State of Utah

GARY R. HERBERT
Governor

SPENCER J. COX
Lt. Governor

Department of Administrative Services
KIMBERLY K. HOOD
Executive Director

Division of Facilities Construction and Management
P. JOSHUA HAINES
Director

Addendum No. 1

Date: January 24, 2014

To: Contractors

From: Rick James – Project Manager, DFCM

Reference: Lassonde Living Learning Center – CM/GC Services
University of Utah
DFCM Project No. 13285750

Subject: **Addendum No. 1**

Pages	Addendum Cover Sheet	1	page
	General Items	360	page
	Total	361	pages

Note: This Addendum shall be included as part of the Contract Documents. Items in this Addendum apply to all drawings and specification sections whether referenced or not involving the portion of the work added, deleted, modified, or otherwise addressed in the Addendum. Acknowledge receipt of this Addendum in the space provided on the Bid Form. Failure to do so may subject the Bidder to Disqualification.

1.1 SCHEDULE CHANGES: See attached Revised Project Schedule. Changes are highlighted.

1.2 GENERAL ITEMS: See Addendum No. 1, Dated January 24, 2014
Revised Schedule
Draft Program
Design Schedule

Addendum No. 1

January 24, 2014

Addendum No. 1
Solicitations for CM/GC Services for the Lassonde Living Learning Center
DFCM Project 13285750

Item 1
The Schedule has changed: Refer to "Revised Schedule", which is attached. The Proposals including a cost proposal, management plan, references and statements of qualifications must be submitted by 12:00 Noon on Thursday, February 6 2014 to DFCM. The schedule is attached to this Addendum No. 1.

Item 2
Additional Management Plan Requirement:
"Parking on the University of Utah Campus is extremely limited. Part of the submitted CMGC Management Plan is to present a parking plan that will minimize construction staging and contractor parking in University parking lots. These submitted proposed staging and parking plans will be provided to the University for use during negotiations with the successful CMGC. A final parking plan for each Bid Package will be developed during design and approved by the Construction Impacts to Parking (CIP) Committee."

Item 3
See the attached DRAFT Program.

Item 4
See the attached Design Schedule "Proposed Schedule Spring 2014". This schedule presents preliminary dates for the Schematic Design process.

Item 5 Question
Q: Construction can start Feb/March?
A: Yes. The construction may start in February or March. Also, it is anticipated that there may be early bid packages in September or October.

Item 6 Question
Q: Substantial Completion Dates
A: The project should be done in May to allow for move in time for occupancy of August. May 1, 2016 is the requested finish date. The finish date must be determined by coordination of all of the events and activities that must be done for preparation to move in. The finish date may vary depending on the coordinated schedule which must meet the needs of the University. The most important thing about the finish date and schedule is that the facility be open for business at the beginning of the Fall Semester.

Item 7 Question
Q: Are playfields part of this effort?
A: No.

End of Addendum

REVISED PROJECT SCHEDULE

PROJECT NAME: **LASSONDE LIVING LEARNING CENTER**
UNIVERSITY OF UTAH – SALT LAKE CITY, UTAH
DFCM PROJECT NO. 13285750 **CM/GC**

Event	Day	Date	Time	Place
Request for Proposals Available	Wednesday	January 8, 2014	3:00 PM	DFCM web site *
Mandatory Pre-Proposal Site Meeting	Thursday	January 23, 2014	3:00 PM	Room 241 University Services Bldg University of Utah 1795 East South Campus Drive SLC, UT
Last Day to Submit Questions	Monday	January 27, 2014	3:00 PM	Rick James – DFCM E-mail rjames@utah.gov
Addendum Deadline (exception for proposal delays)	Wednesday	January 29, 2014	3:00 PM	DFCM web site *
Cost Proposals, Management Plans, References, Statements of Qualifications, and Termination/Debarment Certifications Due	Thursday	February 6, 2014	12:00 NOON	DFCM Room 4110 State Office Bldg Capitol Hill Complex SLC, UT 84114
Short Listing by Selection Committee, if applicable.	Friday	February 14, 2014	2:00 PM	DFCM web site *
Interviews	Wednesday	February 19, 2014	TBA	To Be Announced
Announcement	Monday	February 24, 2014	4:00 PM	DFCM web site *
Requested Substantial Completion Date	Sunday	May 1, 2016		

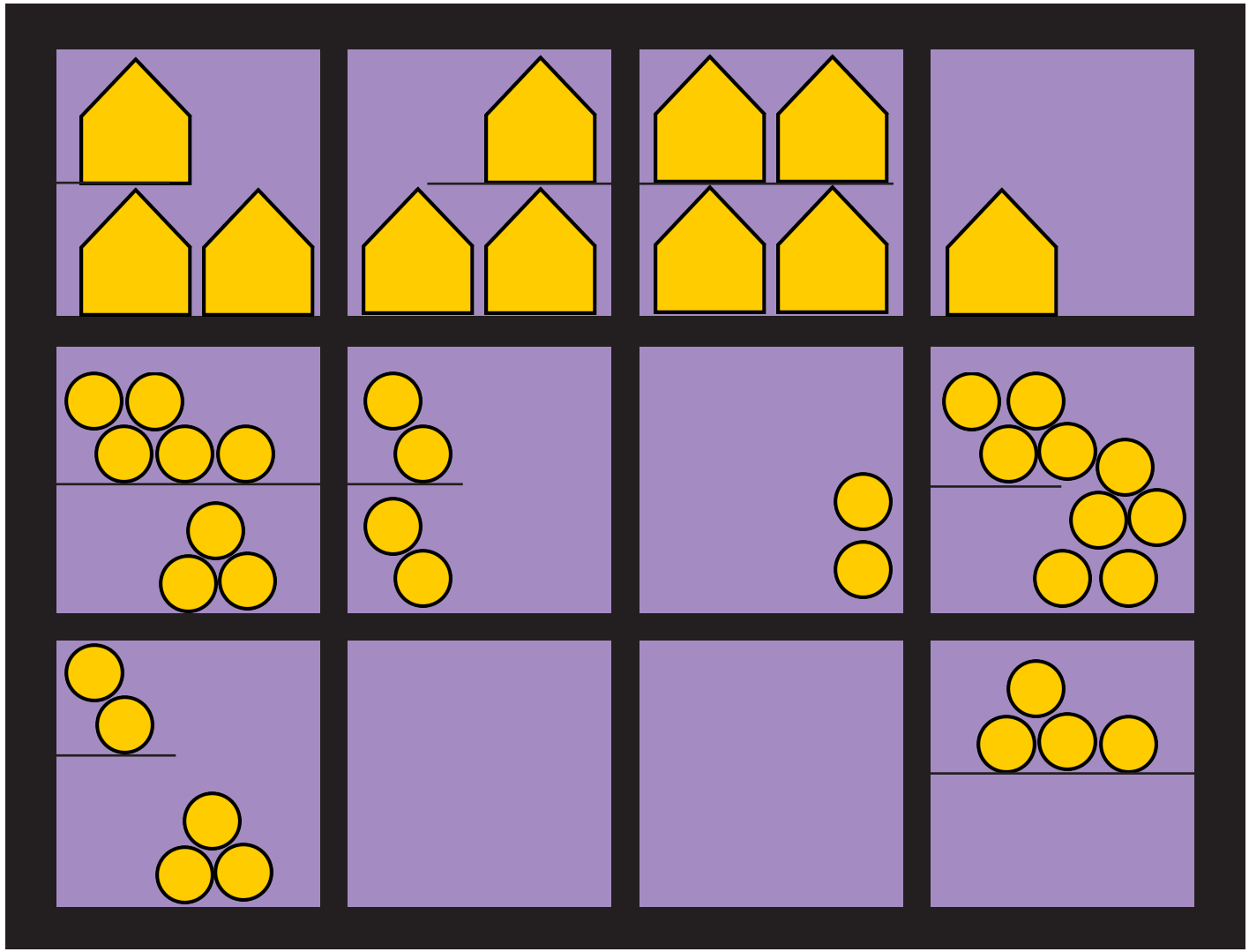
* **DFCM's web site address is www.dfcm.utah.gov**

in association with CANNONDESIGN

PROJECT PROGRAM FOR

LASSONDE MAKE-LIVE CENTER

THE UNIVERSITY OF UTAH



EDA ARCHITECTS, INC.
9 Exchange Place
Salt Lake City, Utah 84111
ph. 801.531.7600

January 15, 2014

DFCM Project No:
13285750

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LASSONDE MAKE-LIVE CENTER REVIEW SIGNATURES

UNIVERSITY OF UTAH REVIEW SIGNATURES

We have reviewed the Lassonde Make-Live Center Program for the University of Utah and warrant that it adequately represents our request for a facility to fulfill our mission and programmatic needs. All appropriate parties representing the University have reviewed it for approval.

Patti Ross, Chief Strategy Officer — **Date**

Ruth V. Watkins, Senior Vice President of Academic Affairs — **Date**

Barbara H. Snyder, Senior Vice President for Student Affairs — **Date**

Arnold B. Combe, Senior Vice President, Administrative Services — **Date**

Jerry Basford, Associate Vice President for Student Affairs — **Date**

Taylor Randall, Dean, David Eccles School of Business — **Date**

Troy D'Ambrosio, Director of Education, Lassonde Make-Live Center — **Date**

Kathy Hajeb, Director, Lassonde Make-Live Center — **Date**

Barbara Remsburg, Director, Housing & Residential Education — **Date**

Michael G. Perez, Associate Vice President, Facilities Management — **Date**

John McNary, Director, Campus Planning — **Date**

Cory Higgins, Executive Director, Facility and Construction Operations — **Date**

Jennifer Still, Campus Planning — **Date**

DIVISION OF FACILITIES CONSTRUCTION & MANAGEMENT, STATE OF UTAH

I have reviewed the Lassonde Make-Live Center Program, jointly prepared with the University for approval.

Rick James, Project Manager, DFCM — **Date**

ACKNOWLEDGEMENTS

The following participants have contributed to the completion of this program

Steering Committee

Patti Ross
Barb Snyder
Jerry Basford
Mike Perez
John McNary
Taylor Randall
Troy D'Ambrosio
Kathy Hajeb
Barb Remsburg
Matt Yurick
Reyn Gallacher
Mark Parker

Working Committee

Troy D'Ambrosio
Kathy Hajeb
Barb Remsburg
Jerry Basford
John McNary

University of Utah

Jennifer Still

DFCM

Rick James

PROGRAMMING TEAM

Programming Architect	EDA Architects in association with Cannon Design John Shuttleworth, EDA Architects Stephanie McCarthy, EDA Architects Nick Lorenzo, EDA Architects Mehrdad Yazdani, Cannon Design Craig Hamilton, Cannon Design Yan Krymsky, Cannon Design Lynne Denninger, Cannon Design
Facilitation	Karin Giefer, Arup Francesa Birks, Arup
Cost Model Proforma	Greg Wachalski, Brailsford & Dunlavey Daniel Durack, Brailsford & Dunlavey
Structural Engineer	Roel Shierbeek, Arup Gregory Nielsen, Arup
Mechanical Engineer	Erin McConahey, Arup
Plumbing Engineer	Vivian Enriquez, Arup
Electrical Engineer	Perry DeCuir, Arup
Civil Engineer	Ryan Cathey, NV5
Landscape Architect	Richard Gilbert, ArcSitio
Sustainability Programmer	Shruti Kasarekar, Atelier Ten Kristen DiStefano, Atelier Ten Claire Maxfield, Atelier Ten
Cost Estimator	Kris Larson, Construction Control Corporation

PROGRAMMING REFERENCES

University of Utah Campus Master Plan, 2008

University of Utah Housing Master Plan, 2011

Lassonde Living and Learning Center Feasibility Study, 2013

Lassonde Living and Learning Center - Ideas for and Entrepreneur Community, 2013

DFCM Programming Standards

2012 International Building Code (IBC)

2012 International Fire Code (IFC)

2012 International Plumbing Code (IPC)

2012 International Mechanical Code (IMC)

2011 National Electrical Code (NEC)

2009 International Energy Conservation Code (IECC)

2009 ANSI/A117.1

2012 International Fuel Gas Code (IFGC)

LEED 2009 for New Construction

2010 ADAAG (ADA)

01.

EXECUTIVE SUMMARY

Project Justification
Project Vision, Goals, Needs and Concepts
Project Description
- Make-Live Center
- Site Selection
Proforma
Project Cost Summary

PROJECT JUSTIFICATION

The Lassonde Institute works with thousands of University of Utah students to support and encourage their entrepreneurial aspirations. Although part of the University Business School, the Lassonde Institute also serves students from Engineering, Health Sciences, Law, Fine Arts and Social and Behavioral Sciences as well. The mission of the Lassonde Institute is to bring these students with different backgrounds together in a highly collaborative and interactive environment to create an inventive entrepreneurial experience to support start up companies by students.

Based on the research of the Business School and Lassonde Institute, one of the biggest impediments to the program is the lack of space for students to meet and work together. The Lassonde Make-Live Center was envisioned to serve this purpose.

Part of this project also includes 400 beds for student housing. The impetus for this component is multi-faceted. First, the University has identified a priority and a need for more on campus housing. This initiative is based on the University's vision of a 24/7 campus to enhance the student life experience. Second, the Lassonde Institute envisions an immersion type of make/live experience in which a portion of the 400 students housed will participate. The balance of the remaining beds will offer an opportunity for underclassmen to be exposed to this entrepreneurial experience as a part of their campus life experience. Third, the Lassonde Institute plans to leverage Mr. Pierre Lassonde's generous gift to the Business School for the Make Live Center by creating a profit center for the housing portion of the project. These profits will generate a mechanism to fund additional Business School scholarships for university students.

PROJECT VISION AND PROGRAMMING PROCESS

Early in the process, the design team working closely with the University representatives identified the need to define what kind of building is this to be. Is this a student housing building? Is it an entrepreneurial student garage building? Can one (the entrepreneurial center) plus one (housing for 400) come together to equal more than the two parts? Can we help create synergies that provide new, and evolving opportunities for learning, making, creating businesses, that transform a student's experience at the University of Utah?

In the exploration of this new building typology, the vision statement took the form of a question:

How can the "Make-Live Hub" build and organize its community to leverage existing and new assets to provide a transformative studen life experience and launch a leacy of entrepreneurs?

Given the need to create this new building typology, the design team developed a new programming process: prototyping. We worked with the University to collaboratively create a vision for this new idea, and then created a series of prototypes (projects, really) that allowed us to test the ideas and merits of the prototype against the vision. This process impacted every decision from site selection, building organization and building systems.

PROJECT DESCRIPTION

The program for the Lassonde Make Live Center describes a project that contains approximately 15,000 square feet of student garage work space on the ground floor level with four levels of housing above. The ground floor will also house 4,000 square feet of administration space as well as mechanical space, electrical space and other support areas. On each of the four levels there is approximately 1,250 square feet of garage "maker" space infused with the living spaces. Therefore, there is approximately a total of 20,000 square feet of student garage space to support the Lassonde Institute's need for student space dedicated to entrepreneurial pursuits. There is approximately 26,000 square feet on each of the four floors above the ground level for housing. Therefore, the total square footage dedicated for housing is 104,000 square feet. Grossing factors include mechanical and electrical space, circulation space and wall thicknesses which brings the total gross square footage to approximately 152,000 square feet.

Building systems that the program considers focus on flexibility and durability. A concrete frame structure with a "universal grid" that supports the three types of housing (modular, loft and single/double units) contained in the Lassonde Make Live Center. This approach insures that the building will be able to accommodate change in the future should one or the other housing styles prove more successful as time goes on. This approach also supports the notion the building could one day become all housing or all garage.

The desire for an iconic, transformative building on campus has also factored into the development of the program document. The exterior of the building will be 60% wall surface and 40% glazing. The garage space at the ground level shall be porous, open and inviting. This reinforces the vision that the Lassonde Make/Live Center serves not just 400 residents who are fortunate enough to live there, but the thousands of students across campus who are part of the Lassonde program. The desire for an iconic, transformative building on campus has also factored into the development of the program document.

These two characteristics, flexibility and a vision of a iconic, transformative project, are what separates the Lassonde Make Live Center from the 20 year building life span housing projects found in the private sector. These projects are singular in purpose and because of that are inflexible in design in an effort to reduce front end costs.

Site Selection

The University had identified four sites for the design team to analyze and work with the Steering and Working Committees in order to identify the preferred site for the project. Sites A, B, C and D, can

basically be described as two options on the north side of the HPER mall (A&D) and two being adjacent to the Honor's Housing (B & C). Located in relatively close proximity to one another, the four sites nonetheless began to display distinct advantages and disadvantages when viewed through the lens of the prototype. As the prototype evolved so did the impressions and opinions on the sites.

Site A was ultimately identified as the preferred site. Site A is the western site along the HPER mall establishing a visual connection with the academic core of the campus and the Business School Building. The infrastructure upgrade costs associated with all four sites are effectively neutral, but the costs associated with the displacement of existing facilities created by the project had a significant impact. Site C required the replacement of the current NCAA soccer stadium (approximately $3 million) and Site B required the replacement of permanent surface parking with structured parking (approximately $7 million). Neither Sites A or D carried displaced facilities costs because the parking on these sites were identified as temporary by the University.

However, cost was not the deciding factor. The deciding factors were identified when the prototype and the vision were tested on each site. These became the differentiating criteria in the site selection process. These differentiating criteria are the following:

1. The project is a student life building as opposed to a housing building where it is academic in nature and desires connection to the academic core. Proximity to the academic core is consistent with the land use vision in the Master Plan. (Site A preferred)
2. The project is envisioned to be a hub crossroads where interaction is encouraged as opposed to a destination to be sought out. (Site A preferred)
3. The project is envisioned as a transformative project that will be a catalyst in enhancing student life and interaction. (Site A preferred)
4. The mission for the project requires that it needs to be in as close proximity to the heart of the campus. (Site A preferred)
5. Visibility for the project is required to support the hub/crossroads functionality as well as the desired iconic nature of the project. (Site A preferred)
6. The project is to support the Master Plan vision by not impacting the future facilities planned on all four sites. (Site B preferred)

Site A was identified as the preferred site based on the fact that this site will mostly likely support the academic program of the Lassonde Make Live Center and allow it to flourish.

PROFORMA

The proforma financial model created by Brailsford & Dunlavey analyzes capital costs, projected revenues, operating expenses and the general economic performance of the Lassonde Make Live Center. The overarching objective of this financial analysis was to develop a right sized program and capital budget that was fully supported by the revenue generated from the rental units. In addition, additional revenue generated by the living units is expected to be recycled and used to support the expenses associated with the garage space and the Lassonde programs and staff that will be a part of the Lassonde Make Live Center.

Based upon the assumptions outlined in Section 06 of this document and the appendix under a separate cover, there is a cash flow available from the housing units to support the Lassonde programs. However, it is important to note that this financial analysis represents a budget, revenue, expense assumptions completed to date. As the project enters the design phase, it is expected that future revisions to the overall program, unit mix, construction type, rental rate structure and operating model will be necessary. As a result additional revisions to the model are anticipated in order to continue to ensure project feasibility and performance.

PROJECT COST SUMMARY

Based on the program information developed to date, the construction cost for the Lassonde Make Live Center has been estimated at $31,645,966 at approximately $215 per square foot.

02.

PROGRAMMING PROCESS

Prototyping Process

PROGRAMMING PROCESS

When the design team began working with the University of Utah on the Lassonde Make-Live Center, we were faced with several interesting challenges posed by the idea of creating a new environment combining housing and an entrepreneurial 'garage' space into a single facility and working community:

- What is the nature of this facility that mixes two types of spaces – entrepreneurial making / creative spaces with student housing? Are they simply co-located for convenience, or are they a new mix that fosters new ways of combining living and making space that encourages entrepreneurism?
- Can this be a new typology, or is this another example of a living- learning community?
- Can this be a new model of learning that is woven into the fabric of a living community?
- How can this work for commuter students, as well as the students who are residents?
- Can we find a way to create vertical integration, where graduate and upper class students mentor and guide underclassmen?
- Can one (the entrepreneurial center) plus one (housing for 400) = more than two? Can we help create synergies that provide new, and evolving opportunities for learning, making, creating businesses, that transform a student's experience at the University of Utah.

There are also practical questions that arise when combining functions in new ways:

- Can this organization, with a mixture of funding and operational strategies create better value for the university?
- Can a new model for community governance (i.e. how is the Center run) be crafted that supports the unique nature of this new typology?

And finally, and one of the most vexing questions;

- Where should this new type of building be located? Should it be near other housing? Should it be near other academic resources?

The answers to this and many other questions were uncovered during a programming process where we turned the normal process upside down. With the potential for this to define a new typology for the campus, and achieve its transformational potential, we thought required a new way of thinking and planning—the idea of prototyping.

PROTOTYPING PROCESS

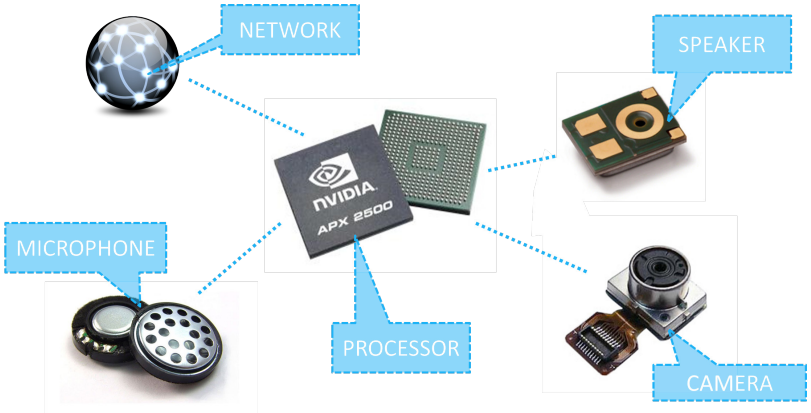
A conventional programming process asks questions, defines goals, wants and needs, determines the physical space needed in response, then may analyze sites, consider campus planning needs, etc. to arrive at a project direction.

Prototyping is different: we still seek input, but we work more from the aspirational ideas for the project. We worked with the university to collaboratively create a vision for this new idea, and then created a series of prototypes (projects, really) that allowed us to test the ideas and merits of the prototype against the vision.

THE RISK OF NOT CONSIDERING TYPOLOGY

Is this a garage and housing in close proximity, or is this a new building type that still needs to be invented? Without a clear understanding of this new typology, the project may not reach its full potential as a true architype.

PROXIMATE, STATIC



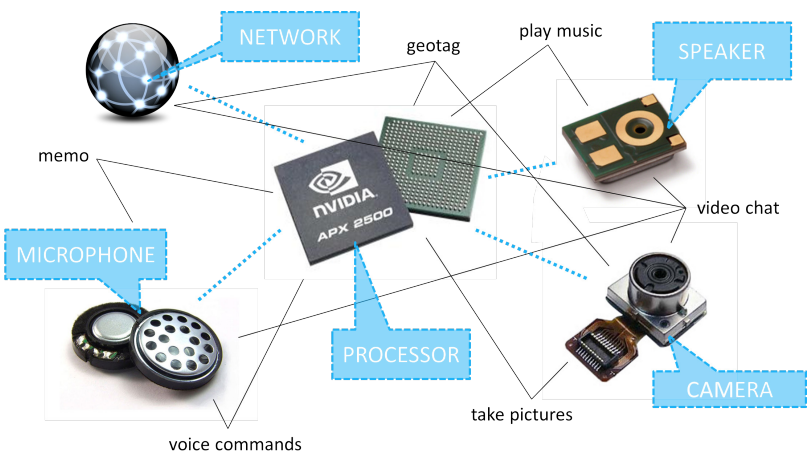
PROCESSOR CREATING SYNERGIES

Through an iterative process of investigation, prototyping, getting feedback, modifying and retesting prototypes against the vision, we developed a preferred 'model' for the project. The advantage of this process is that it is looking for a holistic solution that optimizes the all of the key issues and drivers of the project, including important project considerations, such as governance, that are critical to creating a self-sustaining project that achieves the potential articulated in the Vision Statement.

We were then set to ask the question: Given this model, where is the best place on campus for the model to go to meet the Vision and Goals of the project?

VISION

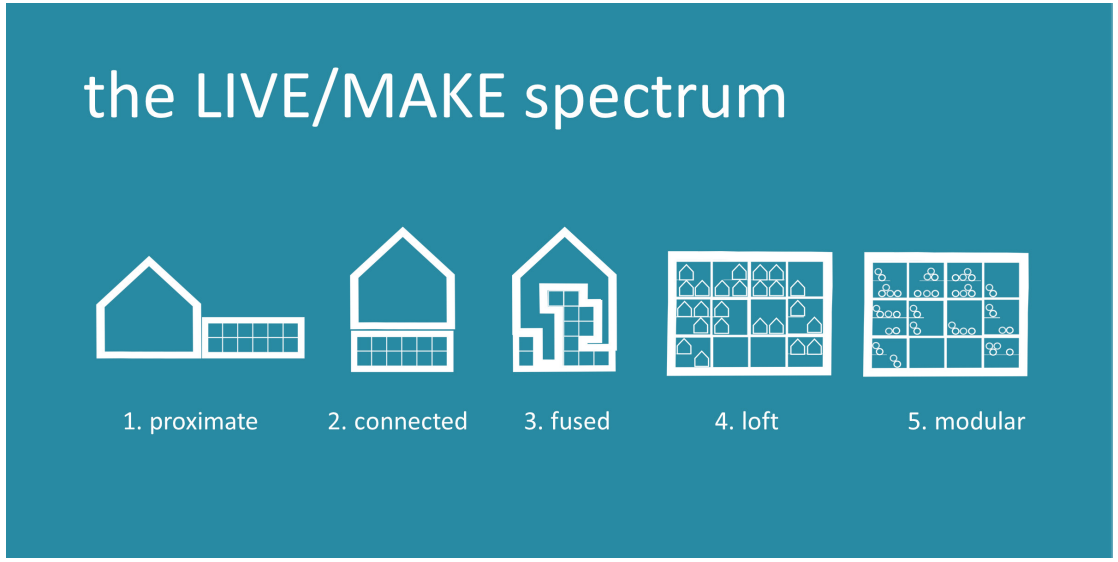
How can the "Live/Make Hub" build and organize its community to leverage existing and new assets to provide a transformative student life experience and launch a legacy of entrepreneurs?



UNLOCKING OPPORTUNITIES

CONVERGENCE CREATING RESULTS NOT ORIGINALLY ENVISIONED

The process has been collaborative and engaging- working with staff and students to craft the prototype. To help the participants see new ways of considering how the building could function, in a two day workshop, we developed the ideas of “personas”, a series of idealized or stereotypical students – the incoming freshman, the junior returning to campus from a year abroad, the grad student returning to campus—as a way to think about how different people might use the facility throughout a 24/7 week. The documentation of this an other work sessions is included in this section beginning on Page O2.9.



HOUSING WORKSHOP, OCTOBER 14-15, 2013

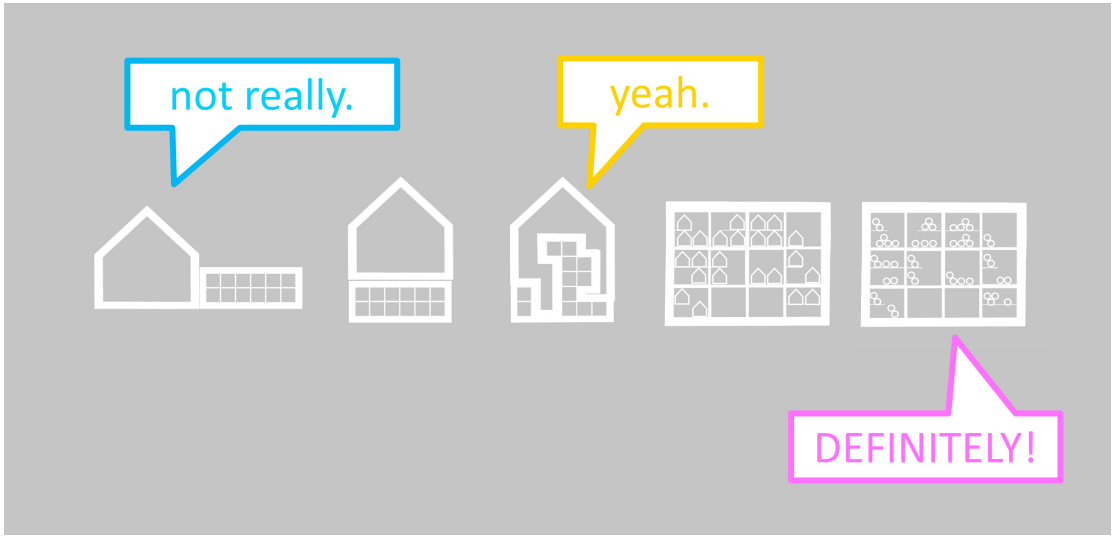
ROAD MAP

9/9+10	9/24	10/14+15	10/21+22	11/4+5	11/18+19
1	2	3	4	5	6
vision	prototype definition	focus groups	prototypes	site test	recommend
FOCUS GROUP SESSION •Engineering/Facilities	FOCUS GROUP SESSION •Commuter services	FOCUS GROUP SESSION •Housing workshop •Universal design	FOCUS GROUP SESSION •Dining •Faculty/Representatives •Student resident focus group •Student leadership town hall •Sustainability and building systems •Recreation and athletics focus group •Lassonde student advisory council		FOCUS GROUP SESSION •BOT presentation

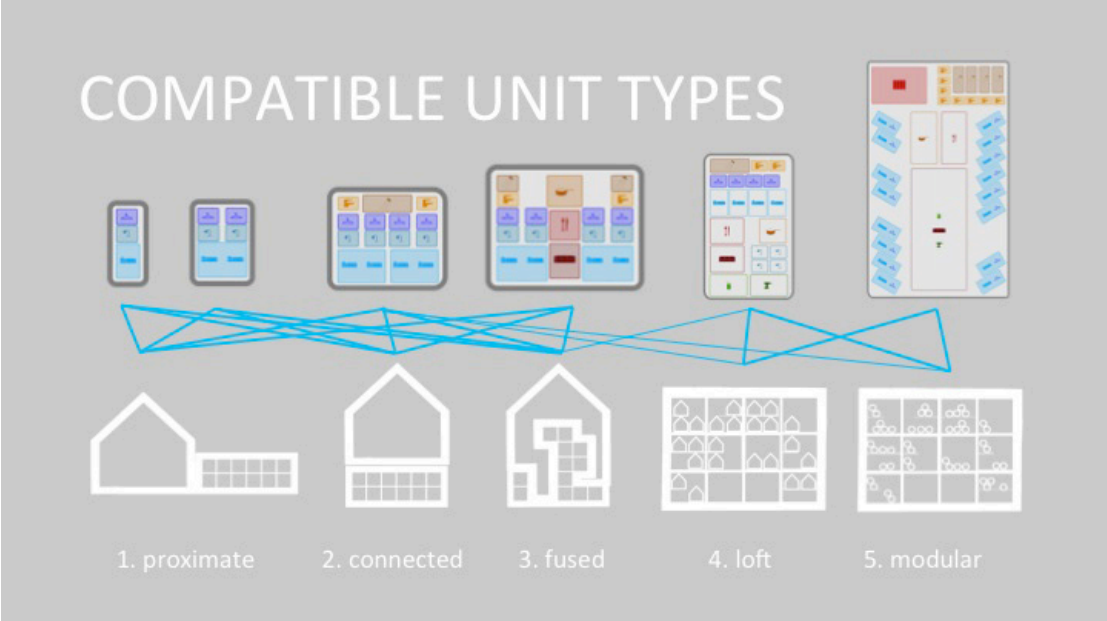
MEETING MILESTONES

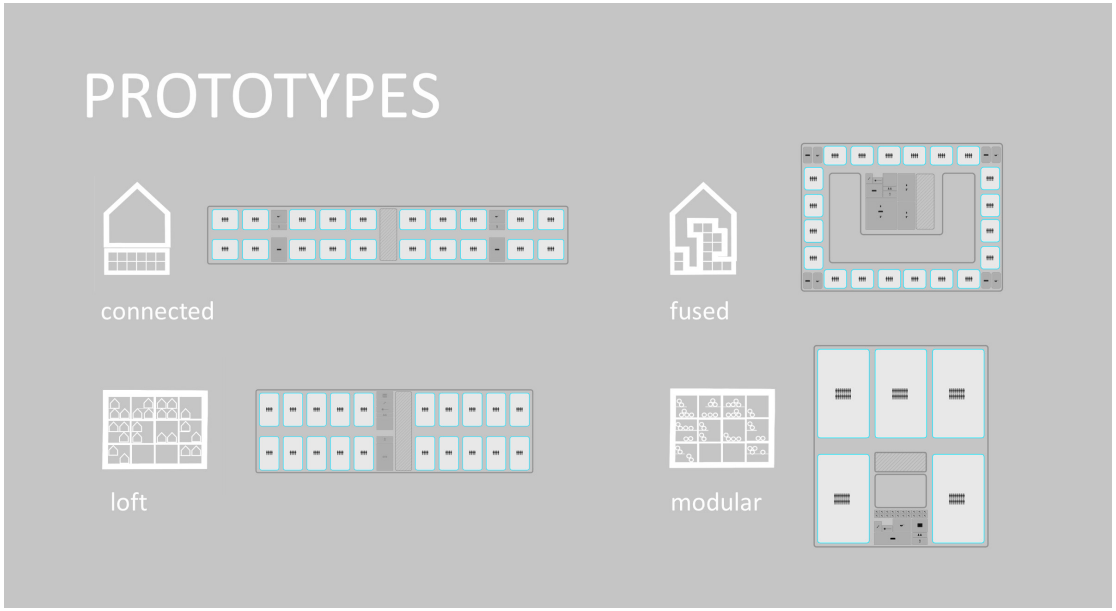
The design team explored flexibility and ways to accommodate changes in living and making space – at the outset of occupancy, but also understanding that the building must be able to adapt and change over time to be successful. The design team is expanding on a flexible planning approach– the universal grid –and are exploring this as a way to create a flexible armature for the variety of living spaces types in the Lassonde Make-Live Center.

The outcome of this prototyping process is new, flexible typology, sited close to other academic and student resource facilities, posed to create a new center of engagement, learning and exploration for the campus when occupied in 2016.

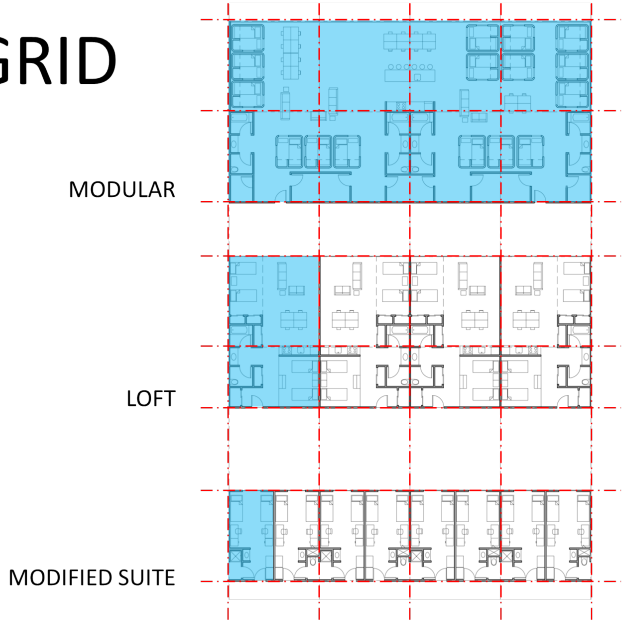


DOES YOUR LIVING ENVIRONMENT CONTRIBUTE TO YOUR SUCCESS AS AN ENTREPRENEUR/INNOVATOR/CREATIVE INDIVIDUAL?





