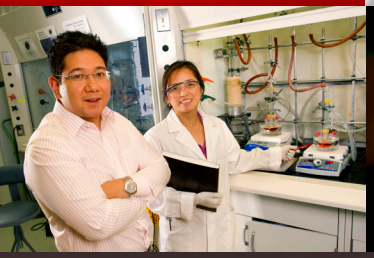

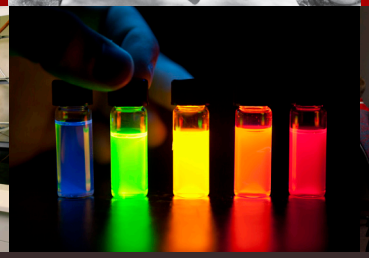

Lassonde Living Learning Center

THE UNIVERSITY OF UTAH®

FEASIBILITY STUDY

Lifetime Business Scholars Engagement Community Connections

Innovation Scholars
College Experience
Bench to Bedside (B2B)
Lego League
Retention
Technology Venture
The Foundry
Undergraduate Experience
Social Network
Crowdfunding
Graduation
Invent
Trademark Patent
Entrepreneur

JACOBY ARCHITECTS Inc.

Lassonde Living Learning Center

FEASIBILITY STUDY

May 2013

THE UNIVERSITY OF UTAH®

JACOBY ARCHITECTS INC.

425 SOUTH 400 EAST
SALT LAKE CITY, UTAH, 84111
TEL: 801.363.1434
WWW.JACOBYARCHITECTS.COM

University of Utah Review Signatures:

We have reviewed the Feasibility Study for the Lassonde Living Learning Center and warrant that it adequately represents our request for a facility to fulfill our mission and preliminary needs. All appropriate parties representing the University have reviewed it for approval.

Michael Hardman, Interim Senior V.P. for Academic Affairs — Date: 2/20/13

Arnie Combe, Senior V. P. for Administrative Services — Date: 2/13/13

Barbara Snyder, Vice president for Student Affairs — Date: 2/18/13

Patti Ross, Chief Strategy Officer — Date: 2-13-13

Mike Perez, Associate Vice President for Facilities — Date: 1/30/13

John McNary, Director, Campus Planning — Date: 1-29-13

Cory Higgins, Director, Construction Project Delivery — Date: 1.29.13

Taylor Randall, Dean, David Eccles School of Business — Date: 2/8/13

Troy D'Ambrosio, Director, Pierre Lassonde Entrepreneur Center — Date: 2/8/13

Barbara Remsburg, Director, Housing and Residential Education — Date: 2/1/13

Jennifer Still, Campus Planning — Date: 1.28.13


Engagement
Business Scholars
Connections
Community
Lifetime
Innovation Scholars
Lego League
College Experience
Bench to Bedside
(B2B)
Retention
Technology Venture
The Foundry
Undergraduate Experience
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Trademark
Patent
Entrepreneur

Executive Summary

In October, 2012 University of Utah Facilities Management commissioned this Feasibility Study to explore the determinants, opportunities, constraints and feasibility for designing and constructing the Lassonde Living Learning Center.

The Lassonde Living Learning Center project is a collaborative endeavor between the Pierre Lassonde Entrepreneur Center and Housing and Residential Education. The goal of this endeavor is to design, build, occupy, and operate a new academic/housing facility which will house 401 new student residents and be the new permanent home for the innovation and support spaces of the Lassonde Center.

The intent of this Feasibility Study is to provide the information required for making decisions during the next phases of planning/ programming/design for the Lassonde Living Learning Center project.

In summary the information within the Feasibility Study includes:

The project vision; preliminary design/space/ adjacency considerations; and suggestions for design benchmarks and precedents have been identified.

Four viable building sites have been identified; each with technical, spatial, and functional, considerations that have been weighed in comparison to the other sites.

Standard procurement methods for the project (CMGC and Design Build) have been compared against an alternate option of delivering the project through the Developer Method.

Anticipated project costs have been identified through: cost analysis of a recent, similar project (Marriott Honors Community, UofU); review of national averages for construction cost for recent student housing projects (College Housing Report/ACUHO-I Report); and cost modeling by a local construction cost expert.

Under separate cover, three proforma models have been assembled to explore the economic feasibility, the break-even period, and revenue generating capacity of the project.

Steering Committee

Jerry Basford, Associate Vice President
University of Utah Student Affairs

Bill Billingsley, Architectural Project Manager
University of Utah Facilities Management

Eric Browning, Planner/Staff Architect
University of Utah Facilities Management

Troy D'Ambrosio, Director
University of Utah Pierre Lassonde Entrepreneur Center

Kathy Hajeb, Executive Director
Technology Venture Development, University of Utah Pierre Lassonde Entrepreneur Center

John McNary, Director
Campus Design and Construction, University of Utah Facilities Management

Mike Perez, Associate Vice President
University of Utah Facilities Management

Raelynn Potts, Director of Business Affairs
University of Utah David Eccles School of Business

Barb Remsburg, Director
University of Utah Housing & Residential Education

Patti Ross, Chief Strategy Officer
President's Office, University of Utah

Jennifer Still, Architect/Project Manager
University of Utah Facilities Management

Design Team

Architect:
Robert Jacoby, President
Jacoby Architects

Eric Jacoby, Principal
Jacoby Architects

Joe Jacoby, Principal
Jacoby Architects

Cost Consultant:
Troy North
Gramoll Construction

Structural Engineer:
Mike Buehner
Reaveley Engineers

Mechanical/Plumbing Engineer:
Win Packer
WHW Engineering

Electrical Engineer:
Enayat Nawabi
ECE Consulting

Civil Engineer:
Randall Vickers, Meridian Engineering

Proforma and Master Plan Consultant:
Greg Wachalski
Brailsford & Dunlavey

Vision Statement

This exciting project is envisioned as a collaboration between the Pierre Lassonde Entrepreneur Center and Housing & Residential Education. The intent is to fulfill, in part, needs established by the University Housing Master Plan while at the same time enhancing the student resident community with the addition of a unique student community of the Pierre Lassonde Entrepreneur Center.

One goal is to enhance recruitment and visually motivate students to develop an interest in the Lassonde Entrepreneur Center. A second goal is to motivate and recruit more student residents to live on the University of Utah campus.

The Lassonde Living and Learning Center project aims to accomplish these goals by combining a new Student Entrepreneur Space (Student Garage) with a revenue generating student housing community.

The anticipated result will be a highly visible mixed-use building bustling with a collaborative, interdisciplinary, creative, and high energy community composed of student entrepreneur activities, classrooms, and student residents.

Anticipated Budget:

$40-70 million dollars.
The project must work within the proforma and anticipated housing revenue.

Project Milestones:

Board of Regents and Trustees:
September/October 2013

Building Board:
October/November 2013

Legislative Approval Process:
January - March 2014

Design Team Selection Process:
April -May 2014

Complete Construction:
Fall of 2016

Energy Efficiency Considerations:

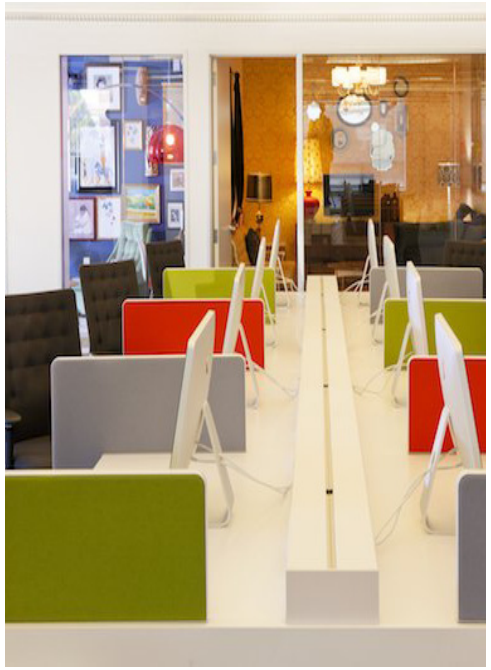
The project must meet DFCM energy performance criteria

The project must meet LEED
And perform 40% better than ASHRAE

Possible Project Procurement Methods:

Design/Build
CMGC

Bloomberg's Headquarters



Airbnb Office

Student Garage Space

Design Considerations:

The Student Garage is intended to create an inspirational and collaborative atmosphere where students can train to think like entrepreneurs through the cyclical process of learning, discovering, exploring, creating, partnering, and discovering. Not only is this space intended to enhance student innovation, but also to serve as a recruiting tool for the Lassonde Entrepreneur Center.

This specialized space will be utilized to facilitate students' process in venture: having to present an idea, being pointed towards potential grants, having access to essential resources, being provided work space, and launching companies. The space will allow a safe haven for testing a business hypothesis and the entrepreneurial process: *Try out an idea, Fail in an inexpensive way, Try again with better outcome.*

The Student Garage will be a resource to all students on campus, visualized to include rentable spaces resembling "bays to fix your own car." It is envisioned as: *Engaging, Unique, Differentiating, Interdisciplinary, and Competitive* for students from diverse colleges (ex. Business, Engineering, Arts, Sciences, etc..)

Adjacency and Layout Considerations:

(To be read in conjunction with The Organizational Diagrams):

The Student Garage space is intended to be a strong anchor for the building's common area, both visually and experientially; where passers-by and residents are drawn in to the activities and the spaces of the "Garage".

The spatial arrangement is intended to create possibilities for interacting with and overlooking into the Garage space from common areas, possibly from housing units, and possibly from the exterior of the building.

In anticipation of future technologies, programs, and innovation practices, the intent is to provide future flexibility by using a variety of sizes of spaces as well as a variety of privacy levels.

The Area Summary in this document shows the Student Garage as a singular space rather than a group of individual spaces because, in comparison to the residential space, it is a non-revenue generating space that will be funded differently.

Google, Pittsburgh

MakerBot Factory 3D Printers

Possible Spaces within the Student Garage:

Integrated community spaces that highlight innovation / entrepreneurship.

24 hour, collaborative workspace that will be the home base "Garage" for tinkering and building prototypes. (The Lassonde Entrepreneur Center will also facilitate connecting students with other sub-specialty resources around campus). Specific requirements in this area may include:

- Collaborative work spaces
- Flexibility in workspace size/configuration for different size/quantity of prototype construction
- Software development space
- Medical gaming device development and testing space
- Biomedical design and assembly space.

Classroom spaces

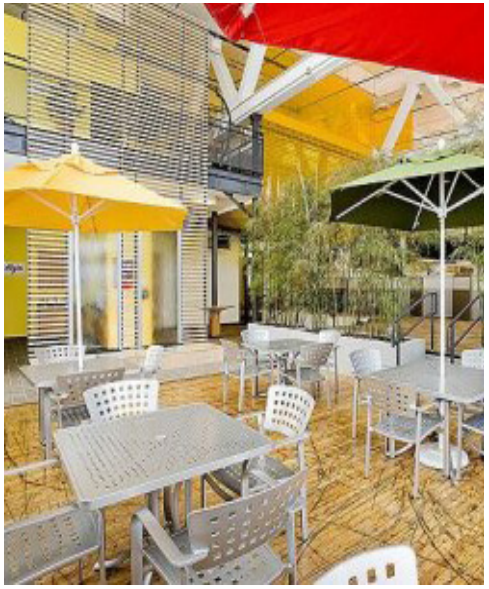
Event space for current student programs such as the Utah Entrepreneur Challenge, Opportunity Quest, Bench 2 Bedside, Innovation Scholars and the Student Entrepreneur Conference.

Foundry space used for testing business ideas and launching companies.

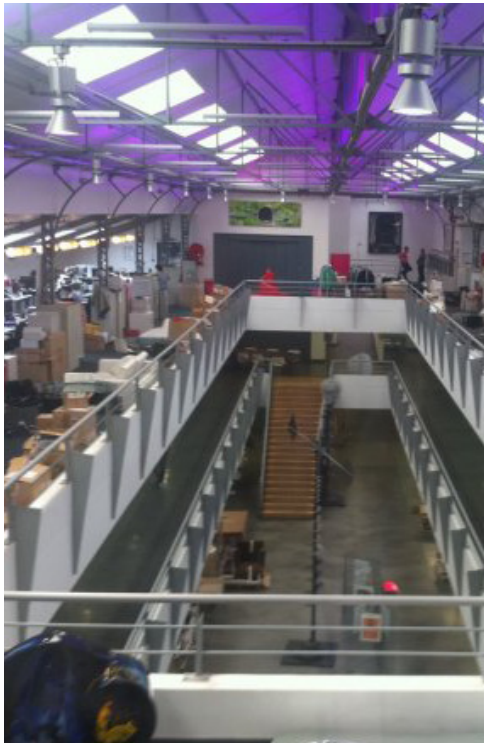
Donor acknowledgment spaces
This mixed-use project is made possible through a generous pledge from Pierre Lassonde. Additional donor support will be sought for non-residential space. The design should include exterior and interior signage naming opportunities within the building and a donor wall/tribute to the projects donors.

Other university programs which may be integrated within the Student Garage:

- Theatre
- Fine Arts
- Electrical Engineering
- Computer Engineering



Google, Pittsburgh



Vente Privee's Headquarters

Precedents for Innovative/Creative Spaces:

(See Appendix for images)

This study included a discussion about several relevant building types which can be used as design precedents for the Student Garage. These various project types all have in common the following characteristics: facilitate creativity, collaborative, flexible, integrative, open workspace, balanced small & big, balanced public & private. The precedents include but are not limited to:

- Art & Architecture studio spaces
- Workshop spaces
- Exploratorium / tinkering spaces
- Industrial re-use spaces
- Automotive garage spaces

Potential Benchmarks:

Several specific existing facilities were discussed as potential buildings that a future programming/design team may visit with the Steering Committee.

Musée National des beaux-arts du Québec
http://www.archdaily.com/54850/oma-wins-competition-for-the-new-beaux-arts-museum-in-quebec/

University of Florida INSPIRE-ation Hall
http://www.ufinspireationhall.com/

Stanford Ideo Center
http://www.ideo.com/work/stanford-center-for-innovations-in-learning/

"Tech Shop"

Pixar Studios

Apple Campus

Adobe building, Thanksgiving Point

Business Insider "15 Coolest Offices"
http://www.businessinsider.com/15-coolest-offices-in-tech-2012-1#

Existing Facility Information:

The Pierre Lassonde Entrepreneur Center provides and teaches real world business experience to help young entrepreneurs be better prepared to understand and assume the risks of business ownership and management. Through this education process the Center hopes to inspire entrepreneurs to continue their education not only today, but continually so that they may be better prepared for tomorrow's market.

Pierre Lassonde Entrepreneur Center Programs:

The Foundry
8th South and 4th West in the Art Space building 2500 Square feet building with Internet and Desks. The space is currently used for business incubation.

Student entrepreneur programs at the University of Utah
http://www.techventures.utah.edu/news/2011/05/video-student-entrepreneur-programs-at-the-u-of-utah/

Bench to Bedside competition
http://www.techventures.utah.edu/news/2011/05/video-bench-to-bedside-competition/

Innovation Scholar Program
http://www.innovation.utah.edu

Business Scholars Program
http://undergrad.business.utah.edu/page/business-scholars

Marriott Honors Community, 4 Bedroom Apartment
University of Utah

Marriott Honors Community, Lobby
University of Utah

Student Housing

Housing & Residential Education is home to 2,700 students. The mission of Housing & Residential Education is to encourage, facilitate, and support the learning and development of residents. Students that live on campus, in comparison to their counterparts, have a higher GPA, are retained at higher rates, and have a higher graduation rate. *(See appendix for statistics on this study.)*

Design Considerations:

The residential space should have a look and feel that is vibrant and progressive with a modern aesthetic, meet University sustainability goals, and serve to attract students who are typically single, creative, and are interested in the development of new technology. Many of the students involved and associated with entrepreneurial activities tend to be upper-division undergraduate and graduate students. While graduate and upper-division undergraduate students are a focus, there will also be opportunities for first and second year undergraduates to be housed in the building.

The Housing & Residential Education Housing Master Plan, completed in 2012 and approved by the Board of Trustees, shows additional on-campus housing demand for 1,000 beds for first year students, 780 beds for upper-division students, and an additional 300 beds for graduate students by the year 2019-2020.

A total of 401 student beds is the ceiling for this project. The building will need to accommodate a live-in housing staff apartment. There is also a need for academic support spaces.

As Utah enjoys a wonderful climate and a student body that engages in outdoor activities, opportunities to develop outdoor spaces as extensions of the building would be desirable.

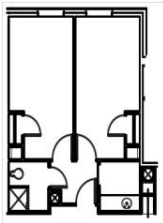
It is possible students will qualify to live in these residences for year round and multiple years.

Housing Adjacency Considerations:

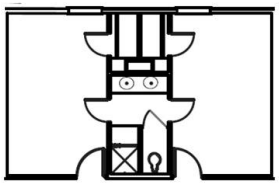
For this project the housing has been conceptually divided into two categories: A Residence Hall Style Community for first year students and an Apartment Community for upper-division students. Each housing category has fundamentally different issues which need to be addressed with a new housing facility:

> The Residence Hall Style Community for first year students needs to be designed and organized with the intent to get students out of their bedroom and suite spaces in order to collide and connect in common spaces that would be located both on the residential floors as well as in the public areas of the building. The residential floors could have study spaces with glass walls and white boards. The students living in the semi-suites would need to be on a meal plan and have access to a dining facility.

Residence Hall Style Community Unit Types

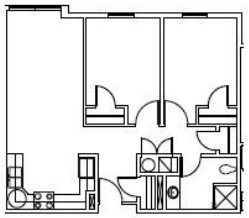


Single Semi Suite

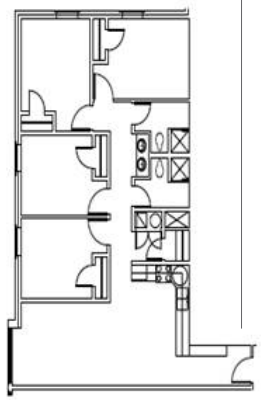


Double Semi Suite

Apartment Community Unit Types



2 Bedroom Apartment



4 Bedroom Apartment

Diagrams are from the University Housing Master Plan, they are included for reference - not design.

The Apartment Community serving upper-division students needs to be designed to appeal to residents who wish to remain engaged in the experience of this community as well as those who may opt for a more private living experience. To accomplish this, the upper-division housing is best suited with 2 and 4 bedroom apartments (market analysis suggests that a large number of 1-bedroom apartments are not viable within the Project Proforma).

A social and entertainment space also needs to be included in the building outside of the public space as a place for the residents of the building to decompress and build community.

A potential strategy for organizing the first year student housing and upper-division housing is to separate the two communities into two separate housing “towers” that share a common/community area with each other and with the Student Garage Space.

Housing Unit Mix:

For the first year student beds, the proposal is a mix of 35% **Single Semi-Suite Units** and 65% **Double Semi-Suite Units,** arranged as a Residence Hall Community:

196 first year beds

For the upper-division and graduate student beds, the proposal is a mix of **2-person & 4-person Apartments,** which would be furnished and sold by the bed**:**

196 upper-division and grad student beds

Additionally, there will be a requirement Residential Education Staff housing:

2 Residential Education Staff within (2) apartments

Housing Infrastructure Considerations:

AV Systems

TV Systems

Security Systems including card readers, door entry systems and emergency police call button

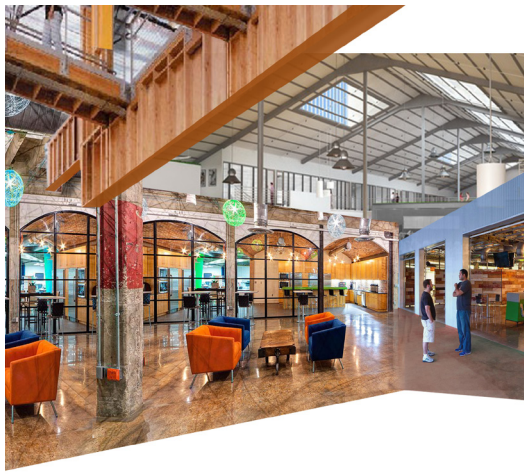
DAS (Mobile phone signal amplification)

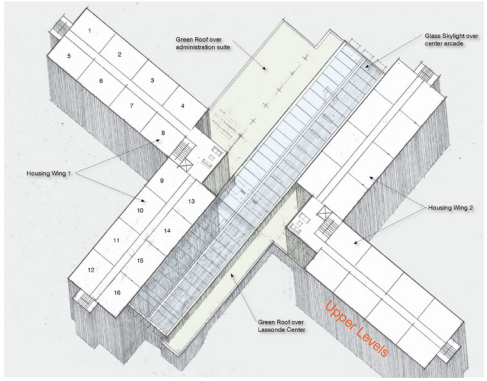
Wireless and data lines

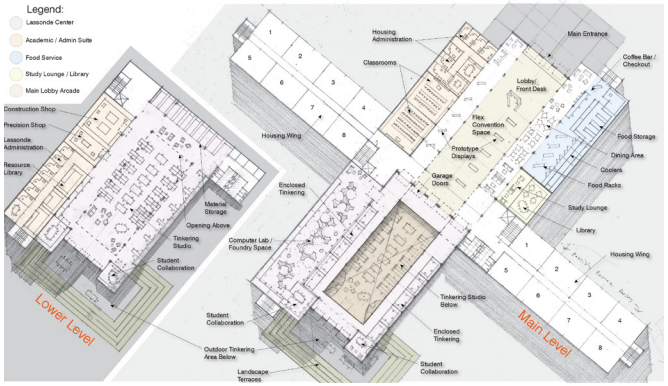
ADA spaces in association with Living Learning programs within the building

Food Service Considerations

Although not part of this project, a stand-alone food service building servicing between 300 - 500 meal plans will be required to accommodate the development of ANY future housing phases, including the new 401 beds proposed by the Lassonde Living and Learning Center.





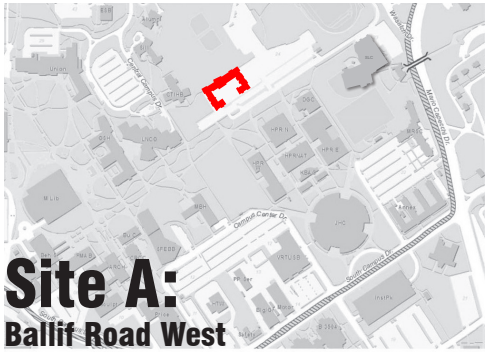


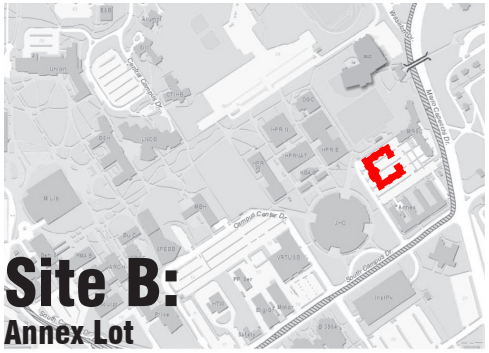
Strategies for Integrating Student Garage and Student Housing

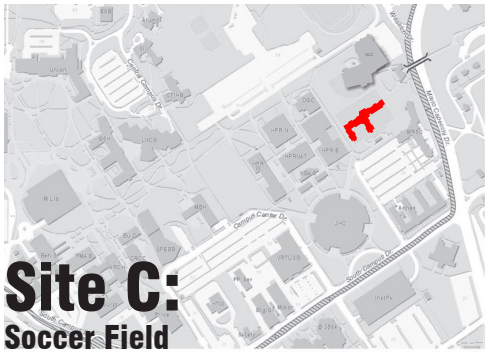
The architecture for the building should facilitate a seamless integration between Student Housing and the Student Garage Space by creating opportunities for multiple, random interactions between student residents and student entrepreneurs.

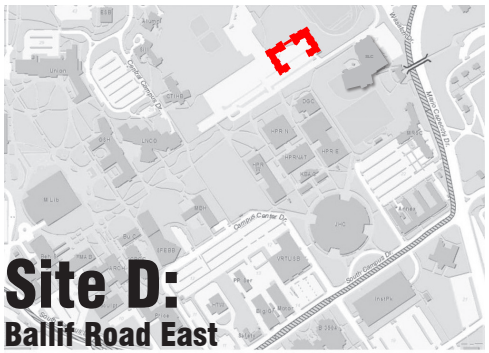
Early discussions suggest that there will be two separate housing towers: one for the Residence Hall Style Community housing, and one for the Apartment Community housing. However, to maximize community and collaboration, both towers are conceptualized to be accessed from a common lobby that is shared with the Student Garage. The lobby is intended to provide added opportunities for occupants to overlook the entrepreneurial activities of the Student Garage. The shared lobby is desired to be a strong architectural statement which visually links the two housing towers; speak of a successful academic program; and project a welcoming entrance to invite casual, curious visitors who may not be student residents, nor student entrepreneurs yet.

To further integrate the collaboration between Student Housing and the Student Garage, there are a number of spaces which may be shared by Housing and the Student Garage. The Area Summary, included in this document following the organizational diagrams, highlights spaces which have this potential.









Impact of Site Selection on Project Vision

Four Potential Sites:

Site A, Ballif Road West (east of Humanities)

Site B, Annex Lot (west of Marriott Honors Community)

Site C, Soccer field (northwest of Marriott Honors Community)

Site D, Ballif Road East (west of Track & Field)

Site Prioritization:

Required:
Site with visual exposure to heart of campus.

Meeting donor expectations for prominent site central to life of campus.

Site in immediate viewable/walkable vicinity to dining service. Walking path must be “active”. Maximum distance is the distance between Sage Point and Heritage Commons.

Site that allows vehicular access including:

- Fire department access
- Resident “move-in day”
- Student material drop off parking
- Garbage pick up
- Mail delivery

Site which allows parking adjacent to new housing:

The current ratio supports 40% of the population to have vehicles. This would translate to 160 student parking spaces.

Beyond parking garages proposed in the Parking Master Plan, one potential location for a new parking garage is in the hill directly east of the proposed HPER mall building site.

Recommended:
Site which consolidates new and existing housing so that Chartwells can commit to building a new dining facility.

Site within walkable distance to public transit. No greater walking distance than comparable housing on campus.

Site within close proximity to existing facilities that support the student invention and entrepreneurship program:

- Business School
- College of Engineering
- College of Science
- Health Sciences

Desirable:
Site within close proximity to existing housing community to capitalize on existing spaces:

- Student community spaces
- Mail room
- Front desk

Site that suits housing phasing (expansion) considerations.

STEP 1: Define the Site Evaluation Criteria

(A) *Identify the attributes the **ideal** location would or would not have and how this will be measured.*

(B) *Classify the necessity of each criterion. Is it required for the intended building use to function, will it provide additional benefit to the users and/or the university, or is it a feel-good issue?*

Programmatic Requirement = 5 *Additional Benefit = 3* *Feel-good Issue = 1*

	CRITERION	MEASURABLE INDEX (units)	
1	Visual Exposure to the Heart of Campus	The new 'social heart' of campus: the Union, main-campus housing, intramural fields and athletics facilities, and the Student Life Center	5
2	Within Walking Distance to Food Services Along an Active Pathway	Less than 400 yards / 5 minute walk	5
3	Within Walking Distance of Public Transportation (TRAX, Bus or Shuttle)	Less than 400 yards / 5 minute walk	5
4	Minimal Impact to Neighboring Facilities and Other Campus Groups	Physical & Political Impacts	5
5	Minimal Cost to Relocate Existing Facilities	Estimated $2M to relocate soccer field and $2.88M for replacement of displaced parking	3
6	Reasonable Proximity to Existing Allied Campus Resources	Business School, Architecture Shop, Engineering Labs, Medical School, Library	3
7	Vehicle Access for Loading and Unloading	Legal Parking Spots, No Parking on the Sidewalks or Lawn	5
8	Area for 160 Adjacent Student Parking Stalls (Based on a 213,487 GSF building on 5 floors)	42,697 SF Footprint + 56,000 SF for Parking + 170,400 SF for Landscape & Circulation Total for a Site 218,697 SF	5
9	Compatible with the Campus Master Plan's Guiding Principles for Future Development	Compact Academic Campus, Transit Oriented Developments, Enhanced Pedestrian & Bike Connections, Student Engagement Facilities	5
10			

Project: Lassonde Living & Learning Center **Date:** April 2013

Matrix provided by University of Utah Facilities

STEP 2: Identify the Criticality of Each Factor

Consider each pair of options listed below. If it were necessary to choose between them, which would it be? After marking each choice, indicate how difficult the decision was. Scores will be generated automatically.

	CRITERION	SCORE
1	Visual Exposure to the Heart of Campus	12
2	Within Walking Distance to Food Services Along an Active Pathway	8
3	Within Walking Distance of Public Transportation (TRAX, Bus or Shuttle)	2
4	Minimal Impact to Neighboring Facilities and Other Campus Groups	17
5	Minimal Cost to Relocate Existing Facilities	10
6	Reasonable Proximity to Existing Allied Campus Resources	3
7	Vehicle Access for Loading and Unloading	7
8	Area for 160 Adjacent Student Parking Stalls (Based on a 213,487 GSF building on 5 floors)	7
9	Compatible with the Campus Master Plan's Guiding Principles for Future Development	8
10		

	Hard	Easy
2		
1		✓

	Hard	Easy
3		
1		✓

	Hard	Easy
3		
2		✓

	Hard	Easy
4	✓	
1		

	Hard	Easy
4	✓	
2		

	Hard	Easy
4		✓
3		

	Hard	Easy
5		
1		✓

	Hard	Easy
5		
2	✓	

	Hard	Easy
5		✓
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	Hard	Easy
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	Hard	Easy
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3	✓	

	Hard	Easy
7	✓	
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7		✓
3		

	Hard	Easy
7	✓	
6		

	Hard	Easy
8		✓
3		

	Hard	Easy
8	✓	
6		

	Hard	Easy
9	✓	
2		

	Hard	Easy
9		
5	✓	

	Hard	Easy
9	✓	
8		

	Hard	Easy
10		
3		

	Hard	Easy
10		
6		

	Hard	Easy
10		
9		

STEP 3: Site Compatibility Evaluation

Campus Planning evaluated each site for compatibility with this facility based on the selection criteria the Steering Committee developed in Step 1.

\+ Meets the requirement. (100%)

= Marginally meets the requirement. (40%)

\- Does not satisfy the requirement. (0%)

Scores are generated automatically via spreadsheet calculations.

