PennState
Physical Plant

**Office of Physical Plant**
Physical Plant Building
University Park, PA 16802-1118

DATE: December 17, 2020

SUBJECT: Construction Management – Request for Qualifications (RFQ)
General Classroom Building (GCB) Renovation
**Beaver Campus – Monaca, PA**

PSU PROJECT #: 00-06839.00

TO: Construction Management Firm

The Pennsylvania State University (the University) invites your firm to submit your qualifications for Construction Management Services for the above-referenced project.

**PROJECT SCOPE/DESCRIPTION:**

The Penn State University Beaver Campus is planning a complete renovation of the GCB. GCB was built in 1968 and is a 17,895 gsf classroom building. The ground floor consists of four classrooms, office suites, a large server room and mechanical space. The first floor consists of classrooms, two lecture halls and office space. The current mechanical system was installed in 1998 and utilizes a water source heat pump system that provides heating and cooling with a rooftop gas fired air handling unit to provide ventilation air. The individual heat pumps have been failing in recent years and are being replaced as needed. The desire is to update this entire system. A study for this renovation project has been completed by BHDP. The results of this study will be used as the bases for design.

The project will address deferred maintenance, renew building systems, replace windows, update spaces including classrooms offices and student space, add an elevator to the building.

Selected pages from the BHDP Beaver Campus General Classroom Building Renovation Study, dated June 22, 2020 is attached for reference, as part of this RFQ.

The goals of the project include the following:

- Address deferred maintenance
- Renew building systems
- Update classrooms, offices and student spaces
- Install elevator

The University will start design of the renovation in January 2021. Renovations to the building will require ACM abatement. The University will sample and test the existing building conditions. The abatement work will be bid separately by PSU and coordinated with the CM.

The total project budget is $8,000,000. This includes $5.8M earmarked for construction, $0.4M for abatement, $0.9M design and support costs, $0.4M of owner contingencies and $0.6M for FFE. The selected CM will be working directly with the project's A/E firms to ensure all aspects of the project are executed in a timely and professional manner. BHDP is the project A/E lead and Reese Hackman (MEP/FP).

**DESIRED CONSTRUCTION MANAGEMENT SERVICES**:

The University intends to engage a Construction Management at Risk (CM) firm to provide construction phase services for the project described above. The design schedule is as follows: SD @ 3/2021; DD @ 7/2021; CD @ 9/2021. It is intended that the awarded CM firm will ultimately enter into a GMP (Guaranteed Maximum Price) contract with the University.

The GMP for the Construction portion of the project will need to be established by October 2021. It is expected that construction will start in January 2022.

**QUALIFICATION SUBMISSION REQUIREMENTS**:

If your firm is interested in pursuing this project, please convince PSU that you are highly qualified to perform Construction Management services on this type of project. Please respond on two (2) single-sided A3's (11 x 17) only, in pdf format, with no cover letter as follows:

Please provide evidence of the following (at a minimum):

a. Recent experience with projects of this size, type, and complexity
b. Availability of experienced and exceptional staff
c. Ability to apply Target Value Delivery and other value-adding lean principles to the project
d. Virtual reality and technology capabilities
e. Established QA/QC protocols during construction

No formal site visits or tours will be provided at this stage. Please e-mail your submission, as a PDF attachment, by 3:00 p.m. on **Monday, January 11, 2021** to Rustyann Echard at rae12@psu.edu, with a copy to Marcus Marasco at mam326@psu.edu. In the subject line/field of your e-mail submission, please type: "Penn State Beaver GCB Renovation CM Qualifications Submission, [*your firm's name here*]". Please limit your submission to **two (2)** single sided A3's. If you have any questions regarding this request, please contact Rustyann Echard or Marcus Marasco (Project Manager) via email.

The University will use a qualifications-based selection process with long list, short list and interviews (these may be virtual). The CM Selection Committee will select a long list based upon an evaluation of the responses to this RFQ. A Request for Proposal (RFP) will be issued to the long-listed firms by January 21, 2021. The response to the RFP's will be due by 3:00 p.m. on February 11, 2021. The short list will be selected by February 18, 2021. Interviews will tentatively be held during the week of March 8, 2021 (location to be determined, may be virtual). The final selection will be made shortly after the interviews.

**Form of Agreement.** Included is the link to our Form of Agreement 1-CM-GMP, along with the related General Conditions:

**https://wikispaces.psu.edu/display/OPPDCS/Division+00+-+Procurement+and+Contracting+Requirements**

Section "00 53 00 CONSTRUCTION MANAGER AGREEMENTS"

**Please review this agreement to ensure that your firm accepts all terms and conditions as written. In submitting a proposal for this project, you acknowledge that you concur, without exception, with all terms, conditions and provisions of Form of Agreement 1-CM-GMP (v. 10/2020) and the related General Conditions (v. 01/2019).**

*Confidentiality/News Releases:* News releases pertaining to this project will not be made without prior approval by Penn State, and then only in coordination with Penn State. Additionally, the contents of this correspondence are to remain confidential and as such are to not be made public.

The University reserves the right to waive any informality in any or all proposals, and to reject or accept any proposal or portion thereof. The University's intent is to identify the firm that provides the best overall fit with the perceived need. **Additionally, the above dates are target dates established by the University. The University reserves the right to modify the dates as/if it deems necessary**.

