.18 CFM/sq.ft. Exhaust shall be sufficient to deliver 1.25 CFM/sq.ft.

An outside air flow measuring device will be provided at each air handler. A CO2 sensor will reset the outside air flow between minimum and maximum value.

HVAC SYSTEM

A central station variable air volume (VAV) reheat system is a good fit for this building. Air handlers will be located on the roof. VAV Boxes with hot water reheat coils will be provided for each zone. The air handler will be equipped with fan-wall fans to reduce sound levels and provide redundancy.

Thermal Zoning:

Corner Rooms	Individual Thermostat
Classrooms	Individual Thermostat
Teaching Labs	Individual Thermostat
Conference Rooms	Individual Thermostat
Offices	Offices with similar exterior exposure may be grouped together
MITC	Individual Thermostat

EXHAUST AIR SYSTEMS

Toilet Rooms: Provide exhaust air system for toilet room ventilation. Exhaust fans to be rooftop
Composite & Forklift labs: Provide independent exhaust air system with outlets near the floor and ceiling.

AIR DISTRIBUTION

The duct system will be oversized from traditional velocities in order to reduce noise and fan energy. The ducts from the air handler to VAV boxes should be medium velocity (2500 feet per minute maximum, 0.20 water gage/100 feet maximum pressure drop.) The ceiling space will be a return air plenum.

HEATING HOT WATER PIPING SYSTEM

Variable flow. Primary and standby pumps each sized at 100% flow. Variable Frequency drives on each variable flow pump.

Perimeter radiation will be provided at each perimeter office, classroom, hallway, etc. with floor to ceiling glass.

REFRIGERATED CHILLED WATER PIPING

Constant flow primary loop; variable flow secondary loop, Primary and Standby pumps, each sized at 100% flow. Variable frequency drives on each variable flow pump.

HIGH PERFORMANCE AIR-CONDITIONING

The air-handlers will be equipped with economizer cooling which utilizes outdoor air to provide free cooling during cool outdoor temperatures.
The use of evaporative cooling (Direct, Indirect/Direct) will be considered to extend the use of the economizer. Heat recovery to be considered on exhaust systems serving composite labs, ovens, and locker/toilet room. split system air conditioning units will be used to reduce cooling airflow in rooms with high plug loads (server rooms, electrical rooms) and allow for fan shutdown during unoccupied hours.

PLUMBING

Solar hot water heaters shall be provided as the first stage. Provide secondary high efficiency domestic hot water heater with domestic hot water storage tank. The domestic hot water system shall provide 130ºF hot water to the building.

Water reduction will be utilized via dual flush water closets, low consumption urinal (quart/flush), and sensor faucets.

ENERGY AND ENVIRONMENT STRATEGIES

The HVAC and plumbing will utilize the following green building design methods:

- NEMA Premium Efficient Motors
- Occupancy Sensors
- Economizer Cooling
- Variable Frequency Drives on all 3-Phase Motors with Varying Loads
- Oversized ductwork and air handler cabinet to reduce fan energy
- Monitor and control CO2 levels in all densely occupied spaces.
- Water Cooled Chiller

HIGH PERFORMANCE DESIGN

The State of Utah require the building be designed and constructed so as to meet or exceed the requirements associated with a LEED 3.0 Silver rating. A high performance mechanical system must be utilized to achieve this rating. The building mechanical system must consider energy consumption, water consumption, and indoor air quality in order to achieve this goal. The complexity associated with high performance buildings requires that the building receive commissioning and measurement and verification during the construction process. Energy conservation will include computer modeling to verify compliance with ASHRAE 90.1 Energy Standard.

ADDITIONAL HIGH PERFORMANCE CHOICES FOR CONSIDERATION

The methods have not been considered in this report, but may be required to meet the LEED Silver rating:

- Groundsource Wellfield Heat Pump System
- Thermal Displacement Ventilation (not suitable in composites lab)
- Radiant Cooling:
  - Chilled Beam
  - Radiant Cooling with Evaporative Cooling Source
- In-Floor Radiant Heating
- On-Site Renewable Energy:
  - Solar Water Heating
  - Photovoltaic Panels
  - Wind
- Fenestration Shading System

MECHANICAL SYSTEM NARRATIVE

Green Building: The HVAC and plumbing system must not only meet the varying demands of diverse occupancies, it must beat the 2007 ASHRAE 90.1 minimum energy requirements by 10% and meet DFCM LEED Silver Requirements. The 2007 version represents a much higher performance standard than the previous 2004 version that was required under the predecessor to LEED 3.0. For this reason, the following high performance methods will be utilized:

1. Air Conditioning:
   a. Air cooled refrigerated air-conditioning will be utilized.
   b. Economizer Cooling will be implemented when ambient temperatures permit.
   c. 2-stage cooling will be implemented in the main building air-handler.
   d. 2-stage cooling will be used in the Construction Technology, Welding and Auto Shops.
2. Heating: Condensing 90% efficient boilers.
3. Motors: Premium efficient. VFD's on all three phase variable demand motors.

Implementation of Teaching: The facility will be utilized for the instruction of green building technologies. For this reason, the facility building automation system will be viewable via web based protocol for teaching purposes. The building will be equipped with a modern DDC control system, capable of displaying graphics and control points for teaching purposes. The building systems will be as follows:

MAIN BUILDING HVAC SYSTEM:

1. Areas Served:
   a. Classrooms
   b. Student Commons
   c. Visitor Observation
   d. Conference Rooms
   e. MITC Program
   f. Lobby

2. HVAC & Ventilation Distribution:
   a. Custom Built Fan Wall Supply and Return Air-Handler.
   b. Manufacturers: Hunt-Air, Temtrol, Climate Craft, or equivalent.
   c. Airflow: Based on loads.
   d. Fan Type: Fan Wall
   e. Heat: Glycol Pre-Heat Coil.
   f. Cooling: 2-stage
      i. 1st: Direct evaporative media.
      ii. 2nd: Chilled Water Cooling served by chiller.
   g. Cabinet Size: 400 FPM max velocity.
   h. Zone Control: VAV boxes with re-heat coils. Manufacturers; Price, Titus, Carnes, or equivalent.

3. Heating:
   a. 1st Stage: Perimeter Radiation Baseboard.
      i. Manufacturers: Runtal, Panel Radiator, or equivalent.
   b. 2nd Stage: VAV Box with reheat coils.
   c. Source: Qty (2) 60% capacity Aerco Model BMK 2.0-million Btu/h low NOx boilers. Sealed combustion intake connected directly to outdoors. Vent shall be stainless steel.
      i. Manufacturers: Aerco, Viessmann, Cleaver Brooks, or equivalent.

4. Air Conditioning:
   a. Chiller:
      i. Chiller: Smart magnetic bearing water air cooled chiller. Alternate manufactur ers, McQuay magnetic bearing, Carrier magnetic bearing, or equivalent.
   b. Outdoor Enclosure:
      i. Enclosure: By architect.

5. Hydronic Distribution:
   a. Heating Pumps: Qty (2) TACO model FI 7.5 HP. VFD control.
   b. Glycol Pre-Heat Pump: Qty (2) TACO model FI 3 HP. VFD control.
   c. Chilled Water:
      i. Chiller Circ Pump: Qty (2) TACO model FI 5-HP. Constant speed.
      ii. Chilled Water Dist: Qty (2) TACO model FI 5-HP. VFD control.
   d. Single Phase Inline Pumps: 3/4 HP. Qty (4) serving glycol heating coils.
   e. Single Phase Inline Pumps: 1/2 HP. Qty (3) serving specialty shop heat recovery.

6. Heat Exchangers:
   a. Glycol Heating: 600,000 Btu/h plate and frame HTX. Brazed connections.
   b. Condenser Economizer Cooling: 900,000 Btu/h plate and frame HTX. Brazed connec tions.
   c. Solar Water Heater: See High Performance Systems for Teaching Purposes below.

COMPOSITES LAB

7. Composites:
    a. Air Handler: Packaged constant volume ventilating and heating/cooling airhandling unit. Complete with the following:
        i. Manufacturers: Trane, Carrier, McQuay or equivalent.
        ii. Airflow: Based on loads.
        iii. Fan Type: Forward Curved
        iv. Heat: 2-stage.
            1. 1st: Glycol Run-Around Heat Recovery.
            2. 2nd: Glycol Pre-Heat.
        v. Cooling: 2-stage
            1. 1st: Direct evaporative media.
            2. 2rd: Chilled water cooling coil served by chiller
        vi. Cabinet Size: 450 FPM max velocity.
        vii. Zone Control: Single Zone
    b. Heating:
        i. Low-Intensity natural gas fired radiant tube heaters. Low sound.
            1. Manufacturers; Corayvc, Infra-Red, or equivalent.
    c. Exhaust: general exhaust fan with glycol run-around coil.

8. Incidental Composite Classrooms, Offices, and Tool Storage:
    a. Air Handler: Packaged constant volume ventilating and heating/cooling airhandling unit. Complete with the following:
        i. Manufacturers: Trane, Carrier, McQuay or equivalent.
        ii. Airflow: Based on loads
        iii. Fan Type: Forward Curved
        iv. Heat: 2-stage.
            1. 1st: Glycol Run-Around Heat Recovery.
            2. 2nd: Glycol Pre-Heat.
        v. Cooling: 2-stage
            1. 1st: Direct evaporative media.
            2. 2rd: Chilled water cooling coil served by chiller
        vi. Cabinet Size: 450 FPM max velocity.
        vii. Zone Control: Single Zone
    b. Heating:
        i. Qty (4) Unit Heaters. Ultra-Quiet.
            1. Manufacturers; Reznor, Hastings, Greenheck, or equivalent.
    c. Exhaust:
        i. General: general exhaust fan with glycol run-around coil.

9. Fork Lift Training:
    a. Air Handler: Gas fired make-up air handling unit.
        i. Manufacturers: Trane, Carrier, McQuay or equivalent.
        ii. Airflow: 1.5 cfm/sq.ft minimum.
        iii. Fan Type: Forward Curved
        iv. Heat: 1-stage.
            1. Existing gas fired unit heaters.
        v. Cooling: 1-stage
            1. Existing rooftop direct evaporative swamp coolers.
        vi. Zone Control: Single Zone
    b. Heating:
        i. Low-Intensity natural gas fired radiant tube heaters. Low sound.
            1. Manufacturers; Corayvc, Infra-Red, or equivalent.
    c. Exhaust:
        i. General: General exhaust fan with glycol run-around coil.
        ii. On/Off wall control with automatic CO2 detection initiation.

CODES AND STANDARDS

Codes which are applicable to the design of the electrical systems are listed below. Comply with each of the latest adopted publications. They are part of project requirements by reference and are not restated in this narrative.

ASHRAE 90.1 Energy Code
DFCM, Division of Facilities Construction and Management, Design Criteria
EIA/TIA, Electronics Industries Association/ Telecommunications Industry Association
IBC, International Building Code
IESNA, Illuminating Engineering Society of North America
NFPA, National Fire Protection Association (applicable sections including but not limited to):
NFPA 70, National Electrical Code
NFPA 72, National Fire Alarm Code
UL, Underwriter's Laboratories
University of Utah Design Criteria
USGBC LEED 2009 for New Construction and Major Renovations Rating System
Utah State Fire Marshal Laws, Rules and Regulations
Standard Broadcast Wiring and Installation Practices", as excerpted from "Recommended Wiring Practices," Sound System Engineering, (2nd Edition), D. Davis

SITE UTILITIES

Electrical
The new building shall be served from a new Rocky Mountain Power transformer located at the southwest corner of the building. This will feed a switchboard with one building meter, and breakers to feed the existing electrical distribution panels as well as a new 800A service for OWATC's new build-out

BUILDING SERVICE AND DISTRIBUTION

Main Service
The existing electrical distribution serving the south end of the building (not part of the remodel) will be re-fed from the new exterior switchboard. The remodeled portion of the building (the northern half) shall have a main electrical room where an 800A service will be provided and powered from the new exterior switchboard at the southwest corner of the building.
Motor Control Centers
Provide motor control centers for areas where 3 or more motors are grouped. All 3-phase motors shall be provided with phase-loss protection. Provide variable frequency drives where required for mechanical equipment in compliance with DFCM and Campus requirements.

Panelboards
New panelboards shall be provided in new electrical room. This room shall be dedicated to electrical distribution and shall not be used for storage or any other purposes. Consideration shall be given to the ease and accessibility of running new and future conduits out of each room, for example, do not lock the room between stairs, elevators, restrooms, etc. that would make future work difficult. If inaccessible ceilings surround the room, then stub (5) spare 3/4" conduits from each panelboard to accessible ceiling areas. Dedicate an area of each room for current and future riser conduits or busways so that wall-mounted equipment shall not impede vertical distribution.

Spare Capacity
Switchboards, panelboards, transformers and other distribution equipment shall be provided with approximately 50% spare capacity and spaces/spares for future growth and flexibility. Electrical equipment rooms shall have 25% additional space for future equipment. Design system to minimize shutdowns for future additions or work.

Branch Circuits
Branch circuits shall be loaded to no more than 80% of what is allowed by NFPA 70. Where outlets are intended for a specific piece of equipment, the load of the outlet shall be based on the equipment nameplate. Otherwise, allow no more than 6 convenience outlets per circuit or 4 outlets per circuit serving workstation computer terminals. Outlets with dedicated branch circuits (one outlet per circuit) are required for vending machines, copy machines, break room counters, A/V cabinets and other locations likely to have equipment requiring dedicated circuits. Each branch circuit homerun shall have no more than 3 circuits per raceway. All branch circuits shall be provided with a dedicated neutral conductor for each phase conductors. Shared neutral conductors are not allowed.

Conductors
All conductors shall be copper. Conductors for branch circuits shall be sized to prevent voltage drop exceeding 3% at the farthest load. The total voltage drop on both feeders and branch circuits shall not exceed 5%. When calculating the voltage drop, the load shall be assumed to be 80% of the ampacity of the branch circuit and feeder conductors.

Raceways:
All wiring shall be run in raceways, minimum ¾"C. Type MC or AC cable is strictly prohibited. Provide cable tray system so that station cable raceways do not extend more than 50' max to cable tray. Conduits shall stub to the cable tray. Include pull strings in all empty conduits. Include raceway for all audio/visual, security, voice/data and other technology systems whether furnished as part of the construction contract or furnished by the Owner.

Equipment and Furniture
All equipment and furniture identified in the program documents, whether it is furnished in this contract or a separate contract, shall be provided with power and raceway rough-in for complete operation. Coordinate furniture connections with furniture systems suppliers.
Fault Current and Coordination
New equipment shall be adequately rated for the amount of available fault current. System coordination shall be studied, and fuses or breakers selected to ensure minimum system outage due to overloads or fault currents. Breakers with adjustable long time, short time, instantaneous and/or ground fault settings shall be set at levels for optimum system coordination, while also taking into consideration the safety of the maintenance personnel. Include an arc flash study for each distribution point in the system, with printed labels indicating arc flash energy levels that can be applied to the equipment when construction is complete.

Transient Voltage Surge Suppression
Provide surge protective devices (SPD's) and "noise" protection at service equipment (each main) and on branch panelboards in the facility which serve computer terminals. SPD units may be integral to the panelboard or switchboard, or individually mounted "stand-alone" units. However, if individual units are used, they shall be placed immediately adjacent to the panelboard or switchboard to minimize the effects of increasing clamping voltages due to excessive lead lengths.

Outlets

Refer to program and space plan sheets for basic requirements. Where requirements cannot be identified, the following shall be used as a general guideline:

Offices: For each workstation, provide one outlet dedicated to computer terminals and one normal outlet, and one additional normal outlet for every 10' of wall space.
Conference and Board Rooms: One outlet for every 10' of wall space, plus one outlet dedicate to computer terminals on two walls. Provide floor outlets underneath conference room tables.
Classrooms: Outlets for audio-visual equipment at instructor's location, plus outlets on walls at 10' intervals.
For computer classrooms, provide outlets for each student seat or computer terminal.
Student Seating/Study Areas: Outlets on walls at 10' intervals, plus floor outlets where cords would not reach
walls.
Lounges/Breakrooms/Kitchenettes: GFI Outlets on dedicated circuits every 4' on counter top plus dedicated outlets for refrigerator, microwave, and disposal (switched at counter top), plus one outlet for every 10' of other wall space in room.
Telephone/Data Closets: At least 6 quad outlets on emergency power with circuit density to allow for at least 40 VA per square foot.
Electrical Rooms: At least one outlet on emergency power.
Restrooms/Shower Rooms: One GFI outlet near each lavatory counter top.
Corridors, Lobbies: Provide at least one outlet every 25', on alternating sides of the corridor or lobby.
Stairs: One outlet at the landing of each level.
Storage Rooms (small), Janitors Closets: One outlet.
Building Exterior: One WP/GFI outlet near each entrance.
Other Areas: Refer to individual space plan data sheets, and where not defined coordinate requirements with user during design.

Grounding

All feeder and branch circuit raceways shall include an insulated equipment grounding conductor. Provide an additional insulated/isolated grounding system throughout all 120/208V panelboards and associated feeders in compliance with Campus standards. Provide a grounding riser system throughout the telecommunications closets, with grounding bus bars mounted accessible in each closet. All grounding systems shall be bonded together per NEC requirements.

Emergency Service and Distribution:

Provide an emergency diesel generator for the new building. Locate generator outdoors in a screened area with weather-protective, sound-attenuating housing and skid-mounted, double-walled tank. Fuel supply shall be minimum 18 hours at full load. Design at least two transfer switches: one for emergency and one for standby loads. Annunciate alarms adjacent to fire alarm panel. Design generator distribution panel with digital metering. The following shall be provided with emergency power:

- Emergency egress and exit lighting
- Fire Alarm
- Elevators (where required by IBC)
- Smoke Control Systems (if required)
- Communications rooms – outlets, lights and air conditioning
- Electrical rooms – lights and outlets
- Security systems

LIGHTING

General
Comply with illuminance levels and uniformity criteria of IESNA and its Recommended Practices. For exterior lighting, indirect lighting, and other specialized task lighting provide point-by-point plot of illuminance establishing conformance with the Recommended Practices. Except for specialized applications, provide lighting with a minimum efficacy of 90 lumens per watt. Provide maximum 10% THD electronic ballasts. In addition, design lighting with a CRI exceeding 85, except in storage, mechanical, electrical, and similar nonpublic applications. Where appropriate, minimize number of lamp types utilized. Use 4' T-8 lamps with CRI of 85 or greater wherever possible. Provide lamps complying with EPA TCLP requirements.

Strong consideration shall be given to LED lighting technologies. LED fixtures should be considered as replacements for any recessed downlights, accent lighting, task lighting and could possibly be used for general ambient lighting.

Comply with ASHRAE 90.1 requirements, except that overall energy target requirements should be exceeded by 10% as per DFCM sustainability guidelines. Provide lighting control to harvest daylighting where practical, to control based upon occupancy, and according to programmable scheduling as applicable to the application.

Interior Lighting
In general, utilize low-glare fluorescent lighting with electronic ballasts. Select luminaires for areas where VDTs are planned which are designed to minimize veiling reflections, and provide multilevel lighting control and task lighting to reduce the illuminance on the VDT. In addition, in rooms with audio visual (including all classroom and instruction spaces), provide lighting with variable or switched levels as indicated with a separate controlled zone to reduce glare and illuminance on the audio visual display. In rooms with projectors, provide a separate bank of lighting control switches or station near the instructor position.

Lighting Control
Select occupancy sensors for the appropriate applications and control for daylight harvesting. Specify dual technology ceiling mounted directional sensors in private offices and other rooms with manual off switches. Specify ultrasonic sensors in restrooms. Specify programmable lighting control with manual timed overrides in all common areas such as open offices, corridors, lobbies, and similar areas. Carefully evaluate areas of the building that have natural day light and design appropriate methods of daylighting control, suitable for the type of space. Continuous dimming, stepped switching and simple on/off schemes should all be part of the design.

Emergency and Egress Lighting
Provide exit lighting to comply with IBC. Design emergency lighting for means of egress to 1 fc minimum to comply with IBC. Include emergency lighting in restrooms, electrical rooms, vaults and communication rooms.

LIGHTING REQUIREMENTS

	Illuminance (Avg. Footcandles)	
Function/Space	Ambient	Task
Public Circulation & Lobbies	20 FC	n/a
Private Offices	30 FC	50 FC
Open Staff Work Areas	30 FC	50 FC
Copy Rooms	30 FC	50 FC
Conference Rooms	10-50 FC	n/a
Classrooms, Training Rooms	10-50 FC	n/a
Mechanical Rooms	30 FC	n/a
Restrooms	30 FC	n/a
Kitchenettes/Break Rooms	30 FC	50 FC
Storage Rooms	30 FC	n/a
Outdoor Walkways	1 FC	n/a
Outdoor Entrances	10 FC	n/a

FIRE ALARM

Fire Alarm and Life Safety:
Comply with Utah State Fire Marshall's "Rules and Regulations", the IBC and OWATC Design Standards. Provide an addressable system. Provide smoke detection throughout all corridors and pathways of egress, with strobe lights visible from all locations except private offices. Provide horns to comply with NFPA including for higher ambient noise requirements. Provide duct detectors and fan shutdown where required by NFPA and the IMC, including detection of smoke at all return air shafts serving multiple floors. Monitor flow and tamper switches per the fire sprinkling design. Coordinate location of the building annunciator with the Campus fire marshal. All other detectors and functions shall comply with the referenced codes and standards.

TELECOMMUNICATIONS RACEWAYS

Riser Distribution
Comply with EIA/TIA and campus Netcom requirements in the sizing and locating of Telecom rooms. Increase room size for A/V, TV and other systems that may be located in these rooms. Coordinate equipment layout and wall space with the Owner. Locate closets such that when cabling is routed through the raceway system provided, the distance shall not exceed 290 feet to the furthest outletInclude at least (1) 2" conduit to the roof for antennae and/or satellite dish.

Horizontal Distribution
Provide a cable tray distribution network throughout each floor and into the IDF closets. Extend the cable tray around inside of the IDF closet to allow cables to be routed within the room. Consider ease of access to the tray system when the building is in full operation. Limit cable tray routing to be above corridors, common and similar areas. Where ceilings are exposed or inaccessible, then provide a bridge of equivalent conduit connecting the cable trays in the accessible ceiling areas. It shall be the designer's responsibility to size the cable tray and raceway system for the intended cabling installation. Do not load the cable tray and raceway system to more than 50% of what is allowed by cable fill requirements of NFPA 70.

Voice/Data Drops
Each voice/data outlet location shall consist of a 4" square box with mud ring and one 1" conduits stubbed to the nearest cable tray. Refer to program space plans for quantities and coordinate exact locations with the users during design. As a minimum, provide one voice/data drop for each workstation, fax machine, copy machine, desk, computer terminal and teaching station. Where wireless networks are being considered, still allow sufficient empty raceways for future hardwired connections should the wireless system have insufficient bandwidth for evolving applications.

SUSTAINABLE DESIGN - ELECTRICAL

General
The following general areas are being addressed in the electrical design in order to meet sustainable design criteria:

Optimize Energy Performance:
The lighting power density for the project shall be at least 30% better than the requirements listed in ASHRAE/IESNA Standard 90.1-2004. The most energy efficient lamp and ballast combinations that are feasible for the project should be used. Give consideration for maintenance and lamp replacement according to campus standards shall. A variety of lighting control methods and lighting power reduction techniques shall be considered, based on type and use of each space, including the following:

1. Corridors and Common Areas: Provide a lighting relay control system that controls lights based on time of day occupancy. For after hours, override switches may be used that turn lights on for no longer than one hour at a time.
2. Enclosed Spaces (offices, conference rooms, equipment rooms, etc.): Provide occupancy sensors with local “off” override switches.
3. Daylighting Areas: For corridors and common areas with daylighting, provide indoor photo-cells to turn on/off artificial illumination, or to provide stepped switching based on the amount of natural daylighting available. For normally occupied interior spaces, consider the use of a photocell and continuous dimming.
4. Exterior Areas: Control exterior lighting through a photocell and timeclock combination. Campus environments should have a minimal level of security lighting throughout the dark night hours.
5. Task/Ambient Lighting: Energy consumption can be greatly reduced by reducing the ambient lighting and providing additional, separately controlled lighting for individual tasks.