SITES	
A	Ballif Road West
B	Annex Lot
C	Soccer Field
D	Ballif Road East

	CRITERION	A	B	C	D
1	Visual Exposure to the Heart of Campus	+	=	+	+
2	Within Walking Distance to Food Services Along an Active Pathway	+	+	+	-
3	Within Walking Distance of Public Transportation (TRAX, Bus or Shuttle)	=	+	+	=
4	Minimal Impact to Neighboring Facilities and Other Campus Groups	-	-	-	=
5	Minimal Cost to Relocate Existing Facilities	+	=	-	+
6	Reasonable Proximity to Existing Allied Campus Resources	=	=	=	-
7	Vehicle Access for Loading and Unloading	=	-	+	=
8	Area for 160 Adjacent Student Parking Stalls (Based on a 213,487 GSF building on 5 floors)	=	-	+	=
9	Compatible with the Campus Master Plan's Guiding Principles for Future Development	-	+	+	=
10					

Site Compatibility		A	B	C	D
	Ranked	2	3	1	4
	Raw Percentage	51	47	71	44

Matrix provided by University of Utah Facilities

STEP 4: CALCULATIONS

Weighted Scores: *The intuitive importance of each criterion* (STEP 1) *multiplied by its comparative criticality* (STEP 2).
Formal Weight: *The weighted scores converted to a percentage.*
Composite Scores: *How well each criterion is satisfied at each site (STEP 3) multiplied by the formal weight.*
Final Site Compatibility Score: *The sum of all the composite scores for each site.*

CRITERIA	(STEP 1)	(STEP 2)	Weighted Score	Formal Weight	(STEP 3) A	B	C	D
1	5	12	60	17%	100%	40%	100%	100%
2	5	8	40	12%	100%	100%	100%	0%
3	5	2	10	3%	40%	100%	100%	40%
4	5	17	85	25%	0%	0%	0%	40%
5	3	10	30	9%	100%	40%	0%	100%
6	3	3	9	3%	40%	40%	40%	0%
7	5	7	35	10%	40%	0%	100%	40%
8	5	7	35	10%	40%	0%	100%	40%
9	5	8	40	12%	0%	100%	100%	40%
10								
			344	100%	51%	47%	71%	44%

Composite Scores

CRITERIA	A	B	C	D
1	17%	7%	17%	17%
2	12%	12%	12%	0%
3	1%	3%	3%	1%
4	0%	0%	0%	10%
5	9%	3%	0%	9%
6	1%	1%	1%	0%
7	4%	0%	10%	4%
8	4%	0%	10%	4%
9	0%	12%	12%	5%
10				
	48%	38%	65%	50%
	3rd	4th	1st	2nd

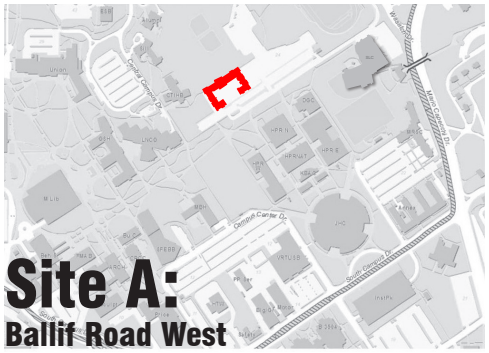
SITES	
A	Ballif Road West
B	Annex Lot
C	Soccer Field
D	Ballif Road East

Final Site Compatibility Scores

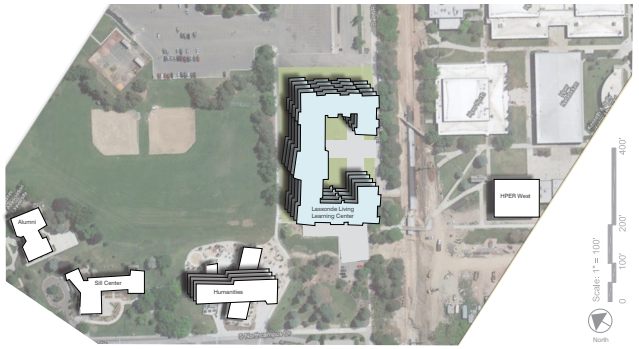
Site Ranking

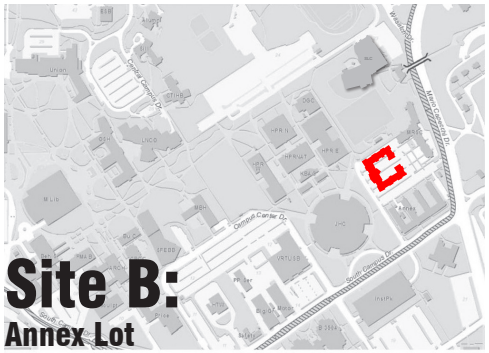
Matrix provided by University of Utah Facilities

Note: These diagrams are not intended to describe building design. The shapes are only intended to illustrate the approximate dimension for building wings of residential housing, and the approximate size of the footprint for a 5-story building on each building site.

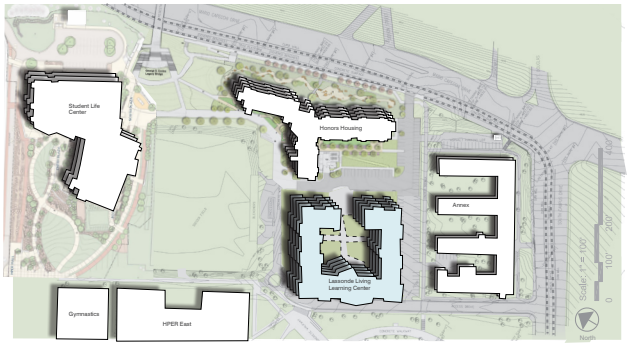


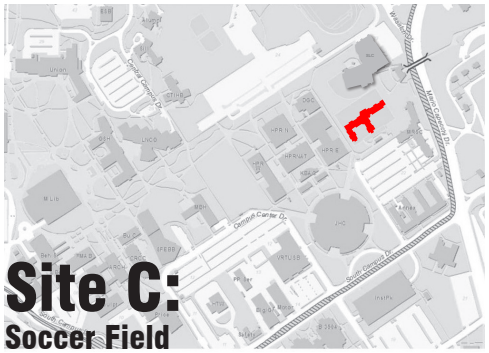
Site A:
Ballif Road West



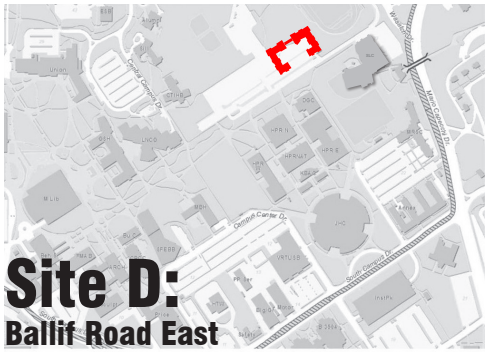


Site B:
Annex Lot

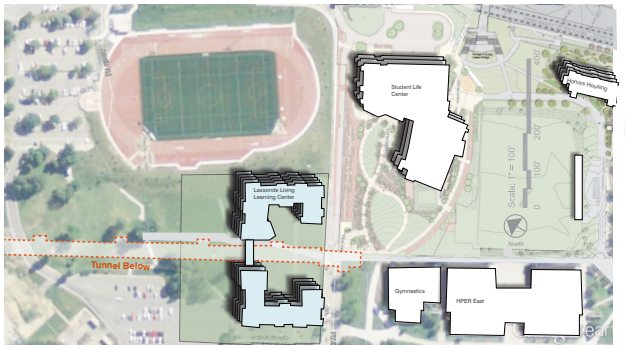




Site C:
Soccer Field

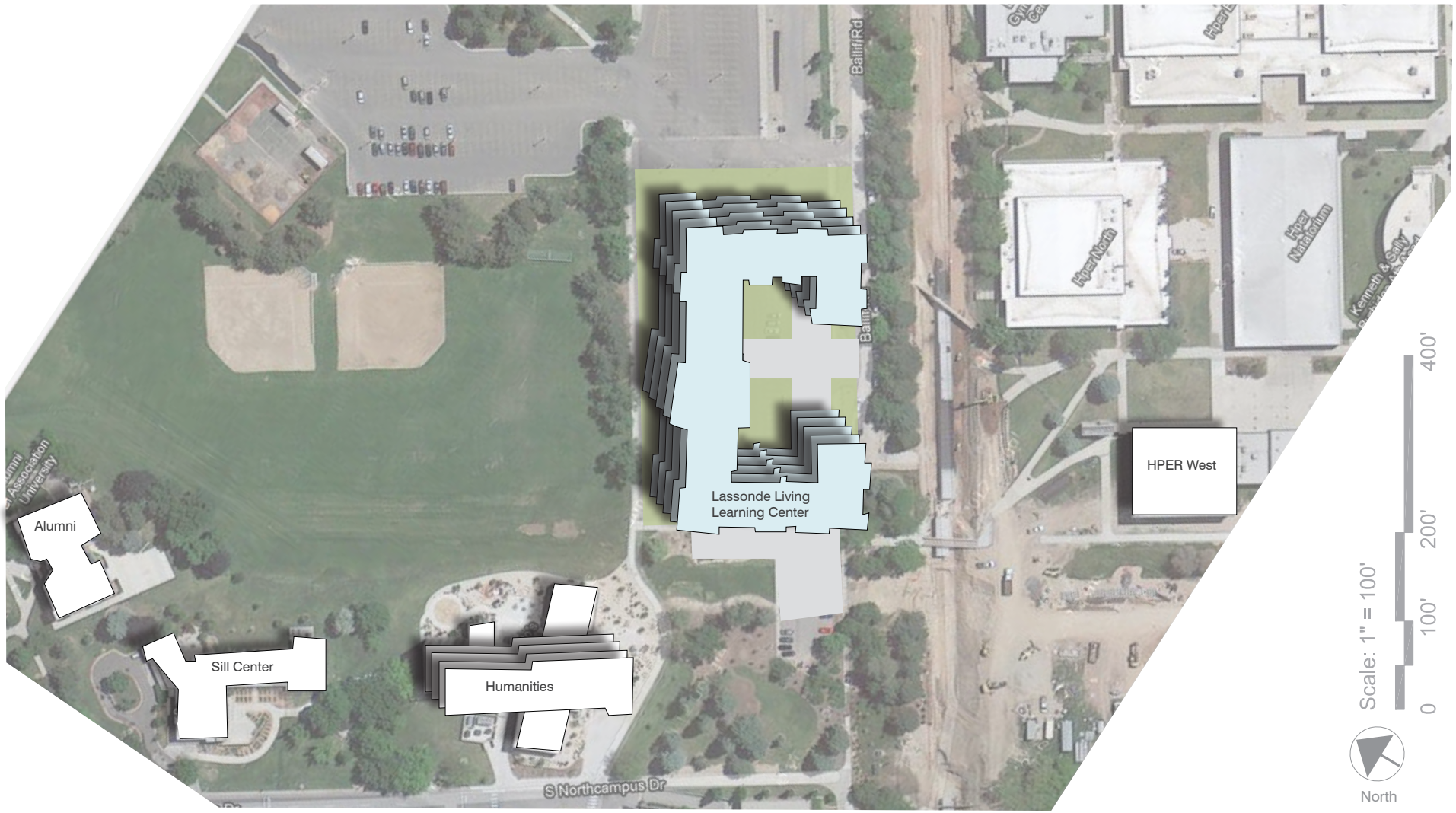


Site D:
Ballif Road East



Note: This diagram is not intended to describe building design. The shape is only intended to illustrate the approximate dimension for building wings of residential housing, and the approximate size of the footprint for a 5-story building on this building site.

Site A:
Ballif Road West



Site Selection: Site Option A

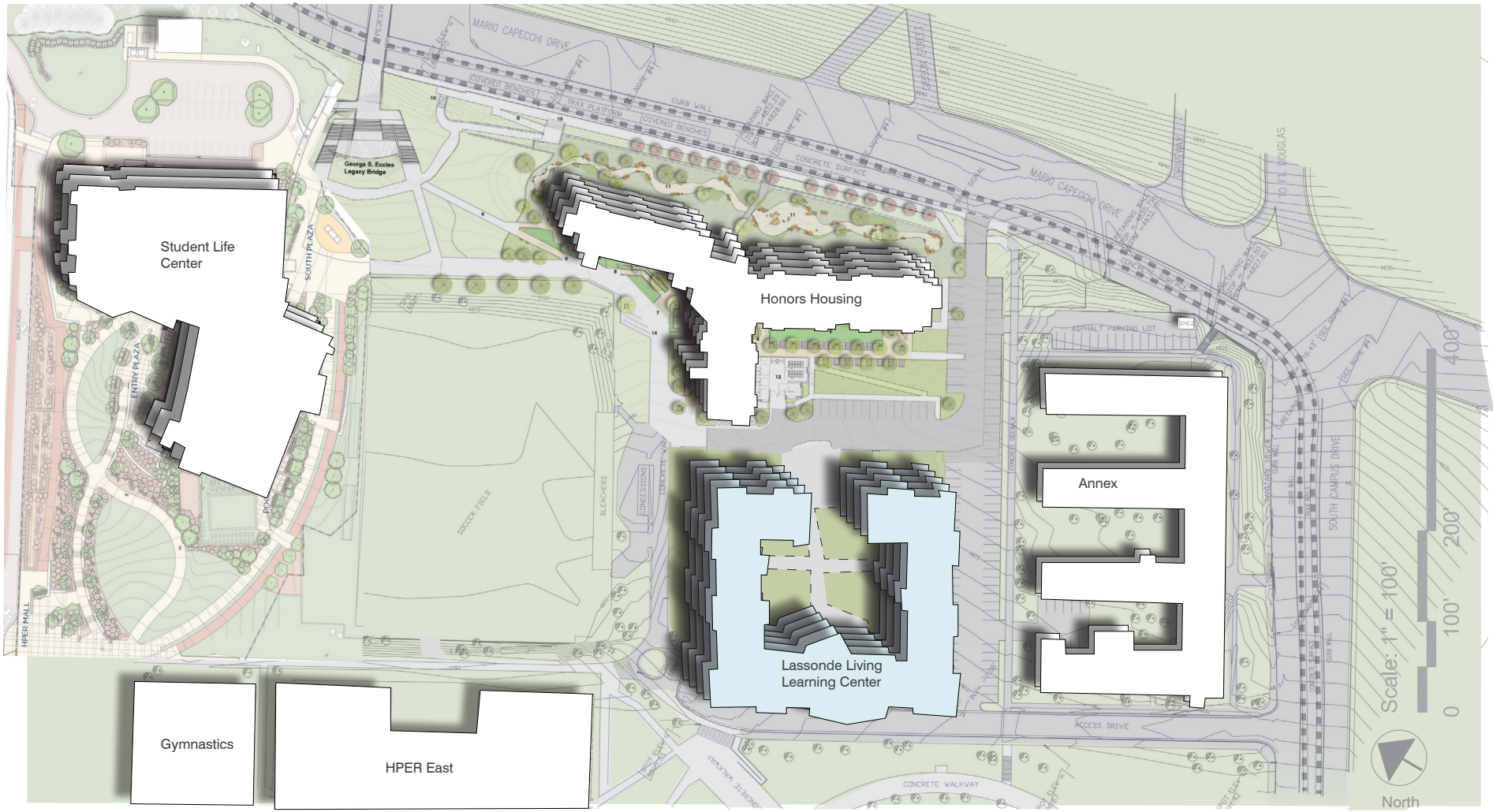
Note: This diagram is not intended to describe building design. The shape is only intended to illustrate the approximate dimension for building wings of residential housing, and the approximate size of the footprint for a 5-story building on this building site.

Site A.1:
Ballif Road West

Site Selection: Site Option A.1

Note: This diagram is not intended to describe building design. The shape is only intended to illustrate the approximate dimension for building wings of residential housing, and the approximate size of the footprint for a 5-story building on this building site.

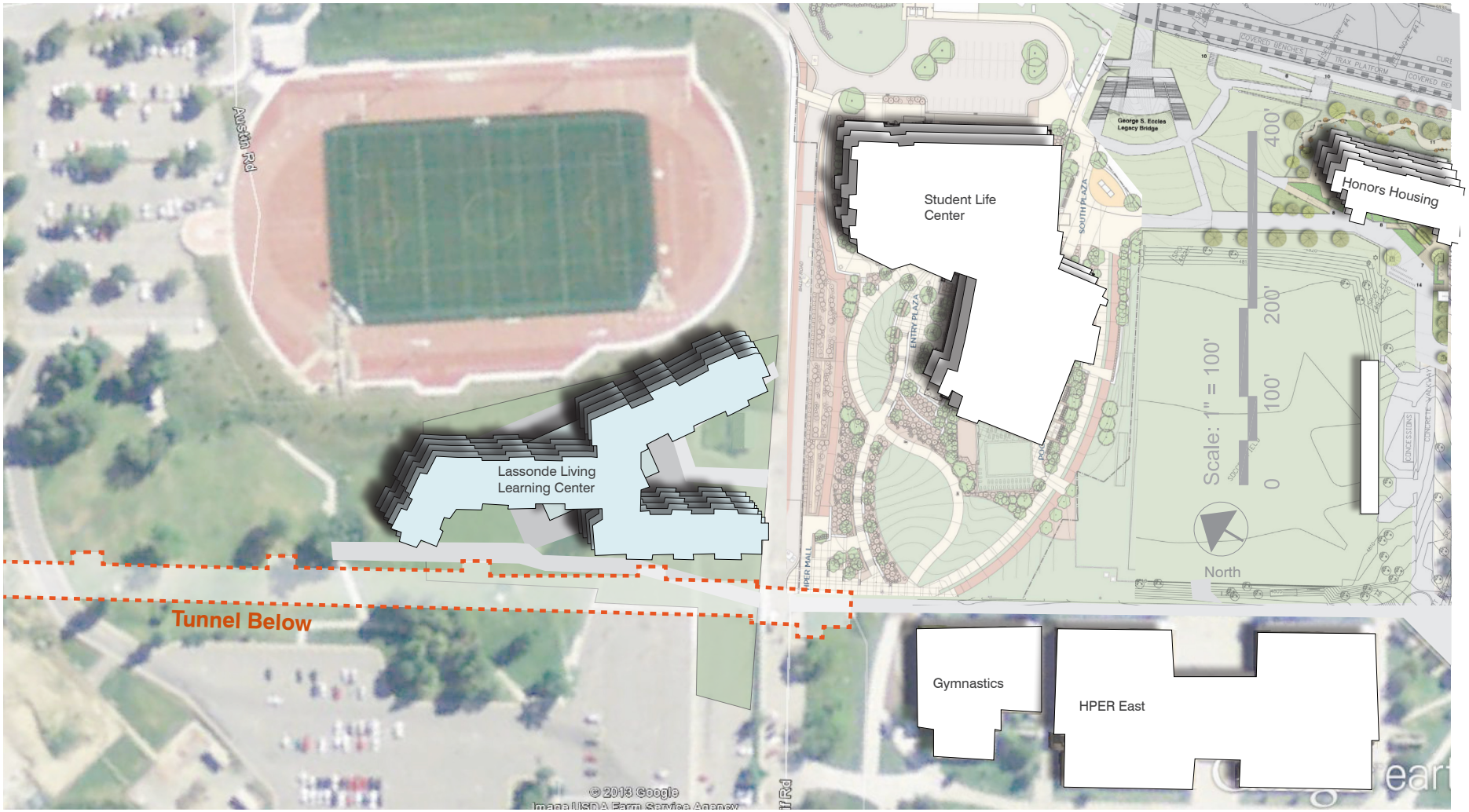
Site B:
Annex Lot



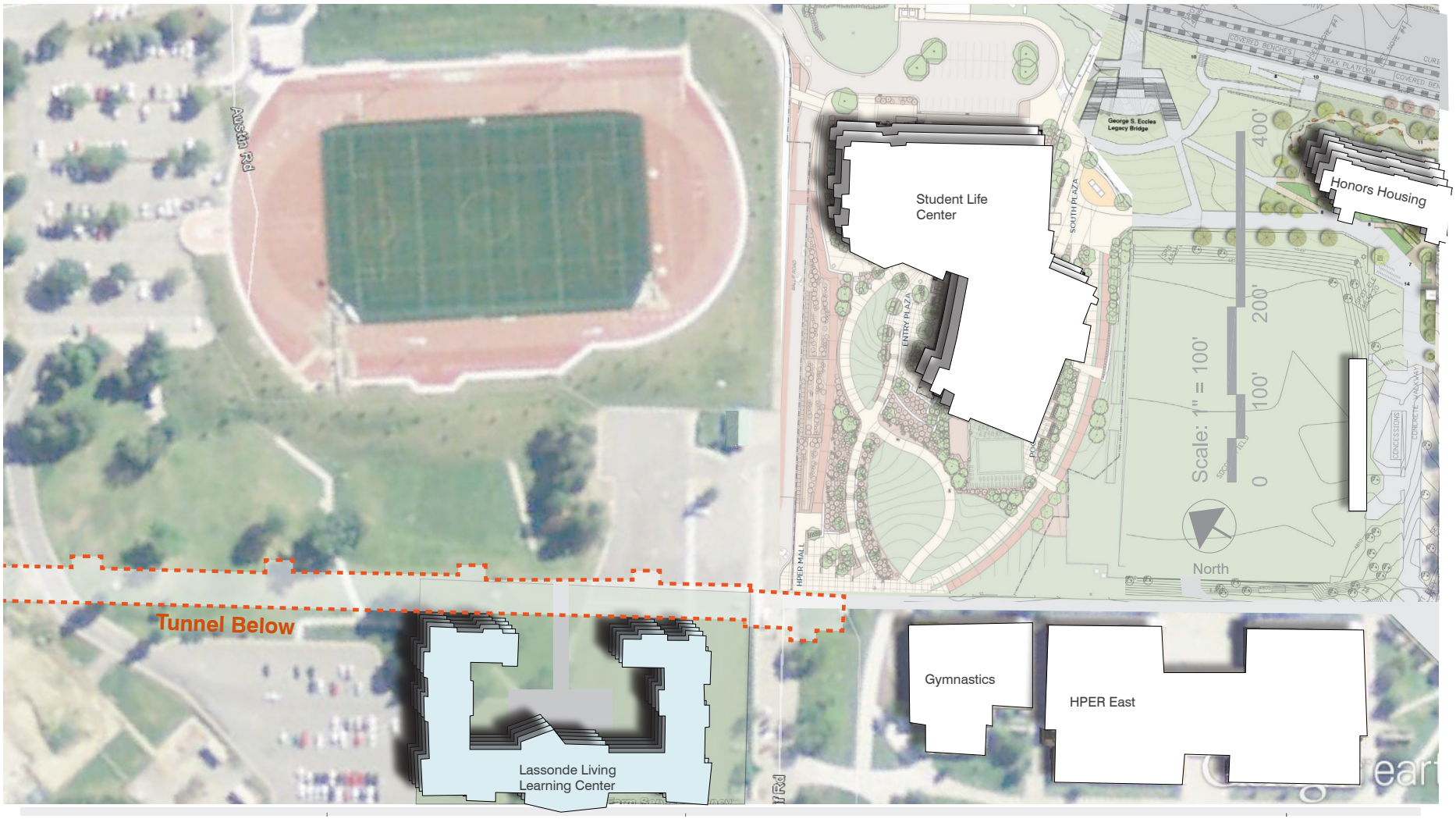
Note: This diagram is not intended to describe building design. The shapes are only intended to illustrate the approximate dimension for building wings of residential housing, and the approximate size of the footprint for a 5-story building on this building site.

Site C:
Soccer Field

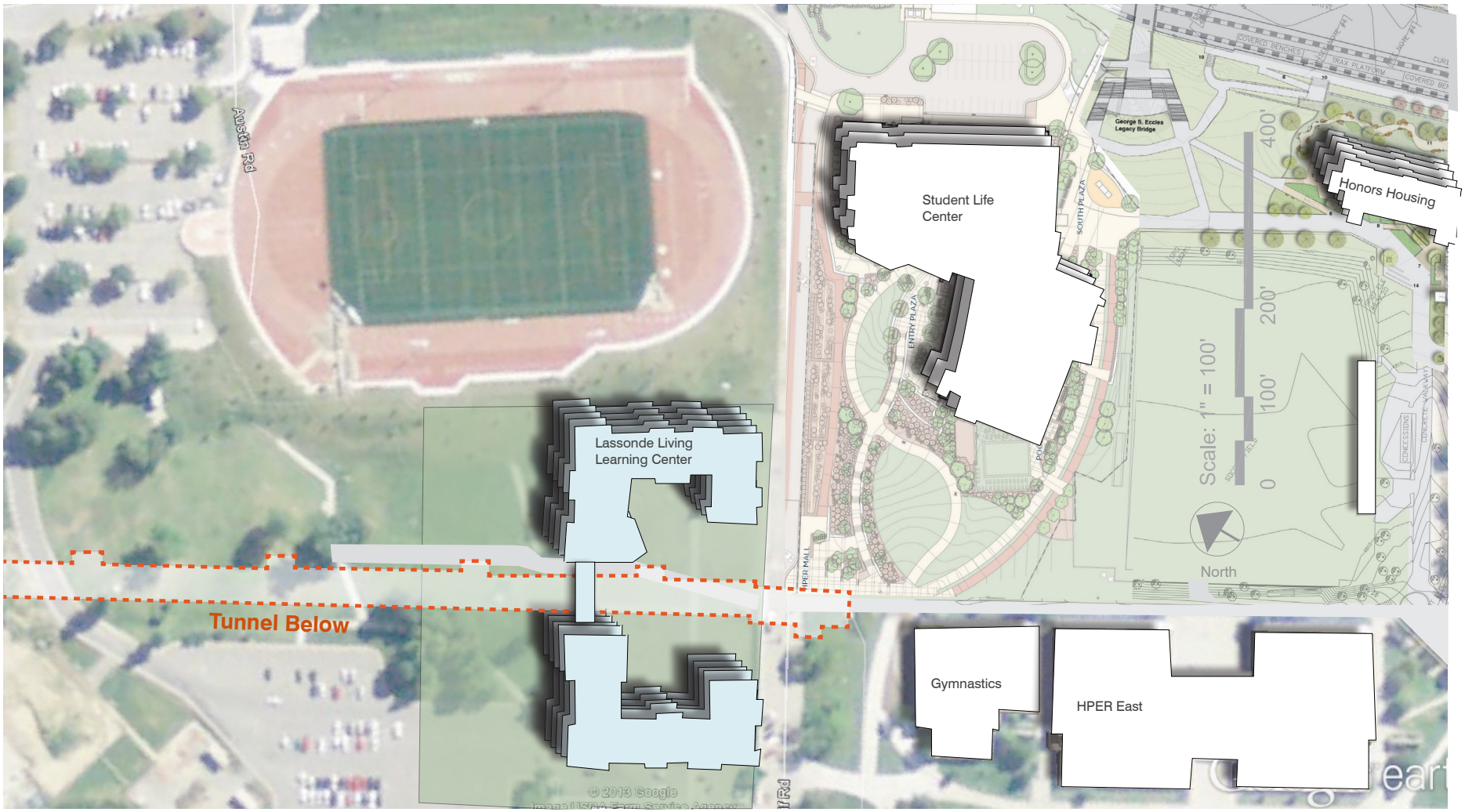
Site D.1:
Ballif Road East



Site D.2:
Ballif Road East

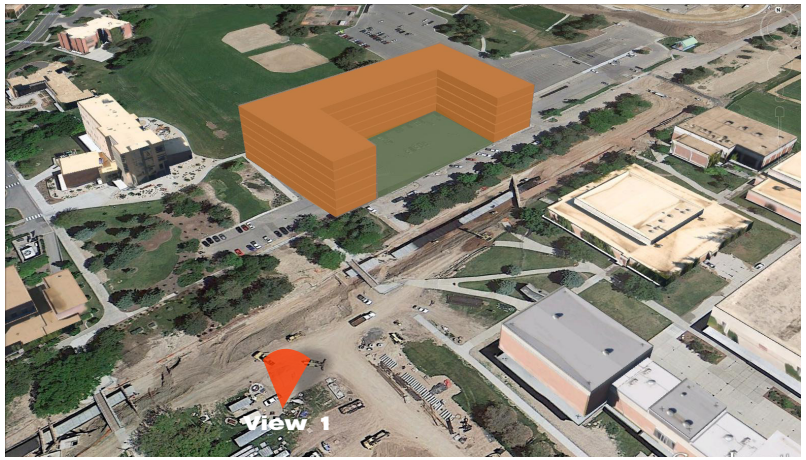


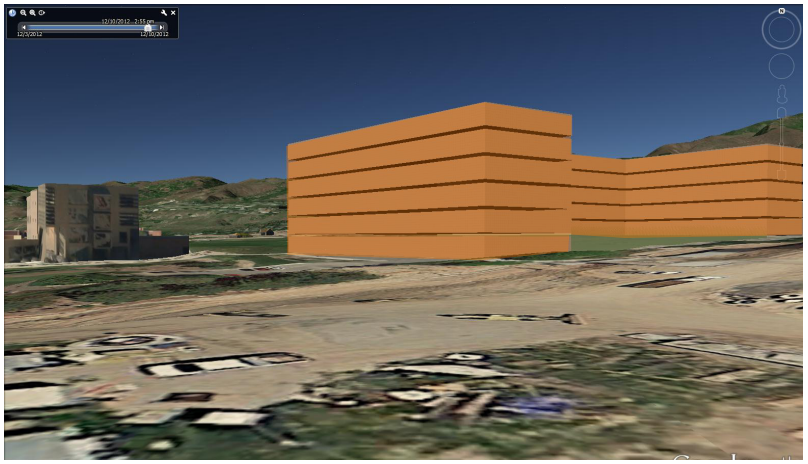
Site D.3:
Ballif Road East



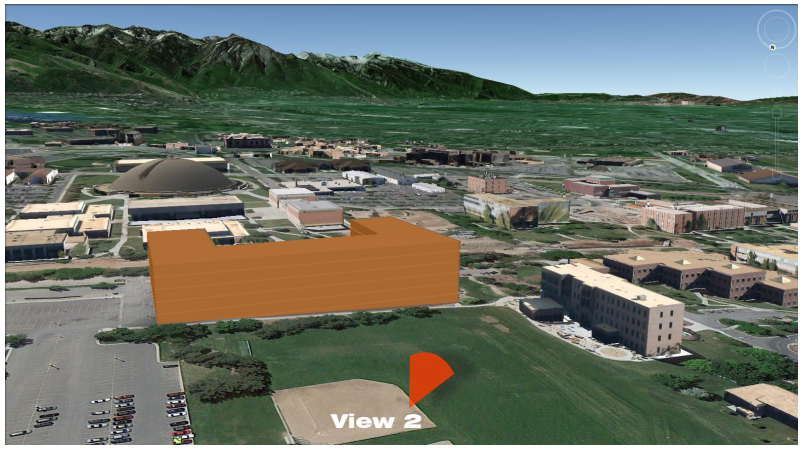
Note: These Visual Impact Studies are not intended to be interpreted as design form, but are solely intended to represent estimated building height and the proposed impact to surrounding buildings and views.

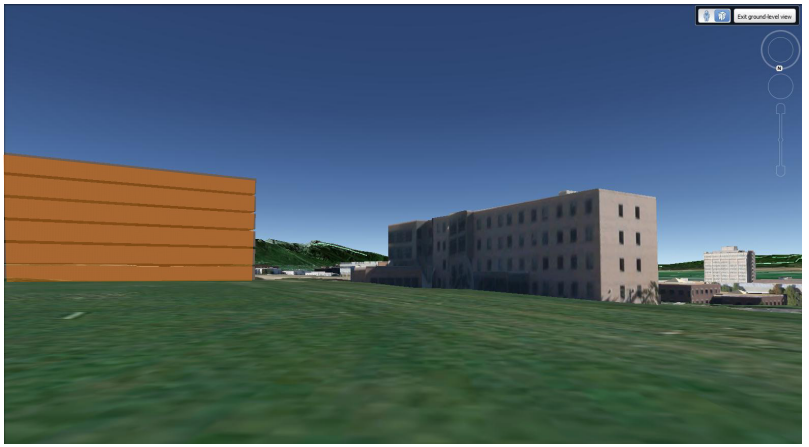
Site A:
Ballif Road West





View 1

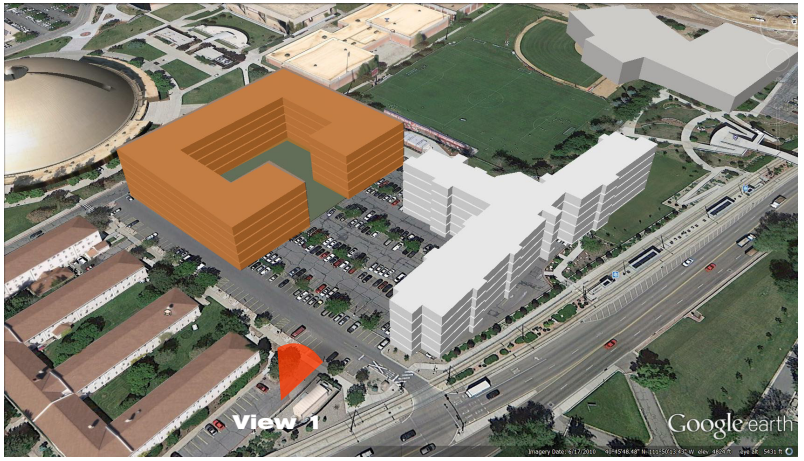


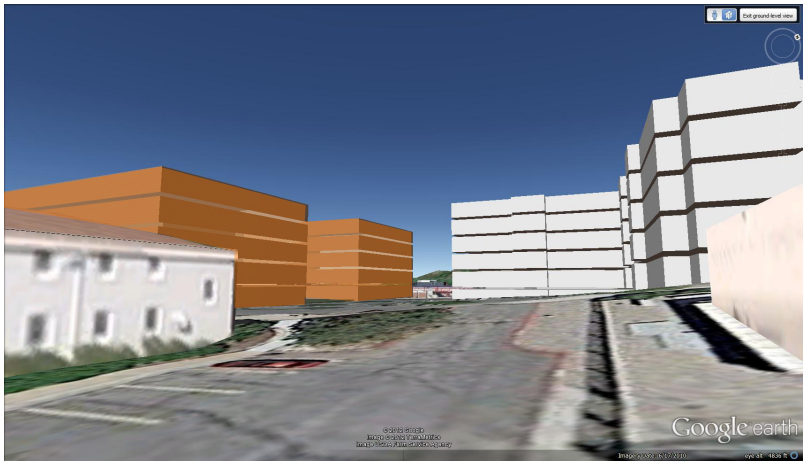


View 2

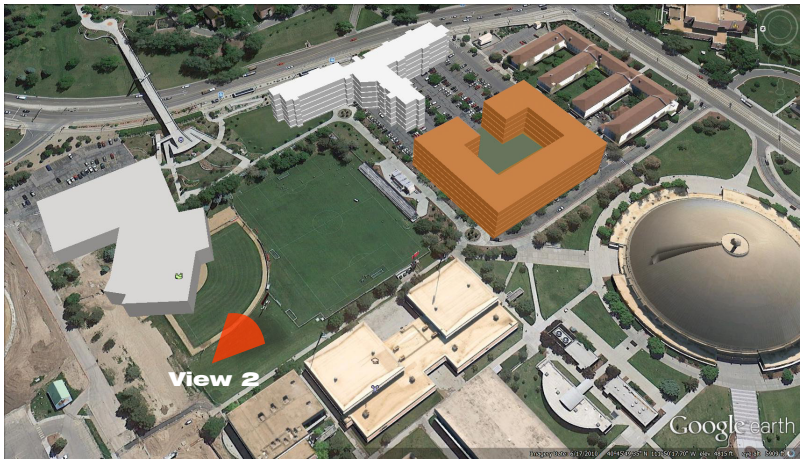
Note: These Visual Impact Studies are not intended to be interpreted as design form, but are solely intended to represent estimated building height and the proposed impact to surrounding buildings and views.