Sincerely,

*Todd D. Webber*

Todd D. Webber, MBA, CPP, Assoc. DBIA, EFP
The Pennsylvania State University
Construction & Contract Specialist
#106 Physical Plant Building
University Park, PA 16802
Ph: 814.865.6876

cc: J. Bechtel; A. Dent; M. Marasco; R. Echard; CM Selection Committee

BHDP + PennState

# Beaver Campus General Classroom Building Renovation Study

06.22.2020

PSU Project # 00-06839.00
BHDP Project # PSU01.03

# PROJECT INTENT

The project scope included the completion of a feasibility study to identify options for the renovations to the General Classroom Building on the PSU Beaver Campus.

More specifically, the Owner's initial goals identified in the Request for Proposals included the following:

- Identify costs associated with a complete renovation of the building
- Evaluation of the adequacy of the building for current program and identify needed changes
- Address exterior features such as windows, entrances and canopies

Initial observations and design criteria identified as part of first discussions with the Campus Leadership included the following:

- The existing building does not have an elevator. This is desired in order to provide access to each floor.
- The ground floor does not include restrooms. As part of a renovation, the Building Code will require a substantial investment toward ADA upgrades. Restrooms will need to be renovated to be compliant, which will likely mean expansion of the current footprints as well as utilization of additional space to meet the current fixture count.
- The building lacks 'soft' space for students to study, collaborate and socialize. The Study should address defining new areas/ opportunities appropriate to the building size and PSU classroom building design guidelines.
- Additional faculty offices are needed. This will be confirmed during the Programming process and may require additional space internal or in addition to the existing building footprint.
- The existing corridors are dark, with little transfer of natural light or views in/out of teaching spaces. The renovated classroom spaces must also "show well" as part of the admissions process. BHDP is well-experienced in designing spaces for the student experience, both for initial/ first impressions focused on admissions as well as retaining students.
- Due to their age, current classrooms do not support models for project-based learning and group interaction as well as provide flexibility, modern technology, furniture and sufficient whiteboards. Concepts to achieve this will be studied.
- The two lecture halls can be slightly reduced in size in order to modernize the seating typology and technology use.
- There is a desire to enhance the exterior look of the building, with the canopies as one option.
- Mechanical and Electrical Systems serving the building are mostly original and require evaluation and planning for repair, modernization and/or replacement. A fire protection system should be added.

Overall Project Scope

As part of the building renovations, it is assumed that major upgrades will occur to building mechanical, electrical and plumbing systems and a new fire protection system will be added. In terms of interior architectural upgrades, in addition to the interior of teaching spaces, it is assumed that corridors, support areas, office areas and toilet rooms will be upgraded. New student study and collaboration areas will be added, and a new addition will provide elevator access to both building floors. ADA upgrades will include the provision of new restrooms on the ground floor and renovation to the existing restrooms on the first floor, making both compliant.

The exterior/ envelope of the building is anticipated to receive new windows, minor masonry repair and updates to the entry canopies to improve the building aesthetics. The building has a relatively new roof (under warranty) and therefore roof work other than as required by the provision of new rooftop equipment is excluded.

The process for developing the study involved field investigation of existing conditions, visioning session and meetings/ interviews with project stakeholders, review of existing drawings, analysis of existing classroom utilization, development of supporting plans/ graphics, conceptual cost estimates and scope narratives.

# EXISTING CONDITIONS

Located on the Beaver Campus of Penn State University, the General Classroom Building consists of a one-story section with two lecture halls and corridor link connecting to a two-story building. In total, the building consists of approximately 18,000 gross square feet of space. The building was originally constructed in 1968 and has received few upgrades since that time. The following general assessment is organized by building system or element.

## Building Exterior / Envelope

The building exterior consists of a brick masonry veneer over CMU structure, with several areas of exposed painted concrete as accents. Concrete canopies exist at the exterior door locations, which are currently painted. The masonry is generally in good condition, and limited repair in the form of tuck-pointing is recommended. Exterior sealants should also be replaced at the time of other renovations. The exposed painted concrete accents and canopies are in need of scraping, cleaning, prep and new exterior finish. A thorough cleaning of the existing masonry and concrete is also recommended.

Exterior doors and windows are original to the building and should be replaced. This includes the existing hollow metal doors and frames as well as the aluminum glazed entry and window systems.

The two-story building roof was replaced in summer 2016, with a Garland 2-ply built-up modified-bitumen system being installed. We understand the one-story lecture hall and corridor link roof was similarly replaced in 2010. Both areas are currently under warranty and should be protected during any exterior work as part of this project. A contractor able to work within and maintain the existing warranties should be used for any associated work.

## Interior Space / Finishes

The building interior consists of both painted and exposed dark brick and CMU walls, acoustical tile ceilings, carpet and vinyl tile floors, vinyl wall base and wood doors. The lecture halls include a mix of exposed concrete floor and rubber/ vinyl flooring on the aisle stairs. Interior window blinds are provided at most spaces.

The majority of the building interior finishes are aged/ worn. Based on condition as well as extent of space reconfiguration, all interior finishes are recommended to be replaced. This includes ceilings, flooring and wall finishes as well as window treatments. The existing 9x9 floor tile is suspected to be asbestos-containing and will need to be tested and likely abated as part of any renovations.

Although the condition is acceptable, the replacement of interior doors and hardware is recommended for aesthetic reasons as well as upgrading to ADA-compliant hardware. Most door locations will be changed anyway, leaving very few existing doors feasible for reuse.