Controllability of Lighting:
Maximize the use of lighting controls by ensuring that at least 90% of the occupants have individual controllabil

ity of lighting in their respective work area. Where open office furniture is used, then separately switched task lighting mounted in the systems furniture is preferred. For shared multi-occupant spaces, provide variable lighting controls to allow adjustment that meets group needs and preferences.

SYSTEM COMMISSIONING

As part of the LEED and High Performance Building Rating System, commissioning shall be an integral process of the project. Participate fully with the Commissioning Agent during design and construction. The contractors shall be part of the commissioning. As a minimum, the following systems shall be included in the commissioning process:

- Main switchgear
- Lighting Control Devices and Systems
- Generators and Transfer Switches
- Motor Controllers
- Variable Frequency Controllers
- Fire Alarm Systems
- Security Systems

GENERAL

Buildings play a significant role in our natural environment, health, productivity and economy. Sustainable design and building practices are aimed to directly address these important issues and maximize both economic and environmental performance. In an effort to contribute to this progress, the U.S Green Building Council has developed the LEED (Leadership in Energy & Environmental Design) Green Building Rating System to measure individual project design strategies and construction components that directly contribute to these goals above and beyond standard building code requirements. LEED is a voluntary, consensus-based national standard for developing high performance, sustainable buildings. The LEED process provides a complete framework for assessing building performance and meeting sustainability goals.

Based on well-founded scientific standards, LEED categorizes sustainability into six major themes: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Materials and Resources, Indoor Environmental Quality, and Innovation in Design process. The U.S. Green Building council offers LEED Certification for distinguished projects that have demonstrated a commitment to sustainability by meeting the highest performance standards. Different levels of certification are available depending on the quantifiable increase in water efficiency, energy efficiency, etc (Certified, Silver, Gold, and Platinum).

The State of Utah is aligned with the U.S. Green Building council, in their commitment to building sustainable projects. New projects funded by the State of Utah are required to comply with DFCM's most current High Performance Building Rating System. The High Performance Building Rating System requires, as prerequisite, a minimum of LEED Silver certification level design and construction standards. By means of thorough analysis and modeling, the State intends to limit a building's ecological and economic impact, and targets strategies for reducing energy and water consumption, as well as reducing consumption and waste of resources during and after construction. Additionally, the State requires buildings to be built to a minimum 50-year life-cycle. The selection of design and construction practices are based on modeling of building systems to analyze life-cycle costs, including: Initial costs (Purchase – Acquisition), Construction Costs, Fuel and Energy Costs, Operation, Maintenance and Repair costs, Replacement Costs, Residual Values (Resale, Salvage or Disposal), and Finance Charges (loan interest payments where applicable).

The proposed OWATC BDO Bay 2 Improvement Project will be required to meet the State's requirements. A Sustainability Workshop was held for this project in November 2012 and was facilitated by the Programming Team, including LEED Accredited Professionals at Bott Pantone Architects and consulting engineers. The workshop participants discussed the opportunities and challenges of a high performance building with respect to the mission and goals of the OWATC.

Based on the Sustainability Workshop, OWATC determined that the proposed OWATC BDO Bay 2 Improvement Project is to meet LEED 3.0 Silver certification design and construction standards. The current construction cost estimate includes costs to achieve this objective.

STATE OF UTAH HIGH PERFORMANCE BUILDING RATING SYSTEM (2009)

Reference Standards and Codes

ANSI/ASHRAE Standard 52.2	Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size
ANSI/ASHRAE Standard 55	Thermal Environmental Conditions for Human Occupancy
ANSI/ASHRAE Standard 62	Ventilation for Acceptable Indoor Air Quality
ANSI/ASHRAE/IESNA Standard 90.1	Energy Standard for Buildings Except Low-Rise Residential Buildings, including Appendix G
Illuminating Eng. Society of North America	IESNA Lighting Handbook
U.S. Green Building	Leadership in Energy & Environmental Design for New & Major Renovations (LEED – NC)

Per DFCM High Performance Building Rating System requirements, the project must achieve the following credits in the LEED rating system:

1. WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%
2. EA Credit 3: Enhanced Commissioning
3. EQ Credit 3.1: Construction IAQ Management Plan: During Construction
4. EQ Credit 4.1: Low-Emitting Materials: Adhesives and Sealants
5. EQ Credit 4.2: Low-Emitting Materials: Paints and Coatings

LEED 2009 for New Construction and Major Renovations

Project Checklist

OWATC BDO Bay 2 Improvement Program

11.05.12

Sustainable Sites — Possible/Actual Points: 26 — 8

Y	?	N	d/C				
Y			C	Prereq 1	Construction Activity Pollution Prevention		
Y			d	Credit 1	Site Selection	1	1
		N	d	Credit 2	Development Density and Community Connectivity	5	0
	?		d	Credit 3	Brownfield Redevelopment	1	
	?		d	Credit 4.1	Alternative Transportation—Public Transportation Access	6	
Y			d	Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1	1
Y			d	Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3	3
Y			d	Credit 4.4	Alternative Transportation—Parking Capacity	2	2
		N	C	Credit 5.1	Site Development—Protect or Restore Habitat	1	0
		N	d	Credit 5.2	Site Development—Maximize Open Space	1	0
		N	d	Credit 6.1	Stormwater Design—Quantity Control	1	0
		N	d	Credit 6.2	Stormwater Design—Quality Control	1	0
		N	C	Credit 7.1	Heat Island Effect—Non-roof	1	
Y			d	Credit 7.2	Heat Island Effect—Roof	1	1
	?		d	Credit 8	Light Pollution Reduction	1	

Water Efficiency — Possible/Actual Points: 10 — 5

Y	?	N					
Y			d	Prereq 1	Water Use Reduction—20% Reduction		
		N	d	Credit 1	Water Efficient Landscaping	2 to 4	
					Reduce by 50%	2	
					No Potable Water Use or Irrigation	4	
Y			d	Credit 2	Innovative Wastewater Technologies	2	2
Y			d	Credit 3	Water Use Reduction	2 to 4	
					Reduce by 30%	2	
					Reduce by 35%	3	3
					Reduce by 40%	4	

Y	?	N					
0	0	0		**Energy and Atmosphere**	Possible/Actual Points:	**35**	**13**
Y			C	Prereq 1	Fundamental Commissioning of Building Energy Systems		
Y			d	Prereq 2	Minimum Energy Performance		
Y			d	Prereq 3	Fundamental Refrigerant Management		
Y			d	Credit 1	Optimize Energy Performance	1 to 19	
					Improve by 12% for New Buildings or 8% for Existing Building Renovations	1	
					Improve by 14% for New Buildings or 10% for Existing Building Renovations	2	
					Improve by 16% for New Buildings or 12% for Existing Building Renovations	3	
					Improve by 18% for New Buildings or 14% for Existing Building Renovations	4	
					Improve by 20% for New Buildings or 16% for Existing Building Renovations	5	
					Improve by 22% for New Buildings or 18% for Existing Building Renovations	6	**6**
					Improve by 24% for New Buildings or 20% for Existing Building Renovations	7	
					Improve by 26% for New Buildings or 22% for Existing Building Renovations	8	
					Improve by 28% for New Buildings or 24% for Existing Building Renovations	9	
					Improve by 30% for New Buildings or 26% for Existing Building Renovations	10	
					Improve by 32% for New Buildings or 28% for Existing Building Renovations	11	
					Improve by 34% for New Buildings or 30% for Existing Building Renovations	12	
					Improve by 36% for New Buildings or 32% for Existing Building Renovations	13	
					Improve by 38% for New Buildings or 34% for Existing Building Renovations	14	
					Improve by 40% for New Buildings or 36% for Existing Building Renovations	15	
					Improve by 42% for New Buildings or 38% for Existing Building Renovations	16	
					Improve by 44% for New Buildings or 40% for Existing Building Renovations	17	
					Improve by 46% for New Buildings or 42% for Existing Building Renovations	18	
					Improve by 48%+ for New Buildings or 44%+ for Existing Building Renovations	19	
Y			d	Credit 2	On-Site Renewable Energy	1 to 7	
					1% Renewable Energy	1	
					3% Renewable Energy	2	
					5% Renewable Energy	3	**3**
					7% Renewable Energy	4	
					9% Renewable Energy	5	
					11% Renewable Energy	6	
					13% Renewable Energy	7	
Y			C	Credit 3	Enhanced Commissioning	2	**2**
Y			d	Credit 4	Enhanced Refrigerant Management	2	**2**
		N	C	Credit 5	Measurement and Verification	3	
	?		C	Credit 6	Green Power	2	

0	0	0		Materials and Resources	Possible/Actual Points:	14	9
Y	?	N					
Y			d	Prereq 1	Storage and Collection of Recyclables		
Y			C	Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3	
					Reuse 55%	1	
					Reuse 75%	2	
				Y	Reuse 95%	3	3
		N	C	Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1	0
Y			C	Credit 2	Construction Waste Management	1 to 2	
					50% Recycled or Salvaged	1	1
					75% Recycled or Salvaged	2	
	?		C	Credit 3	Materials Reuse	1 to 2	
					Reuse 5%	1	
					Reuse 10%	2	
Y			C	Credit 4	Recycled Content	1 to 2	
					10% of Content	1	
					20% of Content	2	2
Y			C	Credit 5	Regional Materials	1 to 2	
					10% of Materials	1	
				Y	20% of Materials	2	2
		N	C	Credit 6	Rapidly Renewable Materials	1	
Y			C	Credit 7	Certified Wood	1	1

Y	?	N					
0	0	0			**Indoor Environmental Quality**	Possible/Actual Points:	**15**	**14**
Y			d	Prereq 1	Minimum Indoor Air Quality Performance		
Y			d	Prereq 2	Environmental Tobacco Smoke (ETS) Control		
Y			d	Credit 1	Outdoor Air Delivery Monitoring	1	1
Y			d	Credit 2	Increased Ventilation	1	1
Y			C	Credit 3.1	Construction IAQ Management Plan—During Construction	1	1
Y			C	Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1	1
Y			C	Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1	1
Y			C	Credit 4.2	Low-Emitting Materials—Paints and Coatings	1	1
Y			C	Credit 4.3	Low-Emitting Materials—Flooring Systems	1	1
Y			C	Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1	1
Y			d	Credit 5	Indoor Chemical and Pollutant Source Control	1	1
Y			d	Credit 6.1	Controllability of Systems—Lighting	1	1
Y			d	Credit 6.2	Controllability of Systems—Thermal Comfort	1	1
Y			d	Credit 7.1	Thermal Comfort—Design	1	1
Y			d	Credit 7.2	Thermal Comfort—Verification	1	1
Y			d	Credit 8.1	Daylight and Views—Daylight	1	1
		N	d	Credit 8.2	Daylight and Views—Views	1	0

Y	?	N					
0	0	0			**Innovation and Design Process**	Possible/Actual Points:	**6**	**3**
Y			d/C	Credit 1.1	Innovation in Design: Specific Title	1	1
Y			d/C	Credit 1.2	Innovation in Design: Specific Title	1	1
			d/C	Credit 1.3	Innovation in Design: Specific Title	1	
			d/C	Credit 1.4	Innovation in Design: Specific Title	1	
			d/C	Credit 1.5	Innovation in Design: Specific Title	1	
Y			d/C	Credit 2	LEED Accredited Professional	1	1

Y	?	N					
0	0	0			**Regional Priority Credits**	Possible/Actual Points:	**4**	**0**
			d/C	Credit 1.1	Regional Priority: Specific Credit	1	
			d/C	Credit 1.2	Regional Priority: Specific Credit	1	
			d/C	Credit 1.3	Regional Priority: Specific Credit	1	
			d/C	Credit 1.4	Regional Priority: Specific Credit	1	

0	0	0			**Total**	Possible/Actual Points:	**110**	**52**

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

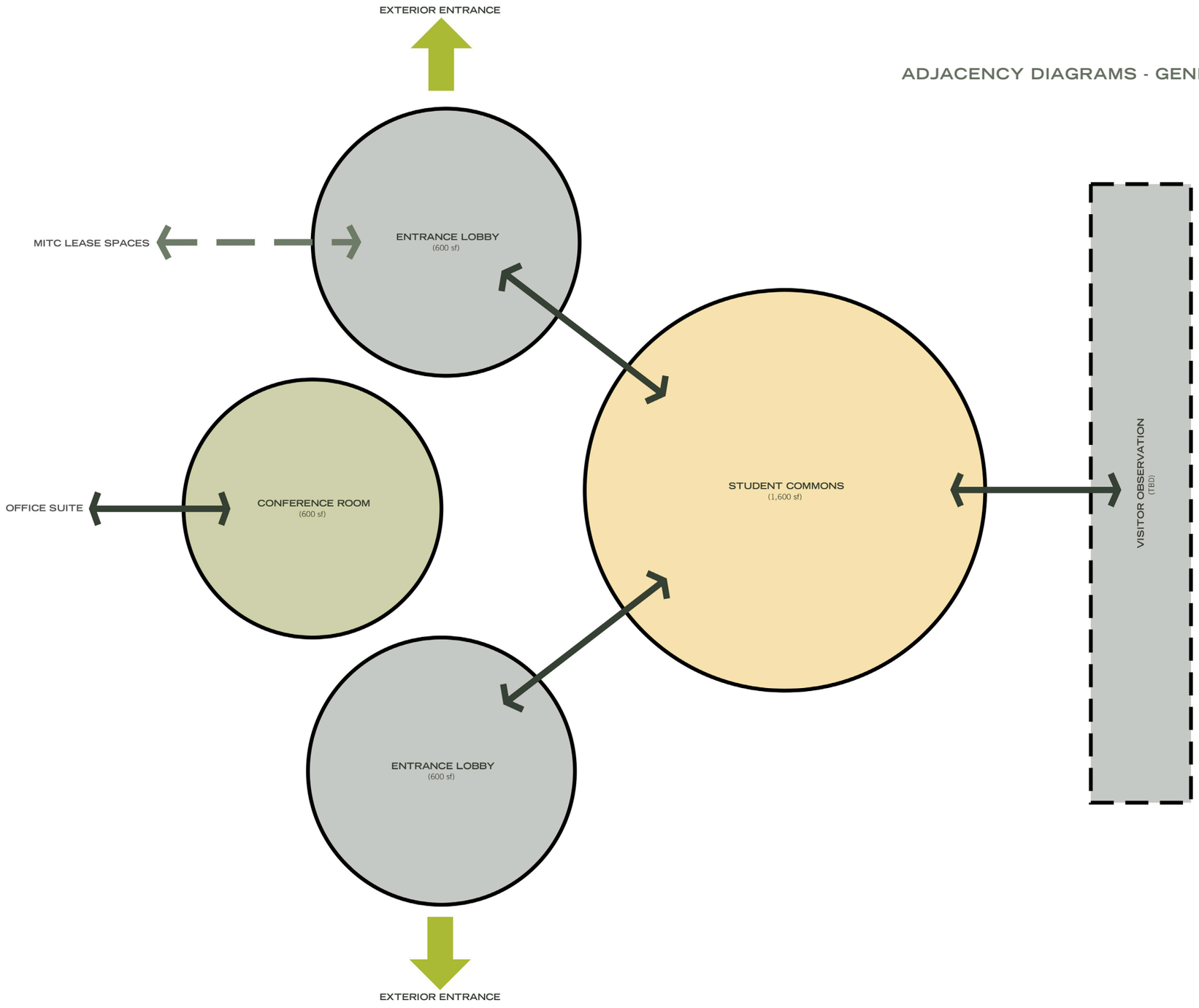
4 INDIVIDUAL SPACE OUTLINE

OGDEN-WEBER APPLIED TECHNOLOGY COLLEGE

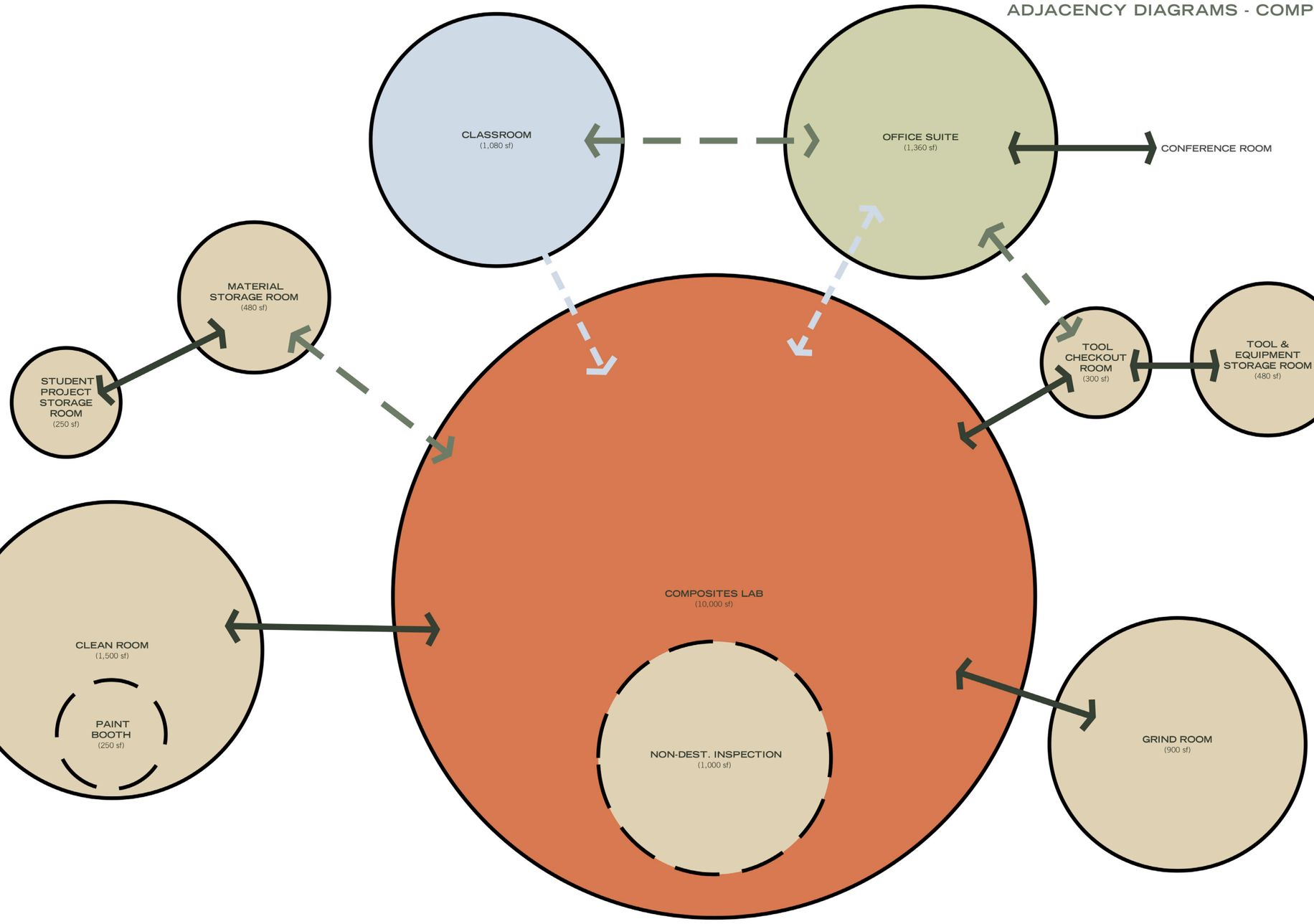
PROGRAM OF SPACE NEEDS - SUMMARY

DESCRIPTION	QTY.	NSF	TOTAL	PAGE #	COMMENTS
GENERAL/SHARED SPACES					
Entrance Lobby	2	600	1,200		Entrance Lobby at East and West sides of Bay 2
Student Commons	1	1,600	1,600		Direct connection to Bay 2 Entrance Lobbies, Visitor Observation
Visitor Observation	1		0		Integrated into circulation system. Possible mezzanine level.
Conference Room	1	600	600		6-8 people
General/Shared Spaces Subtotal			3,400		
COMPOSITES PROGRAM					
Office Suite	1	1,360	1,360		Shared with Flex Program Office Suite
Material Storage Room	1	480	480		
Student Project Storage Room	1	250	250		
Tool & Equipment Checkout/Storage Room	1	800	800		
Clean Room	1	1,500	1,500		Includes paint booth
Grind Room	1	900	900		
Composites Lab	1	9,600	9,600		Adjacent to Flex Program Lab
Classroom	1	1,080	1,080		Adjacent to Flex Program Classroom; ability to combine both classrooms into single large classrom
Composites Program Subtotal			15,970		
FLEX PROGRAM					
Office Suite	1	n/a			Shared with Composites Program Office Suite
Faculty Workroom	1	n/a			Adjacent to Office Suite. Shared with Composites Program Workroom
Material Storage Room	1	480	480		
Student Project Storage Room	1	250	250		
Tool & Equipment Checkout/Storage Room	1	800	800		
Computer Lab	1	n/a			Shared with Composites Program?
Flex Lab	1	8,000	8,000		Adjacent to Composites Program Lab
Classroom	1	1,080	1,080		Adjacent to Composites Program Classroom; ability to combine both classrooms into single large classrom
Flex Program Subtotal			10,610		
MITC PROGRAM					
MITC Tenant Space	2	1,200	2,400		Access to restrooms. Secure from remainder of facility. 24/7 operation
MITC Tenant Space	2	900	1,800		Convert existing classroom to MITC Tenant Space
MITC Program Subtotal			4,200		
FORKLIFT PROGRAM					
Forklift Training Lab	1	11,080	11,080		Visual access to classroom and computer lab
Forklift Program Subtotal			11,080		
Total Net Square Feet			45,260		
Grossing Factor		0.20	9,052		
Subtotal Gross Square Feet			54,312		
Total Gross Square Feet			**54,312**		
Existing Bay 2 Square Feet			39,458		
Existing Bay 1 High Bay Square Feet			14,140		
Existing Bay 1 Classrooms Square Feet			1,892		
Total Existing Square Feet			**55,490**		
Difference			**1,178**		