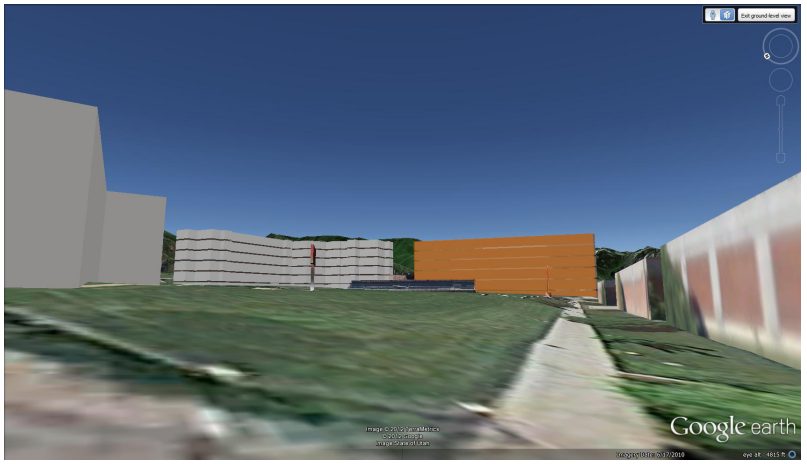
Site B:
Annex Lot





View 1

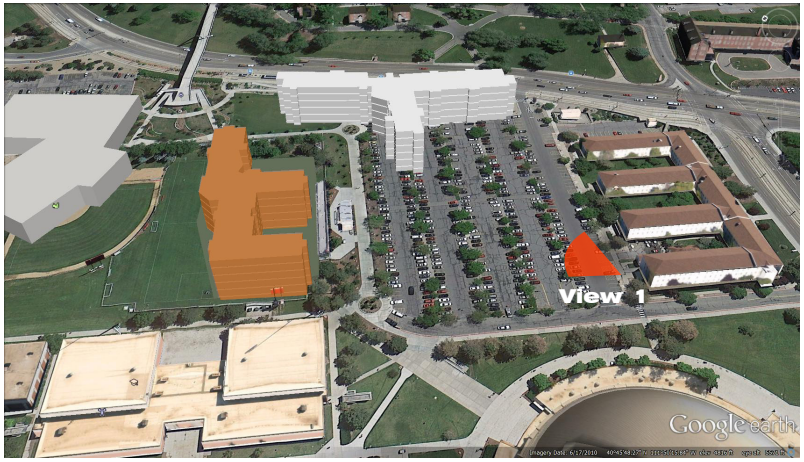


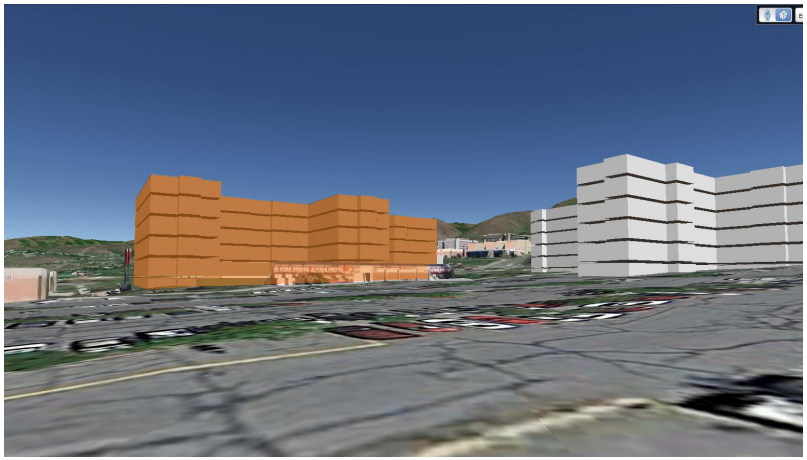


View 2

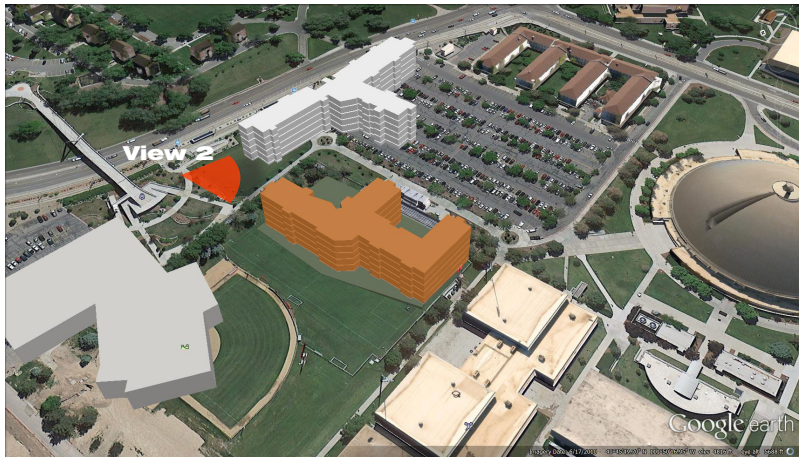
Note: These Visual Impact Studies are not intended to be interpreted as design form, but are solely intended to represent estimated building height and the proposed impact to surrounding buildings and views.

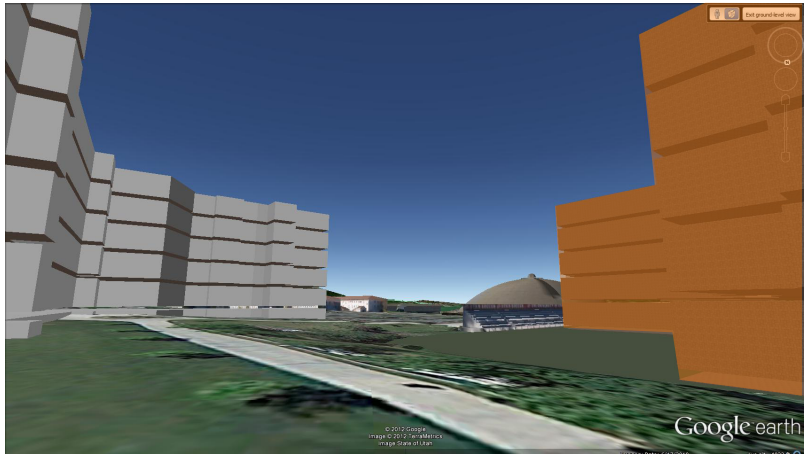
Site C:
Soccer Field





View 1

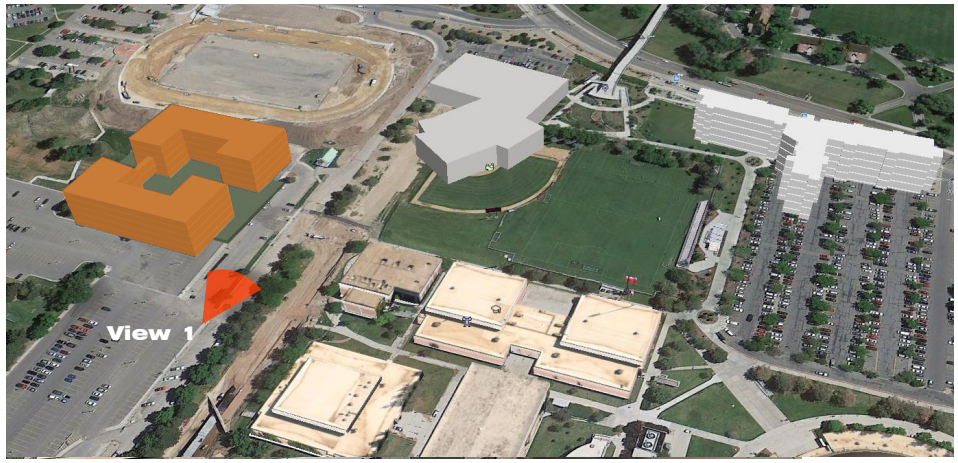


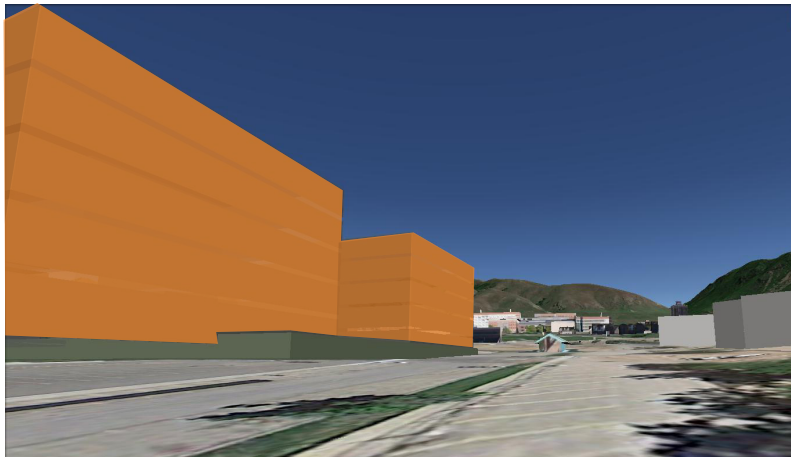


View 2

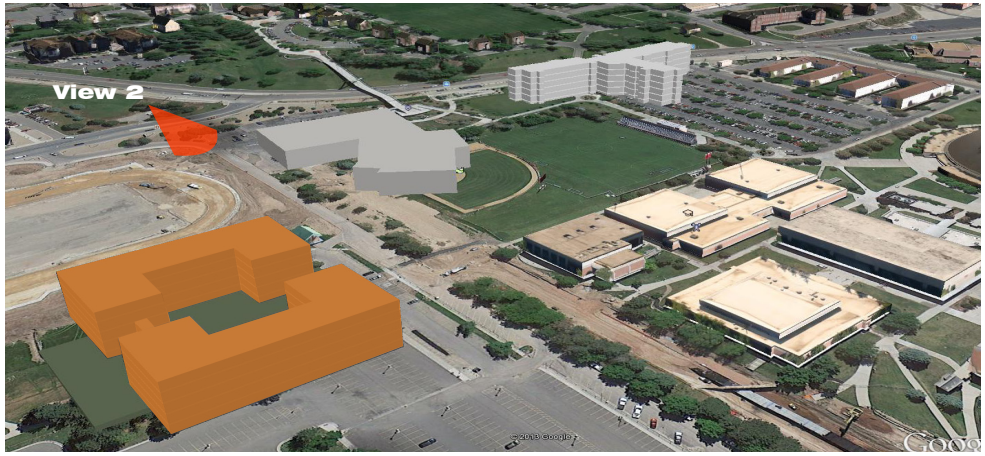
Note: These Visual Impact Studies are not intended to be interpreted as design form, but are solely intended to represent estimated building height and the proposed impact to surrounding buildings and views.

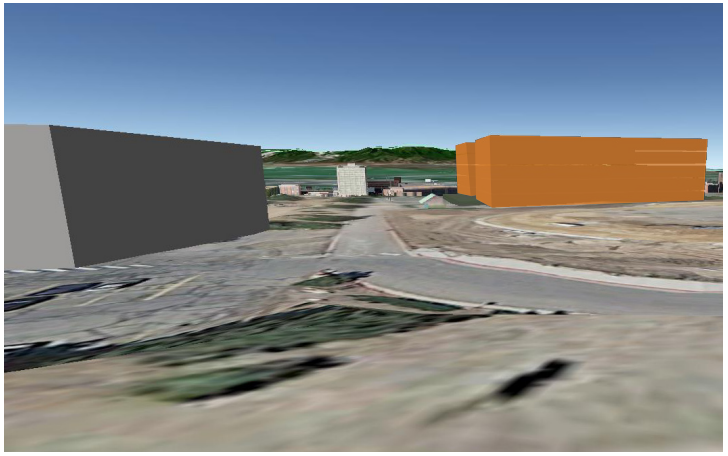
Site D:
Ballif Road East





View 1





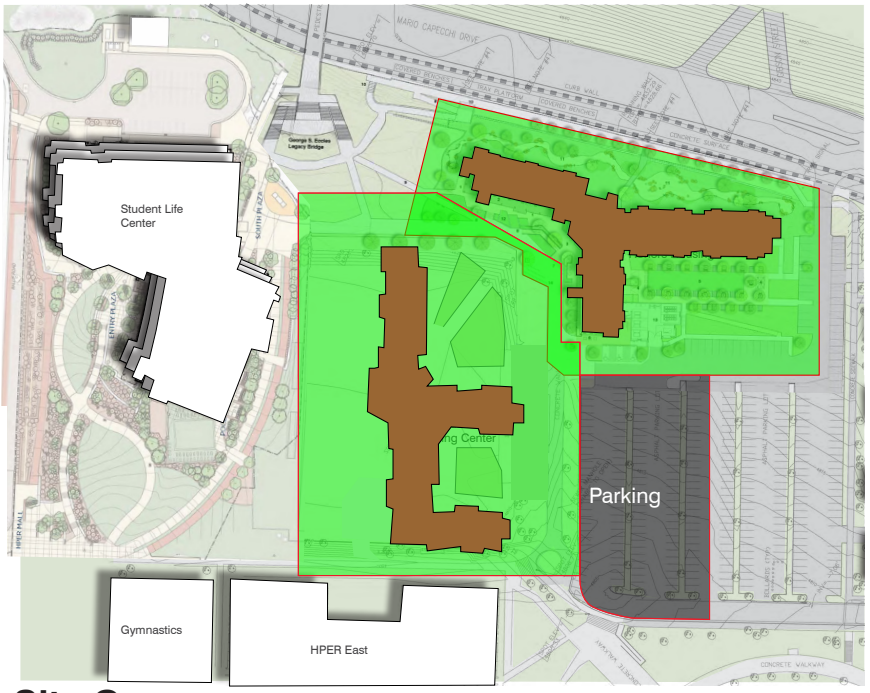
View 2

Site Selection: Building / Required-Open-Space Ratio Diagrams

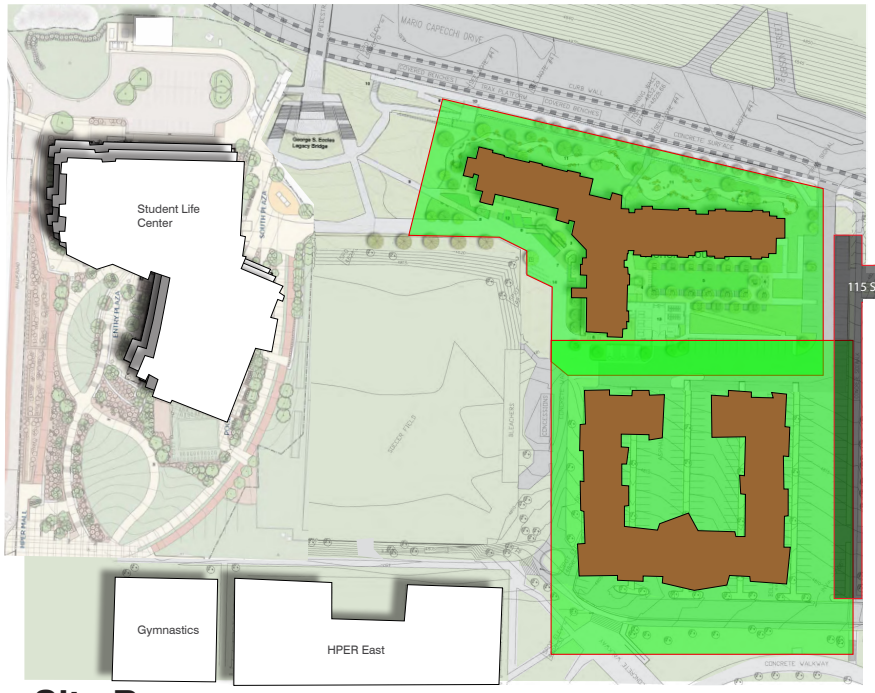
Site A

Diagrams Provided by University Facilities

North



Site C



Site B

Site D

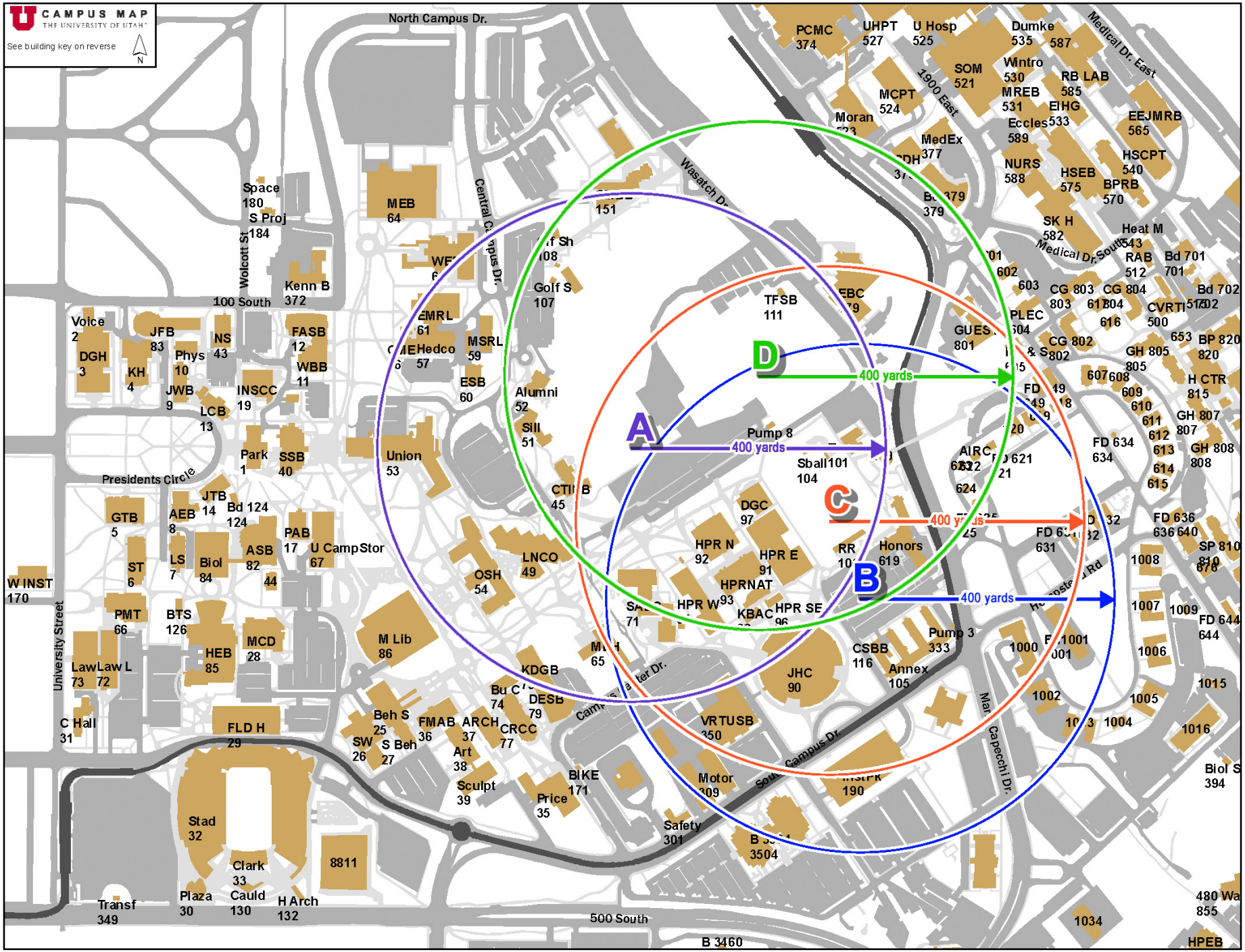
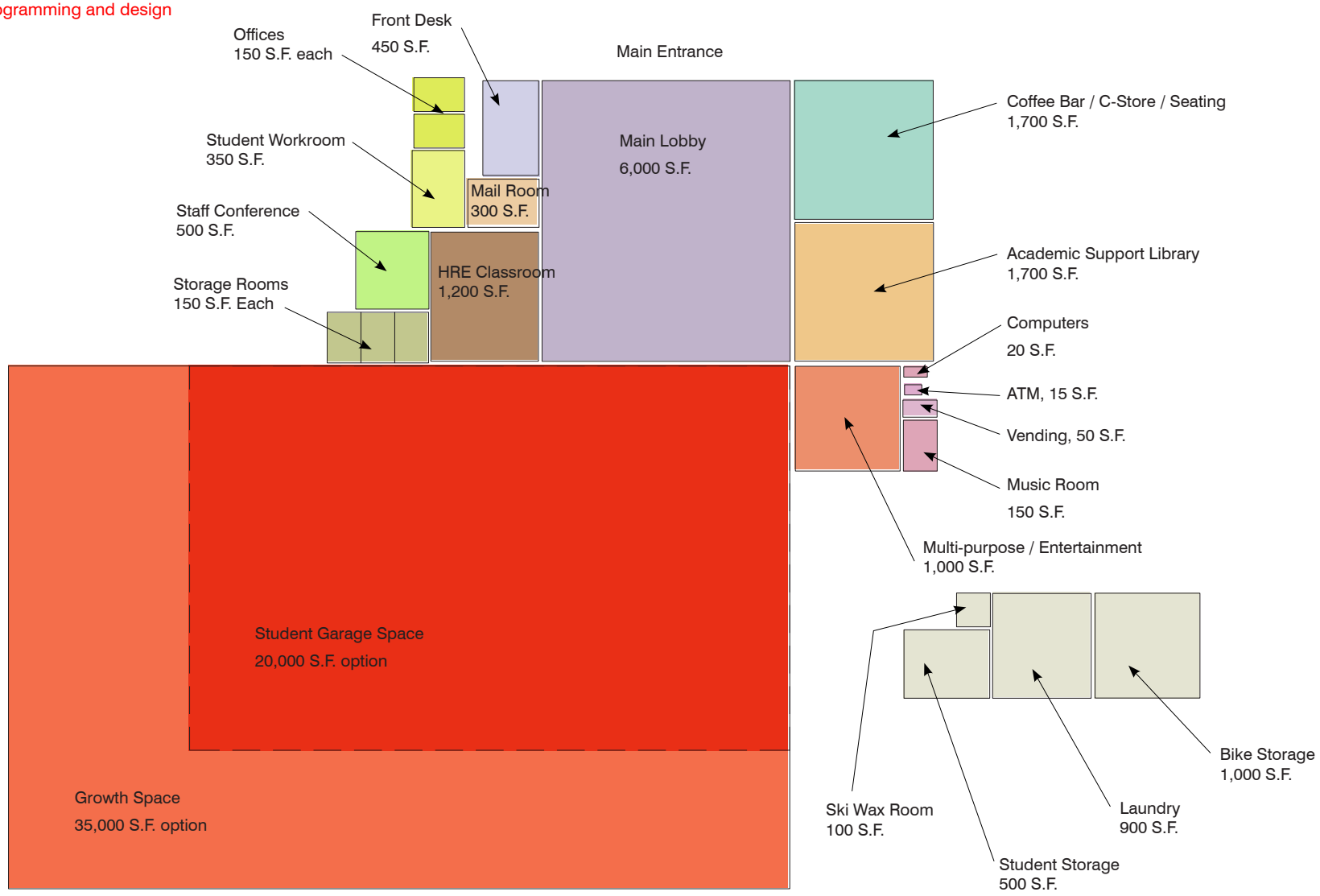


Diagram Provided by University Facilities

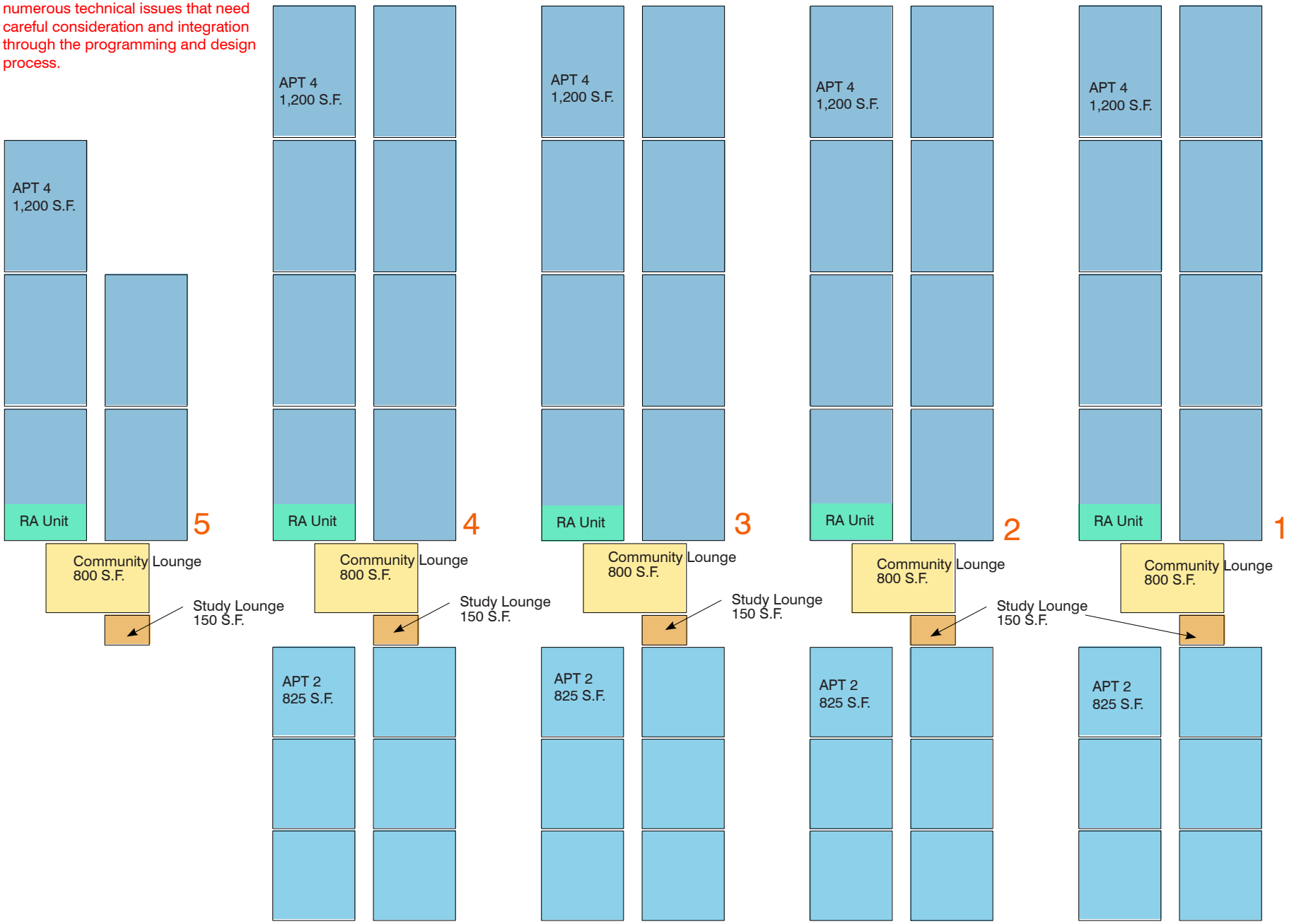
Note: The attached Organizational Diagrams should not be interpreted as comprehensive Floor Plans, as they have been developed solely to study area adjacencies and sizes. There are numerous technical issues that need careful consideration and integration through the programming and design process.

Common Area Organizational Diagram



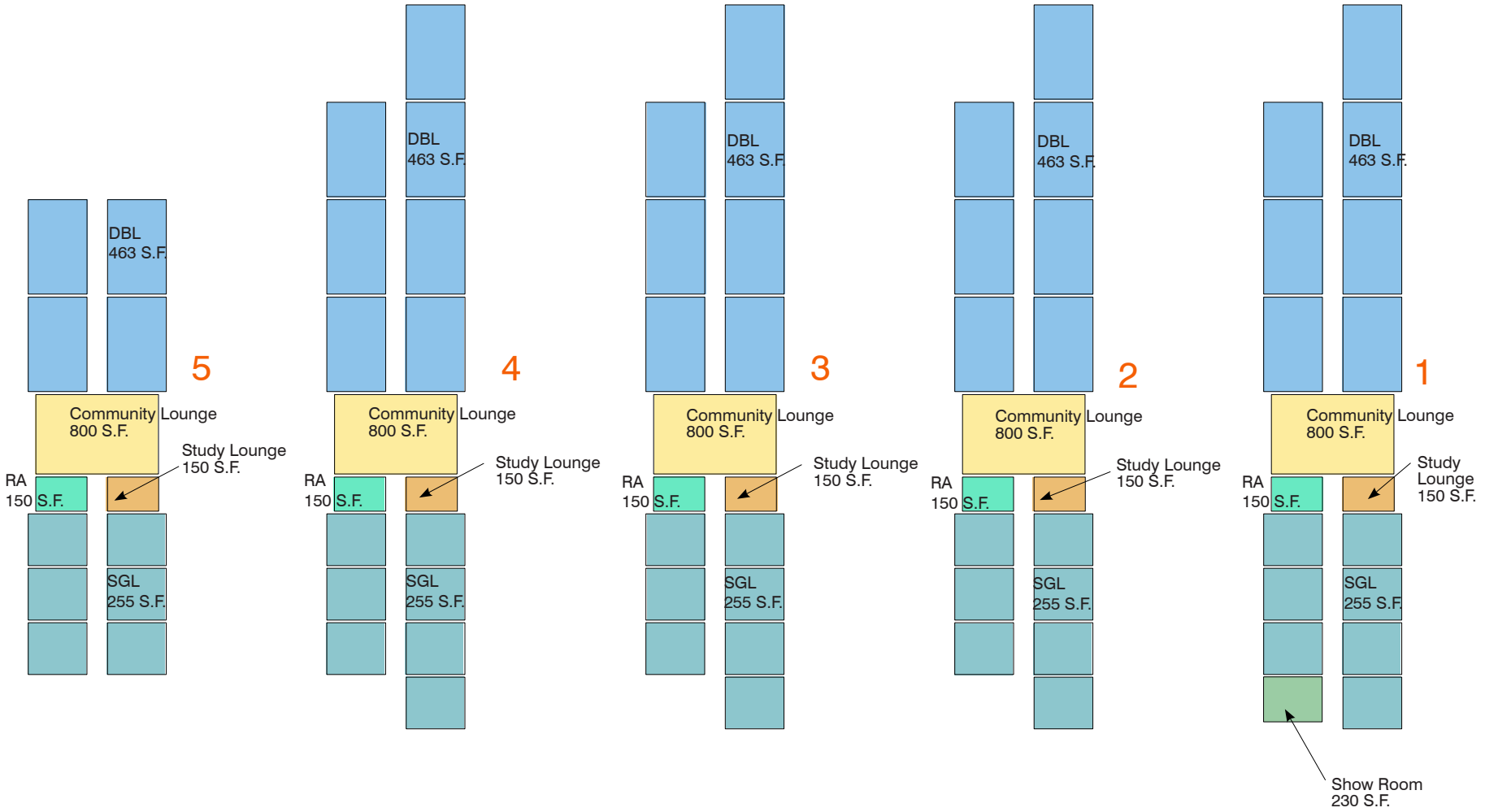
Note: The attached Organizational Diagrams should not be interpreted as comprehensive Floor Plans, as they have been developed solely to study area adjacencies and sizes. There are numerous technical issues that need careful consideration and integration through the programming and design process.