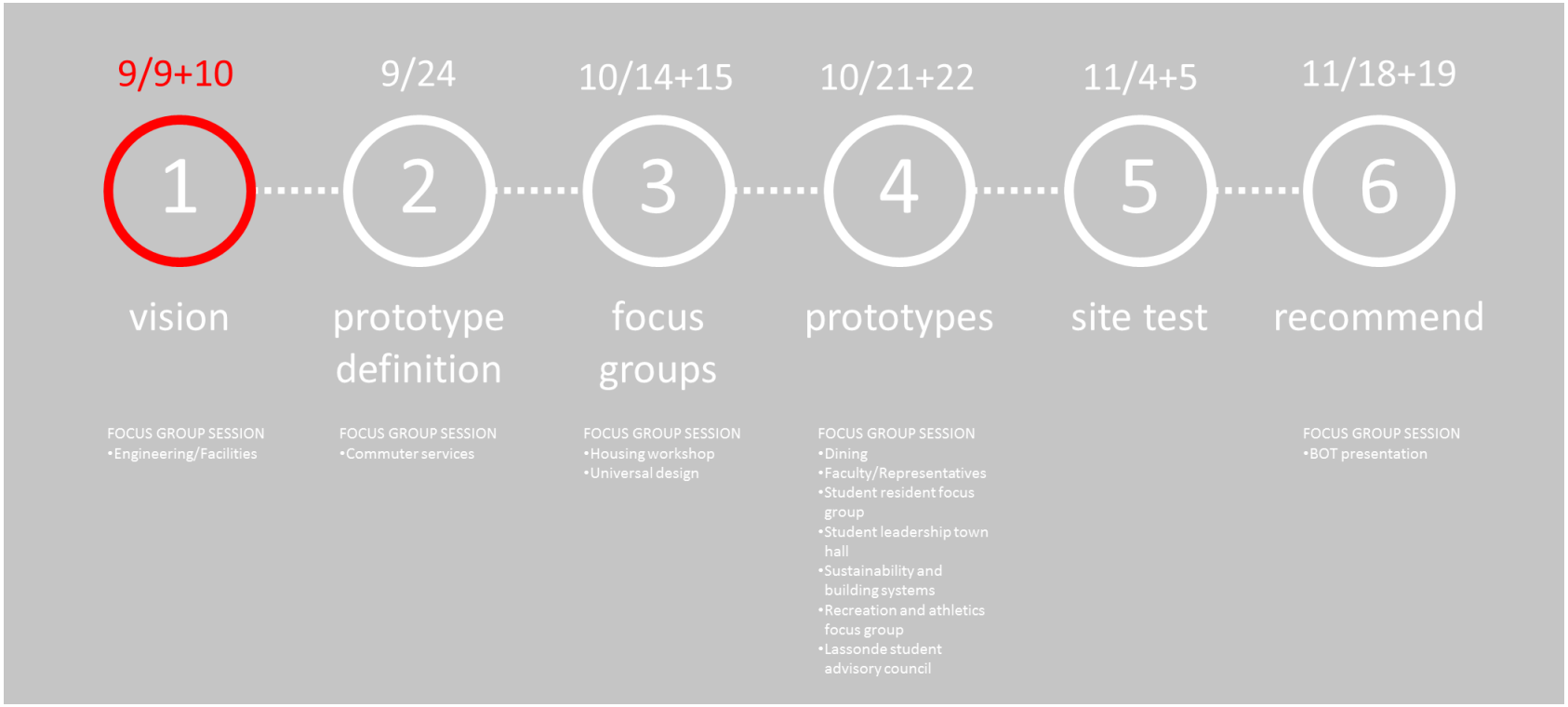
UNIVERSAL GRID



THE UNIVERSAL GRID ESTABLISHES THE COMMON STRUCTURAL SYSTEM TO ACCOMODATE ALL THE LIVING UNIT TYPOLOGIES. THIS SYSTEM ENSURES THE MAXIMUM FLEXIBILITY TO ACCOMMODATE FUTURE CHANGES.

O2.A

APPENDIX FOR PROGRAMMING PROCESS - MEETING MINUTES



MEETING MINUTES:
STEERING COMMITTEE MEETING NO. 1 - VISIONING

DATE:
09.09.2013 & 09.10.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE ENTREPRENEUR CENTER

MEETING ATTENDEES

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ITEMS/ISSUES

Item #	Date	Issue/Topic
1-1	09.09.2013	Opening - Purpose of meetings: To build upon work already done; to review/update broad design & planning issues, project mission, site selection, vision, goals & objectives.
1-2	09.09.2013	Milestones: • Project Budget – (established by site selection matrix) • Board of Trustees - draft presentation (09-17-13) • Board of Trustees Subcommittee presentation (09-24-13) • Construction budget confirmation for legislature (10/2013) • Program Completion (12/2013) • Occupancy (6/2016)
1-3	09.09.2013	Communication - Project Directory: Confirm participant names & contacts / confirm channels of communication – coordinated by Jennifer Still.
1-4	09.09.2013	Visioning: Steering Committee members were asked to imagine the future by providing answers to a series of questions: • What do you expect/desire to tell people at the building opening? • What do you want to see in 10 years when you return? • How do you encourage a Hub? • How is this housing different? • What makes a successful living/learning center? • How do we measure success? • How does/will it transform campus? From the answers and subsequent definition of key terms used a list of facts, needs, and goals was created.

ITEMS/ISSUES

Item #	Date	Issue/Topic
1-5	09.09.2013	Facts: • Must be a $$ generator • 400 beds (150/200 freshmen) • $45 million budget / $13 million committed • Self supporting • Not just a business school facility • Interdisciplinary • Multiple users/audience • Serious business to occur here. • Place for startup resources • Don't let vertical integration drive housing • Together is better • Young adult demographic • Metering for building • Parking needs = 40% of occupants (can be off site)
1-6	09.09.2013	Needs: • Collision space • Flexibility • Inspires / teaches / engages • Transformative living / learning environment • Authentic – not superficial • Secure • Value added • Creative / well thought solutions to logistics • Connection between interior/exterior • Choices: observe or participate (Rucker park / pickup basketball - analogy) • Food / amenities in close proximity • Singular entry yet porous • Comfortable for students and community • Program development (framework) • Participatory • Convenient proximity to classes

ITEMS/ISSUES

Item #	Date	Issue/Topic
1-7	09.09.2013	Goals: • Iconic • Hub / cross path / central station • Cross pollination • Cool / fresh (student ownership, industrial chic) • 24 hour facility / start up culture • Visible • Signature experience for students (not found anywhere but UofU) • Innovative • Adaptive • Best place in country for entrepreneurial education • Merge two programs / not a hybrid • The whole is greater than the sum of the parts • Immersed learning • Successful real estate project • State of the art / one of a kind • Create the game • Freshman exposure • 40% better than ASHRAE (LEED silver/gold?) • Floor lounge / hacker maker space • Innovative room types • Vertical integration – tier / mentorship • Inviting to non-residents • Create a culture around an idea • Elevate UofU to be a top 25 business school • Full on day one • Supports University of Utah Master Plan
1-8	09.09.2013	Ideal Site - Characteristics: • Visible / prominent / iconic • Central • Accessible (visitors, services, etc) • On a thoroughfare – not an endpoint • Views; utilized where possible, and respects view corridors. • Natural light • Minimal impact on open/green space • Parking convenience • Accepting of scale

ITEMS/ISSUES

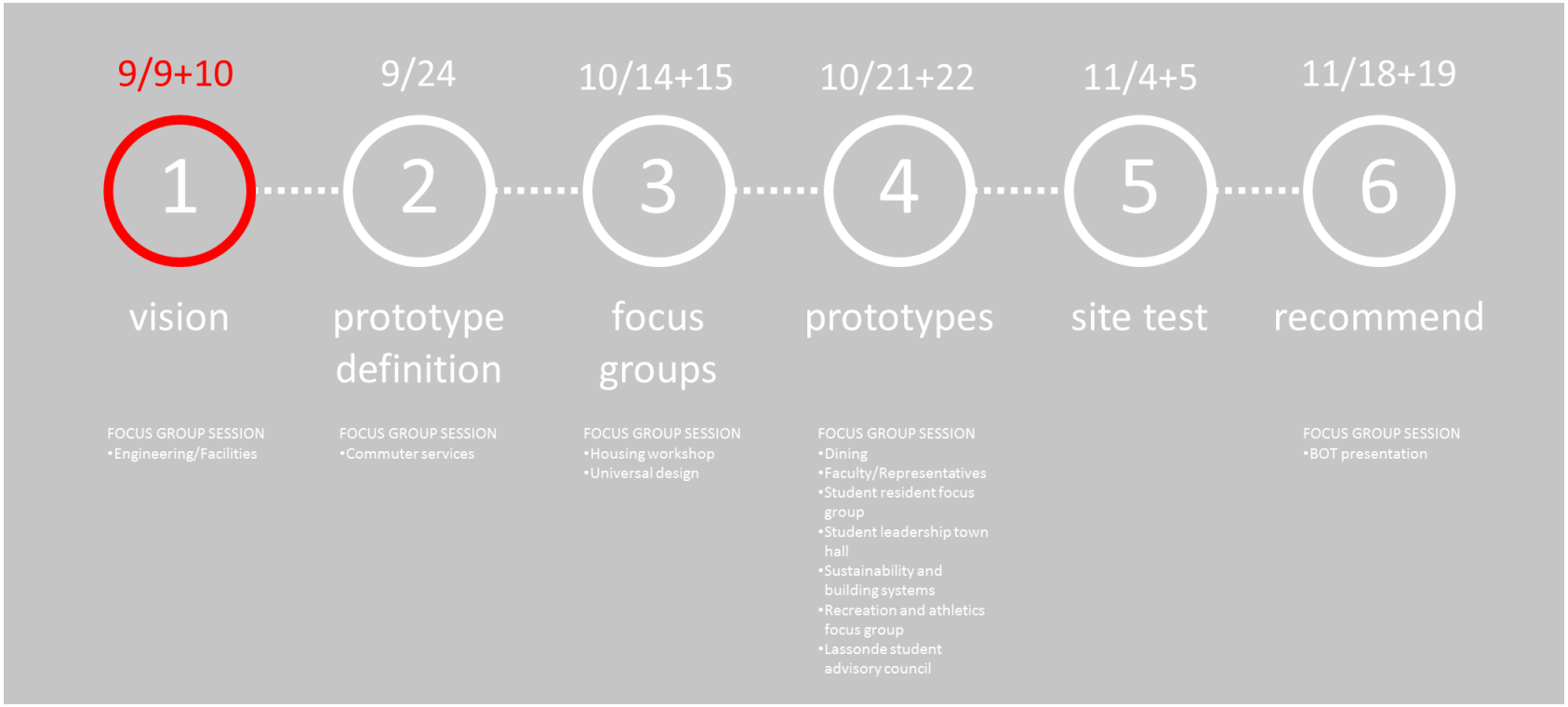
Item #	Date	Issue/Topic
1-9	09.09.2013	Similar programs / Synergies: Living learning communities – experience based : 12 (small) to 50 (large) • Honors housing (28% business students) • Fine Arts • Law • Bennion Center • Mines & Earth Sciences • Go Global • Humanities • Sustainability • Sorenson Arts and Education • Crocker Science Center
1-10	09.09.2013	Fatal Flaws: • Loss of green space • Financial burden ($ model does not work) • Compromising Iconic status to major donors • Does not balance academic engagement/mission with student experience
1-11	09.09.2013	Site Walk: • Site D – most likely to be eliminated first due to site utility conflicts. • Site A & B – lowest/no replacement costs.
2-1	09.10.2013	Site Considerations: • Do the site characteristics support or negatively impact the academic or student life experience? • How does the site/building fit w/ the Universities institutional vision? • Donor as a stakeholder. • Densification • Blending of functional / support functions well in campus environment
2-2	09.10.2013	Student Life Criteria: • 24/7 activity • Proximity to food • Some parking • Provide opportunities to engage & experiment – hands on. • Multiple communities within - cross pollinate • Freshmen involvement - experience advisors (RA evolves to EA) • Visible and used by students

ITEMS/ISSUES

Item #	Date	Issue/Topic
2-3	09.10.2013	Programmatic Precedence: • The Foundry – downtown location has been more successful than Fort Douglas location; primarily due to convenience of parking. • Micro apartments / Hacker Hostels – successful examples of separation of private and community spaces/common rooms (i.e., communal restrooms and dining). Communal restrooms may not work; however smaller (4-6 person) semi private restrooms should be explored. • Pixar, Google Campus. • Lego program • Create a culture around an idea
2-4	09.10.2013	Financial:
		Model Inputs - Non-Flexible: • Program: Residential (Fr & So are focus, options for Jr & Sr), Garage • Parking & Site Development costs • Budget: contributions ($13M), $32M financed, rent revenue capitalized • Proforma: Revenue, expenses, debt service, and performance (4% return)
		Model Inputs – Flexible: • Program: 400 beds (options for graduate students?), Garage = 28,000 gsf, housing community space. • Site costs • Budget: $45M • Proforma: costs associated with return, and rental rates (possibly 10% premium rate)
2-5	09.10.2013	Financial: Proforma to be updated based on discussions.
2-6	09.10.2013	Milestones: • Site Selection: no date given, completion date not to be affected.
2-7	09.10.2013	Mission Statement: Cannon Design presented a draft of the mission statement; the draft was reviewed and edited, and is to be revisited at a later date.
2-8	09.10.2013	Prototype / Process: Mehrdad presented his plan to proceed by 'prototyping' with the program, site(s), cost models, building systems, and the University vision as a means of finding the solution.
2-9	09.10.2013	Stakeholders (in addition to Steering Committee): • Commuter Services • Sustainability • Dining

ITEMS/ISSUES

Item #	Date	Issue/Topic
2-10	09.10.2013	Focus Groups: • ASUU (Student Government) • Business school • Engineering • Health Sciences • Honors • Arts & Humanities • Freshmen • Upperclassmen • Non-resident students • Sustainability/LLC's
2-11	09.10.2013	Next Steps: • Cannon Design is to set the agenda for the first workshop on September 28th and 29th. Developing 'prototyping' options and some focus group meetings are anticipated. • Cannon Design is to forward a draft presentation to John McNary on September 17th for Board of Trustees presentation on the 24th. • EDA will develop the site development cost model for all four sites.



MEETING MINUTES:
STEERING COMMITTEE
MEETING NO. 1 -
BUILDING SYSTEMS

DATE:
09.10.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE
ENTREPRENEUR CENTER

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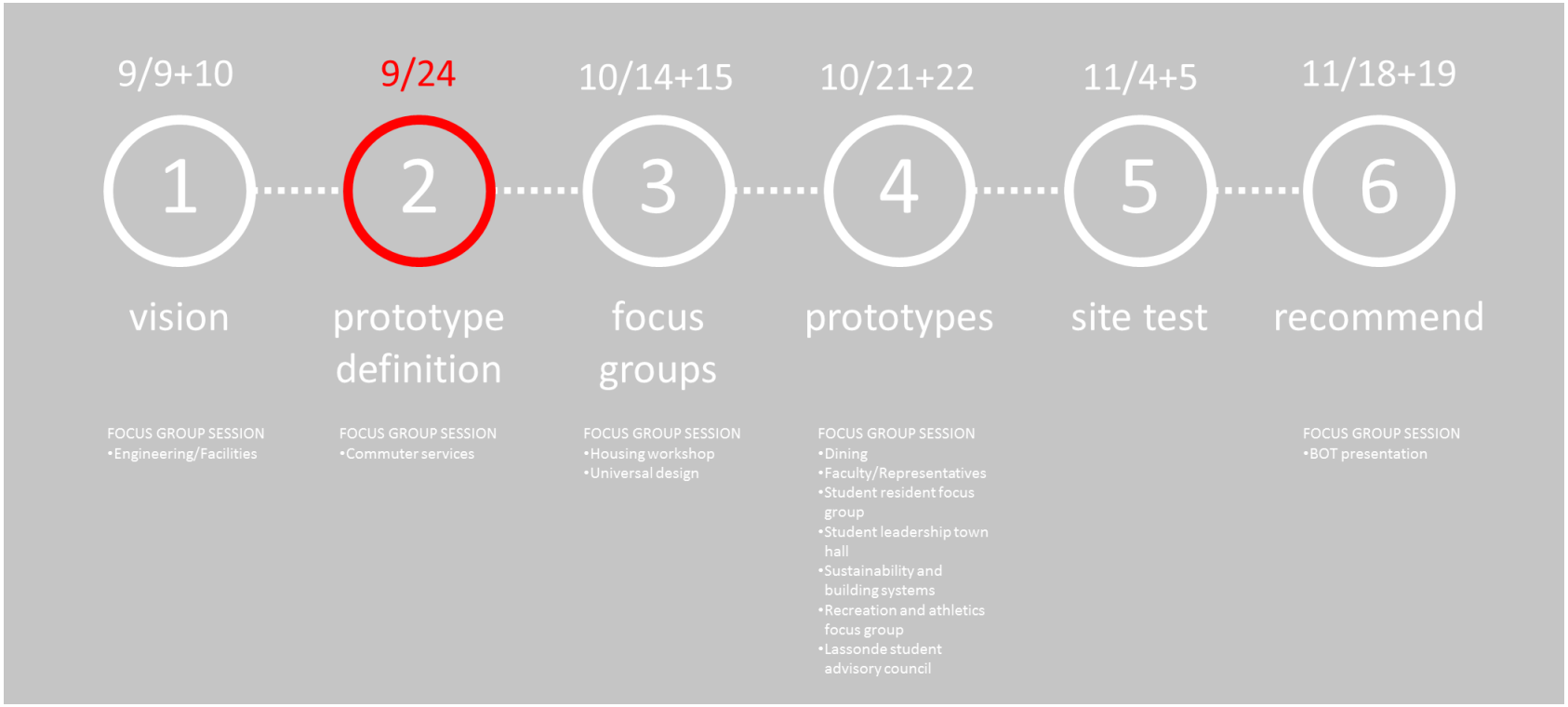
ITEMS/ISSUES

Item #	Date	Issue/Topic
Building Sytems		
3-1	09.10.2013	Goals: • University of Utah: 50 year building • Meet financial model • LEED certification: silver/gold?
3-2	09.10.2013	Standards: • 40% better than ASHRAE (project realizes energy savings) • University does not have a separate residential standard; residential standards should be less stringent and more flexible. • Cannon standards for residential projects shall be compared to University standards. Deviations will be reviewed with the University • Variance process discussed. The University and facilities are willing to consider alternative systems and products more appropriate to residential projects.
3-3	09.10.2013	Standalone or connected? • If connected the University will meter and charge for use. • If connected University will expect compensation for system expansion equivalent to estimated cost of equipment to be standalone – offset cost. • A connected system would reduce peripheral costs associate with mechanical systems: space, structure, electrical.
3-4	09.10.2013	Program Requirements / Garage Characteristics: • General open flex space • Not a fully functional shop space (3D printers as opposed to welders or CNC's) • Flexibility is key (future uses will be different) – though flexibility is expensive • Need to be able to meet future demands • Heavy duty / industrial / durable • Innovative
3-5	09.10.2013	Lighting: • Occupancy sensors in bedrooms; options for ideal controllability to be explored.
3-6	09.10.2013	Thermal Comfort and Ventilation: • University generally allows for 3 degree variation in control • Naturally ventilated spaces are an option – control tie in is key.
3-7	09.10.2013	Structural: • Seismic performance is #1 criterion for structural design. • Wood framing / timber – not ideal solution. • Durability / Innovation is important • Site will effect structural design

ITEMS/ISSUES

Item #	Date	Issue/Topic
3-8	09.10.2013	Exterior Finish Materials: • Brick is University standard but not mandatory. • Essentially anything but EIFS pending University approval.



MEETING MINUTES:
STEERING COMMITTEE
MEETING NO. 2 -
WORKSHOP NO. 1

DATE:
09.24.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE
ENTREPRENEUR CENTER

MEETING ATTENDEES

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ITEMS/ISSUES

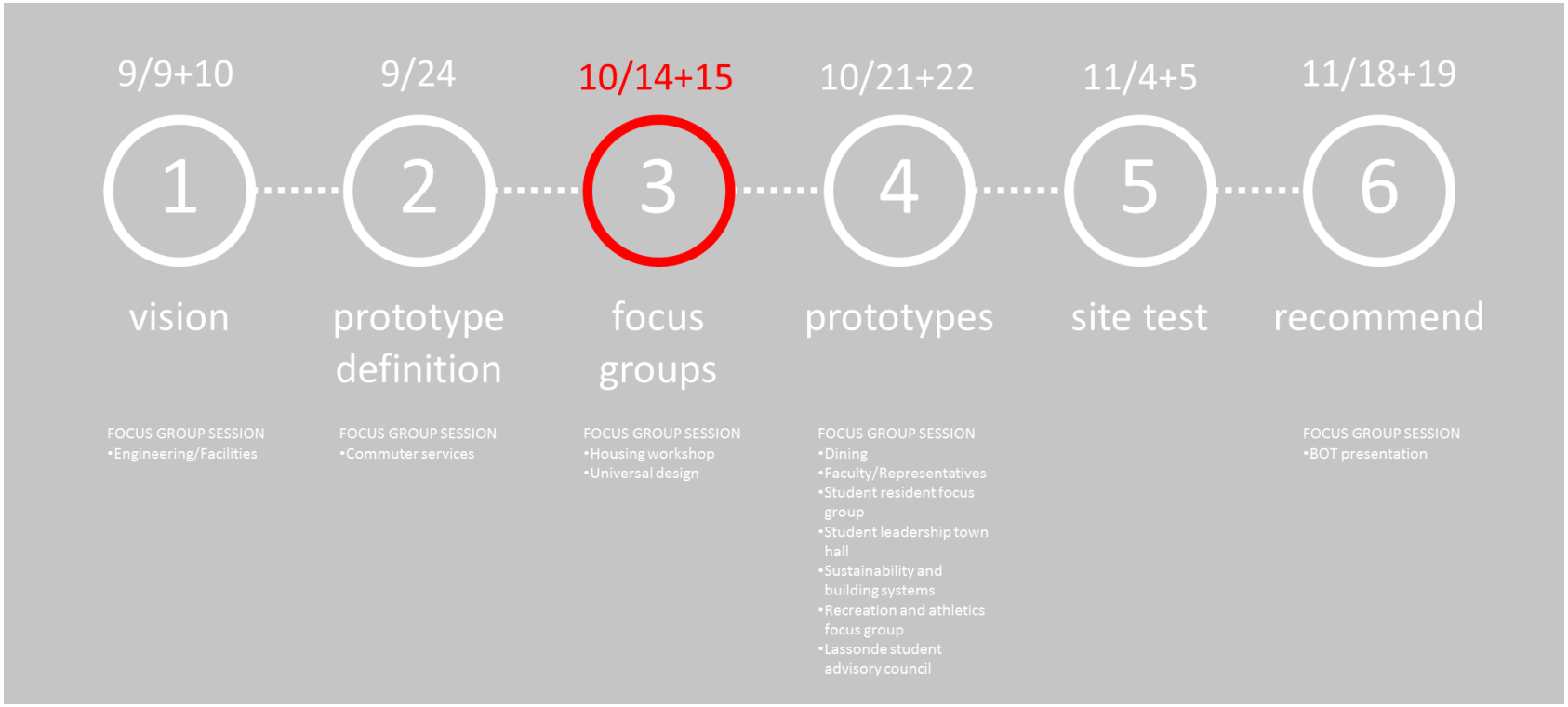
Item #	Date	Issue/Topic
3-1	09.24.2013 9:00 am	The Foundry: Members of the working committee visited the Foundry in downtown Salt Lake City. The group met two of the center's managers – Robert Bell and Rocky Kerr -- and a 90 minute (+/-) Q&A ensued.
3-2	09.24.2013 11:15 am	Commuter Services: challenges and factors • UofU – 9K parking spaces, 27K permits sold • Lack of parking is number 1 complaint regarding campus • Current demand = 4parks/person (1:1 for every resident with an auto; which is 40% of all residents) [i.e. 400 residents x .40 = 160 parking stalls required] • Mass transit (Trax) is at max capacity and only serves 2/3 of student population • Honors Housing displaced 100's of residents parking spaces – residents must compete with general population for parking near their building. • Currently, no policy for parking and new buildings exist • Cost to displace parking – currently is not official but project will most likely need to account for it.
3-3	09.24.2013	Commuter Services: formula for ideal parking Convenience + Plentiful + Cost
3-4	09.24.2013	Commuter Services: Ideas and possible solutions • Reserved/site specific parking stalls are an option for residents – but come at an increased cost. • Further develop/promote/solve peripheral parking options • Restrict Freshman auto use (30% of freshmen have a car) • Build a parking garage that operates (financially) similar to hospital parking terraces – is for profit – and works with the business model.
3-5	09.24.2013 12:50 pm	Designing a Prototype: Goals / facts / needs The list of goals/facts/needs generated during the kick-off meetings was reviewed. Additions/modifications are as follows: • Adaptability should be a hard goal • Merging the two programs – making both better - should be a hard goal. • "Doing, making, getting dirty" – should be a hard goal • Watching the game – should be a soft goal • Accessibility to industry/community partners Interdisciplinary – soft goal • Graduate housing – based on demand • LEED Silver – is a fact • Under facts; "metered water" should be modified to read "metered utilities" • "Framework for program/cohort experience" – add to needs • "Common space where it's o.k. to just hang out" – add to needs

ITEMS/ISSUES

Item #	Date	Issue/Topic
3-6	09.24.2013	Vision The draft vision statement was reviewed. Karin shared that it lacked 'pop' and that it only reiterated statements already developed. As an alternative the group strongly embraced the "want to be an entrepreneur?" slide as a basis for the *mission statement. (* note that the group wanted to change wording from vision to mission) The draft mission statement is to be modified appropriately.
3-7	09.24.2013	Road Map Overall programming/pre-design schedule/process was discussed. • Building program development / site analysis / proforma to occur in parallel with the road map schedule • Focus groups – primarily University stakeholders • Pop-ups – students • Salon – interactive event with industry/community members
3-8	09.24.2013	Prototype Definition • Program assumptions – no objections. • Definition of prototype was discussed in context to typology. • Typology – this project should be a true/new archetype. • Do we want a camera and phone combined or a new device that does both and more?
3-9	09.24.2013	Physical Space and Governance "Governance that allows the physical space to thrive is essential to the success of the new live / work typology." • What/who is the RA/EA? • A three (3)-tool RA/EA should be explored (mentor/coach/connector) – a super mentor. • By merging job descriptions/duties/roles an attempt can be made to create relationships that help develop a space which is owned; and nothing is left in the middle.
3-10	09.24.2013	Physical Space and Governance: Size • Cult: 2-5 • Culture: 5-12 • Company: 12+ • Group (housing): 1:25 for RA/Coaching/Concierge • Business scholars: 1:40 (110-200 – cohorted down to 7 groups) • Tiers of access – residents get more space • Community scale – Clustered around interest
3-11	09.24.2013	How do we configure resources? Design around program; not spaces.

ITEMS/ISSUES

Item #	Date	Issue/Topic
3-12	09.24.2013	The LIVE/MAKE Prototype Spectrum: 1. Proximate – (side by side/ de-coupled) 19th century – not our prototype but should remain as a point of reference for where we are departing from. 2. Connected – (combined) 3. Fused – (spaces merge/intertwine) 4. Loft – (Housing inserted into garage shell) 5. Modular – (completely flexible/modular, “igloos” in the garage) 22nd Century
3-13	09.24.2013	Schedule: • Focus Groups: 10/14 and 10/15 • Prototypes: 10/21 and 10/22 - 10/21 – 1:00-4:00 – Steering Committee - 10/21 – 6:00-8:00 – Evening Salon - 10/22 – Work session – narrow down options to 1 or 2. • Site Test / Choose Prototype: 11/04 and 11/05 • Recommend Site: 11/18 and 11/19 • Schematic Design to Begin: 12/02



MEETING MINUTES:
STEERING COMMITTEE MEETING NO. 3 - WORKSHOP NO. 2

DATE:
10.14.2013 & 10.15.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE ENTREPRENEUR CENTER

University of Utah - Lassonde Living Learning Centre

Workshop 14-15 October 2014

Introduction

For two days in October; 45 designers, resident hall professionals, administrators, students, innovators, agitators and entrepreneurs came together at the University of Utah to work on a paradigm shifting idea.

What would a living learning incubator for entrepreneurs look like? Does a new paradigm bring a new student type? What does that student's day look like? What drives them? And what do they need to thrive?

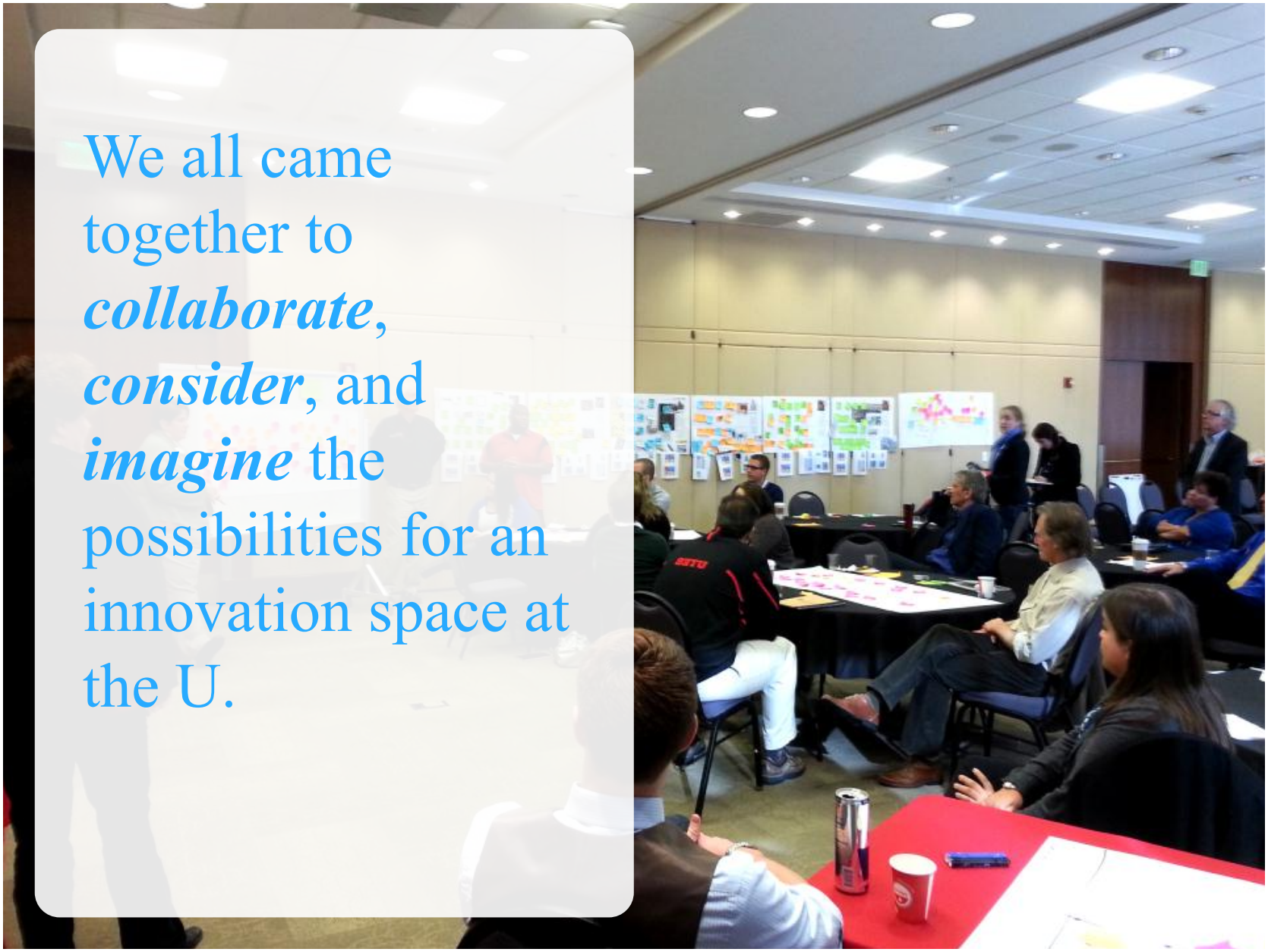
The report that follows is a record of the day and is concluded with a summary of finding and suggested next steps.

Workshop Agenda: Day One

Monday, October 14	
1:00 – 1:30	Introductions for all *What do you hope to get out of today?* *What is your secret superpower?*
1:30 – 1:45	Agenda and rules for the day *What is the context?*
1:45 – 2:15	Review of **Case Studies**
2:15 – 2:30	Introduction to **Personas**
2:30 – 3:00	**Personas**
3:00 – 3:15	Break
3:15 – 3:45	**Personas** presentation
3:45 – 4:00	Introduction to **Typologies**
4:00 – 4:30	Pros/Cons of **Typologies**
4:30 – 5:00	Top two love/hate **Typologies** by **Persona**
5:00 – 5:30	Insights of the day, review of day two

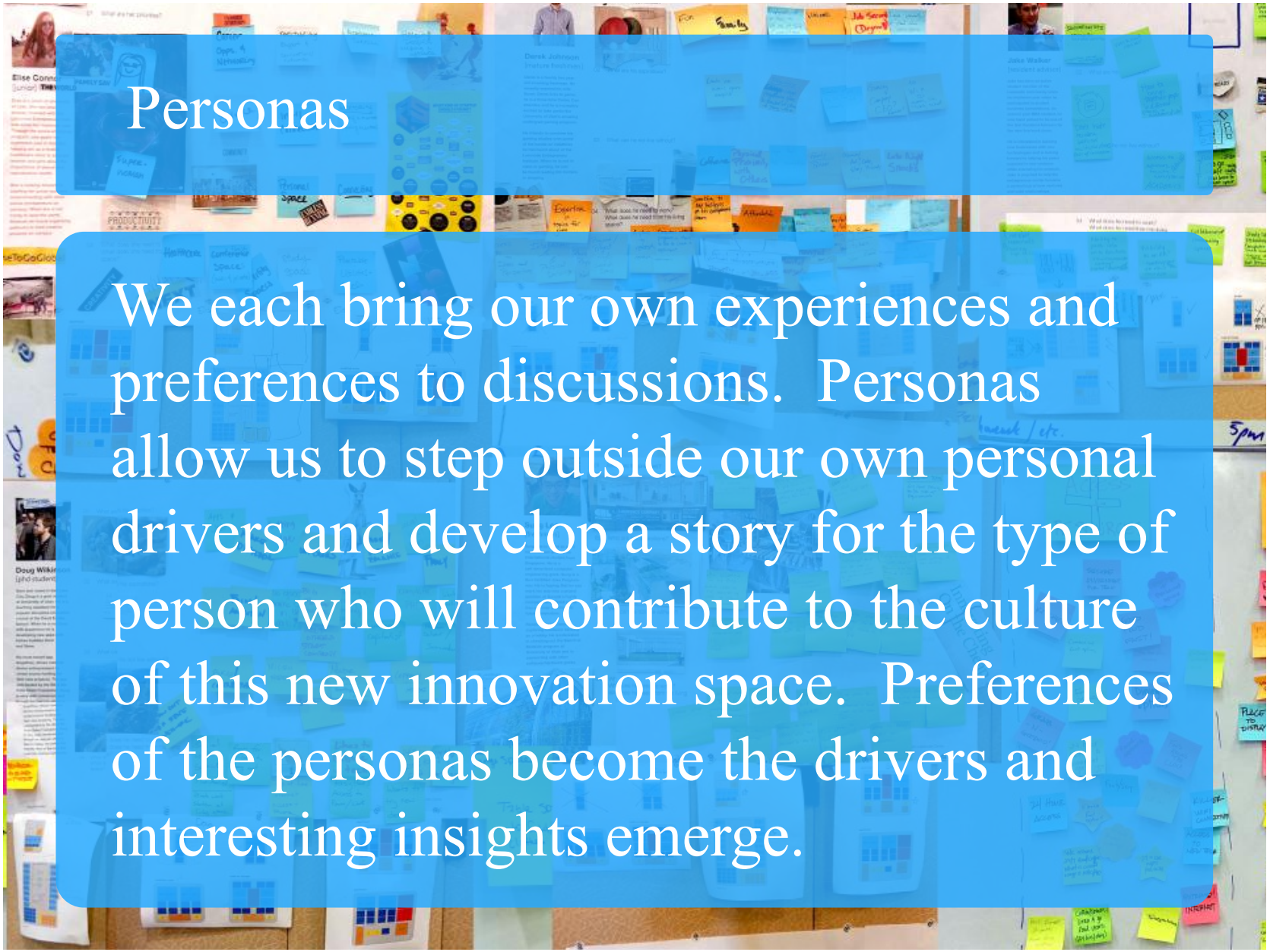
Workshop Agenda: Day Two

Tuesday, October 15	
9:00 – 9:15	Day one recap
9:15 – 9:30	Typology-Prototype pairs
9:30 – 10:15	**Day in the life** *Personas matched with Typology-Prototype pair*
10:15 – 10:30	Break
10:30 – 11:00	Present top five **Wants and Needs**
11:00 – 11:15	Post-it reflection *What are the common themes?* *Wants and Needs*
11:15 – 11:30	Cluster *Theme call-outs and alignment*
11:30 – 12:00	Insights of the day
12:00	Lunch



We all came together to ***collaborate***, ***consider***, and ***imagine*** the possibilities for an innovation space at the U.