## Accessibility

Accessibility upgrades will be a major aspect of proposed building renovations and will constitute a minimum of 20% of the projected renovation budget. The current building lacks accessible accommodations in several areas:

- Main entrances
- Connectivity between building floors, including lack of elevator
- Stairwell handrails and guardrails
- Restrooms, including space, reach/ height, fixtures and grab bars
- Drinking fountains
- Door hardware as well as accessible approach/ clear maneuvering space at several door locations
- Interior signage

# EXISTING CONDITIONS

Continued

## Mechanical

In 1999 most of the original building mechanical systems were replaced. The primary mechanical system is a Water Source Heat Pump (WSHP) system which uses water as the medium for heat rejection and heat supply. When an individual heat pump is in the heating mode the water acts as the heat source. In the cooling mode the heat pump rejects heat to the water. This system allows simultaneous heating and cooling to occur throughout the facility.

The water is located in a single piping loop and is circulated throughout the facility with the use of centrally located pumps. The water temperature in the loop is maintained between upper and lower set points of 65 and 90 degrees using a high efficiency, condensing boiler and a grade-mounted cooling tower. If the upper set point temperature is exceeded the loop water is diverted to the cooling tower and heat is dissipated to the atmosphere. Conversely, the boiler adds heat to the water if the lower set point temperature is matched. One heat pump is provided for each thermal zone to allow for independent temperature control. The heat pumps are a combination of horizontal units located above accessible ceilings and several vertical units located in an upper mezzanine. The units vary in age from approximately 21 years old to 7 years old, range from poor to fair in quality, and accessibility for proper maintenance is limited.

A dedicated heating-only make-up air unit is located on the roof to provide ventilation air to the facility. The unit is original to the building construction and is inoperable; therefore, the building has no source of outside air to meet the code-required ventilation or improve indoor air quality. General-purpose exhaust is collected via galvanized sheet metal and terminated at roof-mounted exhaust fans which are in fair condition and are approximately 10 years old.

Note that no ventilation or conditioning from the WSHP system is provided for bathrooms or corridors. As a result, the staff has been forced to implement plug-in style space heaters in certain bathrooms to provide conditioning in colder months. Electric cabinet unit heaters serving areas with high infiltration rates have also failed.

The central plant components were installed in 1999 and are in fair condition. These items include: Condenser Pumps; Heat Pump Loop Pump; Heat Exchanger; Expansion Tank; Flue System and Controls. The boiler is a high-efficiency, condensing, natural gas-fired boiler that was replaced in 2007 and is in fair condition. The low-profile, forced-draft cooling tower is approximately 21 years old, has had several repairs related to corrosion. The tower is inefficient by modern standards and in poor condition. No leaks are apparent in the piping system and the quality is undetermined from an external visual inspection. If piping is considered for reuse it is recommended that select sections be removed and analyzed to determine quality and remaining service life. The plant pumping system operates under constant volume operation. The system capacity appears to be equal to the original design with little to no spare capacity for additional load.

Controls are a legacy version of Automated Logic and require replacement as part of a renovation. Energy management is extremely limited under the current capabilities and operating sequences of the system.

All major components and equipment noted above are at, or near, the end of their service life and would normally be considered for replacement as part of any major renovation; however, there are options to meet a limited design intent with reduced budget for this project.

# EXISTING CONDITIONS

Continued

## Electrical

The classroom building's existing electrical system is comprised of a 480/277-volt distribution panelboard located in the boiler room, which in turn feeds a series of 480/277-volt panelboards located throughout the classroom building in the Boiler Room as well as the corridors. The 480/277-volt panelboards provide power to the 277-volt fluorescent lighting as well as the mechanical equipment. The distribution panelboard feeds one 45-KVA transformer, which in turn feeds 208/120-volt panelboards, which provide power to receptacle and general-purpose power circuits. The 45 KVA transformer and the downstream panelboard are in good condition and could potentially be re-used. The 45 KVA transformer replaced a 15 KVA transformer in an effort to provide more power for classroom computer loads. The emergency system includes a 7.5KW Onan generator located in the Boiler Room. Although the main distribution panelboard appears to have been re-furbished in 1999, a majority of the electrical distribution system, including the emergency system, is original to the building. For this reason and the fact that the electrical system was not designed to handle current classroom computer loads, we recommend replacement of the entire existing electrical distribution system as part of any major renovation project. Also, the fire alarm system is original to the building and should be replaced in its entirety. The lighting fixtures were retrofitted with better fluorescent technology lamps (possibly in the mid 2000's), but these are now antiquated based on current LED technology and associated control systems and should be replaced as well.

## Plumbing

Plumbing within the facility is original to the 1968 construction. Modifications and minor component replacement have occurred as part of ongoing repairs, but no piping systems have been fully replaced. All piping systems which are original to the building are nearing the end of their useful service life and are recommended for replacement. If piping systems are considered for reuse to reduce project cost, it is recommended that representative samples of the piping systems be removed and sent to a lab for forensic evaluation and remaining lifespan determination. This will allow the university to consider incorporating pipe replacement into the project should the findings indicate poor quality as anticipated.

Existing fixtures vary in age and none are water-conserving style. All are recommended for replacement if the facility undergoes a substantial renovation. The existing water service entry and domestic water heater have capacity to serve the renovated space and can remain and be replaced as they fail.

