09.05.2019

UIUC PROJECT # U18083

UIUC LIBRARY REDEVELOPMENT PLAN PROGRAMMING AND CONCEPTUAL DESIGN STUDY

PART 2: CONCEPTUAL DESIGN, FINAL SCENARIO

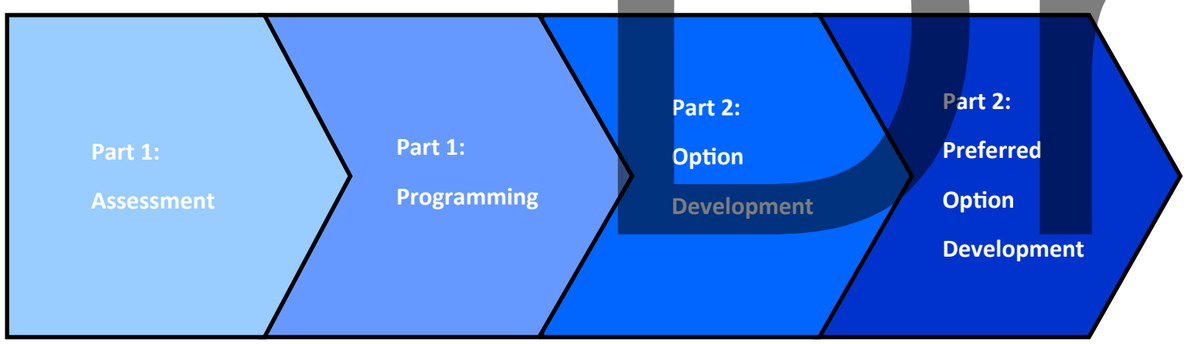
JLK JOHNSON LASKY KINDELIN ARCHITECTS

brightspot

IMEG

TABLE OF CONTENTS

PROCESS DIAGRAM



- Review of previous studies
- Review of existing building conditions
- Visualization, program scenarios, and space prioritization workshops

- Category-level programming
- Adjacency studies
- Introduction of 3 options
- Blocking and stacking diagrams

- Presentation of 3 conceptual design options
- Conceptual MEP evaluation of options
- Cost estimate for 3 options

- Revision and additional development of preferred option into conceptual plans and sections
- Revised MEP evaluation of preferred option
- Cost estimate for preferred option

PREFACE

This report is the fourth and final submission for the UIUC Library Redevelopment Plan Programming and Conceptual Design Study. It follows the Part 1: Programming Report and Part 2: Conceptual Design, 3 Scenarios submissions. Response and discussion of these previous submissions have guided the development of one preferred design scenario presented here. This scenario will serve as the basis for programming and space planning in the upcoming Library Redevelopment design project.

While reviewing the materials presented, please note the following:

- Drawings presented in this report are sketches intended for conceptual design use only. All measurements are approximate. Design work beyond the conceptual will fall outside the scope of this report and will require field verification of all measurements and conditions.
- Partition walls, restroom fixtures, and minimal furnishings are shown for scale and illustration of how larger programmed spaces may be arranged. They are not intended to indicate the final design of each space. Please refer to the 2009 Masterplan for additional programmatic details which will aid in the future schematic design of these spaces.
- Life safety analysis and plumbing code information is based on the 2009 Masterplan report. During design development of the building project, this analysis should be updated to meet governing codes at that time.
- Plans and sections reflect current decisions made by the University and design team. Programming, space planning, and design may be updated in the future to accommodate any desired changes hereafter.
- A conceptual cost estimate will follow separately.

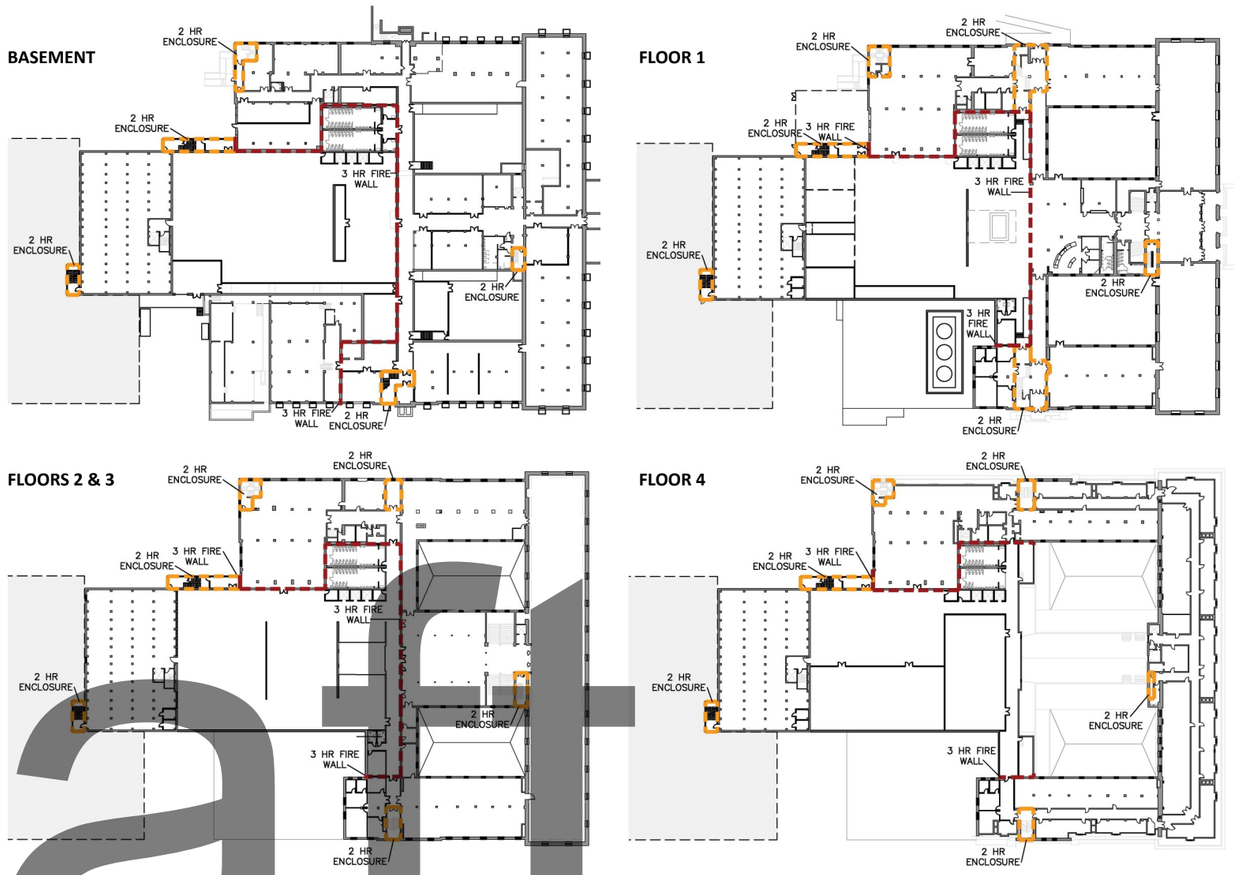
Draft

BACKGROUND INFORMATION

Summary of Conclusions from the 3 Scenarios

Review and discussion of the previously submitted design scenarios resulted in a series of conclusions and led to the development of the final scenario presented here. Other adjustments were made to accommodate the concurrent South Campus Instructional Facility design project. Major conclusions and adjustments included:

- The loading dock is to be located near the southwest corner of the infill addition and will serve the Library as well as the adjacent instructional facility.
- The courtyards will be infilled at the first floor level and made accessible to the public. It is preferred that these be enclosed by an atrium roof system at the first floor. A second pricing option will be provided for leaving them open-air. On the basement level, these spaces will be excavated to provide additional space for MEP equipment.
- The preferred location for cooling towers is on top of the Air-Conditioning Center roof. This will require structural analysis and likely some structural reinforcement. A screening wall will surround the towers to block view of these structures as well as associated noise.
- Access to the stacks will be available from all floors, but may be secured. Main points of access will be at the first floor along the wall of books and at the west wall of the infill on the second floor.
- While visual connection between floors is desired, an atrium space (open to more than 2 floors) requires additional fire protection systems at a high cost and need for additional footprint. Therefore, openings between floors will be limited to that above the main circulation area between first to second floors.
- Departmental Libraries were relocated to the second floor due to concerns that these services were too remote from the broader undergraduate population while located on the third floor.
- Designated Flexible Instruction Spaces will be located at the first and third floors and will double as study/ collaboration space when not being used for instruction. Additional instructional spaces may be accommodated within Departmental Libraries.
- Due to the current conceptual level of planning, individual offices will not be shown in plan. It is important to note that staff offices for Departmental Library staff should be provided within or adjacent to their corresponding library departments in lieu of being located at the fourth floor.
- An option for a new 200 seat general assignment classroom / lecture hall is provided at the northwest corner of the plan. A this time, it has not been determined if this program element will be required at this location.



Life Safety

A 3 hour fire wall must separate the existing building from the new addition. This wall must be continuous from foundation to the roof without horizontal offsets. In the final conceptual design scenario, this wall is located near the west edge of the original building to remain. At the first floor and basement, the main north-south corridor is located east of this line. At upper floors, the main north-south corridor is located west of this line. In order to open up this fire wall and allow views and passage between the original building and addition, overhead and oversized fire-rated doors may be utilized.

Existing stairways intended for egress must be enclosed with fire-rated enclosures and areas of rescue assistance provided at each. This includes all existing stairs except for the historic main stair between floors 1 and 2 and the existing communicating stairs within the 6th stacks. Additional egress stairs have also been added at the west end of the plan to meet egress and life safety requirements.

Plumbing Code

The proposed plans accommodate current deficiencies in plumbing fixture counts with additional large restrooms located in the new addition. Gender-neutral restrooms have also been designated at each floor. Several existing restrooms that are not ADA-compliant have been replaced with other programmed areas.

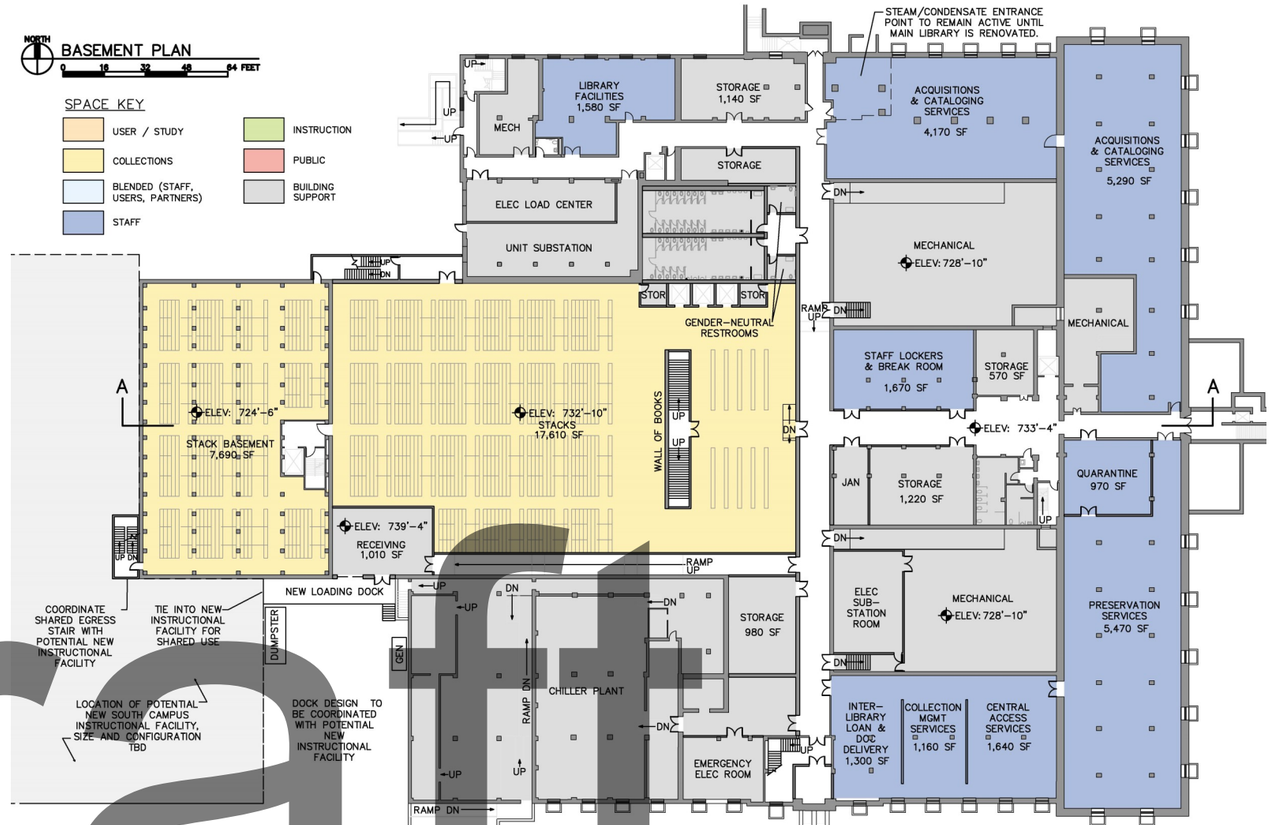
Draft

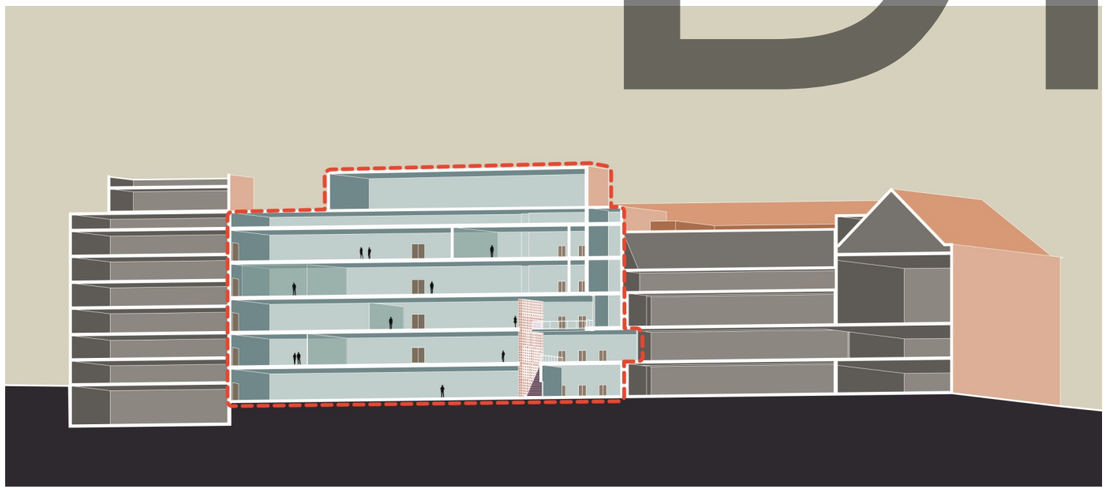
Conceptual sketch, south elevation of the new infill addition.

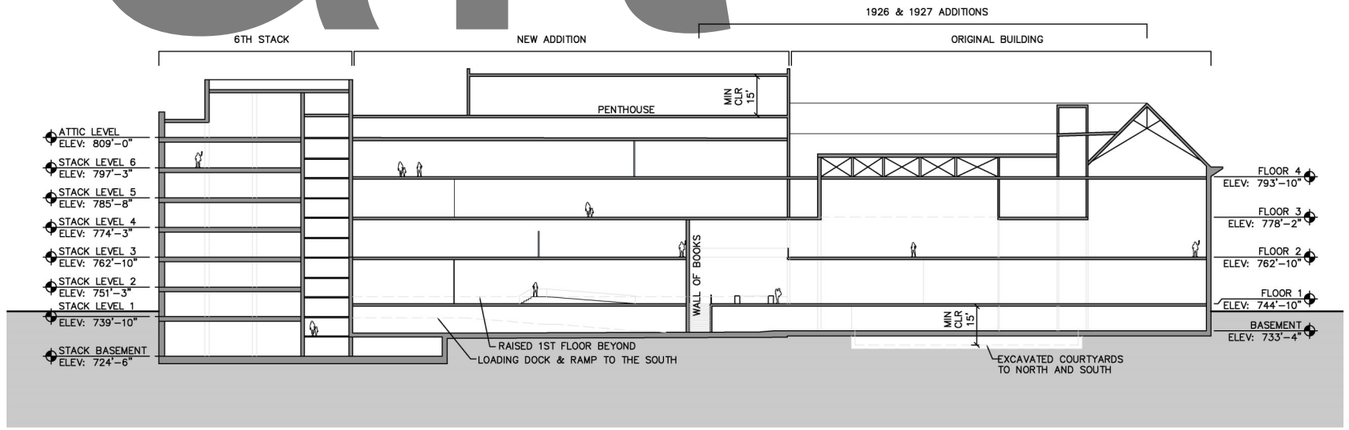
FINAL SCENARIO

In this scenario, the first floor is reserved primarily for lively collaboration, group study, and public event functions. Courtyards are enclosed at the first floor for spill over space from adjacent areas and allow more direct circulation between spaces that are otherwise disconnected. Within the Hub, the first and second floors are connected via a 2-story space that surrounds the main circulation area. Along the west side of this space, a wall of books stretches from the basement through second floors, acting as a central feature of the Library and as a backdrop for the Hub. This wall will contain browsable collections and should be constructed using salvaged historic stacks from the original building. Departmental libraries are collocated at the second floor, allowing adjacency and ease of access to users on first and third floors. The Media Center, Scholarly Commons, and Cooperative Research Commons are located on the third floor while quiet study areas and staff offices are on the fourth, isolated from noise on lower levels. Main access points to the stacks will be from the first and second floors while secured access is available at all floors. The loading dock has been moved to the southwest corner of the building with the intention of sharing this space with the future instructional facility. Relocation of this service area to the south elevation of the building will allow the north elevation to be further beautified and become a more prominent entrance to the library.

Please Note: Not all floors of the 6th stack are shown in plan, but generally repeat from basement through 6th level.