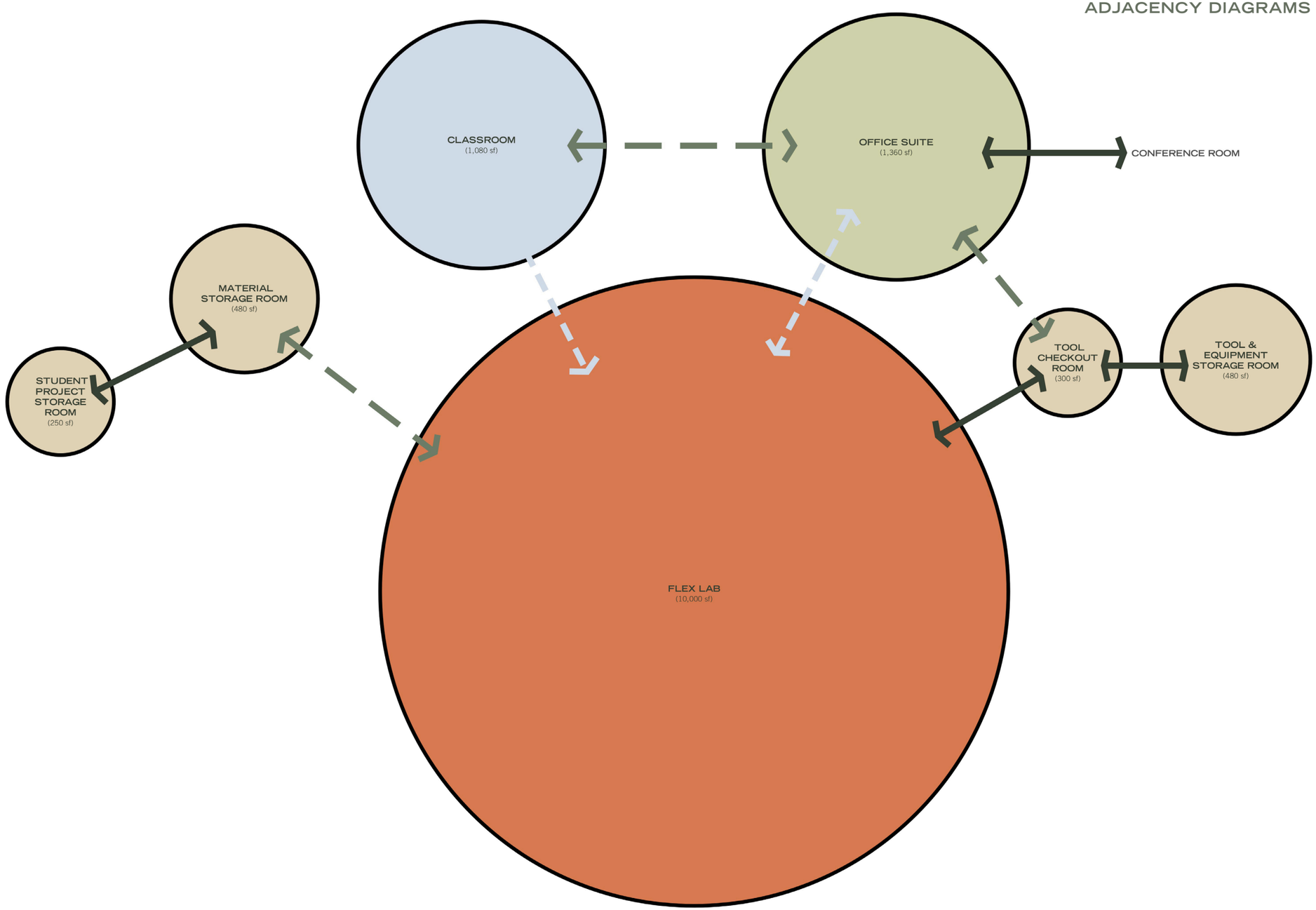
ADJACENCY DIAGRAMS - GENERAL/SHARED SPACES

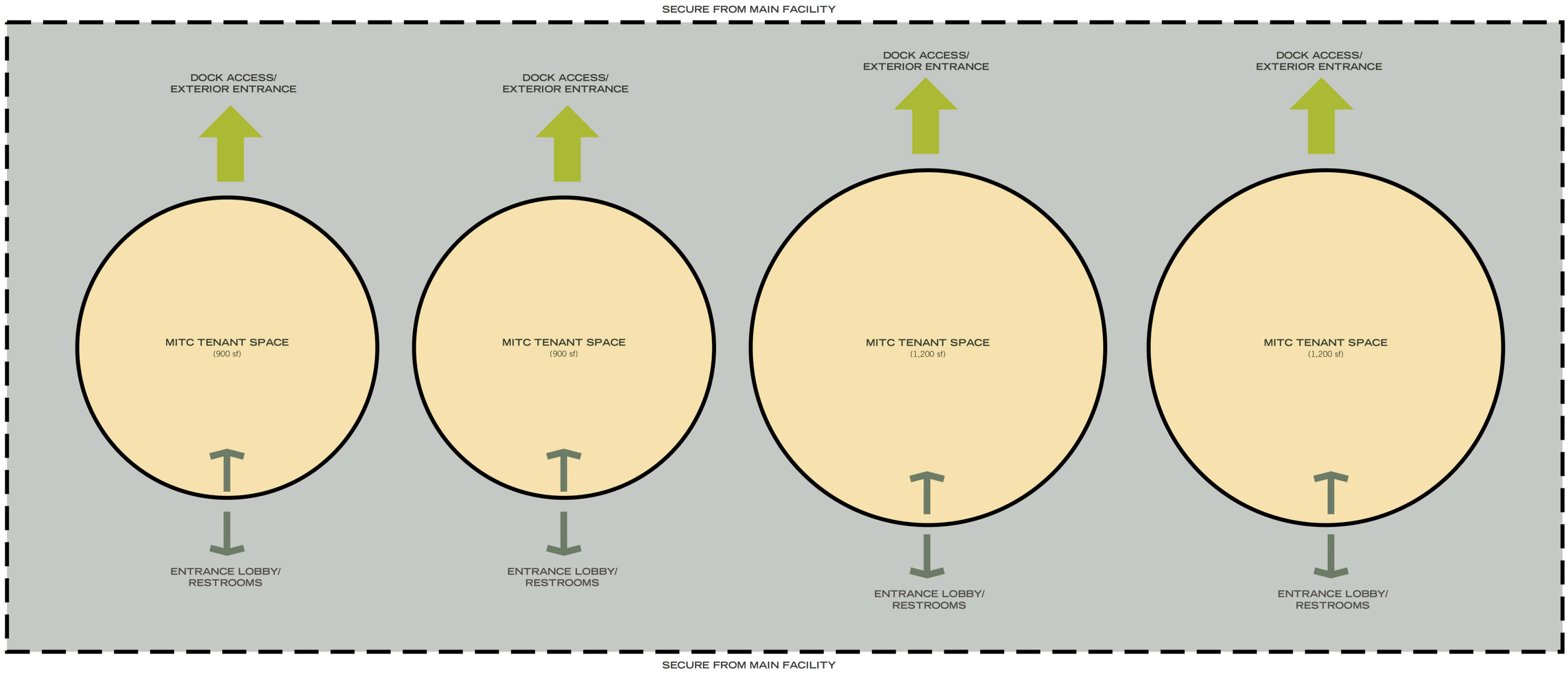


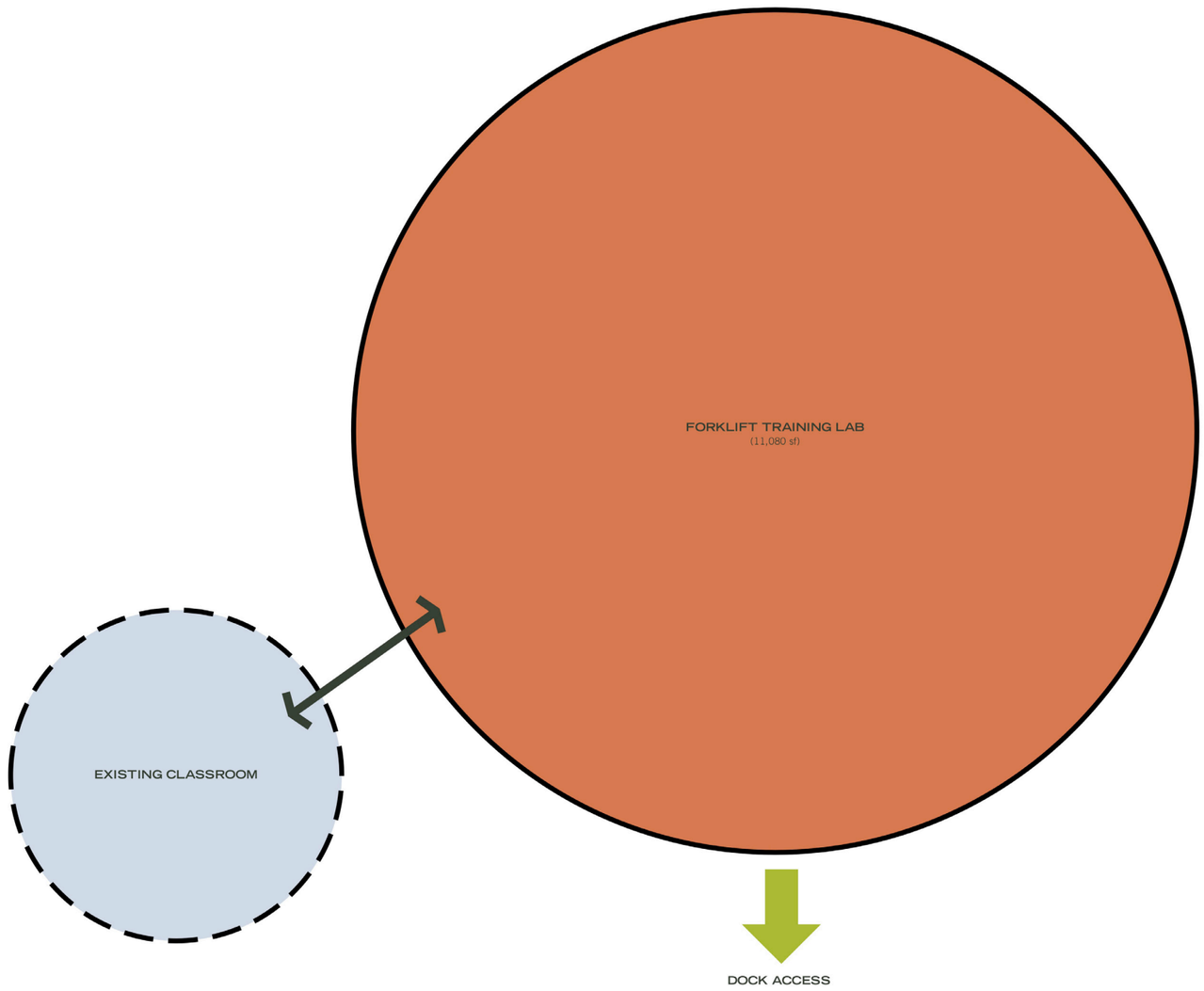
ADJACENCY DIAGRAMS - COMPOSITES PROGRAM



ADJACENCY DIAGRAMS - FLEX PROGRAM




SECURE FROM MAIN FACILITY
DOCK ACCESS/
EXTERIOR ENTRANCE
MITC TENANT SPACE
(900 sf)
ENTRANCE LOBBY/
RESTROOMS
DOCK ACCESS/
EXTERIOR ENTRANCE
MITC TENANT SPACE
(900 sf)
ENTRANCE LOBBY/
RESTROOMS
DOCK ACCESS/
EXTERIOR ENTRANCE
MITC TENANT SPACE
(1,200 sf)
ENTRANCE LOBBY/
RESTROOMS
DOCK ACCESS/
EXTERIOR ENTRANCE
MITC TENANT SPACE
(1,200 sf)
ENTRANCE LOBBY/
RESTROOMS
SECURE FROM MAIN FACILITY


FORKLIFT TRAINING LAB
(11,080 sf)
EXISTING CLASSROOM
DOCK ACCESS


180' 3"
79' 5"
220' 0"
DOCK
WAITING
WAITING
WAITING
CLASSROOM
MITC TENANT SPACE
MITC TENANT SPACE
MITC TENANT SPACE
MITC TENANT SPACE
LOBBY
MEN
WOMEN
CONF. ROOM
OFFICE SUITE
CLASSROOM
CLASSROOM
CORRIDOR
OFFICE
OFFICE
CASHIER
REGISTRATION
WORK
OFFICE
OFFICE
OFFICE
OFFICE
WOMEN
MEN
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
JAN.
WOMEN
MEN
COMPUTER LAB
CLASSROOM
LAB SPACE
MECH.
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
OFFICE
CLASSROOM
CLASSROOM
BREAK ROOM
STO.
STO.
CONF. ROOM
CLASSROOM
CLASSROOM
CLASSROOM
FORKLIFT TRAINING LAB
STUDENT COMMONS
COMPOSITES LAB
PHASING LINE
FLEX LAB
PAINT BOOTH
CLEAN ROOM
TOOL CHECKOUT
TOOL STORAGE
TOOL STORAGE
TOOL CHECKOUT
CORRIDOR
CORRIDOR
LOBBY
GRIND ROOM
STUDENT STORAGE
MATERIAL STORAGE ROOM
MECH.
MECH.
MATERIAL STORAGE ROOM
STUDENT STORAGE
DOCK
DOCK
161' 0"
60' 11"
59' 2"
181' 1"
61' 0"
NORTH

1. PROGRAM

Space Description:	**Entrance Lobby**
Occupants:	20+
Existing Area:	n/a
Proposed NSF:	600 sf
Quantity:	2

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Close proximity to Student Commons and Visitor Observation Area

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes
Doors:	72" double leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Acoustical panel ceiling
Ceiling Height:	10'-0"
Acoustical Treatment:	No special treatments

4. ENGINEERING SYSTEMS

HVAC:	Cabinet heaters at entrances
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	Ambient lighting
Phone/Data:	None
Security:	Video surveillance
Special Requirements:	No special requirements

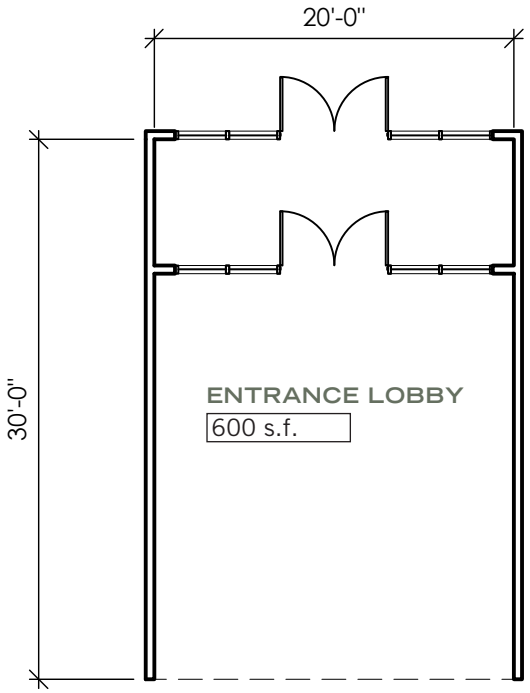
5. FURNITURE, FIXTURES & EQUIPMENT

General: -

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Locate at East and West sides of Bay 2
- Secondary entrances.
- Provide direct access to MITC spaces
- Extend existing west side dock to new west entry


20'-0"
30'-0"
ENTRANCE LOBBY
600 s.f.

GENERAL/SHARED SPACES

1. PROGRAM

Space Description:	**Student Commons**
Occupants:	30+
Existing Area:	n/a
Proposed NSF:	1,600 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Close proximity to Entrance Lobbies, Visitor Observation Area, Composites and Flex Labs Visual access to Composites and Flex Labs

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	72” double leaf
Floors:	Carpet tile
Walls:	Painted gypsum board
Ceiling:	Exposed to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	VAV re-heat. 72º f setpoint. RC-45 noise levels
Plumbing:	None
Electrical:	Perimeter outlets. Outlets at tables
Lighting:	Ambient and task lighting
Phone/Data:	Hard wired data at permeter. Wireless data
Security:	No special requirements
Special Requirements:	-

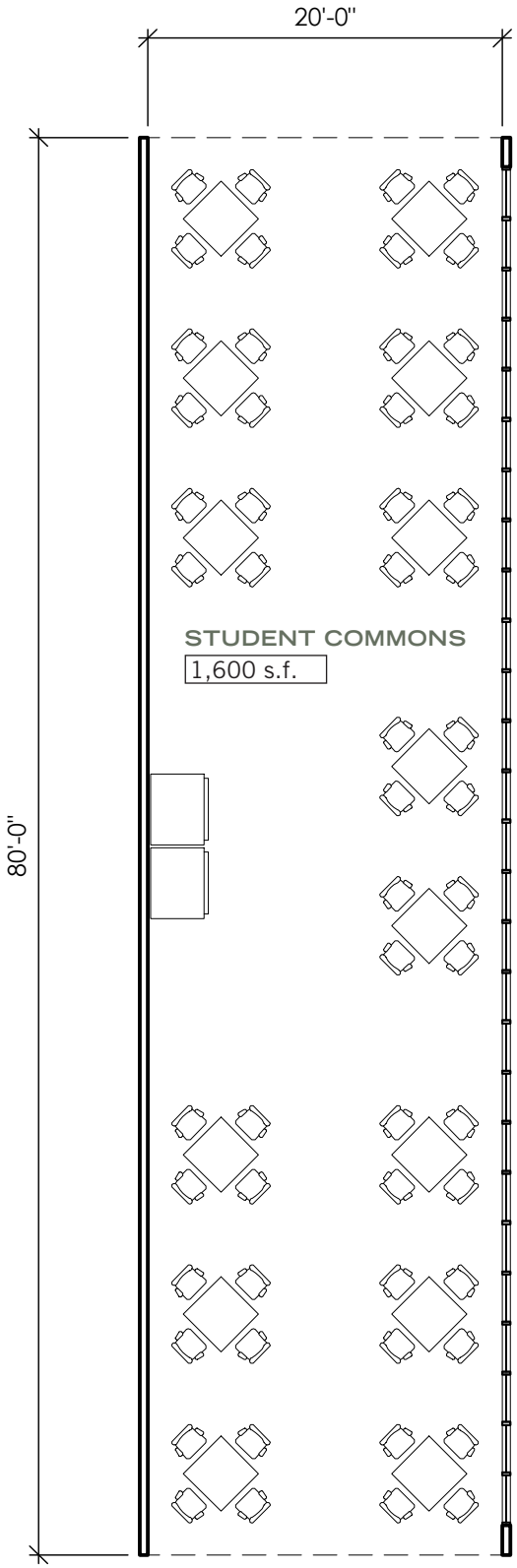
5. FURNITURE, FIXTURES & EQUIPMENT

General:

- Spaces and tables to provide study groups of varying sizes.
- 2 Vending machines

6. SPECIAL REQUIREMENTS & NOTES

Notes:


20'-0"
80'-0"
STUDENT COMMONS
1,600 s.f.

GENERAL/SHARED SPACES

1. PROGRAM

Space Description:	**Visitor Observation**
Occupants:	20 maximum
Existing Area:	n/a
Proposed NSF:	n/a
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Close proximity to Entrance Lobbies, Composites and Flex Labs
	Locate at mezzanine level above Student Lounge
	Direct visual connection to Composites and Flex Labs

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes
Doors:	None
Floors:	Carpet tile
Walls:	Painted gypsum board, metal guardrails
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	VAV re-heat. 72º f setpoint. RC-25-35 noise levels
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	High bay lighting
Phone/Data:	Hard wired data. Wireless data
Security:	No special requirements
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

General:
- n/a

6. SPECIAL REQUIREMENTS & NOTES

Notes:
- Direct visual connection to Composites and Flex Labs

GENERAL/SHARED SPACES

1. PROGRAM

Space Description:	**Conference Room**
Occupants:	12-14 people
Existing Area:	n/a
Proposed NSF:	600 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Close proximity to Office Suite
	Visual connection to Composites and Flex Labs

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior & exterior)
Doors:	36" single leaf
Floors:	Carpet
Walls:	Painted gypsum board
Ceiling:	Acoustical panel ceiling
Ceiling Height:	10'-0"
Acoustical Treatment:	No special requirements (Soundproofing if located next to mechanical room)

4. ENGINEERING SYSTEMS

HVAC:	VAV re-heat. 72º f setpoint. RC-30 noise levels
Plumbing:	None
Electrical:	Perimeter outlets. Power to conference table and monitor
Lighting:	Zoned lighting. Separate controls for headwall and seating areas. Dimming capability
Phone/Data:	Wireless data. Hard wired data and phone to conference table. Hard wired data to display.
Security:	No special requirements
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

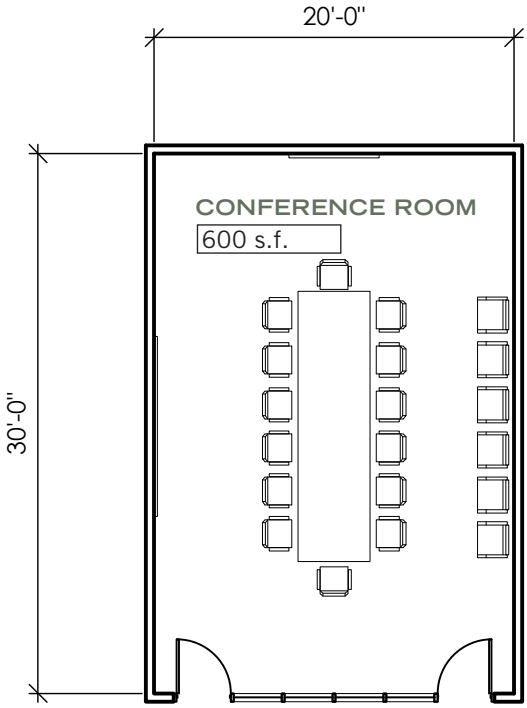
General:

- 1 Conference table
- 20 Chairs
- 1 Whiteboard
- 1 Flat panel display

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Visual connection to Composites and Flex Labs


20'-0"
CONFERENCE ROOM
600 s.f.
30'-0"

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Office Suite**
Occupants:	6 Faculty/Administration members
Existing Area:	n/a
Proposed NSF:	1,360 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Close proximity and direct visual connection to Lab Spaces, Classrooms, Tool and Equipment Storage Directly adjacent to Conference Room Visual connection to Composites and Flex Labs

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior & exterior)
Doors:	36" single leaf
Floors:	Carpet tile
Walls:	Painted gypsum board
Ceiling:	Acoustical panel ceiling
Ceiling Height:	10'-0"
Acoustical Treatment:	(Soundproofing necessary if located next to Mechanical Room)

4. ENGINEERING SYSTEMS

HVAC:	VAV re-heat. 72º f setpoint. RC-25-35 noise levels. Independent exhaust in copy room. Positive pressure in relation to Composites Lab
Plumbing:	Break room sink with disposer
Electrical:	Perimeter outlets. Power to office spaces and conference table
Lighting:	Indirect/suspended linear, task lighting
Phone/Data:	Phone/Data lines to each office, conference table & printer/copier
Security:	No Special Requirements
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

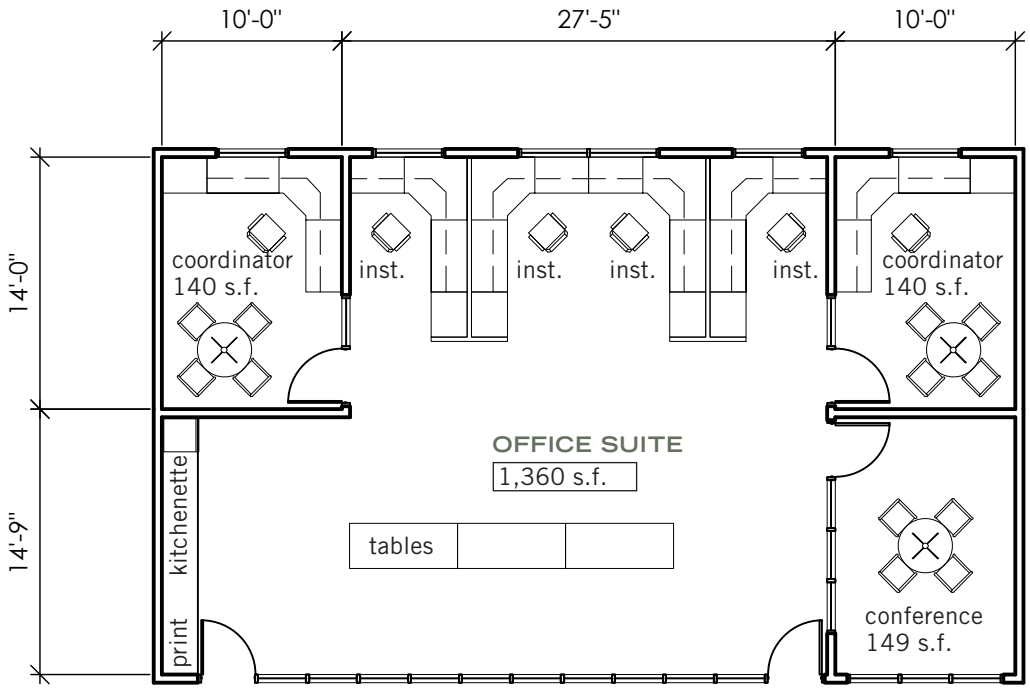
General:

- 2 Coordinator offices (1 office chair, 1 desk with PC, 4 visitor chairs, 1 round table, 1 large filing cabinet, 1 bulletin board)
- 4 Instructor stations (1 office chair, 1 workstation with PC, 1 large filing cabinet)
- 1 Private meeting space (1 round conference table, 4 chairs, 1 white board)
- Kitchenette (1 sink, 1 microwave, 1 fridge, cabinetry)
- 1 multifunction printer
- Cabinetry

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Shared between Composites program and Flex program


10'-0"
27'-5"
10'-0"
14'-0"
14'-9"
coordinator
140 s.f.
inst.
inst.
inst.
inst.
coordinator
140 s.f.
OFFICE SUITE
1,360 s.f.
tables
kitchenette
print
conference
149 s.f.