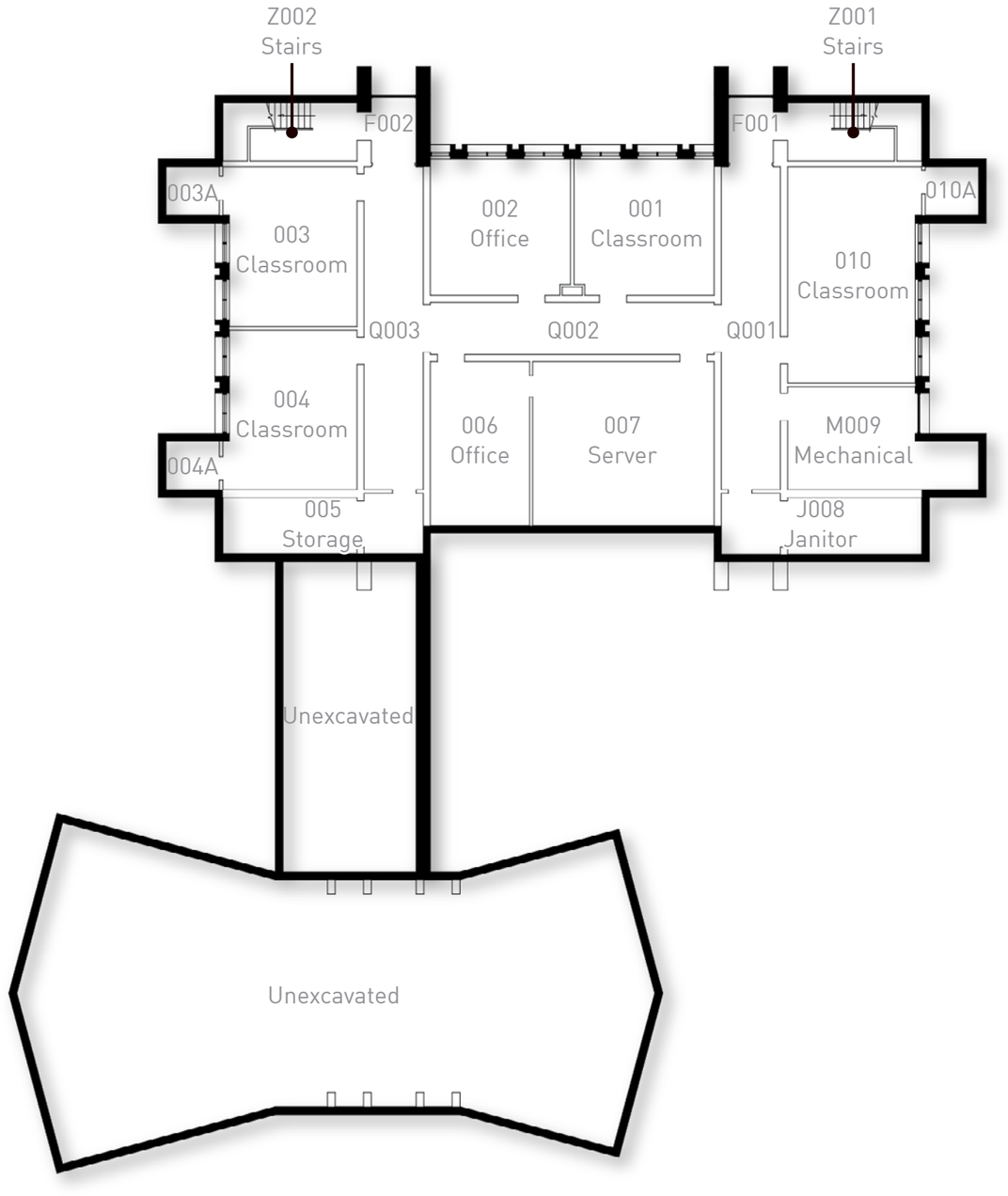
## Fire Protection

The current building does not have a fire protection/ sprinkler system.