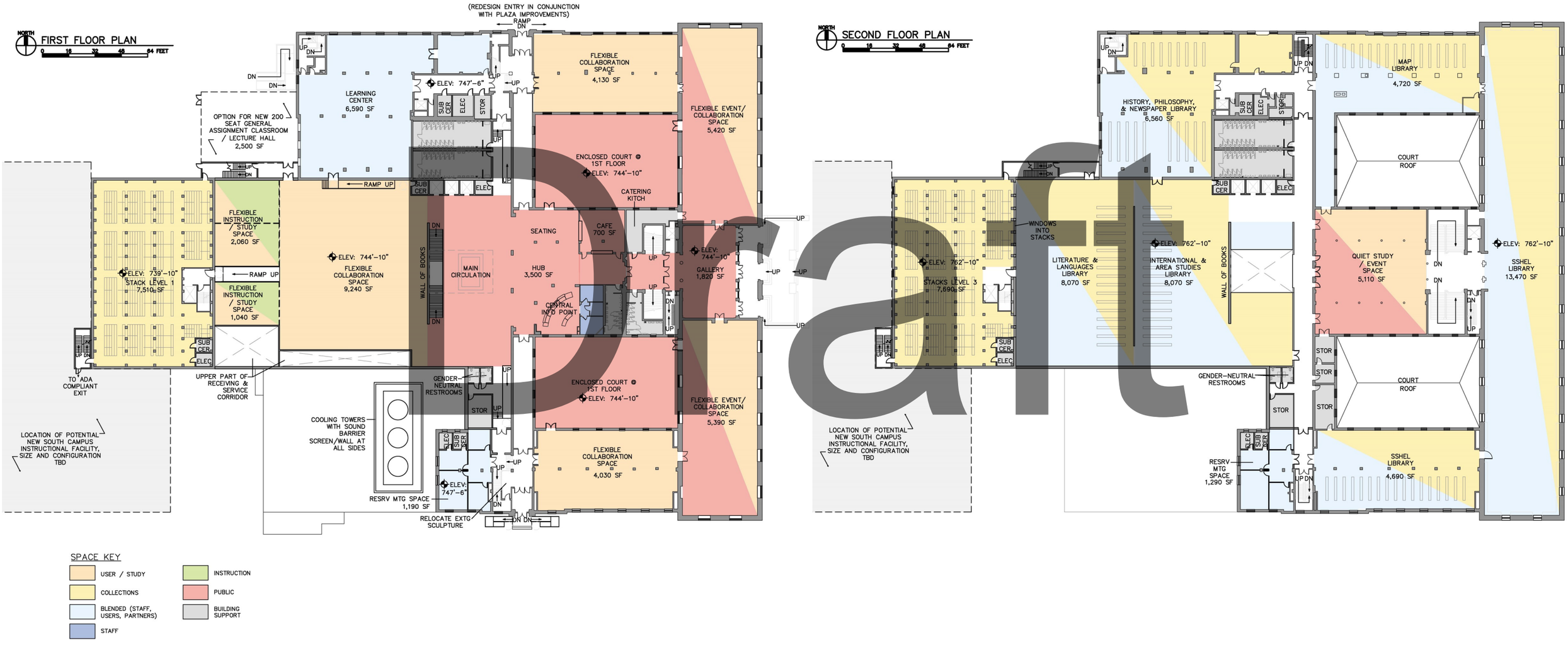




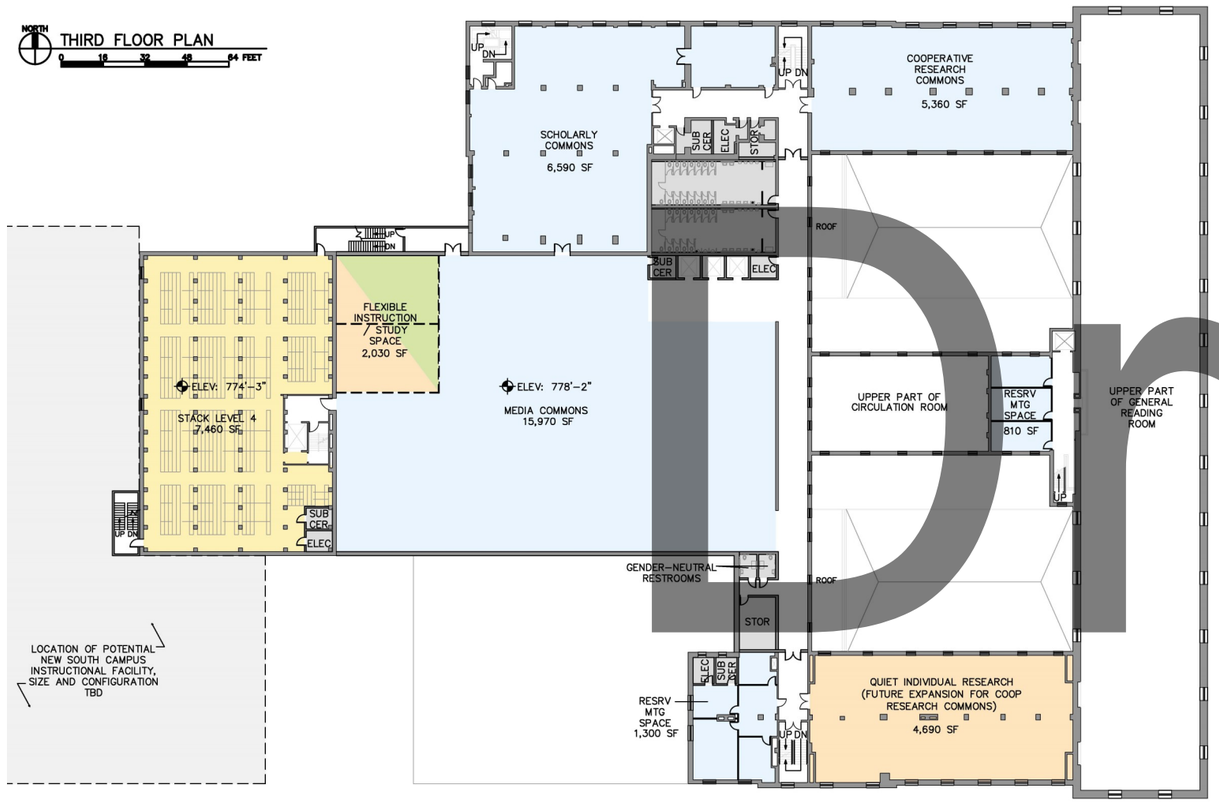
SECTION A–A
0 16 32 48 64 FEET

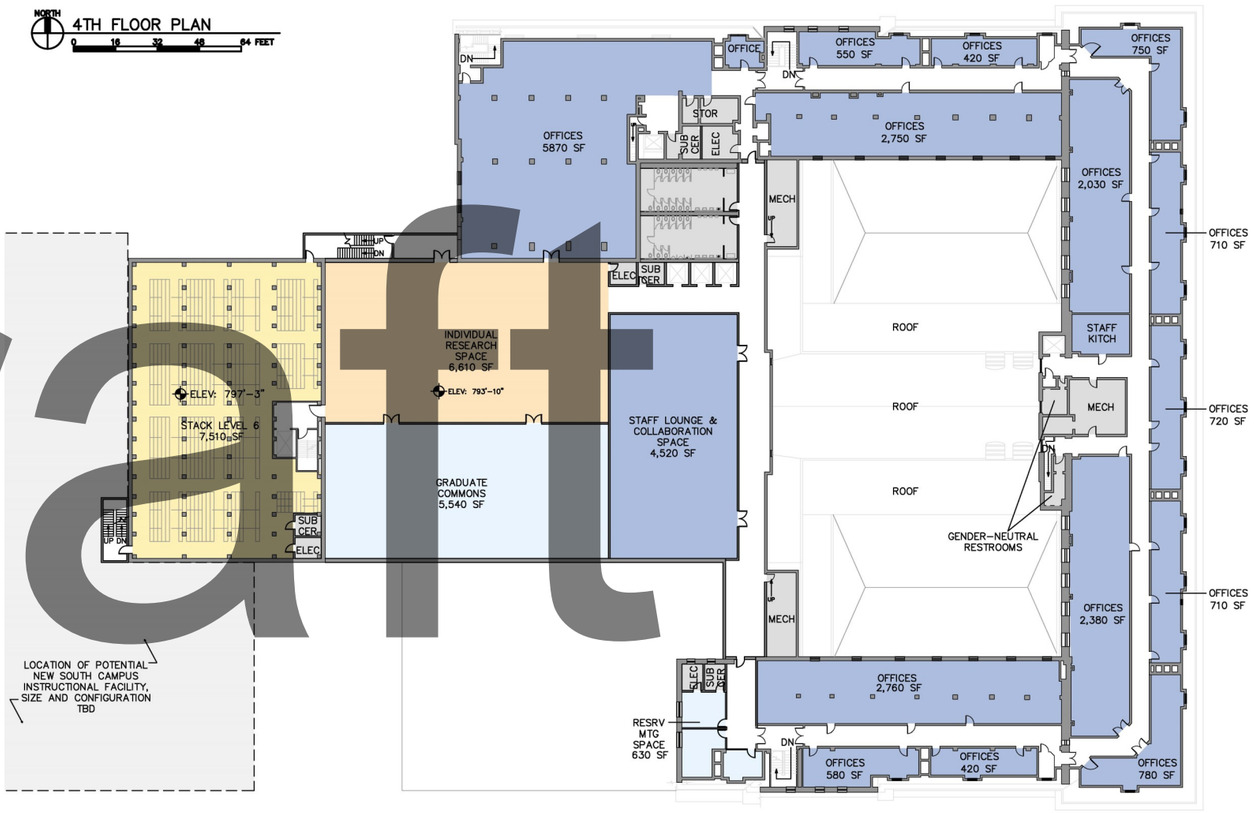
Draft

FINAL SCENARIO



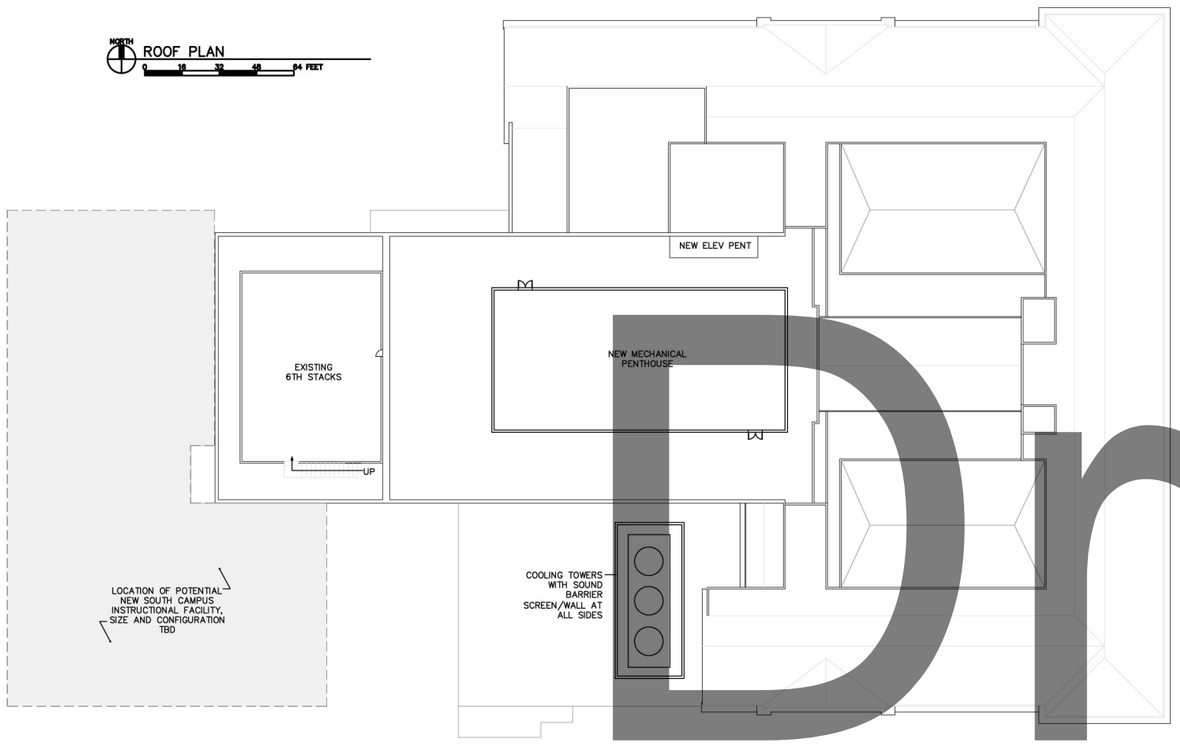
Draft

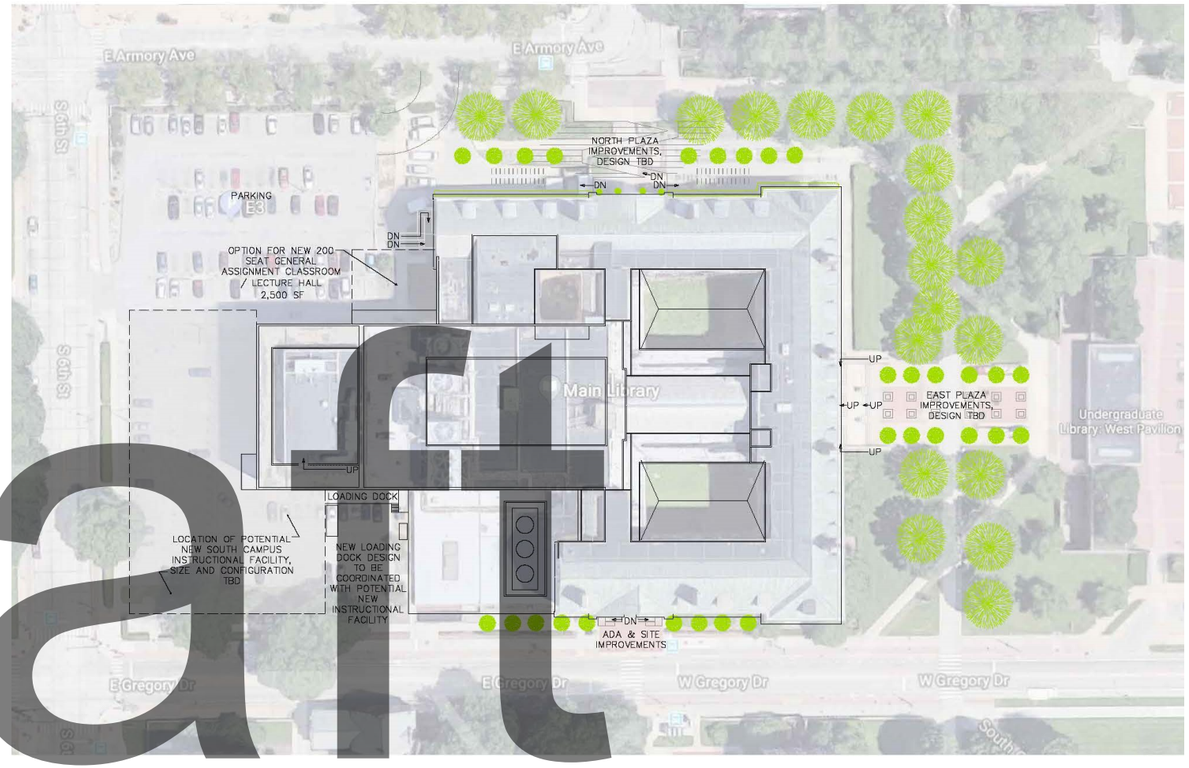

NORTH
THIRD FLOOR PLAN
0 16 32 48 64 FEET
SCHOLARLY COMMONS 6,590 SF
COOPERATIVE RESEARCH COMMONS 5,360 SF
FLEXIBLE INSTRUCTION / STUDY SPACE 2,030 SF
ELEV: 774'-3"
STACK LEVEL 4 7,460 SF
ELEV: 778'-2"
MEDIA COMMONS 15,970 SF
UPPER PART OF CIRCULATION ROOM
RESRV MTG SPACE 810 SF
UPPER PART OF GENERAL READING ROOM
ROOF
GENDER-NEUTRAL RESTROOMS
STOR
RESRV MTG SPACE 1,300 SF
QUIET INDIVIDUAL RESEARCH (FUTURE EXPANSION FOR COOP RESEARCH COMMONS) 4,690 SF
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD


NORTH
4TH FLOOR PLAN
0 16 32 48 64 FEET
OFFICES 5870 SF
OFFICE
OFFICES 550 SF
OFFICES 420 SF
OFFICES 750 SF
OFFICES 2,750 SF
OFFICES 2,030 SF
OFFICES 710 SF
MECH
ROOF
STAFF KITCH
OFFICES 720 SF
INDIVIDUAL RESEARCH SPACE 6,610 SF
ELEV: 797'-3"
STACK LEVEL 6 7,510 SF
ELEV: 793'-10"
STAFF LOUNGE & COLLABORATION SPACE 4,520 SF
GRADUATE COMMONS 5,540 SF
GENDER-NEUTRAL RESTROOMS
OFFICES 2,380 SF
OFFICES 710 SF
OFFICES 2,760 SF
RESRV MTG SPACE 630 SF
OFFICES 580 SF
OFFICES 420 SF
OFFICES 780 SF
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD

Draft

ROOF AND SITE PLANS





Draft

Roof Plan

Updates to the Main Library building and the new infill building will require extensive updates and additions to the mechanical, electrical, plumbing, fire protection, and IT systems. While a portion of MEP/FP/IT equipment may be placed in the basement level, a new penthouse will be required to house additional equipment.

The preferred location for cooling towers is at the roof of the Air-Conditioning Center. This is considered the most efficient and cost effective solution and will not interfere with the location of the new South Campus Instructional Facility. These must be enclosed by a screening wall, approximately 15’ tall. See the MEP analysis for additional discussion.

An additional penthouse will be required for the new elevators near the northeast corner of the infill addition.