Upper-Division & Graduate Student Housing Organizational Diagram



Note: The attached Organizational Diagrams should not be interpreted as comprehensive Floor Plans, as they have been developed solely to study area adjacencies and sizes. There are numerous technical issues that need careful consideration and integration through the programming and design process.

First Year Student Housing Organizational Diagram



Room:	Staff per unit	Ocpts per unit	QTY	Unit (S.F.)	Total (S.F.)	Adjacency Requirements:	Comments:
Residential Living Units (Bed quantity)	resident count		net sf:	91,036			**2 Residential Towers - 1 upper division - 1 lower division**
APT-4	148	4	37	1,200	44,400	100 sq ft bedrm/1200 sq ft apt	private bedroom, closet, 2 bath, kitch, living
APT- 2	48	2	24	825	19,800	110 sq ft bedrm/ 825 sq ft apt	private bedroom, closet, bath, kitch, living
Double Type B- Semi-Suite double	128	4	32	463	14,816	209 sq ft bedrm/ 463 sq ft suite	shared bedroom, 1/2 closet, shared bath
Single Type A - Semi Suite Single	68	2	34	255	8,670	105 sq ft bedrm/255 sq ft suite	private bedroom, closet, shared bath
RA spaces- res hall	5	1	5	150	750	150 sq ft bedrm single studio	private bedroom, closet, bath
RA spaces- in a 4 bed apt	4	1	4	200	800	220 sq ft bedroom suite in apt	private bedroom, closet, bath, with living rm
APT-Res Ed Staff			2	900	1,800		Residential Education Coordinator and Assistant Residential Education Coordinator apartments.
	401						
Residential Community Spaces:			net sf:	23,375			
Entry Lobby			1	6,000	6,000	1st floor	
Academic Support/Library			1	1,700	1,700	1st floor	tutoring space
C-Store/Coffee Bar/Seating			1	1,700	1,700		
Multi-Purpose/Entertainment Zone		40 to 50	1	1,000	1,000		pool table, ping Pong, 72" TV, soft seating for 1/4 occupants
HRE Classroom		70	1	1,200	1,200		RA Program Space
Music Room			1	150	150	1st floor	
Computer Drop and Stop Space / print			3	20	60		
Study lounges - per floor		6 to 8	10	150	1,500	1 each floor	Glass wall, white board, conference table
Community Lounges - per floor		40	10	800	8,000	1 each floor	
Vending Machine Space			1	50	50		
ATM Space			1	15	15		
Bike Storage			1	1,000	1,000		adjust area to LEED and Bike MasterPlan requirements
Laundry area			1	900	900		
Ski wax			1	100	100		
Residential Administration Spaces			net sf:	3,080			
Front Desk			1	450	450	1st floor	includes vacuum storage and roomkey board
Staff Offices			2	150	300		
Show space for tours			1	230	230		1/2 of double unit type, to be used as a tour room
Student Workroom			1	350	350		
Mail Room			1	300	300		could be shared with Honors
Storage Rooms			3	150	450		
Student Storage (revenue generating)			1	500	500		if near Honors, could use Honors
Staff Conference room		15	1	500	500		
Student Garage Space			net sf:	20,000	35,000	(Alternate size)	
Building Support and Maintenance							**Gross Area Estimate includes these spaces**
Trash Deposit Rooms			10				
Trash Collection Room			2				
Custodial Break Room			1				
Maintenance Storage			1				
Custodial Office			1				
Custodial Storage Room			1				
Custodial washer/dryer room			1				
Custodial Closets			11				
Furniture and supply storage			1				
Cell Phone Antenna Room			1				
Vertical Circulation (Stairs / Elevators)			4				
Public Men/Women Toilet Rooms			2				
Public Unisex Toilet Rooms			2			One adjacent to each Men/Women	
Satelite Electrical Rooms			6				
Netcom Closets			6				
Main Electrical Room			1				
Mechanical Room			1				
Elevator Equipment Rooms			2				
Landscape Maintenance Room			1				

Highlighted spaces indicate possible combined use (and net area redundancy) for both residential and garage functions.

Model 1 (20,000 s.f. Garage Space)
Total Net Square Footage: **137,491** NSF
Total Gross Square Footage Estimate: **192,487** GSF

Model 2 (35,000 s.f. Garage Space)
Total Net Square Footage: **152,491** NSF
Total Gross Square Footage Estimate: **213,487** GSF

Gross Square Foot Multiplier= 1.4
(71% Efficiency

Utility Considerations

Site Utilities

The general existing utilities locations are shown on the Figures for each site location. The existing utilities that will be relocated as part of the project are outlined the same Figures for each location. Refer to below for the utilities that will need to be extended or constructed for the new building at each site.

Existing Utilities to be Extended

Below outlines the basic utilities which are available near each site and utility extensions to each proposed building site. The capacity of these utilities to service the proposed building are being evaluated at this time by the U of U Utility personnel. Detention storage for storm drain systems will also be required at each site. Detention storage areas have not been shown but will be necessary before connection to the existing campus storm drain system.

Water

Site Option A1:
An 8" water line is located adjacent to the Humanities building on the northwest side of the proposed site. A new 8" line will be looped around the new site and connect in the Mall on the southern side of the site to an existing 16" waterline. Fire sprinkler service and domestic service will be able to connect to the building from this new 8" loop. Refer to Figure A1.

Site Option B:
An 8" water line is located adjacent to the Marriott Honors Community building on the west side of the building. A new 8" line will be looped around the new site and connect back to the existing 8" line. Fire sprinkler service and domestic service will be able to connect to the building from this new 8" loop. Refer to Figure B1.

Site Option C:
An 8" water line is located adjacent to the HPER complex along the northern side of these buildings. In addition, there is a 12" line located near the south landing of the Legacy Bridge. A new 12" water line would be extended and looped around the proposed future building. The fire sprinkler and domestic water system for this option would extend from this new 12" waterline extension. In addition, a new 8" line will be extended from the Marriott Honors Community waterline on the western side of this building to the existing water line on the northern side of the HPER buildings. This will provide water for fire hydrants that would be required on this side of the building. Refer to Figure C1.

Site Option D.3:
An 18" water line is located in the mall along the southern side of the proposed building. An 8" or 10" fire sprinkler and 6" domestic water system for this option would extend from this existing 18" waterline. This will provide water for Fire Hydrants that would be required around the building spaced at 300 foot intervals. Refer to Figure D1.

Sewer

Site Option A1:
An existing 8" sewer line is located on the western side of the site that services the Humanities building. Based on 401 Beds, the peak flow from the housing building would be approximately 110 gpm. The existing 8" should have capacity to accommodate the new project. Refer to Figure A1 for the sewer connection.

Site Option B:
The existing 12" sewer line along the southern side of this option is near capacity, according to the U of U Utility personnel so the proposed building could not connect to this system. There is also a 12" sewer line located on the northwest side of the existing softball field (adjacent to the Mall). Connection to this line will require a new 8" sewer line to extend across the athletic fields to service the proposed building. Refer to Figure B1 for the sewer line extension to the building.

Site Option C:
There is an existing 12" sewer line located on the northwest side of the existing softball field. A new 8" sewer would need to extend across the athletic fields to service the proposed building. Refer to Figure C1 for the sewer line extension to the proposed building.

Site Option D.3:
An existing 8" sewer line is located on the southern side the new site that extends northward from the mall adjacent to the tunnel. If this line cannot be used on both sides of the tunnel, then a secondary connection to the existing 12" sewer adjacent to the HPER complex would need to be constructed to connect the building to the Campus sewer system. Refer to Figure D1 for the sewer connection

Storm Drain

Site Option A1:
An existing 24" storm sewer line is located along the Mall on the southern side of the proposed building. New connections will be made to this 24" line in two locations. Each connection will be routed through a detention system to release 0.2 cfs per acre of developed area prior to release to the 24" pipe. To meet LEED requirements for the building, gravel basins will be used to infiltrate the 2 year storm without any release to the existing system. Refer to Figure A1 for the proposed connection locations.

Site Option B:
An existing 24" storm sewer line is located along the northern side of the proposed building and an existing 12" line is located along the western side of the proposed building. New connections will be made to the 24" line in one location. Due to the downhill gradient of the court yard the out-fall from the courtyard would most likely need to be sleeved through the building wing. Other building connections will need to be connected on the south side of the building. Each connection will be routed through a detention system similar to Option A1. Refer to Figure B1 for the connection locations.

Site Option C:
An existing 24” storm sewer line is located along the southern side of the proposed building. New connections will be made to this 24” line in two locations. Each connection will be routed through a detention system similar to Option A1. Refer to Figure C1 for the connection locations.

Site Option D.3:
An existing 24” storm sewer line is located along the Mall on the Southern side of the proposed building. New connections will be made to this 24” line in two locations. Each connection will be routed through a detention system to release 0.2 cfs per Acre of developed area prior to release to the 24 inch pipe. To meet LEED requirements for the building, gravel basins will be used to infiltrate the 2 yr storm without any release to the existing system. Refer to Figure D1 for the proposed connection locations.

Gas / HT Water
Site Option A1:
An existing 6” high pressure gas main would need to be relocated around the site. HT water is located in the Mall along the southern side of the proposed building. This site would most likely use the HT water for building use. Refer to Figure A1 for a possible connection location.

Site Option B:
An existing 4” gas line is located along the northern end of the proposed building. The gas line has been shown to extend to the site for building use. HT Water is located north of the Softball Fields and is a considerable distance from the building, but could be extended to the proposed building for use. This will need to be determined which would be most cost effective. We have shown only the gas line extension on the Figure. Refer to Figure B1 for the connection location of the gas line.

Site Option C:
An existing 4” gas line is located along the northern end of the proposed building. A portion of the line will need to be relocated around the end of the building site. The gas line could also be extended to the site for building use. HT water is located north of the Softball Fields and could also be extended to the proposed building for use. This will need to be determined which would be most cost effective. We have shown only the gas line extension on the Figure. Refer to Figure C1 for the connection location of the gas line.

Site Option D.3:
An existing Gas lateral would need to be relocated around the site if the line is still active. This cannot be confirmed at this point. . HT water is located in the Mall along the southern side of the proposed building as well as running between the two halves of the building. This site would most likely use the HT water for building use. Refer to Figure D1 for a possible connection location. The existing gas lateral is in the area and using gas may be desirable for the new building for laundry or other building uses in addition to heating.

Relocation of Utilities

The majority of the utilities that will need to be removed from the site do not impact other areas but are sprinkler lines for athletic fields. However, each site will have some existing utilities that will need to be relocated as part of the site construction to maintain utility service to the rest of Campus.

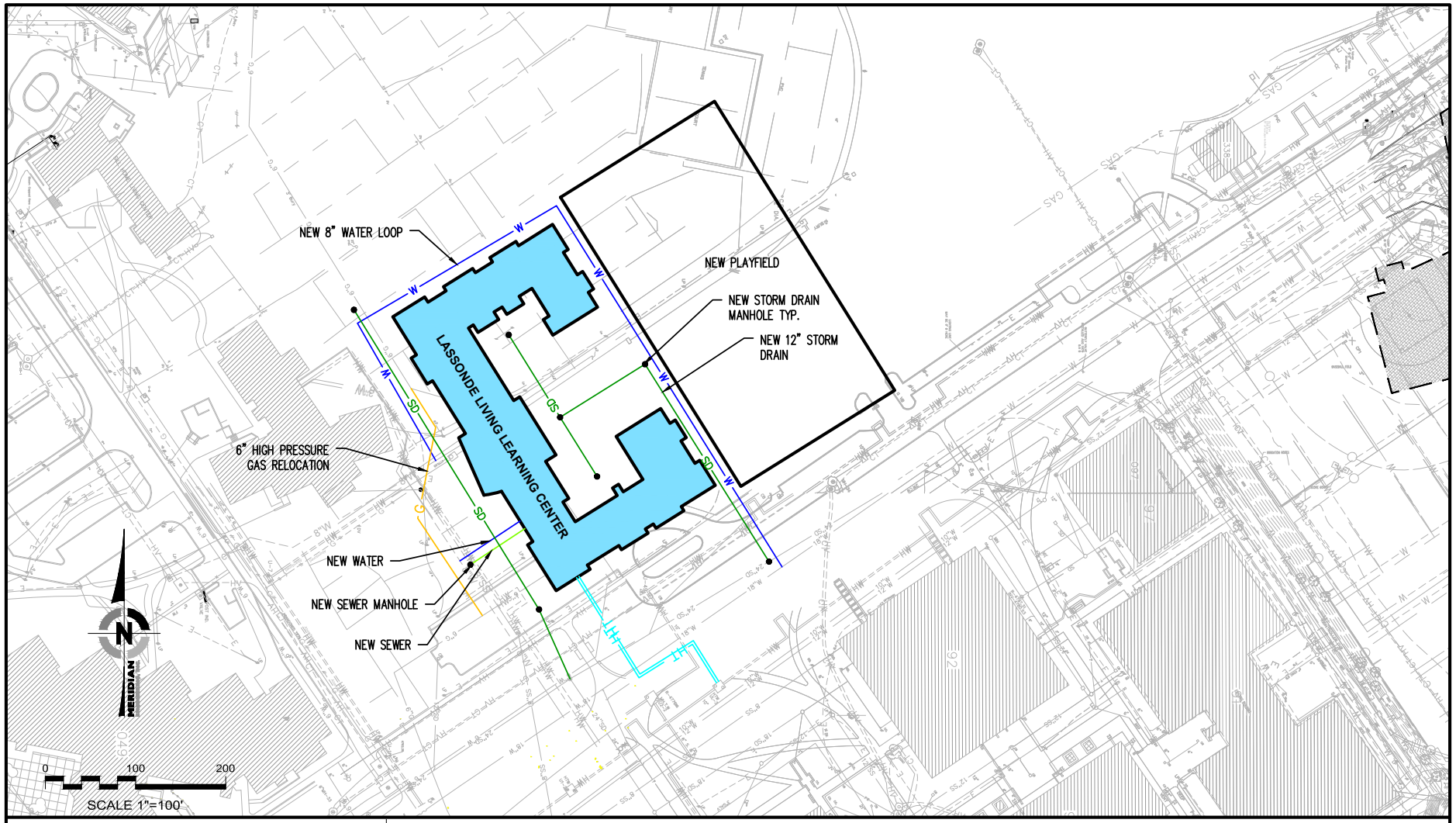
Option A1:
This site has a 6" high-pressure gas main that would require relocation to place the building in the location shown on Figure A1. The entire site could move north and east by about 40 feet and avoid the gas main, otherwise, the high pressure main would need to be relocated as indicated on Figure A1.

Option B:
This site has a high voltage and communications duct bank that routes east and west through the proposed building site. This duct bank has been shown routed northward around the proposed building. Refer to Figure B1. Refer to the electrical section for the sizes of the relocated duct banks and new connections to the proposed building.
There is also a short section of an existing 24" storm drain and an 8" water line that need to be relocated around the northwest corner of the site in order to accommodate the proposed building location. These relocations are shown on Figure B1.

Option C:
This site has a high voltage line routing from the north that would need to be rerouted along the northern side of the proposed building. There is also high voltage and communications duct bank that routes east and west through the proposed building site. This duct bank has been shown routed southward around the proposed building. Refer to Figure C1. Refer to the electrical section for the sizes of the relocated duct banks and new connections to the proposed building.

In addition, there is an existing 4" intermediate pressure gas main on the north end of the building that may require relocation. The relocation and connection to the proposed building is shown on Figure C1.

Option D.3:
This site has a high voltage line routing along the existing tunnel that would need to be protected or rerouted if the building could not be placed over this line similar to the tunnel. The tunnel needs to stay in place and the building must be located on either side of the tunnel, or bridge over it. An existing gas lateral (unsure if it is abandoned) would require relocation if it is an active line.

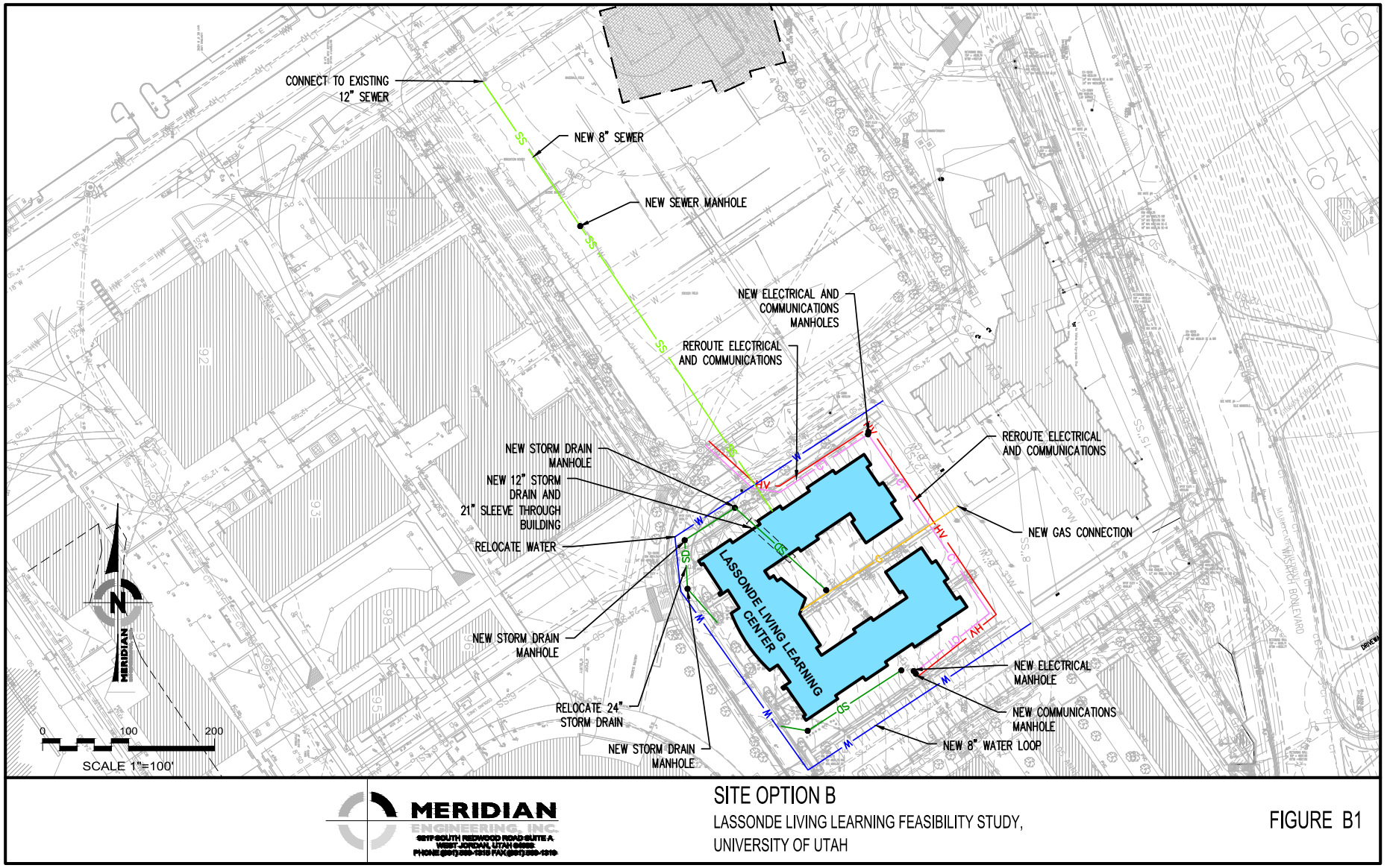


MERIDIAN ENGINEERING, INC.
4919 SOUTH REDWOOD ROAD SUITE A
WEST JORDAN, UTAH 84088
PHONE (801) 569-1515 FAX (801) 569-1310

SITE OPTION A1

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE A1

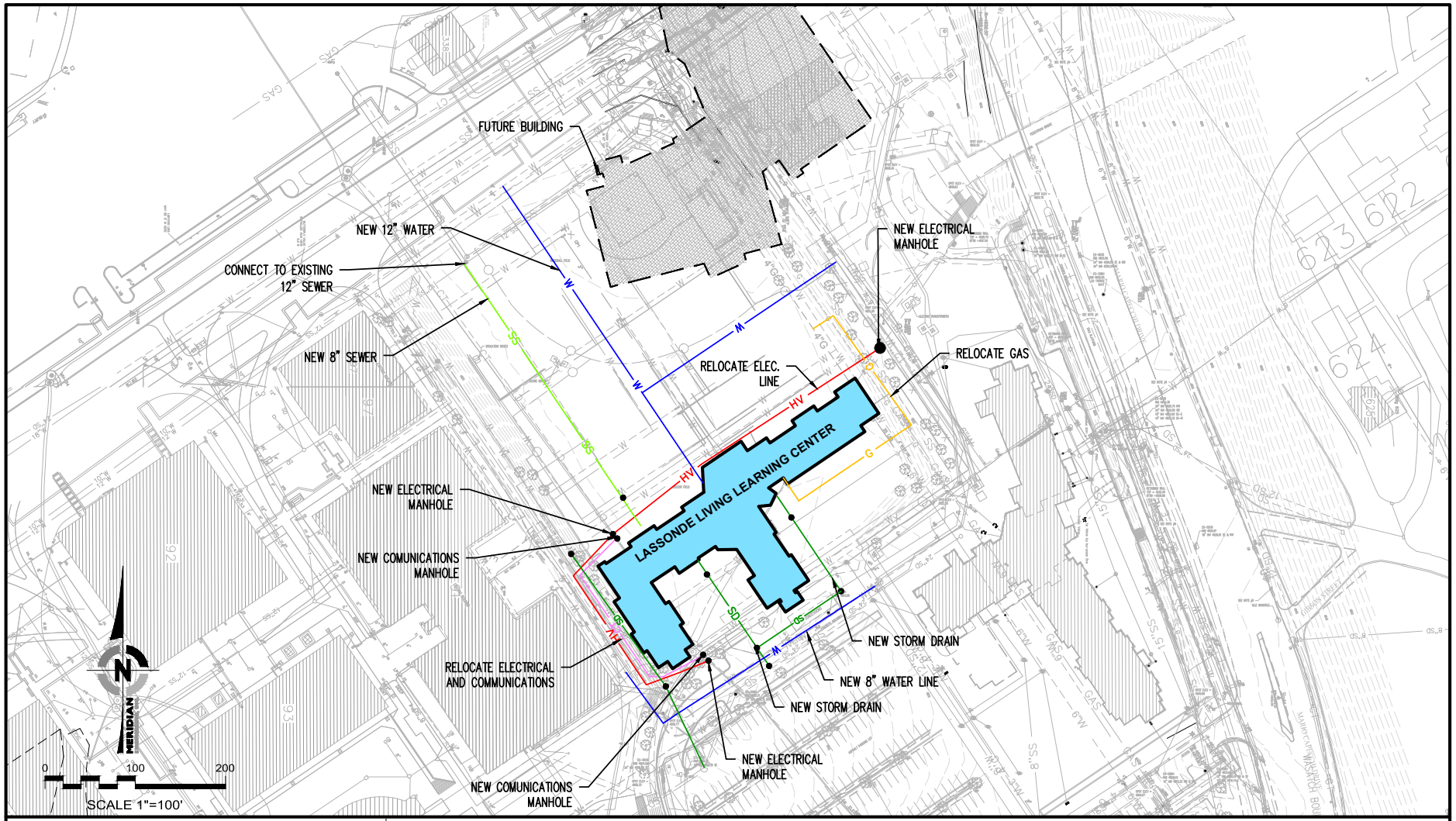


MERIDIAN ENGINEERING, INC.

SITE OPTION B

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE B1



MERIDIAN ENGINEERING, INC.
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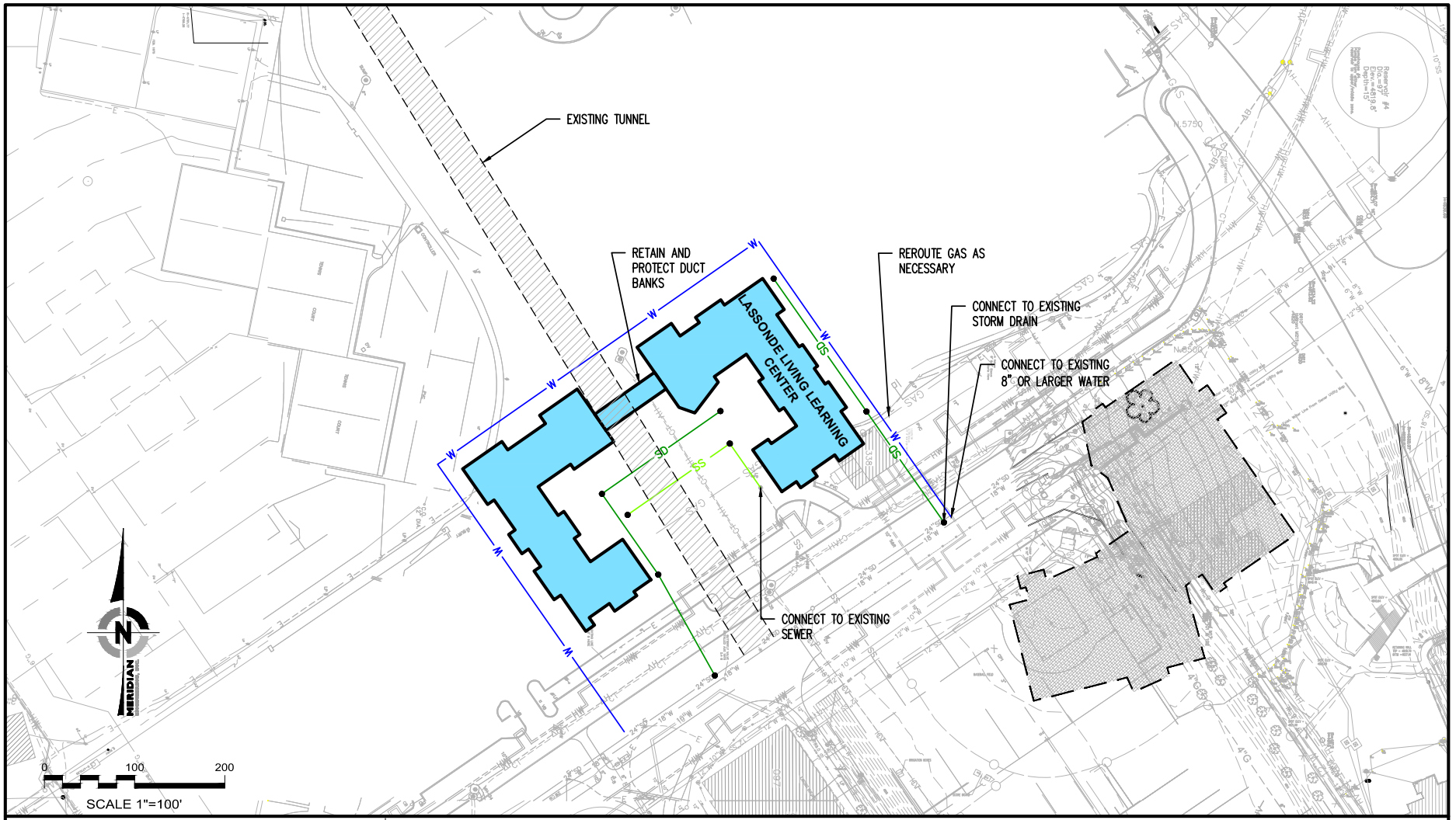
SITE OPTION C

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE C1



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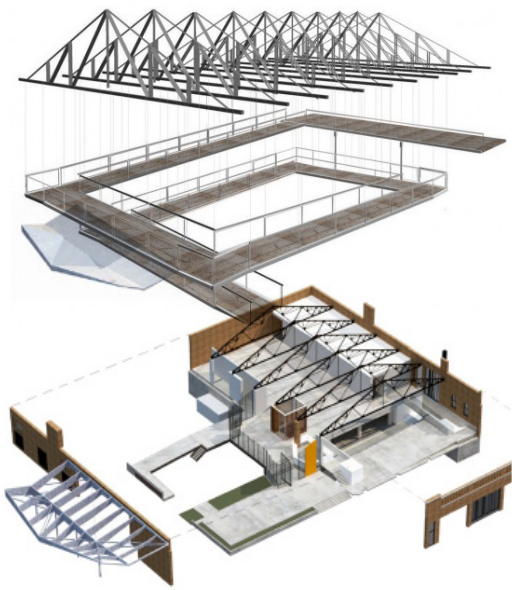
SITE OPTION D3

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE D3



Structural Systems

The Lassonde Living Learning Center is proposed to be a 5-story mixed-use facility with residential, academic, meeting, and work spaces. The academic, meeting and work spaces are on the main level with residential spaces above. This configuration can pose challenges in creating a structural system that can be continuous for the full height of the building without having transfer conditions at the second level.

Seismic Demand

The east trace of the East Bench Branch of the Wasatch Fault is thought to be in close proximity to the three sites under consideration for this facility. No evidence of the fault has been discovered during foundation excavations and special trench studies in the area, however. The sites north of the HPER complex are closer to the presumed fault line and have a 1.5% larger ground shaking factor than the other site.

Framing Options

Conventional Steel Framing:
Conventional framing utilizes composite wide flange girders and purlins with composite concrete on metal deck floors. This system would have a total depth of structure of about 16” at minimum.

Long-Span Deck on Steel Framing:
A long-span composite concrete on metal deck floor supported by steel wide-flange girders at bearing lines. Bearing lines would need to be along a corridor walls and exterior walls. Long-span deck would be in the range of 10” to 12” thick, but require no other steel framing in rooms. This method would require shored construction for the decks.

Lateral System Options

Braced Frames:
Braced frames are a commonly used lateral force resisting system. Either conventional braces or buckling restrained braces (BRB) could be utilized. BRB frames have the added advantage of being a ductile energy dissipating system that reduces the demand on foundations. The drawback with BRB is that special detailing for exterior cladding must be incorporated to account for the effects of story drift.

Location of braces must be done in close coordination with the architectural layout of the building.

Shear Walls:
Masonry or concrete shear walls are also commonly used in buildings. They are stiff and rigid lateral members. Like brace frames, locating shear walls must be done in close coordination with the architectural plan of the building.

Mechanical Systems

Mechanical and Plumbing Systems

The design of the mechanical and plumbing systems for the University of Utah Lassonde Living Center shall comply with all current University of Utah design and construction standards (unless specifically noted otherwise), as well as the current adopted version of the International Mechanical Code (IMC), International Plumbing Code (IPC), the International Energy Conservation Code (IECC), and the International fuel gas code (IFGC). The mechanical and plumbing systems shall be programmed and designed using the systems outlined in this report. These systems have been recommended in order to be cohesive with the current mechanical systems in similar buildings on campus. They shall be programmed and designed in a way to maximize reliability, and minimize maintenance. Systems used shall be proven systems, with a history of use in similar installations.

The plumbing fixtures in each room shall be coordinated during programming and design. It is desirable for maintenance to use fixtures that are comparable to the rest of the Housing buildings. Low flow water conserving fixtures shall be considered and evaluated as necessary to meet the project LEED requirements.

The individual resident rooms shall be heated and cooled using dedicated 4 pipe fan coil units.

Design Parameters

Altitude 4750 feet
Summer 97 deg. F DB, 62 deg. F WB.
Winter 0 deg. F DB
Winter Indoor Design 72^{0}F
Summer Indoor Design 75^{0}F

Site Considerations

There are currently 4 primary site options being considered. The site selection could have an impact on the preferred mechanical systems for the building. The biggest mechanical site consideration is whether to tie the new building into central campus high temp and chilled water loops, or provide dedicated local heating and cooling systems for the building.