# EXISTING CAMPUS CONTEXT

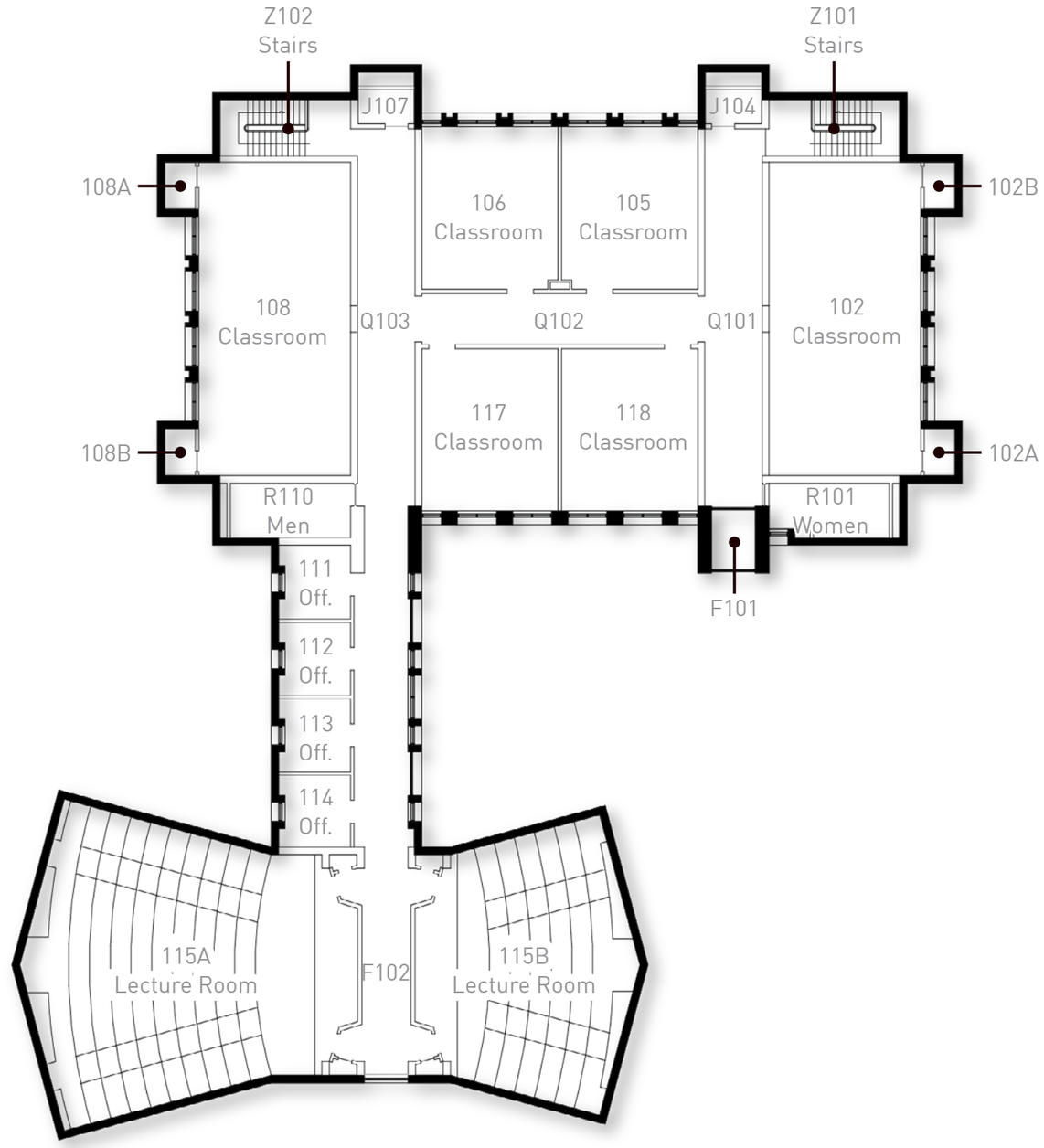
# EXISTING CONDITIONS

## Floor Plans: Ground Level



# EXISTING CONDITIONS

## Floor Plans: First Level



# CLASSROOM UTILIZATION ANALYSIS

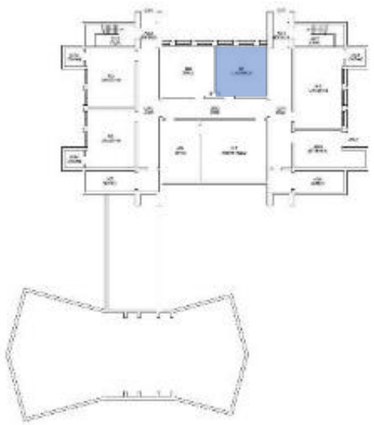
001 GCB

## Faculty Likes

- n/a

## Faculty Dislikes

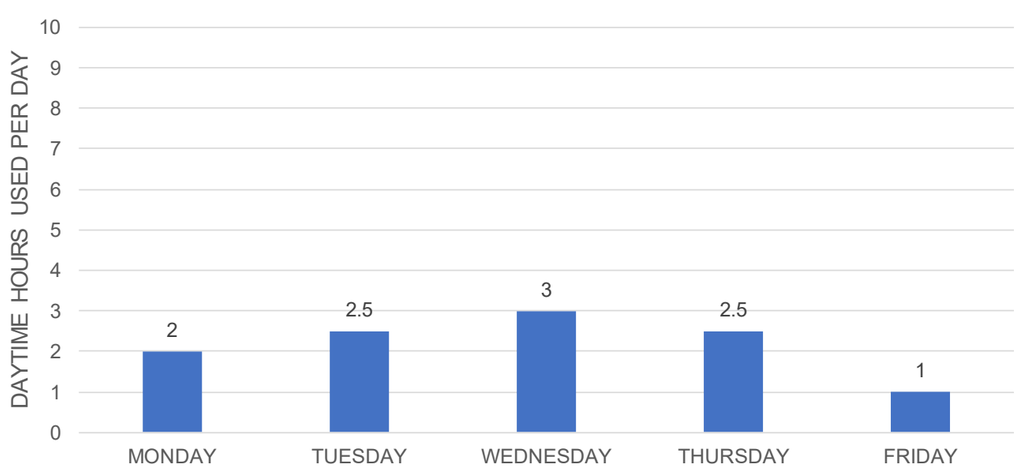
- Poor technology
- Lack of natural lighting



| DAY | 8 am | 9 am | 10 am | 11 am | 12:00 | 1 pm | 2 pm | 3 pm | 4 pm | 5 pm | 6 pm | 7 pm | 8 pm | 9 pm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MON | | | | MATH200 11:15-12:05 | | | MGMT341 1:25-2:15 | | | | | | | |
| TUE | | FR2 9:05-11:00 | | | | | | | | MGMT418 4:35-5:50 | ACCT405 6:00-7:15 | ACCT432 7:30-8:45 | | |
| WED | | | | MATH200 11:15-12:05 | | | MGMT341 1:25-3:20 | | | | | | | |
| THU | | FR2 9:05-11:00 | | | | | | | | MGMT418 4:35-5:50 | ACCT405 6:00-7:15 | ACCT432 7:30-8:45 | | |
| FRI | | | | MATH200 11:15-12:05 | | | | | | | | | | |

| CLASS | ROOM CAPACITY | SPRING 2019 ENROLLMENT |
|---|---|---|
| FR 2 | 17 | 9 |
| MATH 200 | 17 | 2 |
| MGMT 341 | 17 | 2 |
| MGMT 418 | 17 | 9 |
| ACCTG 405 | 17 | 9 |
| ACCT 432 | 17 | 9 |

| CLASSROOM FEATURES |
|---|
| ▪ TABLES W/ CHAIRS |
| ▪ INSTRUCTOR PC |
| ▪ 1 PROJECTOR |
| ▪ 1 SCREEN |
| *POLYCOM SPECIALTY |



# PROJECT SCOPE NARRATIVE

The following graphic floor plans illustrate proposed options for renovating the ground/ first and second floors as well as the addition of a new elevator tower.