It is preferred that the east courtyards be enclosed at the first floor with an atrium/glass roof, but an optional deduct will be priced to leave these open to the outdoors.

Site Plan

Major changes to the existing site include the location of the new South Campus Instructional Facility at the southwest corner of the plan, an option for a new general assignment classroom / lecture hall at the northwest corner of the building, and relocation of the loading dock to the south side of the building.

Improvements to the site also include redesign of the north and east plazas, making these the most prominent entries into the building. ADA improvements to the north and south entrances will also be required. Improvements to Gregory Drive are also planned in a separate project which should be coordinated with the Library Redevelopment project.

Site design and plaza improvements will be developed further in a separate design project.

PROGRAMMED AREAS

Space	Programmed Area	Existing Area (NSF)	Final Scenario (NSF)	Notes
Collections				
Main Library	TBD based on collections strategy	195,646	70,180	All stacks listed to be high-density compact shelving. Additional stacks to be included within dept libraries and other browsable stack areas.
Departmental Libraries*	TBD based on disciplinary needs			*SF shifted to study and collaboration areas.
International & Area Studies		5,673	8,070	
History, Philosophy, & Newspaper		10,967	6,560	
Literature & Languages		18,187	8,070	
Map Library		3,433	4,720	
Social Science, Health & Education		18,993	18,160	Includes Reading Room 200
Anchor Spaces				
Learning Center	5K-10K	2,900	6,590	Spillover to study/collab space
Media Commons	15K-30K	8,000	15,970	Spillover into adjacent Flexible Instruction / Study Space
Scholarly Commons	3.5K-5K	5,360	6,590	Important Adjacencies: Media Center and Coop Research Commons
Cooperative Research Commons	3.5K-10K	N/A	5,360	Important Adjacencies: Scholarly Commons, May expand into Quiet Individual Research Space to the south
Graduate Commons	3.5K-10K	N/A	5,540	
Public / Event Spaces				
Entry Hub	2.5K-3.5K	N/A	3,500	
Café	Variable, approx. 25/person	N/A	700	
Gallery		1,820	1,820	
User Spaces				
Flex Instruction/ Study Space	1K-14K	2,480	5,160	May also be accommodated within Department Libraries
Flex Quiet Study/Events		N/A	5,110	
Flex Collaboration Space	Variable	N/A	17,400	Likely Noisy - 1st floor
Flexible Event / Collaboration Space	Variable	N/A	10,810	
Individual Research Space	TBD, approx. 35-40/seat	Carrels	6,610	Upper floors, quiet area
Quiet Individual Study & Collab		N/A	4,690	
Reservable Meeting Space		5,649	5,220	May also serve as Reflection Rooms or Lactation Rooms. Reservation protocols TBD.
Staff				Non-user-facing staff to be located on 4th and bsmt levels
Collaboration Space	TBD, approx. 25-30/seat	N/A	4,520	Near staff offices
Offices Proposed for 4th Floor		15,053	21,590	
HR Office, 1st Floor		0	0	
Basement Offices/Services				
Preservation Services		3,200	5,470	
Acquisitions & Cataloging		8,890	9,460	
Collection Management Services		1,620	1,160	Near Receiving, Collocate with: Central Access Services and Interlibrary Loan & Document Delivery
Central Access Services		N/A	1,640	Near Receiving, Collocate with: Collection Management Services and Interlibrary Loan & Document Delivery
Interlibrary Loan & Document Services		750	1,300	Near Receiving, Collocate with: Collection Management Services and Central Access Services
Library Facilities		1,580	1,580	
Receiving		920	1,010	

Draft

PHASING

Due to the strong relationship between their programs and spaces, phasing for the Main Library and Special Collections Redevelopment Plans shall be developed in tandem. While detailed analysis of phasing was conducted in the 2009 study, this project includes a general analysis that may be used for conceptual -level planning.

The following phasing plan is largely dependent on MEP requirements—maintaining environmental controls in occupied spaces, replacement of outdated equipment, and installation of new mechanical spaces and equipment for the new infill addition. Other considerations include space for program elements, life safety, access, and existing building conditions.

The following table includes 5 phases which mostly address only one building or portion of a building within each. Phase 2 includes activities at both the Special Collections Research Center and the Main Library with the intention of hastening this process.

Activities listed within each phase are in listed in a suggested order of succession but may be reordered in future phasing plans.

See MEP Analysis for additional information.

Draft

1. UTILITY WORK

Item No.	Building	Description	Notes
1a	ML	Architectural work associated with new cooling tower Location - structural support at A/C Center roof (or pad/foundation if on ground), screening wall, and access.	
1b	ML	Install new cooling towers.	See MEP Analysis
1c	ML	Extend steam and condensate to new entrance location.	See MEP Analysis

2. COMPLETE SPECIAL COLLECTIONS RESEARCH CENTER & MEP WORK AT MAIN LIBRARY

Item No.	Building	Description	Notes
2a	SCRC	Move all existing collections - to either storage or a small portion to the Main Library stacks.	
2b	SCRC	Interior and exterior demolition work per construction documents.	Scope TBD
2c	SCRC	Construct new Special Collections Research Center per construction documents.	Scope TBD
2d	ML	Buildout new mechanical rooms at existing courtyards - excavation and construction, creation of vertical MEP chases.	See MEP Analysis
2e	ML	Install and extend steam and chilled water as described in MEP Analysis.	See MEP Analysis
2f	ML	Construct both new access stairs to 6th stack.	

3. RELOCATE MAIN LIBRARY FUNCTIONS INTO EXISTING BUILDING TO REMAIN

Item No.	Building	Description	MEP Work
3a	ML	Move existing collections - retain portion on site in existing building to remain, move remaining to storage.	
3b	ML	Relocate library services and functions affected by the demo & construction work into existing building to remain relatively unaffected by construction of Infill Addition (including 6th stack).	
3c	ML	Other temp construction requirements TBD during creation of construction documents.	

4. COMPLETE MAIN LIBRARY INFILL ADDITION

Item No.	Building	Description	MEP Work
4a	ML	Construct new Main Library Infill Addition per construction documents.	
4b	ML	Install new MEP eqpt to serve Infill Addition.	See MEP Analysis
4c	ML	Extend utilities to Infill Addition.	See MEP Analysis
4d	ML	Move collections into infill addition and 6th stacks.	
4e	ML	Move library services and functions into the new Infill Addition.	

5. RENOVATE EXISTING MAIN LIBRARY BUILDING

Item No.	Building	Description	MEP Work
5a	ML	Renovate existing Main Library per construction documents.	
5b	ML	Install new MEP eqpt required for existing building renovation	See MEP Analysis
5c	ML	Relocate services and functions into final locations.	

UNIVERSITY OF ILLINOIS

University of Illinois Main Library

IMEG #19000691.00

Draft

TABLE OF CONTENTS

Mechanical/Electrical Master Plan Update
for
University of Illinois Main Library
Champaign, Illinois

IMEG #19000691.00
September 5, 2019

A. Introduction

1. The following is a master plan update for mechanical, electrical, plumbing and technology systems at the Main Library.

2. The goals for the master plan were to work with the University of Illinois and JLK Architects to refresh the 2009 Master Plan for a complete renovation of the Main Library. This plan included:

   a. Recommending systems for new and renovated spaces.
   b. Recommending space requirements.
   c. Developing phasing plan.
   d. Systems should follow University of Illinois Standards.
   e. Systems should provide a 25-year+ life expectancy.

3. The existing building contains many systems well beyond their useful life and lack capacity for expansion. Many components are in locations that prohibit appropriate maintenance and repair.

4. The systems discussed in this master plan are not intended to limit project designers and dictate systems and concepts. The systems chosen are conceptual in nature for the purpose of developing updated phasing plans, project budgets, load estimates, and approximate equipment and room sizes.

5. Final equipment, room sizes, exact duct and piping routing, and chases will be the responsibility of the project designers.

6. The loads given are an estimate based on envelope and equipment assumptions for the purposes of estimating equipment sizes.

7. The development of this plan understands there are multiple systems concepts available to designers. Technology advances may also provide additional opportunities to project designers. The project designers may propose system alternates and discuss feasibility with the University as individual projects develop.

B. Systems

1. Overview

   a. Mechanical

      1) The systems presented include a chilled beam system, variable air volume, and hydronic heating such as perimeter radiation that would in compliance with all UIUC standards. Maintenance should generally be limited to mechanical rooms located both in the basement and in an Infill mechanical penthouse. Refer to the master plan drawings for locations.
      2) A combination of variable air volume and chilled beam systems are provided for the existing Library structure given the historic nature of the facility to closely replicate the existing systems for these types of spaces.
      3) A chilled beam air handling unit(s) with active chilled beams is proposed for the new West Infill structure for Second, Third, and Fourth Floors. This type unit is also being proposed for two units in the Main Library.
      4) For the Infill addition, the large open Collaboration spaces on First Floor with high ceilings would be served by displacement air distribution systems.
      5) Energy recovery would be used where required by code and for the chilled beam units.
      6) Humidification will be provided in new construction only where contents dictate. Those areas are outside this Main Library master plan evaluation. While a dedicated unit may be required for the Preservation Services area, there are no special humidification requirements for the Main Library.
         a) Humidification is not recommended in the existing Main Library building. The existing envelope and recently replaced double pane windows will most likely remain. The existing envelope that would remain unchanged does not provide a satisfactory vapor barrier to allow humidification.
      7) The existing Library AC Plant will remain. The existing cooling towers located on top of the stacks will be replaced to permit proposed demolition of Stacks 1 through 5.
      8) Any proposed systems, including proposed manufacturers, will comply with UIUC Standards for all disciplines.

   b. Fire Protection

      1) Refer to the Main Library section narrative.

Draft

c. Plumbing

1) The design intent should have one central domestic water heating plant in the North Courtyard mechanical room.
2) All existing plumbing piping, equipment, and fixtures will be replaced.
3) Low flow fixtures should be used throughout the facility.
4) Local water heater equipment is recommended for restroom groups, as restroom groups are spread throughout the building.
5) New sanitary waste and storm piping above stacks should be limited. Drip pans must be provided on piping in Collections areas.

d. Electrical

1) New primary distribution system for the complex will be provided.
2) All new electrical services, panels, receptacles, wiring, etc. for the buildings will be provided.
3) All lighting in the buildings will be replaced.
4) Historically deemed light fixtures should be refurbished or replaced by historically accurate replicas.
5) The fire alarm will be upgraded to the new Pyrotronics XLSV panel and a radio repeater provided in the Main Library fire alarm system. All devices should be replaced.
6) New emergency generator for the Library will be provided.

e. Telecommunications

1) New telecommunications cabling will be installed throughout the facilities.
2) New communication equipment rooms (CER) will be built throughout the facilities.
3) A new main terminal room will be constructed.
4) New copper and fiber backbone cabling will be installed to each CER from the main terminal room.

f. Security

1) All current security systems will be replaced with new integrated access control systems, video surveillance systems, book security systems, and intrusion detection systems.
2) A new standalone integrated access control system, video surveillance system, and intrusion detection system will be installed in the Special Collections area.
3) New emergency phones will be strategically placed throughout the facilities.
4) New paging systems will be installed throughout the facilities.

Draft

5) A new emergency band radio repeater should be installed to support fire department communications as well as other emergency responders.

g. Audio/Visual

1) New A/V systems will be installed in all new classrooms, conference rooms, and other special media rooms.
   a) Cameras will connect to new DVRs (digital video recorder) or NVRs (network video recorder). DVRs and/or NVRs will be IP based to allow for remote connection and viewing via the campus network. The requirements for this system have not been approved by the University at this time.
   b) The DVR / NVR will be sized to provide simultaneous and continuous recording of all 16 inputs at 15 FPS for 14 days at 4 CIF resolution.
   c) New Category 6, 4 pair cabling will be installed to each camera to support video, power, and future migration to IP cameras.
   d) NVT or similar products will be used to convert video from UTP to BNC and provide power.
   e) Use University Standards for approved manufacturers.
   f) Consideration should be given to a full IP-based H.264 megapixel camera system recorded with an open architecture software NVR solution with full GUI. This will provide ultra-high resolution images with minimized network bandwidth usage and ease of integration into other systems.
   g) The CCTV system should be integrated into the access control system for video event tagging and central GUI management.
   h) This system should tie into the University's central security system.
2) Security Pedestals
   a) New and/or existing security pedestals will be installed at selected areas within the facility.
   b) The pedestals will be integrated to the access control system and video surveillance system so security officers can be notified in the event a book or article is removed from the Library without being checked out and provide time-coded video tags of the event.
   c) The system will be monitored at the security office and will use cameras to record events.
   d) These security pedestals should be integrated into the access control system for event tagging and central GUI management.

3) Intrusion Detection System
   a) A new intrusion detection system will be installed with duress buttons, glass break detectors, and motion sensors. A keypad will be installed at selected doors to allow for activation and deactivation of the system.
   b) This system will be an addressable system, and each room with intrusion detection devices should be on its own zone for fast identification of trouble areas.
   c) This system should be fully integrated into the access control system for event tagging and central GUI management.
   d) This system should tie into the University's central security system.
4) Emergency Telephones
   a) New emergency phones should be strategically installed throughout the facility.
   b) Use University standards for approved emergency telephone manufacturers.
   c) These phones should be cabled back to the nearest CER.
   d) These phones should be fully integrated into the access control system for event tagging and central GUI management.
5) Public Address / Overhead Paging System
   a) New ceiling speakers will be required to connect to a new paging control system. New amplifiers will be provided as needed to support new speakers.
   b) A dedicated microphone station will be provided at the main receptionist's area(s).
   c) All amplified paging cabling will be installed within its own dedicated pathway per NEC requirements.
   d) Consideration should be given to using an IP-based paging system for providing supervised emergency notification and ease of expansion. This system should use open source IP protocols like Cobranet, Audinate, or Ethersound.

2. Replacement Cooling Towers

a. The existing cooling towers currently located on the Stacks roof will be removed. These towers will be replaced. There are three potential options for the location of the new towers:
   1) Option #1: Locate new towers on the roof structure of the existing AC Plant. There would be two distinct orientation options at this location.

Draft

   Refer to the Cooling Tower section below. The following would require further evaluation during design:
   a) Structural modifications to support towers.
   b) Enclosure design to screen from view from adjacent Library and Infill addition.
   c) Acoustical considerations.
   d) Tower locations would be designed to keep the access hatch on the roof fully functional for one option and require modification for the second option
   e) This location became the best option given the master planning for the proposed Instructional Facility west of the Sixth Stack.
   2) Option #2: The roof of the new Infill addition. The following would require further evaluation during design:
      a) Requires Library AC Plant to be shut down during the winter. Review of timeline with UIUC utilities would be required.
      b) Temporary relocation of towers from Stacks roof to grade.
      c) Number of relocated towers coordinated with UIUC utilities.
      d) Elevation height of relocated towers and structural support so that towers will be above condenser water connection of chillers.
      e) Shutdown duration to allow temporary connections to AC Plant.
      f) Temporary Tower Location: Loss of space and impact to the facility for temporary cooling tower locations.
      g) Freeze protection of condenser water piping. Infill addition will likely be 18 to 24 months and two winters.
      h) Consideration for not using Library AC Plant for winter cooling and draining the temporary towers in the winter.
      i) Temporary tower location would allow purchasing the new cooling towers and installing them on the roof structure during normal construction process of the Infill addition.
      j) The temporary towers then would be removed, along with any temporary condenser water piping, to the Infill roof when the structure is ready.
      k) Note: While this option is possible, we do not believe this is the best option given the proposed project phasing and the following:
         (1) There will be additional cost for this option.
         (2) Loss of parking space on the south side of the Library.

3) Option #3: Directly south of the Sixth Stack.
   a) This is not desired due to the proposed location of the Instructional Facility and south side of the Library loading dock area.
   b) This also impacts the proposed south loading dock.
   c) This is the only other viable option for the towers and would be considered as the last option.
4) Refer to Phasing narrative. Option #3 has not been included in this narrative.

b. Condenser water routing would be as follows:
1) Option #1: Directly through the roof of the AC Plant.
2) Option #2:
   a) Permanent piping would be within a chase on the south side of the Infill addition and back to the AC Plant.
   b) Temporary piping would be above grade into AC Plant. This assumes draining of towers over the winter.

c. The new cooling tower options are based on two options using a Composite Cooling Solutions Models 2FT-3634 or 3FT-2830. The new towers include capacity for the existing Library AC Plant and future capacity.

d. Orientation options identified below would be determined by the UIUC-desired orientation due to many factors. It is assumed the Option #1 location on the AC Plant roof would be selected.
1) Orientation Option #1: North/south on roof, Model 2FT-3634, 2-cell, with a proposed size of 74'L x 36'W x 35'H.
2) Orientation Option #2: East/west on roof, Model 3FT2830, 3-cell, with a proposed size of 84'L x 32'W x 33'H.
   a) Orientation Option #2 would require modifications to the equipment access hatch on the roof but would offer the best overall access to the tower from all sides and allow a greater distance from the proposed Infill addition.
3) Sizing Criteria
   a) 16,500 GPM
   b) Current capacity needed: 9,900 GPM
   c) Future capacity desired: 6,600 GPM
   d) Wet bulb = 80°F (5°F approach)
   e) Cooling Tower Supply (CTS) = 100°F
   f) Cooling Tower Return (CTR) = 85°F

Draft

e. Final sizing and design conditions to be coordinated with UIUC Utilities and verified during design of the Infill addition.