Together, we
contemplated
diverse needs and
characteristics of:
5 personas
5 space types
Daily routines



Personas

We each bring our own experiences and preferences to discussions. Personas allow us to step outside our own personal drivers and develop a story for the type of person who will contribute to the culture of this new innovation space. Preferences of the personas become the drivers and interesting insights emerge.

We split our group into 6 teams to develop a back story for each persona.

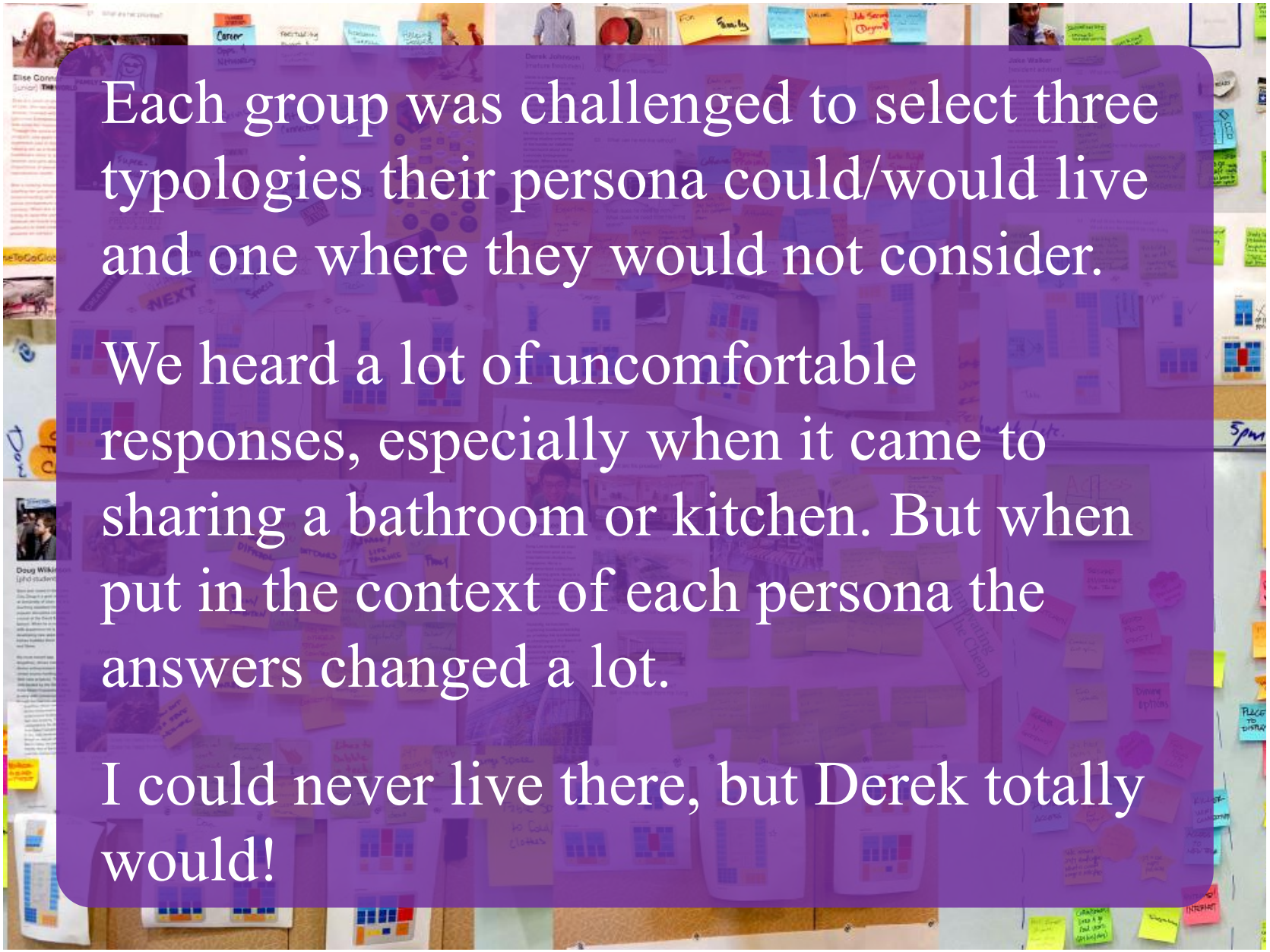
Focus was given to the to their priorities and aspirations. Also to try to identify their what this persona could not live without.

The resulting stories were rich with detail and compelling examples of a paradigm.

What space is the right fit?

Typology: ***ty·pol·o·gy; n; The study or systematic classification of types that have characteristics or traits in common***

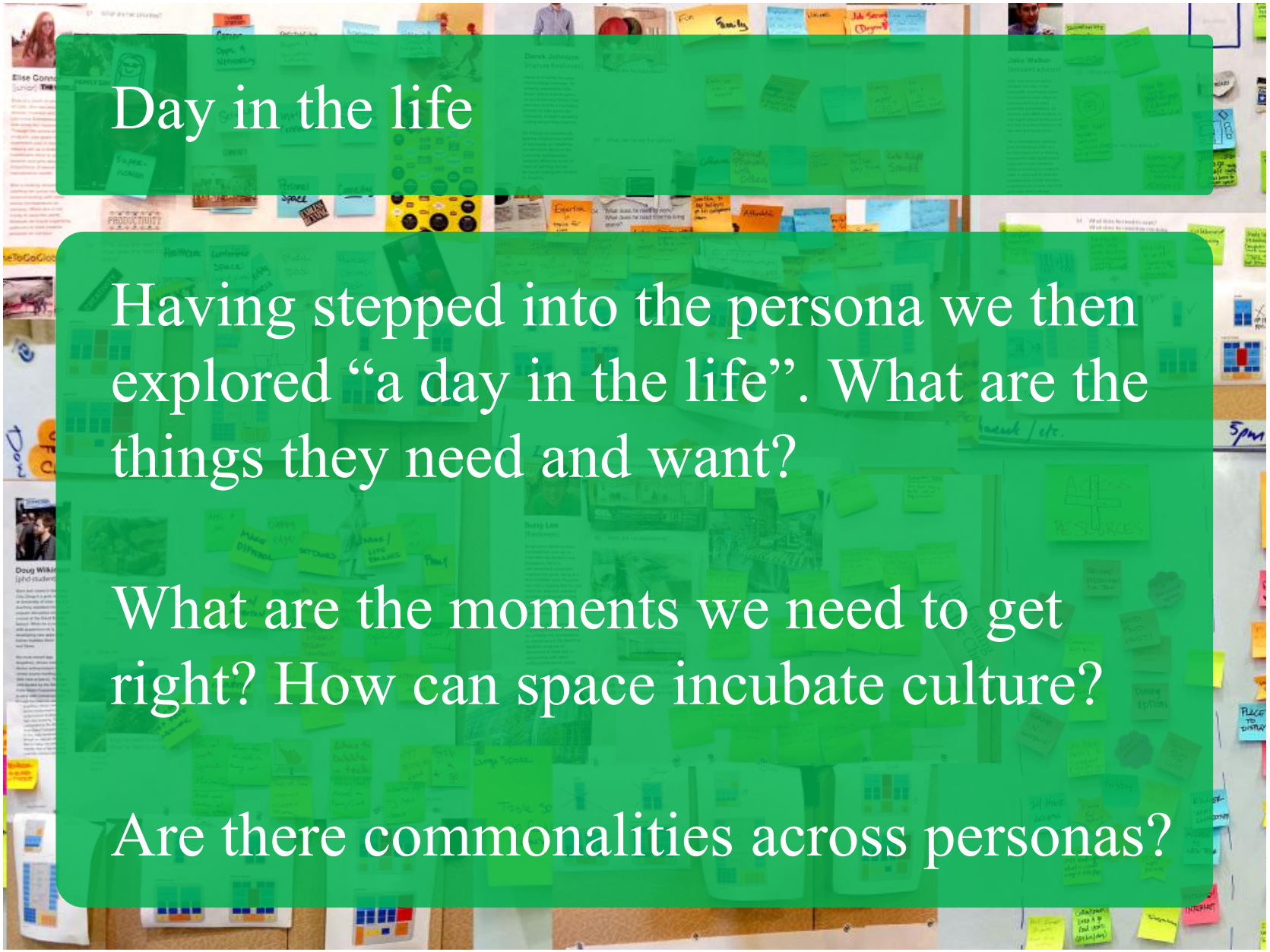
A series of typologies, or space types, were presented; they ranged from a classic two bedroom apartment to pods with variable locations. In which of these spaces would your persona thrive and which would they never consider? The answers were surprising.



Each group was challenged to select three typologies their persona could/would live and one where they would not consider.

We heard a lot of uncomfortable responses, especially when it came to sharing a bathroom or kitchen. But when put in the context of each persona the answers changed a lot.

I could never live there, but Derek totally would!



Day in the life

Having stepped into the persona we then explored “a day in the life”. What are the things they need and want?

What are the moments we need to get right? How can space incubate culture?

Are there commonalities across personas?

By separating needs from wants we are able to quickly identify the critical infrastructure necessary to function.

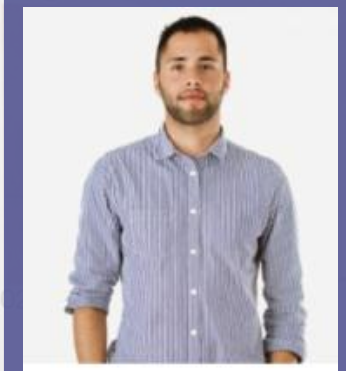
Then we can spend time focusing on curating wants and designing space and governance which can support a wide variety of constituents.

Getting the little things right is often as important as getting the big things right.

Derek Johnson, mature freshman

Derek is a twenty two year old incoming freshman. He recently married his wife Sarah. Derek lives to game: he is a three time Comic Con attendee and he is incredibly excited to take part in the University of Utah's amazing undergrad gaming program. He intends to combine his gaming studies with some of the hands-on initiatives he has heard about at the Lassonde Entrepreneur Institute. When he is not in class or gaming, he can be found reading DC Comics or sleeping.

Derek Johnson
[mature freshmen]
Priorities
Aspirations
Essentials
Work Needs
Living Needs
Fun
Family
Wife's needs
Job Security (Degree)
Create an iconic game empire
Practice
Large programming space to practice w/ others
Gaming Company C.E.O.? Founder?
to Win
Caffeine
Physical Proximity with Others
Family Partner
Late Night Snacks
Something to keep his eyes on his entrepreneurial dreams
Affordable



Derek Johnson
[mature freshmen]

Which space types fit this persona?

✓ space type A
✓ space type B
✓ space type C

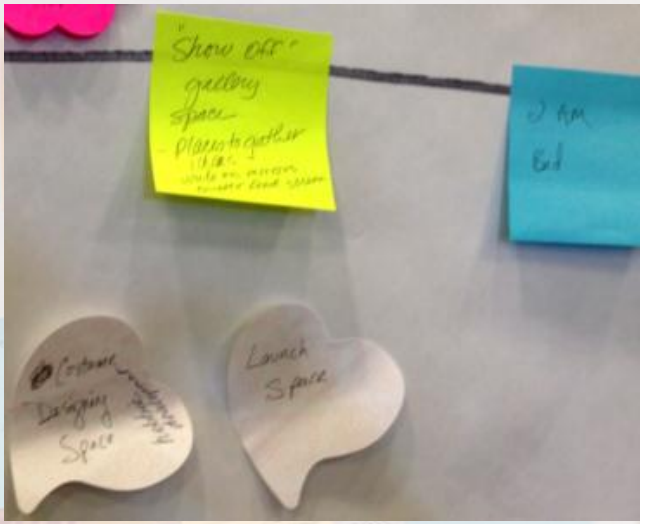
Which space type does NOT fit this persona?

✗ space type D

Derek Johnson
[mature freshmen]

A day in the life…

- **Connect with engineering buddies**
- **Launch space**
- **Night class**



Doug Wilkinson, PhD Student

Born and raised in Salt Lake City, Doug is a grad student at University of Utah. He is a teaching assistant for a popular disruptive innovation course at the David Eccles School. When he is not busy with academics, he is developing new apps with his two buddies, Zach and Steve. His most recent app, Amplifizer, allows medical device entrepreneurs to crowd source funding for their new projects. The app was funded by the Bill & Melinda Gates Foundation. Doug is very well connected and though he has had job offers in Silicon Valley, he prefers the friendly vibe of the local Salt Lake city startup community.

Doug Wilkinson
[phd student]

Priorities
Aspirations
Essentials
Work Needs
Living Needs

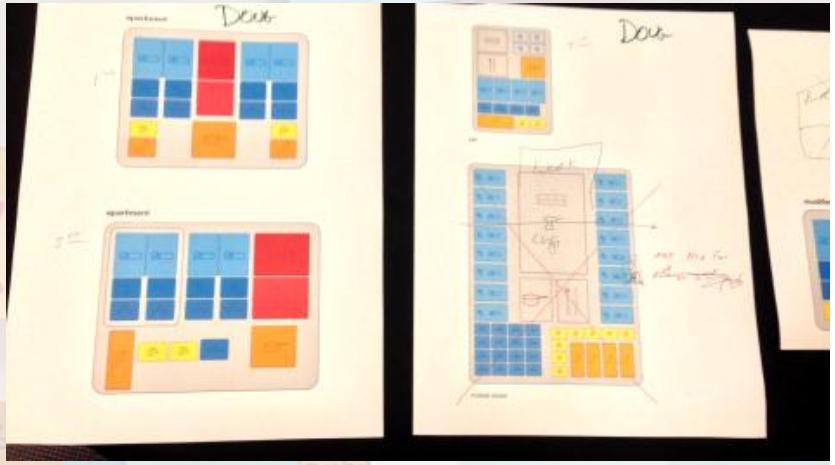
Doug Wilkinson
[phd student]

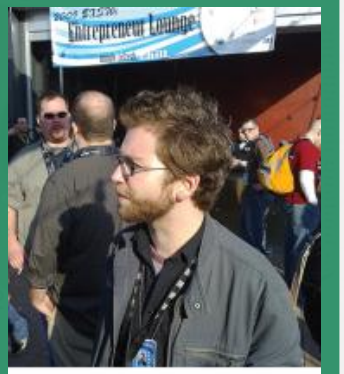
Which space types fit this persona?

✓ **space type A**
✓ **space type B**
✓ **space type C**

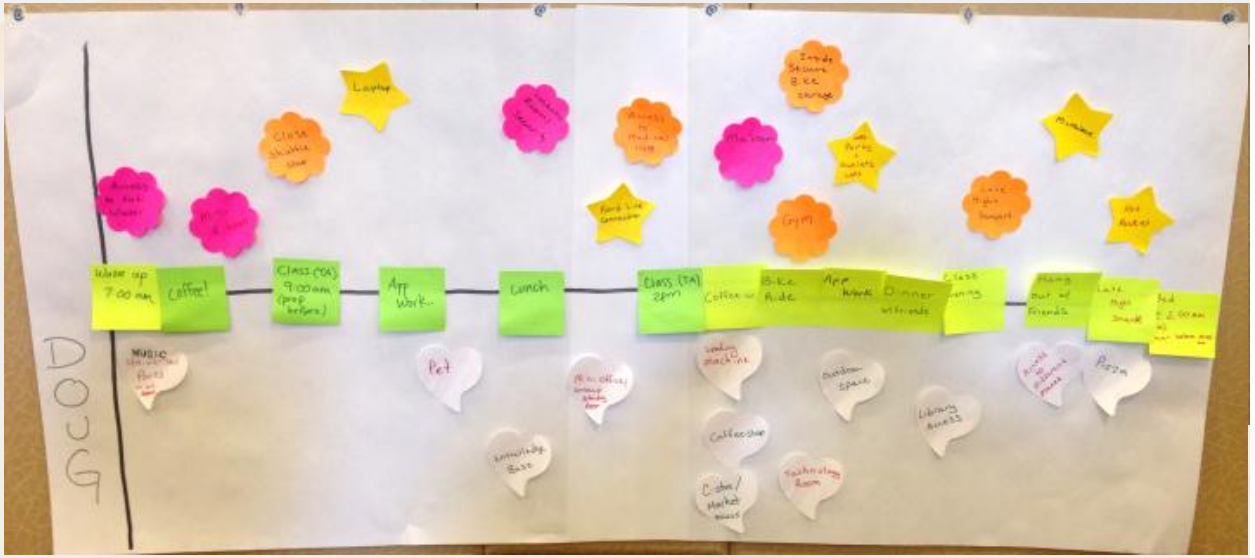
Which space type does NOT fit this persona?

✗ **space type D**





Doug Wilkinson
[phd student]

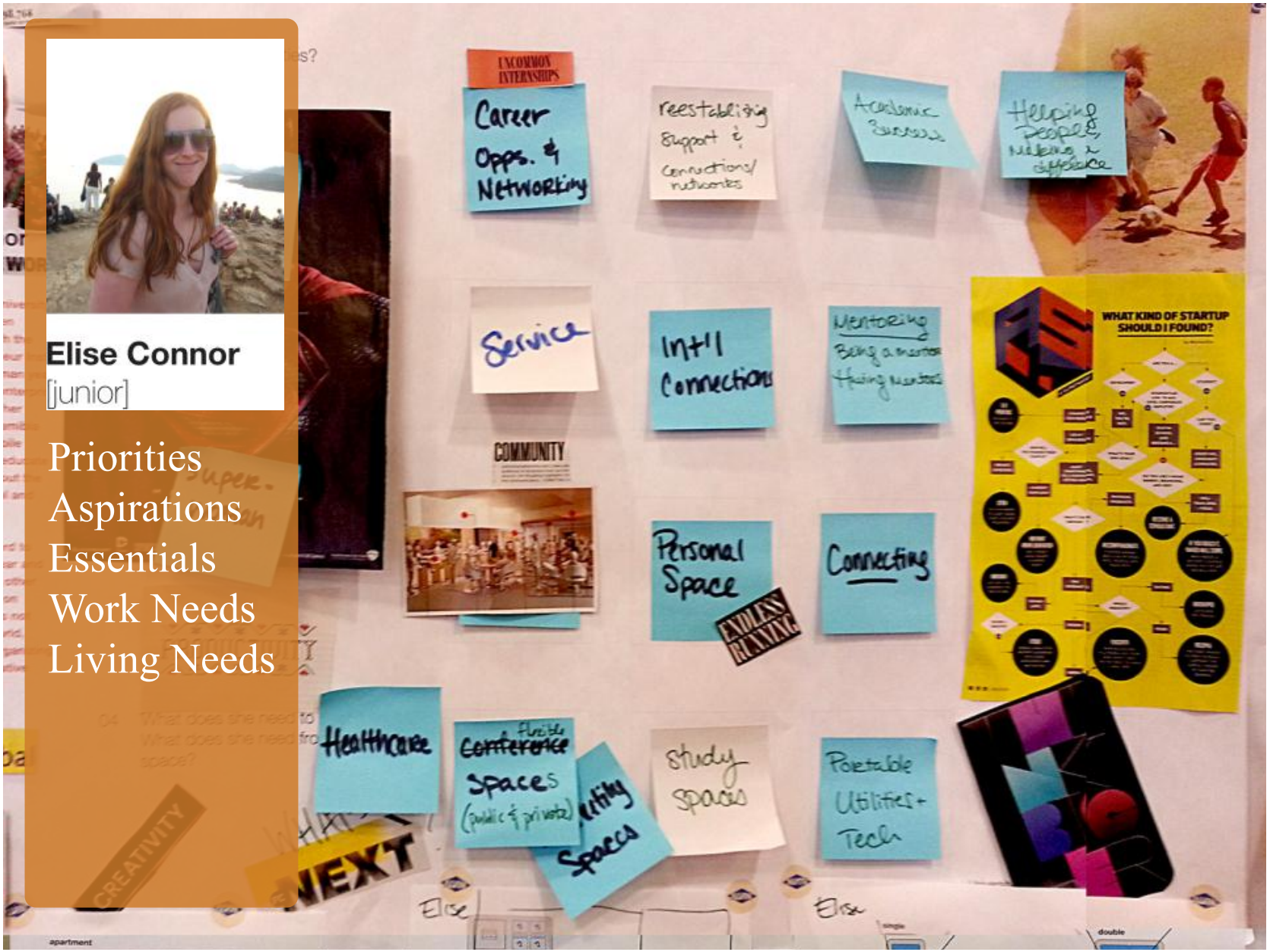


A day in the life…

- **App work**
- **Library Access**
- **Late night transport**

Elise Connor, Junior

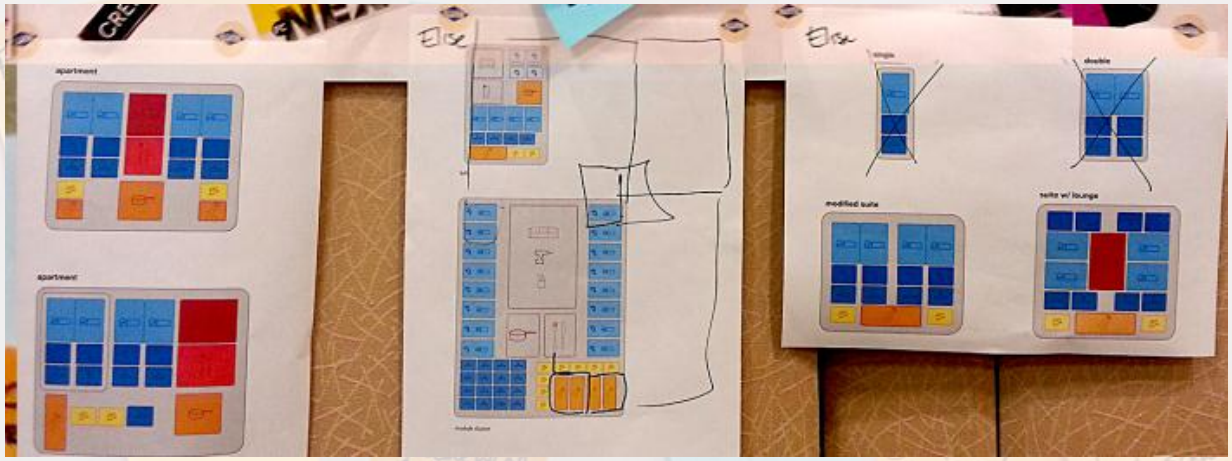
Elise is a junior at the University of Utah. She has been actively involved with the Lassonde Entrepreneur Institute since her freshman year. Through the social enterprise program, she spent her sophomore year in Namibia helping set up a mobile healthcare clinic to educate women and girls about the importance of sexual and reproductive health. She is about to begin her junior year and is looking forward to reconnecting with other social entrepreneurs on campus. When she is not trying to save the world, Elise can be found organizing potlucks to fund creative projects on campus.


Elise Connor
[junior]
Priorities
Aspirations
Essentials
Work Needs
Living Needs
UNCOMMON INTERNSHIPS
Career Opps. & Networking
reestablishing support & connections/ networks
Academic Success
Helping People
Service
Int'l Connections
Mentoring
Being a mentor
Having mentors
WHAT KIND OF STARTUP SHOULD I FOUND?
COMMUNITY
Personal Space
ENDLESS RENTING
Connecting
Healthcare
Flexible Conference Spaces (public & private)
Spaces
Study Spaces
Portable Utilities + Tech
CREATIVITY
NEXT
Elise
Elise
apartment
single
double

Elise Connor
[junior]

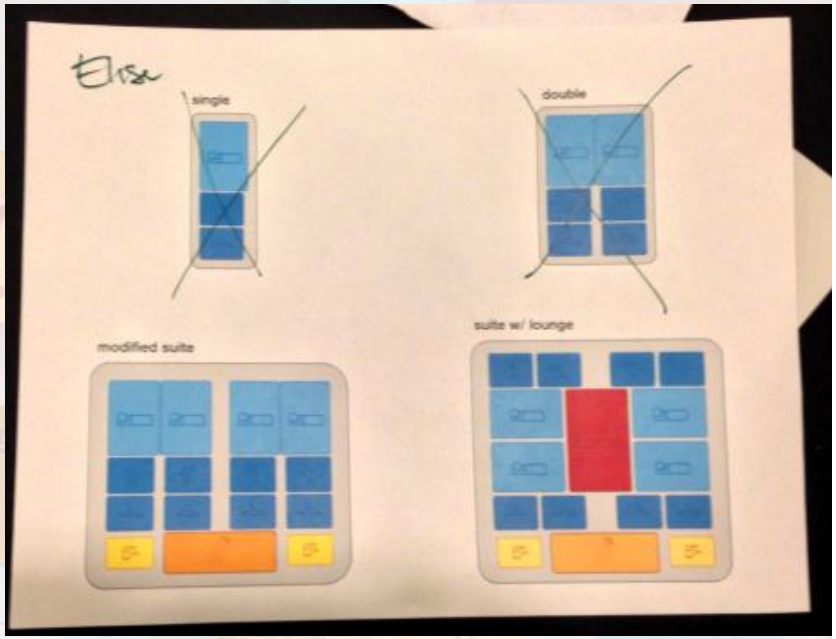
Which space types fit this persona?

Which space type does NOT fit this persona?



✓ space type A
✓ space type B
✓ space type C

✗ space type D



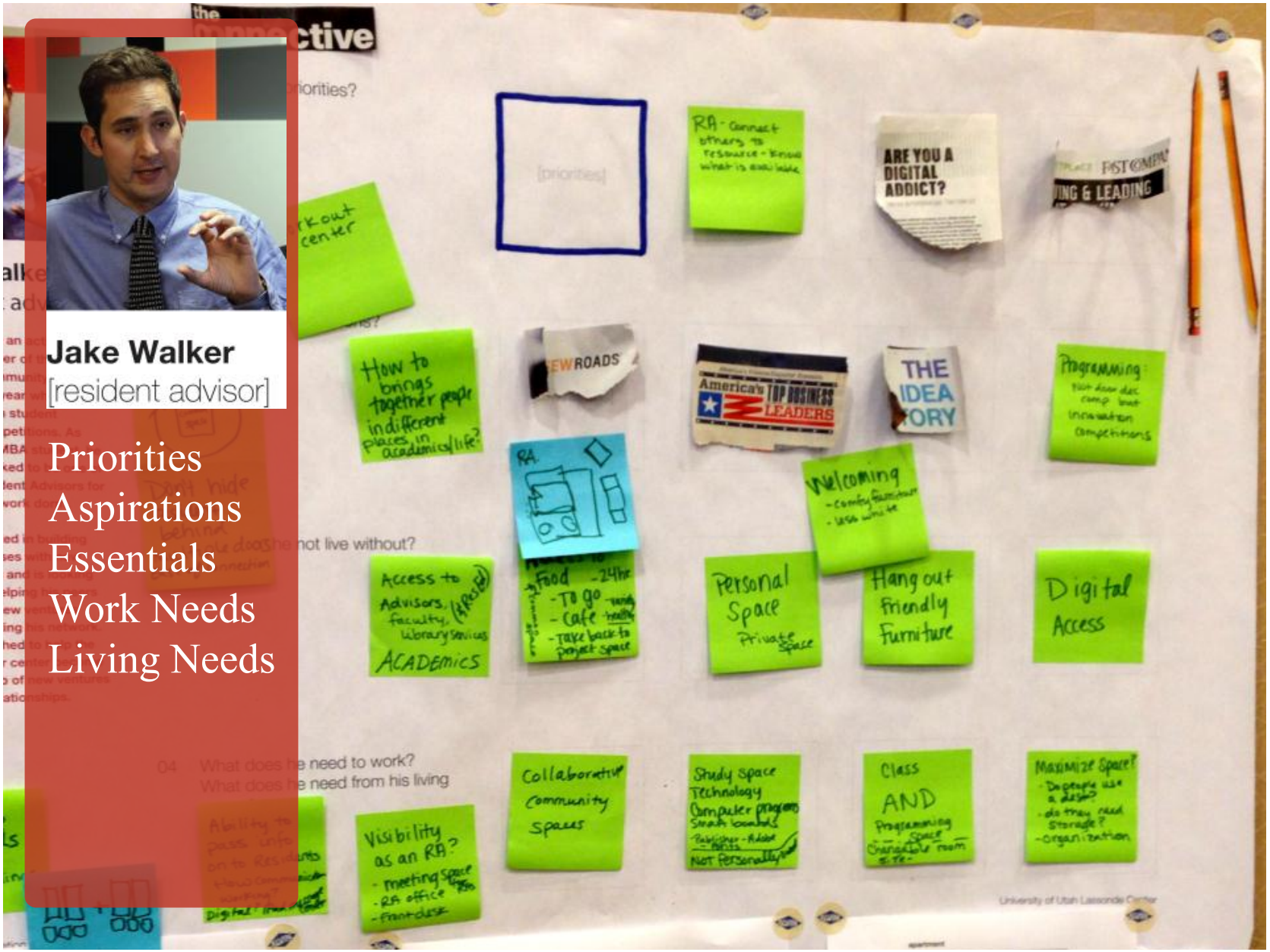
Elise Connor
[junior]

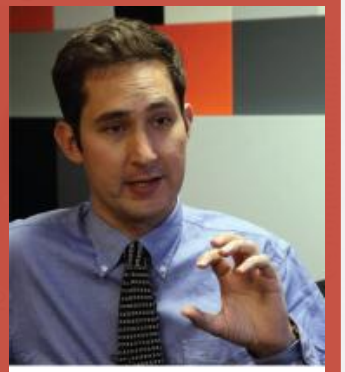
A day in the life…

- **Yogalates**
- **Internship**
- **Large community space**

Jake Walker, RA

Jake has been an invaluable and active student member of the Lassonde community since he took part in the student business competitions as a first-year undergrad. As a second year MBA student, he was hand picked to be one of the first Resident Advisors for the new live/work dorm. He is interested in building new businesses with new technologies and is looking forward to helping his peers succeed in new ventures while extending his network. Jake is psyched to help the new entrepreneur center become a central hub of new ventures and solid relationships.

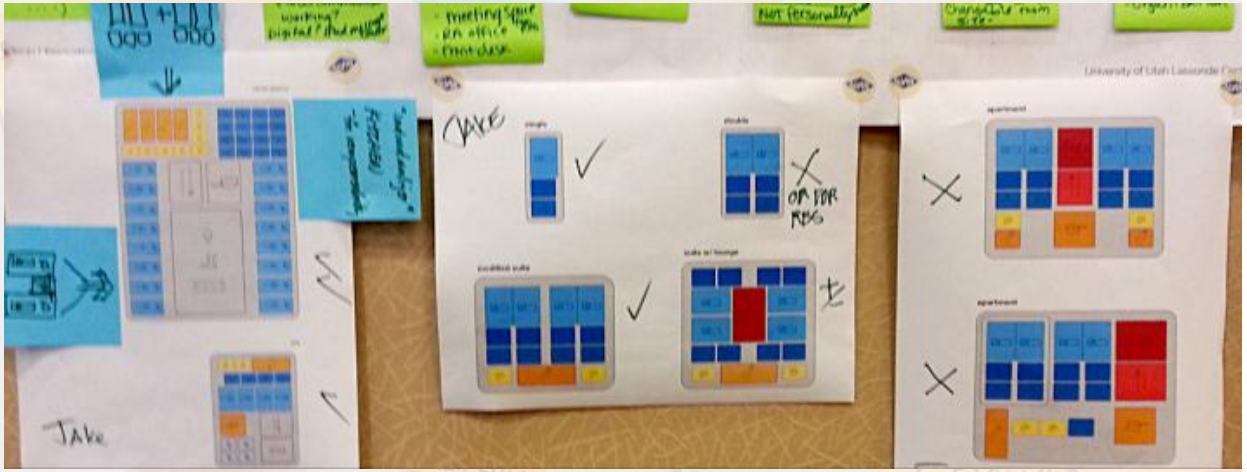

Jake Walker
[resident advisor]
Priorities
Aspirations
Essentials
Work Needs
Living Needs
[priorities]
RA - Connect others to resource - know what is available
ARE YOU A DIGITAL ADDICT?
How to brings together people in different places in academic/life?
America's TOP BUSINESS LEADERS
THE IDEA FACTORY
Programming:
Welcoming
RA
Access to Advisors, faculty, library services
ACADEMICS
Food - 24hr
- To go
- Cafe
- Take back to project space
Personal Space
Private Space
Hang out friendly Furniture
Digital Access
Collaborative Community Spaces
Study Space
Technology
Computer programs
Small boards
Not Personally
Class
AND
Programming
Maximize Space?
- Do people use a desk?
- do they need storage?
- organization
Visibility as an RA?
- meeting space
- RA office
- Front desk
University of Utah Lassonde Center



Jake Walker
[resident advisor]

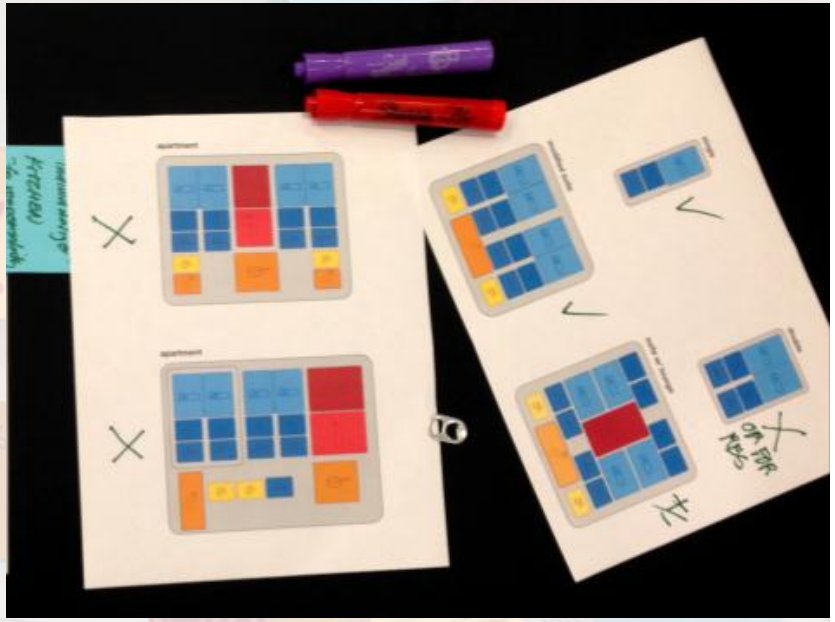
Which space types fit this persona?

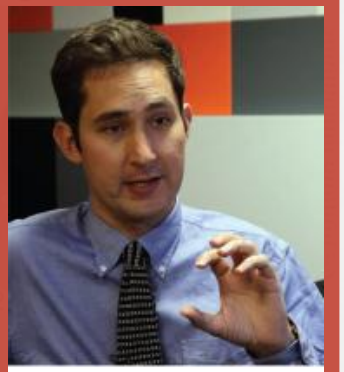
Which space type does NOT fit this persona?