Key recommendations and features of the plans include the following:

- Classrooms have been sized based on projected section sizes/ capacities and industry benchmarks, adjusted to fit within the existing building as required.
- Common spaces within each floor should be better defined and used for 'soft space' for student collaboration, gathering and study. This addresses the significant deficiency in 'soft space' identified as part of the study.
- Interior transparency and views are provided to increase student engagement and promote learning on display. Student spaces have been strategically located in areas to receive natural light and views where feasible.
- Faculty offices have been adjusted in size based on PSU guidelines and have been grouped or co-located where applicable and additional offices have been added as identified in the Programming phase. Open office space for adjunct staff has also been provided.

## Exterior & Interior Improvement Assumptions

As part of the study and resulting cost estimate included, the following scope is included within the renovations:

- Existing spaces will be demolished (finishes, ceilings, doors, wall-mounted items, MEP items, interior CMU walls as required). Abatement of existing hazardous materials is anticipated.
- New interior gypsum board and metal stud partitions will be provided as required by the new space layout.
- Existing concrete masonry (CMU) partitions will be retained where possible. CMU walls will receive metal furring and gypsum board where needed to conceal mechanical and electrical and where feasible within the available budget. All CMU walls are not assumed to be furred out and receive new gypsum board due to budget limits.
- Interior finishes will be replaced throughout.
- The building will receive new doors and hardware to comply with ADA throughout.
- New ceilings will be provided throughout.
- New exterior windows will be provided (replacement storefront windows in existing openings).
- Work on the building roof has been excluded other than work required as part of the new air handler and other rooftop equipment installation.
- New entry canopies on the exterior of the building will be provided.
- An addition on the north of the building will provide an elevator (2-stop) in a new masonry shaft.
- Mechanical systems will be provided per the Narrative in this section.
- Electrical systems will be provided per the Narrative in this section.
- Plumbing systems will be provided per the Narrative in this section.
- A new Fire Protection system will be provided, including sprinkler system and fire alarm.
- Low Voltage systems will be provided per the Narrative in this section.

# PROJECT SCOPE NARRATIVE

Continued

## Mechanical Systems

There are two options for improving the systems as part of a facility renovation project. Option 1 is a complete system replacement as noted below. Option 2 is to retain the existing WSHP system and replace only key components to extend the life of the system at a reduced initial cost.

There are several base mechanical systems that can be utilized for heating, cooling and ventilation of the facility as part of a substantial renovation and system replacement associated with Option 1. Systems initially considered as part of this study included: Variable Air Volume (VAV); Variable Refrigerant Flow (VRF); Water Source Heat Pump (WSHP) and Four-Pipe Fan Coil (FPFC). After review of the current campus systems, staff familiarity with components, maintenance expertise required, initial cost and operating cost, the VAV system most closely meets the preferences of the staff, University Design Standards, and the financial aspects of the project and is the basis of the following Option 1 description.

Option 1 – Full System Replacement

1. All existing components, not including the boiler plant, would be demolished.
2. A new multi-zone VAV roof-mounted air-handling unit with DX cooling, hot water heating, variable speed lead compressor, variable speed supply fan, variable speed exhaust fan and enthalpy-based economizer would be utilized for space heating, cooling and ventilation of all small classrooms, corridors and support spaces. The system will utilize demand-controlled ventilation to minimize energy use.
3. A new single-zone VAV roof-mounted air-handling unit with DX cooling, hot water heating, variable speed lead compressor, variable speed supply fan, variable speed exhaust fan and enthalpy-based economizer would be utilized for space heating, cooling and ventilation of the single large lecture hall. The system will also utilize demand-controlled ventilation to minimize energy use.
4. New galvanized sheetmetal ductwork with fiberglass insulation would be utilized to distribute air to the facility via a series of fan-powered and pinch-down VAV boxes that incorporate hot water reheat coils. Each space would be provided with individual zone control.
5. Space conditioning and ventilation will be extended to the corridors and bathrooms.
6. A new Automated Logic Building Automation System would be installed and connected to the campus network for system control.
7. All hot water supply and return piping outside the boiler room would be replaced with a combination of insulated black steel and copper piping. Should the university want to pursue reuse of the existing piping mains, it is recommended that representative samples of the pipe be removed from the systems and sent to a lab for forensic evaluation and remaining lifespan determination.
8. General purpose exhaust will be retained and provided via the existing roof-mounted exhaust fans and galvanized sheet metal distribution system.
9. Install new electric cabinet unit heaters in bathrooms and areas of high infiltration.
10. Engage in a service contract for heating water system chemical treatment by an outside service vendor.

Option 2 – Limited System Replacement

1. The majority of the duct distribution system can remain intact. Only branch ductwork and air devices will be relocated for the new space layout.
2. The existing boiler shall be retained and reused. A second boiler could be added for system redundancy if preferred by the University.
3. The existing WSHP system piping network is retained and reused as part of this option and is reflected in the estimate. Testing as noted above should be implemented.
4. All pumps shall be replaced with new base-mounted, end-suction pumps with inverter duty motors, shaft grounding rings and VFDs for variable volume operation.