3. Utilities

a. Steam
1) The design intent is to have one single building steam source and one facility steam-to-hot water generation plant for the entire facility. The Phasing narrative below have been written based on this strategy.
2) Provide a new steam and pumped condensate main from the steam tunnel north of Armory Avenue. Refer to Phasing narrative.
   a) Option #1: Direct buried double wall conduit system for steam and pumped condensate routed to the north side of the facility. Final location to be determined during design.
   b) Option #2: Shallow tunnel for steam and pumped condensate routed to the north side of the facility. Final location to be determined during design.
3) Steam will be extended into the building from this new north steam entrance location. Mains would be extended to both the proposed North Courtyard mechanical room and to backfeed existing risers serving the Main Library. Refer to Phasing narrative.
4) A new condensate return station located in the North Courtyard mechanical room will return condensate to the campus system. A return station at the steam entrance room would also be required.
5) Utility Phasing Note: Routing and location of the building steam main would be dependent on final project phasing and has been written assuming the Courtyard mechanical rooms would be completed as noted in the Phasing narrative.
6) Utilities within the tunnel or direct buried are as follows:
   a) 14" S20
   b) 3" pumped condensate

b. Chilled Water
1) Base Scope: Extending new mains sized for the entire facility from the Library AC Plant.
   a) Optional: Provide new redundant direct buried mains from the loop on the north side of the Library. This would be determined by UIUC Utilities if a redundant source is desired.
2) Chilled water would be extended to both Courtyard mechanical rooms, new Infill mechanical penthouse, Sixth Stack, temporarily backfeeding

the existing Main Library facility, and backfeeding AHU-10 serving Library 220, which will remain. Refer to the Phasing narrative.

a) Note: When the existing Library renovation occurs, the risers up to the Fourth Floor would be removed.

c. Domestic Water

1) The design intent is to have one domestic water service for the facility.
2) An 8" new main sized for both domestic water and fire protection services will be extended into the building. Final location to be determined by UIUC Utilities during design.

4. New West Infill addition

a. Mechanical

1) Air Handling

a) Desired space conditions:

a. All Spaces: Cooling - 75°F Heating -72°F

b) Due to programming requirements, the mechanical spaces are limited to a mechanical penthouse for the West Infill addition. Refer to mechanical MP AHU zoning sketches.

c) Space heating and cooling for the West Infill will use two methods for HVAC.

a. Given the height of the First Floor, a displacement ventilation air handling unit located in the mechanical penthouse is being proposed. While the penthouse mechanical room complicates duct routing a bit, the application makes sense given the master plan layout.

b. A chilled beam air handling unit to serve the basement, Second, Third and Fourth Floors.

d) Exterior zones will contain hot water panel radiation for public spaces and standard wall-mounted radiation for office spaces.

e) The displacement ventilation unit will contain the following equipment:

a. MERV 8 (30%) pre-filters
b. MERV 13 (65%) filters
c. Air blender (if space allows)
d. Energy recovery wheel
e. Fan systems ranging in capacity from 30,000 to 50,000 CFM, pending final space loads
f. Hot water heating coil(s)
g. Chilled water cooling coil(s)

f) The chilled beam unit will contain the following:

a. MERV 8 (30%) pre-filters
b. MERV 13 (65%) filters
c. Enthalpy energy recovery wheel
d. Hot water hot water preheat coil
e. Chilled water coil(s)

(a) Two coils in series to obtain the proper design conditions.

f. Hot water reheat coil
g. Final filters
h. Approximately 40,000 CFM supply and return fan(s) sized for full economizer.

g) Zone Controls

a. Each individual displacement zone will contain a space sensor to control zone temperature.
b. Each individual chilled beam zone will contain a space temperature sensor, humidity sensor, and carbon dioxide sensor.

2) Displacement Ventilation Distribution

a) Terminal air boxes with reheat coils will be used to serve this space.
b) Displacement ventilation diffusers will be used at the perimeter of the zone.
c) Each room will be an independent cooling zone.

3) Chilled Beam Distribution

a) Active chilled beams would be used for the basement, Second, Third and Fourth Floors.
b) Each room will be an independent active chilled beam cooling zone.

4) Steam and Condensate

a) No steam or condensate scope. Refer to the Utilities section of the narrative and phasing plan.

5) Chilled Water

a) Chilled water will be extended to the mechanical penthouse from AC Plant mains in the basement. Refer to the Utilities section of the narrative.

6) Heating/Reheat

a) Provided by one central system located in the North Courtyard mechanical room in the basement of the existing Library This allows the project to be phased.

Draft

b) Two individual steam-to-water heat exchangers for both heating water and reheat water, including duplex heating water pumps for each system, will provide heating/reheat water for the air handling unit coils, terminal equipment, reheat coils, and panel radiation.

7) A new building automation system should be installed for the Infill addition compatible with the entire facility for each phase of work completed.

8) Humidification
   a) Humidification will not be provided to the Infill addition units per the master plan program and space usage.

9) Electrical/IT/CER Rooms
   a) The small electrical spaces will have a cooling only 1-ton wall-mounted fan coil unit mounted above the door.
   b) The large electrical and emergency electrical will have two 2-ton cooling only units per room.
   c) Each will have its own space thermostat.

10) Fire Protection
   a) Refer to the description for the Main Library below.

11) Plumbing
   a) The items below are based on the phasing plans noted in this report.
   b) All new fixtures will be low flow type.
   c) Domestic Cold Water
      a. Refer to the Utilities section of the narrative.
   d) Domestic Hot Water
      a. The design intent is to have one domestic hot water system for the facility. A steam-to-hot water system is be recommended. This would be in the North Courtyard mechanical room.
      b. Domestic water heaters will be installed to serve restrooms and any service water needs in the mechanical rooms.
   e) The design intent is to have a single domestic water booster pump for the entire facility. The location of this pump will be in a basement mechanical room. The final location to be determined during facility design.
   f) Sanitary Waste and Vent
      a. New sanitary waste and vent system will be extended to the existing sanitary mains.

Draft

   g) Storm
      a. New storm piping will be extended up to the new roof and connected to existing storm mains.

b. Electrical

1) Primary Power
   a) A new 13.8KV feeder from the existing DC-9 to a new load center located in the renovated portion of the Main Library building will be provided via the existing and new ductline. The University will need to decide which reserve feeder they would like to bring into the building.
   b) A new lineup of 15KV switchgear consisting of two incoming 15 KV switches and eight fused load break switches will be installed. The incoming switches will be phased the same so both incoming switches can be closed at the same time.
   c) This switchgear will be in a separate room from the unit substation for system integrity.
   d) New 8-5" cell concrete encased ductline from the load center in the Main Library building to the new double-ended substation will be provided with appropriately sized copper 133% EPR 15KV cabling.

2) Building Power
   a) A new appropriately sized double-ended unit substation will take the 13.8 KV 3-phase primary service down to a 277/480V 3-phase, 4-wire service for the building.
   b) The substation will be sized to be half loaded, so if one substation goes down, the other substation can pick up the entire load for the building.
      a. All bussing and transformer coils will be copper.
      b. Fans will be installed in the transformers for cooling.
      c. The secondary main switches and the secondary tie switch will be Kirk keyed interlocked.
      d. Metering will be per UIUC Standards.
   c) This substation will provide service to all mechanical, major library equipment loads requiring 480V 3-phase service. It will also be sized to handle the mechanical load for the renovated portion of the Library.
   d) Lighting will be at 277V.
   e) The distribution of electrical power will be done so the mechanical, lighting, and general receptacle loads are separately metered.

f) Power for receptacles will be obtained from a 480V to 120/208V, 3-phase, 4-wire appropriately sized transformer that will provide service to an appropriately sized distribution panel, which, in turn, will provide service to 42 circuit 200 amp branch panelboards. These panelboards will provide power to all receptacles and other loads requiring 120 or 208V single power or 208V 3-phase power.

g) Per University standards, variable frequency drives will be used for air handling equipment and pumps as required.

h) Classroom A/V systems will have their own panelboards with surge protection.

i) Floor boxes in the new addition will be recessed in the new floors. The AV floor boxes will be the University Standard for AV floor boxes.

j) All wiring will be in conduit.

k) All wiring will be copper.

l) All panel bussing will be copper.

m) All receptacles will be specification grade hard use type.

n) Surge protection devices will be installed at the unit substation and the 120/208V distribution panel.

o) Surge protection will also be provided for the fire alarm panels.

3) Emergency Power

a) A new 277/ 480V, 3-phase diesel standby generator will be installed to replace the existing Sixth Stack Addition generator. The new generator will be sized to handle the entire renovated and new spaces for the Library.

b) A separate feed to the fire pump transfer switch from the generator will be provided.

c) The distribution system will be divided into two transfer switches: one for the life safety branch and one for the equipment branch. Each transfer switch will be appropriately sized for each branch. They will be a four-pole type transfer switch.

d) The life safety branch will provide power for egress lighting, elevator, and the fire alarm system.

e) The equipment branch will provide power to a heating water pump, sump pumps, security system, and sewage ejector pumps.

4) Lighting

a) For the most part, building lighting will be LED light fixtures.

b) Foot candle levels will be per IES Standards, except per SAA Guidelines in Special Collections grade level, and meet ASHRAE 90.1 watts per square foot requirements.

c) Direct/indirect lighting will be used in the shelving and reading areas. They will be controlled by a combination of time clocks or occupancy sensors where it makes sense. Near the windows, daylight harvesting will occur using daylight sensors.

d) Direct lighting will be used in restrooms, offices, storage rooms, and work spaces and will be LED type.

e) Dual technology occupancy sensors will be used to control lighting in the restrooms, offices, storage rooms, and work spaces.

f) Ultrasonic sensors will be used to control corridor lighting.

g) Lighting controls to meet current energy code requirements.

5) Systems

a) Fire Alarm

a. Extend the fire alarm system to the new addition.

b. Fire alarm initiation devices will be laid out to meet code minimum requirements for a sprinkled building and University Standards.

c. A radio repeater system will be added to the fire alarm system and through the building.

d. Notification will be done by a voice system and visual lights laid out to meet ADA and code requirements.

e. All fire alarm wiring will be in red color conduit.

b) Lightning Protection

a. A new lightning protection system will be provided for the building per NFPA Article 780 and be UL master labeled.

b. This new system will be connected into the overall Library lightning protection system for the entire building at the end of the project.

c. Technology

1) Interior Spaces

a) New communication equipment rooms (CER) will be located on each floor.

a. CERs will be located to maintain the maximum cable distance limitation of 295 feet from workstation outlet to the equipment patch panel.

Draft

b. Each room size will be a minimum of 8' x 10' (80 square feet). Actual size will be identified during the programming phase to confirm what systems will be installed within the room.

c. CERs will be stacked to minimize backbone cabling.

(a) All walls will receive 3/4" fire treated plywood installed 6" to 8'6" AFF. The rating stamp will be exposed.

(b) The room will have dedicated power, cooling, and standard lighting. Cooling will be 24/7/365 maintaining 68° to 72°F. Dedicated 120 and/or 208 volt power receptacles will also be required.

(c) Doors will be lockable, with rough-ins for proximity readers, door status switches, and exit devices for entry access.

(d) New 19" (w) x 7' (h) equipment racks with vertical wire management will be installed.

(e) Grounding of all equipment to a ground bar located in the CER will be required.

(f) Vertical STI "EZ Path" sleeves should be installed between floors of stacked closets.

2) Structured Cabling System

a) An EIA/TIA Category 6A structured cabling system will be installed to support all voice and data applications.

b) All cabling will route back and terminate within the existing CER.

c) Use University Standards for approved manufacturers.

d) Patch cords will be provided and installed by the Owner.

e) Wireless LAN: Cabling will be provided and installed by the Contractor. All wireless access points (APs) will be provided and installed by the University.

f) Consideration should be given to using a shielded Cat 6A system to maximize pathways and cabling performance.

3) Intra Building-Backbone Cabling Systems

a) New high pair count copper and OS2 single-mode fiber will be required to be installed from each CER back to the server room or main communications equipment room.

b) Copper and fiber quantities will be identified during the programming phase.

draft

4) Cable Television (CATV)

a) A coaxial cabling infrastructure will be provided to distribute cable TV programming.

b) The coaxial system will be RG-6 quad-shield in the horizontal system, distributed from the CERs. RG-11 cabling will be provided from the source signal's service entrance to each CER area.

c) An EIA/TIA Category 6 cable will be installed along with the coaxial cable for IPTV implementation. This cable will be within 295 feet (outlet to patch panel) of the CERs.

d) The Contractor will provide amplifiers, taps, and splitters, as required based on the design, to maintain a required signal level at each jack.

5) Interior Pathways

a) General: Anywhere a penetration is required through a corridor, wall, or hard ceiling for telecommunications cabling, installation of STI "EZ Path" conduit sleeves will be required.

b) A cable tray system with minimum dimensions of 4" (h) x 12" (w) will be installed on each floor to support voice, data, security, and CATV.

a. Overhead paging will not be installed within the cable tray system and will require dedicated conduits. No conduits or other cabling will hang off the cable tray system.

c) One 1" conduit will be installed from each telecommunications outlet to the cable tray installed above the ceiling.

6) Access Control System

a) A new access control system will be required. New control panels, card readers, door contacts, and request-to-exit devices will be installed and connected to the existing campus system.

b) Each door that requires a card reader will have the following:

a. Card reader

b. Request-to-exit device internal to the door hardware

c. Door contact switches

d. Latch retraction detection

e. Electrified hardware

f. Note: Electrified hardware and door contact will be provided and installed by the door hardware contractor.

c) Use University Standards for approved manufacturers.

d) Consideration should be given to a full IP-based system or hybrid IP-based system for ease of integration and future expansion.

e) A full map-based GUI (graphical user interface) should be considered. These maps should include all devices from the access control system, CCTV system, book security system, intrusion detection system and emergency telephones. This will allow security personal to quickly and efficiently find problem areas and video feeds.

f) The access control system should serve as the system to which all other security systems integrate.

g) This system should tie into the University's central security system.

7) Video Surveillance System (CCTV)

a) New surveillance cameras will be required. A new security office will be constructed. New monitors will be required for viewing selected cameras.

b) Cameras will connect to new DVRs (digital video recorder) or NVRs (network video recorder). DVRs and/or NVRs will be IP based to allow for remote connection and viewing via the campus network. The requirements for this system have not been approved by the University at this time.

c) The DVR / NVR will be sized to provide simultaneous and continuous recording of all 16 inputs at 15 FPS for 14 days at 4 CIF resolution.

d) New Category 6, 4 pair cabling will be installed to each camera to support video, power, and future migration to IP cameras.

e) NVT or similar products will be used to convert video from UTP to BNC and provide power.

f) Use University Standards for approved manufacturers.

g) Consideration should be given to a full IP-based H.264 megapixel camera system recorded with an open architecture software NVR solution with full GUI. This will provide ultra-high resolution images with minimized network bandwidth usage and ease of integration into other systems.

h) The CCTV system should be integrated into the access control system for video event tagging and central GUI management.

i) This system should tie into the University's central security system.

8) Security Pedestals

a) New and/or existing security pedestals will be installed at selected areas within the facility.

b) The pedestals will be integrated to the access control system and video surveillance system so security officers can be notified in the event a book or article is removed from the Library without being checked out and provide time-coded video tags of the event.

c) The system will be monitored at the security office and will use cameras to record events.

d) These security pedestals should be integrated into the access control system for event tagging and central GUI management.

9) Intrusion Detection System

a) A new intrusion detection system will be installed with duress buttons, glass break detectors, and motion sensors. A keypad will be installed at selected doors to allow for activation and deactivation of the system.

b) This system will be an addressable system, and each room with intrusion detection devices should be on its own zone for fast identification of trouble areas.

c) This system should be fully integrated into the access control system for event tagging and central GUI management.

d) This system should tie into the University's central security system.

10) Emergency Telephones

a) New emergency phones should be strategically installed throughout the facility.

b) Use University standards for approved emergency telephone manufacturers.

c) These phones should be cabled back to the nearest CER.

d) These phones should be fully integrated into the access control system for event tagging and central GUI management.

11) Public Address / Overhead Paging System

a) New ceiling speakers will be required to connect to a new paging control system. New amplifiers will be provided as needed to support new speakers.

b) A dedicated microphone station will be provided at the main receptionist's area(s).

c) All amplified paging cabling will be installed within its own dedicated pathway per NEC requirements.

Draft

d) Consideration should be given to using an IP-based paging system for providing supervised emergency notification and ease of expansion. This system should use open source IP protocols like Cobranet, Audinate, or Ethersound.

12) Audio/Video Systems

a) Several classrooms, lecture rooms, and presentation rooms will have a standalone A/V system installed. The systems will include video display devices such as LCDs, plasmas, smart boards, projectors, touch screen control system, source equipment, amplification, and sound reinforcement.

b) Consideration should be given to using full HDCP (high-bandwidth digital content protection) compliant digital video systems with high definition video sources, displays, and projectors.

c) The A/V control systems should be integrated into the University's central control management systems.

d) Refer to University Standards and recommendations for additional information on audio/video system requirements and preferred manufacturers.

5. Sixth Stack Addition

a. Mechanical

1) Air Handling

a) Desired space conditions

a. All Spaces: Cooling - 75°F/ RH; Heating - 70°F.

b. Final space temperature and humidity conditions will need to be verified during design.

b) Spaces will be conditioned with a variable air volume system. Some spaces will be served with overhead air distribution.

c) These units will be a direct replacement of the existing Sixth Stack AHU located in the penthouse.

d) Zone Controls

a. Each individual zone will contain a terminal air box and a thermostat. Air will be provided by a variable air volume AHU.

e) Each dedicated outside air handling unit will contain the following:

a. MERV 8 (30%) pre-filters

b. MERV 13 (65%) bag filters

c. Chilled water coil

d. Heating water coil

e. Supply fan

f. Return fan

2) Steam and Condensate

a) Steam, if required, will be extended from the new steam main located in the North Courtyard mechanical room.

3) Chilled Water

a) Chilled water will be extended from the mains serving the Infill addition.

4) Humidification

a) Humidification will not be provided to the existing building units.

b. Fire Protection

1) Remove the fire pump serving this space and tie the existing addition piping system into the new Library fire pump.

c. Electrical

1) The existing generator will be removed, and new emergency power will be fed from the new generator sized to handle the whole building.

2) Remove the electrical feed to the existing fire pump.