✓ space type A
✓ space type B
✓ space type C

✗ space type D





Jake Walker
[resident advisor]

A day in the life…

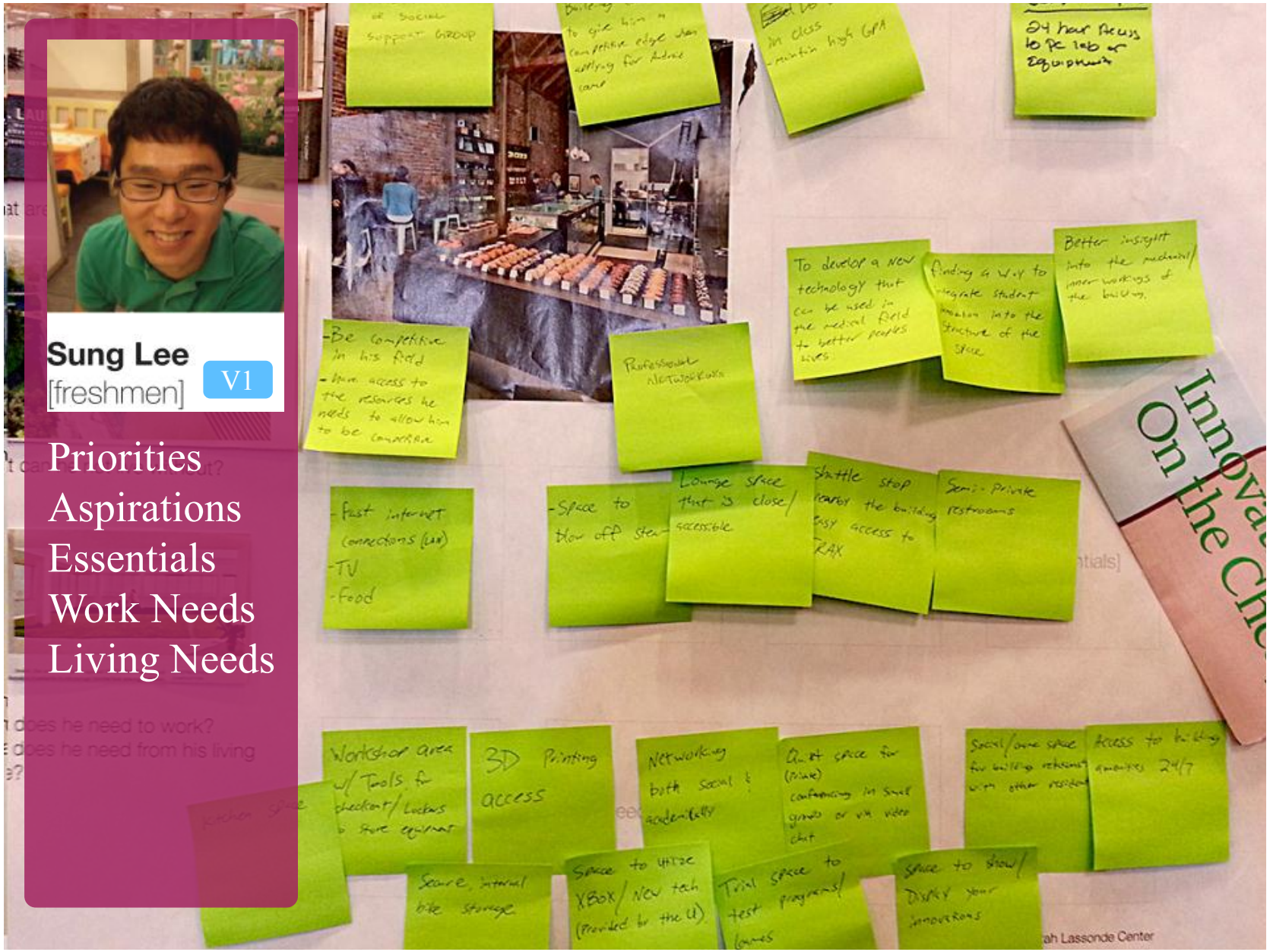
- **Peer mentoring**
- **Dining hall**
- **Movie in common space**

Sung Lee, Freshman

Sung Lee is about to start his freshman year as an international student from Singapore. He is a self-described computer engineering geek. Sung is a Sun Certified Java Programmer and he is hoping that he can work his way into a prized position at Google's highly competitive Android camp this summer that targets future innovators. Recently, he has been exploring hardware hacking as a hobby. He is interested in checking out the Bench to Bedside program at University of Utah and connecting with other software/hardware geeks.

Sung Lee
[freshmen]
V1

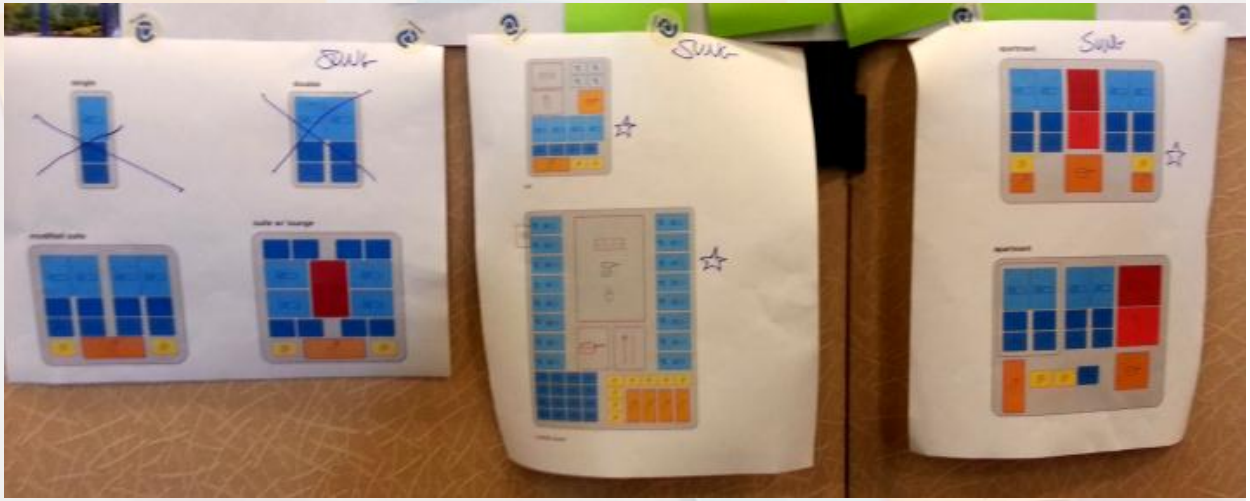
Priorities
Aspirations
Essentials
Work Needs
Living Needs



Sung Lee
[freshmen]
V1

Which space types fit this persona?

Which space type does NOT fit this persona?

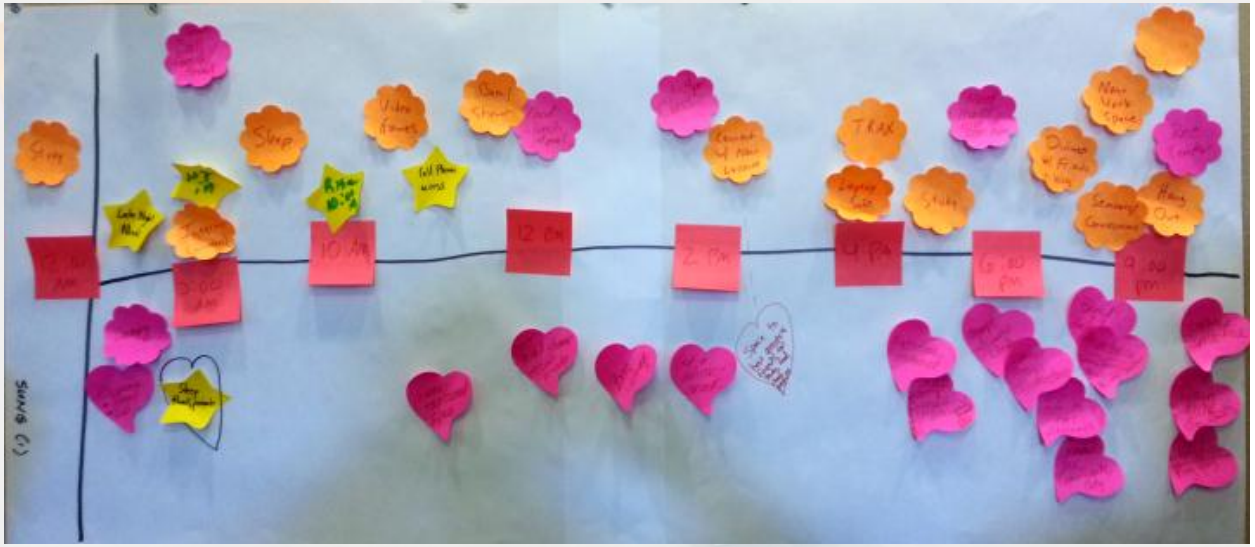


✓ **space type A**
✓ **space type B**
✓ **space type C**

✗ **space type D**

Sung Lee
[freshmen]

V1



A day in the life…

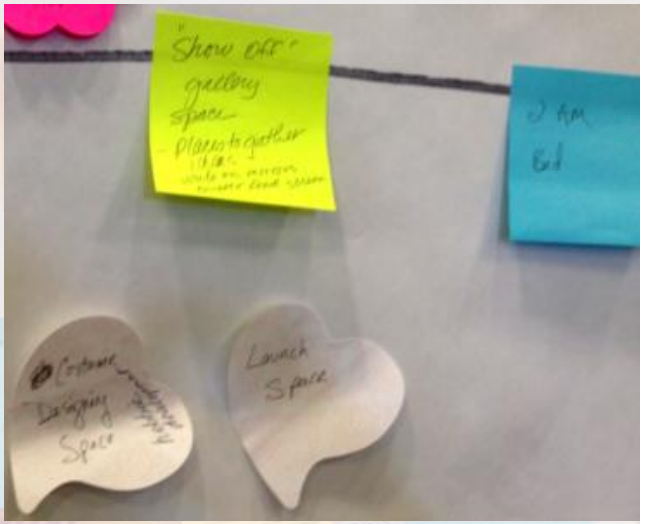
- **Homework**
- **Hacking room marathon**
- **Late night snack**

Sung Lee
[freshmen]
V2
Priorities
Aspirations
Essentials
Work Needs
Living Needs
single room PRIVACY.
Affordability
housing
- equipment
- expenses
GRAD
STRONG EDUCATION
SUCCEED.
NAVIGATE CONFLICTS
FEEL WELCOME
Stand out from other students at other schools
BIO-MED COLLAB
Internship
Connections mentor
Connections w/ upper-class & folks w/in other majors
Get a position at Google's android camp
Bench 2 Bedside
Orientation to the programs
ACCESS
ENTERTAIN SPACE
CELL PHONE
Community building
FOOD. ACCESS WITH BTU
FAMILY KITCHEN FOR COMMUNITY
Study Space
TRAX - SLC
access to 24 hour resources
access to computers
Crazy Strong IT backbone
MAKE SPACE
RELAX COMFORT
BATHROOM MOD. PRIV
MULTI-DIMENSIONAL SPACE
University of Utah Lassonde Center

Sung Lee
[freshmen]
V2

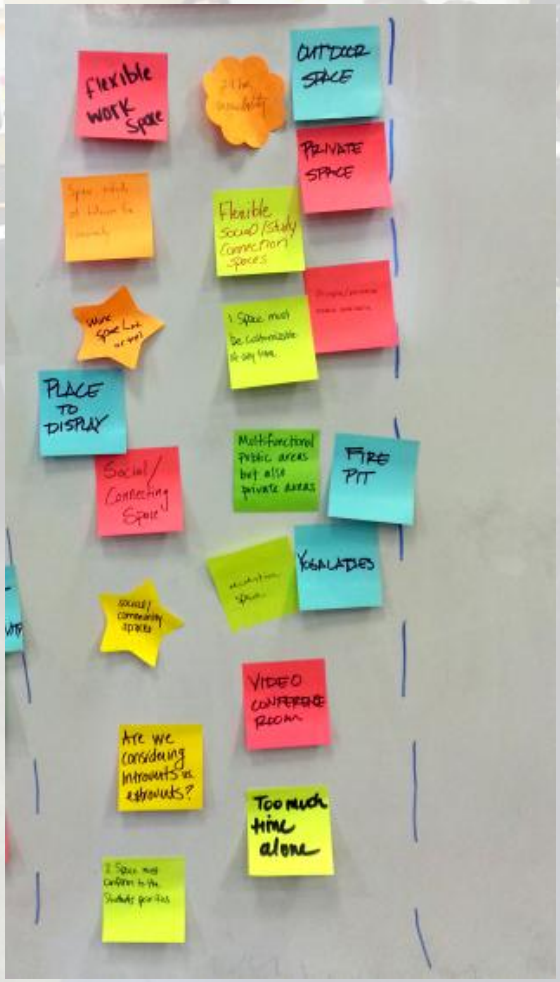
A day in the life…

- **Connect with engineering buddies**
- **Launch space**
- **Night class**

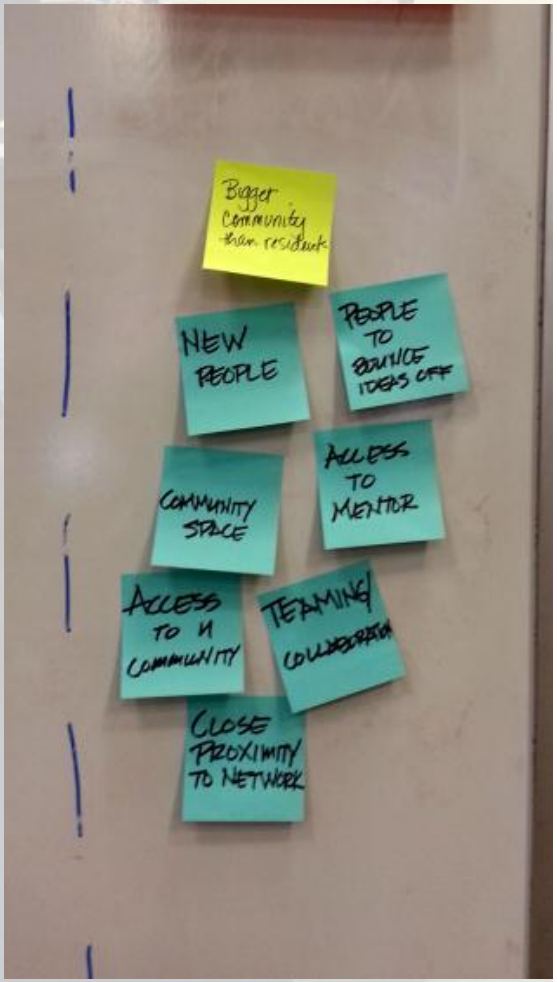


Access + Resources

Variety + Flex Space



Connections + Culture



Observation and implications

- Not surprisingly themes around connectivity, community, and food were loud and clear and universally agreed
- What was surprising and became obvious quickly was that existing roles and job descriptions around staff were not going to work and would need to be refined to balance university requirements and the needs of the new paradigm.
- Flexibility in systems and space (as well and governance) was also a very strong theme which has perhaps the largest implications to selection of typology and building location
- Finalising the site and building type are the first two critical steps to laying the foundation for the rest of the building.

Typologies – Case Studies

The insights and successes from a workshop come from the great ideas generated by active and engaged participants. And we had a great group.

To cull and harness those ideas we needed to do a bit of research to provide our participants with content to respond to.

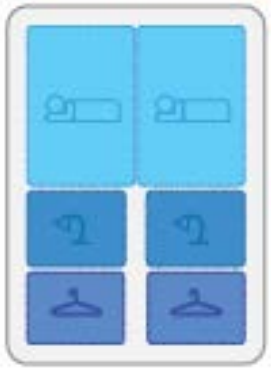
The following are the typologies created for this project and the case studies which support them.

Typologies

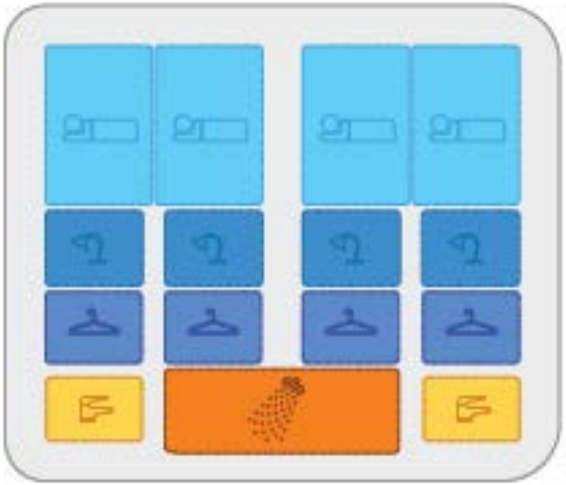
Typology	Description
Proximate	Living and learning spaces are in close proximity, but do not directly share a building or enclosure
Connected	Living and learning areas occupy discreet portions of a single building, and are joined by a shared circulation space
Fused	Living and learning areas share adjacencies and are distributed throughout a building with some overlap in use
Loft	A flexible building structure allows living and learning spaces to be created, moved and scaled on demand
Modular	Living spaces are self-contained units within a larger space, and can be configured to define the size and shape of learning areas

single

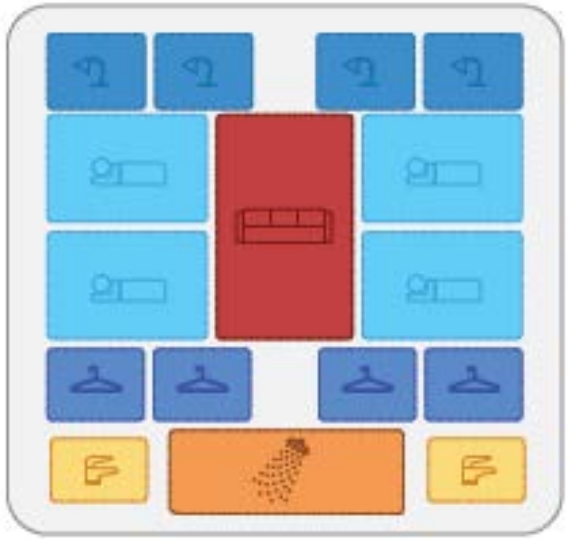
double



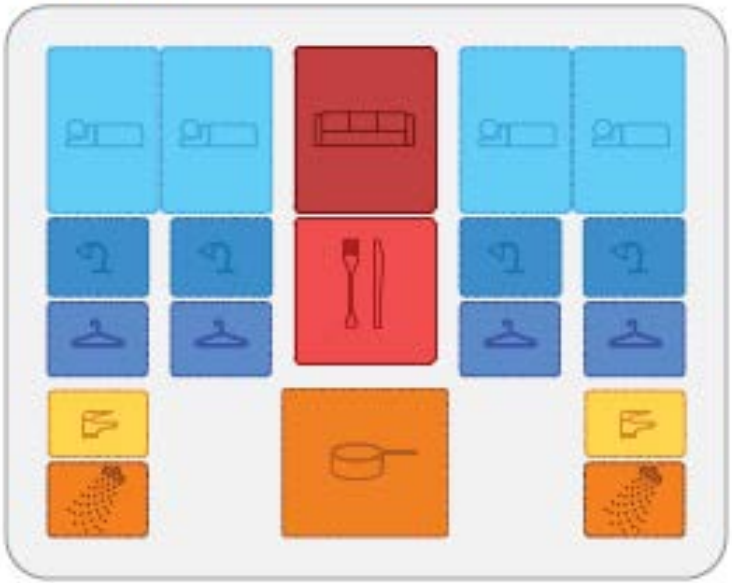
modified suite



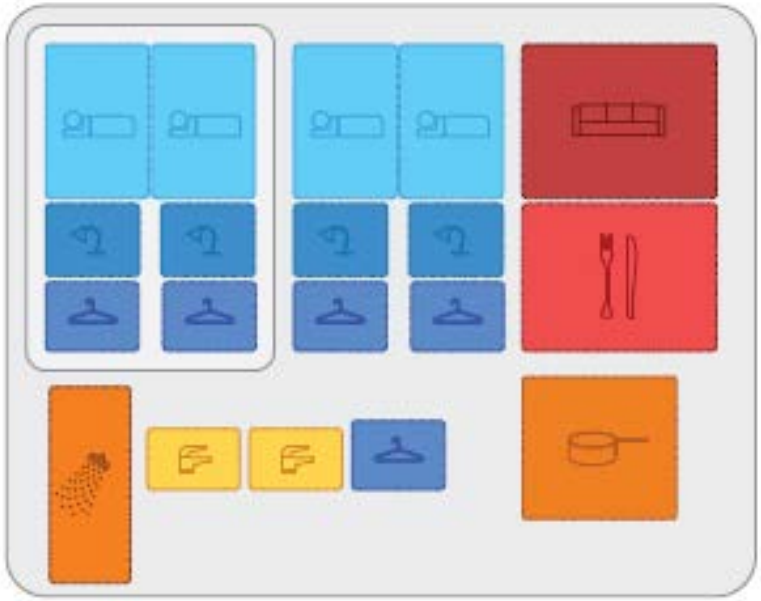
suite w/ lounge

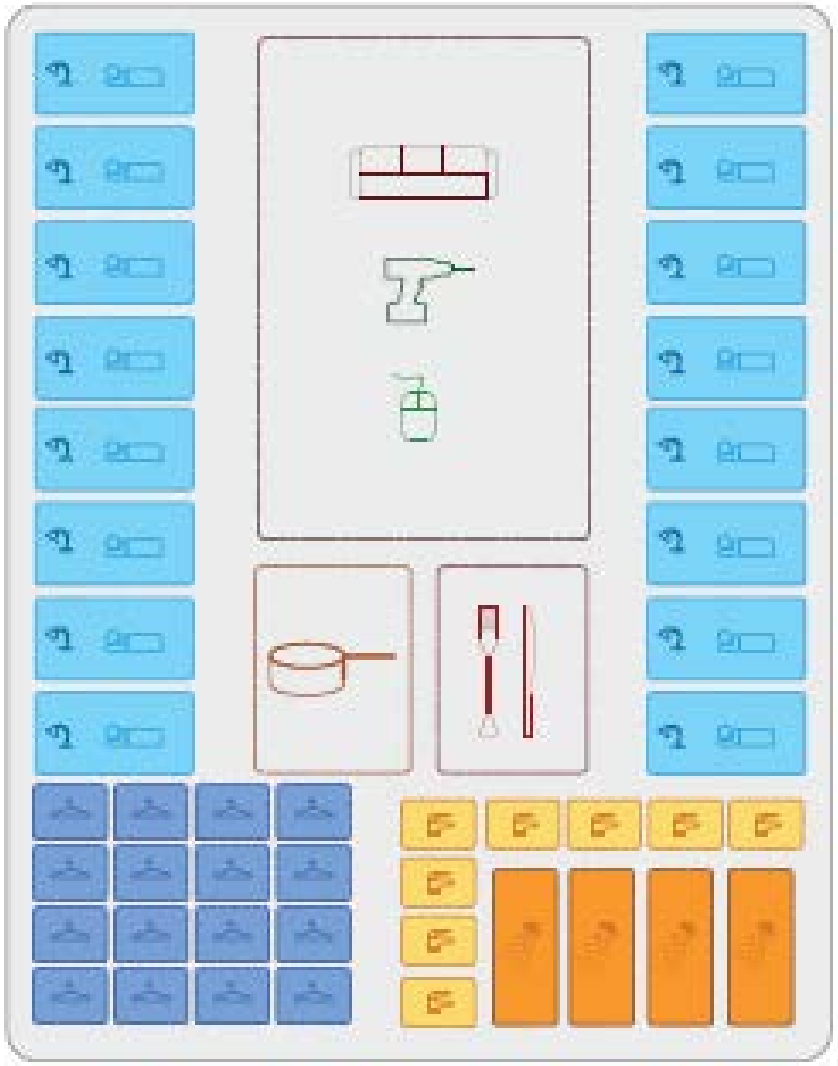


apartment

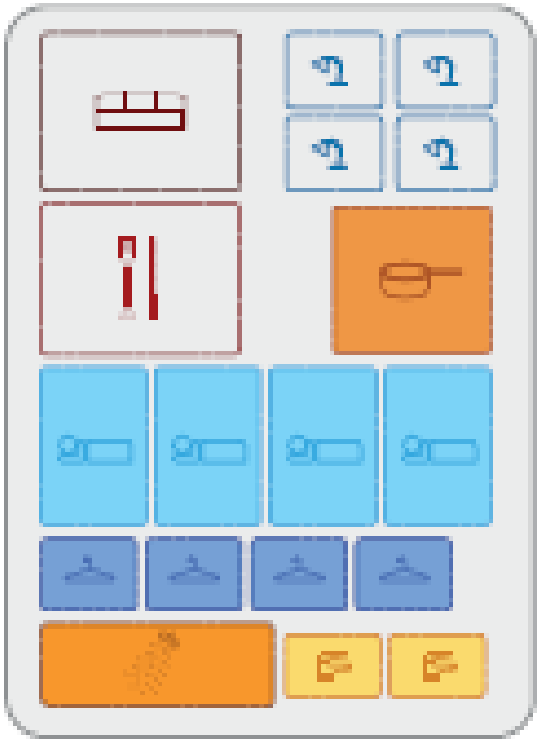


apartment





module cluster

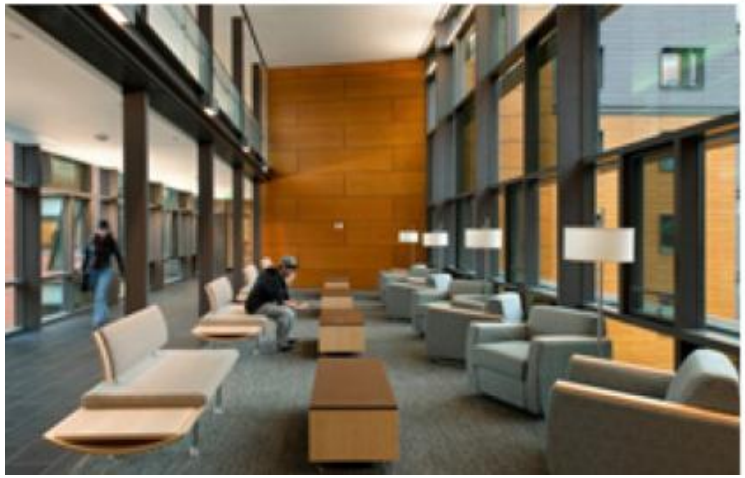


loft

Case Studies

Typology	Academic [ac]	Non-Academic [na]
Proximate	Hillside Hall, University of Rhode Island	
Connected	North Campus Residence Hall, Roger WIlliams University	TAXI, Denver
	Living and Learning Residence Hall 6, Gallaudet University	
Fused	University Center, The New School	Floda31, Sweden
	Innovate, Virginia Tech	Urban Kibbutz, Israel
	Living and Learning Center, University of Vermont	Ace Hotel, USA
	Simmons Hall, Massachusetts Institute of Technology	
	Living-Learning Center, University of Oregon	
	Liiving Learning Community, University of Nevada, Reno	

Typology	Academic [ac]	Non-Academic [na]
Loft		Heavybit Industries, USA
Modular		Private Apartment, Spain
		Naked House, Japan
		Baidu, China
		Port-a-bach, China



Proximate [ac]

Hillside Hall
University of Rhode Island

The 492-bed residence acts a gateway for the university's Hillside District and has a permeable ground level meant to increase pedestrian interconnectivity. The two wings of the building are connected by a glass bridge that houses multiple lounge areas and vertical circulation, which are integral focal points of the university's Living and Learning Community program. The floor plan was designed to create micro-communities of dorm room clusters within the larger complex.

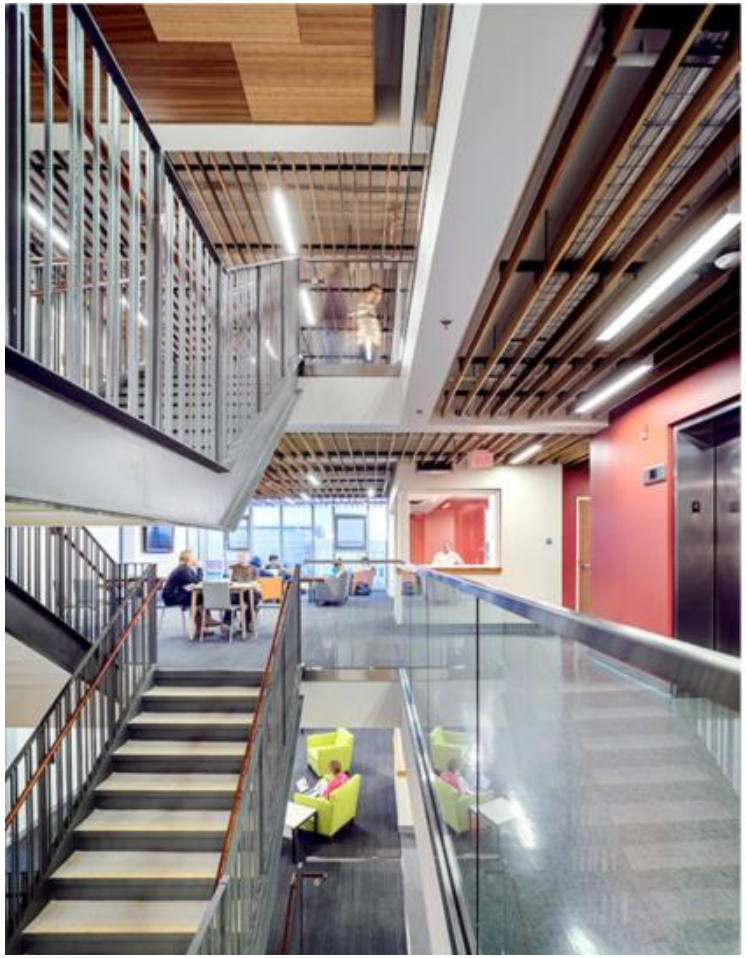
http://www.archdaily.com/328227/hillside-hall-llb-architects/

Connected [ac]

North Campus Residence Hall
Roger Williams University

The 350-bed residence hall anchors the university's development of its north campus. The building's geometry mediates the existing campus grid with the orientation of the north campus. The resulting bend in the building is dedicated to common uses, including a seminar and study rooms as well as activity spaces. A major pedestrian path cuts through the site and divides the common space from the apartments and suites at ground level.

http://www.archdaily.com/160839/rwu-north-campus-residence-hall-perkinswill/



Connected [ac]

Living and Learning Residence Hall 6
Gallaudet University

Gallaudet is the preeminent liberal arts institution for youth who are deaf or hard of hearing, and the residence hall was designed around the unique needs of its student population. Four upper floors house 173 rooms, shared kitchens and faculty apartments. The center of each floor holds glass-walled lounges, which open onto the surrounding campus. Its ground floor is devoted to multipurpose spaces, including a combination living room and assembly hall. This space descends along the gentle slope of the site, terraced with staggered platforms which provide intimate space for groups as well as seating for large assemblies.

http://www.archdaily.com/406845/architecture-s-first-full-fledged-experiment-in-deafspace-design/

Connected [na]

TAXI
Denver, Colorado

TAXI, a mixed-use community in Denver, Colorado, is home to a number of full time residents and over 80 creative businesses. The campus is made up of six buildings, and includes a number of community-oriented amenities including cafes, fitness centers, education centers, a pool and shared garden. It is strategically placed between Denver's major thoroughfares, connecting its residents with the city's downtown and surrounding areas.

http://www.zeppelinplaces.com/taxi.html

Fused [ac]

University Center
The New School

The 16-story building combines all aspects of a traditional campus into a single enclosure, offering academic space on the first seven floors and a 600-bed dormitory on the levels above. Interactive spaces designed to foster spontaneous encounters are dispersed throughout the building are connected vertically by three large fire stairs. Between these zones long, loft-style spaces are located; these areas can accommodate design studios, classrooms, and computing labs and can be easily renovated on reconfigured.

http://www.archdaily.com/316156/in-progress-the-new-school-university-center-som/

Fused [ac]

Innovate
Virginia Tech

Virginia Tech's living-learning community, Innovate, brings together 35 students from a wide variety of majors and interests exchange new ideas and help launch student-led entrepreneurial ventures. Incoming Virginia Tech students commit to one year of residence in the community, located in a former fraternity house, with the option of multi-year involvement.

http://www.roanoke.com/news/nrv/2072935-12/former-fraternity-house-is-now-a-home-for.html

Fused [ac]

Living and Learning Center
University of Vermont

The Living and Learning Center contains a residence hall and hosts the university's Living and Learning Center Programs, where students reside with others who share lifestyles or interests and are part of the Global Residential Learning Community. Students live in singles, doubles or suites and kitchen spaces are readily available throughout the complex.

http://www.uvm.edu/about_uvm/visiting/?Page=online_tour/onlinetour.php&cat=residence&building=living&SM=online_toursubmenu.html

Fused [ac]

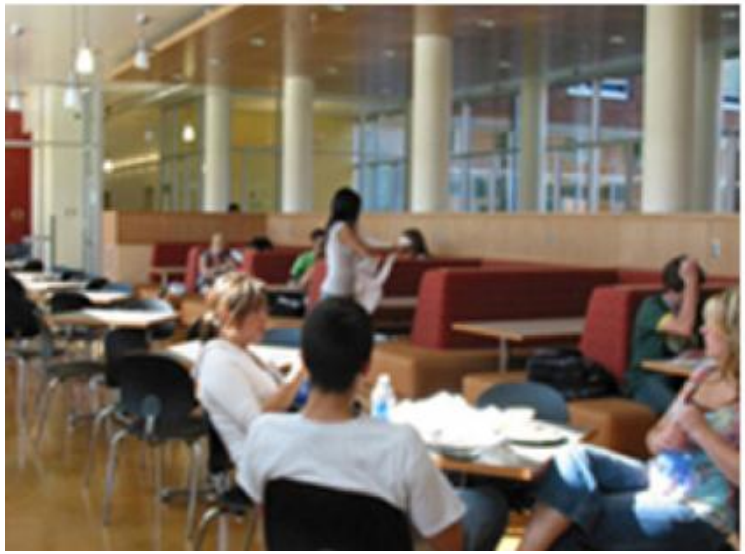
Simmons Hall
Massachusetts Institute of Technology

This 350-room undergraduate dormitory was designed with a multitude of common spaces meant to encourage interaction amongst residents. While the building appears rigid in form from the outside, large voids are cut through the building and provide unusual spaces for gyms and lounges. There is also a theater, a night café, and a large dining hall. While most of the rooms are singles and doubles, there are some suites for graduate student resident tutors who have suites.

http://www.archdaily.com/65172/simmons-hall-at-mit-steven-holl/

http://en.wikipedia.org/wiki/List_of_Massachusetts_Institute_of_Technology_undergraduate_dormitories

http://www.casaligroup.com/portfolio/simmons-hall/



Fused [ac]

Living-Learning Center
University of Oregon

The Living-Learning Center (LLC) integrates spaces for academic classes, study groups, faculty advising, performances, dining and living. The center hosts a bistro and is located near the university's student recreation center, heath center and campus dining. The central plaza dividing the complex serves as an outdoor seating area for students and encourages students mingle, socialize, and study.

http://housing.uoregon.edu/reshalls/llc.php

Fused [ac]

Living Learning Community
University of Nevada, Reno

The Nevada Living Learning Community is home to 320 students in several Living Learning Communities, which provide educational and social opportunities to students who live on campus. Students within these groups share a floor in the residence hall, take one or more core courses together, and actively participate in their communities. Accordingly, each floor of the living learning complex has dedicated shared space, and classrooms are located on the first floor.

http://www.unr.edu/housing/on-campus-housing/residence-halls/nevadallc

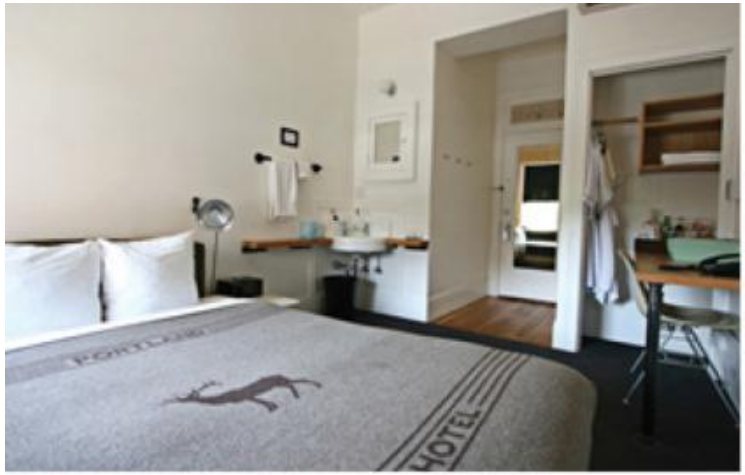
Fused [na]