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Material Storage Room**
Occupants:	
Existing Area:	144 sf
Proposed NSF:	480 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Student Project Storage
	Close proximity to Composites Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	72” double leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	12’-0”
Acoustical Treatment:	None

4. ENGINEERING SYSTEMS

HVAC:	68° F Heating. 75° Cooling
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	Ambient lighting
Phone/Data:	None
Security:	No special requirements
Special Requirements:	-

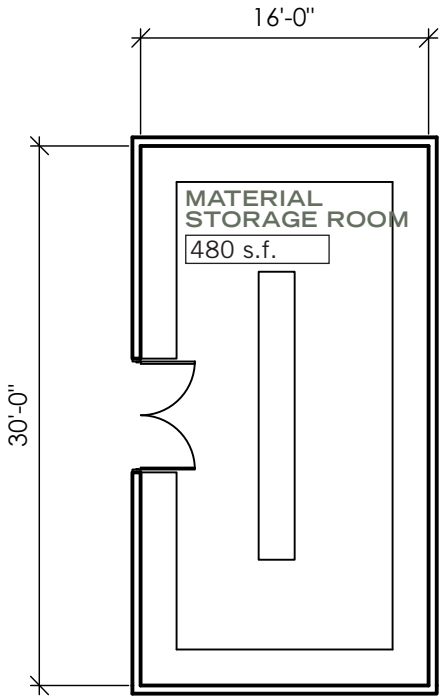
5. FURNITURE, FIXTURES & EQUIPMENT

General:

- 10’ high industrial shelving. 5 horizontal shelves per unit.

6. NOTES

Notes: -


16'-0"
30'-0"
MATERIAL
STORAGE ROOM
480 s.f.

1. PROGRAM

Space Description:	**Student Project Storage Room**
Occupants:	
Existing Area:	n/a
Proposed NSF:	250 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Material Storage Room
	Close proximity to Composites Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	72” double leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	12’-0”
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

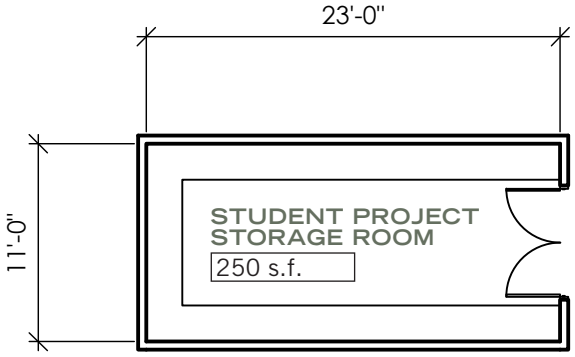
HVAC:	68° F Heating. 75° Cooling
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	Ambient lighting
Phone/Data:	None
Security:	No special requirements
Special Requirements:	- Vacuum system

5. FURNITURE, FIXTURES & EQUIPMENT

General:
- 10’ high industrial shelving. 5 horizontal shelves per unit.

6. NOTES

Notes: -


23'-0"
11'-0"
STUDENT PROJECT
STORAGE ROOM
250 s.f.

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Tool & Equipment Checkout/Storage Room**
Occupants:	
Existing Area:	n/a
Proposed NSF:	800 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Office Suite and Composite Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	Motorized roll up door for forklift access Motorized roll up counter door at Tool Checkout 36" single leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	14'-0" at Tool Storage 10'-0" at Tool Checkout
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Low and high exhaust: 68º F Heating. 75º Cooling @ Storage VAV re-heat. 72º f setpoint. RC-40 noise levels @ Checkout
Plumbing:	Hand wash sink with instantaneous water heater @ Storage
Electrical:	Perimeter outlets. Outlet to checkout computer.
Lighting:	Task lighting with reflectors
Phone/Data:	Phone/Data line to checkout
Security:	No special requirements?
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

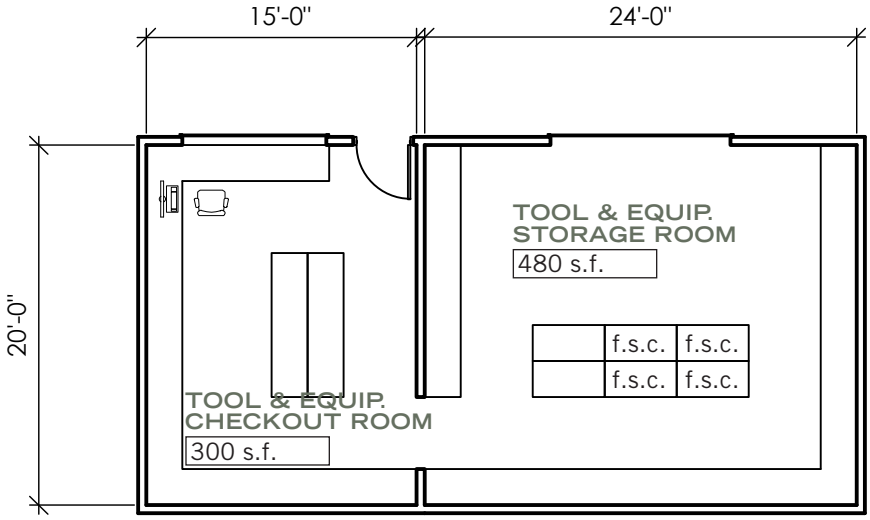
General:

- 12' high industrial shelving at Tool Storage
- 4'-0" spacing between shelving units.
- Flammable storage cabinets (2'-0"x 4'-0"; 2 existing; 2 new)
- 10'-0" high industrial shelving. 5 horizontal shelves for storage at Tool Checkout.

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Tool Storage must be accessible by forklift.
- Flammable storage: no integral requirements for exhaust.
- Epoxy resin storage will not be sufficient to warrant NEMA explosion proof motors & electrical.


15'-0"
24'-0"
20'-0"
TOOL & EQUIP.
STORAGE ROOM
480 s.f.
f.s.c.
f.s.c.
f.s.c.
f.s.c.
TOOL & EQUIP.
CHECKOUT ROOM
300 s.f.

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Clean Room**
Occupants:	10-15 students
Existing Area:	350 sf
Proposed NSF:	1,500 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:
- Direct adjacency to Composites Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	48" single leaf with gaskets
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	10'-0"
Acoustical Treatment:	None

4. ENGINEERING SYSTEMS

HVAC:	Positive pressure. 72° F. MERV-13 filtration Min. ventilation: 10 cfm/person; 0.18 cfm/sf
Plumbing:	No special requirements?
Electrical:	Perimeter outlets. Outlets at computers
Lighting:	Ambient and task lighting
Phone/Data:	Phone/Data line to computers
Security:	No special requirements

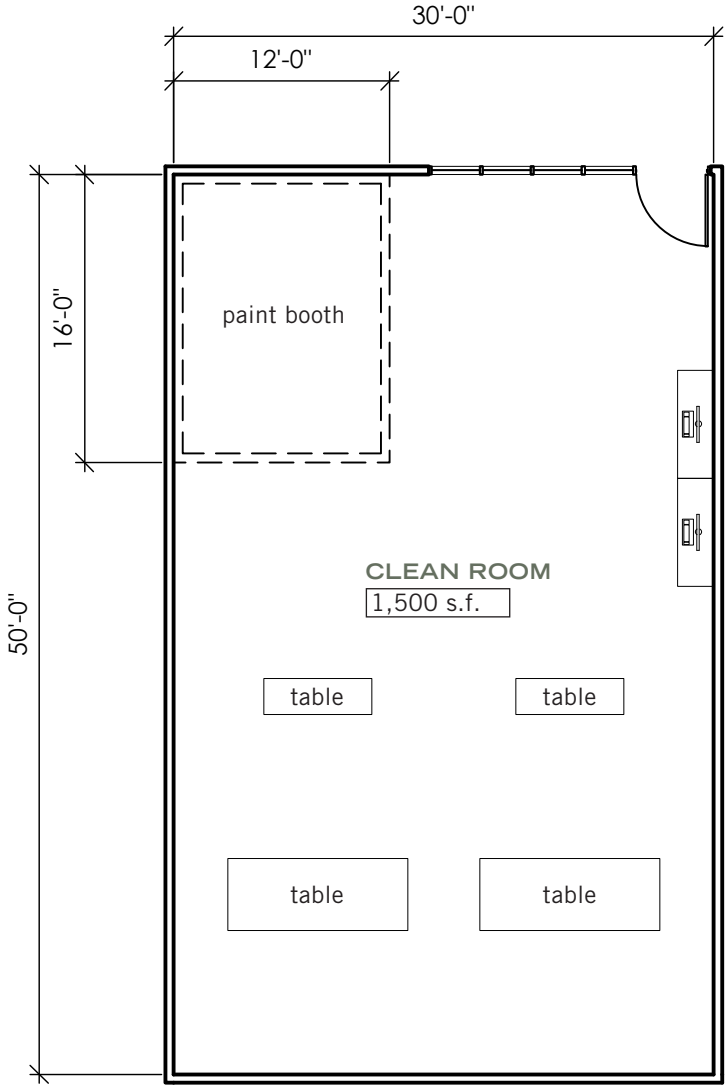
Special Requirements:
- Owner furnished, self contained, evac table for composites vacuum.

5. FURNITURE, FIXTURES & EQUIPMENT

General:
- 1 Whiteboard
- 2 tables 2'x6'
- 2 tables 4'x10'
- 2 desks with PC
- Paint Booth (1 New 12'-0"x16'-0") Owner furnished ASB model #IFPW-120812-S-S non pressurized industrial dry filter crossflow paintbooth. Contractor installed fire protection, wiring, piping ductwork and make-up air.

6. SPECIAL REQUIREMENTS & NOTES

Notes:
-


30'-0"
12'-0"
16'-0"
50'-0"
paint booth
CLEAN ROOM
1,500 s.f.
table
table
table
table

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Grind Room**
Occupants:	10 students
Existing Area:	450 sf
Proposed NSF:	900 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Direct adjacency to Composites Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	48" single leaf with gaskets
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	10'-0"
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Negative pressurization
Plumbing:	Share common emergency eye wash station with Composites Lab. Paint Booth: 30" dia 9,600 cfm exhaust fan furnished with booth.
Electrical:	Perimeter outlets
Lighting:	Ambient and task lighting
Phone/Data:	None
Security:	No special requirements
Special Requirements:	- Air compressors at each downdraft table - Dust collection achieved with owner furnished, self contained downdraft tables - No exhaust connection to downdraft tables - Paint booth: Custom fire sprinkling system required inside booth; compressed air and water

5. FURNITURE, FIXTURES & EQUIPMENT

General:	- 3 Small downdraft tables - 3'x4' (existing) - 2 Large downdraft tables - 4'x8' (existing) - Band saw and scroll saw (existing) - Benches around downdraft tables

6. SPECIAL REQUIREMENTS & NOTES

Notes:	-


22'-0"
40'-0"
GRIND ROOM
900 s.f.
downdraft table
downdraft table

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Composites Lab**
Occupants:	36 students
Existing Area:	4,500 sf
Proposed NSF:	9,600 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency: Directly adjacent to Classrooms, Office Suite, Clean Room, Grind Room and Tool & Equip ment Checkout/Storage Room.
Direct visual connection to Office Suite, Classrooms, Clean Room, Grind Room and Tool & Equipment Checkout/Storage Room.

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	n/a
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Negative air pressurization. High-supply/low return. Radiant heating with minimum ventila tion air. Refrigerated air conditioning.
Plumbing:	Wall mounted sinks, emergency eye wash station (shared with Grind Room).
Electrical:	Single phase and three phase power. Hard wired phone and data to teachers workstation and computer lab.
Lighting:	High bay lighting. Daylighting through clerestory windows and skylights.
Phone/Data:	Phone/Data line to teachers workstation & computer lab.
Security:	Video surveillance.
Special Requirements:	- Compressed air, vacuum piping.

5. FURNITURE, FIXTURES & EQUIPMENT

General:

- Lockers for 36 students.
- 2 freezers: 1 existing (6’-0”x8’-0”), 1 new (12’-0”x26’-0”)
- Laser placement (1,000 sf)
- Ovens: 1 existing (5’-0”x6’-0”; Wisconsin oven corp.; model SBH-444/ep.; 65° F, electric; 240/3/60;18 kw) 1 new (5’-0”x6’-0”; same model as existing)
- Glass Table: 1 existing (8’-0”x8’-0”)
- Cutting Table: 1 existing (8’-0”x8’-0”)
- Vacuum table: 1 existing (4’-0”x8’-0”; 100-140 psi compressed air/ quick connect)
- Hot vacuum table: 1 existing (4’-0”x8’-0”; 100-140 psi compressed air/ quick connect)
- Material rolls: 2 existing (4’-0”x4’-0”) 1 new (4’-0”x4’-0”)
- Hot bonder: 1 existing (4’-0”x8’-0”)

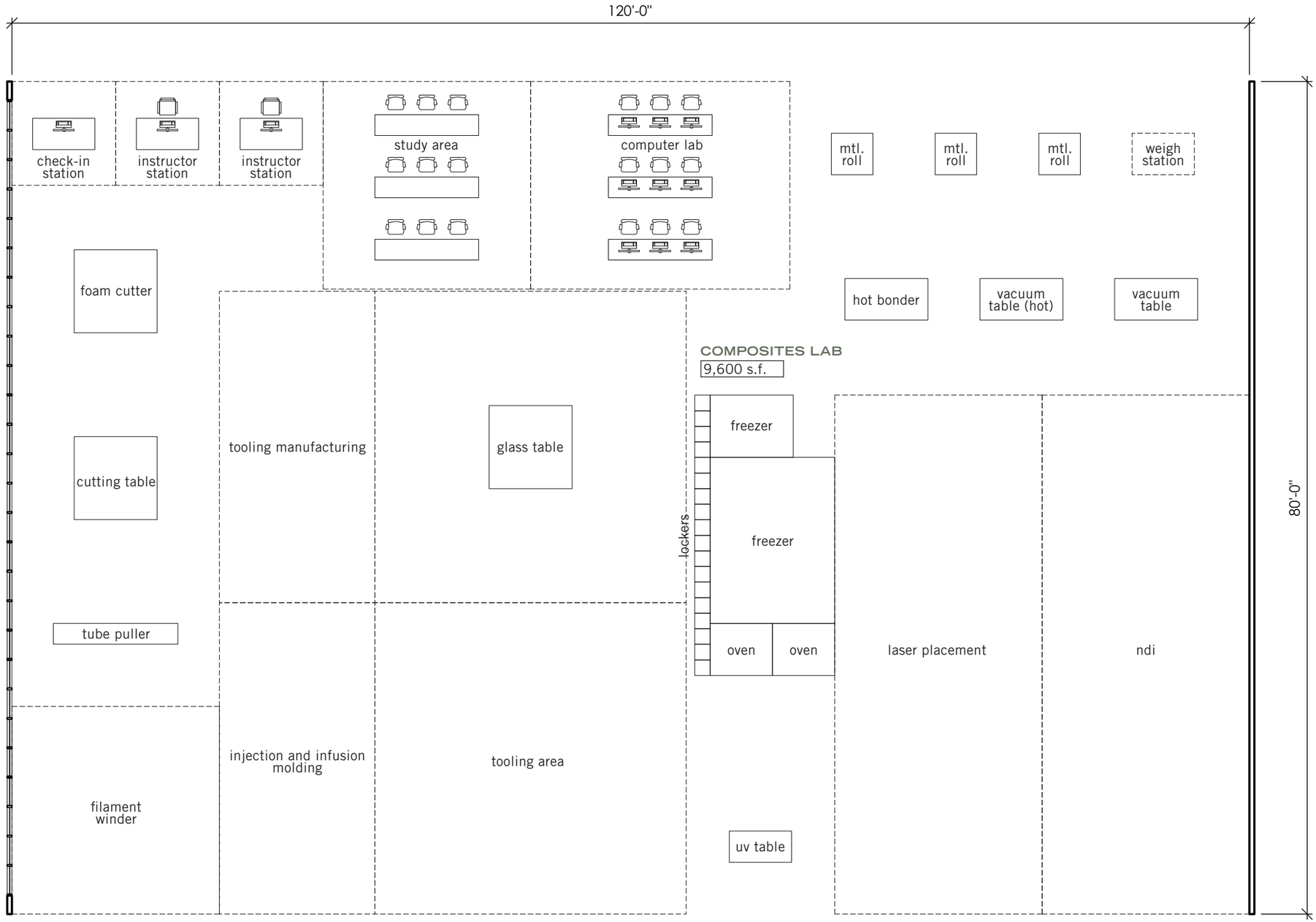
- Filament winder
- Chop saws: 2 existing.
- UV table: 1 existing (3'-0"x6'-0")
- Foam cutter: 1 existing (8'-0"x8'-0")
- Tube puller: 1 existing (2'-0"x12'-0")
- 3 large tables: (3'-0"x10'-0") for study area
- 1 desk for check-in PC
- 2 desks with PCs for instructors stations
- 6 student workstations with PCs for computer lab

6. SPACES

- NDI (Non Destructive Inspection; 1,000 s.f.)
- Student study area (10'-0"x20'-0")
- Tooling area (30'-0"x30'-0")
- Laser placement (1,000 s.f.)
- 2 Instructor stations (10'-0"x10'-0" each)
- Tooling manufacturing (15'-0"x30'-0")
- Weigh station (4'-0"x6'-0")
- Glass Table (30'-0"x30'-0")
- Injection and infusion molding (15'-0"x30'-0")
- Filament winder (20'-0"x20'-0")
- Computer lab (500 s.f.)

7. SPECIAL REQUIREMENTS & NOTES

-


120'-0"
80'-0"
check-in station
instructor station
instructor station
study area
computer lab
mtl. roll
mtl. roll
mtl. roll
weigh station
foam cutter
hot bonder
vacuum table (hot)
vacuum table
COMPOSITES LAB
9,600 s.f.
tooling manufacturing
glass table
freezer
cutting table
lockers
freezer
tube puller
oven
oven
laser placement
ndi
injection and infusion molding
tooling area
filament winder
uv table

COMPOSITES PROGRAM

1. PROGRAM

Space Description:	**Classroom**
Occupants:	24 students
Existing Area:	n/a
Proposed NSF:	1,080 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Flex Program Classroom, Office Suite and Flex Lab Direct visual connection to Composites Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	36" single leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board. (1) Folding panel partition (between Composites and Flex Lab classrooms)
Ceiling:	Acoustic panel ceiling
Ceiling Height:	12'-0"
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	VAV re-eat. 72° F setpoint. RC-25 noise level
Plumbing:	None
Electrical:	Perimeter Outlets. Outlets at student desk stations, teaching station and display panel
Lighting:	Zoned lighting. Separate controls for headwall and seating ares. Dimming capabilities.
Phone/Data:	Wireless data. Hard wired data to student desk stations and monitor. Hard wired phone/ data to teaching station.
Security:	No special requirements
Special Requirements:	- Combine with monitor from Composites Program Classroom

5. FURNITURE, FIXTURES & EQUIPMENT

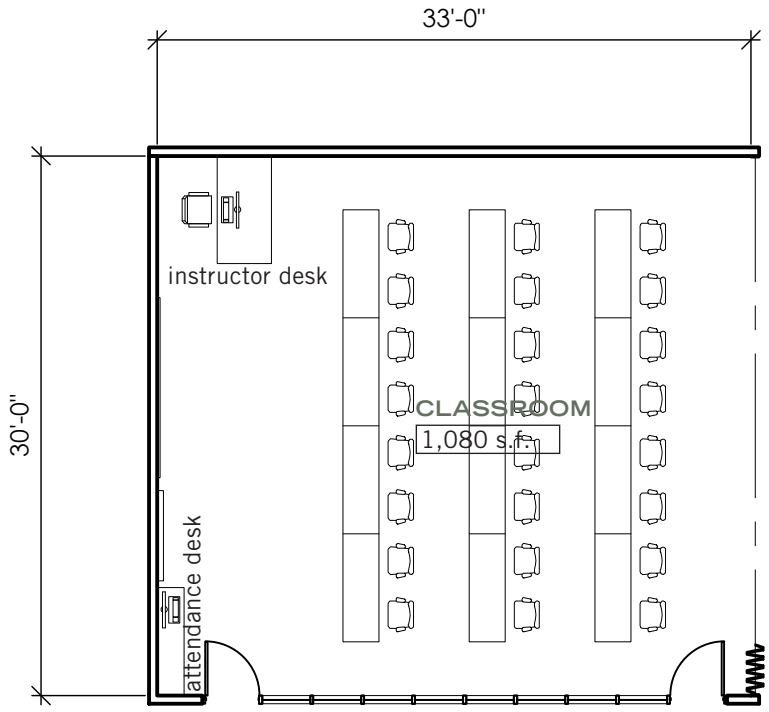
General:

- 24 Student desk stations with flip up hubs for data interface
- 24 Chairs
- 1 Instructor desk
- 1 Attendance desk with computer
- 1 Flat panel display
- 1 Smartboard

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Ability to combine with Flex Program Classroom to create a single large class room


33'-0"
30'-0"
instructor desk
CLASSROOM
1,080 s.f.
attendance desk

FLEX PROGRAM

1. PROGRAM

Space Description:	**Material Storage Room**
Occupants:	
Existing Area:	144 sf
Proposed NSF:	480 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Student Project Storage
	Close proximity to Flex Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	72” double leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	12’-0”
Acoustical Treatment:	None

4. ENGINEERING SYSTEMS

HVAC:	68° F Heating. 75° Cooling
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	Ambient lighting
Phone/Data:	None
Security:	No special requirements
Special Requirements:	-

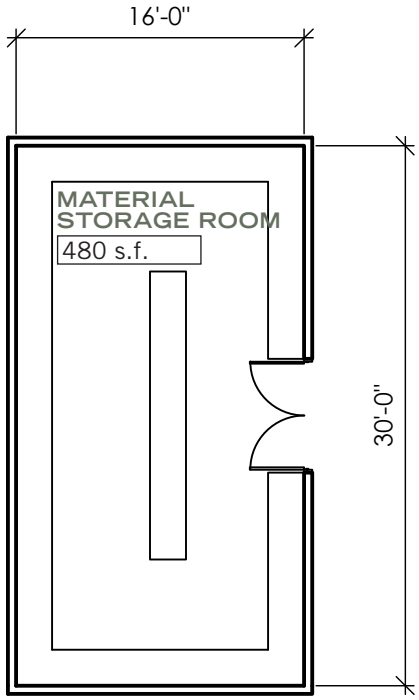
5. FURNITURE, FIXTURES & EQUIPMENT

General:

- 10’ high industrial shelving. 5 horizontal shelves per unit.

6. NOTES

Notes: -


16'-0"
MATERIAL
STORAGE ROOM
480 s.f.
30'-0"

FLEX PROGRAM

1. PROGRAM

Space Description:	**Student Project Storage Room**
Occupants:	
Existing Area:	n/a
Proposed NSF:	250 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Material Storage Room
	Close proximity to Flex Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	72” double leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	12’-0”
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

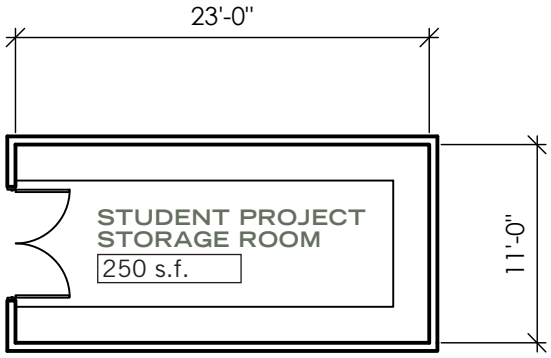
HVAC:	68° F Heating. 75° Cooling
Plumbing:	None
Electrical:	Perimeter outlets
Lighting:	Ambient lighting
Phone/Data:	None
Security:	No special requirements
Special Requirements:	- Vacuum system

5. FURNITURE, FIXTURES & EQUIPMENT

General: - 10’ high industrial shelving. 5 horizontal shelves per unit.