There are advantages of tying into central loops. These include energy efficiency measures taken at the plant level, maintenance advantages to a central system as opposed to dedicated local equipment requiring additional floor space and site space at the building, as well as the noise and access requirements that can be associated with equipment at the building. There are also disadvantages. Where campus housing and plant operations are typically two separate entities, it can be a potential issue with communication and coordination between the two entities. Another disadvantage is the LEED documentation and energy goals specific

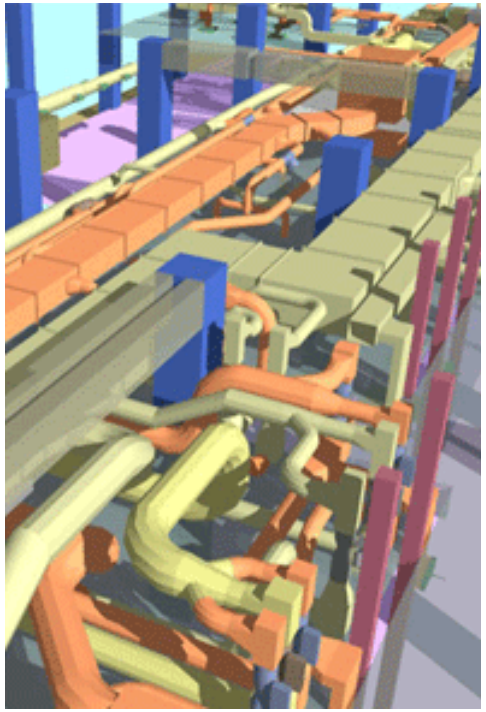
to the project. When the building is served by the central system, the energy efficiency is tied to the central system which can be good and bad. It can be more difficult to document and obtain LEED points; however, the new LEED guidelines do allow the building to take into account efficiency measures taken at the plant level. The central chilled water plant has many energy efficiency measures incorporated which could help meet LEED goals for a given budget, but the central high temp plant is limited in its measures and may have an adverse effect on LEED targets. In addition to complications with LEED documentation, it can be extremely challenging to try and obtain the University requirement of 40% better than code, without providing dedicated local high efficiency and load shedding systems. The central system will also need to be designed to account for the capacity of the additional building loads, and could have an effect on campus master planning. Finally, initial installation cost can be better for a central system if the utilities are close by, but it can be more expensive if they have to be run a considerable distance.

The following is a list of potential advantages and disadvantages associated with each site and potential systems.

Site A is more central to campus, and would be able to tie into the central campus high temp and chilled water loops. There is a central chilled water loop main between the Sill Center and the soccer field. This would require approximately 250'-300' of chilled water piping extended to the building. There is a 10" high temp main in the area as well that would also require approximately 250'-300' of high temp piping extended. Both locations would require valves and vaults as necessary to meet University requirements. Using the current standards of Blue Brute PVC for the chilled water and Thermacore pre-insulated pipe for the high temp piping, this would cost approximately $200,000 to extend these utilities. If ductile iron, or pre-insulated pipe is provided for the chilled water systems, it would cost more (approximately $25,000 additional for ductile iron, and approximately $100,000 additional for pre-insulated Thermacore). The campus plant operations would charge for the chilled water and high temp water, and the maintenance associated with them. These central utilities would require a plate and frame heat exchanger at the building for the chilled water, and a shell and tube exchanger at the building for the high temp. Using the campus utilities would eliminate the need for the chillers and boilers on site. The cost savings of heat exchangers over boilers and chillers may be approximately $300,000 - $350,000 for a net savings of $100,000 - $150,000 by using central plant heating and cooling. This equipment would require less space, maintenance, and generate less noise than a typical boiler and chiller. It would all be indoors and would not require site space. The central plant is equipped with a plate and frame exchanger for indirect cooling, as well chilled water thermal storage, for an overall efficient operation.

Sites B and C are both located in an area that does not have high temp or chilled water capacity. Both of these sites will require dedicated stand-alone equipment comparable to equipment at Marriott Honors Community. This would include a combination of stand-alone high efficiency boilers and a dedicated chilled water system. Marriott Honors Community included outdoor air cooled chillers which are a cost effective method, but only average efficiency. A more efficient local chilled water system would include a water cooled chiller indoors, with an exterior cooling tower. This would require more indoor space; approximately 1% of the total building area, and it would require special considerations for noisier indoor equipment. The exterior cooling tower would require a similar amount of exterior mechanical yard space to the air cooled chillers at Marriott Honors Community. The water treatment of the tower will increase maintenance and may present more challenges in finding an appropriate location for the equipment and the service yard. It would also require coordination to determine the appropriate type of tower. Upgrading to a water cooled chiller system will cost approximately $180,000 for a fiberglass or stainless steel tower, and approximately $280,000 for a ceramic tower, plus the cost of the additional mechanical space inside the building, when compared with Marriott Honors Community. If either site B or C has a better option for a service yard and back of house equipment, that would also be preferable for the stand-alone systems.

Site D is somewhat comparable to site A, in that it is closer to campus utilities. It is much closer to the tunnel system with high temp water, but it is considerably farther from campus chilled water. One possible option is to tie into campus heating water, and provide standalone cooling. The disadvantage of this option is that it would miss the opportunities associated with the central cooling plant's efficiencies, and require extra space and site issues associated with the cooling system. Given the close proximity of the tunnel, it might be best for this building if the University considers extending central chilled water in the tunnel to this location. This chilled water extension will be approximately 1000 linear feet, which will cost approximately $250,000. The chilled water located in the tunnel will need to be steel pipe as opposed to the blue brute PVC. The amount of heating water will be reduced compared to site A, and will need to be brought from the HPER tunnel through the adjacent tunnel. This will require approximately 100 linear feet high temp piping, which will cost approximately $75,000. The total cost of extending the high temp and chilled water piping will be approximately $325,000. The cost of dedicated local equipment in options B and C will be approximately $300,000 - $350,000, so the mechanical cost of site D will be comparable to sites B and C. The other option that should be considered with Site D, is that it may be more advantageous to increase the size of this line to handle future additional loads, whether they are intended for other housing or other University buildings. If the size is increased, it will need to be determined what additional loads it should be sized for, and how to account for the additional cost.



The operational cost of the building will vary depending on whether or not the building is tied into central utilities, or served by stand-alone equipment. Where the central cooling plant is equipped with several energy efficiency features, it will require less electricity to operate; however, the operational cost will depend on the rate which the campus bills for the use of central chilled water. The same applies to the central heating water. The maintenance costs will differ as well. The direct maintenance costs, contracted or performed directly by Housing will be less when tying into the central plant. This is due to the fact that the heat exchangers typically require less maintenance than boilers or chillers. Although the direct maintenance costs will be less, there will also be indirect maintenance costs. This will again depend on how the campus bills for chilled water and heating water, and whether or not the indirect maintenance cost is included in the billing rate, or if plant side maintenance performed by the campus is tracked and billed separately. The costs and rates associated with the campus provided utilities should be evaluated during programming. Likewise, the stand-alone operational costs will depend on the type of equipment selected as well. More efficient systems will typically offer lower energy costs, and higher maintenance costs. For example, a solar hot water system will reduce the operational cost of natural gas with a stand-alone boiler plant, but it will also add an entirely separate system with associated pumps, tanks, piping, panels, etc. which will increase operational maintenance costs. The overall operational costs associated with stand-alone systems should also be evaluated as part of the programming.

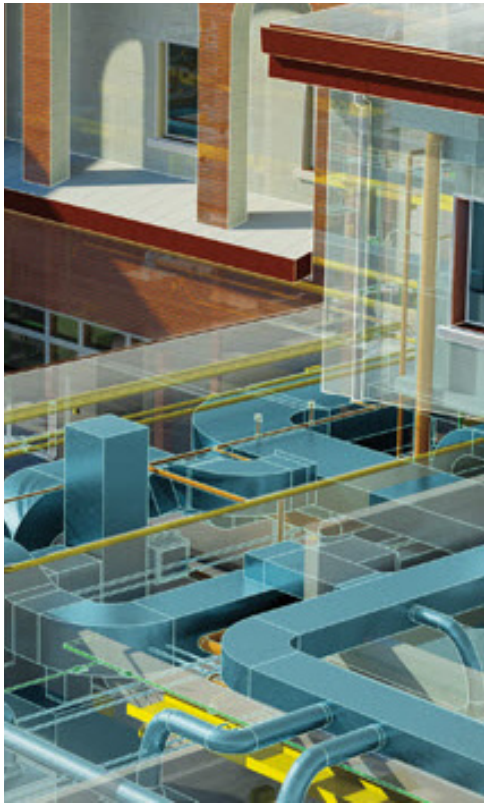
Energy Efficiency Considerations

The current University requirement is that a building performs 40% better than code. This is a very aggressive efficiency goal, and needs to be planned for and accounted for in budget and site considerations from the beginning of the project. The current Cost Models included in this feasibility study include the basic systems, and do not include the additional measures which may be necessary to perform 40% better than code.

Some of the strategies that may be implemented to meet these efficiency goals include, but are not limited to the following:

Provide a cooling tower for an indirect cooling loop. The location of this tower should be considered as part of the site selection. The central plant does already have an indirect loop, so it may be possible to take advantage of this efficiency measure without an additional tower, if tied into the central plant.

Thermal storage, whether ice storage or chilled water storage, will require a significant amount of space. These are regularly buried under landscaping, which again could have an effect on site selection. For example, a central courtyard, such as that shown with sites A&B may lend itself better to thermal storage. Again, the central plant has chilled water thermal storage, so this could be used to some degree if tied in.



Ground source heat pumps are typically not used in a campus setting, particularly on this campus, but they may be considered in some degree or fashion to meet the efficiency goals. If considered, this would be similar to thermal storage and would benefit from an adjacent open area for a well field.

Solar hot water can reduce the connected energy use of the building by utilizing solar panels to heat the domestic water. This would require not only the solar panels, but a location for them, the necessary structural supports, and the space for the large solar hot water storage tanks and associated components.

Building orientation and sun shading will have an effect on total energy use. It is easier to implement shading control on north and south orientations, as opposed to east and west orientations, so if site C has the least east and west exposures, it may be preferable to reduce solar load.

Building Envelope

Building envelope, i.e. wall, roofs, doors and glass values and mechanical systems shall be designed together to meet the current energy use requirements of ASHRAE 90.1 and University of Utah Design Standards. The DFCM has had positive results with envelope commissioning. It should be defined during programming if envelope commissioning is going to be required.

Heating Source and System

The heating source shall be either fed from the central high temp loop, or a local heating water supply and return system. Both systems shall comply with campus standards and requirements. This shall be determined in coordination with the site considerations, energy efficiency goals, and steering committee. The level of back-up and redundancy required should be defined during programming.

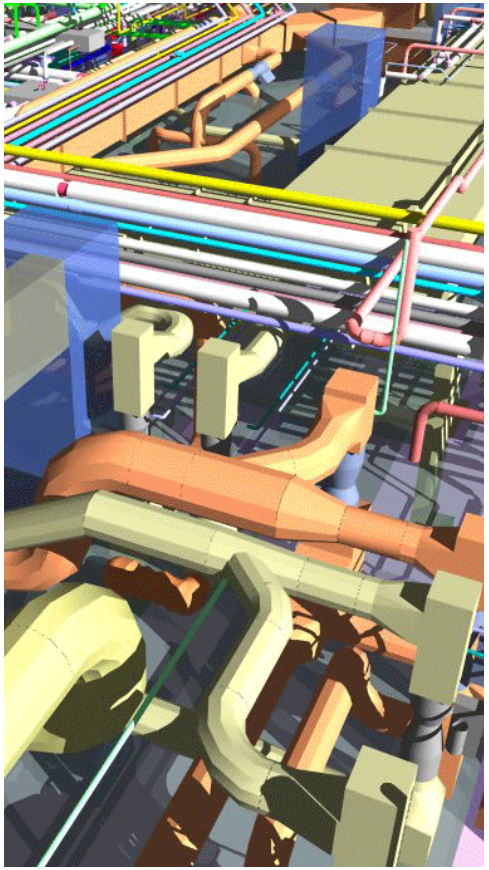
Cooling Source and System

The cooling source shall be either fed from a central campus chilled loop, or a local chilled water supply and return system. Both systems shall comply with campus standards and requirements. This shall be determined in coordination with the site considerations, energy efficiency goals, and steering committee. The level of back-up and redundancy required should be defined during programming.

Ventilation System

Exhaust air shall be provided for:

- Electrical rooms
- Rest rooms
- Janitors closets
- Above common area sinks
- Rooms with odors or contaminants, such as student work rooms, ski wax rooms, printer/ copier rooms, etc.
- Main mechanical rooms



Building shall include adequate make-up to maintain positive pressure, and meet all of the ASHRAE fresh air requirements. Include heat recovery at the exhaust systems where possible to maximize energy efficiency.

Provide additional dryer venting and associated make-up air as necessary for the laundry facilities. Laundry ventilation shall address the combustion air if necessary for gas fired dryers, as well as adequate make-up air for all the dryers.

Controls System

The HVAC controls for individual units shall include at a minimum stand-alone programmable thermostats with automatic change over at each residential unit. Central DDC control and monitoring of the individual residential units may be desirable. The current estimates do not reflect additional DDC control per room, but would need to be added and accounted for in budgeting, if requested.

The central building systems and common areas shall include DDC controls per the current University standards.

The Marriott Honors Community included a building “dashboard” to monitor energy performance. The requirements of this dashboard should be defined in programming so that they can be adequately accounted for in budget and scope. If there is a desire to utilize the dashboard to create competition within the building, the quantity and location of competition zones will need to be determined ahead of time. For example, if it is desired to compete wing against wing, then it will need to be piped and metered with separate loops for each wing; however, if it is desired for each floor of each wing to compete separately, then it will need to be piped and metered per floor per wing. The current estimates do not reflect additional metering or piping besides the main system, but the additional piping loops and meters would need to be added and accounted for in budgeting if requested.

Plumbing System

All domestic water, sewer, waste, and vent piping systems shall be designed to comply with DFCM, University of Utah, and IPC design standards codes and criteria.

The plumbing fixtures in each room shall be coordinated during programming and design. It is desirable for maintenance to use fixtures that are comparable to the rest of the housing buildings. Low flow water conserving fixtures shall be considered and evaluated as necessary to meet the project LEED requirements. Culinary hot and cold water piping shall be routed to the rest rooms, mechanical room, sinks, drinking fountains, service sinks and any other fixtures that require water. Culinary water piping above ground shall be Type L copper. Culinary piping below ground shall be Type K copper.

Soil and waste piping above grade within the building shall be cast iron no-hub. Soil and waste piping below grade shall be cast iron hub and spigot, or no hub with heavy duty couplings per the University Standards. Vent piping shall be cast iron or galvanized steel.

Culinary Hot Water Generators

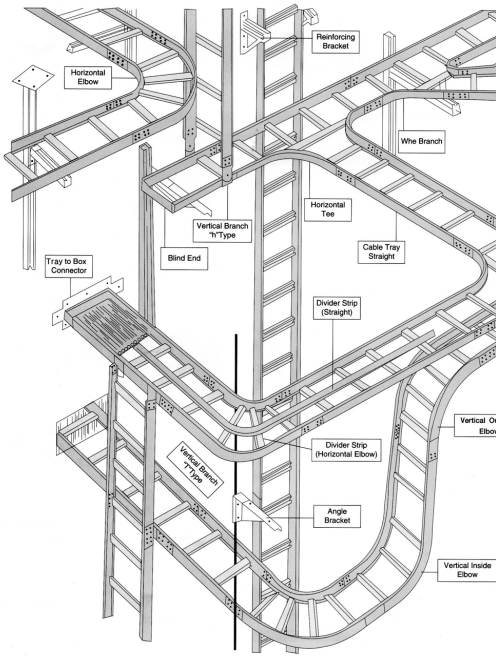
The system shall provide adequate hot water for the residential and other functions of the building, including laundry, café, etc. Hot water may be provided by central high temp converter, stand-alone gas fired water heaters, heating water exchangers, or combination of methods as needed. The level of back-up and redundancy required should be defined during programming.

Water Softeners

Water softeners shall be provided to soften all the culinary hot water. Water softeners shall be twin type to allow for continuous operation.

Fire Sprinkler

Building shall be fully equipped with fire sprinklers. Follow the University of Utah design and construction standards.



Electrical Systems

Abstract

Provision for 480 V, 3-phase and 208 V, 3-phase power to the new Lassonde Living Learning Center can be made by utilizing existing 12470 V power supply in the area to supply power to the new building. This will require separate liquid cooled pad mounted transformers to step-down medium voltage campus distribution supply voltage to 480/277 V and 208/120 V. Provision shall be made for raceways from the existing University of Utah campus communication network system for fiber, copper, and TV system interconnection to the building.

The proposed Lassonde Living Learning Building will require separate transformers for the 480 V system and the 208 V distribution system. A duct bank with a minimum of four (4) conduits is required to be extended from the nearest utility tunnel or communication manhole to the new building for campus communication system interconnection and distribution.

Electrical System Survey

There are tunnels and manholes in the vicinity of all three proposed sites for the new Lassonde Living Learning Center that could provide medium voltage power and communication services to the new building.

Under options B and C, there are existing duct banks for power and communication crossing the proposed sites that serve other buildings. These utilities will be required to be removed and rerouted.

Alternatives

There are four proposed site options for Lassonde Living Learning Center:

SITE A & D:
Existing 12470 V and communication manholes are located to the south-east of this proposed site that can be used to provide power and communication services to the new building.
A new four way, 15 KV switch with two protected way, and two load brake configuration will be required to provide power to the new facility through two MV padmount step down transformers.

A new concrete duct bank of four 4” conduits will be required to be extended from the existing communication manhole to the building.
DEMARK location for fiber and copper cables.

Concrete saw cutting and repair of the existing road and sidewalks are required for running new duct banks for communication.

SITE B:
Electrical services for the facility at this location can be brought in to the building from the existing 12470 system in the existing manhole located to the north of the proposed location.
Communication services can be brought in from the existing communication manhole located to the northeast of the proposed site.

There is an existing 15 kV manhole in this proposed location that requires rerouting.
A new four way, 15 kV switch with two protected way, and two load brake configuration will be required to provide power to the new facility through two MV padmount step down transformers.

New concrete duct bank of four 4" conduits will be required to be extended from the existing communication manhole to the building.
DEMARK location for fiber and copper cables.
Concrete saw cutting and repair of existing sidewalks are required for running new duct banks for communication.

SITE C:
Electrical services for this facility at this location can be brought in to the building from existing 12470 system in the existing manhole located to the north of the proposed site.
Communication services can be brought in from the existing communication manhole located to the northeast of the proposed property.

There are existing 15 KV and communication duct banks passing through the proposed location that require rerouting.

A new four way, 15 KV switch, with two protected way and two load brake configuration will be required to provide power to the new facility through two MV padmount step down transformers.

New concrete duct bank of four 4" conduits will be required to be extended from existing communication manhole to the building
DEMARK location for fiber and copper cables.
Concrete saw cutting and repair of existing sidewalks are required for running new duct banks for communication.

Load Calculation

190,000 or 213,000 SQFT Building Area Options

For load estimation the following assumptions are made:
HVAC 4 Watts/SQFT
Lighting 2 Watts/SQFT
Outlets 3 Watts/SQFT
Misc. 2 Watts/SQFT

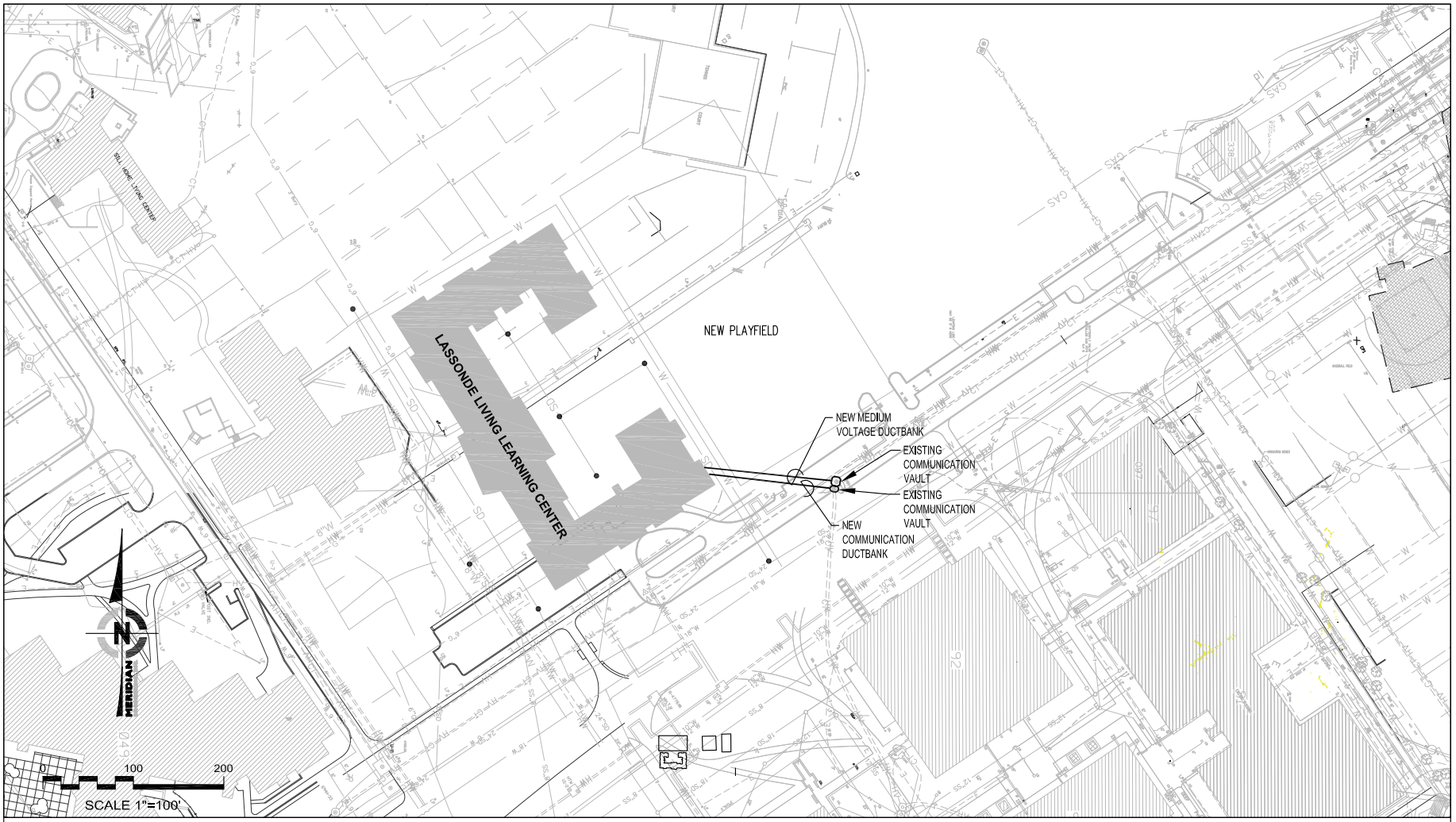
Based on the above assumptions there will be:
6 W/SQFT, electrical load on 480 V Power Distribution System.
5 W/SQFT, electrical load on 208 V Power Distribution System.

A building with 190,000 SQFT Area requires:
One 1500 kVA pad mounted transformer on 480 V Power Distribution System.
One 1000 kVA pad mounted transformer on 208 V Power Distribution System.

A building with 213,000 SQFT Area requires:
One 1500 kVA pad mounted transformer on 480 V Power Distribution System.
One 1500 kVA pad mounted transformer on 208 V Power Distribution System.

Emergency Power Genset

A diesel engine generator is recommended for life safety and essential load for the building that includes individual automatic transfer switches with by-pass for each system.



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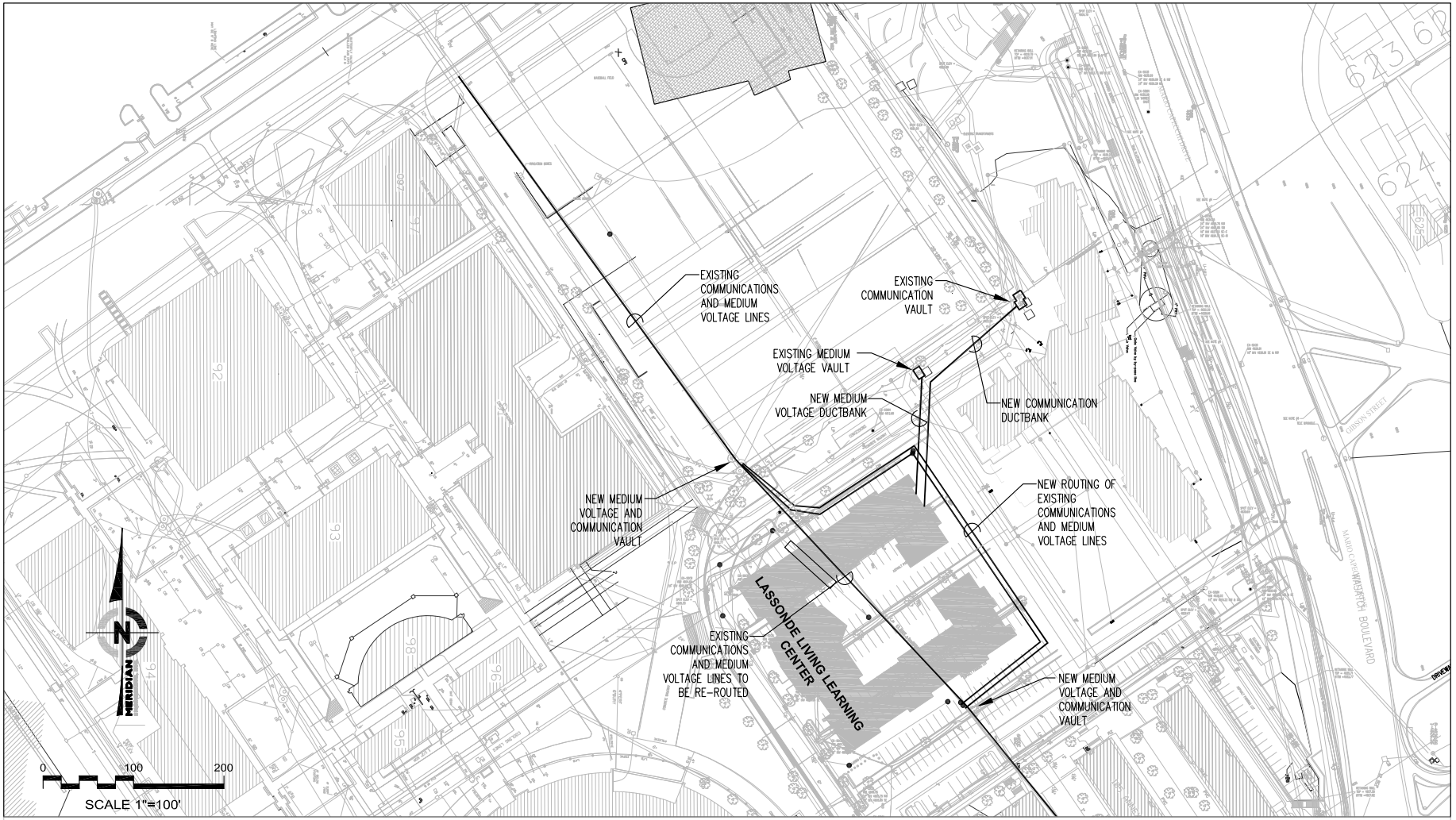
SITE OPTION A1

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE A1



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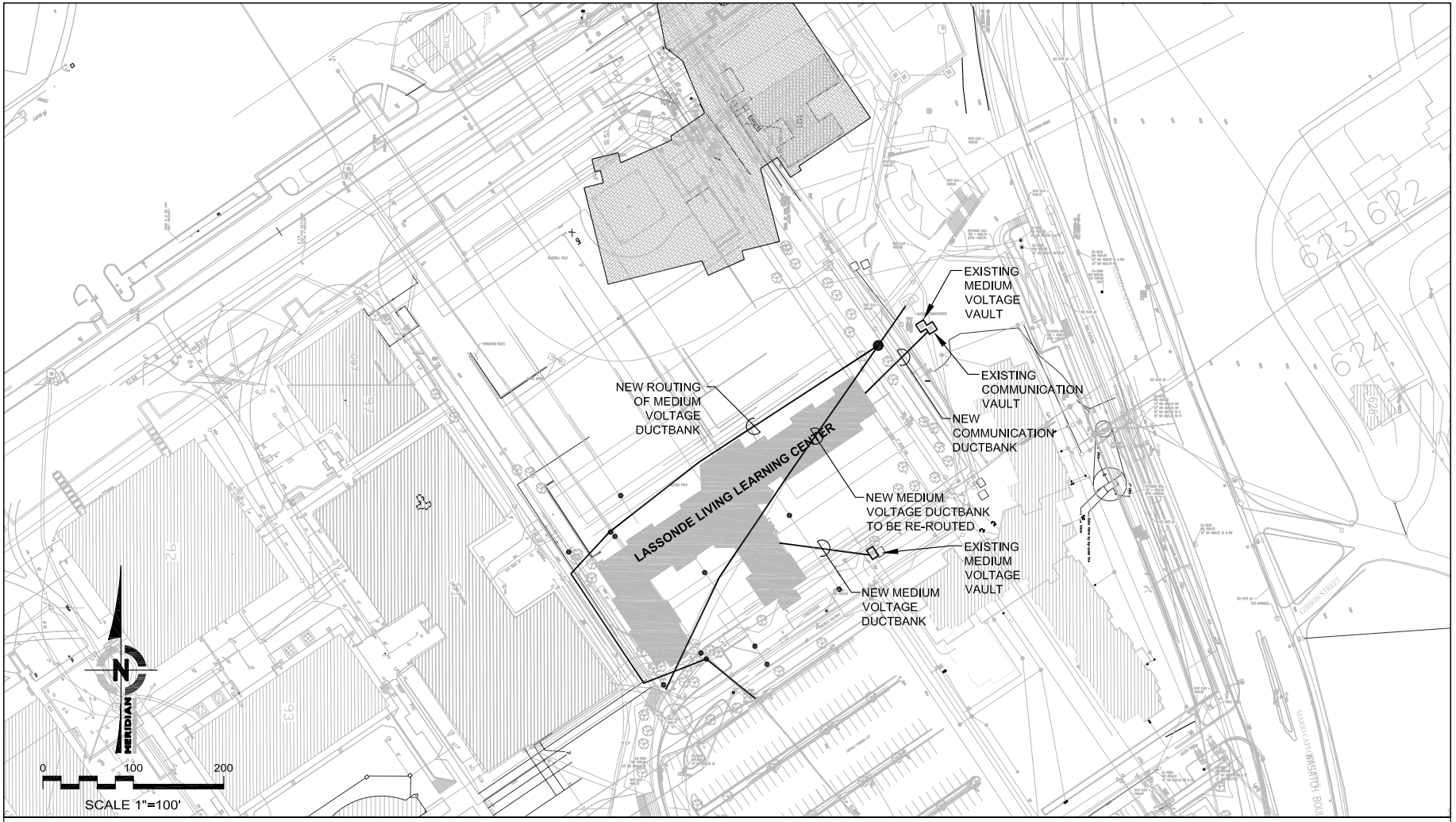
SITE OPTION B1

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE B1



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SITE OPTION C1

LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE C1

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SITE OPTION D1
LASSONDE LIVING LEARNING FEASIBILITY STUDY,
UNIVERSITY OF UTAH

FIGURE D1

Preliminary Code Analysis:

This section describes, in very general terms, anticipated building code requirements for the proposed Lassonde Living Learning Center.

General Description

The building will be located within the University of Utah campus on one of the three site options described in this Feasibility Study. The building is proposed to be 5 stories in height with a total floor area of approximately 200,000 square feet. During the Design Phase, the Design Architect is to determine the actual Construction Type based on the configuration of the final design.

Occupancy Groups

The Lassonde Living Learning Center, will have multiple separated occupancy groups in accordance with IBC 2009, Section 302.

Anticipated Occupancies include:

Group A Assembly: Two-Story Lobby Areas. Classrooms will have A-3 occupancy if occupant load is greater than 50. Classrooms are B occupancy if less than 10% of story, or less than 750 SF, or less than 50 occupants;

Group B Business: Classification for spaces used for educational occupancy when occupants are older than 12th grade.

Group F Factory/Fabrication: Because of the vast number of potential fabricating and processing operations in the Student Garage space, facilities should be classified by the actual level of hazard rather than their function. Consideration, during Programming and Design, needs to be given on how to establish the level to which the spaces need be designed. If it is determined that the hazard is low enough the spaces may be considered a A or B occupancy.