Floda31
Botsmark, Sweden

Floda31, sited on a former farm in northern Sweden, provides an environment that fosters new connections, networks and cross-disciplinary encounters between specialists from diverse professional backgrounds. The program offers "curated residencies" twice a year, in which a design brief is established and a multi-disciplinary team is invited to respond. Residency programs for individual work run throughout the year and last from one week up to three months.

http://floda31.com/wp-content/uploads/2013/09/OutsideCladdingFromTheRight.jpg

http://floda31.com/wp-content/uploads/2012/06/floda31-aerial.jpg

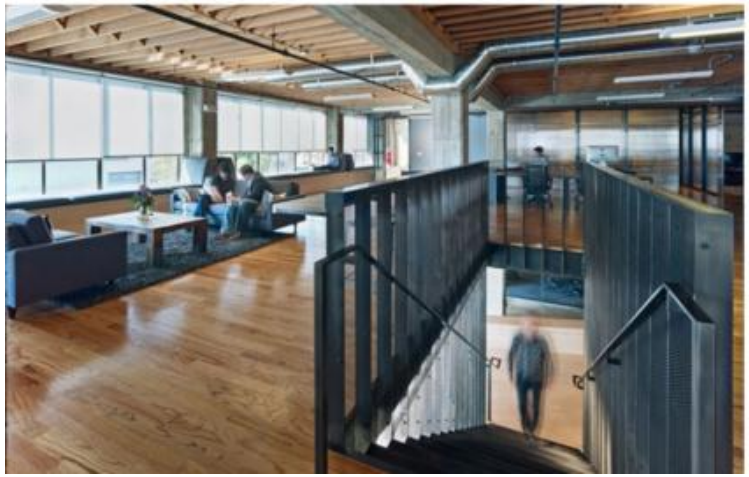


Fused [na]

Ace Hotel
Portland, Oregon

The Ace Hotel in Portland offers guestrooms that use a shared, single-occupant bathroom for each floor, although some rooms have private bathrooms. Guestrooms are well equipped with queen-size beds and flat screen TVs, as a large portion of the hotel's space is allocated to its shared amenities. The building hosts a library with workspaces and office supplies, which is open and well used by the local downtown community. A coffee shop within the hotel also aides the mixing of guests and locals, and creates a space for chance meetings and unexpected exchanges.

https://www.acehotel.com/portland/rooms?type=basic_shared_single



Loft [na]

Heavybit Industries
San Francisco, California

Co-working spaces are a recent trend in office design that provides spaces for members to work. While the traditional model is for employees of one company to work in the same office, this alternative model is a space open to anyone who pays the monthly membership. This provides a productive and creative space for people who want to or need to work remotely from their company, for freelancers, and for start-ups. Heavybit Industries is an example of a community workspace that targets a specific membership profile focused on people working on cloud developer products. Located in a former warehouse, Heavybit Industries provides a mix of open space and meeting rooms for working, eating, socializing, and entertaining for events.

http://www.archdaily.com/401795/heavybit-industries-iwamotoscott-architecture/

Modular [na]

Private Apartment
Bilbao, Spain

Two people share this apartment, each of which lives in an 8' x 6' modular pod that provides each roommate with privacy. The walls of these pods are made of particle board, but the plexiglass top allows for light to enter the chamber. Since the pods are on wheels, the space can be reconfigured based on changing preferences and needs of the roommates. While this is a small project, it shows how modular living spaces can be inserted into larger spaces and allow for flexibility.

http://www.nytimes.com/slideshow/2009/11/06/realestate/20091108-cov-slideshow_7.html?_r=1&

Modular [na]

Naked House
Kawago, Japan

The bathroom, kitchen, and laundry areas are the only interior parts in this house with permanent walls. Each of the four bedrooms is an enclosed wooden box on wheels so they can be moved throughout the space. These movable and combinable pods allow both for privacy and maximum flexibility in the space.

http://nakedhousecasestudy.blogspot.com/p/overview.html

Modular [na]

Baidu
Beijing, China

Baidu, known as the "Google of China," is well known for its innovative culture. The company explicitly values work-life balance, but makes sure to provide its employees with spaces to nap when in need of rest. This office feature is part of what makes their company so well known for its culture of having a comfortable place to work that takes into account the needs of its employees. In addition to these sleep pods, the company also has its own cafeteria, which fosters a sense of community within the company. Known as "young" and "hip," Baidu reflects its company culture through design.

http://www.absolutelyfobulous.com/2011/05/12/naptime-at-baidu-cooler-than-googles-cafeteria/

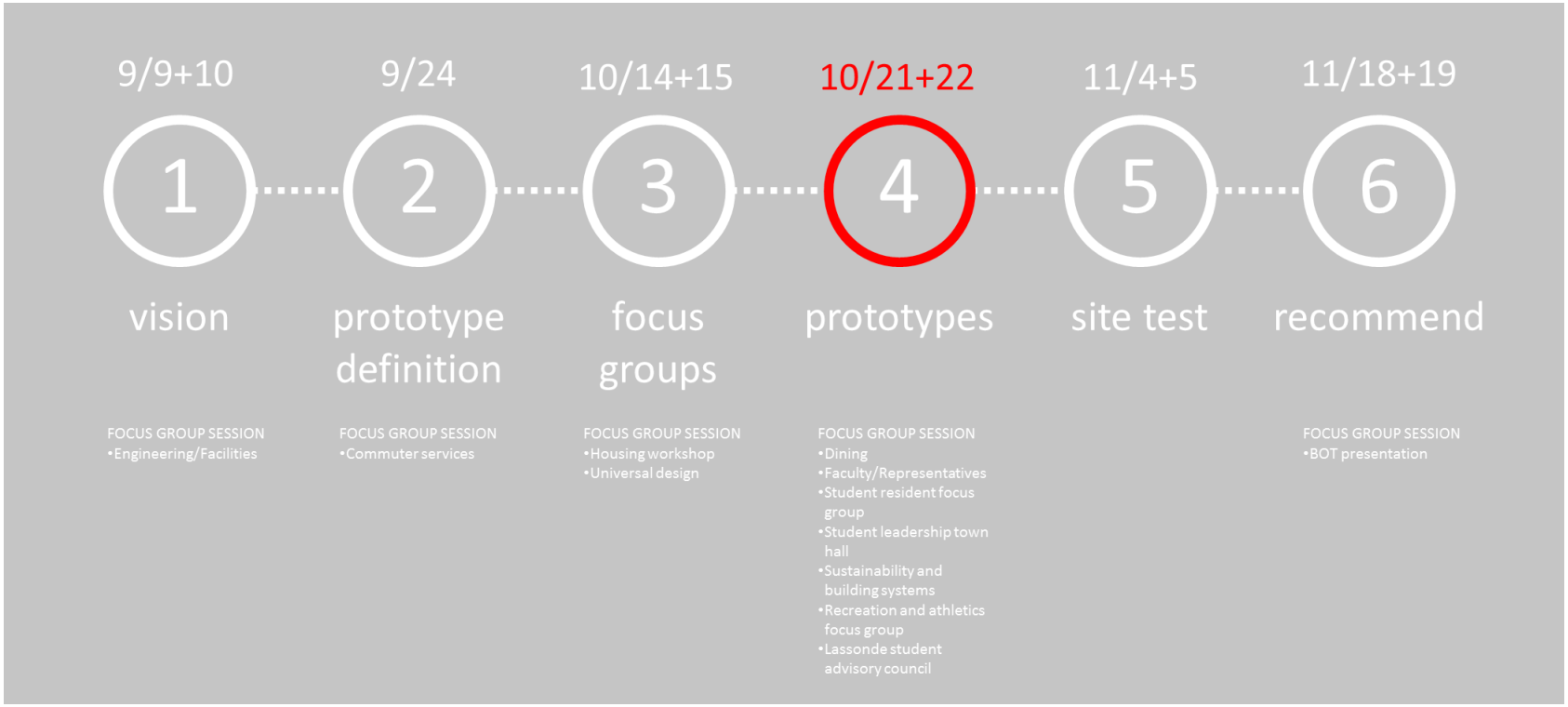
Modular [na]

Port-a-bach
Hangzhou, China

Shipping containers are a new trend in modular design. Several innovative design firms have repurposed shipping containers into compact and green housing units that can be stacked and combined in a variety of ways. This particular portable unit can sleep two adults and two kids. These types of living units are driven by economy of space as the compact living quarters that have an integrated kitchen and modest storage. They are prefabricated and then delivered to the site needing only a connection to local utilities.

http://www.atelierworkshop.com/port-a-bach

http://designcrave.com/2009-06-22/10-brilliant-boxy-and-sustainable-shipping-container-homes/



MEETING MINUTES:
STEERING COMMITTEE MEETING NO. 4 - WORKSHOP NO. 3

DATE:
10.21.2013 & 10.22.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE ENTREPRENEUR CENTER & THE PETERSON HERITAGE CENTER

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ITEMS/ISSUES

Item #	Date	Issue/Topic
4-1	10.21.2013 12:00 pm	Day 1: Working Committee: • Canon Design reviewed the schedule and provided a recap of the persona workshop. It was agreed that the personas were effective but were not representative of all potential residents/student types. • The program as it relates to the financial model was discussed. Program assumptions have begun to shift; total building area has been reduced to 140,000 sf. Bed count may change as well once prototypes are developed. • The process of deconstructing prior to re-constructing the unit types was discussed/explained. • The four prototypes were presented and discussed.
4-2	10.21.2013 1:30 pm	Prototype comments • Loft = work in the living space; Modular = live in the garage • No rooms on wheels • Cult, Culture, Company • Loft may reduce effectiveness of garage by spreading it too thin/far apart. • Community safety and integration are important • Areas requiring supervision should be centralized/on ground floor • Flexibility is critical. • Fused and loft have potential to maintain individual rooms. • Modular and loft appear to have more flexibility within a framework – both appear preferred. • Modular seems best for intense experience, fused does not seem as open or flexible. • Fused, loft and modular in the same building = hybrid?

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-3	10.21.2013 3:30 pm	Meeting 2: Dining The design team/working committee met with Mark Morrison (Resident Dining Coordinator), and Reggie & Dan (Chartwells) to discuss options/possibilities/desires for food service relating to the project. General comments / takeaways from the meeting: • The food/dining solution should fit/work within the context of the University master plan for food service. • The placeholder area of 1700 sf is not enough to serve 400 residents or for anything more than a coffee shop. • All freshmen residents to be on a meal plan (200 estimated) • The student union food court is currently too small/out of date, and does not offer the appropriate dietary options to be considered for use. • There is currently a shortage of dining options in central campus. • The campus as a whole is maxed out with Grab-n-go / coffee shops. • Integrating dining at the beginning is more cost effective than later. • It's possible the presence of Lassonde may warrant the addition of a new dining facility similar to the Heritage Center. • Lassonde may be a great spot for gathering/coffee but 24/7 – 3 balanced meal service is not realistic. • Need to have 24/7 food options. • A new dining element should be a free standing / off-site unit. • C-store at Honor's Housing is successful and could expand. • Student Life Center will have a smoothie bar, light snacks, etc • Food service at top floor of Union is option – would cost $3 mil • Chartwells is open to investing in Lassonde if dining solution is included. Chartwells desires to have greater presence in central campus. • It's preferred that food service is included in the building program. • The dining master plan (B+D) is currently in the process of being finalized. • Building typology impacts the food solution • Food service solution should include a fresh variety of options beyond the typical campus fare. • Other ideas include: order ahead/pick up service (no seating), restaurateur business program, food trucks adopt the swipe system.

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-4	10.21.2013 5:30 pm	Stakeholders: Business / Engineering - Faculty / Staff / Community Attendee's backgrounds/disciplines varied from: MBA/Entrepreneur, to computer science and gaming, to the medical sciences and beyond. Mehrdad reviewed the process to this point and presented the prototypes. Response / comments were as follows: • What are the costs and capabilities of the tinkering spaces? • No heavy machinery and or equipment in Lassonde, but connectivity to other programs is important • Need to consider environmental factors (noise and smells) created by garage and how they affect living spaces. • BOTH public and private tinkering space should be available • Material and supplies – consider who controls the flow (location & governance) • How do you deal with distribution of materials if the maker space is OFF the ground floor? • Functions should drive location of resources • Simpler fabrication will need to happen in the garage, tools, drills, should be expected beyond the 3-D printer • Modular is preferred as it supports the entrepreneurship thoughts of Learn, Collaborate, Create and Launch • Interface design problem, it's about governance. Modular architecture can be adapted • Garage should be centralized and not spread throughout building • Students will push the boundaries (rules) bring in their own tools etc. • Different students have different work styles – spaces should be flexible enough to adapt to different styles. i.e. creative spaces. • There should be options for breaks / to blow off steam: e.g. basketball hoop or a piano • Glassy multipurpose rooms can be unfriendly • Excitement is PROXIMITY not scale of space • Everyone wants a corner... big open spaces don't work well • Having students live there allows them to OWN the space which is good • Teaching /Lab/Studio, students can use the space, but it can be used for teaching • Energy and chance meetings between people doing a variety of tasks will encourage interaction • Functional maintenance and repair, who owns it student, faculty or others? • Is gender an issue to address? How? • LOCATION, LOCATION, LOCATION • The bldg should be located near a hub of activity • Garage space should be visible/accessible from exterior (garage doors open to ext) • Outdoor work area • Must have FOOD...but what • Consumables are required...we may need a lab fee, or some sort of fee for maintenance, to cover STUFF and all its storage • Secure storage space is a necessity • Safety and learning how to use tools, store info, labs and how to live in maker space, how do they share, and stay safe • Live in faculty – house parents? • Peer mentors to guide is essential • Guidance & Governance are a necessity or else chaos will reign

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-5	10.21.2013 8:00 pm	Resident (Student) Focus Group The design team met with a small group of student residents and RA's. Represented were the freshman, sophomore, and junior classes. All participating students have lived on campus since their first year. Comments were as follows: • General perception of housing (residence halls, apartments) is good. • Mass transit (Trax), campus shuttle, and food were noted as positives. • Sense of community is strong. • Some community is experienced through academic endeavors, but mostly through residential experience. • Reasons to live off campus were noted as: lower cost, more convenient to access Marriot Library than from the upper campus area, lack of governance. • Things they would change/are not happy with currently: high cost, function of lighting occ sensors in rooms, not enough community kitchen space (more than empty cabinets and microwaves). • Opportunity to live in building with maker spaces was deemed a big draw for upperclassman and as a mentoring opportunity for first years. • Students felt that a variety of room typologies in one building is essential to a multi tier occupancy. • Privacy is preferred for sleeping and studying (quiet time) • Studying in their own rooms is important – must have necessary power and data capabilities. • They were open to sharing bathroom and kitchen facilities if they are clean and can have their own storage space. • Open to double bedrooms but think singles offer more flexibility • Individual temperature control is a must. • Secure and accessible storage is a must. • Floor lounges are preferred in addition to maker space in living areas. • Open to maker space on their floor provided the noisy, messy, smelly space is limited to lower floor(s). • Open to sharing space with other residents, but would want to keep non-residents on lower floors – for safety and to maintain exclusivity. • Outdoor space is essential. Outdoor maker space with garage doors to interior, and outdoor meeting space for small groups. • Space needs to be flexible for many needs and uses: spray booths, cutting tables, sewing machines, 3D printers, laser cutters, etc • Food is very important at all hours (C-store, coffee, sandwiches were noted) • Building finishes should reflect the nature of the maker space and be durable, yet look innovative and cool. • There should be a variety of spaces in the building: variable sized group/meeting areas, lounges, maker spaces, shared kitchen/dining • Post-it boards (tack boards, or digital information boards) • As many writable surfaces as possible • In regards to building design – "collaboration is not linear, it's circular" • No halls or corridors.

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-6	10.21.2013 9:00 pm	Town Hall / Student Leaders A town hall style meeting was held with the student leaders. Comments were as follows: • Housing should be gender neutral • Security relating to non-residents is a concern – how public are the garage spaces • Residents should have more access – exclusivity • Should be universally designed • Noise would be a concern mixing garage and living space • Actual start-up companies participating at the facility would be beneficial and inspirational • No hallways is not practical • Needs to be comfortable – even if it's temporary • Garage/maker space should be flexible • Garage can be misinterpreted as parking • MIT Living Wall • Posting / display spaces • Need to have food / dining options • The fused prototype may not offer enough security / exclusivity • Needs to be exclusive – tiered levels of public / private • Performance spaces would be good (double as presentation space?), auditorium/ amphitheater? • Outdoor spaces • Bench to Bedside focused area • Don't price out students & create divide between old & new housing • Recreation room / space • Needs to be inclusive and accessible to strengthen collaboration
4-7	10.22.2013 8:30 am	Day 2 – Steering Committee The design team presented an overall update to the steering committee including a review of the prototypes and the personas workshop. Comments were as follows: • Can the 400 beds be filled with like minded students? Will it be backfilled to begin? • "Blue Ocean Strategy" – create something that does not exist and a new market will open. • Financial model needs to be kept in the space • Will the program change based on the prototype? • Not all entrepreneurs will want to live in the modular environment • A variety of bedroom spaces/types are needed to be inclusive of all student types/needs • The building should be a hybrid of unit types • Should be marketed to people who want to make a difference/impact • This is a great opportunity to experiment with housing & community

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-7	10.22.2013 10:00 am	Sustainability Session Atelier Ten and ARUP presented an overview of LEED and the concepts/ideas of integrated sustainable design related to housing with a focus on mechanical systems and impact on structure. Notes and comments are as follows: • It should be anticipated that the energy footprint of the garage is bigger in proportion to the residential portion. • Plumbing fixtures should be “high efficiency”, not “low flow” • Heat recovery and solar thermal are good practices that could be applied. • Lighting and plug load are the most difficult usages to anticipate. Usage can fluctuate greatly based on occupant/user education & feedback (Stanford Green Dorm). • Water is a top issue/concern on campus – should be designed to and celebrated • Is timber framing an opportunity? Carbon capture would be a great sustainable element. • Energy efficiency needs to be a criterion for prototype selection. • Faculty should be engaged relative to materials engineering (for life cycle assessment). • EUI is an important factor and should be distilled • Locally sourced materials should be a priority • Operable windows are important – typical in University housing – how do they affect energy use? • If radiant floors are used sound proofing would be required • Footprint needs to be minimized. Parking and green/open space. • Comfort is a huge priority and a matter of personal preference. • The human experience was considered the most important project goal relative to sustainability. • Naturally ventilated spaces are not an option due to local climate • Glass should be kept to a minimum to keep heating/cooling loads manageable • Valence Passive Cooling/Heating Units, and Variable Refrigerant Flow Units with Heat Recovery – possible system solutions for loft and modular types. • Hospital Servicing Wall (w/ventilation) – possible solution for modular living pods • Raised Access Flooring (w/plenum) – possible solution for modular prototype • Spot ventilation for garage spaces? • An official Sustainability Charrette is still needed – in design or programming?

ITEMS/ISSUES

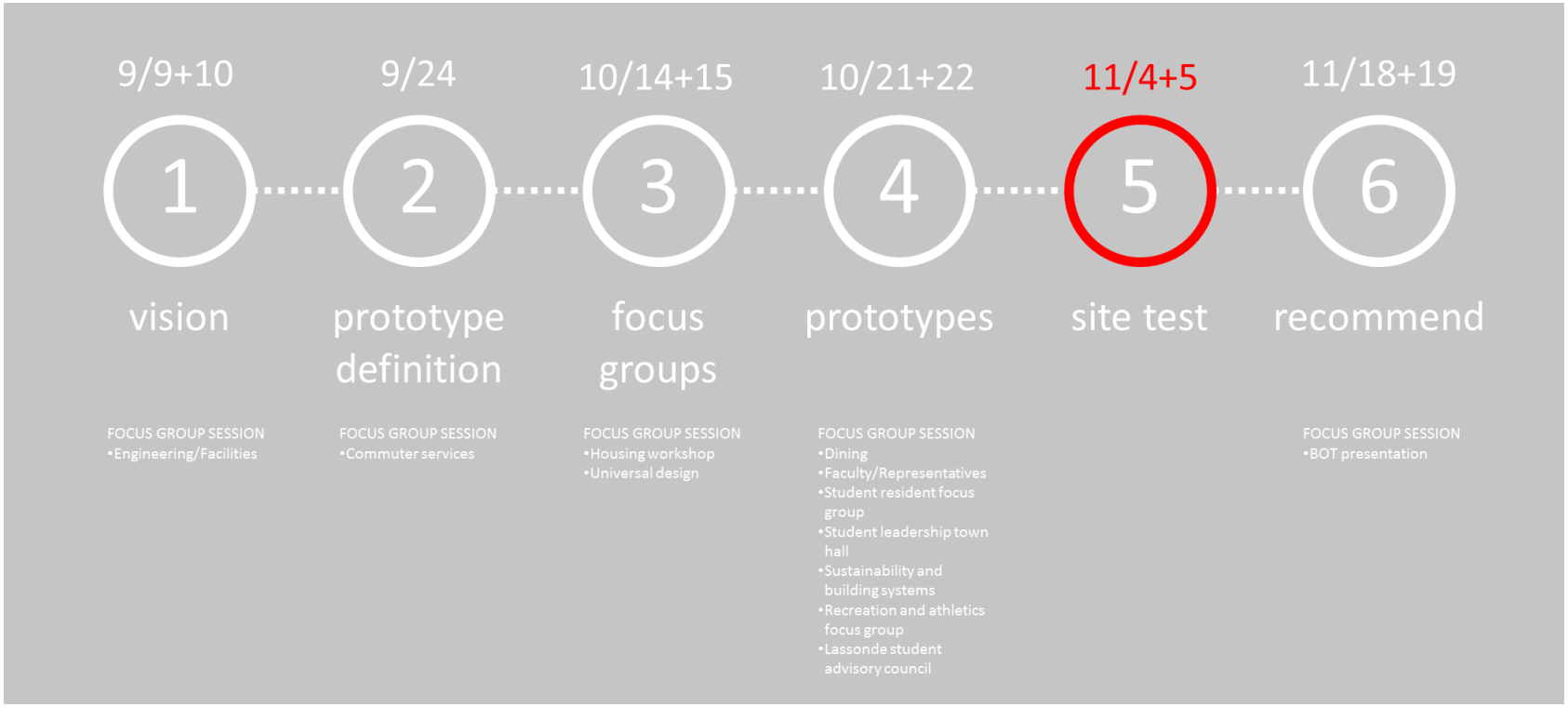
Item #	Date	Issue/Topic
4-8	10.22.2013 1:00 pm	Recreation / Green Space The design team/working committee met with members from Athletics and Campus Recreation to discuss green space as it relates to site selection. Notes and comments are as follows: • General consensus from student affairs and recreation is that the University is woefully underserved in regards to green space. It was noted that the U is far behind other PAC12 institutions in this area. • Removing green space diminishes quality of life on campus and is not an option. • There currently are not enough play fields to serve the intramural demand. 21 teams, 5K students per semester, 10K/year. • More green space must be created on campus to support student residents. • The intent of the Master Plan is to create a “heart” of the campus with play fields centralized. • It is believed that moving playfields away from the center of campus will diminish the student life/community experience. • It was suggested that if future green space is displaced it should come at a cost equal to that of displacing parking. • Logistics require centralized play fields to eliminate need to drive to fields. • Is the MHC visible enough? • Expansion should be part of the selection criteria • Site A – requires elimination of green space to expand • Site B (Huntsman Parking Lot) would allow for expansion without taking green space • Union is a good “sister” building to Lassonde if on Site A, but it will never be the hub for Lassonde • Green space is an important criterion for site selection • Service/Maintenance and access to/of the building are important site selection factors • If building is adjacent to MHC will a stronger/more synergistic student life experience be created? • Tree grove adjacent to Site A and Humanities building – there are probably some protections/setback requirements.

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-9	10.22.2013 2:15 pm	Working Committee Session The design team and working committee reconvened to review/summarize everything to date and discuss the next steps. Notes and comments are as follows: • Too early to define percentage/ratio of unit types • Resident demo should be 50/50; 200 freshman • Freshman cluster should be 1/25 (no more than 30) • It will be necessary to have a mix of singles and doubles (pods in modular) • Program to be tested with 1/3 to ½ doubles • A demand analysis should be done to determine numbers • UC ratio to RA's 1:40 • First year grouping can be 24 behind the door sharing facilities • UC groups 4-16 max for shared facilities • Ground level functions (Garage, service/support) are those critical to site analysis – how do the functions behave/respond to the forces on each site. • A temporary maker space can work as a temporary prototype (full sized mock up tested on campus?) • We are looking to a cultural shift. Criteria • Assets; leverage existing and create new. • Build community • Success of live/make hub • Student activity map will change after the student life center is opened. • Universal design/accessibility • Cost of displacing site amenities (green space, parking) • Sustainability opportunities or limitations (geothermal, e.g.) • Available/existing utilities & infrastructure • Access relative to service and maint. • Expansion (of the garage)

ITEMS/ISSUES

Item #	Date	Issue/Topic
4-10	10.22.2013 5:00 pm	Student Advisory Presentation The design team presented an overview to a group of student leaders, graduate and post graduate students with an emphasis in business and entrepreneurship. Notes and comments area s follows: • Modular and Loft Prototypes were preferred; Lofts all teams to live/work together, Modular is better suited to creating new connections/teams. • Sage Point failed to support community as it lacked communal space(s). • Communal bathrooms are acceptable • Garage should have major (more than lightweight) equipment to properly develop/create prototypes. Supervision is a necessity. • Each floor could have common area(s) with white boards/collaborative spaces, rooms can be used for all things personal including storage. • Private work areas (bench) are needed – as not all projects are ready for public exposure. • Private/personal space is a necessity – more than what is possible with a pod. • Shared resources are important • Areas to bounce ideas around – outside of the garage – are needed. Ping pong open space. • Do people want to live and work in the same space? Need to get away. • Modular may be too much of a live/work mix. Good for short periods of time but not full time. • No hallways – circulation through community spaces. • Variety of unit types is a positive • Value in separation of living and working • Spaces need to accommodate all needs – quiet and active spaces. • Small workstations • The Connected prototype is a proven and successful concept – it should not be ignored. • A hybrid of all types could be good • It should NOT be Google – it's good to get away sometimes. • Pods need to be sound proof if used. • Separate but close is preferred by many • Variety of work spaces (scale, type, privacy, view, location) is important • Individual who are married with kids may not live here but will want to access garage. • Communication forum; residents should be registered with skill set and discipline so all resources are known and available to all. • Customization (of spaces) is a necessity • Fused prototype with breakout spaces would be good • Garage should have high level of porosity – increase passerby's ability to see what is happening inside. • Fused has merit due to mix of public and private • Creative space cannot be exclusive of recreation space.



MEETING MINUTES:
STEERING COMMITTEE MEETING NO. 5 - WORKING COMMITTEE, SITE AND PROTOTYPE

DATE:
11.04.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE ENTREPRENEUR CENTER

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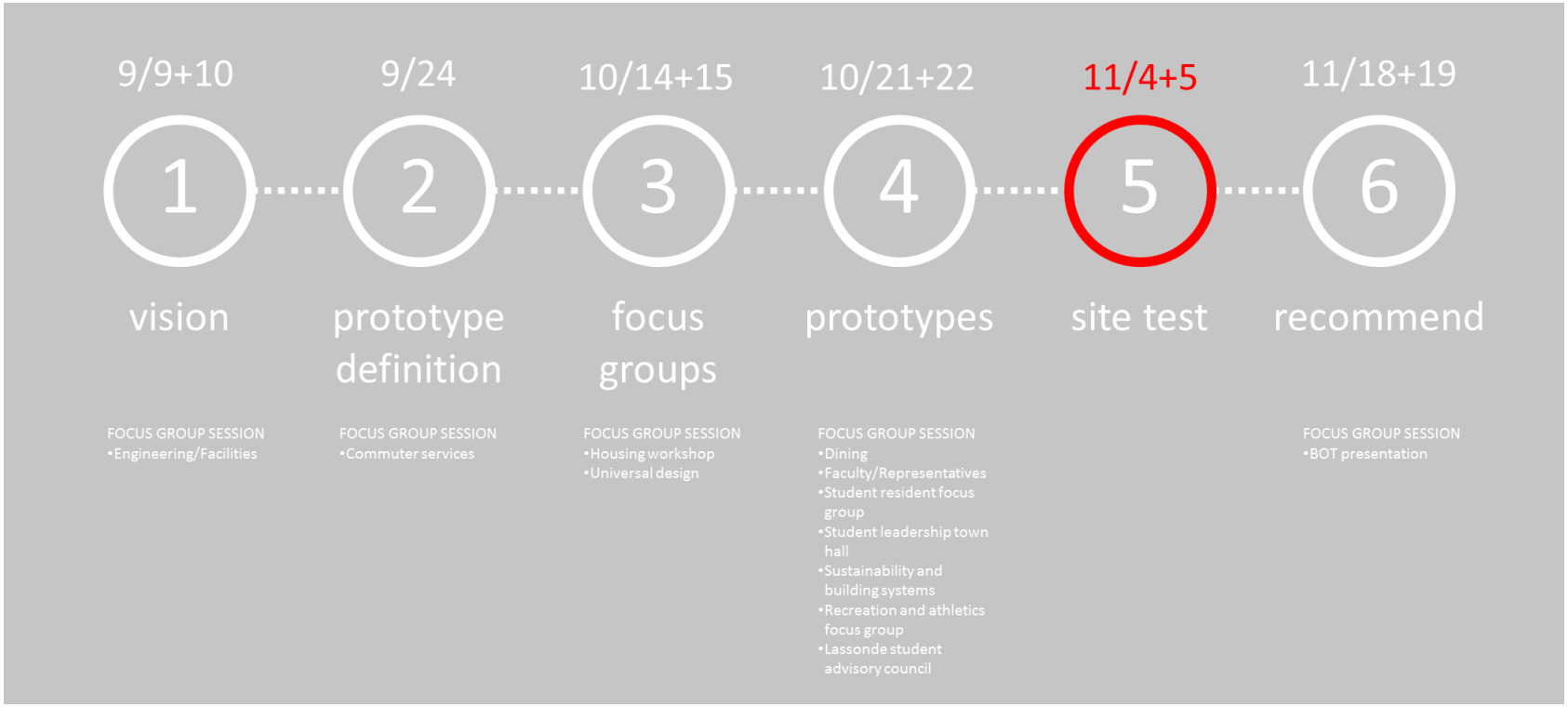
ITEMS/ISSUES

Item #	Date	Issue/Topic
5-1	11.04.2013 11:30 am	Conference Call with Brailsford & Dunlavey • Members of the working committee reviewed status of the Pro forma model(s) with Daniel of B+D. Assumptions and the unit type mix were in line with the prototype development; these may evolve as the prototype develops with the site. • Rental rate description needs clearer definition – as there is a significant difference between single and double units. • Efficiency rate should be higher. • Circulation space is variable – not exclusively space for circulation. • The operating numbers are currently based upon the current UofU housing paradigm. These numbers should be compared to the national numbers. • The model(s) allowed for a construction cost of $165/s.f.. Estimator Kris Larson (Construction Control) warned that this number is low compared to current local trends; current pricing is around $200/s.f., maybe $175/s.f. on the low end. • A 550 bed model was presented – this is too big. • It was recommended that operating cost and program expenses be separated/broken apart. • RA beds (10) were counted in addition to the resident beds (400). • The lending bank(s) are open to a working pro forma but will need additional information. • Next steps: refine the program with design team (vet program elements/spaces – this occurred Tuesday the 5th), review operating expenses for savings, and re-model revenues with an active bed count.
5-2	11.04.2013 12:30 pm	Prototypes • Fused, loft, modular prototypes (and connected as a reference) were presented in the context of how they may lead to the development of a hybrid prototype. The prototypes shown are not actual designs or plans, rather tools to develop grid sizes and vertical overlays. The goal is to develop a hybrid prototype and determine a universal grid (to adapt to fit different unit types as needed). At this time the universal grid is not fully developed/refined. • At this time the design team is still looking at/developing possible solutions to ordering the floor plates. • It was discussed that this building could/should be seen as a student life building; the architectural style should not necessarily be typical of housing or academic. • Balance of unit types shown was received well. • The NYU-New School facility was mentioned as an example. Observations mentioned were; very few walls, it was a vibrant space but not noisy, organized chaos, there is a high cost to participate but students seek it out.

ITEMS/ISSUES

Item #	Date	Issue/Topic
5-3	11.04.2013 1:30 pm	Site Test • The design team presented the sites as tested against the prototype criteria: vision, U, cost, sustainability & systems, program, etc. This means of "testing" the site provides an alternative/supplement to the standard site selection matrix the University usually employs. • When tested against the University Master Plan the following could be assumed; If open space is the only issue then sites A and D are not options as they eliminated intramural fields as designed in the master plan, when the Master Plan as a whole is considered sites A & D are ideal locations to help meet the goals of the master plan – with an emphasis on the desired development of the HPER mall. • The design team will do additional research to determine what the current standards for intramural fields are within the context of the PAC12 conference and compare this to what the University of Utah master plan includes. • All sites work within the context of the housing master plan. • Sites A&D are best for potential geothermal opportunities. • Kathy raised the issue of how development on site B might potentially effect current operations at the Annex complex.
5-4	11.04.2013 2:30 pm	Site Placement / Footprint / Massing Studies • Two typical massing models were tested on each of the sites to help determine any potential issues. • The massing on site C clearly showed proximity/view concerns relative to Honors Housing and the future Student Life Center. • It was noted that the KUED broadcast corridor needs to be considered as it might affect allowable heights on all sites.
5-5	11.04.2013 3:30 pm	Differentiating Criteria • Based on the elements/parameters of the site testing it could be determined that site A best serves the goals of the master plan. • Dining remains an unsolved issue and needs to be addressed. • Site D is not an option - due to underground utility conflicts. • Site C is unlikely due to existing soccer field and findings of massing study. • Design team should probably provide alternative plans/locations for the intramural play fields. • Final "score sheet" for site testing should be added to end of presentation.



MEETING MINUTES:
STEERING COMMITTEE MEETING NO. 6 - STEERING COMMITTEE, SITE SELECTION, & WORKING COMMITTEE, PROTOTYPE DEVELOPMENT

DATE:
11.18.2013

LOCATION:
UNIVERSITY OF UTAH
PIERRE LASSONDE ENTREPRENEUR CENTER

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	Greg Wachalski	Brailsford & Dunlavey	312-799-4601	Gwachalski@programmanagers.com

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ITEMS/ISSUES

Item #	Date	Issue/Topic
6-1	11.18.2013 9:00 am	Steering Committee: Site Selection Presentation • Design team presented new slides which had been added to the site selection presentation. Focus of new slides was site access and views to site • There were some concerns regarding how sites A & D would affect views from HPER mall and from the Humanities building. Views from the east of Humanities need to be considered for development of site A. Development on site C would greatly affect views from the future Student Life Complex – this is a major concern for site C. • Mike Perez raised the issue of the Eccles Broadcast Corridor(s) and asked if they had been considered. The Broadcast corridor diagram was added to the presentation and discussed – according to the diagram there are no obvious limitations for sites A, B, and D – site C is not as clear. The supporting information for the broadcast corridor study is not included in the appendix of the master plan as alluded to in the master plan – it was recommended to contact Eccles Broadcast directly to determine specifics regarding the study and how it may affect site selection. • As the UofU campus slopes dramatically from east to west it was recommended that the design team includes true elevations of top of buildings in studies as opposed to depending solely on elevations above grade. • Mike Perez questioned how the size & massing of the prototype fits in on these sites in the context of the campus. Development on site C would create a density that is not consistent with the campus. Site D would be too isolated and not fit with overall campus density. Site B would work adjacent to Huntsman Center and a like sized Honors Housing. Site A is large enough to fit the prototype and surrounding site development, and would work with existing rhythm along HPER mall. Also, the residential use of the building will provide a lighter, more delicate architectural articulation seemingly reducing the overall mass/presence of the structure. • The group was reminded again that the massing model and plans being shown are diagrammatic and not architectural design solutions; they are a representation of the typology to be used as a lens to evaluate the site(s).
6-2	11.18.2013 9:30 am	Site Selection – Access/Loading/Parking • The issue of site access for loading/unloading, maintenance, etc was discussed at length as it relates to the (4) sites in question. • Based on the current Master Plan sites A & D pose more challenges than sites B & C regarding site access. Most discussion focused on site A. • Options to extend service route through the Humanities building site are not recommended. • Integrating a service road into the playfield plan is an option. • Mike Perez feels strongly that Baliff Road is the only option to access site A – though options from the north should be considered. • It was noted that the access road will be used a lot – therefore it should be appropriately sized and located. • Access from the west is least desirable and references to it should be removed from presentation.