# PROJECT SCOPE NARRATIVE

Continued

5. Existing WSHPs would be replaced with high-efficiency units utilizing ECM motors and 2-stage operation where applicable. Each WSHP will be provided with new controls connected to the building control system.
6. A new updraft cooling tower with stainless steel drain pan and variable speed fan operation shall be provided.
7. A dedicated 100% outside air unit (DOAS) will be provided to replace the existing failed ventilation air unit. Outside air shall be pre-conditioned to a "Space Neutral" condition of 75 deg. F and 50% R.H. through the DOAS unit located on the roof. The unit shall utilize modulating natural gas heating and DX cooling to temper outside air prior to discharge. The unit shall be variable-volume arrangement with variable speed supply fan, variable speed lead compressor, hot-gas reheat, modulating heating control, and MERV 20 filters. Outside air shall be ducted and utilize the existing distribution system where possible. The system will also be extended into corridors to provide ventilation. Ductwork shall be galvanized steel wrapped with 1-1/2" fiberglass insulation.
8. A new dedicated variable-volume exhaust system shall be located on the roof and provided with variable rate exhaust control through the existing open mezzanine return system to operate in conjunction with the demand-controlled ventilation operation of the DOAS unit for space pressurization control.
9. Existing exhaust which is not demolished will be modified and used for point source odor control.
10. New temperature and space pressurization controls would be provided as part of the new Automated Logic Building Automation System.
11. Install new electric cabinet unit heaters in bathrooms and areas of high infiltration.
12. Engage in a service contract for heat pump and heating water system chemical treatment by an outside service vendor.

## Plumbing System

Key items required to renovate the space into the concept depicted in the Architectural section of the report are as follows:

1. Provision of new plumbing fixtures as part of new restrooms and other support spaces indicated on the conceptual floor plans.
2. Replacement of domestic water piping with Type "L" copper utilizing fiberglass insulation and stainless steel full-port ball valves.
3. Vent and waste piping shall be replaced no-hub cast iron in return air plenums and DWV PVC below grade.
4. New gas piping shall be schedule 40 black steel.
5. Replace water heater with high-efficiency, condensing style gas-fired model if existing unit is at the end of service life at the time of design.

## Fire Protection

A new wet-pipe fire protection system shall be installed throughout all areas of the facility. The system shall be designed and installed in accordance with NFPA 13 for light and ordinary hazard occupancies. The system shall be provided with individual zone valves for each floor.

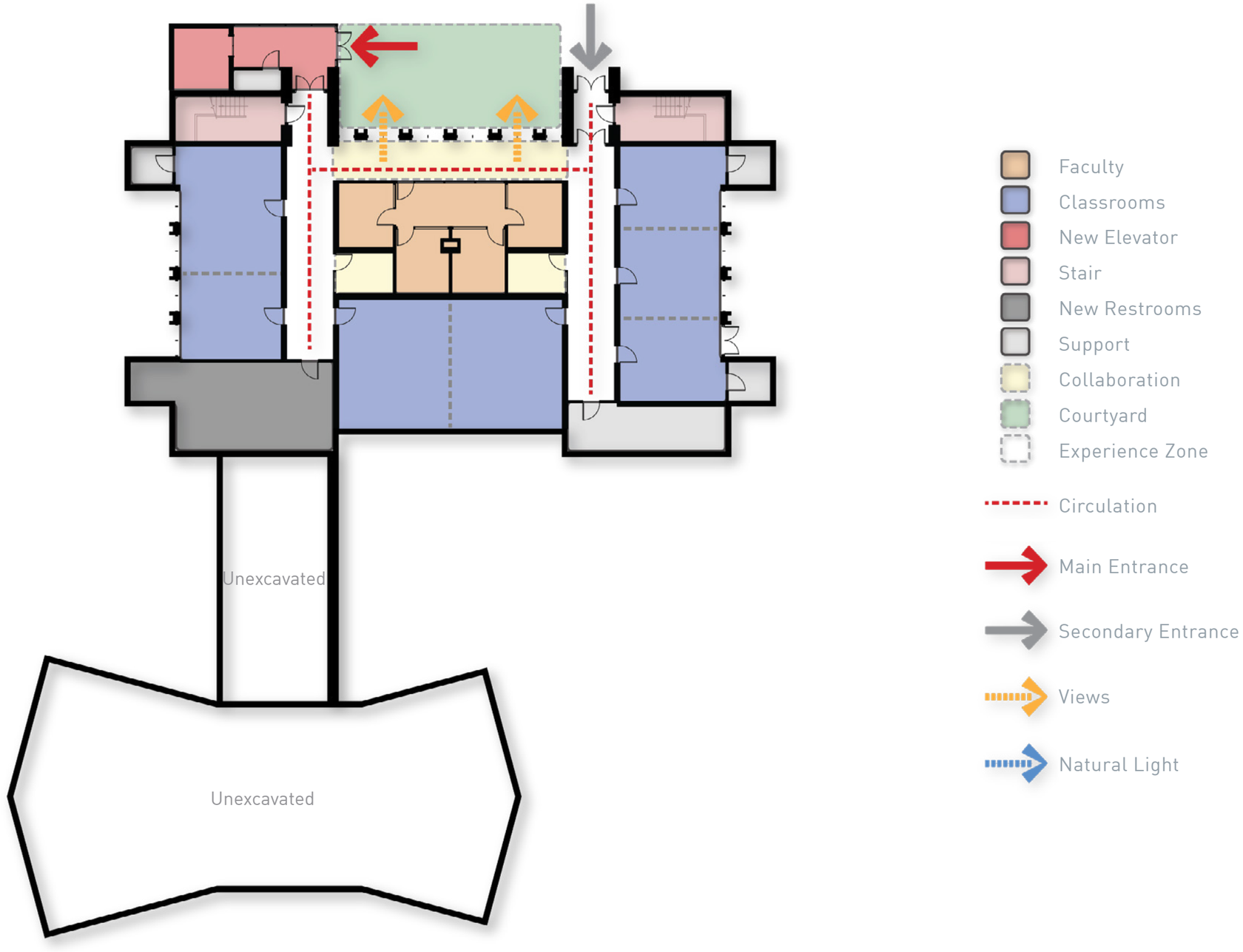
Piping comprising the NFPA-13 wet-pipe system shall be a combination of schedule 40 and schedule 10 black steel (pipe sizes 2-1/2" and larger) and CPVC (2" and smaller) and shall be connected to semi-recessed sprinkler heads with white enameled finish. All sprinkler heads in the finished space shall be located in the center of tile, center of corridor and shall be located symmetrically throughout each space.