Group M: Mercantile – Any retail area including the Coffee Shop/C-Store is to be classified as Group M occupancy because the space is available to the general public (visitors).

Group R: According to the IBC, Apartments and Dormitories are both classified as an R-2 occupancy, since the period of occupancy typically exceeds 30 days. However, when classes are not in session, the rooms in dormitories are sometimes rented out for periods of less than 30 days to other visitors. When dormitories undergo this type of transient use, they more closely resemble Group R-1. It is anticipated that the residential units will be occupied full time over the course of the entire year so R-1 is *not* an anticipated classification for this building.

Applicable Codes and Regulations

The applicable codes governing the design of the Project are:

International Building Code (IBC)

International Fire Code (IFC)

International Mechanical Code (IMC)

International Plumbing Code (IPC) and Utah Amendments

National Electrical Code (NEC)

International Energy Conservation Code (2009)

ICC/ANSI 117.1: Accessible and Useable Building and Facilities

ASHRAE Guides and Standards
Energy Code ASHRAE/IES 90.1

University of Utah Design Standards

Utah State Fire Marshall

American Society of Mechanical Engineers (ASME)

American Society of Testing Materials (ASTM)

American Standard Association (ASA)

Associated Air Balance Council (AABC)

National Fire Protection Association (NFPA)

Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

Underwriters Laboratories (UL)

Utah State Safety Orders (OSHA/UOSH)

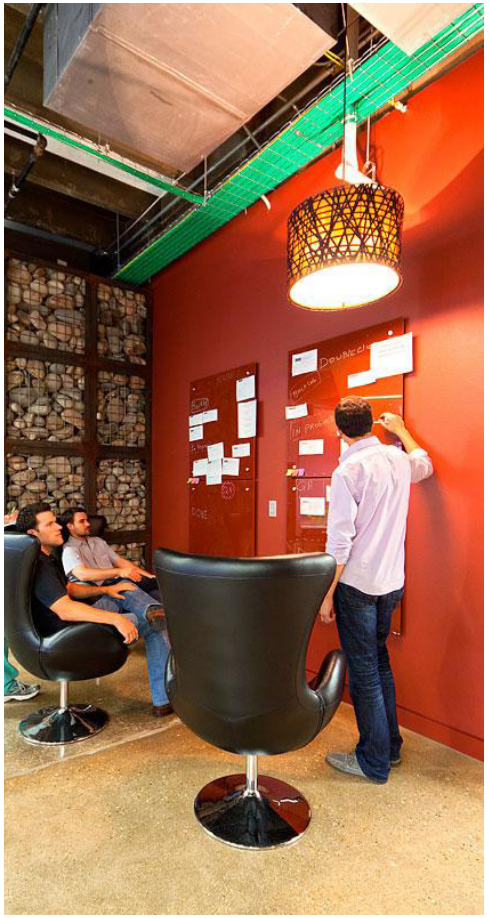
Utah Air Conservation Regulations/Waste Disposal Regulations

Boiler and Pressure Vessel Rules and Regulations

DFCM Design and Construction Standards

International fuel gas code (IFGC)

It is not known whether or not more current versions of the codes will be adopted by the State of Utah before the time the building is being designed.



Cost/Budget Considerations

Student Garage Space Costing Considerations

Because there is a possibility of separate donor money, there is a possibility for the requirement to design/construct to a higher level of finishes/ quality for Student Garage Space, compared to housing spaces.

Student Housing Cost Precedents

The Donna Garff Marriott Honors Residential Scholars Community,University of Utah
(Marriott Honors Community)

Design/Build Procurement
Construction Complete August, 2012
Cost: $28,732,000
Gross Building Area: 167,193 GSF
Gross Housing Area (excluding Honors College and Honors Market): 159,133 GSF
Total Student Beds: 309
Gross Housing Area per Bed: 515 GSF
Cost per square foot: $171.8 / GSF
(including A/E and Contractor Fees)

National Average of Student Housing buildings from the 2012 College Housing Report published in the June 2012 issue of Living on Campus Trends & Analysis (based on data from 50 student housing projects opened or opening between August 2011 and 2013). The median residence hall reported this year:

Average Cost: $33.5M
Average Gross Building Area: 152,404 SF
Average Number of Student Beds: 499
Average Gross Building Area per Student Bed: 305 SF
Average Cost per sq. ft: $202.86

ACUHO-I Association of College and University Housing Officers-International Annual Survey of Universities involved with construction projects (based on 306 colleges and universities in 2012)

Construction Cost per GSF by Unit Type:
Traditional (no bathroom or kitchen amenities): $224/SF

Modified traditional (sink facilities in the room): $226/SF

Adjoining suites (similar to Gateway Heights and Chapel Glen, two rooms connected by a bathroom): $225/SF

Super Suites (includes 1 or 2 bathrooms and a living room, similar to Sage Point Single Deluxe suites): $193/SF

Individual Contract Apartments (apartments that are rented by the bed, furnished): $170/SF

Apartments (apartments that are rented similar to the greater community, unfurnished and to one primary renter): $144/SF

Cost Model 1 (20,000 s.f. Student Garage Space)

Summary of Project Construction Cost (192,487 GSF)

CSI #	Description	Building	Sitework	Total
3	Structural Concrete	$ 1,345,484		$ 1,345,484
4	Masonry	$ 1,942,194		$ 1,942,194
5	Metals	$ 3,274,204		$ 3,274,204
6	Woods & Plastics	$ 768,108		$ 768,108
7	Thermal & Moisture Protection	$ 1,237,691		$ 1,237,691
8	Doors & Windows	$ 3,228,007		$ 3,228,007
9	Finishes	$ 3,918,961		$ 3,918,961
10	Specialties	$ 225,210		$ 225,210
11	Equipment	$ 182,984		$ 182,984
12	Furnishings (window coverings)	$ 96,244		$ 96,244
14	Conveying Systems	$ 384,974		$ 384,974
22	Mechanical	$ 5,976,351		$ 5,976,351
26	Electrical	$ 4,456,629		$ 4,456,629
31	Sitework & Demolition	$ 419,622	$ 1,795,814	$ 2,215,436
	Subtotal	$ 27,456,662	$ 1,795,814	$ 29,252,476
	General Conditions 6%	$ 1,605,342	$ 107,749	$ 1,713,090
	LEED Management	$ 230,984		$ 230,984
	Overhead and Profit 4%	$ 1,152,997	$ 76,143	$ 1,229,140
	Design Contingency 10%	$ 3,020,121	$ 179,581	$ 3,199,702
	Potential Cost Escalation 5%	$ 1,638,064	$ 89,791	$ 1,727,855
	Totals	$ 35,104,170	$ 2,249,077	$ 37,353,248

Prepared by Gramoll Construction Co.

$194/sf (Escalated)
$185/sf (Un-Escalated)

Statement of Probable Construction Costs

Cost Model 1 represents the new building with a 20,000 SF Student Garage Space.

Cost Model 2 represents the new building with a 35,000 SF Student Garage Space.

The models do not currently include the cost for Design Fees or FF&E.

Additionally, the cost models exclude:

$18,000 for each parking space that needs to be relocated if Site A or B is selected.

The cost of relocating the soccer field if Site C is selected.

If Site B or C is selected, stand alone mechanical systems will need to be utilized in lieu of tying into campus utilities (see Mechanical Narrative). The added expense for stand alone mechanical systems will include 2,000 additional square feet of building area; increased expense for the stand alone equipment; and a larger exterior equipment yard. It is assumed that the additional building area will cost approximately $388,000, the increased equipment yard will cost approximately $100,000, and the stand alone equipment will cost approximately $150,000 more than the pipes and equipment for Site A.

If Site D is selected, There will be an assumed additional cost of $325,000 for extending the high temp and chilled water piping to the site.

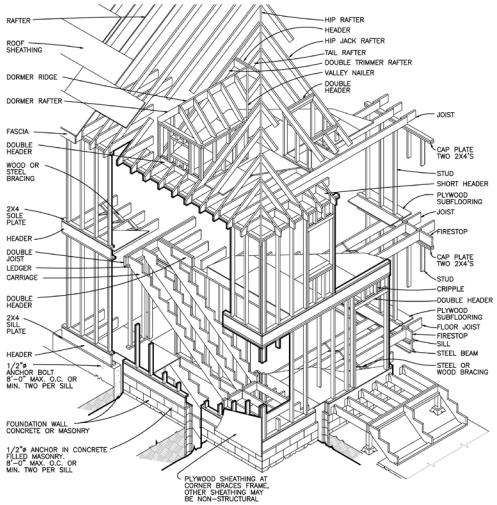
Cost Model 2 (35,000 s.f. Student Garage Space)

Summary of Project Construction Cost (213,487 GSF)

CSI #	Description	Building	Sitework	Total
3	Structural Concrete	$ 1,492,274		$ 1,492,274
4	Masonry	$ 2,154,084		$ 2,154,084
5	Metals	$ 3,631,414		$ 3,631,414
6	Woods & Plastics	$ 805,908		$ 805,908
7	Thermal & Moisture Protection	$ 1,372,721		$ 1,372,721
8	Doors & Windows	$ 3,580,177		$ 3,580,177
9	Finishes	$ 4,345,051		$ 4,345,051
10	Specialties	$ 249,780		$ 249,780
11	Equipment	$ 188,234		$ 188,234
12	Furnishings (window coverings)	$ 106,744		$ 106,744
14	Conveying Systems	$ 426,974		$ 426,974
22	Mechanical	$ 6,621,051		$ 6,621,051
26	Electrical	$ 4,934,799		$ 4,934,799
31	Sitework & Demolition	$ 465,402	$ 1,795,814	$ 2,261,216
	Subtotal	$ 30,374,612	$ 1,795,814	$ 32,170,426
	General Conditions 6%	$ 1,780,482	$ 107,749	$ 1,888,230
	LEED Management	$ 256,184		$ 256,184
	Overhead and Profit 4%	$ 1,278,787	$ 76,143	$ 1,354,930
	Design Contingency 10%	$ 3,349,611	$ 179,581	$ 3,529,192
	Potential Cost Escalation 5%	$ 1,816,774	$ 89,791	$ 1,906,565
	Totals	$ 38,856,450	$ 2,249,077	$ 41,105,528

Prepared by Gramoll Construction Co.

$193/sf (Escalated)
$184/sf (Un-Escalated)



Developer Method Considerations

For comparison purposes, an alternate Proforma Model (under separate cover) has been developed to explore the feasibility of building the project with the Developer Method in lieu of a standard University/State procurement method such as Construction Manager General Contractor (CMGC) or Design/Build. University of Utah Facility Design and Construction has suggested that utilizing the Developer Method for the Lassonde Living and Learning Center method may yield a construction cost of approximately $120 - $130 per square foot.

It is assumed that the Developer Method's lower construction cost may be accomplished by utilizing a Developer's standard construction techniques for constructing a building with a 5 - 10 year life span (in comparison to the University of Utah and State of Utah (DFCM) standard for a 50 year life span).

The lower cost per square foot is also possible by a Developer because Programming and Design Services would be integrated into (and closely controlled by) the Developer process.

Additionally, to accomplish the lower construction cost, the University suggests that a Developer may not be required to follow University of Utah or DFCM design and construction standards. A relaxation of these standards will generally allow the building systems and materials to be reduced from institutional quality to residential quality.

The following are building systems/materials that a developer might utilize if the University and DFCM Standards do not apply to the project (this list is to be read in conjunction with the Quality Comparison Matrix, attached below):

Possible Developer Structural Systems

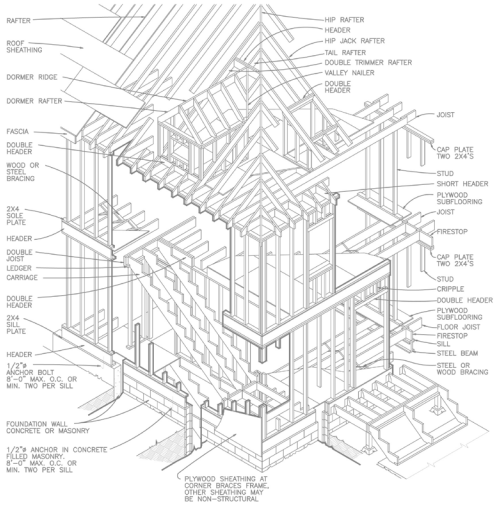
The building structure might be constructed with a wood frame, in lieu of a metal frame.

Preliminary IBC Code investigation suggests that the building can be built to a maximum of 65 feet tall (mean roof height) for a wood framed/wood shear wall building. For a 5-story building, this yields a 13 feet floor to floor height. Rough calculations suggest that this will generate 8' maximum ceiling heights.

The code will require that the "base level" for this building type can be the top of a concrete shear wall structure below. It would require a significant amount of shear wall at exterior walls which means very small/ reduced amount of windows at the base level.

A wood structural system will allow much more noticeable building vibrations than a steel frame.

A wood structural frame presents more opportunity for mold and mildew to develop within the building.



Possible Developer Utilized Architectural Systems

Exterior finish might be EIFS (Stucco) or siding in lieu of bricks, stone or metal panels. EIFS has increased maintenance and reduced durability compared to the institutional grade building envelope systems.

Interior finishes and materials might consist solely of painted gypsum wall board on wood studs in lieu of designed/specified materials including wood, stone, metal on light gauge metal studs.

There might be a decrease in wind design criteria below 100 mph for roof assemblies.

There might be utilization of asphalt shingle roofing in lieu of membrane roofing.

The roof profile will most likely be sloped (in lieu of flat) due to the use of a wood truss roof structure.

Doors might be hollow core, in lieu of solid core.

Floor finishes might include vinyl in lieu of tile.

Possible Developer Utilized Energy/Mechanical/Plumbing Systems

There might be a relaxation of the requirement for LEED Silver Certification and the DFCM High Performance Building Standard.

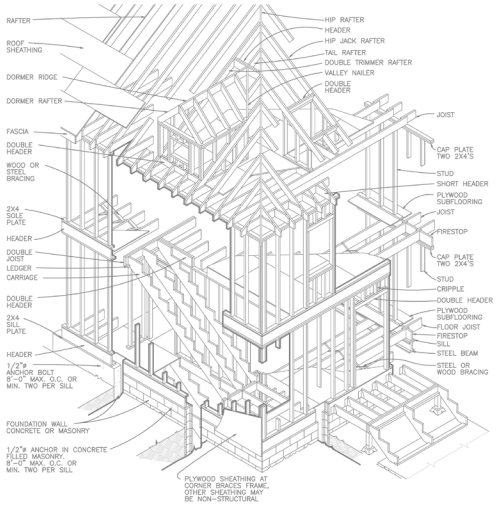
There might be a relaxation of the requirement for the requirement for the building to perform 40% better than Building code (ASHRAE).

Utilization of plastic culinary water distribution and plastic waste pipe in lieu of metal pipe.

There might be reduced controls and reduced quality for mechanical/plumbing systems and equipment:

Unitary equipment like PTAC (window mounted hotel-type units), or a farm of furnaces and outdoor condensing units. These systems may require a significantly higher requirement for maintenance than the more robust systems that would meet state and university standards.

2-pipe combination domestic water and heating and cooling system. The domestic cold water would be used for cooling and the domestic hot water for heating. The system would be piped in series so that the first units off the loop perform better than the last units. There are a lot of precautions that have to be taken for re-circulating the water. There will be limited water treatment options, etc., but it saves a huge amount of money in piping.



Possible Developer Utilized Electrical Systems

Getting 12470 V Power to the site and stepping it down, might be done with one transformer in lieu of multiple transformers.

There might be a reduced quality in communication systems.

The interior electrical system wiring might be done with romex cable in lieu of conduits/ conductors.

Panels and conductors might be aluminum in lieu of copper.

Inferior light fixtures might be used which may require more re-lamping.

Lighting control systems might be omitted.

Emergency lighting system might be accomplished with battery pack, in lieu of a diesel powered generator.

In lieu of complying with UofU Fire Alarm requirements, a developer might install a system that only satisfies the Electrical Code.

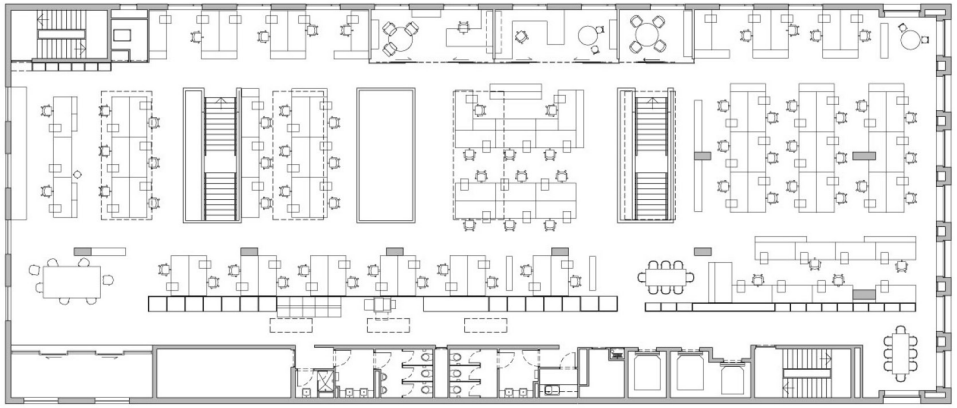
Race way system might be omitted for fire alarm system and communication system.

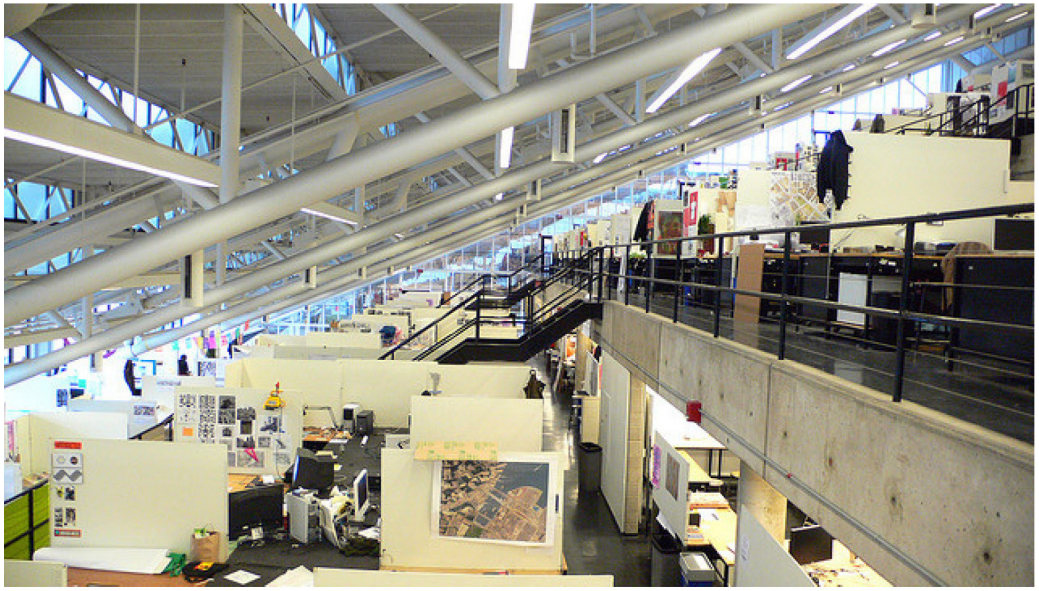
TV distribution system might be by a Cable TV provider and may not have campus interconnection.

Building System		"Developer" Quality * $120 - $150 / S.F.	"Hybrid" Quality * $150 - $184 / S.F.	"Institutional" Quality * $184 - $250 / S.F.
1	Foundation System (Base Line)	Spread Footings	Spread Footings	Spread Footings
2	Structural Frame a. Framing b. Floor Support	a. Wood Frame b. Wood Truss	a. Light Gauge Metal b. Metal Joists	a. Steel Frame b. Composite Deck
3	Roofing a. Flat b. Sloped	a. N/A b. Asphalt Shingle	a. Membrane b. Asphalt / Standing Seam Metal	a. Membrane b. Metal or Tile or Slate
4	Exterior Walls	Siding / EIFS, Brick Veneer	Masonry or Precast	Masonry, Stone / Precast, Metal Panel
5	Interior Finishes	Wood Frame w/ GWB	Masonry / Light Gauge Metal w/ GWB	Limited Masonry / Light Gauge Metal w/ Specified Finishes
6	Plumbing	Tank Toilet, Fiberglass Shower	Wall-Hung Toilet, Terrazo Pan Shower	Wall Mounted Toilet, Full Tile Shower
7	Floor Covering	Carpet / Vinyl	Carpet / Limited Tile	Carpet Tile, Ceramic Tile
8	Mechanical	Split System w/ Condensers	Vertical Fan Coil Units	Variable Air Volume / 4-pipe system
9	Electrical	Residential Grade	Mid-Institutional Grade	Institutional Grade

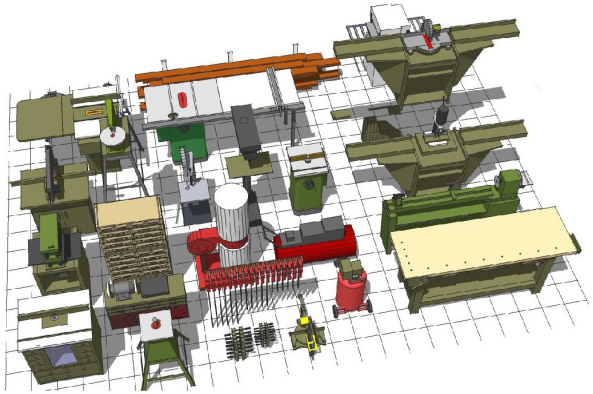
** Cost ranges are estimated 2012 construction costs (un-escalated) excluding design fees*

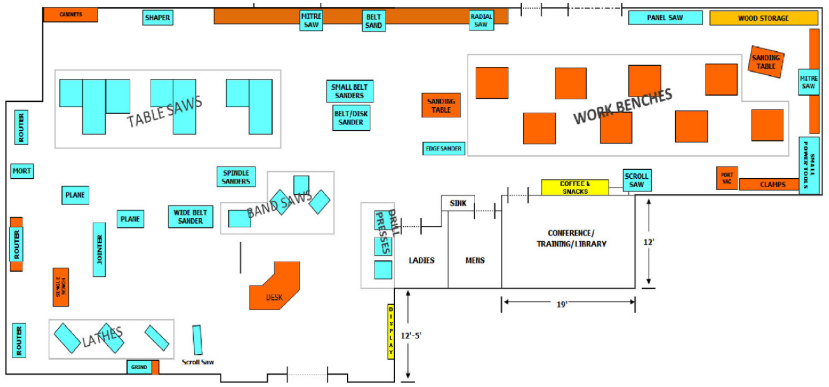
Art & Architecture School / Studio Space
Precedent Study



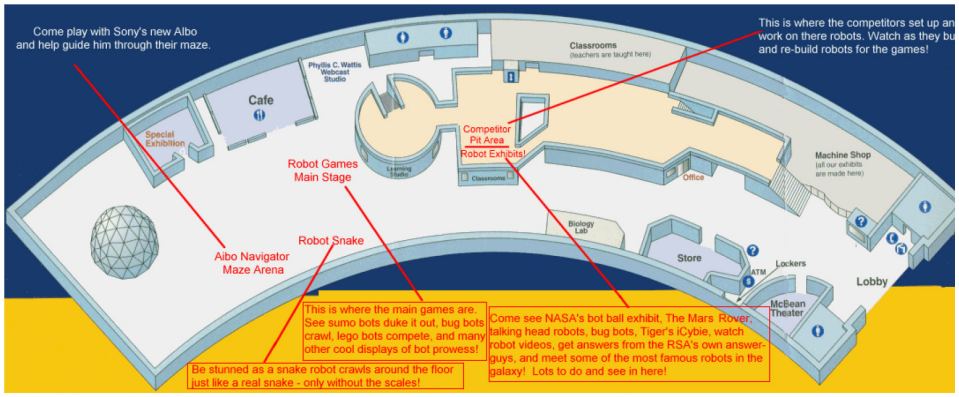


Workshop Spaces
Precedent Study

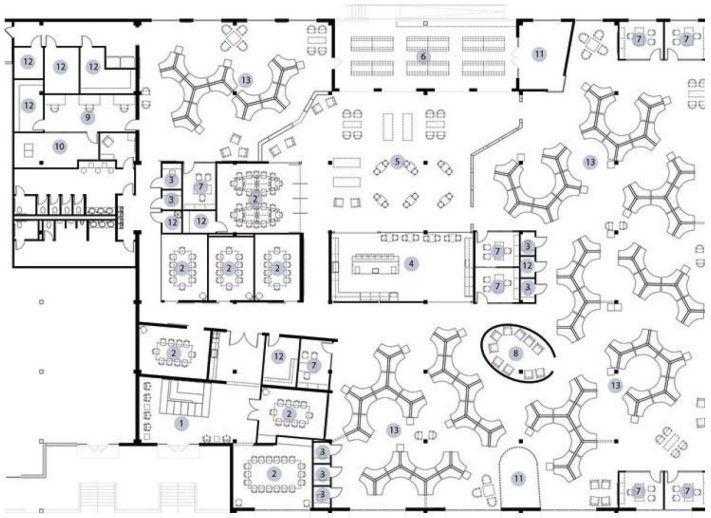


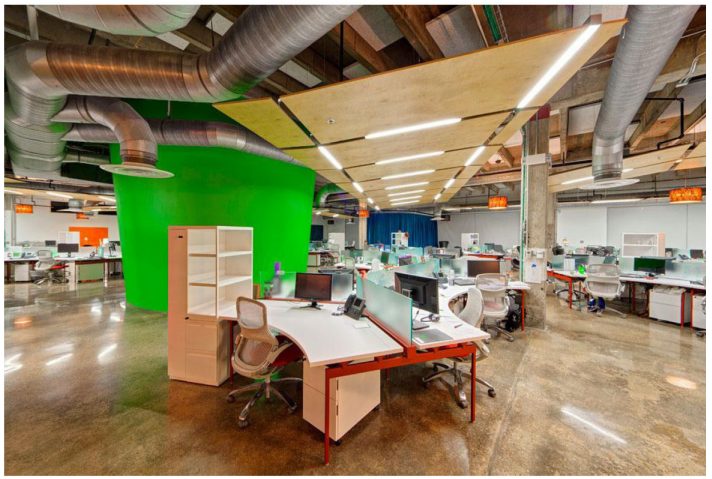


Exploratorium / Tinkering Spaces
Precedent Study



Industrial Re-purposed Space
Precedent Study

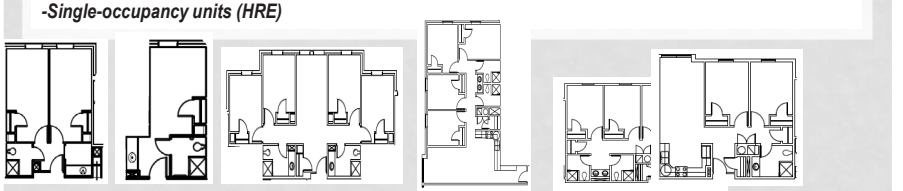




LASSONDE LLC DEMAND AND UNIT MIX

Demand Analysis

Projected demand for 2019-2020
-Single-occupancy units (HRE)



Semi-Suite Unit: $3,827/academic yr | Studio Unit: $4,097/academic yr | Four-bedroom, two-bath suite: $4,097/academic yr | Four-bedroom, two-bath apt: $478/month (No meal plan) | Three-bedroom, two-bath apt: $500/month (No meal plan) | Two-bedroom, one-bath apt: $536/month (No meal plan)

	On-Campus Housing Type: Distribution of Demand					
	Semi-Suite Single	Studio Single	Four Bedroom Suite Single	Four Bedroom Apt Single	Three Bedroom Apt Single	Two Bedroom Apt Single
Freshmen	237	297	415	356	297	237
Sophomores	82	109	27	191	136	109
Juniors	59	59	45	59	30	30
Seniors	151	252	0	101	50	151
Graduates	64	102	13	89	77	217
Total Demand for 2019-2020	4,047	593	819	500	796	590	744
Current Design Capacity	1,277	249	22	346	236	266	158
Current Surplus / (Deficit) of Beds	(2,766)	(344)	(797)	(154)	(560)	(324)	(586)

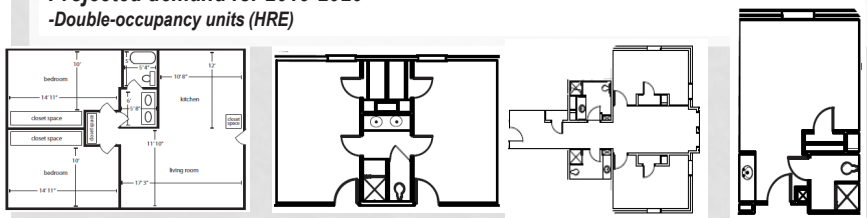
2012 Housing Master Plan Phasing Strategy

		Honors	Lassonde
		opened 8/2012	preliminary
Freshmen: *1000 beds*			
PHASE A:	326 of 500 beds	130 beds	196 beds
PHASE B:	500 beds		
Upper Division: *780 beds*			
PHASE A:	327 of 390 beds	179 beds	148 beds
PHASE B:	390 beds		
Graduate: *300 beds*			
PHASE A:	48 of 300 beds		48 beds

Document courtesy of HRE

Demand Analysis

Projected demand for 2019-2020
-Double-occupancy units (HRE)



Two-bedroom, one-bath apartment: $299/month (No meal plan requirement) | Semi-suite unit: $3,234/academic year | Two-bedroom, two-bath suite: $3,495/academic year | Large double: $3,495/academic year

	On-Campus Housing Type: Distribution of Demand			
	Two Bedroom Apt Double	Semi-Suite Double	Two Bedroom Suite Double	Large Double Double
Freshmen	297	59	237	59
Sophomores	54	0	27	0
Juniors	30	0	0	0
Seniors	101	0	0	0
Graduates	77	13	13	0
Total Demand for 2019-2020	967	558	72	277	59
Current Design Capacity	1,090	60	902	116	12
Current Surplus / (Deficit) of Beds	123	(498)	830	(161)	(47)

Freshmen Demand and Unit Mix

	On-Campus Housing Type: Distribution of Demand					
	Semi-Suite Single	Studio Single	Four Bedroom Suite Single	Four Bedroom Apt Single	Three Bedroom Apt Single	Two Bedroom Apt Single
Freshmen	237	297	415	356	297	237
Sophomores	82	109	27	191	136	109
Juniors	59	59	45	59	30	30
Seniors	151	252	0	101	50	151
Graduates	64	102	13	89	77	217

Semi-Suite	237
Studio	297
4BR-Suite	415
TOTAL	***949 beds***

4BR Apt	356
3BR Apt	297
2BR Apt	237
TOTAL	***890 beds***

890 x 30% (second choice) = 267 beds

949 beds + 267 beds = 1,216 beds

Discount factor: 1,216 beds/1.2 = 1,013 beds

Demand for approx. 1,000 freshmen beds

Graduate Demand and Unit Mix

	On-Campus Housing Type: Distribution of Demand					
	Semi-Suite Single	Studio Single	Four Bedroom Suite Single	Four Bedroom Apt Single	Three Bedroom Apt Single	Two Bedroom Apt Single
Freshmen	237	297	415	356	297	237
Sophomores	82	109	27	191	136	109
Juniors	59	59	45	59	30	30
Seniors	151	252	0	101	50	151
Graduates	64	102	13	89	77	217

562 single-occupancy beds demanded by graduate students
- 208 (graduate students currently living on campus)
354 beds

Discount factor: 354 single-occupancy beds/1.2 = 295 beds

Demand for approx. 300 graduate student beds

Upper Division Demand and Unit Mix

	On-Campus Housing Type: Distribution of Demand										
	Semi-Suite Single	Studio Single	Four Bedroom Suite Single	Four Bedroom Apt Single	Three Bedroom Apt Single	Two Bedroom Apt Single	Two Bedroom Apt Double	Semi-Suite Double	Two Bedroom Suite Double	Large Double Double
Freshmen	237	297	415	356	297	237	297	59	237	59
Sophomores	82	109	27	191	136	109	54	0	27	0
Juniors	59	59	45	59	30	30	30	0	0	0
Seniors	151	252	0	101	50	151	101	0	0	0
Graduates	64	102	13	89	77	217	77	13	13	0

1,853 total beds demanded by upper division students
- 918 (upper division students currently living on campus)