ITEMS/ISSUES

Item #	Date	Issue/Topic
6-3	11.18.2013 11:00 am	Site Selection – Recap / Straw Vote • Following discussions of views and access the group attempted to come to a resolution regarding site selection. • Mike Perez commented that sites A&B appear to be the preferred / most likely option. When the soccer field replacement and adjacency to the Student Life Center are considered site C does not appear to be a likely candidate. Site D, due to underground utility conflicts and isolated location, does not lend itself to selection either. • John Mcnary felt that we should not be so quick to dismiss site C. He feels that the adjacency to Honors Housing and Student Life are positives. This led to further discussion of site C with an emphasis on how the Student Life Center would be negatively affected, and how there would be no connection to the HPER mall or central campus area. • There was further discussion on the merits of site A and how connected to HPER mall it would actually be. • As Mehrdad stated; many issues identified now will be solved through design. • After the discussion it was decided that the Steering Committee should take an informal straw vote on site selection. Results were unofficial and non-definitive – two voting members were not present – but favored site A. Site B was only other site voted on and each vote for B was accompanied by a disclaimer that the vote for B was in lieu of a vote for A pending additional information/solutions for other concerns. • Following the straw vote additional site related discussion ensued. The discussion focused on HPER mall development and site engagement along HPER mall.
6-4	11.18.2013 12:00 pm	Working Committee – Prototype Development & Building Systems • Prototyping process to date was reviewed. Prototype assumptions updates were reviewed and agreed upon. • Two prototype models were presented and discussed; A Vertical Organization model and a Horizontal Organization model. Both models are based on the fused prototype related to separation & management of the residential program. • The Vertical Organization model evoked the most response – feedback was positive and the group expressed excitement for potential of tower concept. • Building systems slides were viewed and discussed. • Some discussion of concrete versus steel structure occurred. As of now a concrete structure is preferred for several reasons – primarily for heavy duty nature of finish and for fire resistance. There are some possible negatives to concrete – primarily time/schedule – design team to further investigate cost/schedule implications of an all concrete structure. • Light gauge/wood structure is not an option. • Primary negative for a steel structure is fireproofing. • Electrical systems were briefly discussed. • There will need to be a central lighting control panel for common spaces. • Floor boxes are anticipated for power. • It was recommended that Corey Higgins should be briefed on the overall prototype/system development. • It was recommended that a cost benefit analysis for be created for comparison of utilities being stand alone or tied into campus systems.

ITEMS/ISSUES

Item #	Date	Issue/Topic
6-5	11.18.2013 1:00 pm	Working Committee – Next Steps • Following site and prototype discussions the working committee discussed future scheduling and program document delivery. • It was tentatively decided that the program document be completed by December 10th. If site selection has not occurred by this date the program document will include a site recommendation. • A tentative schedule for schematic design meetings was developed.

03.

SITE CONSIDERATIONS

The Planning Framework
Sites Considered
The Role of the Prototype
Site Access
Parking
Site Utilities and Infrastructure
Displaced Facilities
Site Design Approach
Environmental Analysis
Site Evaluation with Prototype
Differentiating Criteria and the Preferred Site

SITE SELECTION

PLANNING FRAMEWORK

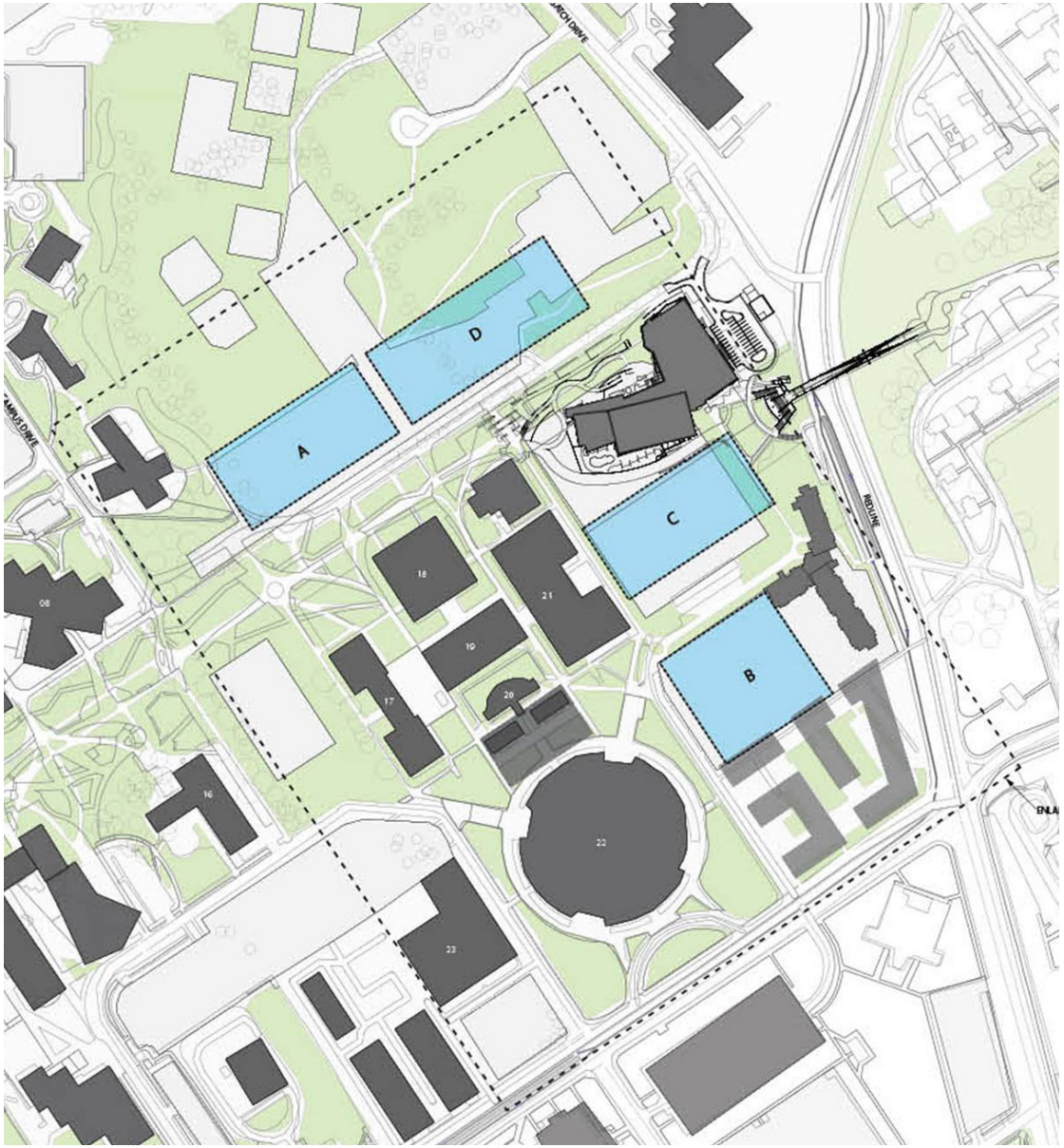
The challenge of this effort was to select a project site that met multiple, and competing needs articulated by campus planning goals, the Lassonde Make -Live Center entrepreneurial goals, and the needs of U of U Housing and Residential Life.

The University of Utah has articulated campus planning goals for buildings and open space in the 2008 Master Plan and its subsequent update. Those goals anticipated growth of building types and open space similar to what currently exists on campus: primarily in the areas considered for the Lassonde Make-Live Center were housing, academic, research, and open recreational and sports space. These important goals, articulated separately, and when considered on their own merits led to differing perspectives about the appropriate site for the Lassonde Make-Live Center.

SITES CONSIDERED

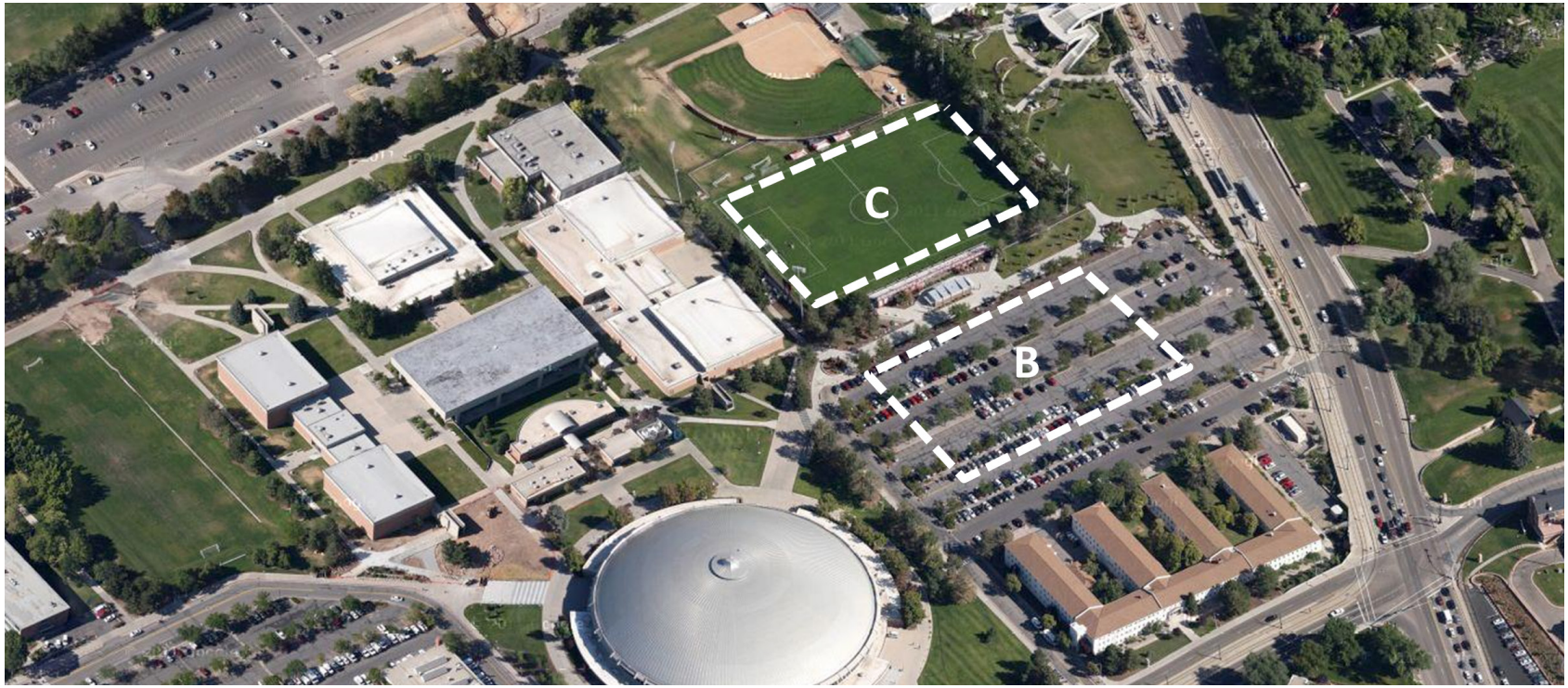
Integrating the Campus Master Plan, the HRE Master Plan, and other campus considerations, four sites were identified by the University for consideration by the design team as potential locations for the Lassonde Make-Live Center. (Sites A, B, C, and D shown to the right.)

Each of these sites can be said to work better or worse when examined through the traditional lenses of access, utilities, cost, and most importantly, programmatic perspective. For example, if this is a 'housing' project, then the benefits and synergies of a location close to other housing resources, particularly the Marriott Honors Housing may be important; from another perspective, if this facility is to be a whole-campus resource, like the library, a location central to the core of campus may be more advantageous.



SITES A, B, C, AND D

CURRENT SITE CONDITIONS FOR SITES A AND D



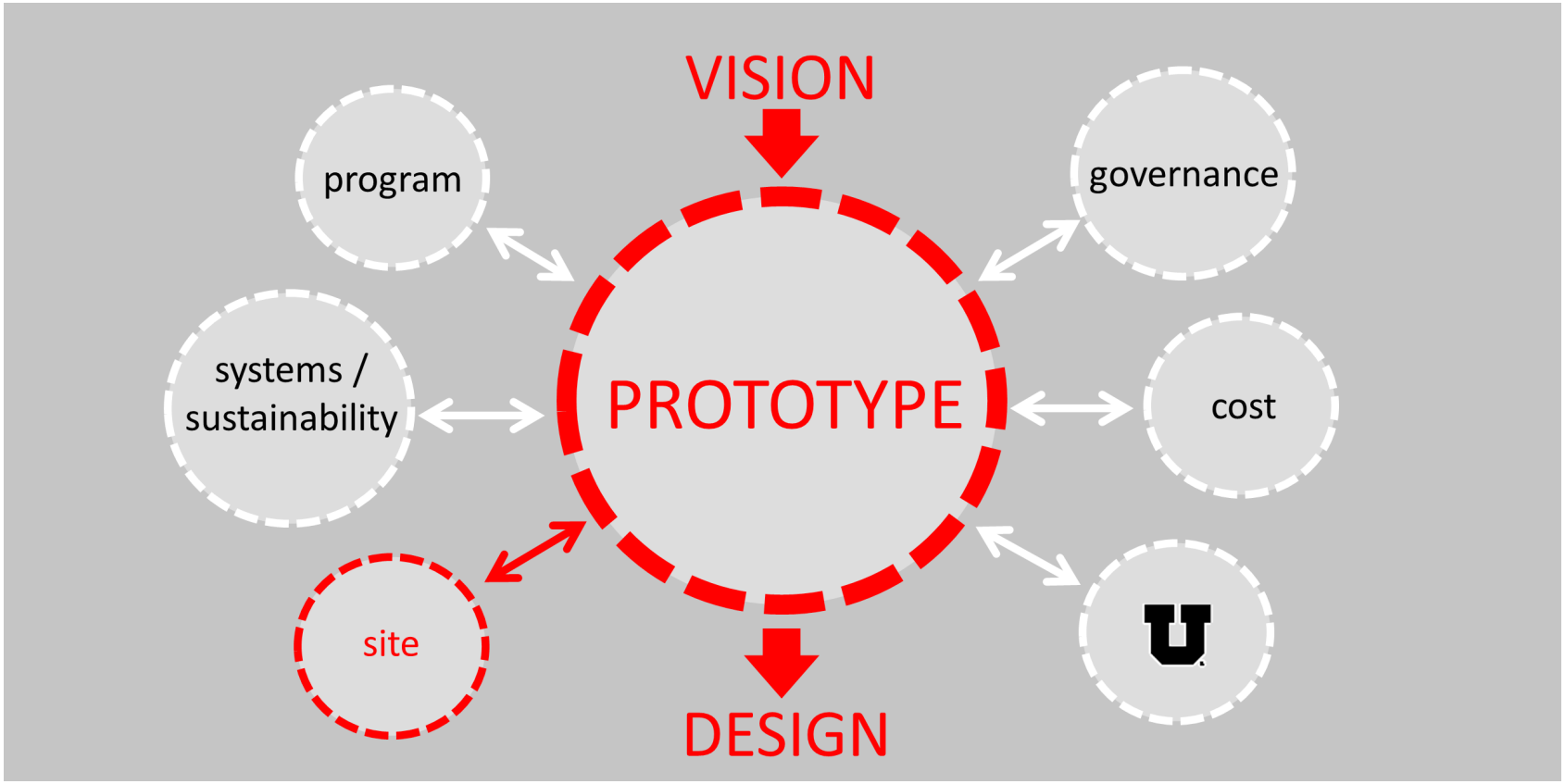
CURRENT SITE CONDITIONS FOR SITES B AND C

ROLE OF THE PROTOTYPE

As the design team began their process of identifying a vision to give direction to this project, it became apparent that some of the reasons for multiple perspectives on the appropriate site came from established preconceptions of what 'kind' of building this project was to be—meaning, what happens when we pose the idea of creating a new environment combining housing and an entrepreneurial 'garage' space into a single facility and working community:

- Is this a new typology, or is this another example of a living- learning community, and therefore a really a housing project?
- Is an entrepreneurial center for upwards of 5000 students, 400 of whom will live in the facility, more of a campus resource akin to the library or student union rather than simply an academic building or a housing building?
- Can this be a new model of learning that is woven into the fabric of a living community?
- What is the right location for commuter students, as well as the students who are residents?
- Can one (the entrepreneurial center) plus one (housing for 400) come together to equal more than the two parts? Can we help create synergies that provide new, and evolving opportunities for learning, making, creating businesses, that transform a student's experience at the University of Utah; if this is our goal, what is the best site on which to accomplish this vision?

To answer this question, the design team proposed a new process - identified as "Prototyping" – to approach the issue of site selection from a different, and more holistic perspective that would be more suitable to the collective goals of the project, rather than the individual goals of the varied stakeholders.

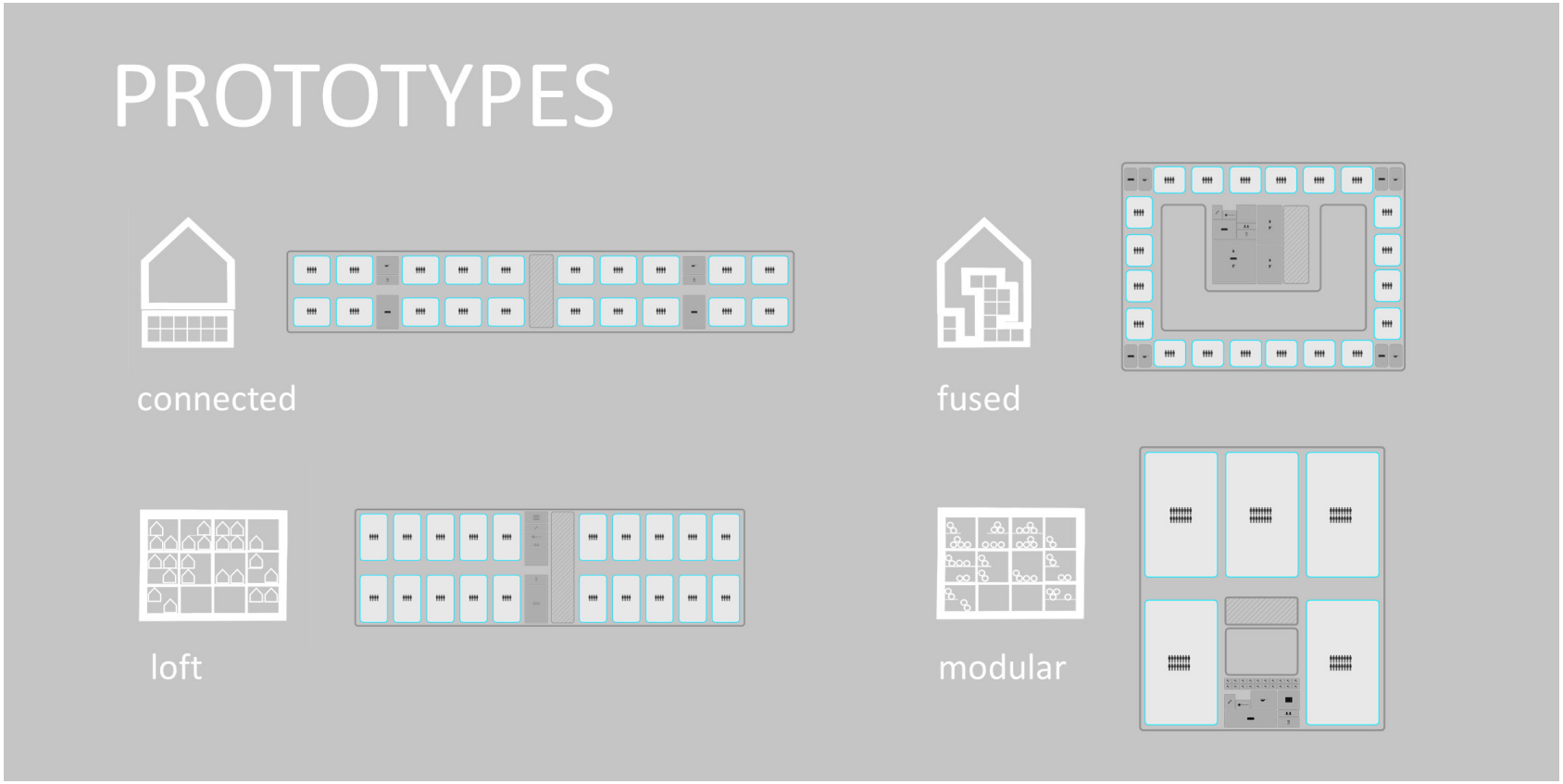


A conventional programming and site selection process asks questions, defines goals, wants and needs, determines the physical space needed in response, then analyzes sites, considers campus planning needs, etc., evaluates this input, ranking criteria in order to arrive at a project direction.

Prototyping is different: It is based upon establishing the vision and aspirational ideas for the project to create an ideal model (the 'Prototype") for the Lassonde Make-Live Center. The design team worked with the university to collaboratively create a vision for this new idea, and then created a series of prototypes (projects, really) that allowed us to test the ideas and merits of the prototype against the vision.

Through and iterative process of investigation, prototyping, getting feedback, modifying and retesting prototypes against the vision, we developed a preferred 'model' for the project. We were then set to ask the question: Given this model, where is the best place on campus for the model to go to meet the Vision and Goals of the project?

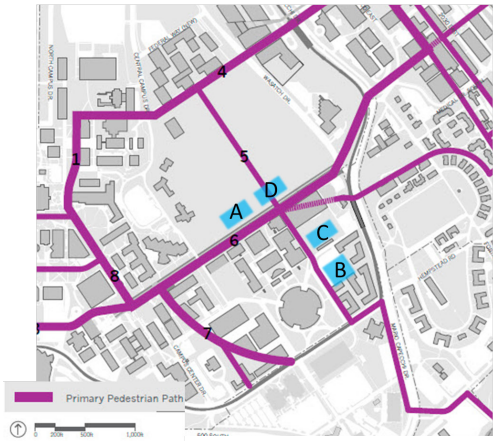
As the design team went though the process of refining the prototype(s) to a single approach, the team then tested the refined prototype on each site to see where the goals, needs and aspirations of this new prototype would be best realized.

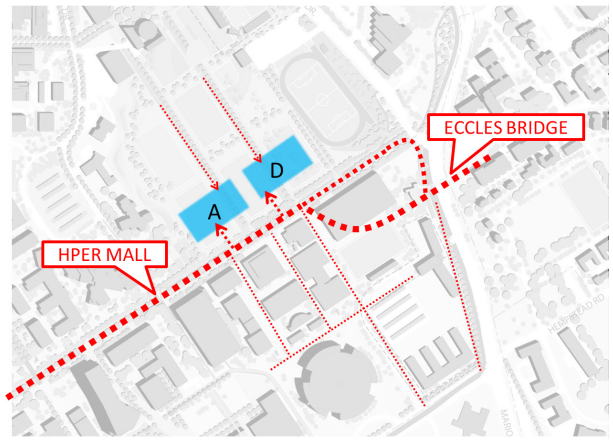


SITE ACCESS

Each site was evaluated for pedestrian, service, emergency, vehicular, and move-in/move out access for residents. Sites B and C are relatively accessible for vehicles, but somewhat less so for pedestrian traffic. Sites A and D are more central to pedestrian flow, but as the HPER Mall and the playfields to the north are developed, special consideration will need to be given to vehicular access to either of these sites.

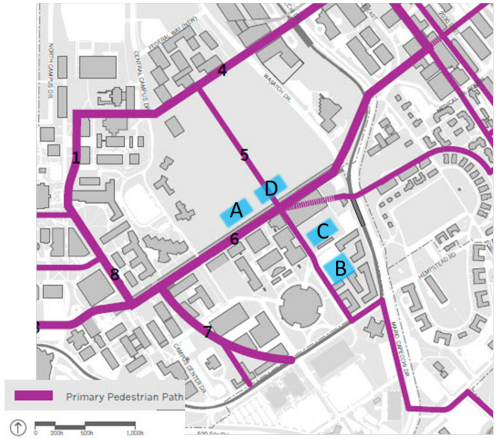
PEDESTRIAN ACCESS

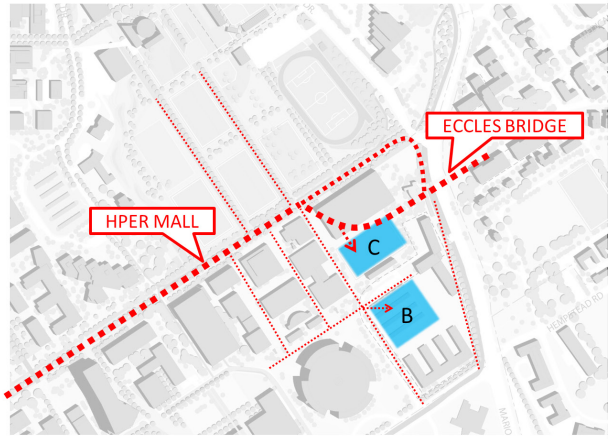




SITES (A) & (D) ARE EASILY ACCESSIBLE FROM THE HPER MALL FOR BOTH PEDESTRIANS AND BIKE RIDERS. THE SITES ARE ALSO LOCATED AT CROSS PATHS RUNNING THROUGH THE PLAYING FIELDS AND ATHLETIC BUILDINGS.

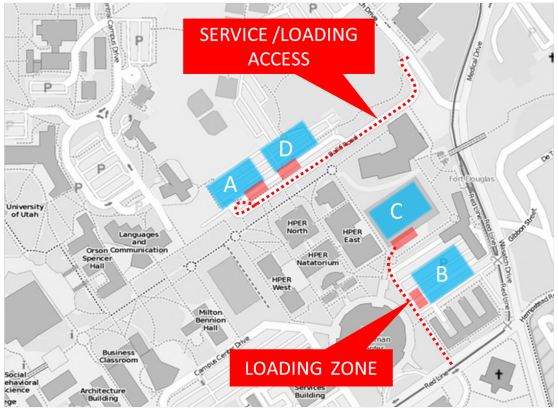
PEDESTRIAN ACCESS

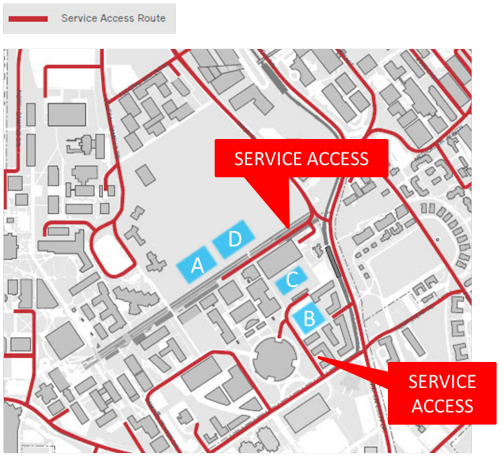




SITE (C) IS EASILY ACCESSIBLE FROM THE MAIN PATH CONNECTING THE HPER MALL AND ECCLES BRIDGE. SITE (B) IS FAR FROM MAJOR CIRCULATION AND DOES NOT HAVE A FRONTAGE WITH A PRIMARY CAMPUS ROUTE UNLIKE THE OTHER SITES.

SERVICE

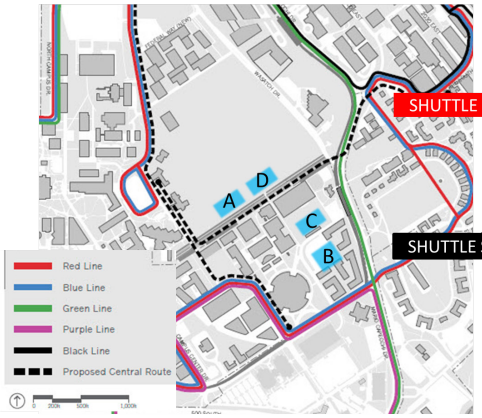


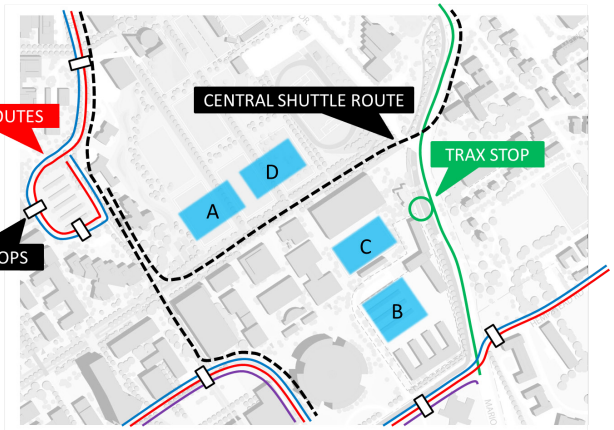


SITES (A) & (D) ARE CURRENTLY ACCESSIBLE FOR SERVICE AND LOADING VIA BALIF ROAD. SITES (C) & (B) ARE SERVICED ALONG SOUTH CAMPUS DRIVE.

FUTURE SERVICE ACCESS TO SITES (A) & (D) IS SHOWN ALONG HPER MALL IN THE UNIVERSITY MASTER PLAN. ALTERNATELY, EXTENDING EXISTING SERVICE ACCESS FROM S. NORTH CAMPUS DRIVE TO SITE (A) IS ALSO POSSIBLE.

TRANSIT





ALL SITES ARE EASILY ACCESSIBLE THROUGH PUBLIC TRANSPORTATION. EACH SITE IS NEARBY TO MULTIPLE SHUTTLE ROUTES, INCLUDING THE PLANNED CENTRAL SHUTTLE ROUTE AND THE TRAX STOP.

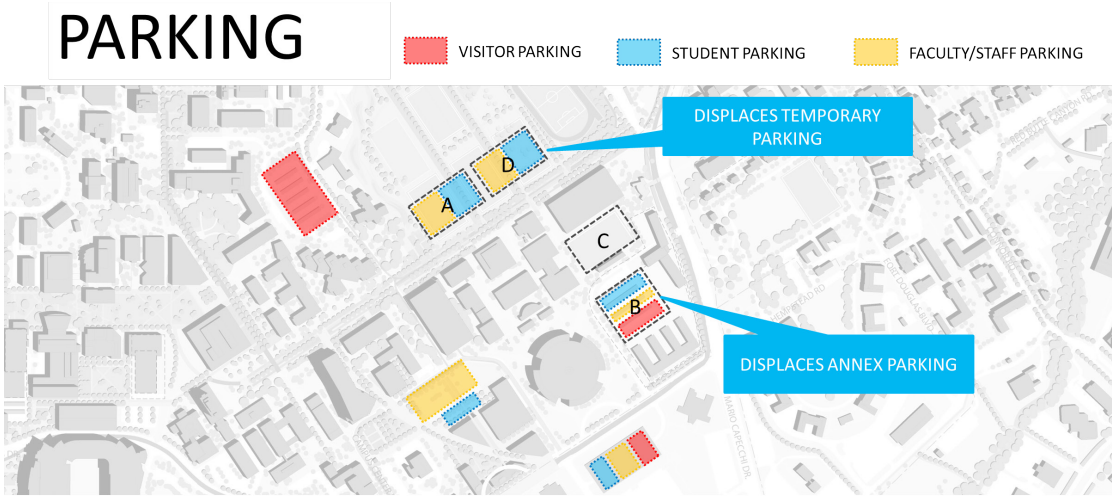
PARKING

The increased direct demand for parking for the Lassonde Make-Live Center is approximately 160 car spaces for the 400 residents, plus accessible spaces. This is based upon HRE's experience with parking demand for similar housing on campus. Staff and commuter parking would be handled as part the overall campus parking strategies for parking and alternative transportation.

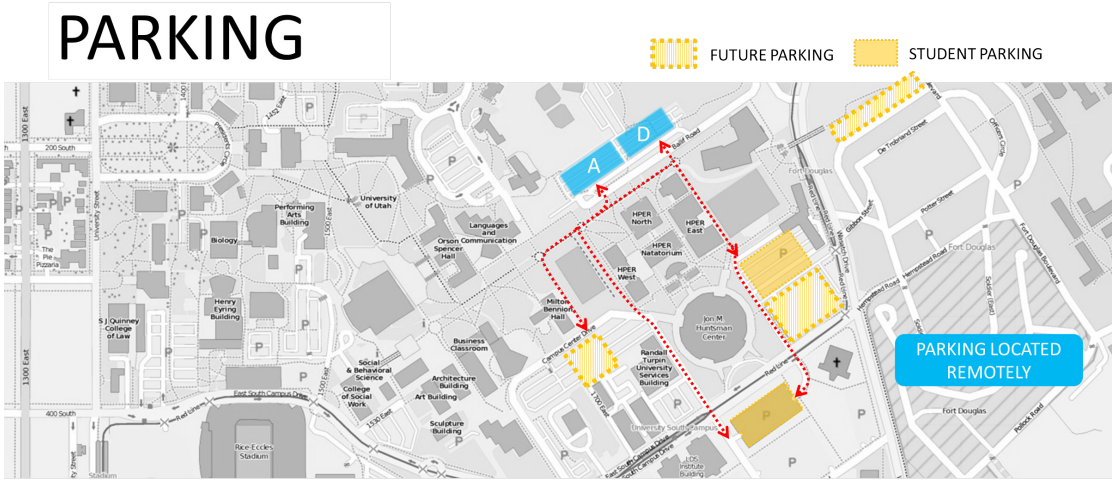
Sites B and C offer little opportunity to create new surface parking; additionally site B would eliminate most of the surface parking adjacent to the Marriott Honors Housing.

Sites A and D eliminate some current surface parking that is considered temporary by the University. Short term, before the recreational play fields are constructed, either Site A or D would have adjacent parking, although currently it is used for faculty and staff. Long term, concurrent with the play field development, adjacent parking could be constructed, but at the impact of reducing space available for recreational use.

The solution to parking may involve both short term and long term planning. While there is a current expectation on campus that residential living comes with associated nearby parking, this may change over time as the campus densifies, improves alternative transportation choices and moves close-in surface parking to structured parking at the campus perimeter.



EXISTING PARKING NEAR THE SITES UNDER CONSTRUCTION.



PERMANENT PARKING ON SITES (A) OR (D) WOULD BE DETRIMENTAL TO THE HPER MALL AND THE SURROUNDING PLAYING FIELDS. ONCE THE HPER MALL AND RECREATION FIELD PROJECTS ARE COMPLETE, ALL PARKING WILL NEED TO BE ACCOMMODATED AT NEARBY PARKING FACILITIES SUCH AS THE PARKING TERRACE OR THE INSTITUTE PAREKING STRUCTURE.

SITE UTILITIES AND INFRASTRUCTURE

Each site was evaluated for access to campus utilities and the infrastructure impact of constructing the proposed facility on each site. Cost considerations were included in evaluation of each site.