6. Existing Main Library Building

a. Mechanical

1) Air Handling

a) Space conditions – Cooling - 75°F; Heating - 70°F

a. Final space temperature and humidity conditions will need to be verified during design.

b) Due to the historical nature of the existing Library, ,most spaces are being proposed to be conditioned with a variable air volume system, except for those served by AHU-MLN2 and AHU-MLS3, which are proposed to be chilled beam units.

c) Energy recovery will be added only when dictated by code based on the percentage of outside air for the VAV units.

d) Energy recovery would remain in the two proposed chilled beam units.

e) The system energy impact as a VAV for a large portion of the existing Library will require evaluation during design to confirm LEED V4 and energy code requirements can be met.

f) All VAV unit spaces would be served with a terminal air box with a reheat coil and overhead air distribution.

Draft

g) Zones using chilled beams in the space would also have a terminal air box with reheat coil supplying air to each active chilled beam.

h) Each space will contain baseboard radiation for heating. The large public spaces will be panel radiation; the office and staff areas would be standard wall-mounted radiation. Each system will be carefully coordinated with any historical elements of each space.

i) Zone Controls
   a. Each individual zone will contain a space sensor for terminal air box and radiation control.

j) Each variable air volume air handling unit will contain the following:
   a. MERV 8 (30%) pre-filters
   b. MERV 13 (65%) bag filters
   c. Air blender (where space allows)
   d. Total enthalpy energy recovery wheel (where required by code)
   e. Chilled water coil
   f. Supply fan
   g. Return fan

2) Air Handling Unit Zoning
   a) The North Courtyard basement mechanical room will contain two AHUs to serve the north portion of the existing Library on all floors. Refer to MP AHU Zoning Plan drawing.
   b) The South Courtyard I basement mechanical room will contain three AHUs to serve the south portion of the existing Library on all floors. Refer to MP AHU Zoning Plan drawing.
   c) Zoning Note
      a. The interior north courtyards should be considered for mechanical chases in the northeast and northwest corners to simplify duct routing from its associated north AHUs to each floor of the existing structure and to save program space.
      b. The interior south courtyards should be considered for mechanical chases in the southeast and southwest corners to simplify duct routing from its associated south AHU(s) to each floor of the existing structure and to save program space.

Draft

3) Steam and Condensate
   a) No steam or condensate scope. Refer to the Utilities section of the narrative and phasing plan.

4) Heating/Reheat
   a) Provided by one central system located in the North Courtyard mechanical room in the basement of the existing Library. This allows the project to be phased.
   b) Refer to the Infill addition above for system description.

5) Chilled Water
   a) Chilled water will be extended to each Courtyard mechanical room from AC Plant mains in the basement. Refer to the Utilities section of the narrative.
   b) Electrical/IT/CER Rooms
      a. The small electrical spaces will have a cooling only 1-ton wall-mounted fan coil unit mounted above the door.
      b. The large electrical and emergency electrical will have two 2-ton cooling only units per room.
      c. Each will have its own space thermostat.

6) Humidification
   a) Humidification will not be provided to the existing building units.

7) Fire Protection
   a) Install a new fire pump and jockey pump complete with all controllers. Location of the pumps is dependent on project phasing. A single fire pump should be sized for the entire facility.
   b) The 80 to 100 HP pump will be capable of 1,250 GPM and 65 psig.
   c) Extend the current wet-pipe system into all areas to provide complete building coverage.
   d) Provide a manual wet standpipe at each code-required egress stair.
   e) Single facility fire pump service to serve:
      a. Existing Sixth Stack Addition
      b. New West Infill addition
      c. Existing Library structure
   f) Phasing Note:
      a. The location of the fire pump will be based on project phasing. If the West Infill addition occurs first, the fire pump location would be in the existing chiller plant.
      b. If the existing Library renovation occurs first, the fire pump would be in the south mechanical room.

c. Note: There is not a dedicated fire pump room shown on the master plan drawings at this time, but it may be required due to phasing during the project design.

8) Plumbing

a) Systems will match that of the Infill addition. Refer to the narrative above.

b. Electrical

1) Primary Power

a) New 8-5" cell concrete encased ductline from the load center room in the existing Library to an existing manhole to the south of the building will be provided. Provide with appropriately sized copper 133% EPR 15KV cabling through new and existing ductlines to a new unit substation.

2) Building Power

a) A new appropriated unit substation will take the 13.8 KV 3-phase primary service down to a 120/208V 3-phase, 4-wire service for the building.

b) The substation will have the following features:

a. All bussing and transformer coils will be copper.

b. Fans will be installed in the transformers for cooling.

c. Metering will be per UIUC Standards.

c) The new west additions to the Library substation will provide service to all mechanical, major library equipment loads requiring 480V 3-phase service.

d) The new 120/208V, 3-phase, 4-wire unit substation will provide service for 42-circuit 200 amp branch panelboards located throughout the renovated space. These panelboards will provide power to all receptacles and other loads requiring 120 or 208V single power or 208V 3-phase power.

e) Lighting will be done at 277V. Some of the historical refurbished light fixtures will be at 120V.

f) Floor boxes will be fire-rated poke-through type that meet University Standards.

g) Variable frequency drives per University Standards will be used for air handling equipment and pumps as required.

h) All wiring will be in conduit.

i) All wiring will be copper.

j) All panel bussing will be copper.

k) All receptacles will be specification grade, hard use type.

l) Surge protection devices will be installed at the unit substation and at the 120/208V branch panels for computer labs.

m) Surge protection will also be provided for the fire alarm panels.

3) Emergency Power

a) The West Addition life safety branch and equipment branch system will be extended into the renovated area.

b) The life safety branch will provide power for egress lighting, elevator, and the fire alarm system.

c) The equipment branch will provide power to a heating water pump, sump pumps, security system, and sewage ejector pumps.

4) Lighting

a) For the most part, the building lighting will be LED light fixtures.

b) The light fixtures that are deemed historically significant will be refurbished and reused. Where fixtures are not original in historically significant spaces, provide historically correct new fixtures.

c) Foot candle levels will be per IES Standards and will meet ASHRAE 90.1 watts per square foot requirements.

d) Direct/indirect lighting will be used in the shelving and reading areas. They will be controlled by a combination of time clocks or occupancy sensors where it makes sense. Near the windows, daylight harvesting will occur using daylight sensors.

e) Direct lighting will be used in restrooms, offices, storage rooms, and work spaces and LED type.

f) Dual technology occupancy sensors will be used to control the lighting in the restrooms, offices, storage rooms, and work spaces.

g) Ultrasonic sensors will be used to control the corridor lighting.

h) Lighting controls to meet current energy code requirements.

5) Systems

a) Fire Alarm

a. Fire alarm initiation devices will be laid out to meet code-minimum requirements for a sprinkled building and University Standards.

b. The radio repeater system will be extended throughout the renovated area.

c. Notification will be done by a voice system and visual lights laid out to meet ADA and code requirements.

d. All fire alarm wiring will be in conduit.

Draft

b) Lightning Protection
   a. New lightning protection system will be provided for the building per NFPA Article 780 and will be UL master labeled.
   b. This new system will be connected into the overall Library lightning protection system for the entire building at the end of the project.

c. Technology
   1) Interior Spaces
      a) A new main terminal room or intermediate distribution frame (IDF) will be required. The purpose of this room is to house voice and data equipment, servers, inter- and intra-building backbone cabling, horizontal cabling, and serve as a main entrance room from the campus duct bank system.
      b) This room will be connected to one of the University's main distribution frames (MDF) via the campus duct bank system.
      c) Room size will be a minimum of 18' x 38' (684 square feet). Actual size will be identified during the programming phase to confirm what systems will be installed within the room. There should be an attached IT storage/work room as well as IT offices.
         a. All walls will receive 3/4" fire treated plywood installed 6"to 8'-6" AFF. The rating stamp will be exposed.
         b. The room will have dedicated power, cooling, and standard lighting. Cooling will be 24/7/365 maintaining 68° to 72°F. Dedicated 120 and 208 volt power receptacles will also be required.
         c. A dedicated UPS power system and generator backed power will be required for this space.
         d. Doors will be lockable with proximity readers, door status switches, and exit devices for entry access.
         e. A minimum of 12 equipment cabinets and four 4-post racks should be provided.
         f. Cooling should be figured at a minimum of 125 watts per square foot and should include a redundant cooling system. Actual cooling loads will be determined during the programming phase.
         g. Lightning protection will be provided for all incoming copper services.

         h. Grounding of all equipment to a ground bar located in the main terminal room or IDF will be required.
      d) A new telecommunications entrance room (ER) will be required to serve as an IDF if the main terminal room is not located in the basement. The purpose of this room is to serve as the entrance point for the campus duct bank. All outside plant fiber optic, copper, and CATV cabling will terminate in this closet to transition to interior rated cabling to be extended to the main terminal room.
      e) If the room will only serve as an ER, the room size will be a minimum of 7' x 8' (56 square feet). If the room will also serve as a communications equipment room (CER), the room size will be a minimum of 10' x 12' (120 square feet). Actual sizes will be identified during the programming phase to confirm what systems will be installed within the room.
         a. All walls will receive 3/4" fire treated plywood installed 6" to 8'6" AFF. The rating stamp will be exposed.
         b. If the room will also serve as a CER, the room will have dedicated power, cooling, and standard lighting. Cooling will be 24/7/365 maintaining 68° to 72°F. Dedicated 120 and 208 volt power receptacles will also be required.
         c. Doors will be lockable, with rough-ins for proximity readers, door status switches, and exit devices for entry access.
         d. Lightning protection will be provided for all incoming copper services.
         e. Grounding of all equipment to a ground bar located in the ER or IDF will be required.
      f) New CERs will be located on each floor.
         a. CERs will be located to maintain the maximum cable distance limitation of 295 feet from workstation outlet to the equipment patch panel.
         b. Each room size will be a minimum of 8' x 10' (80 square feet). Actual size will be identified during the programming phase to confirm what systems will be installed within the room.
         c. CERs will be stacked to minimize backbone cabling.
            (a) All walls will receive 3/4" fire treated plywood installed 6"to 8'-6" AFF. The rating stamp will be exposed.

Draft

(b) The room will have dedicated power, cooling, and standard lighting. Cooling will be 24/7/365 maintaining 68° to 72°F. Dedicated 120 and/or 208 volt power receptacles will also be required.
(c) Doors will be lockable, with rough-ins for proximity readers, door status switches, and exit devices for entry access.
(d) New 19" (w) x 7' (h) equipment racks with vertical wire management will be installed.
(e) Grounding of all equipment to a ground bar located in the CER will be required.
(f) Vertical STI "EZ Path" sleeves should be installed between floors of stacked closets.

2) Structured Cabling System
a) An EIA/TIA Category 6A structured cabling system will be installed to support all voice and data applications.
b) All cabling will route back and terminate within the existing CER.
c) Use University Standards for approved manufacturers.
d) Patch cords will be provided and installed by the Owner.
e) Wireless LAN: Cabling will be provided and installed by the Contractor. All wireless access points (APs) will be provided and installed by the University.
f) Consideration should be given to using a shielded Cat 6A system to maximize pathways and cabling performance.

3) Intra Building-Backbone Cabling Systems
a) New high pair count copper and OS2 single-mode fiber will be required to be installed from each CER back to the main terminal room or IDF.
b) Copper and fiber quantities will be identified during the programming phase.

4) Inter Building-Backbone Cabling System
a) New high pair count copper and OS2 single-mode fiber will be required to be installed from the main terminal room or IDF to the MDF Node #4 at Davenport Hall via the campus duct bank system.
b) New CATV fiber or coaxial hardline cable will be installed to the main campus CATV distribution system.
c) Copper and fiber quantities will be identified during the programming phase.

5) Cable Television (CATV)
a) A coaxial cabling infrastructure will be provided to distribute cable TV programming.
b) The coaxial system will be RG-6 quad-shield in the horizontal system, distributed from the CERs. RG-11 cabling will be provided from the source signal's service entrance to each CER area.
c) An EIA/TIA Category 6 cable will be installed along with the coaxial cable for IPTV implementation. This cable will be within 295 feet (outlet to patch panel) of the CER2.
d) The Contractor will provide amplifiers, taps, and splitters, as required based on the design, to maintain a required signal level at each jack.

6) Interior Pathways
a) General: Anywhere a penetration is required through a corridor, wall, or hard ceiling for telecommunications cabling, installation of STI "EZ Path" conduit sleeves will be required.
b) A cable tray system with minimum dimensions of 4" (h) x 12" (w) will be installed on each floor to support voice, data, security, and CATV.
a. Overhead paging will not be installed within the cable tray system and will require dedicated conduits. No conduits or other cabling will hang off the cable tray system.
c) One 1" conduit will be installed from each telecommunications outlet to the cable tray installed above the ceiling.

7) Access Control System
a) A new access control system will be required. New control panels, card readers, door contacts, and request-to-exit devices will be installed and connected to the existing campus system.
b) Each door that requires a card reader will have the following:
a. Card reader
b. Request-to-exit device internal to the door hardware
c. Door contact switches
d. Latch retraction detection
e. Electrified hardware
f. Note: Electrified hardware and door contact will be provided and installed by the door hardware contractor.
c) Use University Standards for approved manufacturers.

Draft

d) Consideration should be given to a full IP-based system or hybrid IP-based system for ease of integration and future expansion.

e) A full map-based GUI (graphical user interface) should be considered. These maps should include all devices from the access control system, CCTV system, book security system, intrusion detection system, and emergency telephones. This will allow security personal to quickly and efficiently find problem areas and video feeds.

f) The access control system should serve as the system to which all other security systems integrate.

g) This system should tie into the University's central security system.

8) Video Surveillance System (CCTV)

a) New surveillance cameras will be required. A new security office will be constructed. New monitors will be required for viewing selected cameras.

b) Cameras will connect to new DVRs (digital video recorder) or NVRs (network video recorder). DVRs and/or NVRs will be IP based to allow for remote connection and viewing via the campus network. The requirements for this system have not been approved by the University at this time.

c) The DVR / NVR will be sized to provide simultaneous and continuous recording of all 16 inputs at 15 FPS for 14 days at 4 CIF resolution.

d) New Category 6, 4 pair cabling will be installed to each camera to support video, power, and future integration to IP cameras.

e) NVT or similar products will be used to convert video from UTP to BNC and provide power.

f) Use University Standards for approved manufacturers.

g) Consideration should be given to a full IP-based H.264 megapixel camera system recorded with an open architecture software NVR solution with full GUI. This will provide ultra-high resolution images with minimized network bandwidth usage and ease of integration into other systems.

h) The CCTV system should be integrated into the access control system for video event tagging and central GUI management.

i) This system should tie into the University's central security system.

Draft

9) Security Pedestals

a) New and/or existing security pedestals will be installed at selected areas within the facility.

b) The pedestals will be integrated to the access control system and video surveillance system so security officers can be notified in the event a book or article is removed from the Library without being checked out and provide time coded video tags of the event.

c) The system will be monitored at the Security Office and use cameras to record events.

d) These security pedestals should be integrated into the access control system for event tagging and central GUI management.

10) Intrusion Detection System

a) A new intrusion detection system will be installed with duress buttons, glass break detectors, and motion sensors. A keypad will be installed at the selected doors to allow for activation and deactivation of the system.

b) This system will be an addressable system, and each room with intrusion detection devices should be on its own zone for fast identification of trouble areas.

c) This system should be fully integrated into the access control system for event tagging and central GUI management.

d) This system should tie into the University's central security system.

11) Emergency Telephones

a) New emergency phones should be strategically installed throughout the facility.

b) Use University Standards for approved emergency telephone manufacturers.

c) These phones should be cabled back to the nearest CER.

d) These phones should be fully integrated into the access control system for event tagging and central GUI management.

12) Public Address / Overhead Paging System

a) New ceiling speakers will be required to connect to a new paging control system. New amplifiers will be provided as needed to support new speakers.

b) A dedicated microphone station will be provided at the main receptionist's area(s).

c) All amplified paging cabling will be installed within its own dedicated pathway per NEC requirements.

d) Consideration should be given to using an IP-based paging system for providing supervised emergency notification and ease of expansion. This system should use open source IP protocols like Cobranet, Audinate, or Ethersound.

13) Audio/Video Systems

a) Several classrooms, lecture rooms, and presentation rooms will have a standalone A/V system installed. The systems will include video display devices such as LCDs, plasmas, smart boards, projectors, touch screen control system, source equipment, amplification, and sound reinforcement.

b) Consideration should be given to using full HDCP (high-bandwidth digital content protection) compliant digital video systems with high definition video sources, displays and projectors.

c) The A/V control systems should be integrated into the University's central control management systems.

d) Refer to University Standards and recommendations for additional information on Audio/Video system requirements and preferred manufacturers.

C. Phasing

1. Mechanical/Electrical

a. The sequence below is based on the master plan drawings and the A/E team's opinion based on the concepts shown.

b. Phase 1 - Utilities

a) Option #1 – Cooling Towers – AC Plant Roof

a. Step 1: Add additional structural support including tower bases to AC Plant for proposed cooling tower locations on roof.

b. Step 2: Install a new two or three cell cooling tower on the AC Plant roof and extend new condenser piping into AC Plant for backfeeding existing.

c. Step 3: Cut in new condenser water piping into existing mains in AC Plant to allow for new chiller startup.

(a) Note: A short outage will be required.

d. Step 4: Remove five cooling towers from Stack 1-5 roof and all associated condenser water piping on roof and south side of building.

e. Note: This is the most economical and most practical from a phasing standpoint.

b) Option #2 – Cooling Towers - Move to Infill roof.

a. Step 1: Relocate three existing cooling towers located on the Stacks roof to grade west of AC Plant but east of proposed Instructional Facility. This work would occur in the winter.

(a) Note: The number for relocation and associated tonnages would have to be worked out with UIUC Utilities.

b. Step 2: Extend temporary condenser water piping above grade from tower locations on grade to AC Plant to backfeed associated chillers.

c. Step 3: Remove remaining chiller(s) not used for temporary relocation from the Library roof.

d. Step 4: Remove all condenser water piping from roof and south face of Library.

e. Step 5: During normal construction sequencing, install three new cooling towers on the roof of the new infill and route condenser water piping to AC Plant internal to Infill addition.

f. Step 6: When Infill addition has been completed, backfeed existing chillers and start up system with new cooling towers.

g. Step 7: Remove existing relocated cooling towers from grade and all associated temporary condenser water piping.

c) Recommendation: Moving permanent cooling towers to roof of AC Plant. This option is the most practical and least overall cost.