6. NOTES

Notes: -


23'-0"
STUDENT PROJECT
STORAGE ROOM
250 s.f.
11'-0"

FLEX PROGRAM

1. PROGRAM

Space Description:	**Tool & Equipment Checkout/Storage Room**
Occupants:	
Existing Area:	n/a
Proposed NSF:	800 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Office Suite and Flex Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	None
Doors:	Motorized roll up door for forklift access Motorized roll up counter door at Tool Checkout 36" single leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Painted gypsum board
Ceiling Height:	14'-0" at Tool Storage 10'-0" at Tool Checkout
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Low and high exhaust: 68º F Heating. 75º Cooling @ Storage VAV re-heat. 72º f setpoint. RC-40 noise levels @ Checkout
Plumbing:	Hand wash sink with instantaneous water heater @ Storage
Electrical:	Perimeter outlets. Outlet to checkout computer.
Lighting:	Task lighting with reflectors
Phone/Data:	Phone/Data line to checkout
Security:	No special requirements?
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

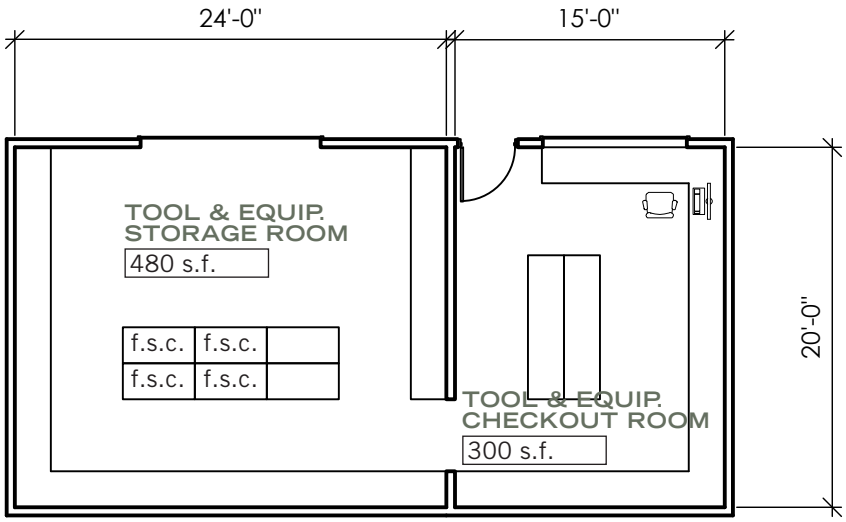
General:

- 12' high industrial shelving at Tool Storage
- 4'-0" spacing between shelving units.
- Flammable storage cabinets (2'-0"x 4'-0") (2 existing, 2 new)
- 10'-0" high industrial shelving. 5 horizontal shelves for storage at Tool Checkout.

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Tool Storage must be accessible by forklift.
- Flammable storage: no integral requirements for exhaust.
- Epoxy resin storage will not be sufficient to warrant NEMA explosion proof motors & electrical.


24'-0"
15'-0"
TOOL & EQUIP.
STORAGE ROOM
480 s.f.
f.s.c.
f.s.c.
f.s.c.
f.s.c.
TOOL & EQUIP.
CHECKOUT ROOM
300 s.f.
20'-0"

1. PROGRAM

Space Description:	**Flex Lab**
Occupants:	36 students
Existing Area:	n/a
Proposed NSF:	10,000
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency: Direct adjacency to Flex Classroom, Office Suite and Tool & Equipment Checkout/Storage Room.
Direct visual connection to Flex Classroom, Office Suite and Tool & Equipment Checkout/ Storage Room.

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	36" Single Leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Negative air pressurization. High-supply/low return. Radiant heating with minimum ventila tion air. Refrigerated air conditioning
Plumbing:	Wall mounted sinks, emergency eye wash station.
Electrical:	Both single phase and three phase power must be available.
Lighting:	High bay lighting. Daylighting through clerestory windows and skylights.
Phone/Data:	Hard wired phone/data to teachers workstation. Wireless data. Hard wired data lines for computer lab.
Security:	Video surveillance
Special Requirements:	- Compressed air/vacuum piping

5. FURNITURE, FIXTURES & EQUIPMENT

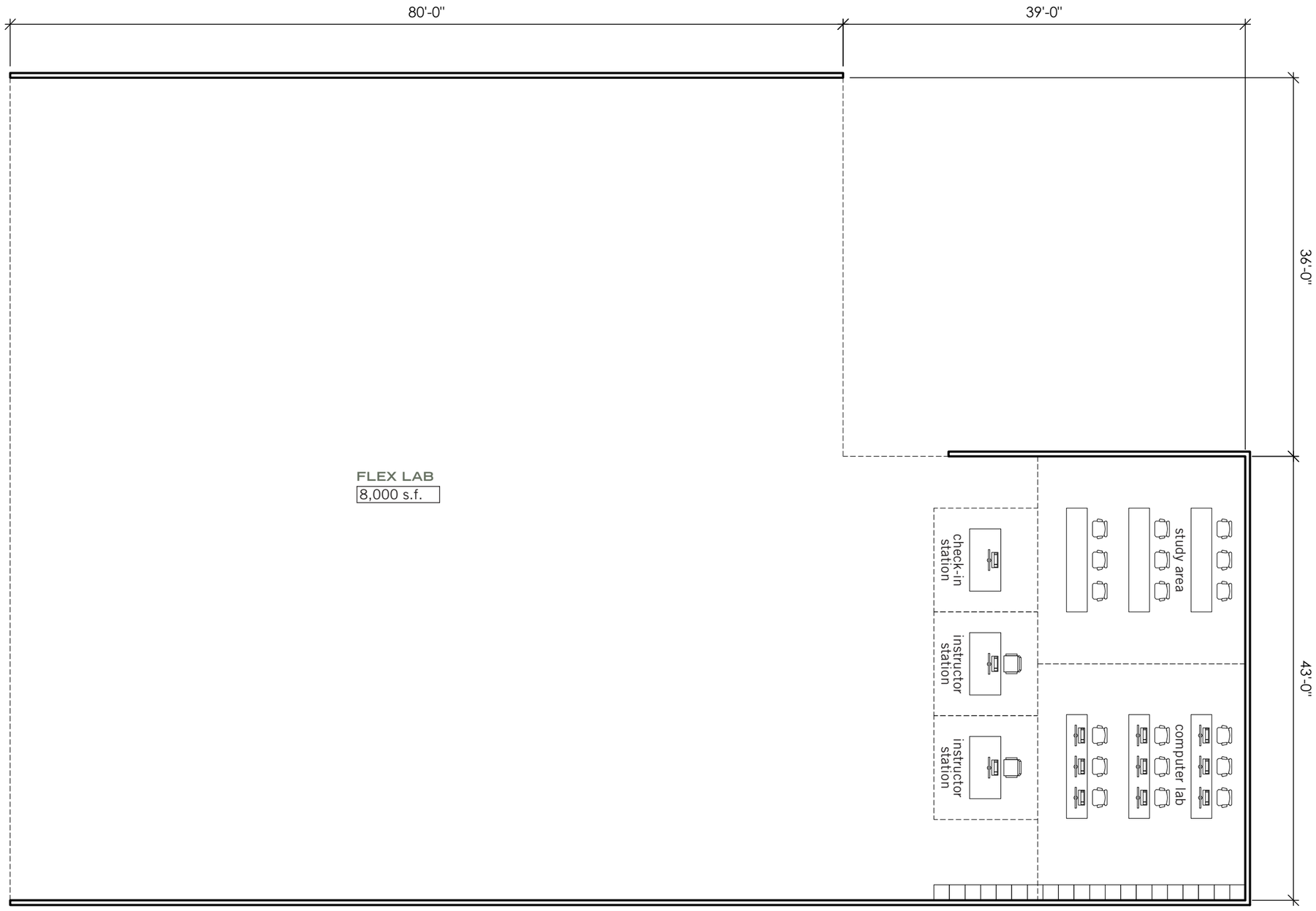
General:
- Lockers for 36 students
- 3 large tables: (3'-0"x10'-0") for study area
- 1 desk for check-in PC
- 2 desks with PCs for instructors stations
- 6 student workstations with PCs for computer lab

6. SPACES

- Student study area (10'-0" x 20'-0")
- Computer Lab (500 s.f.) 6 stations

7. SPECIAL REQUIREMENTS AND NOTES

Notes: -


80'-0"
39'-0"
36'-0"
43'-0"
FLEX LAB
8,000 s.f.
check-in station
instructor station
instructor station
study area
computer lab

FLEX PROGRAM

1. PROGRAM

Space Description:	**Classroom**
Occupants:	24 students
Existing Area:	n/a
Proposed NSF:	1,080 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Directly adjacent to Composites Program Classroom, Office Suite and Flex Lab Direct visual connection to Flex Lab

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	36" single leaf
Floors:	Sealed concrete
Walls:	Painted gypsum board. (1) Folding panel partition (between Composites and Flex Lab classrooms)
Ceiling:	Acoustic panel ceiling
Ceiling Height:	12'-0"
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	VAV re-eat. 72° F setpoint. RC-25 noise level
Plumbing:	None
Electrical:	Perimeter Outlets. Outlets at student desk stations, teaching station and display panel
Lighting:	Zoned lighting. Separate controls for headwall and seating ares. Dimming capabilities.
Phone/Data:	Wireless data. Hard wired data to student desk stations and monitor. Hard wired phone/ data to teaching station.
Security:	No special requirements
Special Requirements:	- Combine with monitor from Composites Program Classroom

5. FURNITURE, FIXTURES & EQUIPMENT

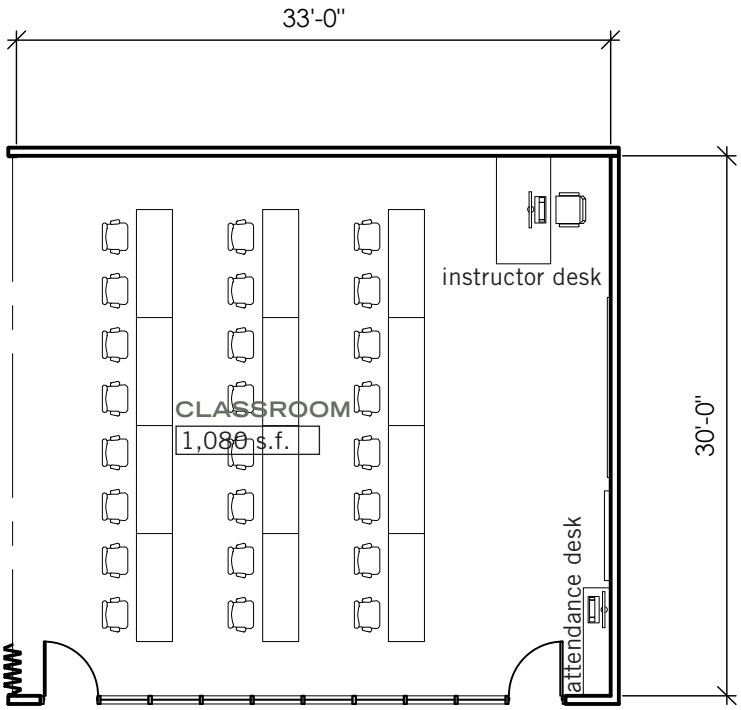
General:

- 24 Student desk stations with flip up hubs for data interface
- 24 Chairs
- 1 Instructor desk
- 1 Attendance desk with computer
- 1 Flat panel display
- 1 Smartboard

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Ability to combine with Composites Program Classroom to create a single large class room


33'-0"
instructor desk
CLASSROOM
1,080 s.f.
30'-0"
attendance desk

MITC PROGRAM

1. PROGRAM

Space Description:	**MITC Tenant Space**
Occupants:	
Existing Area:	1,500 sf
Proposed NSF:	1,200 sf
Quantity:	2

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Access to public restrooms
	Access to exterior entrance and dock for each tenant space

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes
Doors:	48" single leaf
	Motorized roll up door
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

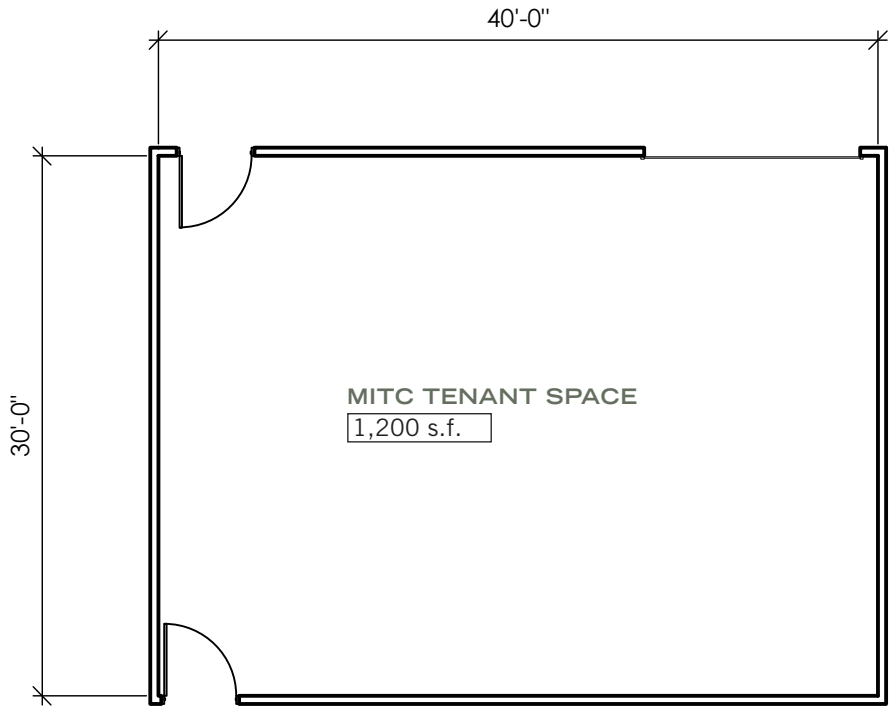
HVAC:	Supply, return, and exhaust ducts shall be stubbed in for tenant connection.
Plumbing:	Domestic cold water stubbed in, rough-in for floor sinks (plumbing fixtures and hot water provided by tenant)
Electrical:	Perimeter outlets
Lighting:	High bay lighting.
Phone/Data:	Separate hard wired phone and data to each tenant space
Security:	Video surveillance in each space
Special Requirements:	- Rough-in compressed air for each space
	- Compressed air will be provided from new owner furnished air compressor
	- Each space metered separately

5. FURNITURE, FIXTURES & EQUIPMENT

General:	- Furnishings provided by tenant

6. SPECIAL REQUIREMENTS & NOTES

Notes:	- Ability to secure all tenant spaces from remainder of facility.


40'-0"
30'-0"
MITC TENANT SPACE
1,200 s.f.

MITC PROGRAM

1. PROGRAM

Space Description:	**MITC Tenant Space**
Occupants:	
Existing Area:	1,500 sf
Proposed NSF:	900 sf
Quantity:	2

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Access to public restrooms
	Access to exterior entrance and dock for each tenant space

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes
Doors:	36” single leaf
	Motorized roll up door
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

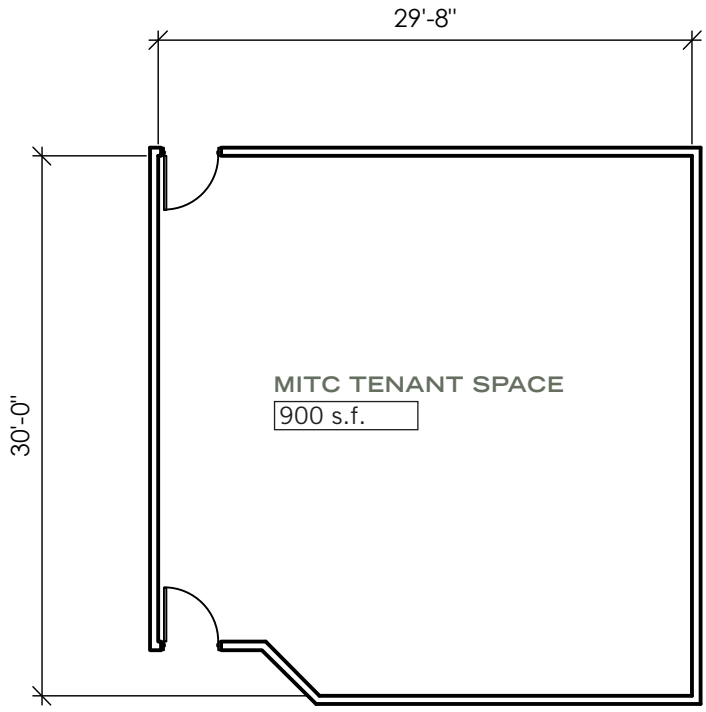
HVAC:	Supply, return, and exhaust ducts shall be stubbed in for tenant connection.
Plumbing:	Domestic cold water stubbed in, rough-in for floor sinks (plumbing fixtures and hot water provided by tenant)
Electrical:	Perimeter outlets
Lighting:	High bay lighting.
Phone/Data:	Separate hard wired phone and data to each tenant space
Security:	Video surveillance in each space
Special Requirements:	- Rough-in compressed air for each space
	- Compressed air will be provided from new owner furnished air compressor
	- Each space metered separately

5. FURNITURE, FIXTURES & EQUIPMENT

General:	- Furnishings provided by tenant

6. SPECIAL REQUIREMENTS & NOTES

Notes:	- Ability to secure all tenant spaces from remainder of facility.
	- Convert existing classroom to MITC Tenant Space.


29'-8"
30'-0"
MITC TENANT SPACE
900 s.f.

FORKLIFT TRAINING PROGRAM

1. PROGRAM

Space Description:	**Forklift Training Lab**
Occupants:	6
Existing Area:	10,000 sf
Proposed NSF:	11,080 sf
Quantity:	1

2. ADJACENCY AND ACCESS REQUIREMENTS

Adjacency:	Direct adjacency to existing Classroom in Bay 1
	Direct visual connection to existing Classroom in Bay 1

3. ARCHITECTURAL CHARACTERISTICS

Windows:	Yes (interior)
Doors:	36" single leaf
	Motorized roll-up door at dock
Floors:	Sealed concrete
Walls:	Painted gypsum board
Ceiling:	Open to structure above
Ceiling Height:	Varies
Acoustical Treatment:	No special requirements

4. ENGINEERING SYSTEMS

HVAC:	Utilize existing gas fired unit heaters, swamp coolers, and exhaust system.
Plumbing:	Sink. Emergency eye wash station. Locate hose bib next to battery station (include filtration to remove solids, minerals, etc. to prevent scaling)
Electrical:	Perimeter outlets. Instantaneous water cooler. Outlets to check-in teaching station
Lighting:	High bay lighting. Daylighting
Phone/Data:	Hard wired phone/data to teaching station. Hard wired data to check-in station.
Security:	Video surveillance
Special Requirements:	-

5. FURNITURE, FIXTURES & EQUIPMENT

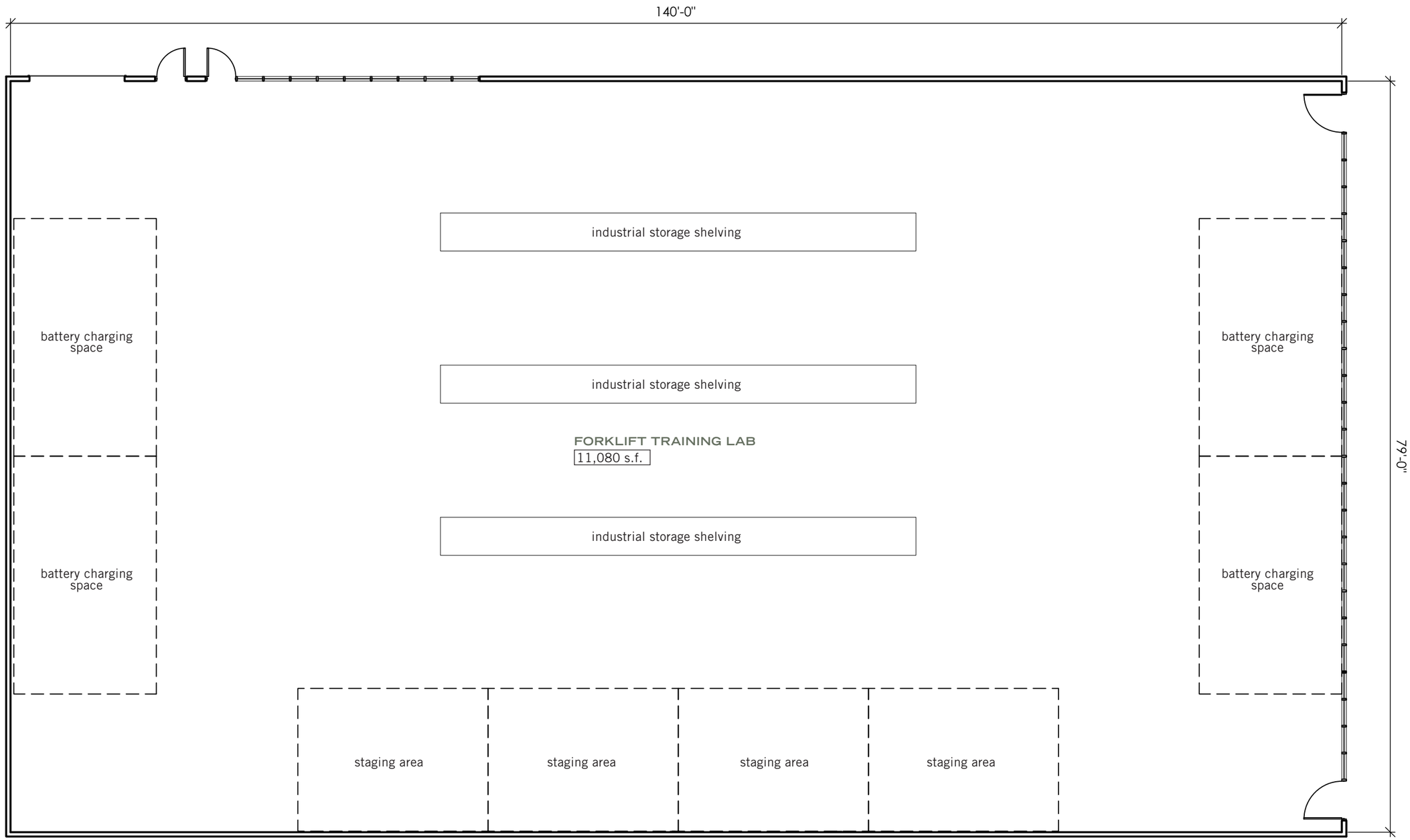
General:

- 4 - 25'-0" x 25'-0" staging areas
- 1 - 15'-0" x 40'-0" battery charging space. 6 chargers. (3) 480 volt, (2) 208 volt
- 6 - 4'-0" w x 50'-0" l x 12'-0" h industrial storage shelves (similar to existing in BDO) to make a total of 3 rows back to back

6. SPECIAL REQUIREMENTS & NOTES

Notes:

- Provide forklift access
- 12'-0" - 14'-0" aisle width between rows
- 10'-0" - 12'-0" free aisle space at perimeter


140'-0"
industrial storage shelving
battery charging space
industrial storage shelving
FORKLIFT TRAINING LAB
11,080 s.f.
industrial storage shelving
battery charging space
battery charging space
79'-0"
staging area
staging area
staging area
staging area

5 PROJECT COST SUMMARY

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER			PROJECT TOTALS	
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE		Project Size	57,938	SF
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	PHASE 1	PHASE 2	TOTALS
02	SITEWORK & DEMOLITION	$ 269,372	$ 133,680	$ 403,051
03	CONCRETE	$ 10,901	$ 3,583	$ 14,485
04	MASONRY	$ 225,018	$ 87,480	$ 312,498
05	METALS	$ 16,570	$ 5,447	$ 22,016
06	WOODS & PLASTICS	$ 13,518	$ 4,444	$ 17,962
07	THERMAL & MOISTURE PROTECTION	$ 586,942	$ 177,842	$ 764,785
08	DOORS & WINDOWS	$ 284,930	$ 106,799	$ 391,729
09	FINISHES	$ 650,818	$ 123,257	$ 774,075
10	SPECIALTIES	$ 71,948	$ 23,649	$ 95,598
11	EQUIPMENT	$ 168,983	$ 82,883	$ 251,866
12	FURNISHINGS	$ 17,760	$ 10,560	$ 28,320
13	SPECIAL CONSTRUCTION	$ 1,275,796	$ 398,591	$ 1,674,387
15	MECHANICAL	$ 1,238,382	$ 407,057	$ 1,645,439
16	ELECTRICAL	$ 778,349	$ 255,844	$ 1,034,193
	SUBTOTAL	$ 5,609,287	$ 1,821,117	7,430,404
	GENERAL CONDITIONS	$ 336,557	$ 109,267	$ 445,824
	OVERHEAD & PROFIT	$ 224,371	$ 72,845	$ 297,216
	DESIGN CONTINGENCY	$ 841,393	$ 273,168	$ 1,114,561
	TOTAL CONSTRUCTION COST	$ 7,011,609	$ 2,276,396	$ 9,288,005