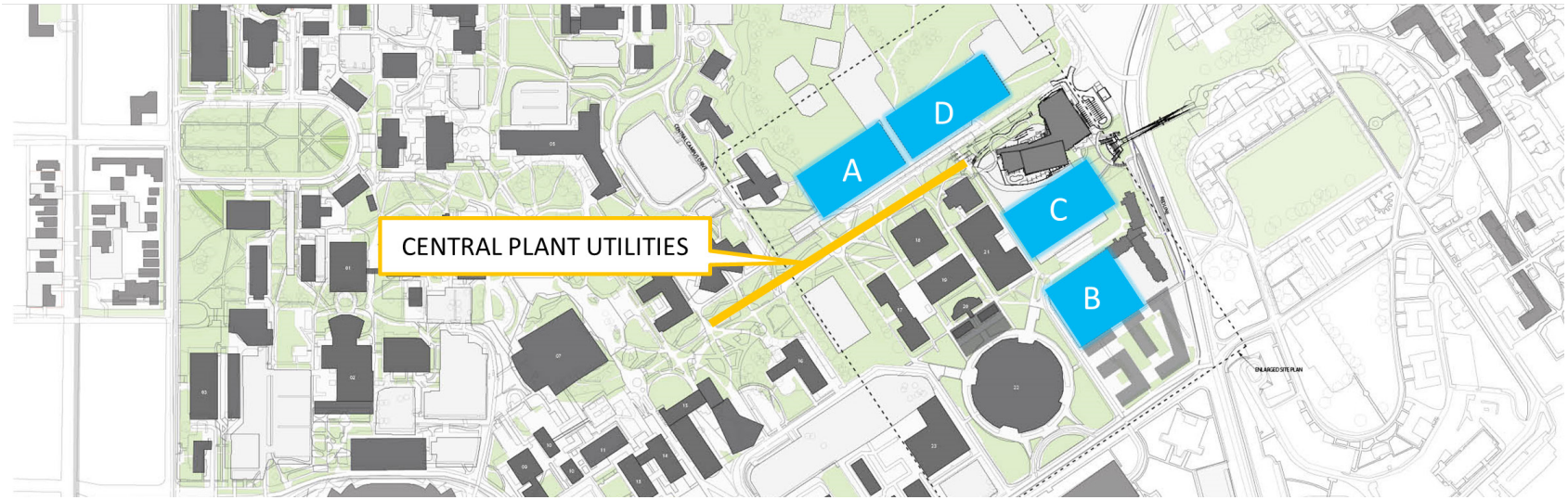
It should be noted that each site, while currently open space, would displace a function that may or will need to be replaced by the university at some time.

Site A and D displace current temporary parking, and future field space (approximately 1 soccer field in the future);

Site C would displace the current NCAA soccer field;

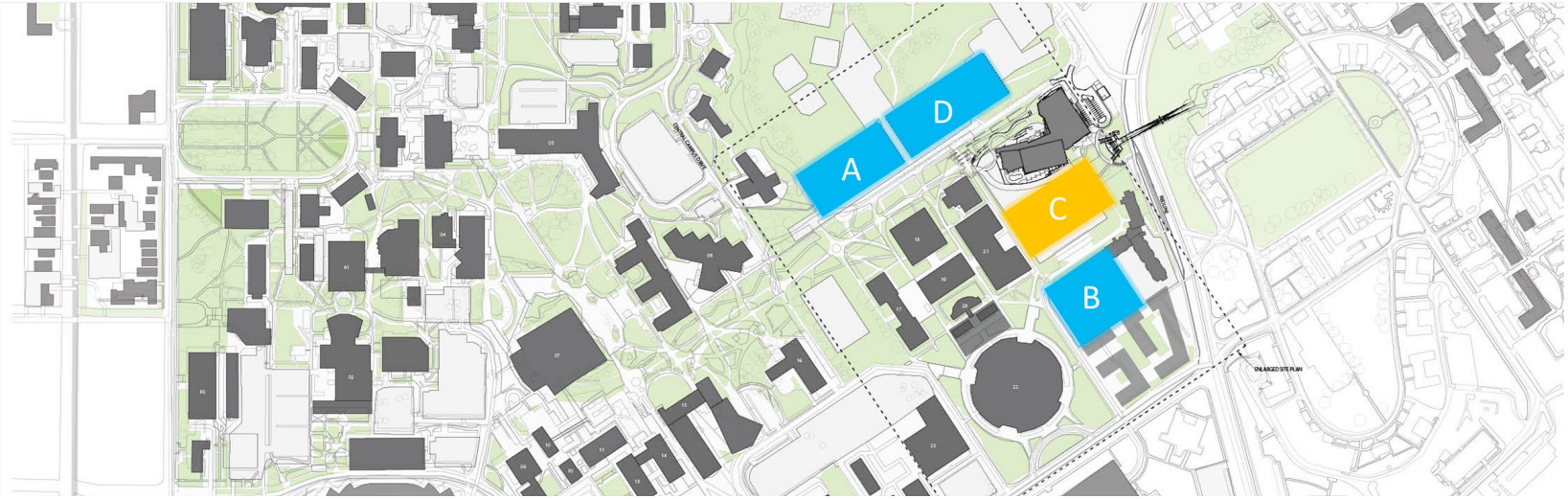
And Site B would displace current parking adjacent to Honors housing and the Sorensen Center (faculty/staff parking and event parking)

UTILITIES



ALL 4 SITES WILL REQUIRE SOME REPLACEMENT OF EXISTING UTILITY LINES AS DETAILED IN THE LASSONDE FEASIBILITY STUDY, 2013. ALL 4 HAVE ACCESS TO UTILITIES PROVIDED BY THE CAMPUS CENTRAL PLANT. SITE (A) (D) MAY CHOSE TO BUILD A FREESTANDING PLANT IF GEOTHERMAL IS INSTALLED UNDER THE ADJACENT INTRAMURAL PLAYING FIELDS. THOUGH THE CENTRAL PLANT UTILITIES ARE ACCESSIBLE, IT SHOULD BE NOTED THERE IS A PREMIUM TO BE PAID BY THE PROJECT TO CONNECT TO THESE LINES VERSUS DESIGNING AN INDEPENDENT, STAND-ALONE SYSTEM.

DISPLACED FACILITIES - PARKING



SITE (A)(D) EACH DISPLACE TEMPORARY ON-CAMPUS SURFACE PARKING. SITE (C) DOES NOT REPLACE ANY EXISTING CAMPUS PARKING. SITE (B) REPLACES CURRENT ON CAMPUS PARKING. THE PROJECT WILL INCUR A REPLACEMENT COST OF $18K PER SPACE AT THIS LOCATION.

DISPLACED FACILITIES – SOCCOR FIELD

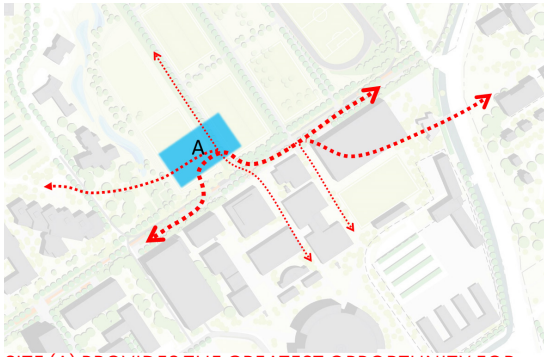
SITE (C) WOULD DISPLACE AN EXISTING SOCCER FIELD. THE PROJECT WOULD INCUR A RELOCATION COST OF APPROXIMATELY 3 MILLION DOLLARS. NONE OF THE OTHER SITES ARE EFFECTED.

SITE DESIGN APPROACH

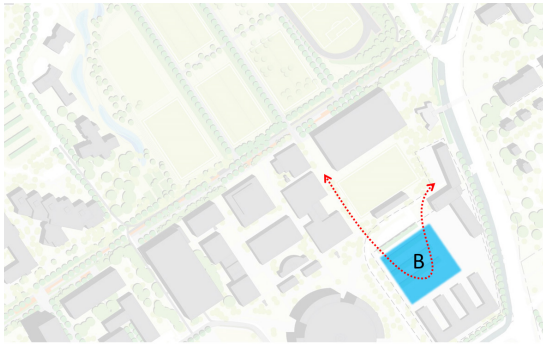
Each of the four sites considered for the Lassonde Make-Live Center share similar topography and accessibility concerns. Given the potential area of the ground floor, and available site dimensions, it is anticipated that the building will have a single level main public floor, and that site topographical changes will need to be sensitively accommodated within the landscape and hardscape development. In general access to the building should embrace the best practices of universal design

In the development of the Prototype, one important consideration for the building is that it be a 'Hub' rather than a destination; this means the ideal location is one where people pass by or circulate though the location on their way to other campus functions. In support of this concept, the ground level of the building is to be considered porous and accessible to the public and campus population from multiple directions.

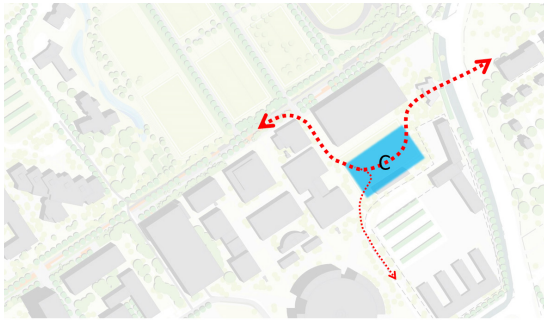
HUB/CROSSROADS



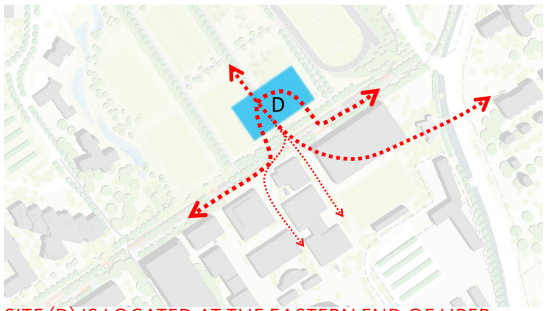
SITE (A) PROVIDES THE GREATEST OPPORTUNITY FOR THE PROJECT TO BECOME A NEW HUB FOR CAMPUS LIFE. STUDENTS WALKING BETWEEN THE TRAX STOP AND HOUSING ON THE EAST SIDE OF CAMPUS OVER TO THE ACADEMIC CORE ALONG HPER MALL COME IN DIRECT CONTACT WITH THE PROJECT. CROSS TRAFFIC BETWEEN RECREATION FACILITIES TO THE SOUTH AND THE STUDENT UNION AND MEDICAL CAMPUS TO THE NORTH CREATE FURTHER OPPORTUNITIES FOR THE CASUAL PASSERBY TO ENGAGE THE LASSONDE PROGRAM.



SITE (B) IS THE MOST REMOTE OF THE FOUR SITES BEING CONSIDERED. THIS IS MUCH MORE OF A DESTINATION THAN A CROSSROADS. THE SITE WILL BENEFIT FROM PEDESTRIAN TRAFFIC BY STUDENTS WHO LIVE IN HONORS HOUSING AS WELL AS ANY FUTURE RESIDENTIAL DEVELOPMENT IN THIS AREA.



SITE (C) IS LOCATED ALONG A ROUTE THAT CONNECTS CAMPUS HOUSING WITH THE HPER MALL AND THE REST OF CAMPUS. THIS SITE COULD BENEFIT FROM MODERATE TRAFFIC GENERATED BY STUDENTS LIVING ON-CAMPUS.



SITE (D) IS LOCATED AT THE EASTERN END OF HPER MALL. WHILE NOT AS CENTRALLY LOCATED AS SITE (A), SITE (D) STILL PROVIDES GOOD OPPORTUNITIES TO ENGAGE PEDESTRIANS TRAVELING BETWEEN ON-CAMPUS HOUSING, THE NEW STUDENT RECREATION CENTER AND THE ACADEMIC CORE OF CAMPUS.

ENVIRONMENTAL ANALYSIS

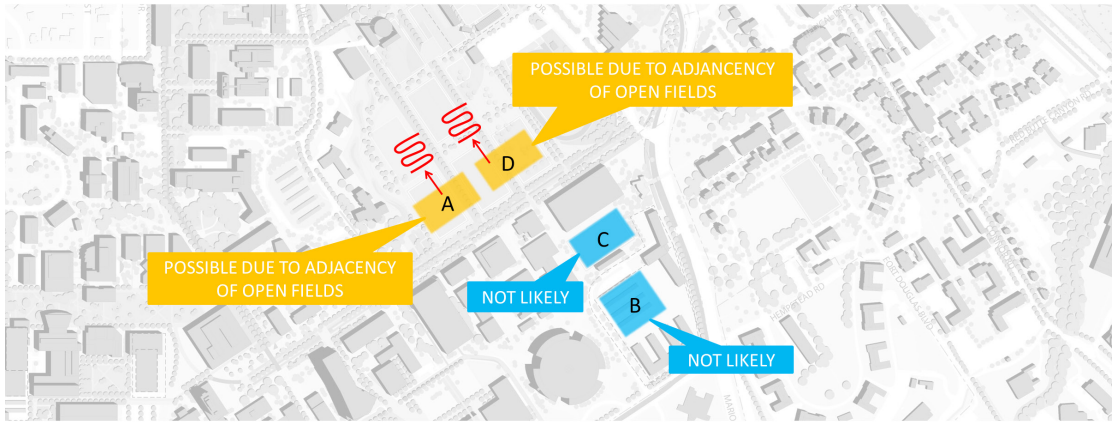
Each site was evaluated for discrete environmental and climatic conditions that might show whether a particular site had significant advantages regarding wind, sun exposure, and orientation. Generally each of the four sites was considered relatively equal in environmental potential and impact. (For more detail, see Section O9. Sustainability Goals.)

SITE MATERIAL APPROACH

Site materials and the development of the site should respond to multiple factors:

- Encourage interior – exterior connections that allow for flexible programming of spaces and well as creating connections of the Lassonde Make-Live Center to the greater campus community
- Materials should relate to the surrounding micro-campus, and help to integrate the building into the campus fabric.
- Materials should be durable and the approach to plant materials and hardscape should reflect the natural environment of Utah while pursuing sustainable, low maintenance strategies.

GEOTHERMAL



SITES (A) AND (D) HAVE GEOTHERMAL OPPORTUNITIES DUE TO THEIR ADJACENCY TO OPEN FIELDS. SITES (B) AND (C) MOST LIKELY DO NOT.

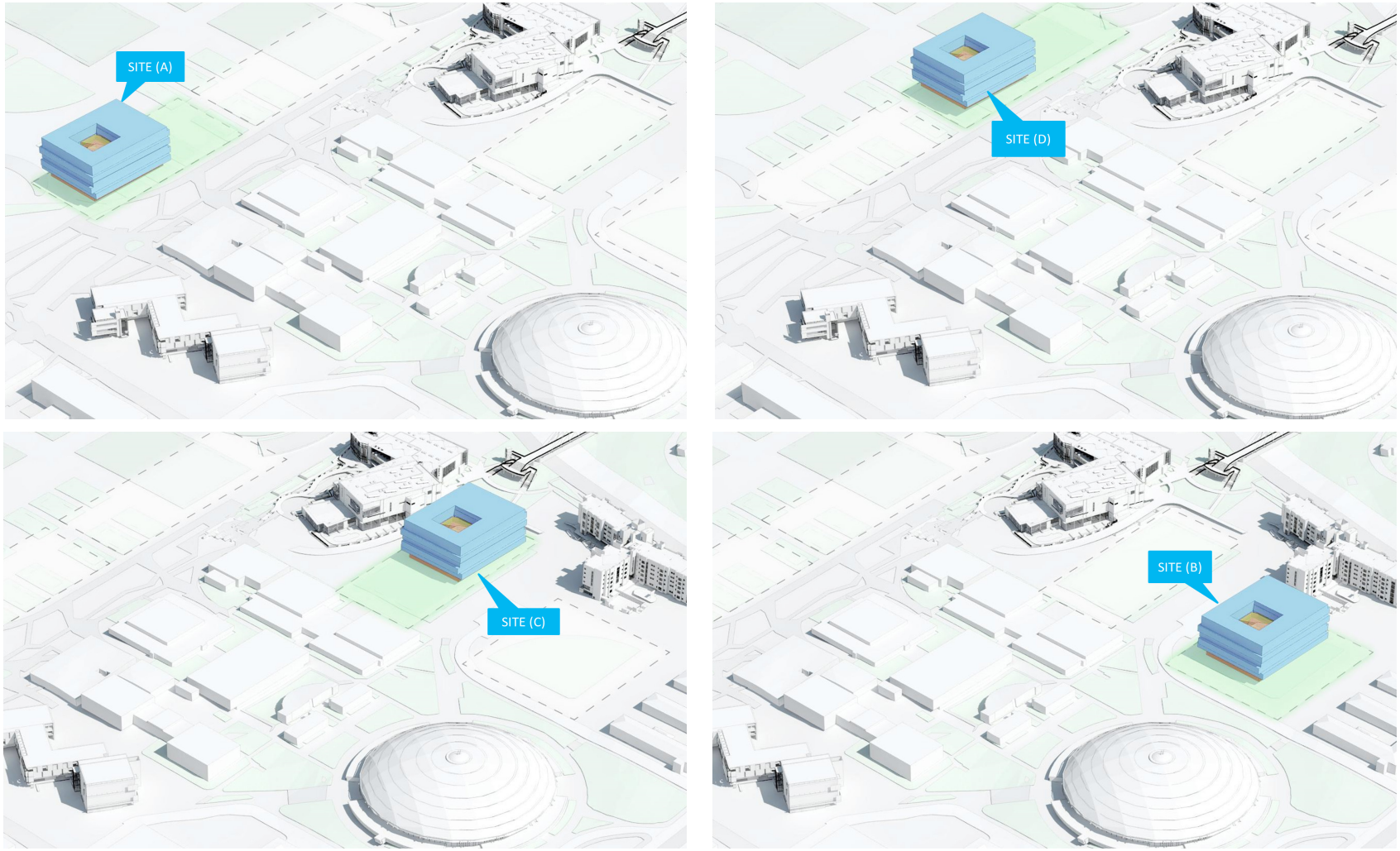
STORM WATER + EXPOSURE

SITES (A) AND (D) CAN CONNECT INTO HPER MALL WATER MANAGEMENT WHEREAS SITES (B) AND (C) WILL NEED INDEPENDENT WATER MANAGEMENT. ALL FOUR SITES IMPLY BUILDINGS THAT ARE ORIENTED SOUTHEAST AND SOUTHWEST - ANY SITE CAN FIT IDEAL BUILDING ORIENTATION. ALL FOUR SITES CAN ACCOMMODATE BUILDINGS THAT HAVE NARROW FOOTPRINTS TO MAXIMIZE OPPORTUNITIES FOR DAYLIGHT HARVESTING AND NATURAL VENTILATION.

SITE EVALUATION WITH PROTOTYPE

The preferred Lassonde Make-Live Prototype was tested in concept-level massing on each site to understand which of the four sites under consideration might best support this new building prototype.

In testing the Prototype on each site, the design team, along with the Working Committee and Steering Committee looked at characteristics of each site that provided either a significant advantage or significant disadvantage over the other sites. These strong advantage/disadvantage criteria were considered important; where sites were relatively equal, this site information was discounted relative to its importance in selecting a preferred site.



MASSING STUDIES

+ POSITIVE NEUTRAL - NEGATIVE

VISION

A	B	C	D	Proximity to assets
A	B	C	D	Creation of new assets
A	**B**	C	D	Live / Make Hub. A crossroads rather than a destination

A	B	C	D	Compatibility with Master Plan Land Use
A	B	C	**D**	Compatibility with Master Plan - Central Playing Fields
A	B	C	D	Compatibility with Master Plan - HPER mall
A	B	C	D	Minimal impact to neighboring facilities/ campus groups
A	B	C	D	Appropriate for freshman housing
A	B	C	**D**	Opportunities for future expansion
A	B	C	D	Community
A	B	C	D	Compatible Housing Master Plan
A	B	C	D	Accessibility

COST

A	**B**	C	D	Displaced parking
A	B	**C**	D	Displaced soccer field Development cost to displace
A	B	C	D	Relocate future intramural playing fields
A	B	C	D	Utilities access

SUSTAINABILITY

A	B	C	D	Geothermal opportunities
A	B	C	D	Storm water management and reuse
A	B	C	D	Orientation
A	B	C	D	Access to central plant

PROGRAM

A	**B**	**C**	D	Views
A	**B**	C	D	Visibility
A	B	C	**D**	Accommodates parking?
A	**B**	C	D	Pedestrian access and connection to campus
A	B	C	D	Service access
A	B	C	D	Access to food
A	B	C	D	Proximity to 24 hour activity
A	B	C	D	Access to transit

+7	-3	-1	+6

Of the various criteria shown, however, the most significant contribution to the design team's site recommendation comes from the most basic consideration of this project: is it a housing project, is it an academic building, or is it a new type of building that has some housing, some academic space, but is in fact a new prototype of a unique campus resource.

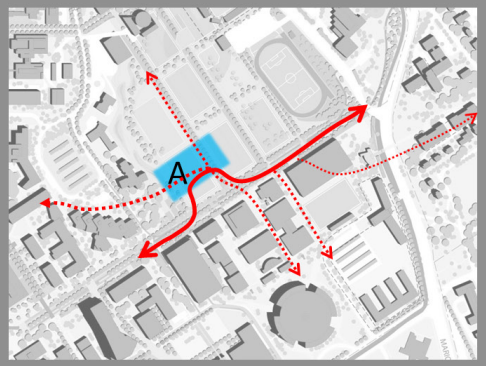
When the sites were evaluated through this lens, the design team was able to establish the differentiating criteria for this process. The sites were now evaluated based upon which site can do the most to further the goals outlined in the Campus Master Plan relating to land use and being a transformative project. Secondly, the sites were now evaluated upon on which site is the project mostly likely to flourish as a mixed use student community and a successful academic program. These characteristics take into account the opportunity for the project to serve as a hub/crossroads for the greater campus community, visibility and connection to the academic core of the campus.

When considered as a new prototype in this context, Site A, close to other campus shared resources, becomes the preferred site.

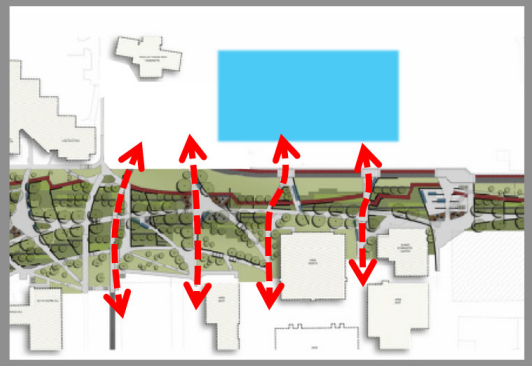
DIFFERENTIATING CRITERIA

Which site does the most to further the goals outlined in the campus Master plan?

Perceived as a student life building; appropriate land use adjacent to the academic core (A)



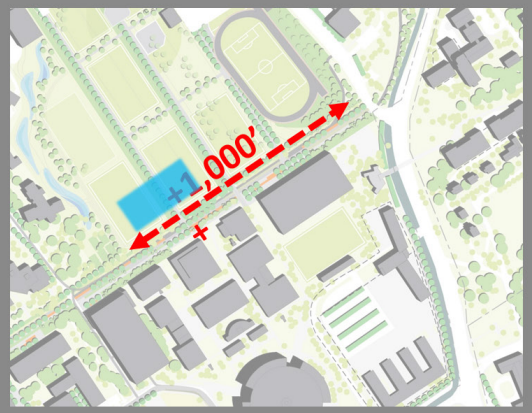
Crossroads/hub (A)



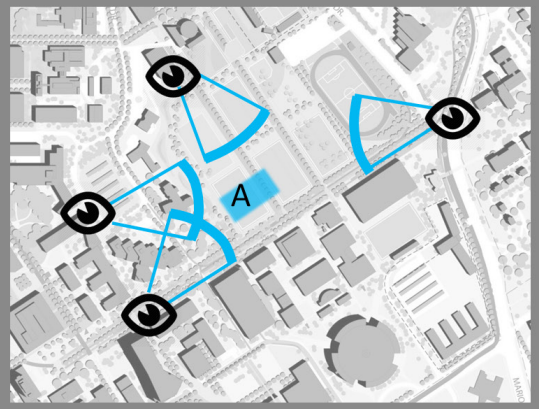
HPER mall; a series of gathering places (A) a transformative project

DIFFERENTIATING CRITERIA

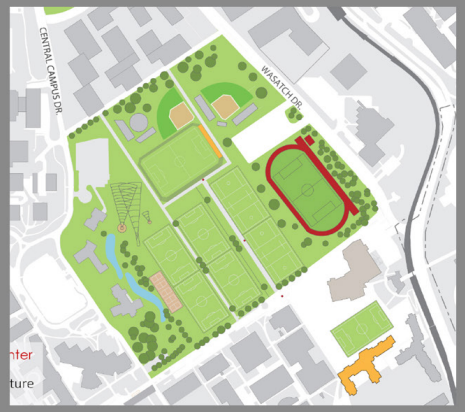
On which site is the Lassonde live/ make center most likely to flourish as a successful academic program?



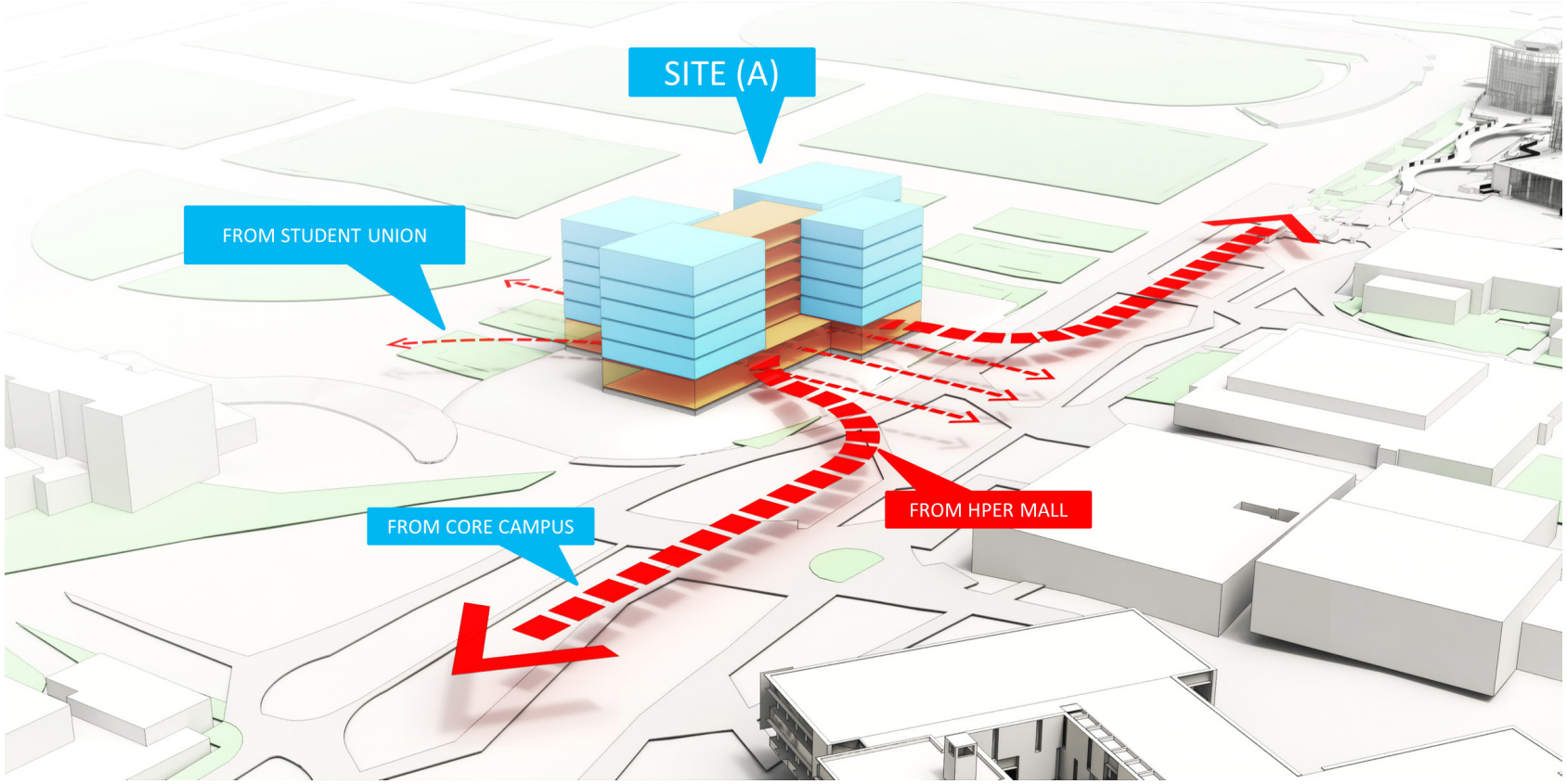
The social heart of campus; appropriate land use (A)



Visibility; a transformative project (A)



Intramural Play Fields (B)



THE PREFERRED SITE

O3.A

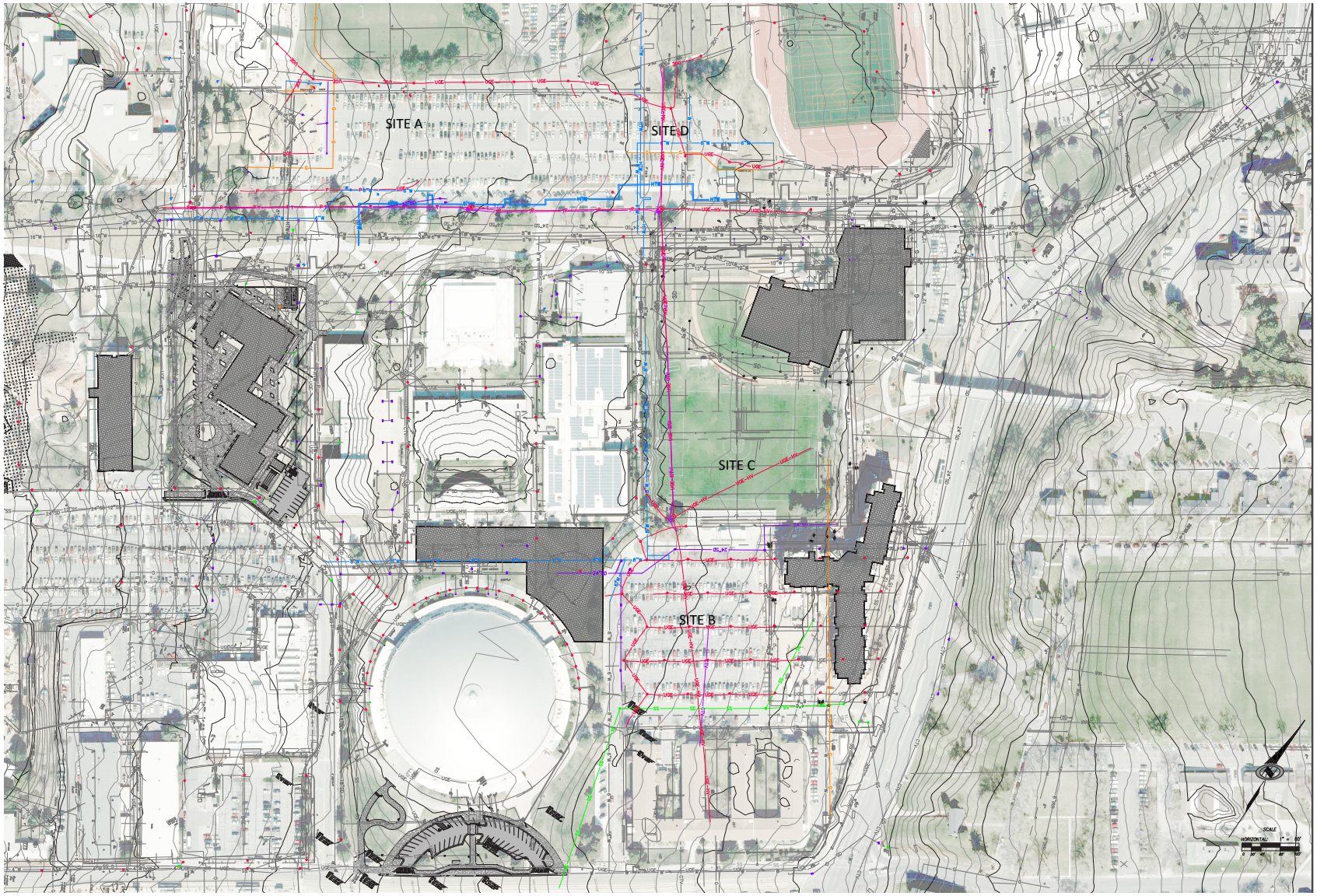
APPENDIX FOR SITE SELECTION - SITE EVALUATION COST STUDY

SITE EVALUATION COST STUDY

SCOPE AND PURPOSE

The purpose of the site evaluation cost study was to identify the utility infrastructure costs associated with the development of the Lassonde Make-Live Center on each of the four sites. In addition to these costs, costs associated with the replacement of existing university facilities displaced by the project were factored in as well as the cost impact to the project should the decision be made to connect to the campus high temperature and chilled water for all four sites. For the purpose of the study, the basic site cost total assumes that the facility will have a stand alone HVAC system and connection to the campus utilities will be an added cost to the project. While the estimate carries a cost for 160 stalls to support the resident population, this portion became cost neutral and did not factor into the cost study.

This study is independent of the prototyping process which defines the vision for the Lassonde Make-Live Center to align the mission of the facility with the most appropriate of the four sites under consideration on campus.



LASSONDE MAKE-LIVE CENTER SITE SELECTION: ARIEL VIEW, TOPOGRAPHY, AND UTILITIES

SITE A

Basic Site Infrastructure Upgrade Costs:
$1,581,440

Existing Facility Replacement Cost:
-0-

While there currently is a parking lot on this site, the University has designated this as temporary parking which has been identified for another use in the future. Therefore, there is no replacement cost impact to the project.

Premium to Connect to the Campus Central Plant:
$ 843,278

LASSONDE MAKE-LIVE CENTER SITE SELECTION: SITE A ARIEL VIEW, TOPOGRAPHY, AND UTILITIES

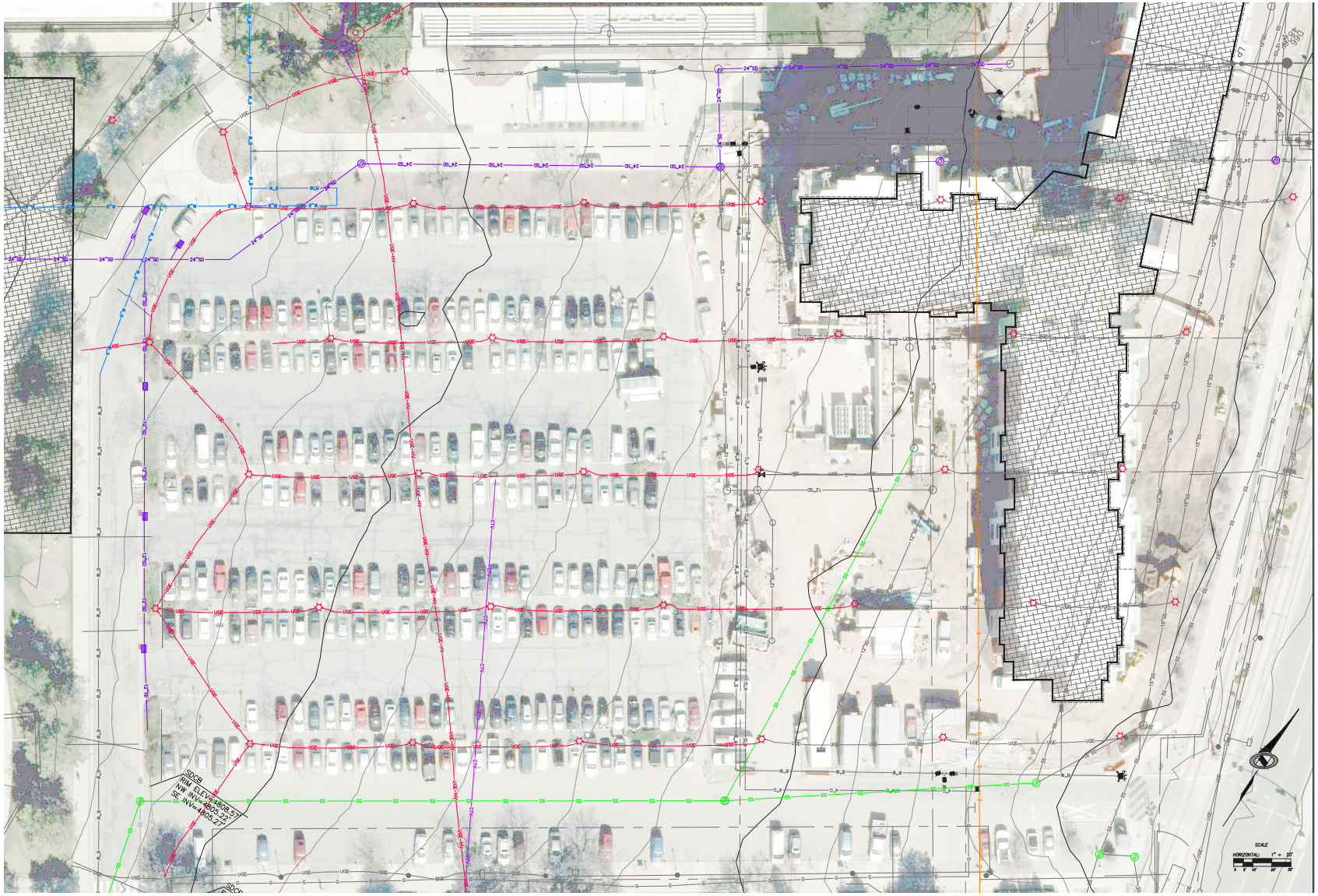
SITE B

Basic Site Infrastructure Upgrade Costs:
$1,644,685

Existing Facility Replacement Cost:
$7,560,000

There is a parking lot currently on this site. This lot serves Honors Housing and the Annex. It also supports parking requirements of the Huntsman Center to the south for large events. The University has designated this as permanent parking which means that when displaced by a specific project, that project bears the financial burden of replacing the lost parking with new structured parking.