2) Extend steam and condensate from steam tunnel north of the Library at Armory Avenue to the northwest corner of the existing portion of the original Library structure. Refer to Phasing plans for location and utilities section of narrative.

a) Extending steam and condensate to the building during Phase 1 allows for a new single source steam service for the proposed facility.

b) Allows for the proposed project phasing, backfeeding of the existing facility, and for new mechanical spaces.

Draft

c. Phase 2: Complete Special Collections Research Center

1) Mechanical/electrical demolition work to be determined during Undergraduate Master Plan phase.
2) Mechanical/electrical new work to be determined during Undergraduate Master Plan phase.
3) Buildout of mechanical rooms in existing North and South Courtyards. Includes excavation and construction of required chases.
4) Modify outside air and relief air for existing AHU-10.
5) Add space heating and mechanical room ventilation.
6) Add any ductwork required for OA/EA for units to be installed during later phases.
7) Install lighting and life safety items required until Main Library renovation takes place.
8) Mechanical/electrical rooms remain open until the Infill addition design.
9) Extend new steam main from the new entrance point defined in Phase 1 to new Courtyard mechanical room and to Stacks riser location defined below.
10) Install new steam and pumped condensate risers outside current location in northeast Stacks structure to allow current risers to be removed in Phase 4.
11) Extend new chilled water mains from AC Plant to new Courtyard mechanical room and to northeast Stacks riser location defined below. Piping sized for entire facility.
12) Install new chilled water supply and chilled water return risers outside the current location within Stacks structure to backfeed existing equipment.
13) Back feed existing Library and Sixth Stack chilled water mains from new risers.
14) Install new 15KV load center into the existing northwest area of the Main Library.

d. Phase 3 – Relocate Main Library Functions into Existing Building to Remain

1) No MEP work for this phase.

e. Phase 4 – Complete Main Library Infill addition

1) Remove abandoned steam, condensate, CWS/CWR risers.
2) Install new mechanical/electrical in penthouse to serve Infill addition.
3) Install new heating plant in North Courtyard mechanical room sized for the entire facility.
4) Install new domestic water heating and pressure booster equipment in North Courtyard mechanical room.

5) Create new unit substation in south portion of northwest Library (refer to drawings).
6) Install new emergency generator and emergency electrical room south of existing Library.
7) Refer to drawings for mechanical/electrical room locations.

f. Phase 5 – Renovate Existing Main Library

1) Install new air moving equipment systems in Courtyard mechanical spaces created to serve existing Main Library. Refer to drawings for room locations.
2) Install new electrical equipment in substation room created to serve existing Main Library.
3) Refer to drawings for mechanical/electrical room locations.

D. Estimated System Sizes and Capacities

1. Mechanical

a. Steam and Condensate

1) Estimated Steam and Condensate (Note: The flow rates noted below do not assume heat recovery wheel failure.)
   a) Existing Main Library Building
      a. 5,500 #/hr
   b) New West Infill addition
      a. 5,000 #/hr
   c) Total Project Steam Consumption
      a. 10,500 #/hr
2) Direct Buried Piping for the Entire Facility
   a) 14" 20 psig steam
   b) 3" pumped condensate
3) Individual branch sizes noted above assume a heat wheel failure within the zone.

b. Chilled Water

1) Estimated Tonnages (provided by the existing central campus system):
   a) Existing Main Library Building
      a. 795 tons
   b) New West Infill addition
      a. 570 tons
   c) Total Project Tonnages
      a. 1950 tons

Draft

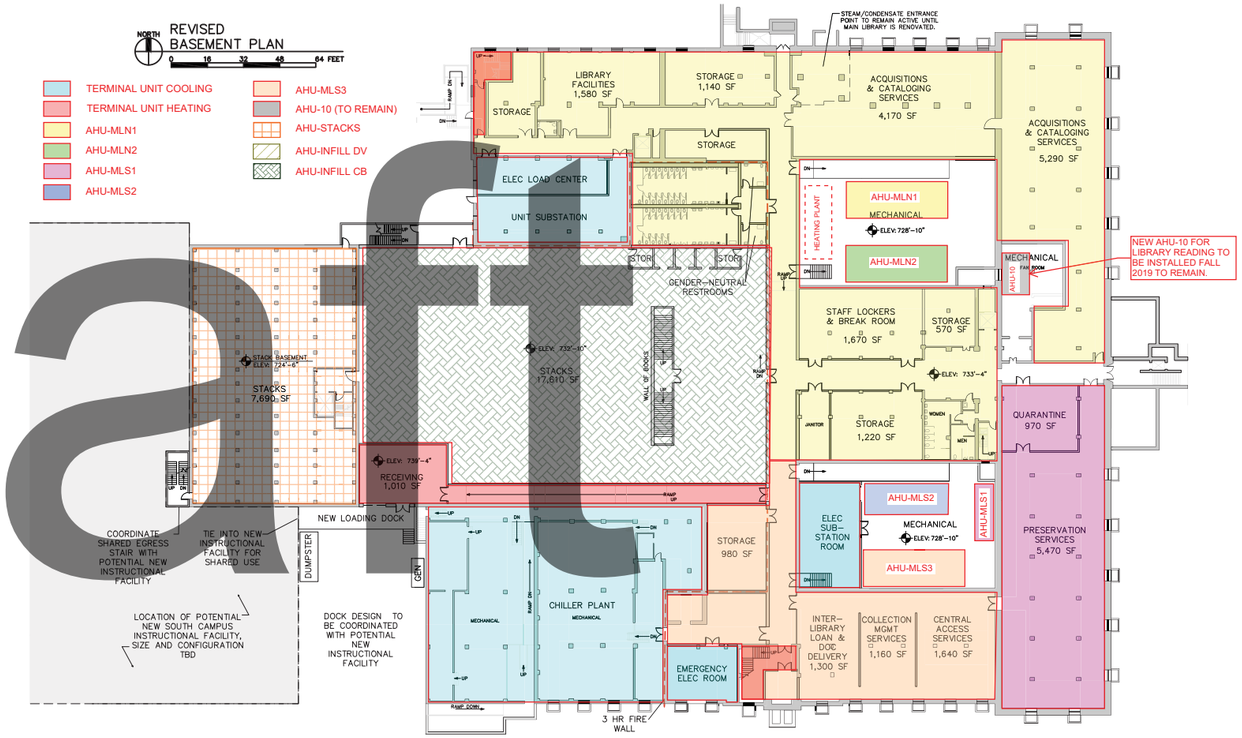
2) Main from AC Plant to Backfeed Facility
   a) 12" chilled water supply and return
3) Existing Sixth Stack Addition
   a) 8" chilled water supply and return
4) West Addition and Existing Main Library Branch
   a) 8" chilled water supply and return

c. Heating Water Systems
1) Estimated Flow Rate and Main Sizes (Note: The flow rates noted below assume heat recovery wheel has failed in each zone for redundancy.)
   a) Existing Main Library Building
      a. Two 350 GPM systems
      b. 6" Φ mains
   b) New West Infill Addition
      a. Two 525 GPM systems
      b. 6" Φ mains

d. Condenser Water
1) No new central plant chillers are provided with this project or within this narrative. The condenser water noted below is provided to connect new cooling towers located in the southwest corner of the Sixth Stack on grade.
2) AC Plant Roof to Chillers
   a) 30" Φ condenser water supply and return
3) West Infill addition
   a) None required

2. Electrical

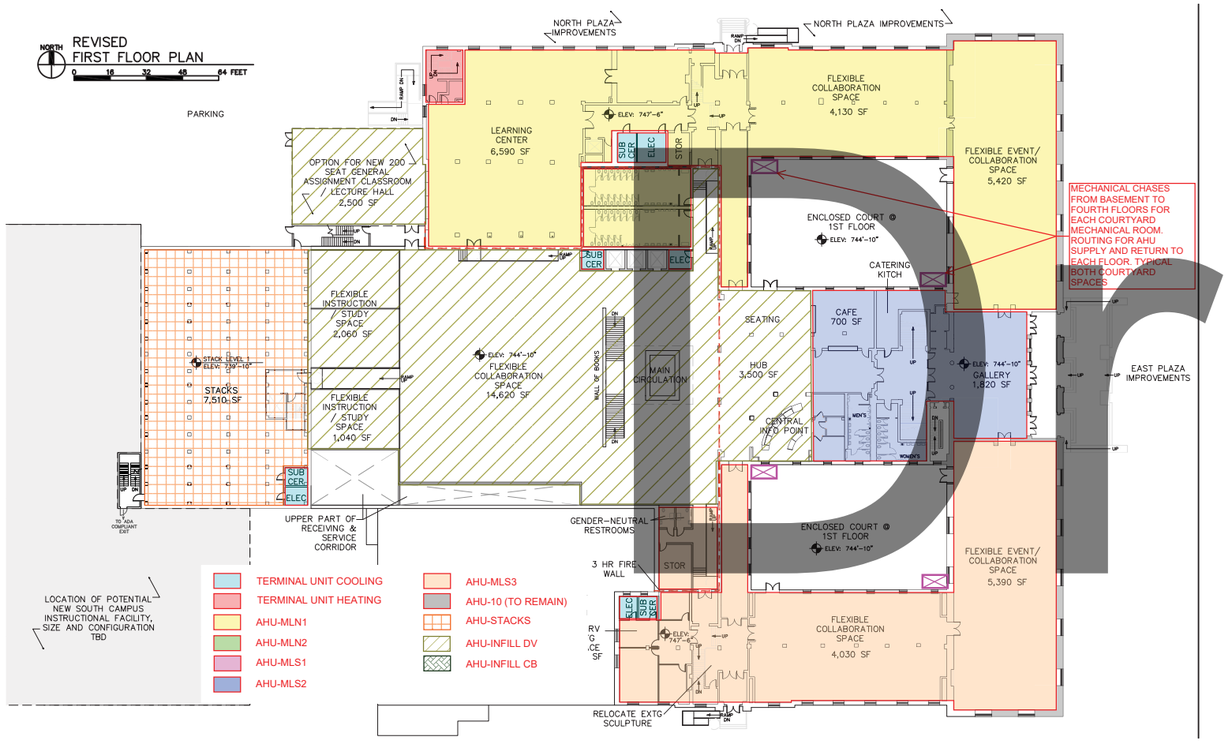
a. Main Library
1) West Addition: Two 3000KVA
2) Renovated Space: One 750KVA
3) Generator: 1000 KW

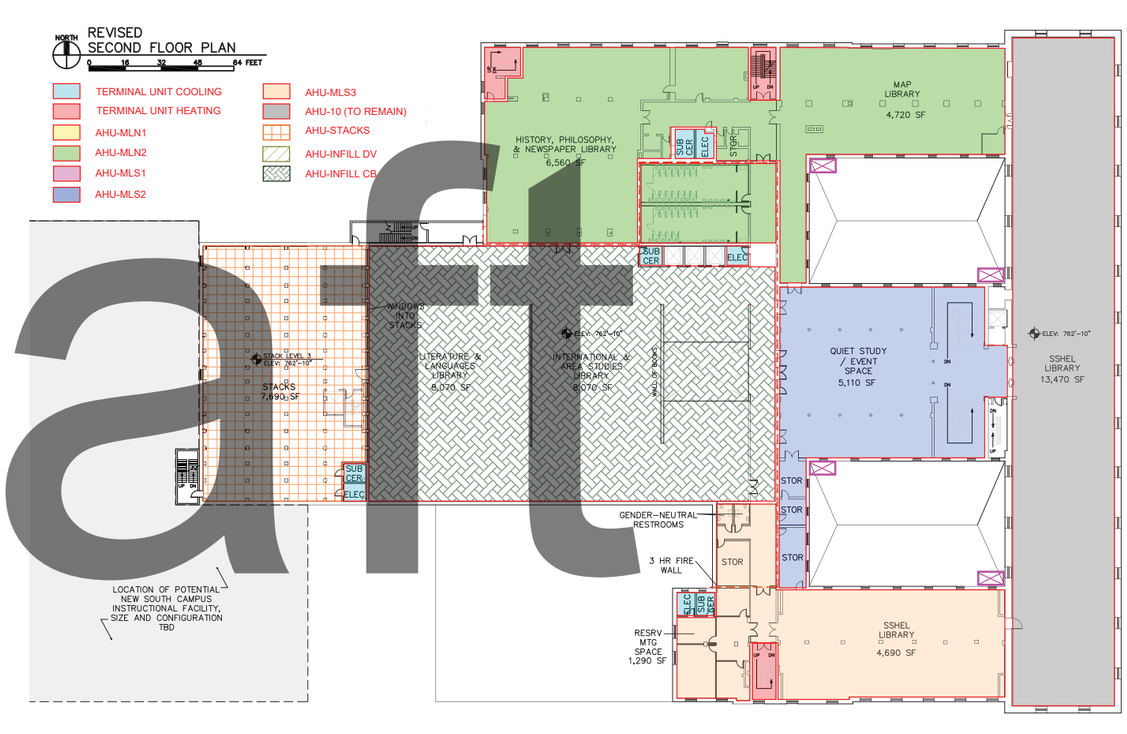


Prepared by: Mike Taube, Dave Hanshaw, PE

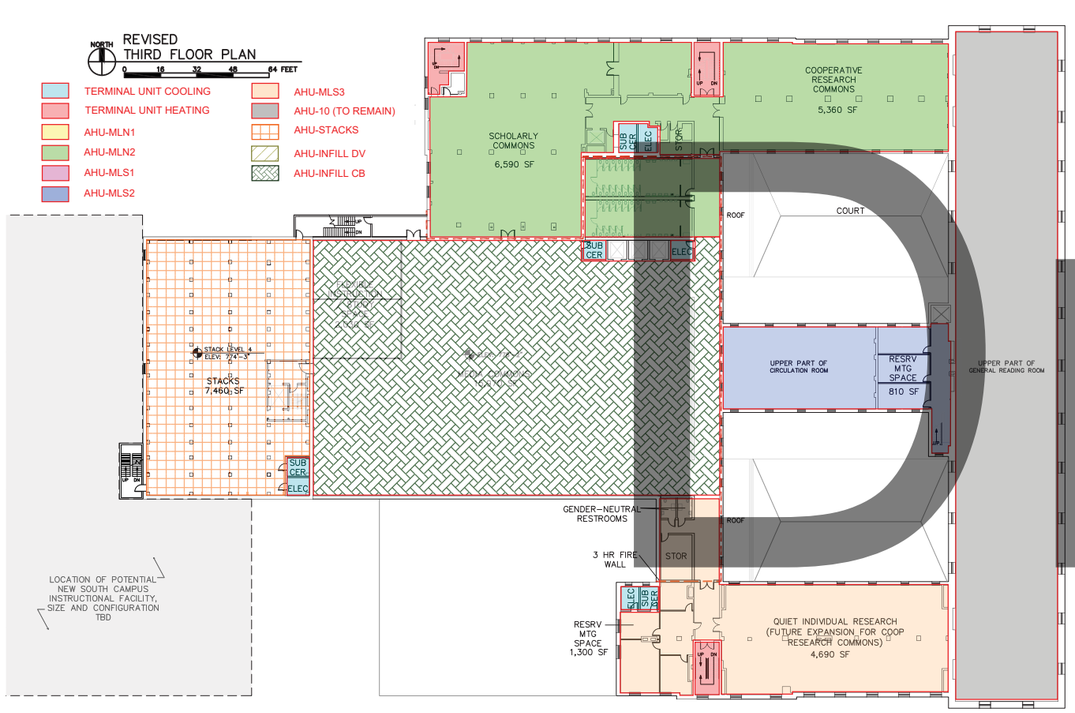
MJT:DAH/dks
\\files\Active\Projects\2019\19000691.00\Design\Reports-Narratives\20190905_ Library master plan_IMEG.docx