The system shall be connected to a new 6" building water service and provided with a pressure reducing valve, water meter and double-check backflow preventer. FM Global insurance requirements shall be followed in accordance with university standards.

# PROPOSED FLOOR PLANS

Option 1

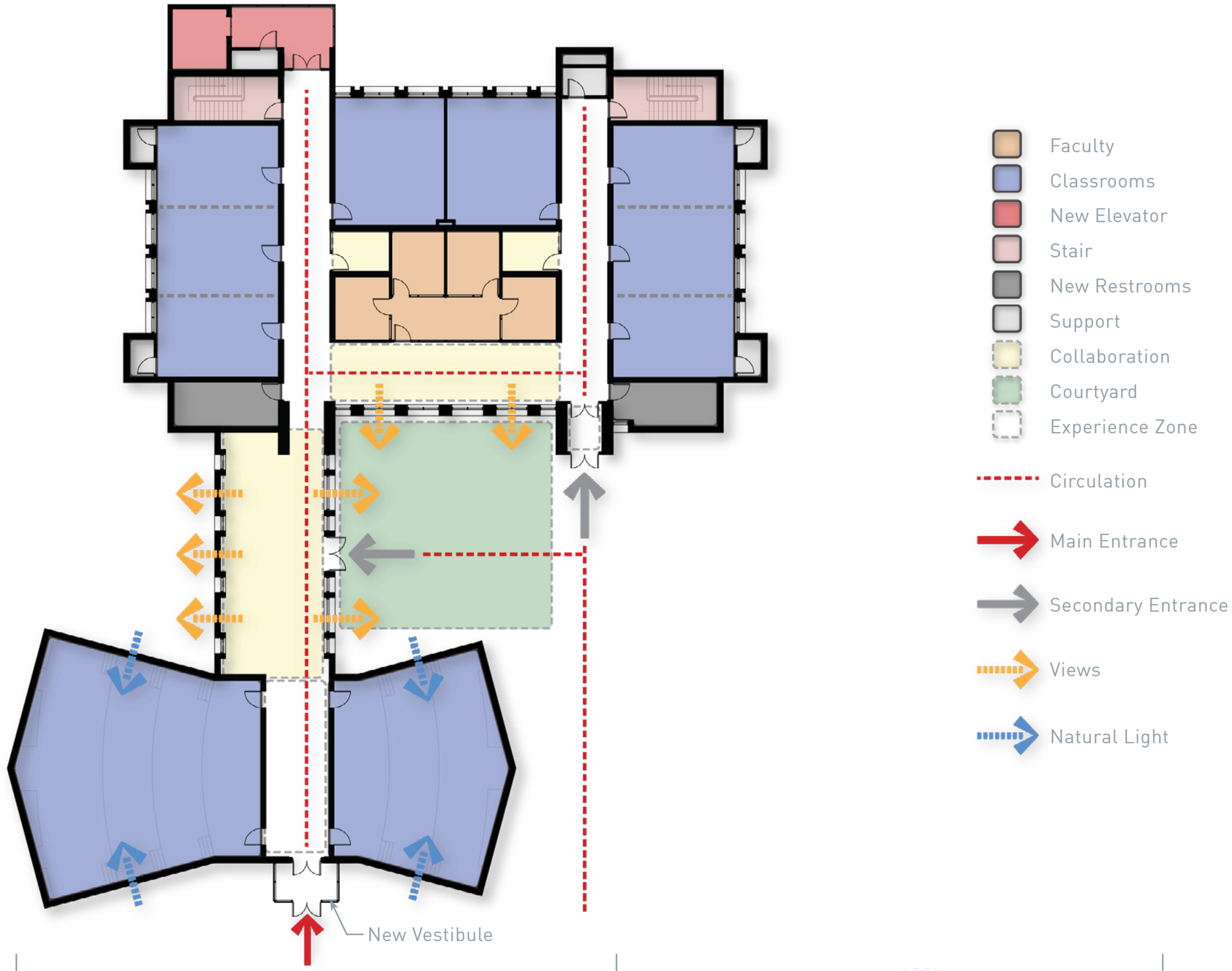
Ground Level



# PROPOSED FLOOR PLANS

Option 1

First Level




Beaver Campus General Classroom
Building Renovation Study