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION				11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	43,605	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION		$ 6.18	$ 269,372
03	CONCRETE		$ 0.25	$ 10,901
04	MASONRY		$ 5.16	$ 225,018
05	METALS		$ 0.38	$ 16,570
06	WOODS & PLASTICS		$ 0.31	$ 13,518
07	THERMAL & MOISTURE PROTECTION		$ 13.46	$ 586,942
08	DOORS & WINDOWS		$ 6.53	$ 284,930
09	FINISHES		$ 14.93	$ 650,818
10	SPECIALTIES		$ 1.65	$ 71,948
11	EQUIPMENT		$ 3.88	$ 168,983
12	FURNISHINGS		$ 0.41	$ 17,760
13	SPECIAL CONSTRUCTION		$ 29.26	$ 1,275,796
15	MECHANICAL		$ 28.40	$ 1,238,382
16	ELECTRICAL		$ 17.85	$ 778,349
	SUBTOTAL		$ 128.64	5,609,287
	GENERAL CONDITIONS	6%	$ 7.72	336,557
	OVERHEAD & PROFIT	4%	$ 5.15	224,371
	DESIGN CONTINGENCY	15%	$ 19.30	841,393
	TOTAL CONSTRUCTION COST		$ 160.80	$ 7,011,609

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION				11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	43,605	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION			
	Demolition			
	Selective Interior Demolition	43605 SF	$ 1.25	$ 54,506
	Demo Exterior Wall	13890 SF	$ 0.95	$ 13,196
	Demo Existing Roof	43605 SF	$ 0.95	$ 41,425
	Subtotal for Demolition			$ 109,127
	Earthwork			
	Redo Loading Dock/ Entrance area	3251 SF	$ 30.00	$ 97,530
	Subtotal for Earthwork			$ 97,530
	Site Utilities			
	Subtotal for Site Utilities			$ -
	Parking Area Improvements	11100 SF	$ 5.65	$ 62,715
	TOTAL SITEWORK & DEMOLITION			$ 269,372
03	CONCRETE			
	Repair Slab on Grade	43605 SF	$ 0.25	$ 10,901
	TOTAL CONCRETE			$ 10,901
04	MASONRY			
	CMU at Stair Enclosure	SF	$ 15.28	$ -
	Exterior Wall	12501 SF	$ 18.00	$ 225,018
	TOTAL MASONRY			$ 225,018

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		43,605 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
05	METALS				
	Miscellaneous Steel	43605 SF	$ 0.38	$	16,570
	TOTAL METALS			$	16,570
06	WOOD & PLASTICS				
	Carpentry:				
	Wood Plates & Blocking	43605 SF	$ 0.31	$	13,518
	Subtotal for Carpentry			$	13,518
	Millwork	43605 SF	$ 4.00	$	174,420
	TOTAL WOOD & PLASTICS			$	187,938
07	THERMAL & MOISTURE PROTECTION				
	Batt Insulation at exterior wall	14756 SF	$ 0.67	$	9,887
	3" Rigid at Building Exterior	14756 SF	$ 2.95	$	43,530
	Rigid Roof Insulation	43605 SF	$ 2.55	$	111,193
	Sound Batt	62776 SF	$ 0.48	$	30,133
	Wall Sheathing	13890 SF	$ 1.65	$	22,919
	Weather Barrier	13890 SF	$ 2.25	$	31,253
	Exterior Wall Paneling	13890 SF	$ 3.60	$	50,004
	Fascia	986 SF	$ 9.65	$	9,515
	New exterior Canopys	1000 SF	$ 59.00	$	59,000
	Metal Flashings	2500 SF	$ 5.65	$	14,125
	Single Ply membrane	43605 SF	$ 2.65	$	115,553
	Expansion Joints at roof/ wall	531 SF	$ 1.65	$	876
	Building Fireproofing	43605 SF	$ 1.65	$	71,948
	Fire Stopping/ Caulking	43605 SF	$ 0.18	$	7,849

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size	43,605	SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
	Caulking & Sealants	43605 SF	$ 0.21	$	9,158
	TOTAL THERMAL & MOISTURE PROTECTION			$	586,942
08	DOORS & WINDOWS				
	Doors	43605 SF	$ 1.95	$	85,030
	Aluminum Double Doors w/ glass	4 EA	$ 3,650.00	$	14,600
	Exterior Glazing Aluminum (20% of Exterior)	2400 SF	$ 34.50	$	82,800
	Transclucent Panel	1600 SF	$ 45.00	$	72,000
	Interior Glazing	1000 SF	$ 30.50	$	30,500
	TOTAL DOORS & WINDOWS			$	284,930
09	FINISHES				
	Interior Metal Stud Partitions	62776 SF	$ 2.25	$	141,246
	5/8" Gypsum board	140308 SF	$ 1.30	$	182,400
	Operable Wall	29 SF	$ 52.00	$	1,508
	Moveable Partition Bulkhead	29 LF	$ 49.00	$	1,421
	MITC Ceiling	4500 SF	$ 2.75	$	12,375
	Classroom Ceiling	3900 SF	$ 2.25	$	8,775
	Clean Room Ceiling	700 SF	$ 9.65	$	6,755
	Office Area Ceiling	1000 SF	$ 2.25	$	2,250
	Seal Exposed Structure	21700 SF	$ 3.00	$	65,100
	Circulation area Ceiling	13788 SF	$ 2.25	$	31,023
	Circulation area flooring	13788 SF	$ 3.33	$	45,914
	Conference/ Board/ Reception Ceiling	1200 SF	$ 3.75	$	4,500
	Conference/ Board/ Reception Flooring	1200 SF	$ 12.00	$	14,400
	MITC Flooring	4500 SF	$ 4.00	$	18,000
	Clean Room Flooring	700 SF	$ 8.65	$	6,055
	Classroom Flooring	3900 SF	$ 3.33	$	12,987
	Office Area Flooring	1000 SF	$ 3.33	$	3,330

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		43,605 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
	Paint Gypsum Board Walls	140308 SF	$ 0.42	$	58,929
	Sealed concrete	21700 SF	$ 0.59	$	12,803
	Wall Coverings	140308 SF	$ 0.15	$	21,046
	TOTAL FINISHES			$	650,818
10	SPECIALTIES	43605 SF	$ 1.65	$	71,948
11	EQUIPMENT				
	Kitchen Equipment	SF	$ 165.00	$	-
	Paint Booth	250 SF	$ 200.00	$	50,000
	Forklift Training Equipemnt	1 LS	$ 20,000.00	$	20,000
	Composites Equipment	1 LS	$ 75,000.00	$	75,000
	Other Building Equipment	43605 SF	$ 0.55	$	23,983
	TOTAL EQUIPMENT			$	168,983
12	FURNISHINGS				
	Walk-Off Mats	240 SF	$ 29.00	$	6,960
	Blinds	2400 SF	$ 4.50	$	10,800
	TOTAL EQUIPMENT			$	17,760
13	SPECIAL CONSTRUCTION				
	Seismic Upgrade				
	New Roof Sheathing	43605 SF	$ 2.25	$	98,111
	Install Simpson type straps on roof	43605 SF	$ 0.75	$	32,704
	Connection at top of Shearwalls	371 LF	$ 30.00	$	11,130
	New Sheathing at East & West Shear walls	13890 SF	$ 2.00	$	27,780
	Anchor Bolts at new shearwall	348 EA	$ 29.68	$	10,332
	Steel Rod X Braces	496 LF	$ 100.00	$	49,600
	Structure Separation at bay ends	531 LF	$ 80.00	$	42,480

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION				11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	43,605	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Gravity Upgrades			
	Install new timber trusses	73568 BF	$ 5.65	$ 415,659
	Upgrade Existing timber trusses	1980 LF	$ 30.00	$ 59,400
	Install New Wood Colums w/ footing	44 EA	$ 7,500.00	$ 330,000
	Install new Girder Trusses	442 LF	$ 300.00	$ 132,600
	Repair existing Columns	44 EA	$ 1,500.00	$ 66,000
	TOTAL SPECIAL CONSTRUCTION			$ 1,275,796
15	MECHANICAL			
	HVAC:	43605 SF	$ 22.00	$ 959,310
	Fire Protection:	43605 SF	$ 2.75	$ 119,914
	Plumbing	43605 SF	$ 3.65	$ 159,158
	TOTAL MECHANICAL			$ 1,238,382
16	ELECTRICAL			
	Service & Distribution:	43605 SF	$ 4.65	$ 202,763
	Power:	43605 SF	$ 2.65	$ 115,553
	Lighting:	43605 SF	$ 5.00	$ 218,025
	Telecommunication System:	43605 SF	$ 1.95	$ 85,030
	Fire/Smoke System:	43605 SF	$ 1.95	$ 85,030
	Special Systems:	43605 SF	$ 1.65	$ 71,948
	TOTAL ELECTRICAL			$ 778,349

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		14,333 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
02	SITEWORK & DEMOLITION		$ 9.33	$	133,680
03	CONCRETE		$ 0.25	$	3,583
04	MASONRY		$ 6.10	$	87,480
05	METALS		$ 0.38	$	5,447
06	WOODS & PLASTICS		$ 0.31	$	4,444
07	THERMAL & MOISTURE PROTECTION		$ 12.41	$	177,842
08	DOORS & WINDOWS		$ 7.45	$	106,799
09	FINISHES		$ 8.60	$	123,257
10	SPECIALTIES		$ 1.65	$	23,649
11	EQUIPMENT		$ 5.78	$	82,883
12	FURNISHINGS		$ 0.74	$	10,560
13	SPECIAL CONSTRUCTION		$ 27.81	$	398,591
15	MECHANICAL		$ 28.40	$	407,057
16	ELECTRICAL		$ 17.85	$	255,844
	SUBTOTAL		$ 127.06		1,821,117
	GENERAL CONDITIONS	6%	$ 7.62		109,267
	OVERHEAD & PROFIT	4%	$ 5.08		72,845
	DESIGN CONTINGENCY	15%	$ 19.06		273,168
	TOTAL CONSTRUCTION COST		$ 158.82	$	2,276,396

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		14,333 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
02	SITEWORK & DEMOLITION				
	Demolition				
	Selective Interior Demolition	14333 SF	$ 1.25	$	17,916
	Demo Exterior Wall	4860 SF	$ 0.95	$	4,617
	Demo Existing Roof	14333 SF	$ 0.95	$	13,616
	Subtotal for Demolition			$	36,150
	Earthwork				
	Redo Loading Dock/ Entrance area	3251 SF	$ 30.00	$	97,530
	Subtotal for Earthwork			$	97,530
	Site Utilities				
	Subtotal for Site Utilities			$	-
	Site Improvements	0 SF	$ 4.00	$	-
	TOTAL SITEWORK & DEMOLITION			$	133,680
03	CONCRETE				
	Repair Slab on Grade	14333 SF	$ 0.25	$	3,583
	TOTAL CONCRETE			$	3,583
04	MASONRY				
	CMU at Stair Enclosure	SF	$ 15.28	$	-
	Exterior Wall	4860 SF	$ 18.00	$	87,480
	TOTAL MASONRY			$	87,480

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		14,333 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
05	METALS				
	Miscellaneous Steel	14333 SF	$ 0.38	$	5,447
	TOTAL METALS			$	5,447
06	WOOD & PLASTICS				
	Carpentry:				
	Wood Plates & Blocking	14333 SF	$ 0.31	$	4,444
	Subtotal for Carpentry			$	4,444
	Millwork	14333 SF	$ 4.00	$	57,332
	TOTAL WOOD & PLASTICS			$	61,776
07	THERMAL & MOISTURE PROTECTION				
	Batt Insulation at exterior wall	4860 SF	$ 0.67	$	3,257
	3" Rigid at Building Exterior	4860 SF	$ 2.95	$	14,337
	Rigid Roof Insulation	14333 SF	$ 2.55	$	36,549
	Sound Batt	9296 SF	$ 0.48	$	4,463
	Wall Sheathing	4860 SF	$ 1.65	$	8,019
	Weather Barrier	4860 SF	$ 2.25	$	10,935
	Exterior Wall Paneling	4860 SF	$ 3.60	$	17,496
	Fascia	986 SF	$ 9.65	$	9,515
	Metal Flashings	1000 SF	$ 5.65	$	5,650
	Single Ply membrane	14333 SF	$ 2.65	$	37,982
	Expansion Joints at roof/ wall	242 SF	$ 1.65	$	399
	Building Fireproofing	14333 SF	$ 1.65	$	23,649
	Fire Stopping/ Caulking	14333 SF	$ 0.18	$	2,580
	Caulking & Sealants	14333 SF	$ 0.21	$	3,010

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size	14,333	SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
	TOTAL THERMAL & MOISTURE PROTECTION			$	177,842
08	DOORS & WINDOWS				
	Doors	14333 SF	$ 1.95	$	27,949
	Exterior Glazing Aluminum (20% of Exterior)	800 SF	$ 34.50	$	27,600
	Transclucent Panel	800 SF	$ 45.00	$	36,000
	Interior Glazing	500 SF	$ 30.50	$	15,250
	TOTAL DOORS & WINDOWS			$	106,799
09	FINISHES				
	Interior Metal Stud Partitions	9296 SF	$ 2.25	$	20,916
	5/8" Gypsum board	23452 SF	$ 1.30	$	30,488
	Classroom Ceiling	1500 SF	$ 2.25	$	3,375
	Seal Exposed Structure	10800 SF	$ 3.00	$	32,400
	Circulation area Ceiling	2033 SF	$ 2.25	$	4,574
	Circulation area flooring	2033 SF	$ 3.33	$	6,770
	Classroom Flooring	1500 SF	$ 3.33	$	4,995
	Paint Gypsum Board Walls	23452 SF	$ 0.42	$	9,850
	Sealed concrete	10800 SF	$ 0.59	$	6,372
	Wall Coverings	23452 SF	$ 0.15	$	3,518
	TOTAL FINISHES			$	123,257
10	SPECIALTIES	14333 SF	$ 1.65	$	23,649
11	EQUIPMENT				
	Paint Booth	250 SF	$ 200.00	$	50,000
	Flex Equipment	1 LS	$ 25,000.00	$	25,000
	Other Building Equipment	14333 SF	$ 0.55	$	7,883
	TOTAL EQUIPMENT			$	82,883

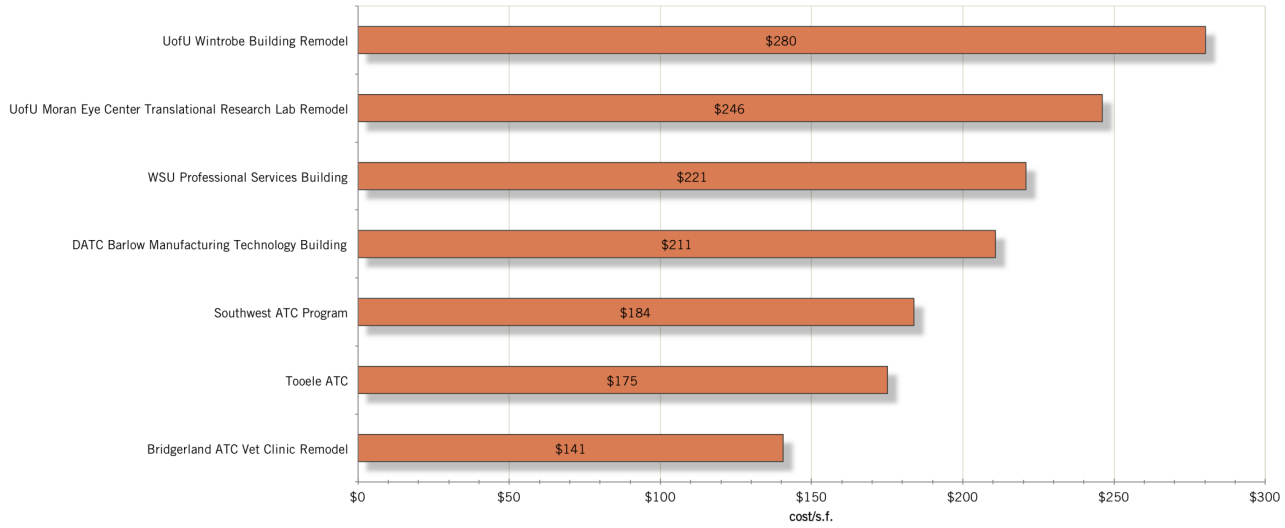
PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION				11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	14,333	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
12	FURNISHINGS			
	Walk-Off Mats	240 SF	$ 29.00	$ 6,960
	Blinds	800 SF	$ 4.50	$ 3,600
	TOTAL EQUIPMENT			$ 10,560
13	SPECIAL CONSTRUCTION			
	Seismic Upgrade			
	New Roof Sheathing	14333 SF	$ 2.25	$ 32,249
	Install Simpson type straps on roof	14333 SF	$ 0.75	$ 10,750
	Connection at top of Shearwalls	161 LF	$ 30.00	$ 4,830
	New Sheathing at East & West Shear walls	4860 SF	$ 2.00	$ 9,720
	Anchor Bolts at new shearwall	121 EA	$ 29.68	$ 3,593
	Steel Rod X Braces	248 LF	$ 100.00	$ 24,800
	Structure Separation at bay ends	242 LF	$ 80.00	$ 19,360
	Gravity Upgrades			
	Install new timber trusses	26752 BF	$ 5.65	$ 151,149
	Upgrade Existing timber trusses	728 LF	$ 30.00	$ 21,840
	Install New Wood Colums w/ footing	8 EA	$ 7,500.00	$ 60,000
	Install new Girder Trusses	161 LF	$ 300.00	$ 48,300
	Repair existing Columns	8 EA	$ 1,500.00	$ 12,000
	TOTAL SPECIAL CONSTRUCTION			$ 398,591
15	MECHANICAL			
	HVAC:	14333 SF	$ 22.00	$ 315,326
	Fire Protection:	14333 SF	$ 2.75	$ 39,416

PROJECT ESTIMATE CONSTRUCTION CONTROL CORPORATION					11/30/12
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2					
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE		Project Size		14,333 SF	
STAGE OF DESIGN.....PROGRAMMING					
CSI #	**DESCRIPTION**	**UNIT QTY**	**UNIT COST**		
	Plumbing	14333 SF	$ 3.65	$	52,315
	TOTAL MECHANICAL			$	407,057
16	ELECTRICAL				
	Service & Distribution:	14333 SF	$ 4.65	$	66,648
	Power:	14333 SF	$ 2.65	$	37,982
	Lighting:	14333 SF	$ 5.00	$	71,665
	Telecommunication System:	14333 SF	$ 1.95	$	27,949
	Fire/Smoke System:	14333 SF	$ 1.95	$	27,949
	Special Systems:	14333 SF	$ 1.65	$	23,649
	TOTAL ELECTRICAL			$	255,844

COST COMPARABLES

APPLIED TECHNOLOGY COLLEGE PROJECTS



6 APPENDICES

APPENDIX A

ALTERNATIVE PHASING APPROACH

PHASING DIAGRAMS

COST ESTIMATE

APPENDIX B

STRUCTURAL REPORT

ALTERNATIVE PHASING APPROACH

Late in the programming process, the Steering Committee asked the Programming Team to develop an alternative phasing approach to the project. This request was made to provide the OWATC with an option for breaking the project into smaller phases, which may closer match the future funding options available to the College. The Steering Committee also requested that the Programming Team develop a phasing approach that would allow the College to relocate the Composites Program to the BDO campus sooner and for less initial costs.

Following are descriptions of the scope of work for the 3 proposed phases for this alternative phasing approach:

Phase 1:

- Relocate the Composites Program to the high bay area of Bay 1, utilizing the existing MITC Program partitions for the Composites Program support spaces (i.e. storage spaces, clean room, grind room, tool storage room, etc.).
- Convert the 2 adjacent classroom spaces at the west side of Bay 1 for use as the MITC Program spaces.
- Convert the 4 existing office spaces directly south of the high bay area for use as the Composites Program office spaces.
- Convert the existing classroom directly southeast of the high bay area for use as the Composites Program Classroom.
- Relocate the Forklift Training Program entirely to the south portion of Bay 2.

Phase 2:

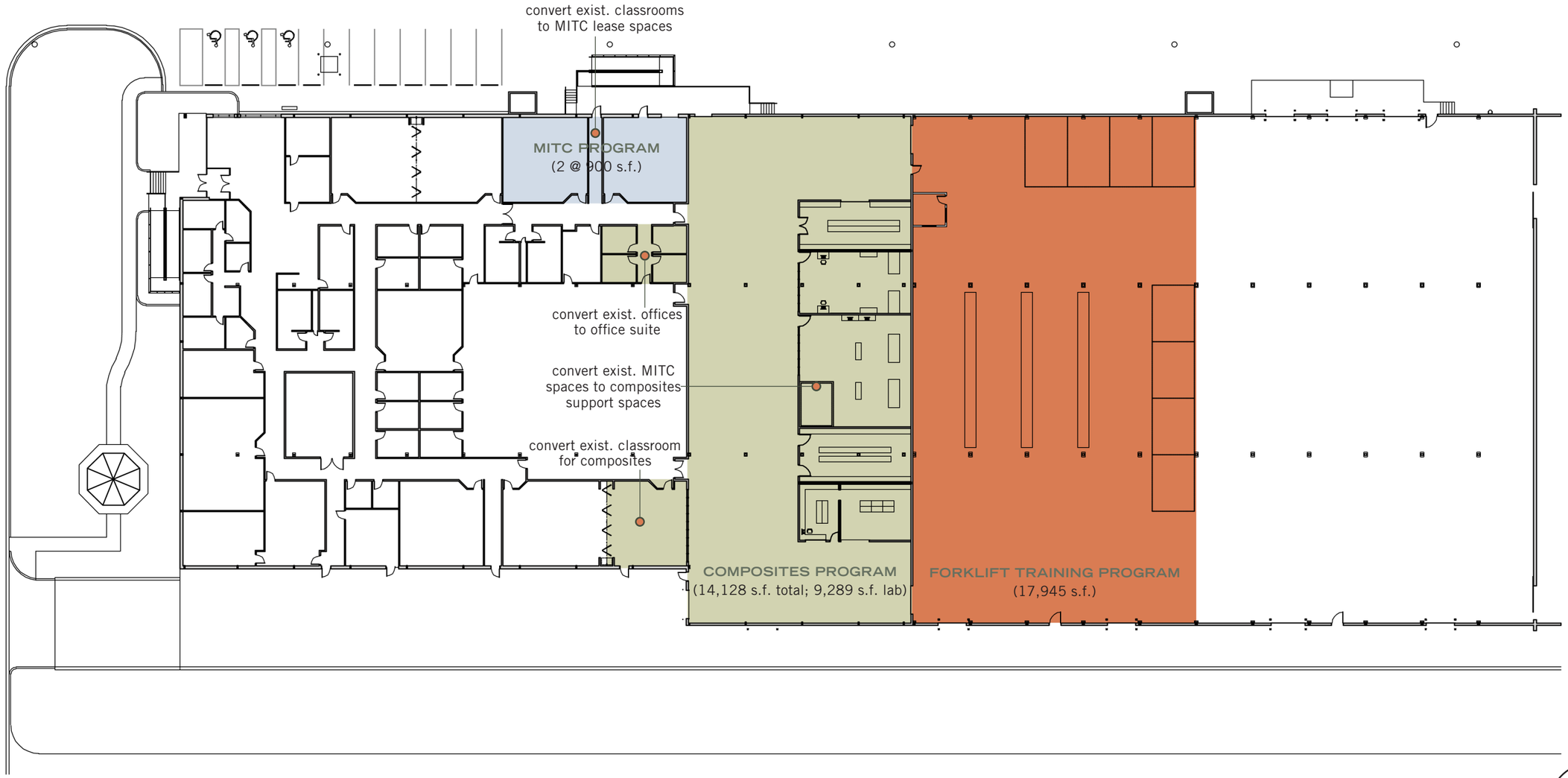
- Complete all Bay 2 seismic/structural improvements as recommended in the structural report.
- The seismic/structural improvements will completed in 2 phases - the north end of Bay 2 being completed first, followed by the south end of Bay 2. This will provide for continued operation of the Forklift Training Program. The Forklift Training Program will be located to the north end of Bay 2 upon completion of the seismic/structural work, the program's final destination.