Discount factor: 935 beds/1.2 = 780 beds

	Updated DBP	
Apartment-style	50%	390 beds
Suite-style	50%	390 beds

Demand for approx. 780 upper division beds in a mix of suites and apartment-style units

Document courtesy of HRE

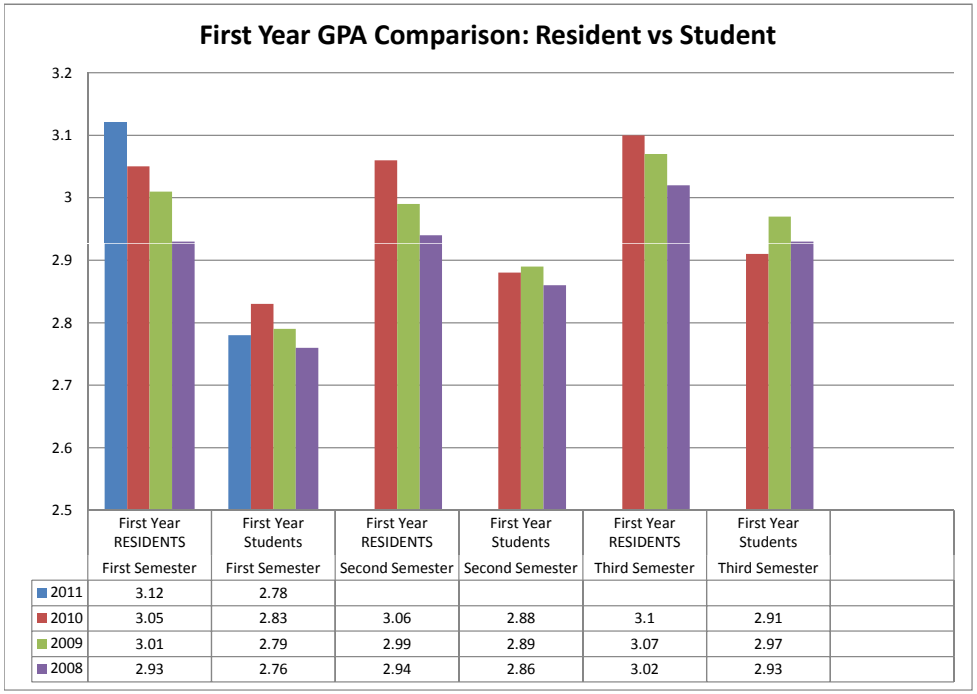
The Residential Student Success Story

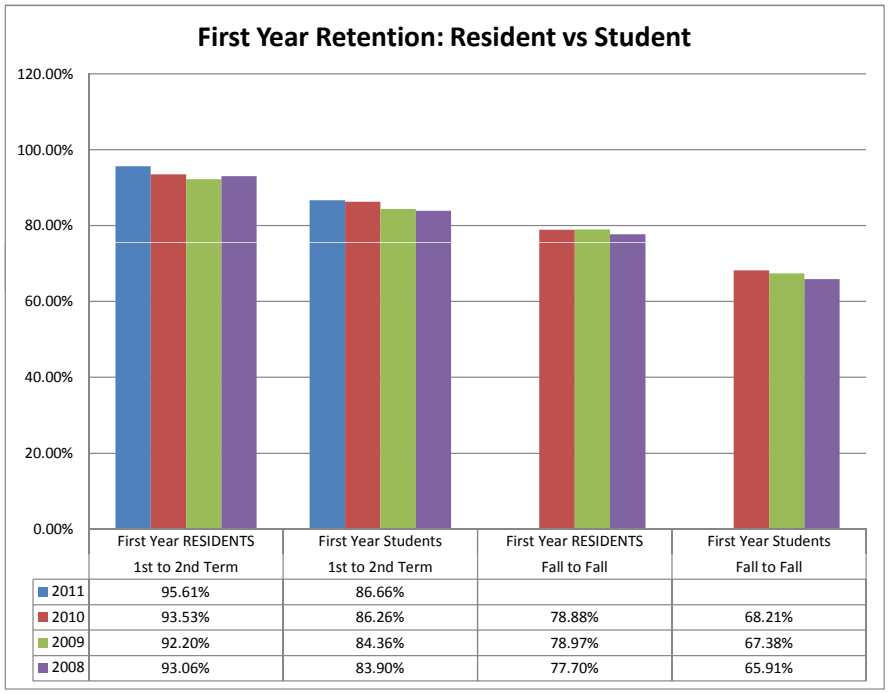
First Year Student GPA Comparison

		2011	2010	2009	2008
First Semester	First Year RESIDENTS	3.12	3.05	3.01	2.93
First Semester	First Year Students	2.78	2.83	2.79	2.76
Second Semester	First Year RESIDENTS		3.06	2.99	2.94
Second Semester	First Year Students		2.88	2.89	2.86
Third Semester	First Year RESIDENTS		3.1	3.07	3.02
Third Semester	First Year Students		2.91	2.97	2.93

Retention

		2011	2010	2009	2008
1st to 2nd Term	First Year RESIDENTS	95.61%	93.53%	92.20%	93.06%
1st to 2nd Term	First Year Students	86.66%	86.26%	84.36%	83.90%
Fall to Fall	First Year RESIDENTS		78.88%	78.97%	77.70%
Fall to Fall	First Year Students		68.21%	67.38%	65.91%





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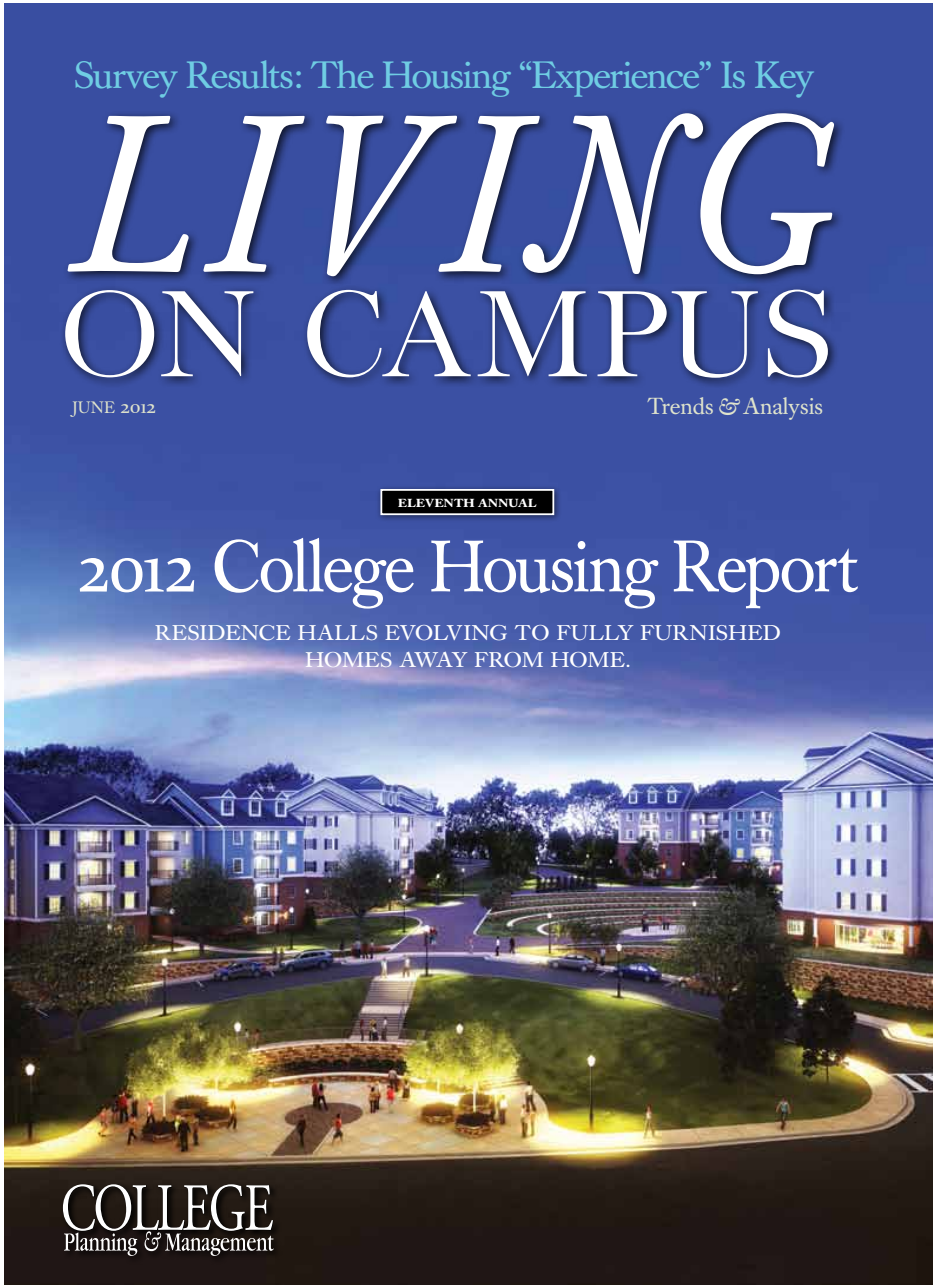


There's No Place Like Home

RESIDENCE HALLS ARE EVOLVING FROM BASIC SLEEPING SPACES TO FULLY FURNISHED HOMES AWAY FROM HOME FOR STUDENTS.

by **PAUL ABRAMSON**

RESIDENCE HALLS — OR dormitories, as they were once called — used to be places where students could sleep, dress, and study while attending college. They were the simplest of spaces, providing each student a bed, a desk, and a place to keep some clothes. And they were usually the least expensive buildings on campus.

Things are different now. Residence halls provide all the comforts of home and, to many students and parents, often more. They are now places for eating, training, studying, banking, taking classes, and yes, sleeping. And they are no longer necessarily the least expensive buildings on campus. The one thing they do continue to have in common across the nation is their role as places where students can live while attending college, a commonality that makes it possible to study them as a whole and to draw conclusions about them and how they both differ and are the same from campus to campus.

This 11th annual survey of college residence hall construction is based on data from 50 projects opened or opening between August 2011 and 2013. Twenty-one are in operation, 15 will open for the fall semester, and the others are currently under construction. Together they will house 26,691 students in 9M sq. ft. Their total cost is more than $2B. **Table 1** (on page 3) shows summary information on the 50 projects, and also examines them in terms of their size, location, and governance.

The median residence hall reported this year houses 499 students, cost $33.5M, and totals 152,404 sq. ft. Cost per student averaged $68,106, lower than a year ago when a number of high-cost projects were reported. Cost per sq. ft., however, rose slightly, to $202.86.

Space allocated per bed in the median project was 312 sq. ft., calculated by dividing the entire size of the building by the number of students housed. The space per sleeping area would be much smaller.

Residence Hall Size

Just seven of the residence halls reported this year house fewer than 200 students. These range from 42 to 170 students. Six of the seven are private. Though they are small, they are not inexpensive, with the median cost per student among them sitting at $79,545. They also provide significantly more space per student (520 sq. ft. per bed compared to 312 for all colleges reporting). Both figures, however, are affected by two very large and expensive projects that are in the small sample. Without those two projects, the cost drops to $61,900 per student and the space per bed to a more reasonable 447 sq. ft.

There are 19 reports on residence halls with 201 to 500 students. The median cost was than $24.7M and the median number of students 416. In terms of cost per student, and cost per sq. ft., these medium-sized residence halls appear to be the most economical, but they provide less space per student.

Larger residence halls (24 reported) house more than 500 students each, with the median at 619 beds. One was designed to house 2,000 students. The median space for the 24 large residence halls was 314 sq. ft. per bed. Cost per student was $67,231. The projects ranged in total cost from just over $22M to $218M. The high-cost project housed almost twice as many students as the low-cost one, but each housed well over 500 students. The major difference was where they were located. One was in a rural community in the south, the other in the middle of a major city in the northeast. Labor costs, weather factors, and other considerations must be taken into account when making comparisons.

PHOTOS COURTESY OF HKDP ARCHITECTURE, INC.

Location, Location, Location

Does the location of the college have an effect on the cost of residence halls? To examine this, we roughly divided the reporting colleges into five regions. Ten were in the Northeast, defined as New England to Virginia. Twelve were in the Southeast (the Carolinas and Tennessee, and south from there). Another 11 are in the Midwest, including the traditional Big Ten states. The largest group of 13 was in the Southwest, including Texas and the states that border it. The balance was placed in the West, from Colorado to the Pacific. Only four colleges are included in this group, so medians could be misleading.

As expected, it costs more to build in the West than anywhere else ($115,434 per student; $404.83 per sq. ft.) but the size of the sample is too small for comfort. Twenty-one residence halls were identified in the western states, but owners and architects from 17 did not respond to requests for information. Unverified data from five of those indicates a somewhat lower cost per sq. ft., but still above the national average.

In the Northeast, the median residence hall cost among 10 reporting institutions was $49M, or $79,285 per student and $294.39 per sq. ft. These residences provided 308 sq. ft. per student, about the national average.

In the Southeast, on the other hand, the median project cost just $25M and $48,106 per student. The difference can be traced to a factor that colleges have difficulty controlling: the cost to build. In the Southeast it was $168.30 per sq. ft., compared to $294 in the Northeast. Cost per sq. ft. of construction in Texas and surrounding states (the Southwest) was also relatively low — $184.59 — and southwestern colleges also kept their costs lower by providing less space per student than those in the rest of the nation. Midwestern colleges had the largest residence halls (a median of 228,639 sq. ft.) and provided the most space per student. Again, space per student is based on overall space, which includes such amenities as classrooms and dining halls. Midwest colleges were more likely than those in any other region to provide dining halls, which may be a factor.

Public and Private

Eight private colleges provided information for this study, compared to 42 public colleges. The private colleges tended to construct smaller residence halls (only two of the private college residences were designed for more than 200 students) and, obviously therefore, they cost less ($11.4M each, compared to $35.5M among public colleges) and were physically smaller (61,834 sq. ft. was the median size of the private college residence halls). However, in terms of cost per student, the private colleges spent a little more and they provided considerably more space (434 sq. ft. per student, compared to 309).

Amenities

Table 2 (on page 4)takes a look at some of the amenities provided in residence halls nationally by size, by region, and by governance. We queried colleges about 12 possible amenities (spaces or services provided in addition to residence rooms). Previously we had also asked about laundry facilities, kitchens for student use, vending machines, and air conditioning, but found that they were included in virtually every project. To save space and time, we eliminated these to concentrate on those amenities that have shown change in availability through the years.

As an example, when we asked about fitness rooms and ATM machines 10 years ago, both were rare. Today, more than one quarter of new residence halls include some sort of fitness room and almost as many provide ATMs. Ten years ago, we sought a way to ask about whether residence halls were providing infrastructure for computer use. A few were. Today we simply ask if wireless networking is available and the answer is yes, in every single project. We'll drop that question next year and assume that every residence hall will provide that amenity.

Towards the end of the last century, the concept of "living/learning" spaces was being written about as a developing trend. Colleges were designing classrooms into their residence halls, in some cases offering students a chance to spend almost their entire academic lives in their residence hall. Now more than half of residence halls include some classroom space.

Use of cards, rather than keys, to permit access to buildings is, and has been, almost standard, except in residences for

TABLE 1

Cost & Size of Residence Halls

	Cost of Total Project*	Number of Students	Size of Project (sq. ft.)	Cost per Student	Cost per Sq. Ft.	Sq. Ft. per Bed
All Reporting Colleges (sample size 50)	$33,520,000	499	152,404	$68,106	$202.86	311.6
Fewer than 200 beds (sample size 7)	$11,200,000	132	55,000	$79,545	$203.64	520.2
201 to 500 beds (sample size 19)	$24,700,000	416	120,566	$66,500	$190.77	294.1
More than 500 beds (sample size 24)	$47,878,126	619	204,750	$67,231	$212.98	314.4
Midwest (sample size 11)	$48,170,000	442	228,639	$94,275	$232.00	382.1
Northeast (sample size 10)	$49,128,126	550	176,129	$79,285	$294.39	308.2
Southeast (sample size 12)	$25,000,000	525	142,000	$48,106	$168.30	314.9
Southwest (sample size 13)	$26,600,000	438	113,178	$54,887	$184.59	294.1
West (sample size 4)	$49,250,000	651	166,891	$115,434	$404.83	282.7
Public (sample size 42)	$35,465,400	525	174,477	$68,106	$206.38	309.3
Private (sample size 8)	$11,410,000	141	61,834	$72,714	$186.43	434.1

* All figures are medians for the sample shown. Each median was determined independently so figures may not add up.

To read this table: The median total cost of 50 reporting residence halls was $33,520,000. The median cost among the seven residences with fewer than 200 students was $11,200,000 but cost per student in the smaller halls was $79,545 compared to $67,231 for larger projects with more than 500 students.

TABLE 3

Where Does the Money Go?

	Median	Range Low	Range High
Construction	83.22%	72.10%	90.50%
Furniture & Furnishings	3.91%	2.20%	5.80%
Fees	7.44%	1.90%	18.10%
Other	5.43%	0.00%	12.30%

How to read this table: Twenty-eight colleges provided full information on how their dollars were divided. The median project allocated 82.2 percent of total spending to construction, almost 4 percent for furniture and furnishings, and about 7.5 percent to fees. Undefined "other expenses" did not include land purchase but probably included land preparation, testing, etc. In looking at data submitted, it was evident that definition of fees and other costs differed from project to project. Hard costs (construction) and furniture and furnishings were the most reliable. The ranges shown are for the two or three projects at each end of the spectrum. Thus, the three projects with most dollars committed to construction, allocated more than 90 percent of their available dollars to construction alone. At the other end, three projects averaged just 72 percent for construction and apparently had more money available for furniture and furnishings as well as fees and other expenses.

TABLE 2

What's in a Residence Hall?

	Fitness Room	Dining Hall	ATM	Computer Center	Classroom	Card Access to Building	Card Access to Rooms	Video Surveillance Internal	Video Surveillance External	Rooms Carpeted
All Reporting Colleges (sample size 50)	28.0%	18.0%	24.0%	34.0%	52.0%	86.0%	40.0%	72.0%	80.0%	50.0%
Fewer than 200 beds (sample size 7)	57.1%	0.0%	0.0%	28.6%	28.6%	28.6%	28.6%	14.3%	42.9%	42.9%
201 to 500 beds (sample size 19)	26.3%	15.8%	26.3%	36.8%	52.6%	94.7%	52.6%	78.9%	78.9%	47.4%
More than 500 beds (sample size 24)	20.8%	25.0%	29.2%	33.3%	58.3%	95.8%	33.3%	83.3%	91.7%	54.2%
Northeast (sample size 10)	10.0%	20.0%	30.0%	30.0%	30.0%	90.0%	40.0%	70.0%	90.0%	30.0%
Southeast (sample size 12)	33.3%	8.3%	16.7%	50.0%	50.0%	75.0%	16.7%	58.3%	66.7%	66.7%
Midwest (sample size 11)	45.5%	36.4%	27.3%	36.4%	36.4%	81.8%	36.4%	72.7%	81.8%	90.9%
Southwest (sample size 13)	23.1%	15.4%	30.8%	30.8%	69.2%	92.3%	61.5%	100.0%	100.0%	15.4%
West (sample size 4)	25.0%	0.0%	0.0%	0.0%	100.0%	100.0%	50.0%	25.0%	25.0%	50.0%
Public (sample size 42)	23.8%	16.7%	23.8%	33.3%	57.1%	92.9%	38.1%	78.6%	88.1%	50.0%
Private (sample size 8)	50.0%	25.0%	25.0%	37.5%	25.0%	50.0%	50.0%	37.5%	37.5%	50.0%

To read this table: Twenty-eight percent of residence halls recently completed or currently underway will contain fitness rooms. In a bit of a surprise, smaller residences (under 200 students) are more likely than larger ones to include that facility. Just 10 percent of residences in the Northeast report fitness rooms. Half of private colleges will include fitness rooms.

fewer than 200 students. There is less use of key cards for rooms, but 40 percent of the projects now use them compared to 25 percent 10 years ago. One would think that most students would prefer to have an access card that cannot be duplicated. Not installing them may be a cost factor.

Video surveillance as a security measure can be controversial. When we first started asking about this feature, we did not distinguish between external surveillance and internal surveillance, but respondents did. They were more comfortable with outside systems that detected people going to and from residence halls than internal surveillance systems that showed who among the residents and visitors went room to room.

That divide is definitely narrowing, with 80 percent of the projects providing external surveillance, 72 percent internal. Smaller residences do not tend to use internal surveillance, and less than half install external systems. It may be that there is a campus system already in place, so the residence hall itself does not need to install one. In the Southwest, every college responding now uses both internal and external surveillance.

The provision of carpeting in student rooms fell this year to 50 percent. Previously, carpeting had been installed in two-thirds of residences. Colleges in the Southwest tend not to provide carpeting (only 15 percent do) while those in the Midwest almost always provide it. Is the difference related to cold floors during cold winters in the Midwest?

How the Costs Are Divided

While the bulk of the cost for any residence hall construction is for the building itself, a key question in analyzing projects is the additional amount paid for work beyond the actual construction, including fees, furnishings and furniture, site work, etc. This is not an easy breakdown to obtain.

For one, many architects (who provide information on construction costs) are not involved in purchasing furniture and furnishings. Architects also have a handle on their fees, but not on the fees of attorneys, bond market experts, and other consultants the college may use. Moreover, some colleges' "other expenses" are far more encompassing than others, so even when full information is obtained, it may not be comparable. Despite all these obstacles, it is useful to try to determine how the total cost of a residence hall project is divided. **Table 3** (on page 4) looks at that.

Respondents at 28 colleges provided their full and best possible information on how the total dollars were split at their institution. (Respondents at the other 22 provided total project cost but could not break down all of the components.) As Table 3 shows, the median spent more than 83 percent of the cost on construction itself, a slight increase from previous years. Another 3.91 percent went to furniture and furnishings while 7.44 percent was allocated for fees. The catchall "other" (which should include site preparation but not the cost of purchasing a site) accounted for $5.43 of every $100 spent.

Even among these 28, there were differences about what should be counted where. Table 3 also shows the range of responses. Thus, construction accounted for as much as 90.5 percent of one college's costs and as little as 72 percent at another. Similar variations from the norm are shown for furniture and furnishings, fees, and other expenses. Somebody could do a significant service for college construction by creating standard definitions for the various categories of spending.

Owners and Operators

Seventy-eight percent of the residence halls included in the study will be owned by the college. The private contractors who constructed them for the college will own the balance. When it comes to managing the buildings, 92 percent will be managed and operated by the college, whether the college or a private entity owns the building. There were no significant differences by size of project, location, or governance.

How Are Students Accommodated?

In ancient times, when I attended college, a residence hall room had sleeping arrangements for one student, two, four, even eight. Everyone used gang toilets, sometimes on the same floor, sometimes not. There was a telephone somewhere in a hallway, and there might or might not be open areas for socializing or lounging. There were no provisions for preparing food. Dormitories, as they were called, were for sleeping and studying, and little else.

Those days are long gone. But how exactly are students accommodated? The word "suites" is often used to describe accommodations. But what is a suite, how many students use it, and what does it include? To try to get a better handle on this, this year we posed a series of questions specifically on how students were housed and how bathroom facilities were allocated. The compiled answers to these questions are shown in **Table 4** (on page 6).

Our question asked what percentage of students would be housed in individual rooms, suites/apartments for two people, or suites/apartments for four to eight persons. As Table 4 shows, on a national basis (with responses coming from 35 residence halls), a little better than half the students being accommodated will be housed in individual rooms. About 35 percent will be in two-person suites while the balance (14 percent) will be in suites or apartments designed to house four to eight students. (I am somewhat surprised by the number in individual rooms and wonder if, in at least some cases, those are individual rooms within a suite for several students. Next year's questionnaire will try to clarify that.)

In smaller residences (fewer than 200 beds), more students appear to be in larger groups. In six residence halls located in the Midwest there are no single rooms, but in the 10 reporting residence halls in the Southeast, almost 90 percent of students are in individual rooms. In the small sample from the West, the emphasis appears to be on larger groups (four to eight students). Public and private colleges appear to have similar arrangements.

Does the amount spent make a difference in how students are housed? We took a look at sleeping arrangements in the bottom quarter and top quarter of each measure of expenditure and found that cost does indeed affect arrangements.

Among the nine residence halls that cost less than $15M, four out of five students were housed in single rooms. Among nine residence halls costing $48M or more, less than half the students were in individual rooms; the bulk were in small and larger suites.

The same differences were found when the more significant measures of cost per student or cost per sq. ft. were analyzed. The less expensive the residence halls, the more likely students would be housed in individual rooms. We did not have plans to analyze, but one way to minimize costs is to provide rows of same-size single rooms along a corridor, which might explain the preponderance of single occupancy rooms — particularly in low-cost projects.

Bathroom Facilities

The availability of bathrooms may be a more significant way to analyze residence hall accommodations. Gang toilets are seldom mentioned (there were a few), but when asked how many students will share a bathroom, responses indicated that, while the majority of students will be in individual rooms, that does not mean they will have toilet facilities of their own. Just 10.7 percent of the 18,000 students to be housed in 36 reporting residence halls will have a private bathroom or share that space with one other student. Somewhat more than half the students (52.7 percent) will share bathroom facilities with three to four other students, while better than 36 percent will share bathroom facilities with four or more students.

TABLE 4

Residence Hall Accommodations

	Median Percentage of Students in			Median Percentage of Students Sharing Bathroom		
	1 person	2 person	4 to 8	1-2	3-4	4+
All Reporting Colleges (sample size 35)	51.3%	34.9%	13.8%	10.7%	52.7%	36.6%
Fewer than 200 beds (sample size 6)	39.4%	23.3%	37.3%	17.7%	36.4%	45.8%
201 to 500 beds (sample size 14)	48.9%	30.8%	20.2%	14.0%	74.1%	11.9%
More than 500 beds (sample size 15)	53.2%	37.5%	9.3%	8.7%	43.8%	47.5%
Northeast (sample size 8)	57.3%	40.1%	2.6%	9.1%	39.9%	51.0%
Southeast (sample size 10)	88.4%	11.6%	0.0%	19.9%	56.0%	24.0%
Midwest (sample size 6)	0.0%	62.8%	37.2%	7.4%	35.4%	57.2%
Southwest (sample size 8)	54.1%	34.0%	11.8%	7.6%	65.5%	26.8%
West (sample size 3)	1.6%	46.6%	51.7%	3.6%	79.3%	17.2%
Public (sample size 27)	52.6%	34.0%	13.4%	11.0%	54.2%	34.9%
Private (sample size 8)	39.5%	43.5%	17.0%	8.1%	37.9%	54.0%
Total Cost						
Less than $15M	80.1%	6.9%	13.1%	17.3%	65.7%	17.0%
More than $48M	44.9%	31.5%	23.5%	2.6%	37.1%	60.4%
Cost per Student						
Less than $48,000	82.6%	17.4%	0.0%	21.7%	71.7%	6.6%
More than $95,000	43.9%	25.0%	31.1%	4.3%	44.5%	51.2%
Cost per Sq. Ft.						
Less than $150	95.8%	4.2%	0.0%	13.0%	63.4%	23.6%
More than $265	47.6%	28.6%	23.9%	2.9%	41.5%	55.6%

How ro read this table: Information on the type of accommodations provided and on sharing of bathroom facilities was supplied on 35 projects. Just slightly more than 18,000 students will be housed in these projects. Fifty-one percent of them will be in indivdual rooms, almost 35 percent will share with one other student, and just 14 percent will share with four or more students. When it comes to toilet facilities, fewer than 11 percent of students will share with a single other student. Almost 53 percent will share facilities with three to four students, while 37 percent will share with more than four other students.

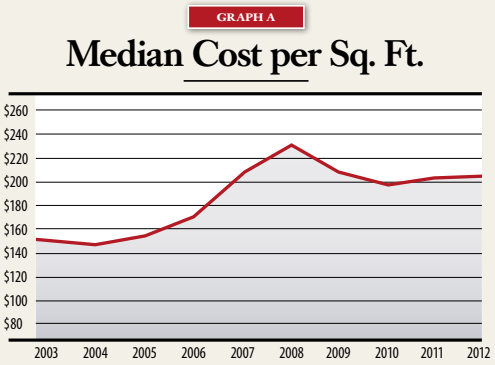
The differences by size of residence hall, location, and governance do not seem significant, but when it comes to cost per student and cost per sq. ft., there are some surprises. One would expect that less costly residence halls would install fewer bathroom facilities and expect students to share, but this does not appear to be true. The nine residence halls costing less than $48,000 per student expect 93 percent of their students to share bathroom facilities with no more than three other students. Among the nine residence halls costing $95,000 per student or more, more than half the students are expected to share bathroom facilities with more than four other students. Among residence halls costing $150 or less per sq. ft., three-quarters of students will share bathroom facilities with three or fewer other students, while in those costing $265 per sq. ft. or more, well over half will share with four or more students. As the King of Siam is said to exclaim (in the play *The King and I*), "It's a puzzlement." The questions and answers need more examination.

A Decade of College Residential Construction

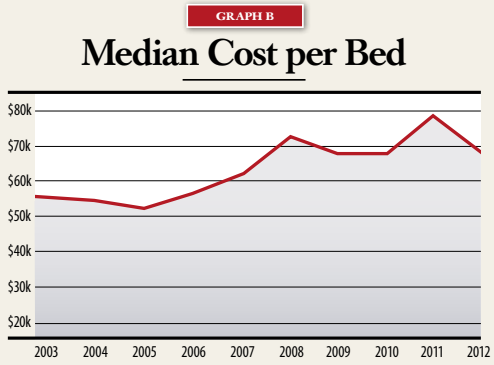
Every year for the last 10 years, *College Planning & Management* has conducted a survey of residence halls that had just opened or were about to be opened. Information is sought on their size, cost, and amenities. Each year, 40 to 50 cooperating institutions and their architects (out of about 100 contacted) provide that basic data. Since there is no control over who responds, where they are located, college size, or governance, year-to-year comparisons can be dangerous. But with 10 years of data in the bank, it is possible to draw some conclusions.

During those 10 years, data was collected on 427 residence hall projects housing 171,000 students in 57M sq. ft. of building. Total estimated cost of the projects was a little more than $13B, and that does not include spending on at least as many residence halls at colleges that did not respond to the requests for information.

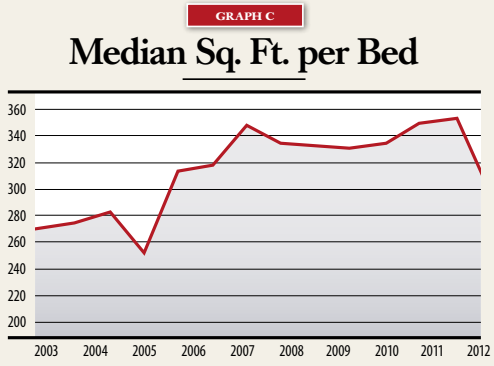
GRAPH A



GRAPH B



GRAPH C



Total residence hall construction over those 10 years certainly exceeded $26B. Among other findings:

- The average residence hall housed 374 students. There were a few much larger and some that had fewer than 100 beds, but even when lows and highs are discounted, the median residence hall over 10 years housed 372 students, essentially the same number as the average.
- The cost of residence halls has risen, but perhaps not as much as might be expected. From 2003 through 2008, cost per sq. ft. rose relatively rapidly (see **Graph A** on page 7) from $148 to $231, but 2008 may have been an aberration. Since then costs have fallen and, among reporting projects, has stabilized nationally around $200 per sq. ft. The recession started in 2008, and as a result there may have been more competition for construction contracts, holding costs down.
- Median cost per bed over the first two years of the study was about $45,000 (see **Graph B**). Five years later it had stabilized around $69,000 per student. Last year it approached $80,000 but, in the current group, the median cost is $68,106 per student. Again, these figures are not necessarily comparable since there is no control over the range of colleges reporting in a single year, but they follow the same pattern as costs per sq. ft., peaking in 2008 and then falling back.
- The space allocated per bed over 10 years (see **Graph C**) averaged out at 333 sq. ft. There was one residence hall (at a seminary) that provided just 60 sq ft. per bed, and there were a few indicating that their residence halls provided almost 500 sq. ft. per student, but the great majority fall into the range of 310 to 375 sq. ft. per bed.