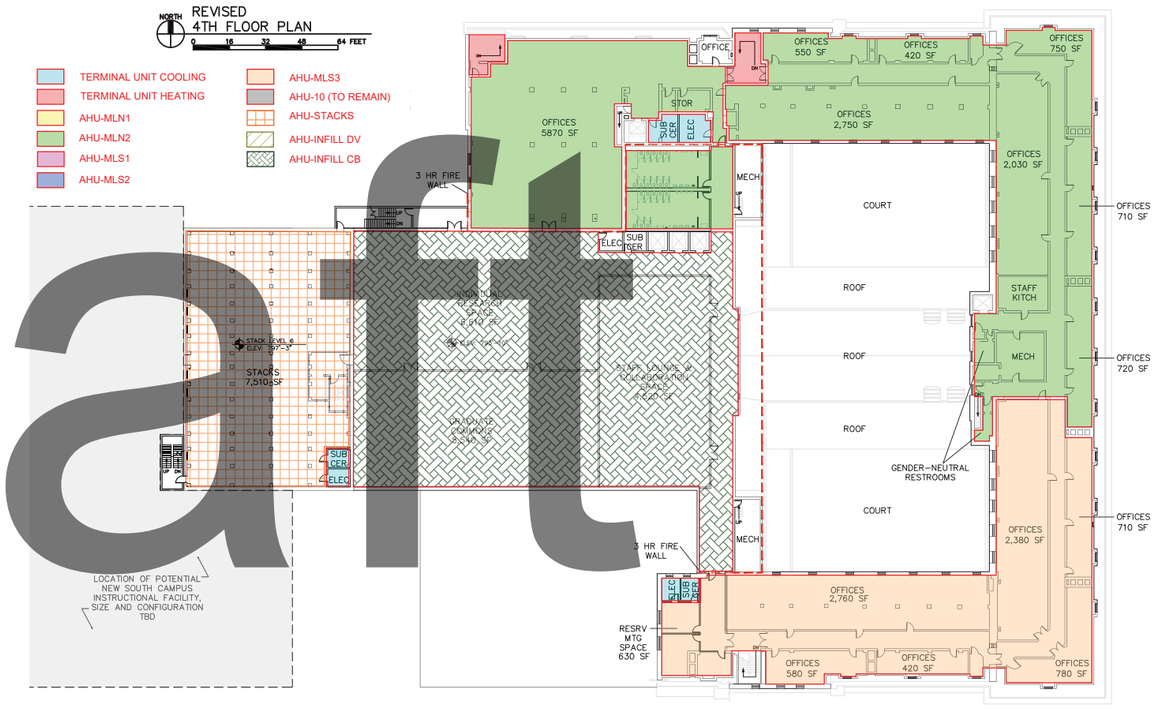
Draft


REVISED
FIRST FLOOR PLAN
NORTH
0 16 32 48 64 FEET
PARKING
NORTH PLAZA IMPROVEMENTS
NORTH PLAZA IMPROVEMENTS
LEARNING CENTER 6,590 SF
OPTION FOR NEW 200 SEAT GENERAL ASSIGNMENT CLASSROOM / LECTURE HALL 2,500 SF
FLEXIBLE COLLABORATION SPACE 4,130 SF
FLEXIBLE EVENT/ COLLABORATION SPACE 5,420 SF
ENCLOSED COURT @ 1ST FLOOR
ELEV: 744'-10"
CATERING KITCH
MECHANICAL CHASES FROM BASEMENT TO FOURTH FLOORS FOR EACH COURTYARD MECHANICAL ROOM. ROUTING FOR AHU SUPPLY AND RETURN TO EACH FLOOR. TYPICAL BOTH COURTYARD SPACES
FLEXIBLE INSTRUCTION / STUDY SPACE 2,060 SF
FLEXIBLE INSTRUCTION / STUDY SPACE 1,040 SF
STACKS 7,510 SF
FLEXIBLE COLLABORATION SPACE 14,620 SF
SEATING
HUB 3,500 SF
MAIN CIRCULATION
CAFE 700 SF
GALLERY 1,820 SF
CENTRAL INFO POINT
EAST PLAZA IMPROVEMENTS
UPPER PART OF RECEIVING & SERVICE CORRIDOR
GENDER-NEUTRAL RESTROOMS
3 HR FIRE WALL
ENCLOSED COURT @ 1ST FLOOR
ELEV: 744'-10"
FLEXIBLE COLLABORATION SPACE 4,030 SF
FLEXIBLE EVENT/ COLLABORATION SPACE 5,390 SF
RELOCATE EXTG SCULPTURE
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD
TERMINAL UNIT COOLING
TERMINAL UNIT HEATING
AHU-MLN1
AHU-MLN2
AHU-MLS1
AHU-MLS2
AHU-MLS3
AHU-10 (TO REMAIN)
AHU-STACKS
AHU-INFILL DV
AHU-INFILL CB

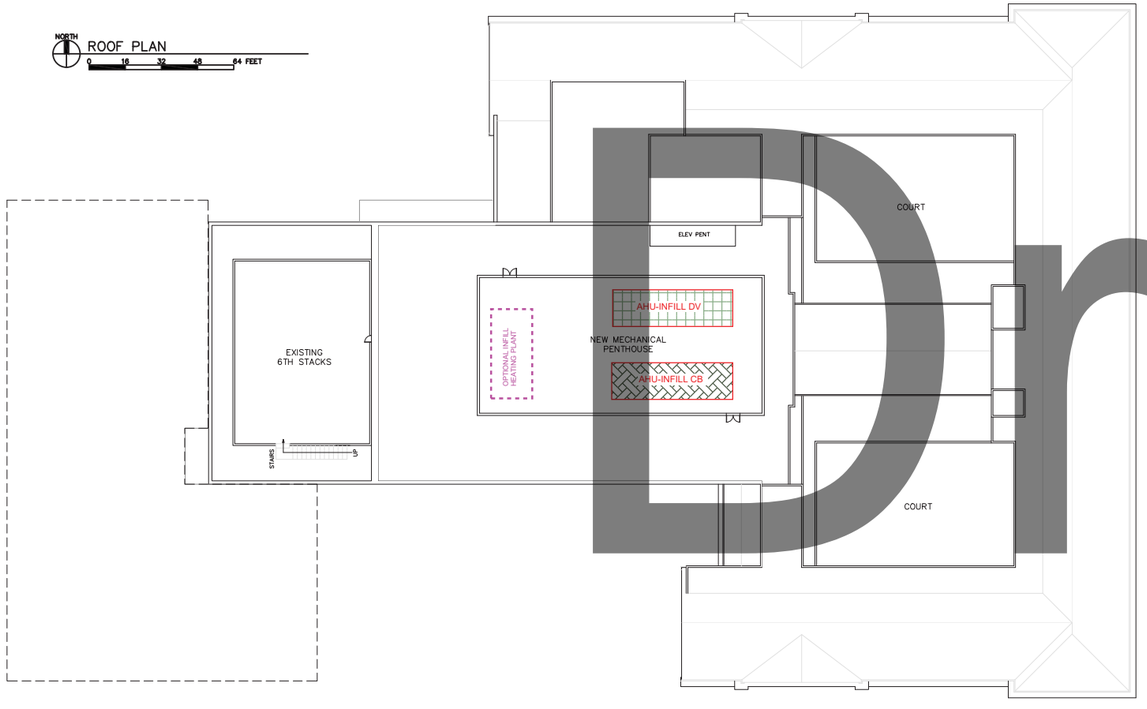

REVISED
SECOND FLOOR PLAN
NORTH
0 16 32 48 64 FEET
TERMINAL UNIT COOLING
TERMINAL UNIT HEATING
AHU-MLN1
AHU-MLN2
AHU-MLS1
AHU-MLS2
AHU-MLS3
AHU-10 (TO REMAIN)
AHU-STACKS
AHU-INFILL DV
AHU-INFILL CB
HISTORY, PHILOSOPHY, & NEWSPAPER LIBRARY 6,560 SF
MAP LIBRARY 4,720 SF
INROOM INTO STACKS
LITERATURE & LANGUAGES LIBRARY 5,020 SF
INTERNATIONAL & AREA STUDIES LIBRARY 6,070 SF
QUIET STUDY / EVENT SPACE 5,110 SF
SSHEL LIBRARY 13,470 SF
STACKS 7,690 SF
GENDER-NEUTRAL RESTROOMS
3 HR FIRE WALL
RESRV MTG SPACE 1,290 SF
SSHEL LIBRARY 4,690 SF
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD

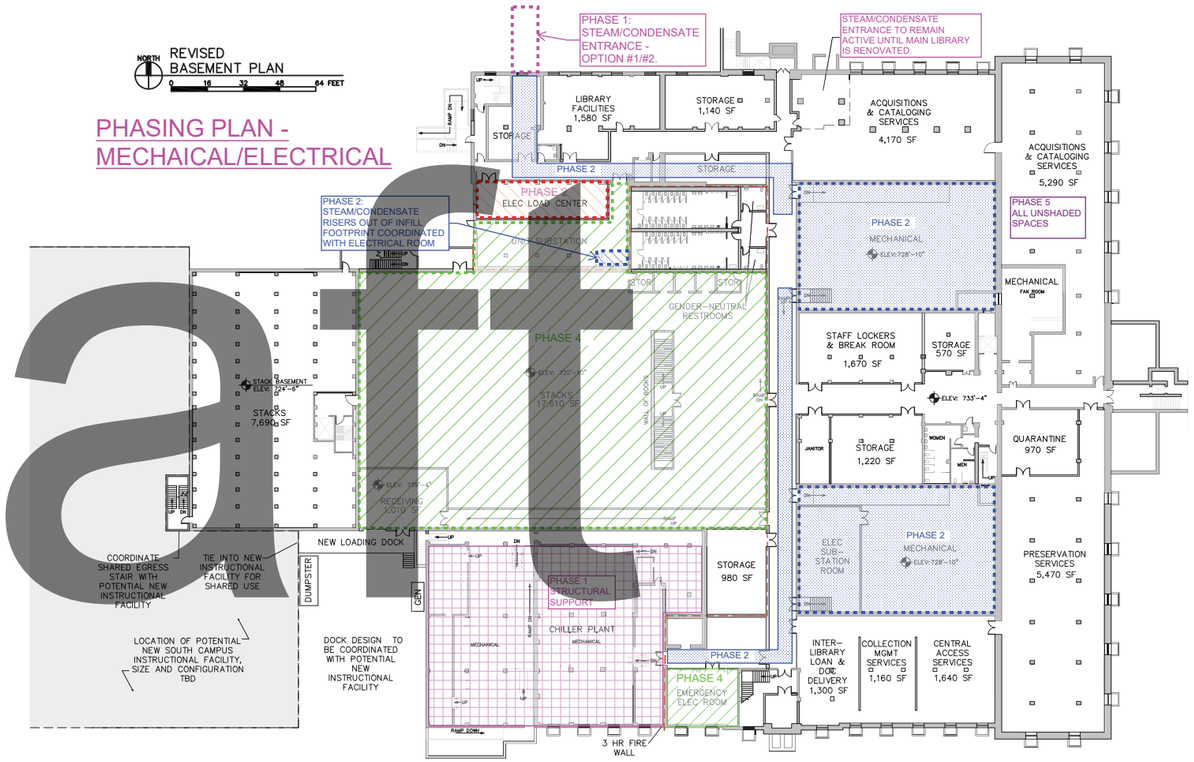
draft


NORTH
REVISED
THIRD FLOOR PLAN
0 16 32 48 64 FEET
TERMINAL UNIT COOLING
TERMINAL UNIT HEATING
AHU-MLN1
AHU-MLN2
AHU-MLS1
AHU-MLS2
AHU-MLS3
AHU-10 (TO REMAIN)
AHU-STACKS
AHU-INFILL DV
AHU-INFILL CB
SCHOLARLY COMMONS 6,590 SF
COOPERATIVE RESEARCH COMMONS 5,360 SF
SUB CER
ELEC
STOR
DN
UP
ROOF
COURT
STACK LEVEL 4 ELEV. 774'-3"
STACKS 7,460 SF
UPPER PART OF CIRCULATION ROOM
RESRV MTG SPACE 810 SF
UPPER PART OF GENERAL READING ROOM
GENDER-NEUTRAL RESTROOMS
3 HR FIRE WALL
RESRV MTG SPACE 1,300 SF
QUIET INDIVIDUAL RESEARCH (FUTURE EXPANSION FOR COOP RESEARCH COMMONS) 4,690 SF
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD


NORTH
REVISED
4TH FLOOR PLAN
0 16 32 48 64 FEET
TERMINAL UNIT COOLING
TERMINAL UNIT HEATING
AHU-MLN1
AHU-MLN2
AHU-MLS1
AHU-MLS2
AHU-MLS3
AHU-10 (TO REMAIN)
AHU-STACKS
AHU-INFILL DV
AHU-INFILL CB
OFFICE
OFFICES 5870 SF
OFFICES 550 SF
OFFICES 420 SF
OFFICES 750 SF
OFFICES 2,750 SF
OFFICES 2,030 SF
STOR
SUB CER
ELEC
DN
3 HR FIRE WALL
MECH
COURT
ROOF
STAFF KITCH
OFFICES 710 SF
OFFICES 720 SF
STACK LEVEL 6 ELEV. 797'-3"
STACKS 7,510 SF
GRADUATE COMMONS 3,340 SF
GENDER-NEUTRAL RESTROOMS
OFFICES 2,380 SF
OFFICES 2,760 SF
RESRV MTG SPACE 630 SF
OFFICES 580 SF
OFFICES 420 SF
OFFICES 780 SF
LOCATION OF POTENTIAL NEW SOUTH CAMPUS INSTRUCTIONAL FACILITY, SIZE AND CONFIGURATION TBD

Draft


NORTH
ROOF PLAN
0 16 32 48 64 FEET
EXISTING
6TH STACKS
STAIRS
ELEV PENT
COURT
AHU-INFILL DV
NEW MECHANICAL
PENTHOUSE
AHU-INFILL CB
OPTIONAL INFILL
HEATING PLANT
COURT

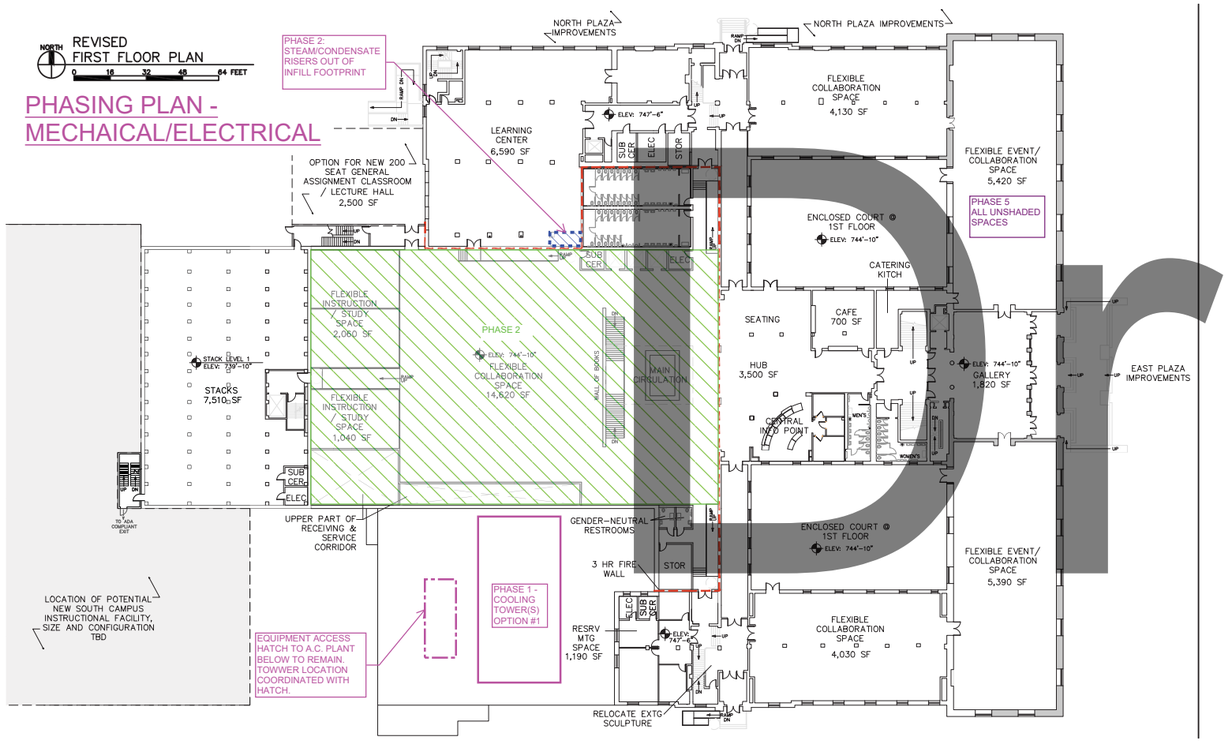

NORTH
REVISED
BASEMENT PLAN
0 16 32 48 64 FEET
PHASING PLAN -
MECHAICAL/ELECTRICAL
PHASE 1:
STEAM/CONDENSATE
ENTRANCE -
OPTION #1/#2.
STEAM/CONDENSATE
ENTRANCE TO REMAIN
ACTIVE UNTIL MAIN LIBRARY
IS RENOVATED.
PHASE 2:
STEAM/CONDENSATE
RISERS OUT OF INFILL
FOOTPRINT COORDINATED
WITH ELECTRICAL ROOM
LIBRARY
FACILITIES
1,580 SF
STORAGE
1,140 SF
ACQUISITIONS
& CATALOGING
SERVICES
4,170 SF
ACQUISITIONS
& CATALOGING
SERVICES
5,290 SF
PHASE 5
ALL UNSHADED
SPACES
PHASE 2
ELEC LOAD CENTER
PHASE 2
MECHANICAL
ELEV: 728'-10"
MECHANICAL
FAN ROOM
GENDER-NEUTRAL
RESTROOMS
STAFF LOCKERS
& BREAK ROOM
1,670 SF
STORAGE
570 SF
ELEV: 733'-4"
STACKS
17,610 SF
STACKS
7,690 SF
STACK BASEMENT
ELEV: 724'-6"
QUARANTINE
970 SF
STORAGE
1,220 SF
JANITOR
WOMEN
MEN
RECEIVING
1,010 SF
ELEC
SUB-
STATION
ROOM
PHASE 2
MECHANICAL
ELEV: 728'-10"
PRESERVATION
SERVICES
5,470 SF
NEW LOADING DOCK
COORDINATE
SHARED EGRESS
STAIR WITH
POTENTIAL NEW
INSTRUCTIONAL
FACILITY
TIE INTO NEW
INSTRUCTIONAL
FACILITY FOR
SHARED USE
DUMPSTER
OPEN
PHASE 1
STRUCTURAL
SUPPORT
CHILLER PLANT
MECHANICAL
MECHANICAL
STORAGE
980 SF
PHASE 2
PHASE 4
EMERGENCY
ELEC ROOM
INTER-
LIBRARY
LOAN &
DOC
DELIVERY
1,300 SF
COLLECTION
MGMT
SERVICES
1,160 SF
CENTRAL
ACCESS
SERVICES
1,640 SF
LOCATION OF POTENTIAL
NEW SOUTH CAMPUS
INSTRUCTIONAL FACILITY,
SIZE AND CONFIGURATION
TBD
DOCK DESIGN TO
BE COORDINATED
WITH POTENTIAL
NEW
INSTRUCTIONAL
FACILITY
3 HR FIRE
WALL