Phase 3:

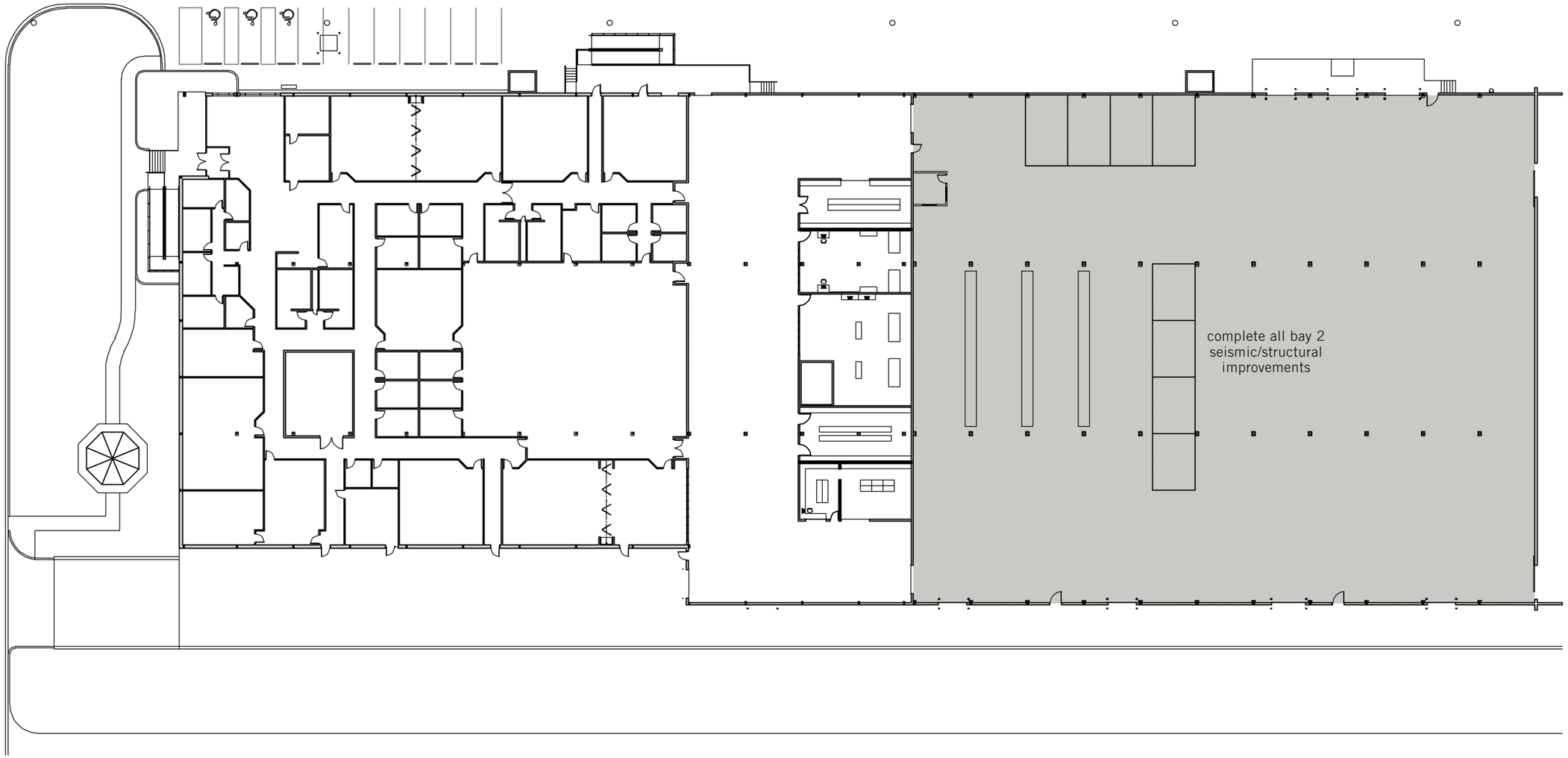
- Relocate the Composites Program to the south end of Bay 2.
- Extend the existing west dock and upgrade the east dock to provide accessible entrances to the new Bay 2 improvements.
- Add 2 new MITC Program spaces at the west end of Bay 1.
- Convert the old Composite Program Lab to the new Flex Program Lab.

Seismic Reroof:

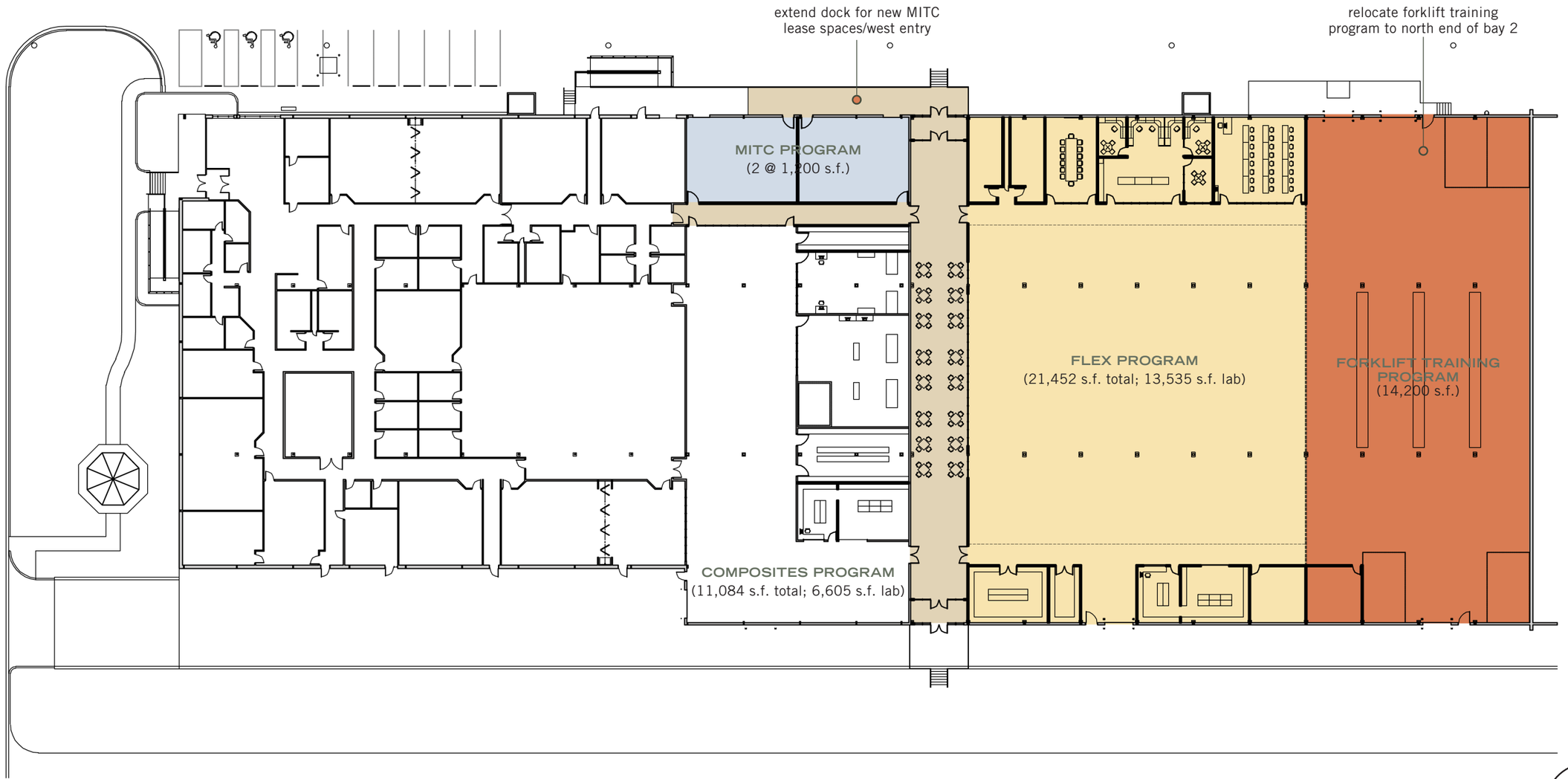
- Complete all of the roof-related seismic work as recommended in the structural report.
- Complete the reroof of the existing Bay 2 roof system including al roof-related work (i.e. fascia and soffit, flashings, skylights, etc.)
- Separating this phase from the remainder of the work will allow the OWATC to pursue funding under the DFCM reroof program.


convert exist. classrooms
to MITC lease spaces
MITC PROGRAM
(2 @ 900 s.f.)
convert exist. offices
to office suite
convert exist. MITC
spaces to composites
support spaces
convert exist. classroom
for composites
COMPOSITES PROGRAM
(14,128 s.f. total; 9,289 s.f. lab)
FORKLIFT TRAINING PROGRAM
(17,945 s.f.)

NORTH



NORTH


extend dock for new MITC lease spaces/west entry
relocate forklift training program to north end of bay 2
MITC PROGRAM
(2 @ 1,200 s.f.)
FLEX PROGRAM
(21,452 s.f. total; 13,535 s.f. lab)
FORKLIFT TRAINING PROGRAM
(14,200 s.f.)
COMPOSITES PROGRAM
(11,084 s.f. total; 6,605 s.f. lab)
NORTH

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION				2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER				PROJECT TOTALS	
LOCATION.....OGDEN, UT					
ARCHITECT.....BOTT PANTONE	Project Size		57,938		SF
STAGE OF DESIGN.....PROGRAMMING					

CSI #	DESCRIPTION	PHASE 1	PHASE 2	PHASE 3	RE ROOF	TOTALS
02	SITEWORK & DEMOLITION	$ 17,660	$ 40,182	$ 214,733		$ 272,574
03	CONCRETE	$ 3,532	$ 8,913	$ 14,485		$ 26,930
04	MASONRY	$ -	$ -	$ -		$ -
05	METALS	$ 5,369	$ 13,548	$ 22,016		$ 40,933
06	WOODS & PLASTICS	$ 4,380	$ 11,053	$ 17,961		$ 33,394
07	THERMAL & MOISTURE PROTECTION	$ 5,510	$ 287,917	$ 229,511		$ 522,938
08	DOORS & WINDOWS	$ 74,090	$ 154,800	$ 126,779		$ 355,669
09	FINISHES	$ 71,398	$ 132,336	$ 676,726		$ 880,461
10	SPECIALTIES	$ 23,311	$ -	$ 95,598		$ 118,909
11	EQUIPMENT	$ -	$ -	$ 201,866		$ 201,866
12	FURNISHINGS	$ -	$ -	$ 8,760		$ 8,760
13	SPECIAL CONSTRUCTION	$ -	$ 1,145,501	$ -	$ 628,156	$ 1,145,501
15	MECHANICAL	$ 270,551	$ -	$ 1,645,439		$ 1,915,990
16	ELECTRICAL	$ 207,682	$ 53,478	$ 1,034,193		$ 1,295,353
	SUBTOTAL	$ 683,482	$ 1,847,728	$ 4,288,067	$ 628,156	6,819,277
	GENERAL CONDITIONS	$ 41,009	$ 110,864	$ 257,284	$ 37,689	$ 409,157
	OVERHEAD & PROFIT	$ 27,339	$ 73,909	$ 171,523	$ 25,126	$ 272,771
	DESIGN CONTINGENCY	$ 102,522	$ 277,159	$ 643,210	$ 94,223	$ 1,022,892
	TOTAL CONSTRUCTION COST	$ 854,353	$ 2,309,660	$ 5,360,083	$ 785,195	$ 8,524,096

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	14,128	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION		$ 1.25	$ 17,660
03	CONCRETE		$ 0.25	$ 3,532
04	MASONRY		$ -	$ -
05	METALS		$ 0.38	$ 5,369
06	WOODS & PLASTICS		$ 0.31	$ 4,380
07	THERMAL & MOISTURE PROTECTION		$ 0.39	$ 5,510
08	DOORS & WINDOWS		$ 5.24	$ 74,090
09	FINISHES		$ 5.05	$ 71,398
10	SPECIALTIES		$ 1.65	$ 23,311
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ -	$ -
15	MECHANICAL		$ 19.15	$ 270,551
16	ELECTRICAL		$ 14.70	$ 207,682
	SUBTOTAL		$ 48.38	683,482
	GENERAL CONDITIONS	6%	$ 2.90	41,009
	OVERHEAD & PROFIT	4%	$ 1.94	27,339
	DESIGN CONTINGENCY	15%	$ 7.26	102,522
	TOTAL CONSTRUCTION COST		$ 60.47	$ 854,353

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	14,128	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION			
	Demolition			
	Selective Interior Demolition	14128 SF	$ 1.25	$ 17,660
	Subtotal for Demolition			$ 17,660
	TOTAL SITEWORK & DEMOLITION			$ 17,660
03	CONCRETE			
	Repair Slab on Grade	14128 SF	$ 0.25	$ 3,532
	TOTAL CONCRETE			$ 3,532
04	MASONRY			
	TOTAL MASONRY			$ -
05	METALS			
	Miscellaneous Steel	14128 SF	$ 0.38	$ 5,369
	TOTAL METALS			$ 5,369
06	WOOD & PLASTICS			
	Carpentry:			
	Wood Plates & Blocking	14128 SF	$ 0.31	$ 4,380
	Subtotal for Carpentry			$ 4,380
	Millwork	14128 SF	$ 4.00	$ 56,512
	TOTAL WOOD & PLASTICS			$ 60,892
07	THERMAL & MOISTURE PROTECTION			
	Fire Stopping/ Caulking	14128 SF	$ 0.18	$ 2,543
	Caulking & Sealants	14128 SF	$ 0.21	$ 2,967
	TOTAL THERMAL & MOISTURE PROTECTION			$ 5,510

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION	2/7/13

PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1

LOCATION.....OGDEN, UT

ARCHITECT.....BOTT PANTONE Project Size 14,128 SF

STAGE OF DESIGN.....PROGRAMMING

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
08	DOORS & WINDOWS			
	Doors	14128 SF	$ 0.70	$ 9,890
	Rated Interior Glazing	400 SF	$ 130.00	$ 52,000
	Interior Glazing	400 SF	$ 30.50	$ 12,200
	TOTAL DOORS & WINDOWS			$ 74,090
09	FINISHES			
	Interior Metal Stud Partitions	7007 SF	$ 2.25	$ 15,766
	5/8" Gypsum board	14014 SF	$ 1.30	$ 18,218
	Clean Room Ceiling	700 SF	$ 9.65	$ 6,755
	Office Area Ceiling	1000 SF	$ 2.25	$ 2,250
	MITC Flooring	900 SF	$ 4.00	$ 3,600
	Paint Gypsum Board Walls	14014 SF	$ 0.42	$ 5,886
	Sealed concrete	32073 SF	$ 0.59	$ 18,923
	TOTAL FINISHES			$ 71,398
10	SPECIALTIES	14128 SF	$ 1.65	$ 23,311
11	EQUIPMENT			
	Paint Booth			
	Forklift Training Equipemnt- By Owner			
	Composites Equipment- By Owner			
	TOTAL EQUIPMENT			$ -
12	FURNISHINGS			
	TOTAL EQUIPMENT			$ -
13	SPECIAL CONSTRUCTION			
	TOTAL SPECIAL CONSTRUCTION			$ -

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 1				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	14,128	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
15	MECHANICAL			
	HVAC:	14128 SF	$ 15.00	$ 211,920
	Fire Protection:	14128 SF	$ 1.65	$ 23,311
	Plumbing	14128 SF	$ 2.50	$ 35,320
	TOTAL MECHANICAL			$ 270,551
16	ELECTRICAL			
	Service & Distribution: Modification Only	14128 SF	$ 1.50	$ 21,192
	Power:	14128 SF	$ 2.65	$ 37,439
	Lighting:	14128 SF	$ 5.00	$ 70,640
	Telecommunication System:	14128 SF	$ 1.95	$ 27,550
	Fire/Smoke System:	14128 SF	$ 1.95	$ 27,550
	Special Systems:	14128 SF	$ 1.65	$ 23,311
	TOTAL ELECTRICAL			$ 207,682

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION	2/7/13

PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2

LOCATION.....OGDEN, UT

ARCHITECT.....BOTT PANTONE Project Size 35,652 SF

STAGE OF DESIGN.....PROGRAMMING

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION		$ 1.13	$ 40,182
03	CONCRETE		$ 0.25	$ 8,913
04	MASONRY		$ -	$ -
05	METALS		$ 0.38	$ 13,548
06	WOODS & PLASTICS		$ 0.31	$ 11,053
07	THERMAL & MOISTURE PROTECTION		$ 8.08	$ 287,917
08	DOORS & WINDOWS		$ 4.34	$ 154,800
09	FINISHES		$ 3.71	$ 132,336
10	SPECIALTIES		$ -	$ -
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ 32.13	$ 1,145,501
15	MECHANICAL		$ -	$ -
16	ELECTRICAL		$ 1.50	$ 53,478
	SUBTOTAL		$ 51.83	1,847,728
	GENERAL CONDITIONS	6%	$ 3.11	110,864
	OVERHEAD & PROFIT	4%	$ 2.07	73,909
	DESIGN CONTINGENCY	15%	$ 7.77	277,159
	TOTAL CONSTRUCTION COST		$ 64.78	$ 2,309,660

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	35,652	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION			
	Demolition			
	Selective Interior Demolition	35652 SF	$ 0.75	$ 26,739
	Demo Exterior Wall	14150 SF	$ 0.95	$ 13,443
	Subtotal for Demolition			$ 40,182
	TOTAL SITEWORK & DEMOLITION			$ 40,182
03	CONCRETE			
	Repair Slab on Grade	35652 SF	$ 0.25	$ 8,913
	TOTAL CONCRETE			$ 8,913
04	MASONRY			
	TOTAL MASONRY			$ -
05	METALS			
	Miscellaneous Steel	35652 SF	$ 0.38	$ 13,548
	TOTAL METALS			$ 13,548
06	WOOD & PLASTICS			
	Carpentry:			
	Wood Plates & Blocking	35652 SF	$ 0.31	$ 11,053
	Subtotal for Carpentry			$ 11,053
	Millwork	SF	$ 4.00	$ -
	TOTAL WOOD & PLASTICS			$ 11,053
07	THERMAL & MOISTURE PROTECTION			
	Batt Insulation at exterior wall	14756 SF	$ 0.67	$ 9,887
	3" Rigid at Building Exterior	14756 SF	$ 2.95	$ 43,530
	Wall Sheathing	14150 SF	$ 1.65	$ 23,348

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION	2/7/13

PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2

LOCATION.....OGDEN, UT

ARCHITECT.....BOTT PANTONE Project Size 35,652 SF

STAGE OF DESIGN.....PROGRAMMING

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Weather Barrier	14150 SF	$ 2.25	$ 31,838
	Exterior Wall Paneling	14150 SF	$ 12.00	$ 169,800
	Fascia	986 SF	$ 9.65	$ 9,515
	TOTAL THERMAL & MOISTURE PROTECTION			$ 287,917
08	DOORS & WINDOWS			
	Exterior Glazing Aluminum (20% of Exterior)	2400 SF	$ 34.50	$ 82,800
	Transclucent Panel	1600 SF	$ 45.00	$ 72,000
	TOTAL DOORS & WINDOWS			$ 154,800
09	FINISHES			
	5/8" Gypsum board	14756 SF	$ 1.30	$ 19,183
	Paint Gypsum Board Walls	14756 SF	$ 0.42	$ 6,198
	Miscellaneous Repair	35652 SF	$ 3.00	$ 106,956
	TOTAL FINISHES			$ 132,336
10	SPECIALTIES	SF	$ 1.65	$ -
11	EQUIPMENT			
	TOTAL EQUIPMENT			$ -
12	FURNISHINGS			
	TOTAL EQUIPMENT			$ -
13	SPECIAL CONSTRUCTION			
	Seismic Upgrade			
	Connection at top of Shearwalls	371 LF	$ 30.00	$ 11,130
	New Sheathing at East & West Shear walls	14150 SF	$ 2.00	$ 28,300
	Anchor Bolts at new shearwall	348 EA	$ 29.68	$ 10,332

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 2				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	35,652	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Steel Rod X Braces	496 LF	$ 100.00	$ 49,600
	Structure Separation at bay ends	531 LF	$ 80.00	$ 42,480
	Gravity Upgrades			
	Install new timber trusses	73568 BF	$ 5.65	$ 415,659
	Upgrade Existing timber trusses	1980 LF	$ 30.00	$ 59,400
	Install New Wood Colums w/ footing	44 EA	$ 7,500.00	$ 330,000
	Install new Girder Trusses	442 LF	$ 300.00	$ 132,600
	Repair existing Columns	44 EA	$ 1,500.00	$ 66,000
	TOTAL SPECIAL CONSTRUCTION			$ 1,145,501
15	MECHANICAL			
	HVAC: Not Included	SF	$ 22.00	$ -
	Fire Protection: Not Included	SF	$ 2.75	$ -
	Plumbing: Not Included	SF	$ 3.65	$ -
	TOTAL MECHANICAL			$ -
16	ELECTRICAL			
	Service & Distribution: Not Included	SF	$ 4.65	$ -
	Power: Modification Only	35652 SF	$ 1.00	$ 35,652
	Lighting:- Not Included	SF	$ 5.00	$ -
	Telecommunication System: Not Included	SF	$ 1.95	$ -
	Fire/Smoke System: Modification Only	35652 SF	$ 0.50	$ 17,826
	Special Systems: Not Included	SF	$ 1.65	$ -
	TOTAL ELECTRICAL			$ 53,478

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 3				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	57,938	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION		$ 3.71	$ 214,733
03	CONCRETE		$ 0.25	$ 14,485
04	MASONRY		$ -	$ -
05	METALS		$ 0.38	$ 22,016
06	WOODS & PLASTICS		$ 0.31	$ 17,961
07	THERMAL & MOISTURE PROTECTION		$ 3.96	$ 229,511
08	DOORS & WINDOWS		$ 2.19	$ 126,779
09	FINISHES		$ 11.68	$ 676,726
10	SPECIALTIES		$ 1.65	$ 95,598
11	EQUIPMENT		$ 3.48	$ 201,866
12	FURNISHINGS		$ 0.15	$ 8,760
13	SPECIAL CONSTRUCTION		$ -	$ -
15	MECHANICAL		$ 28.40	$ 1,645,439
16	ELECTRICAL		$ 17.85	$ 1,034,193
	SUBTOTAL		$ 74.01	4,288,067
	GENERAL CONDITIONS	6%	$ 4.44	257,284
	OVERHEAD & PROFIT	4%	$ 2.96	171,523
	DESIGN CONTINGENCY	15%	$ 11.10	643,210
	TOTAL CONSTRUCTION COST		$ 92.51	$ 5,360,083

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.

ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 3				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	57,938	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	SITEWORK & DEMOLITION			
	Demolition			
	Selective Interior Demolition	57938 SF	$ 1.25	$ 72,423
	Demo Exterior Wall	400 SF	$ 0.95	$ 380
	Subtotal for Demolition			$ 72,803
	Earthwork			
	Redo Loading Dock/ Entrance area	3251 SF	$ 30.00	$ 97,530
	Subtotal for Earthwork			$ 97,530
	Site Utilities			
	Subtotal for Site Utilities			$ -
	Site Improvements	11100 SF	$ 4.00	$ 44,400
	TOTAL SITEWORK & DEMOLITION			$ 214,733
03	CONCRETE			
	Repair Slab on Grade	57938 SF	$ 0.25	$ 14,485
	TOTAL CONCRETE			$ 14,485
04	MASONRY			
	TOTAL MASONRY			$ -
05	METALS			
	Miscellaneous Steel	57938 SF	$ 0.38	$ 22,016
	TOTAL METALS			$ 22,016
06	WOOD & PLASTICS			
	Carpentry:			
	Wood Plates & Blocking	57938 SF	$ 0.31	$ 17,961
	Subtotal for Carpentry			$ 17,961

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 3				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	57,938	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Millwork	57938 SF	$ 4.00	$ 231,752
	TOTAL WOOD & PLASTICS			$ 249,713
07	THERMAL & MOISTURE PROTECTION			
	Batt Insulation at exterior wall	400 SF	$ 0.67	$ 268
	3" Rigid at Building Exterior	400 SF	$ 2.95	$ 1,180
	Sound Batt	72072 SF	$ 0.48	$ 34,595
	Wall Sheathing	400 SF	$ 1.65	$ 660
	Weather Barrier	400 SF	$ 2.25	$ 900
	Exterior Wall	400 SF	$ 12.00	$ 4,800
	New Exterior Canopy	1000 SF	$ 59.00	$ 59,000
	Fascia	986 SF	$ 9.65	$ 9,515
	Expansion Joints at roof/ wall	242 SF	$ 1.65	$ 399
	Building Fireproofing	57938 SF	$ 1.65	$ 95,598
	Fire Stopping/ Caulking	57938 SF	$ 0.18	$ 10,429
	Caulking & Sealants	57938 SF	$ 0.21	$ 12,167
	TOTAL THERMAL & MOISTURE PROTECTION			$ 229,511
08	DOORS & WINDOWS			
	Doors	57938 SF	$ 1.95	$ 112,979
	Exterior Glazing Aluminum	400 SF	$ 34.50	$ 13,800
	TOTAL DOORS & WINDOWS			$ 126,779
09	FINISHES			
	Interior Metal Stud Partitions	72072 SF	$ 2.25	$ 162,162
	5/8" Gypsum board	144544 SF	$ 1.30	$ 187,907
	MITC Ceiling	4500 SF	$ 2.75	$ 12,375
	Classroom Ceiling	3900 SF	$ 2.25	$ 8,775
	Clean Room Ceiling	700 SF	$ 9.65	$ 6,755

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 3				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	57,938	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Office Area Ceiling	1000 SF	$ 2.25	$ 2,250
	Seal Exposed Structure	21700 SF	$ 3.00	$ 65,100
	Circulation area Ceiling	13788 SF	$ 2.25	$ 31,023
	Circulation area flooring	13788 SF	$ 3.33	$ 45,914
	Conference/ Board/ Reception Ceiling	1200 SF	$ 3.75	$ 4,500
	Conference/ Board/ Reception Flooring	1200 SF	$ 12.00	$ 14,400
	MITC Flooring	4500 SF	$ 4.00	$ 18,000
	Clean Room Flooring	700 SF	$ 8.65	$ 6,055
	Classroom Flooring	3900 SF	$ 3.33	$ 12,987
	Office Area Flooring	1000 SF	$ 3.33	$ 3,330
	Paint Gypsum Board Walls	144544 SF	$ 0.42	$ 60,708
	Sealed concrete	21700 SF	$ 0.59	$ 12,803
	Wall Coverings	144544 SF	$ 0.15	$ 21,682
	TOTAL FINISHES			$ 676,726
10	SPECIALTIES	57938 SF	$ 1.65	$ 95,598
11	EQUIPMENT			
	Paint Booth	250 SF	$ 200.00	$ 50,000
	Flex Equipment	1 LS	$ 25,000.00	$ 25,000
	Forklift Training Equipemnt	1 LS	$ 20,000.00	$ 20,000
	Composites Equipment	1 LS	$ 75,000.00	$ 75,000
	Other Building Equipment	57938 SF	$ 0.55	$ 31,866
	TOTAL EQUIPMENT			$ 201,866
12	FURNISHINGS			
	Walk-Off Mats	240 SF	$ 29.00	$ 6,960
	Blinds	400 SF	$ 4.50	$ 1,800
	TOTAL EQUIPMENT			$ 8,760

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION			2/7/13
PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER PHASE 3				
LOCATION.....OGDEN, UT				
ARCHITECT.....BOTT PANTONE	Project Size	57,938	SF	
STAGE OF DESIGN.....PROGRAMMING				

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
13	SPECIAL CONSTRUCTION			
	TOTAL SPECIAL CONSTRUCTION			$ -
15	MECHANICAL			
	HVAC:	57938 SF	$ 22.00	$ 1,274,636
	Fire Protection:	57938 SF	$ 2.75	$ 159,330
	Plumbing	57938 SF	$ 3.65	$ 211,474
	TOTAL MECHANICAL			$ 1,645,439
16	ELECTRICAL			
	Service & Distribution:	57938 SF	$ 4.65	$ 269,412
	Power:	57938 SF	$ 2.65	$ 153,536
	Lighting:	57938 SF	$ 5.00	$ 289,690
	Telecommunication System:	57938 SF	$ 1.95	$ 112,979
	Fire/Smoke System:	57938 SF	$ 1.95	$ 112,979
	Special Systems:	57938 SF	$ 1.65	$ 95,598
	TOTAL ELECTRICAL			$ 1,034,193

PROJECT ESTIMATE	CONSTRUCTION CONTROL CORPORATION	2/7/13

PROJECT NAME.....OGDEN WEBER APPLIED TECHNOLOGY CENTER SEISMIC ROOF PHASE
LOCATION.....OGDEN, UT
ARCHITECT.....BOTT PANTONE Project Size 43,605 SF
STAGE OF DESIGN.....PROGRAMMING

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Demo Existing Roof	57938 SF	$ 0.95	$ 55,041
	Rigid Roof Insulation	57938 SF	$ 2.55	$ 147,742
	Metal Flashings	2500 SF	$ 5.65	$ 14,125
	Single Ply membrane	57938 SF	$ 2.65	$ 153,536
	Expansion Joints at roof/ wall	1062 SF	$ 79.00	$ 83,898
	New Roof Sheathing	57938 SF	$ 2.25	$ 130,361
	Install Simpson type straps on roof	57938 SF	$ 0.75	$ 43,454
	Connection at top of Shearwalls	371 LF	$ 30.00	$ 11,130
	SUBTOTAL		$ 123.80	628,156
	GENERAL CONDITIONS	6%	$ 0.86	37,689.34
	OVERHEAD & PROFIT	4%	$ 0.58	25,126.23
	DESIGN CONTINGENCY	15%	$ 2.16	94,223.36
	TOTAL CONSTRUCTION COST		$ 97.40	$ 785,195

ESCALATION HAS NOT BEEN FACTORED INTO THE COSTS OF THIS ESTIMATE.
ESTIMATE IS FOR CONSTRUCTION COSTS ONLY, SOFT COSTS ARE NOT INCLUDED.

Structural Evaluation Report
of the
OWATC BDO Facility
Building 10A – Bay 2

ARW ENGINEERS
structural consultants

Prepared by ARW Engineers

October 12, 2012

1. Executive Summary

This report is limited to the portion of the OWATC Facility located in Bay 2 of Building 10A in the Business Depot Ogden (BDO) in Ogden, Utah. This specific building is a 43,000 square foot one-story open warehouse facility.

According to existing drawings, the Building 10A was built in 1943. Building 10A originally consisted of 6 bays that are approximately 240'-0" long and 180'-0" wide. A fire occurred in Bay 1 some years ago and this bay was eventually demolished and replaced with a new pre-manufactured metal building which is currently occupied by the OWATC. As mentioned above, this study is limited to Bay 2 and does not outline recommendations for Building 10A outside of this area.

Bay 2 consists of (3) intermediate 60'-0" bays in the east-west direction and large wood trusses spanning these 60'-0" intervals to support the roof structure. The roof height of the center bay is approximately 7'-0" higher than the two outside bays creating a clerestory structure at this center bay with windows in the side walls at this high/low roof transition. The large trusses are supported by wood columns and are spaced at approximately 20 feet on center down the length of the building. The roof structure consists of 1x12 diagonal sheathing that is attached to 2x12 joist spaced at 2'-0" o.c. which are then supported by the large wood trusses.

The east and west exterior walls are constructed of 3x6 wood studs spaced at 24"o.c. and is sheathed with 1x12 diagonal sheathing on the exterior side of the wall. The north and south end walls of Bay 2 are dividing firewalls which are constructed of 3x8 studs with 1x diagonal sheathing on both sides and are covered with 1x tongue and groove siding and approximately 3 layers of gypsum board on each side.

Existing drawings for this building were very limited. As a result, the majority of information used in this evaluation was gathered during site visits to the building.

The intent of this study is to analyze the existing building as it currently sits and determine, as much as possible, if there are structural deficiencies in the lateral and gravity load-resisting elements of the building;

- The lateral load-resisting system has been reviewed and analyzed in accordance with ASCE/SEI 31-03 "Seismic Evaluation of Existing Buildings". A Tier 1 (screening phase) and Tier 2 (evaluation phase) investigation was conducted. Where deficiencies were noted, upgrades were preliminarily determined in accordance with "Basic Safety Objective" criteria as set forth in ASCE/SEI 41-06 "Seismic Rehabilitation of Existing Buildings". During a visit to the building, ASCE/SEI 31-03 checklists were completed and are included as an appendix to this report.
- The gravity load-resisting system has been reviewed and analyzed in accordance with the International Existing Building Code in conjunction with current snow load requirements for the geographic area of the building location.

2. Site Hazards

Table 3- 1

SOILS INFORMATION

Description:	Unknown
Soil Type:	Default value per ASCE 31
Soil Stability:	Unknown
Reference:	Default value per ASCE 31

Table 3- 2

SEISMIC HAZARD

Hazard		Probability of Exceedance 2% in 50 years	Probability of Exceedance 10% in 50 years
Spectral Acceleration[1]	**0.2 sec period**	1.375 g	0.720
	1.0 sec period	0.860 g	0.362
Vulnerability[2]:	**Fault Rupture:**	No	
	Landslide:	No	
	Liquefaction	Yes (Moderate)	

1. FEMA Maps, Reference B1
2. Utah Geologic Survey Maps

Comments:
The Utah Quaternary Fault and Fold Map available online at www.ugs.state.ut.us was used to determine the fault rupture vulnerability for this site. Other maps available at this web site were also used to determine the landslide and liquefaction potential.

Table 3- 3

SNOW CHARACTERIZATION

Parameter	Description
Ground snow load (psf):	43
Roof snow load (psf):	30
Snow drift locations:	At the high/low roof interface of the center bay.

3. Evaluation Findings and Recommendations

The initial analysis/investigation indicates that the existing building lacks an effective lateral force resisting system to resist the required seismic loads. The roof diaphragms and shear walls do not have adequate strength to keep the building performing at acceptable levels in accordance with the Basic Safety Objective outlined in ASCE 41-06.

The gravity analysis indicates that the large wood trusses contain flaws which have severely limited the load carrying capacity of the trusses. The trusses presently are only capable of supporting a safe snow load of approximately 3 to 5 psf. The current code requires the design roof snow load for this building to be 30psf. In addition to this uniform snow load, snow drifting can also occur which would increase the snow load beyond 30psf. This lack of snow load capacity in the trusses is a concern.

The following list contains recommended upgrade procedures that would be necessary to bring Bay 2 of Building 10A into compliance with 1) The Basic Safety Objective for seismic performance and 2) The current code requirements for the structure's gravity carrying capacity.

Recommended Seismic Upgrades:

- Provide a new OSB sheathing overlay on the roof to strengthen roof diaphragm so that building lateral forces can be transferred to the shear walls.
- Install various Simpson type straps on the roof to strengthen the diaphragm capacity.
- Provide new blocking and connection hardware to connect the diaphragm to the top of the shear walls.
- Provide new OSB sheathing on the east and west exterior shear walls and also the north and south fire walls. This sheathing can be installed on the inside of the building if it helps to reduce installation costs when compared to installing this sheathing on the exterior face of the walls.
- Install new epoxy anchor bolts @ 16"0.c. and hold-downs at various locations to attach the shear wall bottom plates to the foundation wall.
- Provide new steel rod x-braces in the walls connecting the high center bay to the lower roof structures on the east and west. These braces can be installed in every third column bay and only need to extend from the high center bay roof to the low roof. It is not necessary for these braces to extend to the floor of the building.
- Provide a seismic separation gap between the south end of Bay 2 and the roof structure of the newer metal building that was built to replace Bay 1.

Recommended Gravity Upgrades:

- Install new timber trusses that are centered between each of the existing roof trusses. This will result in the new trusses being spaced at approximately 20'-0"o.c. with an overall truss spacing reduced to 10'-0"o.c. Adding these new trusses will help to reduce the amount of snow load that the existing roof trusses

are required to carry and will help to simplify the extent of upgrades to the existing trusses.

- Upgrade select members and connections of each existing truss to be adequate to carry the required 30psf snow loads plus drifting.
- Install new wood columns and footings below the new roof trusses. This will only be required at the east and west exterior walls.
- Install new timber girder trusses that span north and south between columns in the interior building space. This new girder truss will support the new roof trusses without requiring additional columns to be installed inside the building space.
- Provide new steel clamps around the interior columns that have large cracks and checks running through the column member. Epoxy will also need to be injected into the large cracks.

4. Cost Estimate

We estimate that the costs associated with completing the structural seismic upgrade measures listed in this report will be between $2.0 million and $2.5 million. This cost does not include costs for re-roofing, re-siding, or other architectural modifications due to new structural elements.

5. References

A. Guideline Documents

1. American Society of Civil Engineers – Structural Engineering Institute, *Seismic Evaluation of Existing Buildings,* ASCE/SEI Standard 31-03, 2003.

B. Geotechnical Information

1. United States Geological Survey, *NEHRP Design Map Set (Maps 1 through 32), 10% in 50 year, 2% in 50 year and the Maximum Considered Earthquake 0.2 second spectral acceleration (5% damping)*, BSSC Project 97, updated 2003.

Appendices

Appendix A - ASCE/SEI 31-03 Checklists

Appendix B - Photographs

Appendix C - Cost Estimate

Appendix A – ASCE/SEI 31-03 Checklists

ENGINEERS
structural consultants

Job Name: BDO ATC Building A10 Date:

Building Address: Page: 1 of 2

Job Number: 12180 Prepared By: AJH

ASCE 31-03 SUPPLEMENTAL STRUCTURAL CHECKLIST – W2
WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

C	NC	N/A		Comments
			LATERAL-FORCE-RESISTING SYSTEM	
☐	☐	☑	HOLD-DOWN ANCHORS: All shear walls shall have hold-down anchors constructed per acceptable construction practices, attached to the end studs. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.4.2.7.9)	
			DIAPHRAGMS	
☐	☑	☐	DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split-level floors and shall not have expansion joints. (Tier 2: Sec 4.5.1.1)	center bay has clerestory roof
☐	☑	☐	ROOF CHORD CONTINUITY: All chord elements shall be continuous, regardless of changes in roof elevation. (Tier 2: Sec 4.5.1.3)	
☐	☐	☑	PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.5.1.7)	
☐	☐	☑	DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.5.1.8)	
☐	☐	☑	STRAIGHT SHEATHING: All straight sheathed diaphragms shall have aspect ratios less than 2 to 1 for Life Safety and 1 to 1 for Immediate Occupancy in the direction being considered. (Tier 2: Sec 4.5.2.1)	
☑	☐	☐	SPANS: All wood diaphragms with spans greater than 24 ft for Life Safety and 12 ft for Immediate Occupancy shall consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Tier 2: Sec 4.5.2.2)	
☐	☑	☐	UNBLOCKED DIAPHRAGMS: All diagonally sheathed and unblocked wood structural panel diaphragms shall have horizontal spans less than 40 ft for Life Safety and 30 ft for Immediate Occupancy and shall have aspect ratios less than or equal to 4 to 1 for Life Safety and 3 to 1 for Immediate Occupancy. (Tier 2: Sec 4.5.2.3)	
☑	☐	☐	OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck, concrete or horizontal bracing. (Tier 2: Sec 4.5.7.1)	

ENGINEERS

Job Name: _____ Date: _____

Building Address: _____ Page: 2 of 2

Job Number: _____ Prepared By: _____

ASCE 31-03 SUPPLEMENTAL STRUCTURAL CHECKLIST – W2
WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

C	NC	N/A		Comments
			CONNECTIONS	
☑	☐	☐	WOOD SILL BOLTS: Sill bolts shall be spaced at 6 ft or less for Life Safety and 4 ft or less for Immediate Occupancy, with proper edge and end distance provided for wood and concrete. (Tier 2: Sec 4.6.3.9)	

ENGINEERS
structural consultants

Job Name: _____ Date: _____

Building Address: _____ Page: 1 of 3

Job Number: _____ Prepared By: _____

ASCE 31-03 BASIC STRUCTURAL CHECKLIST – W2
WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

C	NC	N/A		Comments
			BUILDING SYSTEM	
☑	☐	☐	LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation. (Tier 2: Sec 4.3.1.1)	
☐	☐	☑	MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure. (Tier 2: Sec 4.3.1.3)	
☐	☐	☑	WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80% of the strength in an adjacent story, above or below, for Life-Safety and Immediate Occupancy. (Tier 2: Sec 4.3.2.1)	
☐	☐	☑	SOFT STORY: The stiffness of the lateral-force-resisting system in any story shall not be less than 70% of the lateral-force-resisting system stiffness in an adjacent story above or below, or less than 80% of the average lateral-force-resisting system stiffness of the three stories above or below for Life Safety and Immediate Occupancy. (Tier 2: Sec 4.3.2.2)	
☐	☐	☑	GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30% in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses and mezzanines. (Tier 2: Sec 4.3.2.3)	
☐	☑	☐	VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation. (Tier 2 Sec 4.3.2.4)	
☐	☐	☑	MASS: There shall be no change in effective mass of more than 50% from one story to the next for Life Safety and Immediate Occupancy. Light roofs, penthouses and mezzanines need not be considered. (Tier 2: Sec 4.3.2.5)	
☐	☑	☐	DETERIORATION OF WOOD: There shall be no signs of decay, shrinkage, splitting, fire damage, or sagging in any of the wood members and none of the metal connection hardware shall be deteriorated, broken, or loose. (Tier 2: Sec 4.3.3.1)	
☐	☐	☑	WOOD STRUCTURAL PANEL SHEAR WALL FASTENERS: There shall be no more than 15% of inadequate fastening such as overdriven fasteners, omitted blocking, excessive fastening spacing, or inadequate edge distance. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.3.3.2)	

ENGINEERS

Job Name: _____ Date: _____

Building Address: _____ Page: 2 of 3

Job Number: _____ Prepared By: _____

ASCE 31-03 BASIC STRUCTURAL CHECKLIST – W2
WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

C	NC	N/A		Comments
			LATERAL-FORCE-RESISTING SYSTEM	
☑	☐	☐	REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy. (Tier 2: Sec 4.4.2.1.1)	
☐	☐	☐	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than the following values for Life Safety and Immediate Occupancy: (Tier 2: Sec 4.4.2.7.1) Structural panel sheathing: 1000 plf Diagonal sheathing: 700 plf Straight sheathing: 100 plf All other conditions: 100 plf	
☐	☐	☑	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings shall not rely on exterior stucco walls as the primary lateral-force-resisting system. (Tier 2: Sec 4.4.2.7.2)	
☐	☐	☑	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard shall not be used as shear walls on buildings over one story in height with the exception of the uppermost level of a multi-story building. (Tier 2: Sec 4.4.2.7.3)	
☑	☐	☐	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2 to 1 for Life Safety and 1.5 to 1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of moderate and high seismicity. Narrow wood shear walls with an aspect ratio greater than 2 to 1 for Immediate Occupancy shall not be used to resist lateral forces developed in the building in levels of low seismicity. (Tier 2: Sec 4.4.2.7.4)	
☐	☐	☑	WALLS CONNECTED THROUGH FLOORS: Shear walls shall have interconnection between stories to transfer overturning and shear forces through the floor. (Tier 2: Sec 4.4.2.7.5)	
☐	☐	☑	HILLSIDE SITE: For structures that are taller on at least one side by more than half of a story due to a sloping site, all shear walls on the downhill slope shall have an aspect ratio less than 1 to 1 for Life Safety and 1 to 2 for Immediate Occupancy. (Tier 2: Sec 4.4.2.7.6)	
☐	☐	☑	CRIPPLE WALLS: Cripple walls below first floor level shall be braced to the foundation with wood structural panels. (Tier 2: Sec 4.4.2.7.7)	
☑	☐	☐	OPENINGS: Walls with openings greater than 80% of the length shall be braced with wood structural panel shear walls with aspect ratios of not more than 1.5 to 1 or shall be supported by adjacent construction through positive ties capable of transferring the lateral forces. (Tier 2: Sec 4.4.2.7.8)	

ENGINEERS

Job Name: _____ Date: _____

Building Address: _____ Page: 3 of 3

Job Number: _____ Prepared By: _____

ASCE 31-03 BASIC STRUCTURAL CHECKLIST – W2
WOOD FRAMES, COMMERCIAL AND INDUSTRIAL

C	NC	N/A		Comments
			CONNECTIONS	
☑	☐	☐	WOOD POSTS: There shall be a positive connection of wood posts to the foundation. (Tier 2: Sec 4.6.3.3)	Connections should be upgraded
☑	☐	☐	WOOD SILLS: All wood sills shall be bolted to the foundation. (Tier 2: Sec 4.6.3.4)	
☑	☐	☐	GIRDER/COLUMN CONNECTION: There shall be a positive connection utilizing plates, connection hardware, or straps between the girder and the column support. (Tier 2: Sec 4.6.4.1)	

ENGINEERS
structural consultants

Job Name: _____ Date: _____

Building Address: _____ Page: 1 of 2

Job Number: 12180 Prepared By: _____

ASCE 31-03 GEOLOGIC SITE HAZARD AND FOUNDATION CHECKLIST

C	NC	N/A		Comments

GEOLOGIC SITE HAZARDS

The following statements only need be completed for buildings in levels of high or moderate seismicity.

☐ ☐ ☐ LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy. (Tier 2: Sec 4.7.1.1)

☑ ☐ ☒ SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure. (Tier 2: Sec 4.7.1.2)

☑ ☐ ☐ SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated. (Tier 2: Sec 4.7.1.3)

CONDITIONS OF FOUNDATIONS

The following statement shall be completed for all Tier 1 building evaluations.

☑ ☐ ☐ FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure. (Tier 2: Sec 4.7.2.1)

The following statement only need be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

☑ ☐ ☐ DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure. (Tier 2: Sec 4.7.2.2)

CAPACITY OF FOUNDATIONS

The following statement shall be completed for all Tier 1 building evaluations.

☐ ☐ ☑ POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 ft for Life Safety and Immediate Occupancy. (Tier 2: Sec 4.7.3.1)

The following statements only need be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

☐ ☐ ☐ OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than $0.6S_a$. (Tier 2: Sec 4.7.3.2)

☐ ☐ ☐ TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1, Tier 2: Sec 4.7.3.3)

ENGINEERS

Job Name: _____ Date: _____

Building Address: _____ Page: 2 of 2

Job Number: _____ Prepared By: _____

ASCE 31-03 GEOLOGIC SITE HAZARD AND FOUNDATION CHECKLIST

C	NC	N/A		Comments
			CAPACITY OF FOUNDATIONS	
☐	☐	☐	DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.7.3.4)	
☐	☐	☐	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only. (Tier 2: Sec 4.7.3.5)	

Appendix B – Photographs

Structural Evaluation Report

OWATC
BDO Building 10A, Bay 2

ARW Project Number: 12180
October 12, 2010

Photo 1 – Typical exterior stud wall

Photo 2 – Typical bow string wood roof trusses at low bays

Photo 3 – Typical bow string wood roof trusses at high center bay

Photo 4 – Typical interior columns at high/low roof interface

Photo 5 – Typical exterior building elevation

Photo 6 – View of high/low roof transition from above

Appendix C – Cost Estimate

RETROFIT COST ESTIMATES FOR OWATC Bldg 10A Bay2

Structural Construction Costs:									**Roof or Balance**
Add full height 2x12 blocking where roof meets walls	$5.00	/LF	*	1,800	LF	=	$9,000		R
New A35 in-plane connectors @ shear walls	$2.50	A35	*	1,600	A35s	=	$4,000		R
Add new 3/4" epoxy A.B. @ 16"o.c.	$50.00	Bolt	*	1,600	Bolts	=	$80,000		B
15/32" osb roof overlay	$12.00	SF	*	43,200	SF	=	$518,400		R
15/32" osb shear wall upgrade	$12.00	SF	*	20,000	SF	=	$240,000		B
Hold-downs	$100.00	/EA	*	50	HDU	=	$5,000		B
Simpson straps as drag struts and chords	$20.00	LF	*	2,000	LF	=	$40,000		R
New x-Braces at high bay roof	$3,000.00	EA	*	10	X-braces	=	$30,000		
New Trusses between existings trusses	$15,000.00	EA	*	36	Trusses	=	$540,000		B
Upgrade Existing Trusses	$5,000.00	EA	*	36	Trusses	=	$180,000		B
New columns/footings at exterior walls for new trusses	$2,000.00	EA	*	24	Columns	=	$48,000		R
New Girder Trusses to support new roof trusses	$10,000.00	EA	*	24	Trusses	=	$240,000		R
New column clamps	$1,000.00	EA	*	25	Columns	=	$25,000		R
		LF	*			=	$0		R
		EA	*			=	$0		R
		EA	*			=	$0		B
			*			=	$0		

Sub-Total Structural =	**$1,959,400**	
Contractor's Conditions & Fees (Roof)	**$132,660**	
Contractor's Conditions & Fees (Balance)	**$156,750**	
Total Structural =	**$2,248,810**	

Total of above = $2,248,810