That does not mean every bed is in an area of 333 sq. ft. The calculation was made by dividing the total space of the residence hall by the number of students to be accommodated. The seminary with just 60 sq. ft. per student provided virtually nothing but sleeping rooms. Most residence halls include significant additional space, including TV rooms, study rooms, laundry rooms, computer centers, kitchens, and social space. Over the 10 years, more than one-third of new residence halls included classrooms, and one in five included a fitness room. All of these activities and spaces are included in the calculation of space per student bed.

Paul Abramson *is education industry analyst for* CP&M *and president of Stanton Leggett & Associates, an educational facilities consulting firm based in Mamaroneck, NY. He was named CEPFI's 2008 "Planner of the Year." He can be reached at* intelled@aol.com.

…And the Survey Says

ENROLLMENT CONTINUES TO GROW, BUT TO ATTRACT AND RETAIN THOSE STUDENTS DEPENDS IN PART ON THE QUALITY OF HOUSING AT YOUR INSTITUTION.

by **DEB MOORE**

ENROLLMENT CONTINUES to grow at colleges and universities across the country. Along with growing enrollment comes the need to provide more and better housing for students who plan to live on campus. Your ability to recruit new students and retain the students you have depends in part on the quality of campus housing at your institution.

To find out more about the housing issues facing colleges today, *College Planning & Management* surveyed administrators from two- and four-year colleges and universities nationwide. The 2012 Living on Campus Survey was completed by 209 of your colleagues from 45 states. The respondents were responsible for more than 2,500 residence hall buildings — new and old, large and small. Here is what they had to say.

Forty-four percent reported a lack of sufficient space in response to the question "How much residence hall space does your campus currently have?" Only three percent reported having surplus space. Despite the shortage of residence hall space, only 25 percent of the institutions surveyed reported that they are currently in the process of increasing the number of available beds.

Seventy percent of the new residence halls being planned will be owned and operated by the university. Even if a private developer or university foundation has ownership of the buildings, most universities will still operate the facility.

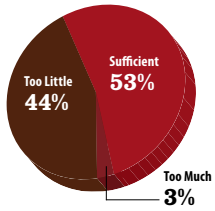
When asked about the impact of the economy on the number of students living on campus, 44 percent of the institutions reported no effect. Thirty-one percent reported an increase in the number of students living on campus, while only 25 percent reported a decrease. Seventy-four percent of institutions actively campaign to keep students in campus housing. But not having enough space has translated into overcrowding, not enough housing for juniors and seniors, and a negative impact on their relationship with the neighborhoods that are in close proximity to the school.

While building new may not be an option, 62 percent of the institutions polled are in the process of renovating or

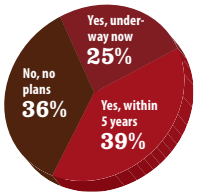
WHEN ASKED ABOUT THE IMPACT OF THE ECONOMY ON THE NUMBER OF STUDENTS LIVING ON CAMPUS, 44 PERCENT OF THE INSTITUTIONS REPORTED NO EFFECT. THIRTY-ONE PERCENT REPORTED AN INCREASE IN THE NUMBER OF STUDENTS LIVING ON CAMPUS, WHILE ONLY 25 PERCENT REPORTED A DECREASE.

Space

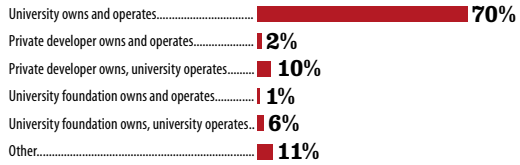
How much residence hall space does your campus currently have?



Is your institution planning to increase the number of residence hall beds on campus?

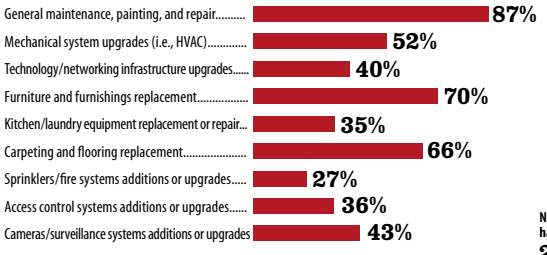


Who will own and operate the new residence halls being planned?

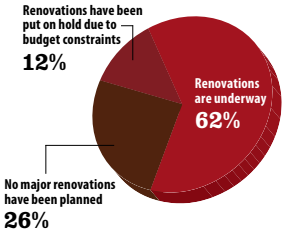


Renovations/Upgrades

What types of renovations/upgrades are being considered in the next 3-5 years?



What are your plans for upgrades/ renovations to the residence halls on your campus?



upgrading their facilities. Renovations have been put on hold in 12 percent of the institutions due to budget constraints. The good news is that this number is down from the 17 percent reported in last year's survey. The lack of sufficient space has made it near impossible for many institutions to make improvements to their residence halls on a rotating basis, adding to the deferred maintenance dilemma.

Top Concerns

Last year the concern that topped the list was the growing cost of a college education for students and families (tuition, room & board). This year, growing student/parent expectations and deferred maintenance have taken the #1 and #2 slots. Students' priorities still appear to be amenities, privacy, and single units — a "hotel" experience rather than a "college" experience — and many are basing their choice of college on the quality of the residence halls.

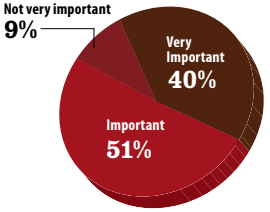
A number of universities reported concern regarding students' ability to adjust successfully to community living. There is increasing concern about students' experiences prior to college and their ability to share space, think about security, make good decisions, and communicate clearly. A number of schools reported experiencing an increased percentage of students with mental health issues. Others are finding that many of their students do not feel they should be held accountable for breaking rules. When they get fined or evicted, they bad-mouth the college housing and spread gossip that hinders new tenants from coming in.

Other noted concerns were aging facilities, the demand for modern housing options, a need for technology upgrades, cost to students, debt limits, adequate funding, and adequate staffing. The commitment of one university is "what we lack in facilities, we must be able to make up in adequate staff/customer service." CPM

***A special thanks** to all who contributed to the information presented in this report.*

Importance

How important is the quality of on-campus housing in determining whether a student will attend your institution?



STUDENTS' PRIORITIES STILL APPEAR TO BE AMENITIES, PRIVACY, AND SINGLE UNITS — A "HOTEL" EXPERIENCE RATHER THAN A "COLLEGE" EXPERIENCE — AND MANY ARE BASING THEIR CHOICE OF COLLEGE ON THE QUALITY OF THE RESIDENCE HALLS.

Top 5 issues facing chief housing officers over the next 3 to 5 years:

1. **Student/parent expectations**
2. **Deferred maintenance**
3. **Cost to students**
4. **Civility/entitlement issues**
5. **Need to modernize facilities**

2012 ACUHO-I CONSTRUCTION AND RENOVATION FINDINGS

Presented by: MGT OF AMERICA, INC.

Presenters

1

Rita Moser, *Florida State University*

Cynthia Parish Balogh, *MGT of America, Inc.*

Case Studies

Harriet Green-Sappington, *University of Missouri*

Rosanne Proite, Texas State *University–San Marcos*

Introduction

2

- History of the Survey – Jim Grimm
- ACUHO-I and MGT Collaboration
- Project Goals and Objectives
  - Establish a national data set that is reliable, useful, and easily accessible for institutional planning

Purpose of Presentation

3

- Share results from the 2012 survey of 306 colleges and universities
- Identify trends over five iterations of the survey
- Facilitate discussion among CHOs concerning construction/renovation issues
- Showcase exemplary projects related to current trends

Survey Instrument

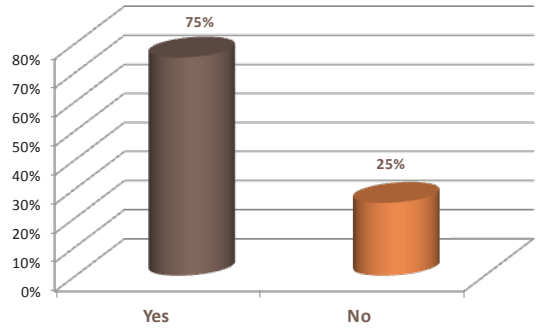
4

- *Section A:* Institutional Characteristics
- *Section B:* Facilities Planning Initiatives
- *Section C:* New Construction Projects
- *Section D:* Renovation Projects

5 Survey Results

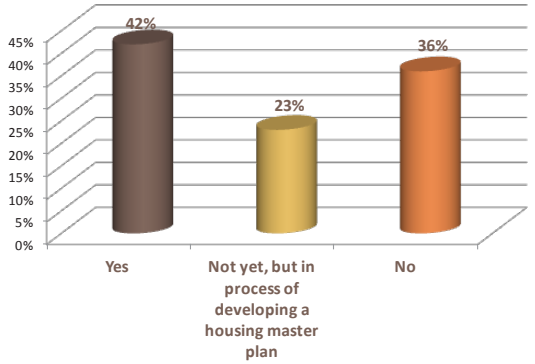
Institution Has a Campus Master Plan That Includes Housing

9



Institution Has a Separate Housing Master Plan

10



11

New Construction Findings

62 . . .Institutions Reporting

70 . . .New Construction Projects

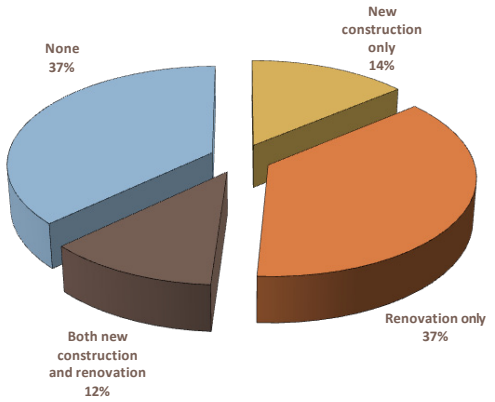
Responding Institutions

6

- 1,269 Institutions Contacted (902 members, 367 non-members)
- **306 Respondents ~ 24.1% Response Rate**
- 95% 4-Year, 2.5% 2-Year Institutions , 2.5% Other
- 62% Public, 38% Private, .4% Other
- 54% have an on-campus residency requirement

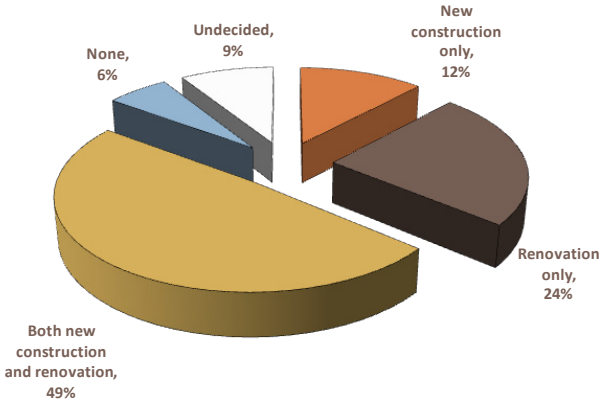
Construction or Renovation Completed Winter 2010 - Fall 2011

7



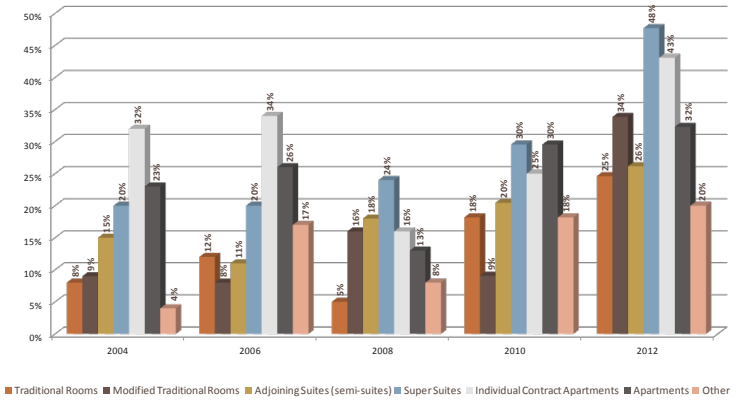
Planning to Initiate Construction or Renovation Project in Next 5 Years

8



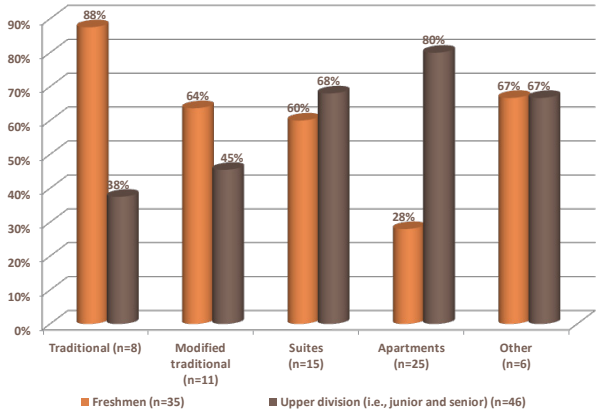
Type of Living Units

12



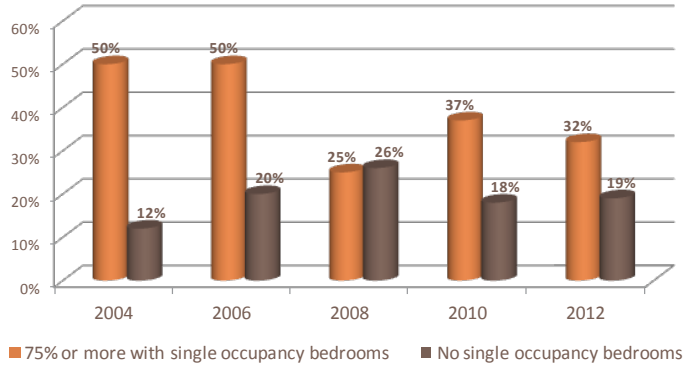
Target Resident by Housing Type

13



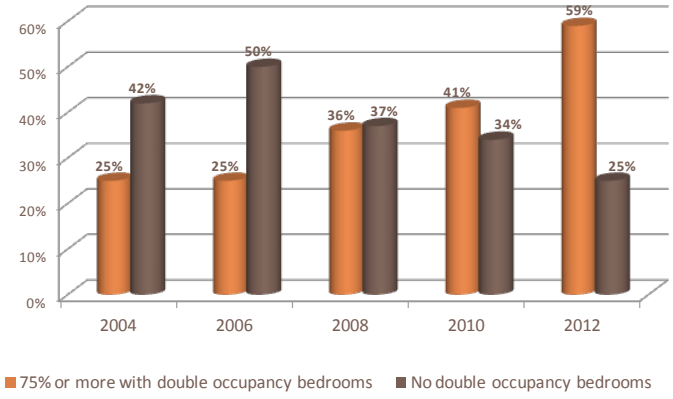
Projects Configured as Single Occupancy Bedroom

14



Projects Configured as Double Occupancy Bedroom

15



Types of Space & Amenities in Facility

16

Top Responses

- Wireless Internet access (95%)
- Bicycle racks outside (88%)
- Laundry (80%)
- Lobby (75%)
- Staff apartments (75%)
- Kitchen(s) (74%)
- Staff offices (69%)
- Floor lounges (69%)
- Reception office/main desk (65%)
- Vending area (65%)

Types of Amenities in Unit

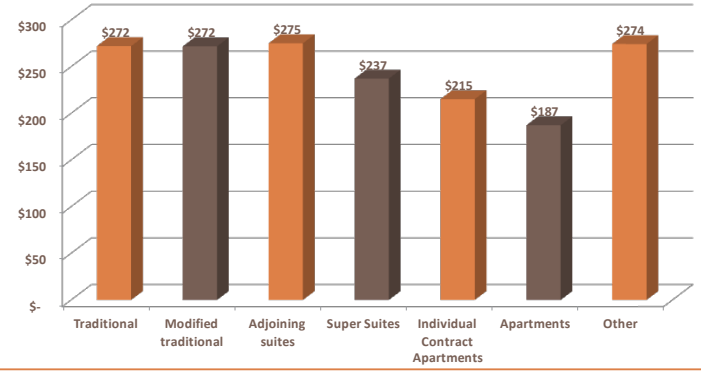
17

Top Responses

- Wireless Internet access (97%)
- Furniture (94%)
- Cable TV service (89%)
- Air conditioning (83%)
- Temperature control in living unit (82%)
- Hardwired Internet access (80%)
- Carpeting (62%)
- Refrigerator (58%)
- Telephone outlet (50%)

Project Cost Per GSF by Type of Unit (2012 Survey)

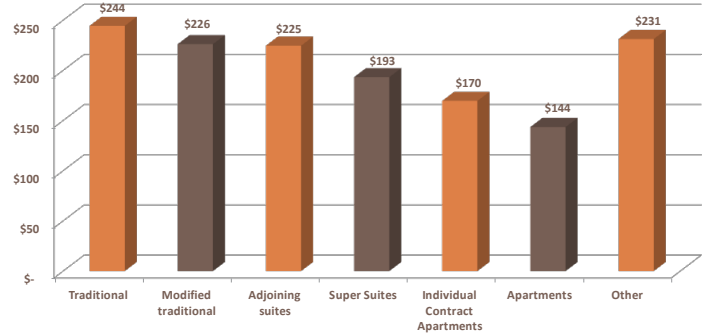
18



Traditional, n = 6
Modified Traditional, n = 10
Adjoining Suites, n = 5
Super Suites, n = 10
Individual Contract Apartments, n = 8
Apartments, n = 7
Other, n = 4

Construction Cost Per GSF by Type of Unit (2012 Survey)

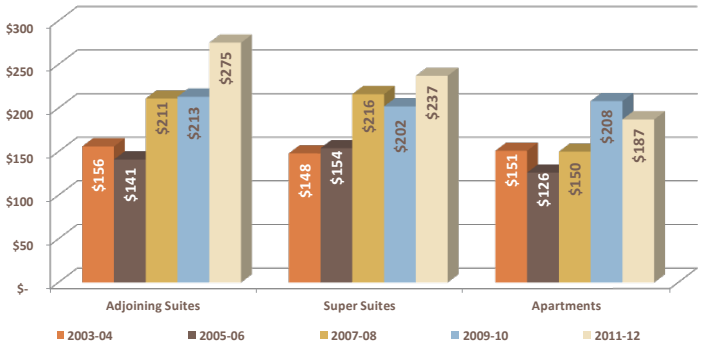
19



Traditional, n = 7
Modified Traditional, n = 10
Adjoining Suites, n = 5
Super Suites, n = 10
Individual Contract Apartments, n = 8
Apartments, n = 7
Other, n = 5

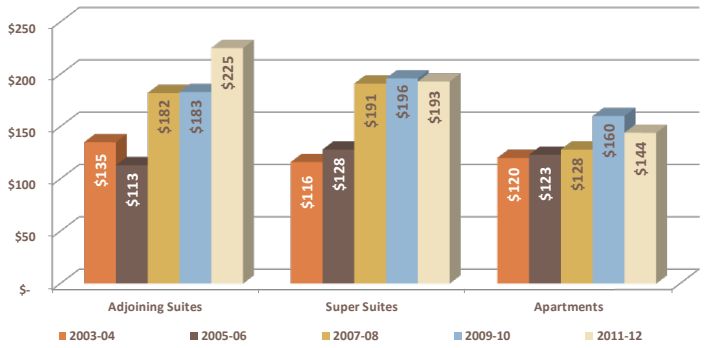
Project Cost Per GSF Trends 2004 through 2012 Surveys

20



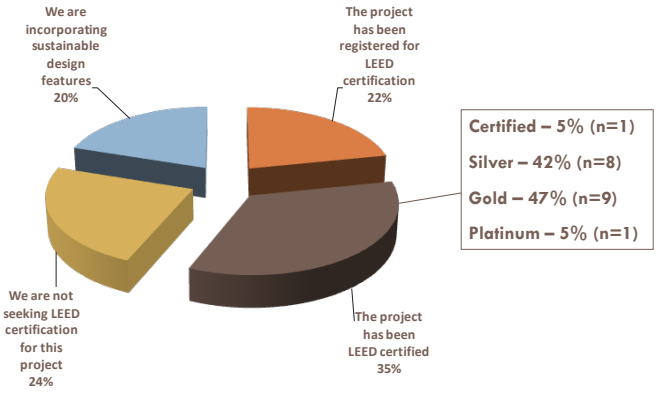
Construction Cost Per GSF Trends 2004 through 2012 Surveys

21



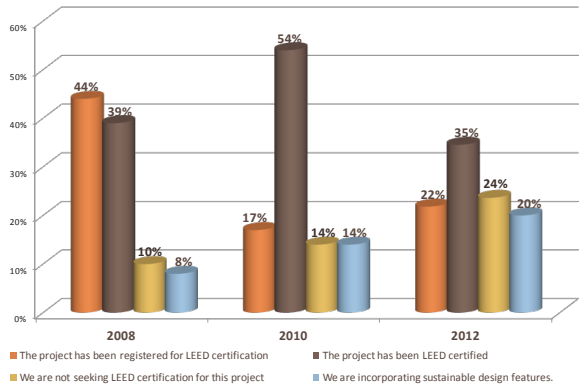
LEED Certification for Project

22



LEED Certification Trends for Project

23



Reason Facility Was Built

24

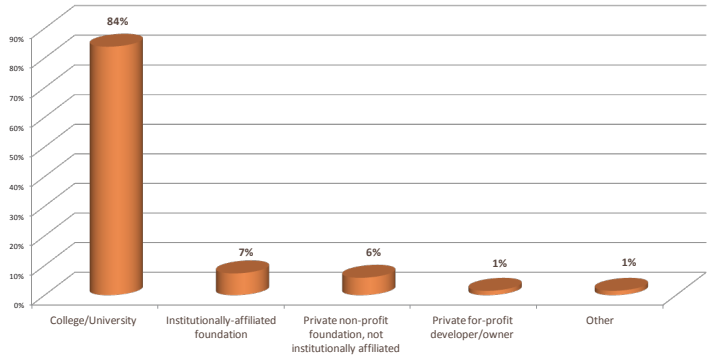
- Meet the demand for additional beds (80%)
- Meet the needs and interests of students (68%)
- Keep pace with institutional enrollment growth (56%)
- Increase the variety of housing options (47%)
- Replace outdated facilities (44%)
- Increase the percentage of undergraduates housed on campus (42%)
- Provide higher levels of privacy (36%)

Primary Reason:

- Meet demand for additional beds (48%)

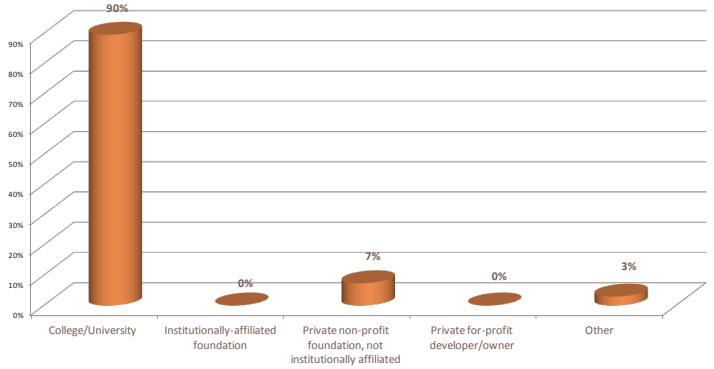
New Facility Ownership

25



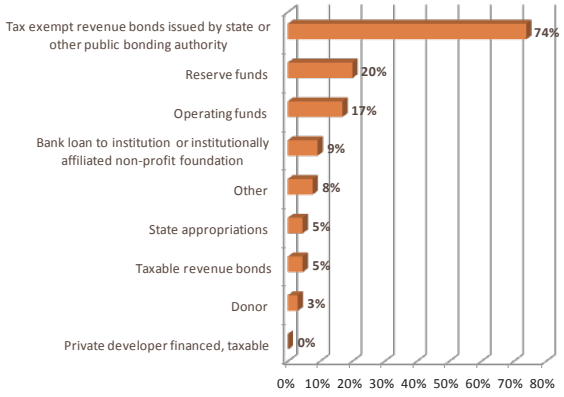
Management of New Facility

26



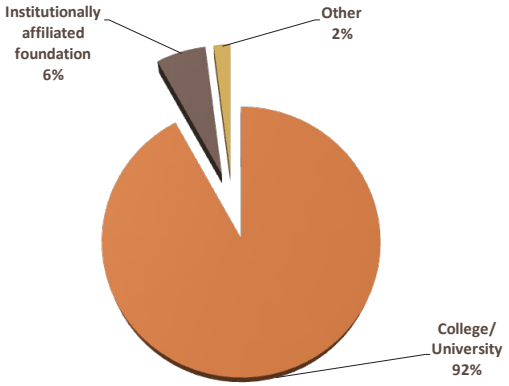
Project Funding Mechanisms

27



If Debt Financed, Who is Responsible for Debt?

28



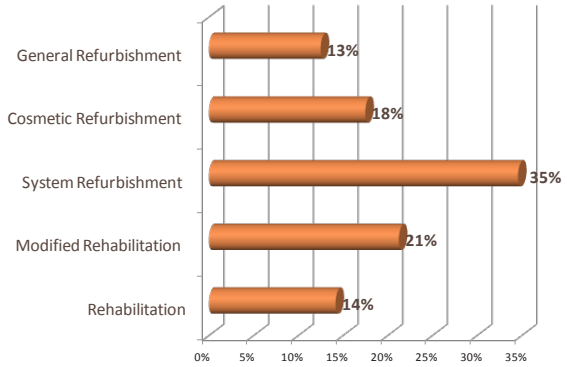
29 Renovation Findings

121 **Institutions Reporting**

320 **Renovation Projects**

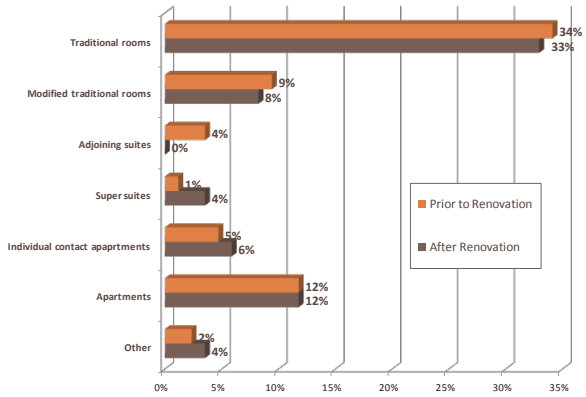
Extent of Renovation (all institutions)

30



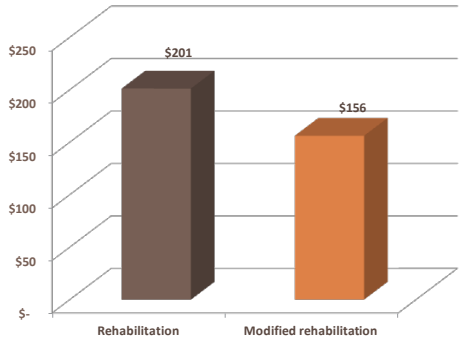
Type of Living Unit (Rehab/Modified Rehab)

31



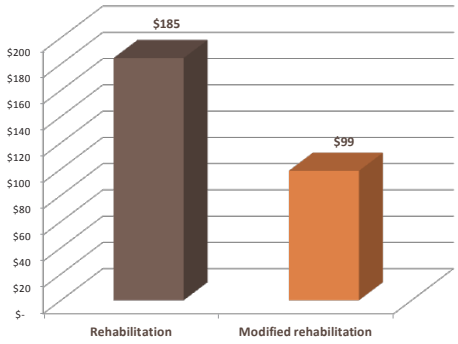
Project Cost Per GSF

32



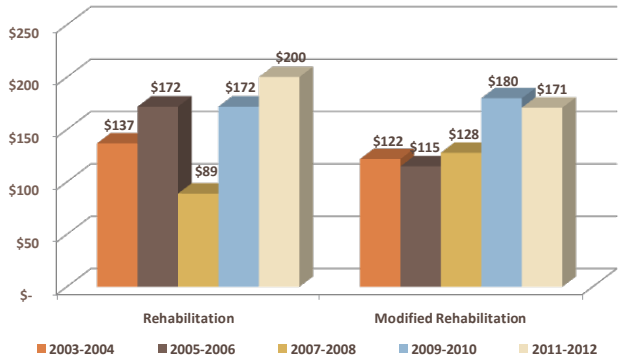
Construction Cost Per GSF

33



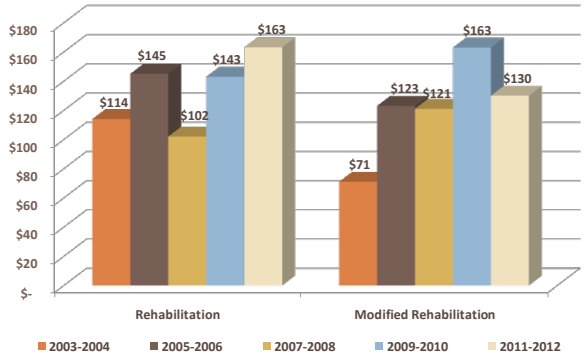
Trends in Project Cost Per GSF 2004-2012

34



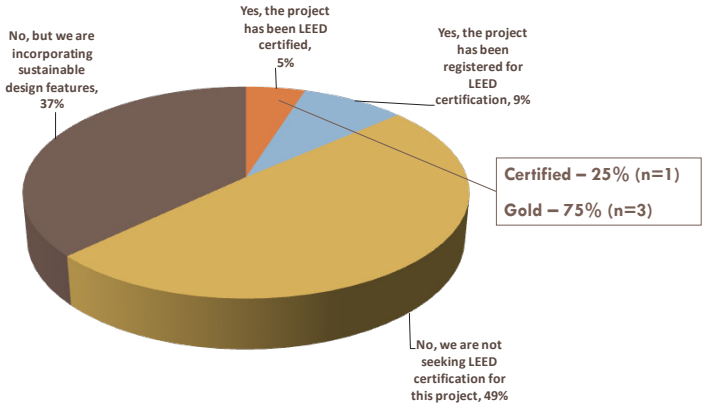
Trends in Construction Cost Per GSF 2004-2012

35



LEED Certification for Project

36



Reason for Renovation (all respondents)

37

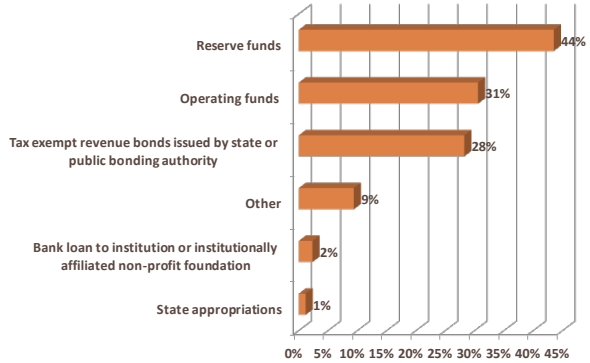
- Update facilities (210 responses)
- Meet the needs and interests of students (115 responses)
- Other (40 responses)
- Provide higher levels of privacy (23 responses)

Primary Reason:

- Update facilities (165 responses)

Method of Project Funding (Rehab/Modified Rehab)

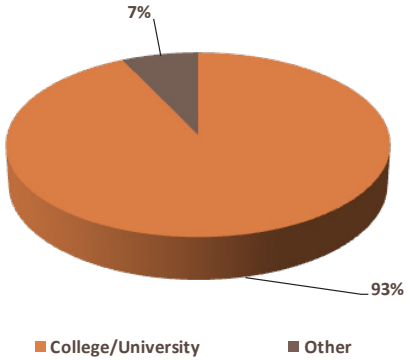
38



***No respondents indicated using taxable revenue bonds, donors, or private developers to finance their rehab projects.*

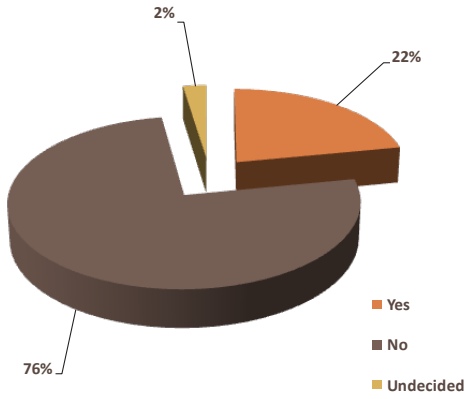
If Debt Financed, Who is Responsible for Debt? (Rehab/Modified Rehab)

39



Project Includes Rental Rate Increase (Rehab/Modified Rehab)

40



41

DISCUSSION & QUESTIONS

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CLICK ON "REPORTS"