Draft

REVISED
FIRST FLOOR PLAN

0 16 32 48 64 FEET

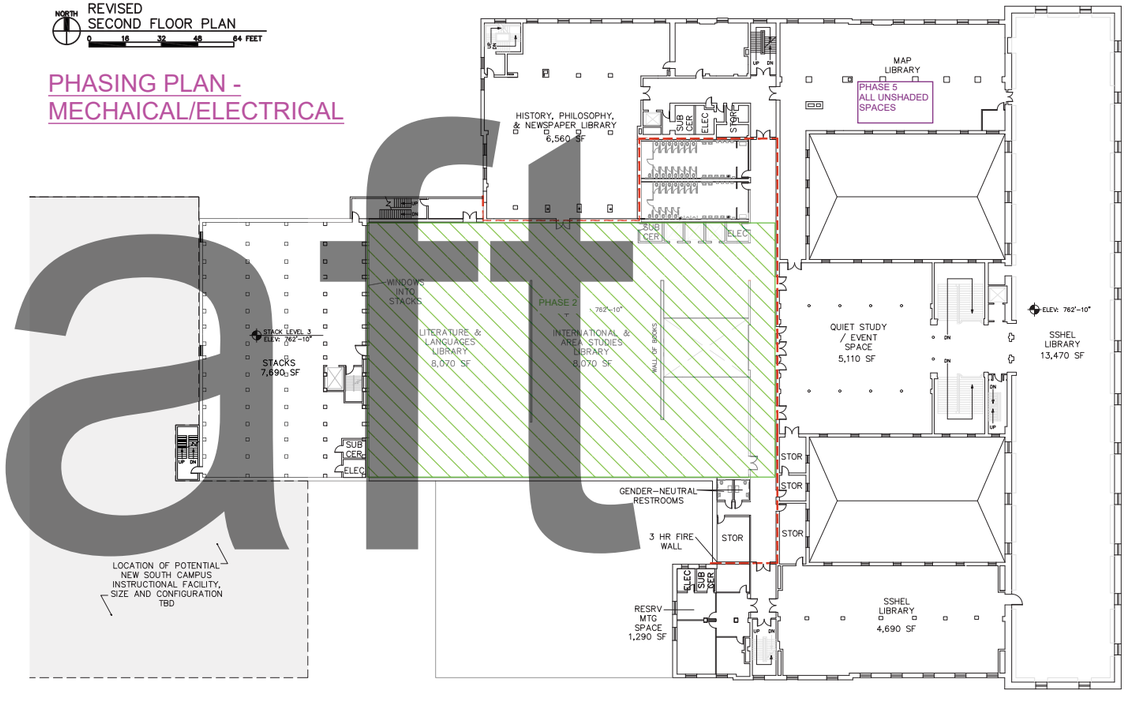
PHASING PLAN - MECHAICAL/ELECTRICAL



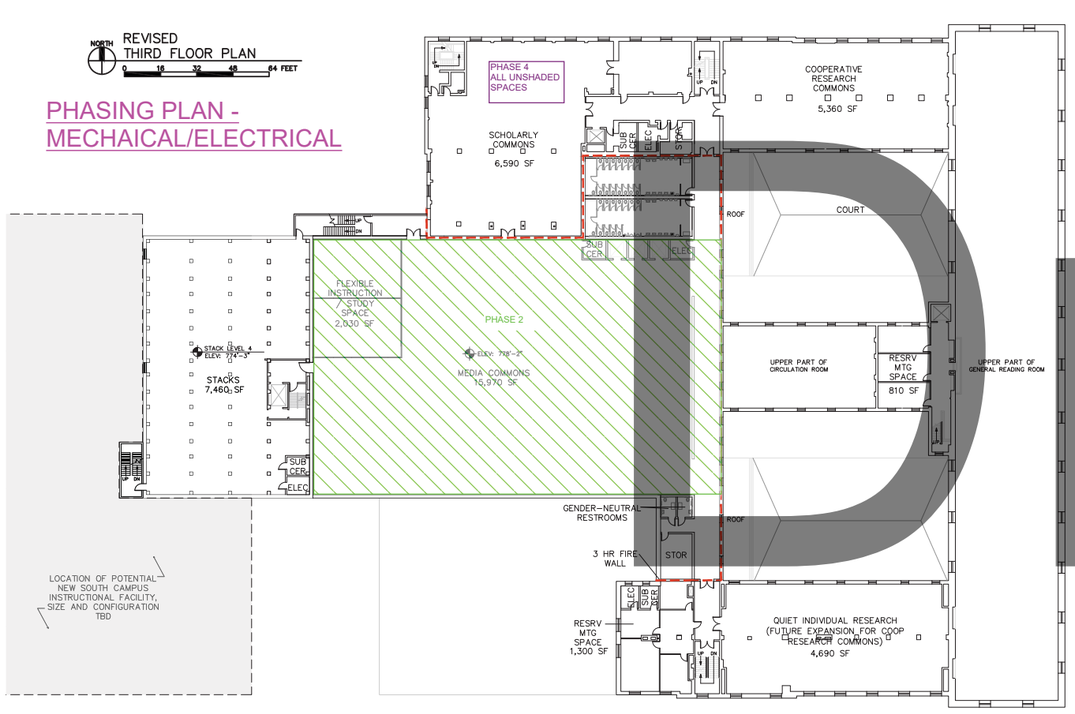
REVISED
SECOND FLOOR PLAN

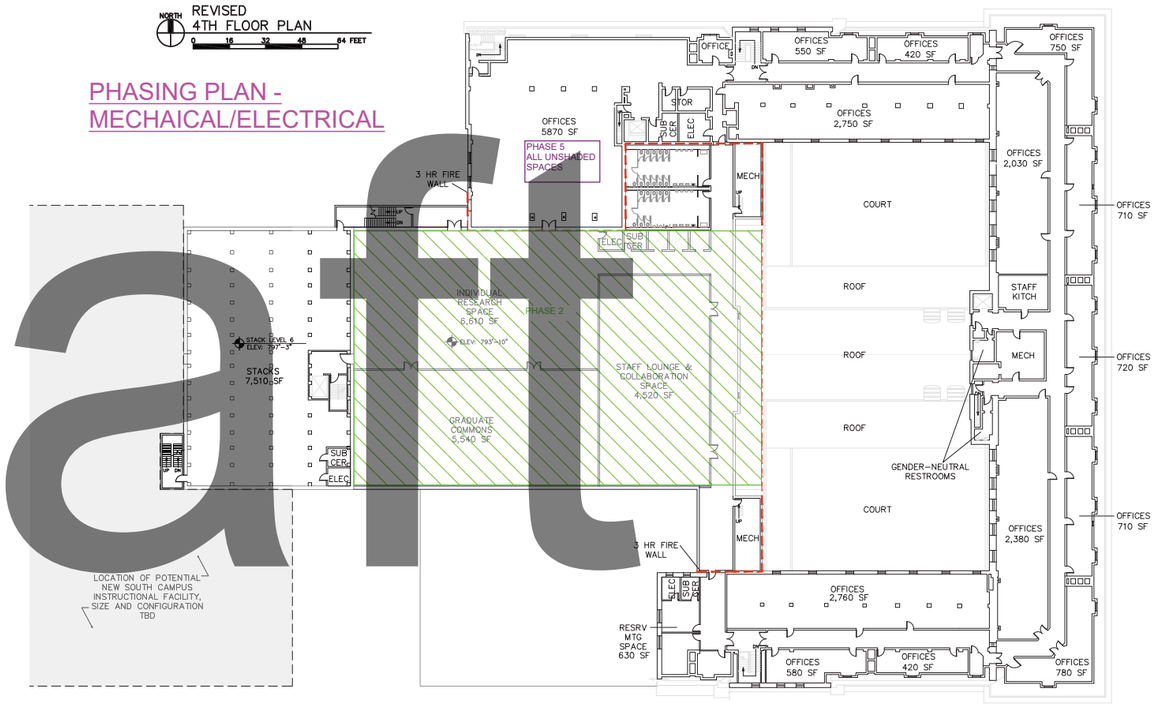
0 16 32 48 64 FEET

PHASING PLAN - MECHAICAL/ELECTRICAL

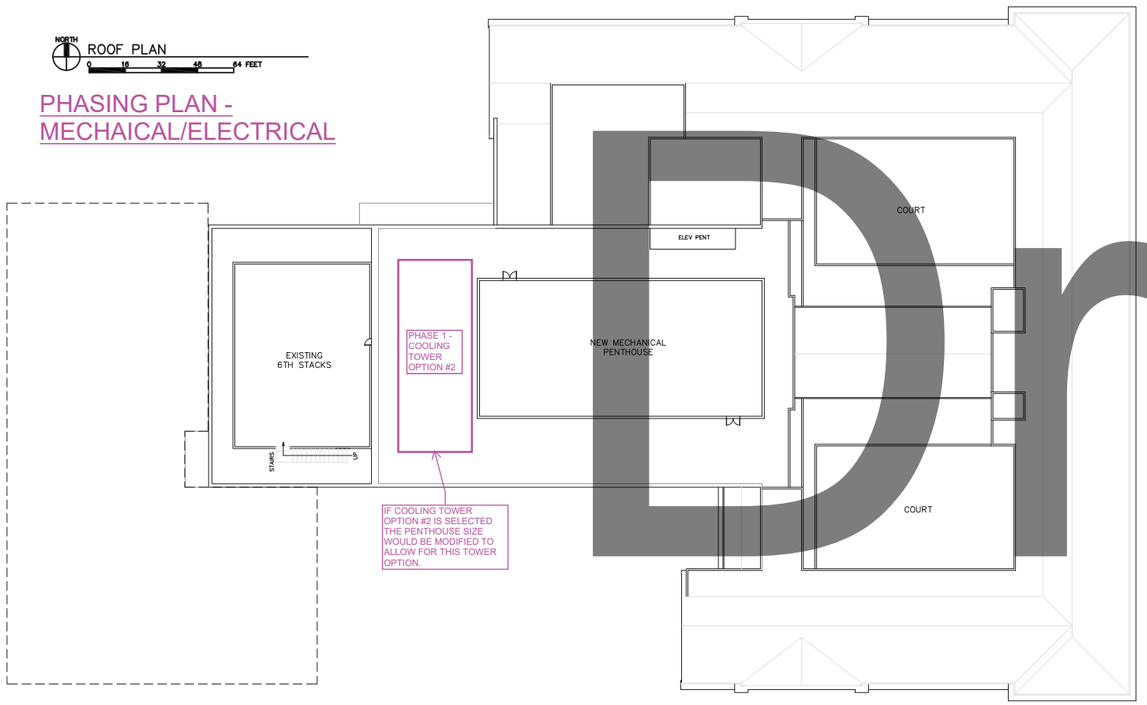


Draft


NORTH
REVISED
THIRD FLOOR PLAN
0 16 32 48 64 FEET
PHASING PLAN -
MECHAICAL/ELECTRICAL
PHASE 4
ALL UNSHADED
SPACES
SCHOLARLY
COMMONS
6,590 SF
COOPERATIVE
RESEARCH
COMMONS
5,360 SF
ROOF
COURT
SUB
CER
ELEC
FLEXIBLE
INSTRUCTION
STUDY
SPACE
2,030 SF
PHASE 2
STACK LEVEL 4
ELEV. 774'-3"
STACKS
7,460 SF
ELEV. 778'-3"
MEDIA COMMONS
16,970 SF
UPPER PART OF
CIRCULATION ROOM
RESRV
MTG
SPACE
810 SF
UPPER PART OF
GENERAL READING ROOM
GENDER-NEUTRAL
RESTROOMS
ROOF
3 HR FIRE
WALL
STOR
RESRV
MTG
SPACE
1,300 SF
QUIET INDIVIDUAL RESEARCH
(FUTURE EXPANSION FOR COOP
RESEARCH COMMONS)
4,690 SF
LOCATION OF POTENTIAL
NEW SOUTH CAMPUS
INSTRUCTIONAL FACILITY,
SIZE AND CONFIGURATION
TBD


NORTH
REVISED
4TH FLOOR PLAN
0 16 32 48 64 FEET
PHASING PLAN -
MECHAICAL/ELECTRICAL
OFFICE
OFFICES
550 SF
OFFICES
420 SF
OFFICES
750 SF
OFFICES
5870 SF
STOR
SUB
CER
ELEC
OFFICES
2,750 SF
PHASE 5
ALL UNSHADED
SPACES
3 HR FIRE
WALL
MECH
COURT
OFFICES
2,030 SF
OFFICES
710 SF
SUB
CER
ELEC
ROOF
INDIVIDUAL
RESEARCH
SPACE
6,610 SF
PHASE 2
STAFF
KITCH
STACK LEVEL 6
ELEV. 797'-3"
ELEV. 793'-10"
STACKS
7,510 SF
STAFF LOUNGE &
COLLABORATION
SPACE
4,520 SF
ROOF
MECH
OFFICES
720 SF
GRADUATE
COMMONS
5,540 SF
ROOF
GENDER-NEUTRAL
RESTROOMS
COURT
OFFICES
2,380 SF
OFFICES
710 SF
3 HR FIRE
WALL
MECH
OFFICES
2,760 SF
RESRV
MTG
SPACE
630 SF
OFFICES
580 SF
OFFICES
420 SF
OFFICES
780 SF
LOCATION OF POTENTIAL
NEW SOUTH CAMPUS
INSTRUCTIONAL FACILITY,
SIZE AND CONFIGURATION
TBD

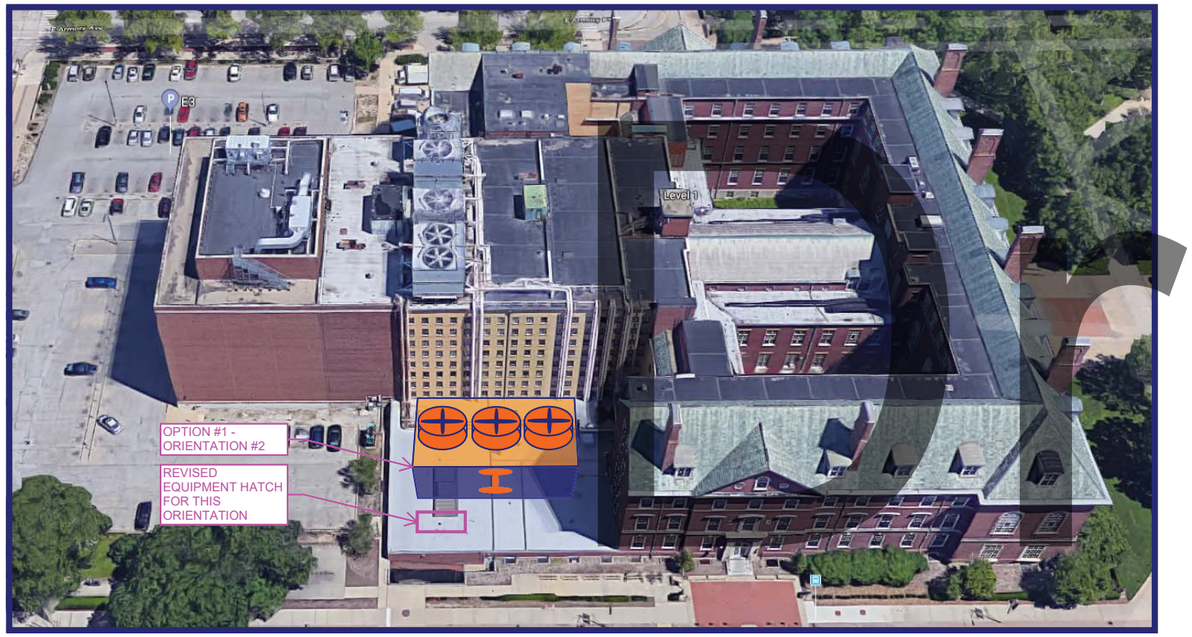
Draft



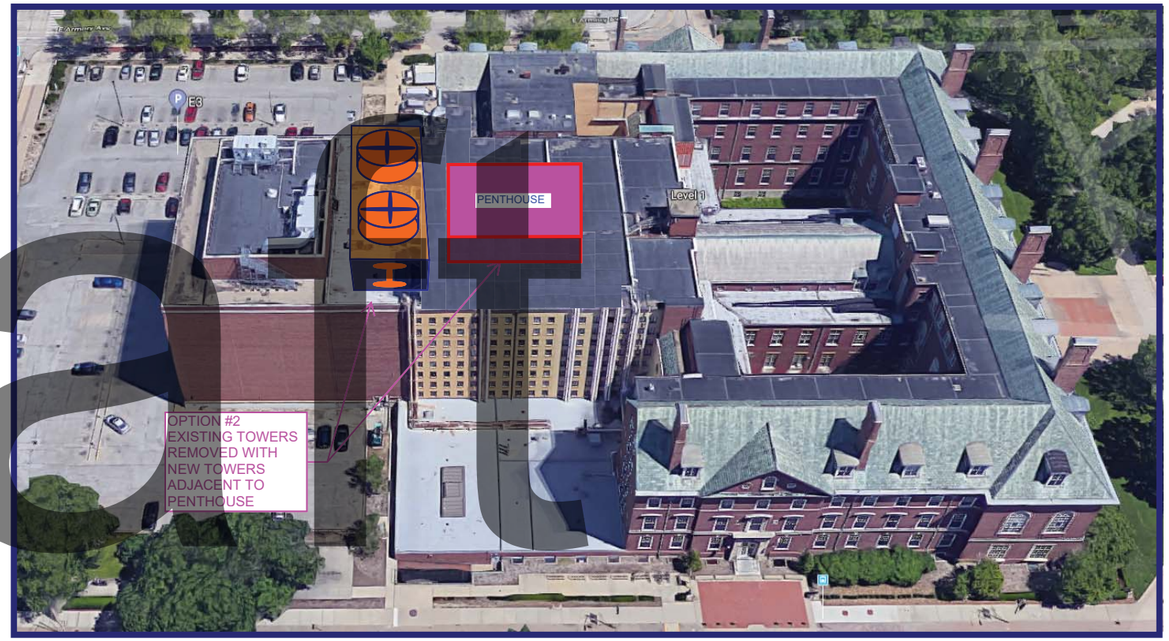
PHASING PLAN - MECHAICAL/ELECTRICAL

COOLING TOWER LAYOUT - AC PLANT ROOF - OPTION #1 ORIENTATION #1

Draft



COOLING TOWER LAYOUT -
AC PLANT ROOF - OPTION #1
ORIENTATION #2



COOLING TOWER LAYOUT - INFILL
ADDITION ROOF - OPTION #2