Premium to Connect to the Campus Central Plant:
$1,935,278



LASSONDE MAKE-LIVE CENTER SITE SELECTION: SITE B ARIEL VIEW, TOPOGRAPHY, AND UTILITIES

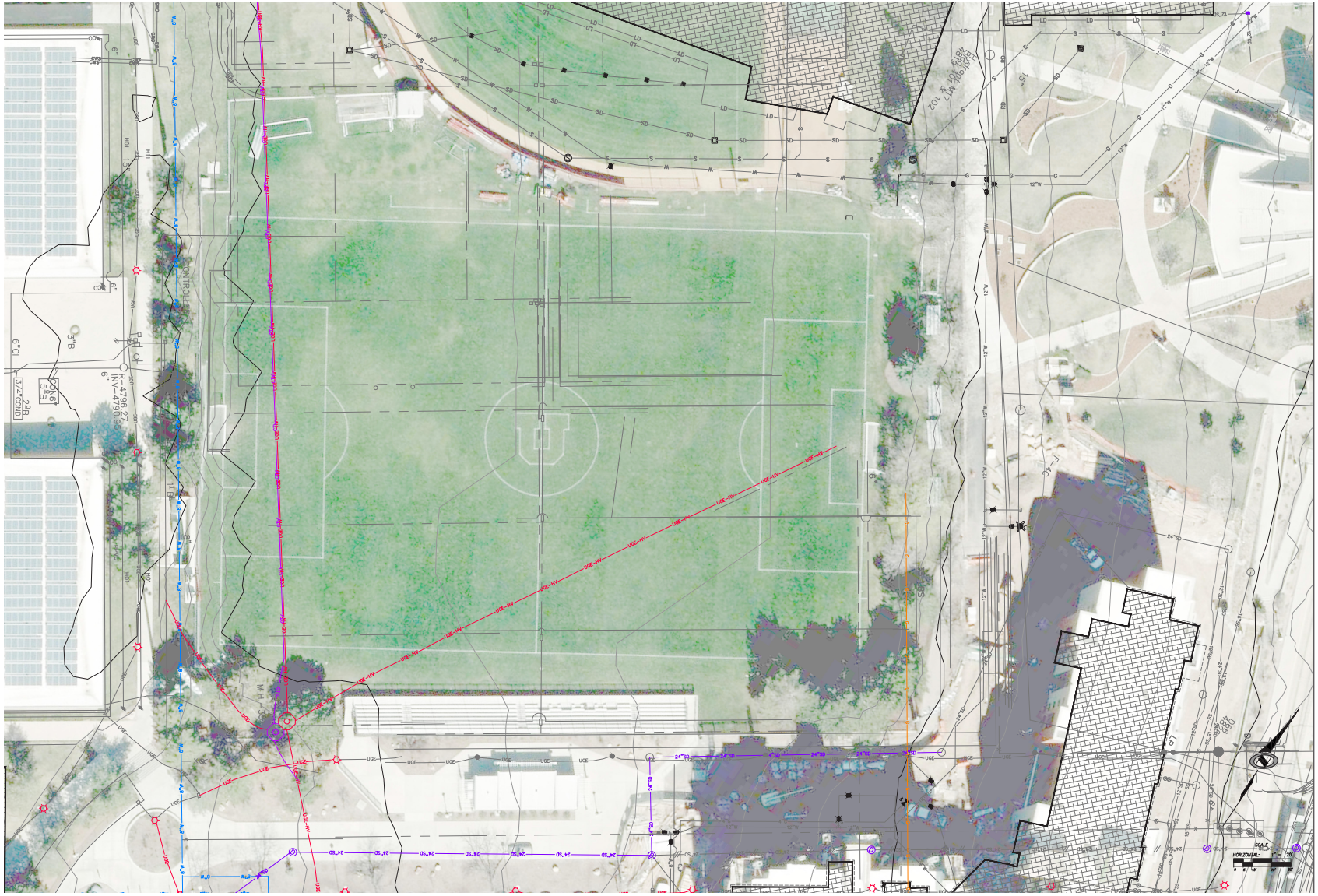
SITE C

Basic Site Infrastructure Upgrade Costs:
$1,525,199

Existing Facility Replacement Cost:
$3,000,000

The competitive women's soccer field currently resides on this site. Replacement of this field will be required and the financial burden falls to the project which displaces this field. This budgeted number includes has been carried forward as a place holder. It assumes that there will be an upgrade above the existing field which has been deemed by the University Athletic Department as inadequate for its intended use.

Premium to Connect to the Campus Central Plant:
$ 1,604,778



LASSONDE MAKE-LIVE CENTER SITE SELECTION: SITE C ARIEL VIEW, TOPOGRAPHY, AND UTILITIES

SITE D

Basic Site Infrastructure Upgrade Costs:
$1,913,121

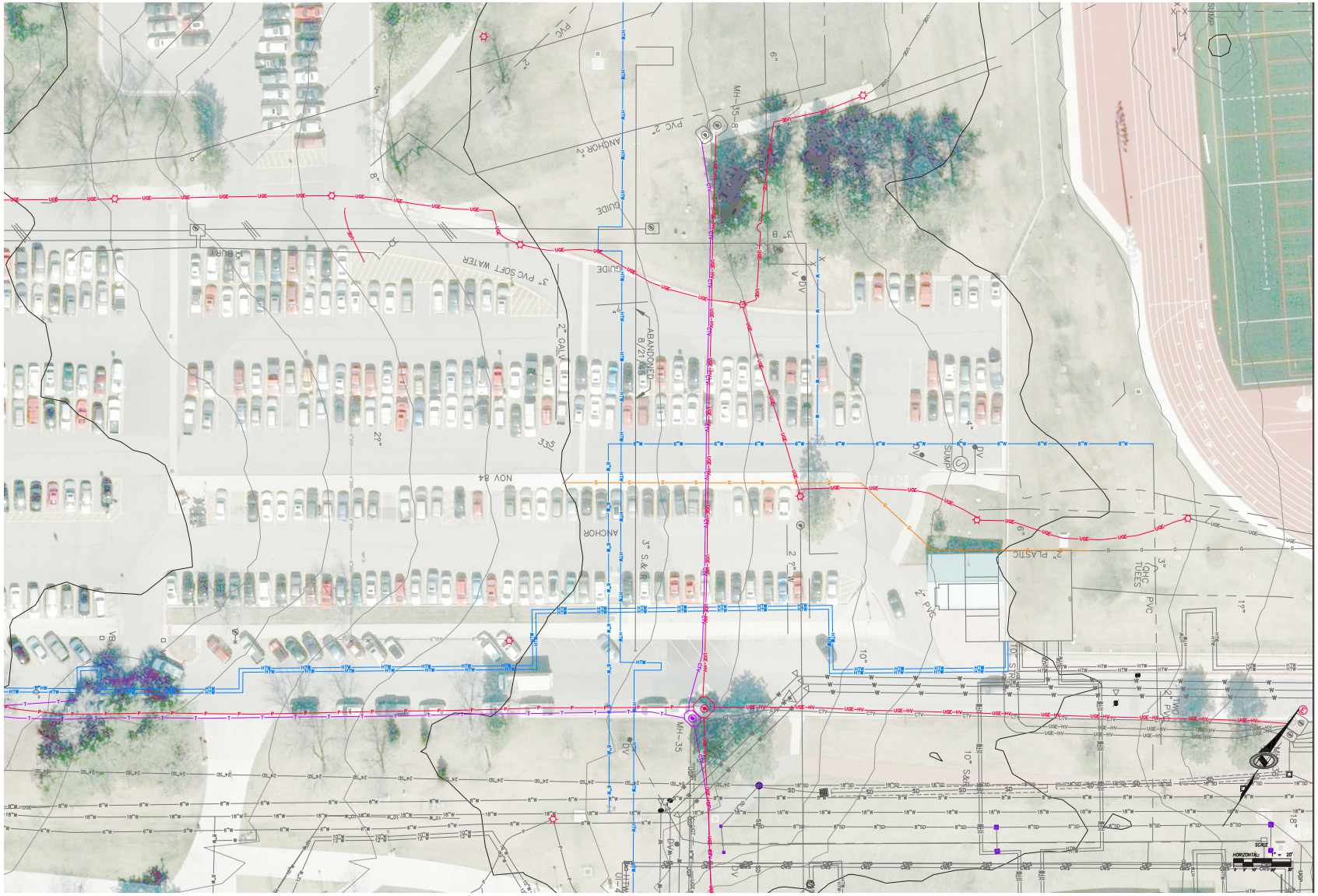
Existing Facility Replacement Cost:
-0-

While there currently is a parking lot on this site, the University has designated this as temporary parking which has been identified for another use in the future. Therefore, there is no replacement cost impact to the project.

Premium to Connect to the Campus Central Plant:
$2,343,278

Utility Tunnel Conflict:
$ 400,000

This site has the additional cost burden of dealing with the utility tunnel which runs northwest from HPER Mall through the site. This budget number was added to cost associated with the development of this site.



LASSONDE MAKE-LIVE CENTER SITE SELECTION: SITE D ARIEL VIEW, TOPOGRAPHY, AND UTILITIES

CONCLUSIONS

Based on site development costs alone, Site A is the most cost effective site for development. If the decision is made to connect to the campus central plant system, Site A remains the most cost effective site for development.

Infrastructure Upgrades - (Stand alone MEP Plant)

Site A:

Basic Site Infrastructure Upgrade Costs:	$1,581,440
Existing Facility Replacement Cost:	-0-
Total Site Development Cost	$1,581,440

Site B:

Basic Site Infrastructure Upgrade Costs:	$1,644,685
Existing Facility Replacement Cost (Parking Structure):	$7,560,000
Total Site Development Cost	$9,204,685

Site C:

Basic Site Infrastructure Upgrade Costs:	$1,525,199
Existing Facility Replacement Cost (Soccer Field):	$3,000,000
Total Site Development Cost	$4,525,199

Site D:

Basic Site Infrastructure Upgrade Costs:	$1,913,121
Existing Facility Replacement Cost:	-0-
Utility Tunnel Conflict:	$400,000
Total Site Development Cost	$2,313,121

INFRASTRUCTURE UPGRADES PLUS CENTRAL PLANT PREMIUM

Site A:

Infrastructure Upgrade	$1,581,440
Premium to Connect to the Campus Central Plant:	$843,278
Total Site Development Cost	$2,424,718

Site B:

Infrastructure Upgrade	$9,204,605
Premium to Connect to the Campus Central Plant:	$1,935,278
Total Site Development Cost	$11,139,883

Site C:

Infrastructure Upgrade	$4,525,199
Premium to Connect to the Campus Central Plant:	$1,604,778
Total Site Development Cost	$6,129,977

Site D:

Infrastructure Upgrade	$2,313,121
Premium to Connect to the Campus Central Plant:	$2,343,278
Total Site Development Cost	$4,656,399

PROJECT COST ESTIMATE: SUMMARY

CSI #	DESCRIPTION		OPTION A	OPTION B	OPTION C	OPTION D
	SITE OPTION COST SUMMARY					
02	EXISTING CONDITIONS		$ 74,233	$ 73,895	$ 95,049	$ 252,122
23	HVAC		$ 526,578	$ 526,578	$ 526,578	$ 526,578
26	ELECTRICAL		$ 194,184	$ 348,222	$ 299,002	$ 253,797
31	EARTHWORK		$ 319,667	$ 246,333	$ 168,941	$ 356,333
32	SITE IMPROVEMENTS		$ 15,050	$ 11,550	$ 10,500	$ -
33	UTILITIES		$ 135,441	$ 109,170	$ 120,090	$ 141,666
	SUBTOTAL		$ 1,265,152	$ 1,315,748	$ 1,220,159	$ 1,530,497
	GENERAL CONDITIONS	6%	$ 75,909	$ 78,945	$ 73,210	$ 91,830
	OVERHEAD & PROFIT	4%	$ 50,606	$ 52,630	$ 48,806	$ 61,220
	DESIGN CONTINGENCY	15%	$ 189,773	$ 197,362	$ 183,024	$ 229,575
	TOTAL SITE COST		$ 1,581,440	$ 1,644,685	$ 1,525,199	$ 1,913,121
	PARKING REQUIRED (160 STALLS @ $1,525/STALL)		$ 244,000	$ 244,000	$ 244,000	$ 244,000
	DISPLACED PARKING ($18,000/STALL)			$ 7,560,000		
	DISPLACED PLAY FIELD				$ 3,000,000	
	BUILDING PREMIUM ASSOCIATED w/ SITE					$ 400,000
	TOTAL		$ 1,825,440	$ 9,448,685	$ 4,769,199	$ 2,557,121
	CENTRAL PLANT UTILITY ALTERNATE		$ 843,278	$ 1,935,278	$ 1,604,778	$ 2,343,278

PROJECT COST ESTIMATE: OPTION A

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	BUILDING COST SUMMARY			
02	EXISTING CONDITIONS		$ 0.82	$ 74,233
03	CONCRETE		$ -	$ -
04	MASONRY		$ -	$ -
05	METALS		$ -	$ -
06	WOODS & PLASTICS		$ -	$ -
07	THERMAL & MOISTURE PROTECTION		$ -	$ -
08	DOORS & WINDOWS		$ -	$ -
09	FINISHES		$ -	$ -
10	SPECIALTIES		$ -	$ -
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ -	$ -
21	FIRE SUPPRESSION		$ -	$ -
22	PLUMBING		$ -	$ -
23	HVAC		$ 5.85	$ 526,578
26	ELECTRICAL		$ 2.16	$ 194,184
31	EARTHWORK		$ 3.55	$ 319,667
32	SITE IMPROVEMENTS		$ 0.17	$ 15,050
33	UTILITIES		$ 1.50	$ 135,441
	SUBTOTAL		$ 14.06	$ 1,265,152
	GENERAL CONDITIONS	6%	$ 0.84	$ 75,909
	OVERHEAD & PROFIT	4%	$ 0.56	$ 50,606
	DESIGN CONTINGENCY	15%	$ 2.11	$ 189,773
	TOTAL CONSTRUCTION COST		$ 17.57	$ 1,581,440

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
02	**EXISTING CONDITIONS**			
	Remove Asphalt Parking Lot	90000 SF	$ 0.69	$ 62,100
	Remove Curb & Gutter	2200 LF	$ 3.50	$ 7,700
	Remove Sidewalk	3000 SF	$ 0.89	$ 2,670
	Concrete Saw-Cutting	430 LF	$ 2.65	$ 1,140
	Asphalt Saw-Cutting	430 LF	$ 1.45	$ 624
	TOTAL EXISTING CONDITIONS			**$ 74,233**
23	**HVAC**			
	2700 MBH Boiler	2 EA	$ 39,400.00	$ 78,800
	Gas Meter	1 EA	$ 2,500.00	$ 2,500
	2" Gas Pipe	100 LF	$ 11.78	$ 1,178
	300 Ton Chiller	2 EA	$ 163,750.00	$ 327,500
	300 Ton Cooling Tower	2 EA	$ 58,300.00	$ 116,600
	TOTAL HVAC			**$ 526,578**
26	**ELECTRICAL**			
	Service & Distribution			
	15 KV Switch - Four-Way	1 EA	$ 47,158.26	$ 47,158
	208/120V Step-Down Transformer	1 EA	$ 57,653.04	$ 57,653
	480/277V Step-Down Transformer	1 EA	$ 40,708.70	$ 40,709
	Electrical Ductbank	200 LF	$ 141.58	$ 28,316
	Communications Ductbank	200 LF	$ 101.74	$ 20,348
	TOTAL ELECTRICAL			**$ 194,184**
31	**EARTHWORK**			
	Clear & Grub Site	90000 SF	$ 0.39	$ 35,100
	Site Excavation	23333 CY	$ 5.00	$ 116,667
	Site Grading	90000 SF	$ 0.31	$ 27,900
	Haul Off Site	23333 CY	$ 6.00	$ 140,000
	TOTAL EARTHWORK			**$ 319,667**
32	**EXTERIOR IMPROVEMENTS**			
	Site Repair After Ductbank Install	4300 SF	$ 3.50	$ 15,050
	TOTAL EXTERIOR IMPROVEMENTS			**$ 15,050**
33	**UTILITIES**			
	Storm Drain	970 LF	$ 33.65	$ 32,641
	Detention Storage	1 LS	$ 50,000.00	$ 50,000
	8" Water Line	560 LF	$ 32.89	$ 18,418
	Sewer Line	660 LF	$ 34.65	$ 22,869
	Gas Line	420 LF	$ 13.84	$ 5,813
	6" High Pressure Gas Re-route			NIC
	Manhole	2 Ea	$ 2,850.00	$ 5,700
	TOTAL UTILITIES			**$ 135,441**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	CENTRAL UTILITY PLANT ALTERNATE			
	Chilled Water (Direct Bury C-900)	1200 LF	$ 250.00	$ 300,000
	Chilled Water (Schedule 40 In Tunnel)	200 LF	$ 98.00	$ 19,600
	CTW Heat Exchanger	1 EA	$ 10,000.00	$ 10,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Expand North Plant 450 Tons	1 LS	$ 360,000.00	$ 360,000
	High-Temp Water Piping (Thermacore)	1200 LF	$ 330.50	$ 396,600
	HTW/CTW 20'X20' Vault	1 EA	$ 25,000.00	$ 25,000
	HTHW Heat Exchanger	2 EA	$ 15,000.00	$ 30,000
	Control Valves	2 EA	$ 15,000.00	$ 30,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Air Compressor	1 EA	$ 10,000.00	$ 10,000
	Eliminate Stand-alone System	-1 EA	$ 526,578.00	$ (526,578)
				$ 674,622
	General Conditions	**6%**		$ 40,477
	Overhead & Profit	**4%**		$ 26,985
	Design Contingency	**15%**		$ 101,193
	TOTAL CUP UTILITY ALTERNATE			**$ 843,278**

PROJECT COST ESTIMATE: OPTION B

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	BUILDING COST SUMMARY			
02	EXISTING CONDITIONS		$ 0.82	$ 73,895
03	CONCRETE		$ -	$ -
04	MASONRY		$ -	$ -
05	METALS		$ -	$ -
06	WOODS & PLASTICS		$ -	$ -
07	THERMAL & MOISTURE PROTECTION		$ -	$ -
08	DOORS & WINDOWS		$ -	$ -
09	FINISHES		$ -	$ -
10	SPECIALTIES		$ -	$ -
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ -	$ -
21	FIRE SUPPRESSION		$ -	$ -
22	PLUMBING		$ -	$ -
23	HVAC		$ 5.85	$ 526,578
26	ELECTRICAL		$ 3.87	$ 348,222
31	EARTHWORK		$ 2.74	$ 246,333
32	SITE IMPROVEMENTS		$ 0.13	$ 11,550
33	UTILITIES		$ 1.21	$ 109,170
	SUBTOTAL		$ 14.62	$ 1,315,748
	GENERAL CONDITIONS	6%	$ 0.88	$ 78,945
	OVERHEAD & PROFIT	4%	$ 0.58	$ 52,630
	DESIGN CONTINGENCY	15%	$ 2.19	$ 197,362
	TOTAL CONSTRUCTION COST		**$ 18.27**	**$ 1,644,685**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
02	**EXISTING CONDITIONS**			
	Remove Asphalt Parking Lot	90000 SF	$ 0.69	$ 62,100
	Remove Curb & Gutter	1340 LF	$ 3.50	$ 4,690
	Remove Irrigation System	13250 SF	$ 0.25	$ 3,313
	Remove Sidewalk	3800 SF	$ 0.89	$ 3,382
	Concrete Saw-Cutting	100 LF	$ 2.65	$ 265
	Asphalt Saw-Cutting	100 LF	$ 1.45	$ 145
	TOTAL EXISTING CONDITIONS			**$ 73,895**
23	**HVAC**			
	2700 MBH Boiler	2 EA	$ 39,400.00	$ 78,800
	Gas Meter	1 EA	$ 2,500.00	$ 2,500
	2" Gas Pipe	100 LF	$ 11.78	$ 1,178
	300 Ton Chiller	2 EA	$ 163,750.00	$ 327,500
	300 Ton Cooling Tower	2 EA	$ 58,300.00	$ 116,600
	TOTAL HVAC			**$ 526,578**
26	**ELECTRICAL**			
	Service & Distribution			
	Re-route Electrical Underground	787 LF	$ 95.00	$ 74,765
	Re-route Communications Underground	787 LF	$ 95.00	$ 74,765
	Electrical/Communications Manhole	2 EA	$ 3,250.00	$ 6,500
	15 KV Switch - Four-Way	1 EA	$ 47,158.26	$ 47,158
	208/120V Step-Down Transformer	1 EA	$ 57,653.04	$ 57,653
	480/277V Step-Down Transformer	1 EA	$ 40,708.70	$ 40,709
	Electrical Ductbank	150 LF	$ 141.58	$ 21,237
	Communication Ductbank	250 LF	$ 101.74	$ 25,435
	TOTAL ELECTRICAL			**$ 348,222**
31	**EARTHWORK**			
	Clear & Grub Site	90000 SF	$ 0.39	$ 35,100
	Site Excavation	16667 CY	$ 5.00	$ 83,333
	Site Grading	90000 SF	$ 0.31	$ 27,900
	Haul Off Site	16667 CY	$ 6.00	$ 100,000
	TOTAL EARTHWORK			**$ 246,333**
32	**EXTERIOR IMPROVEMENTS**			
	Site Retaining Walls			Building Cost
	Site Retaining Footings			Building Cost
	Site Repair After Ductbank Install	3300 SF	$ 3.50	$ 11,550
	TOTAL EXTERIOR IMPROVEMENTS			**$ 11,550**
33	**UTILITIES**			
	Storm Drain	690 LF	$ 33.65	$ 23,219
	Detention Storage	1 LS	$ 50,000.00	$ 50,000
	8" Water Line	175 LF	$ 32.89	$ 5,756
	Sanitary Sewer	675 LF	$ 34.65	$ 23,389
	Gas Line	80 LF	$ 13.84	$ 1,107
	Manhole	2 Ea	$ 2,850.00	$ 5,700
	TOTAL UTILITIES			**$ 109,170**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	CENTRAL UTILITY PLANT ALTERNATE			
	Chilled Water (Direct Bury C-900)	1600 LF	$ 250.00	$ 400,000
	CTW Heat Exchanger	1 EA	$ 10,000.00	$ 10,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Expand North Plant 450 Tons	1 LS	$ 360,000.00	$ 360,000
	High-Temp Water Piping (Thermacore)	3600 LF	$ 330.50	$ 1,189,800
	HTW/CTW 20'X20' Vault	1 EA	$ 25,000.00	$ 25,000
	HTHW Heat Exchanger	2 EA	$ 15,000.00	$ 30,000
	Control Valves	2 EA	$ 15,000.00	$ 30,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Air Compressor	1 EA	$ 10,000.00	$ 10,000
	Eliminate Stand-alone System	-1 EA	$ 526,578.00	$ (526,578)
	Subtotal			**$ 1,548,222**
	General Conditions	**6%**		$ 92,893
	Overhead & Profit	**4%**		$ 61,929
	Design Contingency	**15%**		$ 232,233
	TOTAL CUP UTILITY ALTERNATE			**$ 1,935,278**

PROJECT COST ESTIMATE: OPTION C

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	BUILDING COST SUMMARY			
02	EXISTING CONDITIONS		$ 1.06	$ 95,049
03	CONCRETE		$ -	$ -
04	MASONRY		$ -	$ -
05	METALS		$ -	$ -
06	WOODS & PLASTICS		$ -	$ -
07	THERMAL & MOISTURE PROTECTION		$ -	$ -
08	DOORS & WINDOWS		$ -	$ -
09	FINISHES		$ -	$ -
10	SPECIALTIES		$ -	$ -
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ -	$ -
21	FIRE SUPPRESSION		$ -	$ -
22	PLUMBING		$ -	$ -
23	HVAC		$ 5.85	$ 526,578
26	ELECTRICAL		$ 3.32	$ 299,002
31	EARTHWORK		$ 1.88	$ 168,941
32	SITE IMPROVEMENTS		$ 0.12	$ 10,500
33	UTILITIES		$ 1.33	$ 120,090
	SUBTOTAL		$ 13.56	$ 1,220,159
	GENERAL CONDITIONS	6%	$ 0.81	$ 73,210
	OVERHEAD & PROFIT	4%	$ 0.54	$ 48,806
	DESIGN CONTINGENCY	15%	$ 2.03	$ 183,024
	TOTAL CONSTRUCTION COST		**$ 16.95**	**$ 1,525,199**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
02	**EXISTING CONDITIONS**			
	Remove Curb & Gutter	535 LF	$3.50	$ 1,873
	Remove Playing Field Sod	90000 SF	$0.19	$ 17,100
	Remove Irrigation System	90000 SF	$0.25	$ 22,500
	Remove & Save Play Field Light Pole	4 EA	$5,000.00	$ 20,000
	Remove & Save Scoreboard	1 EA	$5,000.00	$ 5,000
	Remove Sidewalk	7400 SF	$0.89	$ 6,586
	Concrete Saw-Cutting	100 LF	$2.65	$ 265
	Remove Bleachers	1 LS	$10,000.00	$ 10,000
	Demolish Concessions/Restroom Building	18000 CF	$0.55	$ 9,900
	Remove Architectural Metal Fence	730 LF	$2.50	$ 1,825
	TOTAL EXISTING CONDITIONS			**$ 95,049**
23	**HVAC**			
	2700 MBH Boiler	2 EA	$ 39,400.00	$ 78,800
	Gas Meter	1 EA	$ 2,500.00	$ 2,500
	2" Gas Pipe	100 LF	$ 11.78	$ 1,178
	300 Ton Chiller	2 EA	$ 163,750.00	$ 327,500
	300 Ton Cooling Tower	2 EA	$ 58,300.00	$ 116,600
	TOTAL HVAC			**$ 526,578**
26	**ELECTRICAL**			
	Service & Distribution			
	Re-route Electrical Underground	700 LF	$ 95.00	$ 66,500
	Re-route Communications Underground	450 LF	$ 95.00	$ 42,750
	Electrical/Communications Manhole	5 EA	$ 3,250.00	$ 16,250
	15 KV Switch - Four-Way	1 EA	$ 47,158.26	$ 47,158
	208/120V Step-Down Transformer	1 EA	$ 57,653.04	$ 57,653
	480/277V Step-Down Transformer	1 EA	$ 40,708.70	$ 40,709
	Electrical Ductbank	115 LF	$ 141.58	$ 16,282
	Communications Ductbank	115 LF	$ 101.74	$ 11,700
	TOTAL ELECTRICAL			**$ 299,002**
31	**EARTHWORK**			
	Clear & Grub Site	90000 SF	$ 0.39	$ 35,100
	Site Excavation	9631 CY	$ 5.00	$ 48,155
	Site Grading	90000 SF	$ 0.31	$ 27,900
	Haul Off Site	9631 CY	$ 6.00	$ 57,786
	TOTAL EARTHWORK			**$ 168,941**
32	**EXTERIOR IMPROVEMENTS**			
	Site Retaining Walls			Building Cost
	Site Retaining Footings			Building Cost
	Site Repair After Ductbank Install	3000 SF	$ 3.50	$ 10,500
	TOTAL EXTERIOR IMPROVEMENTS			**$ 10,500**
33	**UTILITIES**			
	Storm Drain	1020 LF	$ 33.65	$ 34,323
	Detention Storage	1 LS	$ 50,000.00	$ 50,000
	8" Water Line	880 LF	$ 32.89	$ 28,943
	Sanitary Sewer	145 LF	$ 34.65	$ 5,024
	Gas Line	130 LF	$ 13.84	$ 1,799
	TOTAL UTILITIES			**$ 120,090**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	CENTRAL UTILITY PLANT ALTERNATE			
	Chilled Water (Direct Bury C-900)	1600 LF	$ 250.00	$ 400,000
	CTW Heat Exchanger	1 EA	$ 10,000.00	$ 10,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Expand North Plant 450 Tons	1 LS	$ 360,000.00	$ 360,000
	High-Temp Water Piping (Thermacore)	2800 LF	$ 330.50	$ 925,400
	HTW/CTW 20'X20' Vault	1 EA	$ 25,000.00	$ 25,000
	HTHW Heat Exchanger	2 EA	$ 15,000.00	$ 30,000
	Control Valves	2 EA	$ 15,000.00	$ 30,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Air Compressor	1 EA	$ 10,000.00	$ 10,000
	Eliminate Stand-Alone System	-1 LS	$ 526,578.00	$ (526,578)
	Subtotal			**$ 1,283,822**
	General Conditions	**6%**		$ 77,029
	Overhead & Profit	**4%**		$ 51,353
	Design Contingency	**15%**		$ 192,573
	TOTAL CUP UTILITY ALTERNATE			**$ 1,604,778**

PROJECT COST ESTIMATE: OPTION D

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	BUILDING COST SUMMARY			
02	EXISTING CONDITIONS		$ 2.80	$ 252,122
03	CONCRETE		$ -	$ -
04	MASONRY		$ -	$ -
05	METALS		$ -	$ -
06	WOODS & PLASTICS		$ -	$ -
07	THERMAL & MOISTURE PROTECTION		$ -	$ -
08	DOORS & WINDOWS		$ -	$ -
09	FINISHES		$ -	$ -
10	SPECIALTIES		$ -	$ -
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ -	$ -
13	SPECIAL CONSTRUCTION		$ -	$ -
21	FIRE SUPPRESSION		$ -	$ -
22	PLUMBING		$ -	$ -
23	HVAC		$ 5.85	$ 526,578
26	ELECTRICAL		$ 2.82	$ 253,797
31	EARTHWORK		$ 3.96	$ 356,333
32	SITE IMPROVEMENTS		$ -	$ -
33	UTILITIES		$ 1.57	$ 141,666
	SUBTOTAL		$ 17.01	$ 1,530,497
	GENERAL CONDITIONS	6%	$ 1.02	$ 91,830
	OVERHEAD & PROFIT	4%	$ 0.68	$ 61,220
	DESIGN CONTINGENCY	15%	$ 2.55	$ 229,575
	TOTAL CONSTRUCTION COST		$ 21.26	$ 1,913,121

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
02	**EXISTING CONDITIONS**			
	Remove Asphalt Parking Lot	54700 SF	$ 0.69	$ 37,743
	Remove Curb & Gutter	600 LF	$ 3.50	$ 2,100
	Remove Irrigation System	35300 SF	$ 0.25	$ 8,825
	Remove Sidewalk	2250 SF	$ 0.89	$ 2,003
	Concrete Saw-Cutting	370 LF	$ 2.65	$ 981
	Asphalt Saw-Cutting	325 LF	$ 1.45	$ 471
	Remove Vault/Shed	1 LS	$ 200,000.00	$ 200,000
	TOTAL EXISTING CONDITIONS			**$ 252,122**
23	**HVAC**			
	2700 MBH Boiler	2 EA	$ 39,400.00	$ 78,800
	Gas Meter	1 EA	$ 2,500.00	$ 2,500
	2" Gas Pipe	100 LF	$ 11.78	$ 1,178
	300 Ton Chiller	2 EA	$ 163,750.00	$ 327,500
	300 Ton Cooling Tower	2 EA	$ 58,300.00	$ 116,600
	TOTAL HVAC			**$ 526,578**
26	**ELECTRICAL**			
	Service & Distribution			
	15 KV Switch - Four-Way	1 EA	$ 47,158.26	$ 47,158
	208/120V Step-Down Transformer	1 EA	$ 57,653.04	$ 57,653
	480/277V Step-Down Transformer	1 EA	$ 40,708.70	$ 40,709
	Electrical Ductbank	445 LF	$ 141.58	$ 63,003
	Communications Ductbank	445 LF	$ 101.74	$ 45,274
	TOTAL ELECTRICAL			**$ 253,797**
31	**EARTHWORK**			
	Clear & Grub Site	90000 SF	$ 0.39	$ 35,100
	Site Excavation	26667 CY	$ 5.00	$ 133,333
	Site Grading	90000 SF	$ 0.31	$ 27,900
	Haul Off Site	26667 CY	$ 6.00	$ 160,000
	TOTAL EARTHWORK			**$ 356,333**
32	**EXTERIOR IMPROVEMENTS**			
	Site Retaining Walls			Building Cost
	Site Retaining Footings			Building Cost
	TOTAL EXTERIOR IMPROVEMENTS			**$ -**
33	**UTILITIES**			
	Storm Drain	1020 LF	$ 33.65	$ 34,323
	Detention Storage	1 LS	$ 50,000.00	$ 50,000
	8" Water Line	665 LF	$ 32.89	$ 21,872
	Sanitary Sewer	540 LF	$ 34.65	$ 18,711
	Re-route HP Gas Line	500 LF	$ 33.52	$ 16,760
	TOTAL UTILITIES			**$ 141,666**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	TOTAL
	CENTRAL UTILITY PLANT ALTERNATE			
	High Temp Water Piping (Thermacore)	1200 LF	$ 330.50	$ 396,600
	HTHW Heat Exchangers	2 EA	$ 15,000.00	$ 30,000
	HTW/CTW 20'X20' Vault	1 EA	$ 25,000.00	$ 25,000
	Control Valves	2 EA	$ 15,000.00	$ 30,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Air Compressor	1 EA	$ 10,000.00	$ 10,000
	Chilled Water (Direct Bury C-900)	6000 LF	$ 250.00	$ 1,500,000
	Chilled Water (Schedule 40 In Tunnel)	200 LF	$ 98.00	$ 19,600
	CTW Heat Exchanger	1 EA	$ 10,000.00	$ 10,000
	BTU Meter	1 EA	$ 10,000.00	$ 10,000
	Expand HPER 450 Tons	1 LS	$ 360,000.00	$ 360,000
	Eliminate Stand-Alone System	-1 LS	$ 526,578.00	$ (526,578)
				$ 1,874,622
	General Conditions	**6%**		$ 112,477
	Overhead & Profit	**4%**		$ 74,985
	Design Contingency	**15%**		$ 281,193
	TOTAL CUP UTILITY ALTERNATE			**$ 2,343,278**

04.

BUILDING ORGANIZATION

Program Components - Housing and Garage
Efficiency Analysis

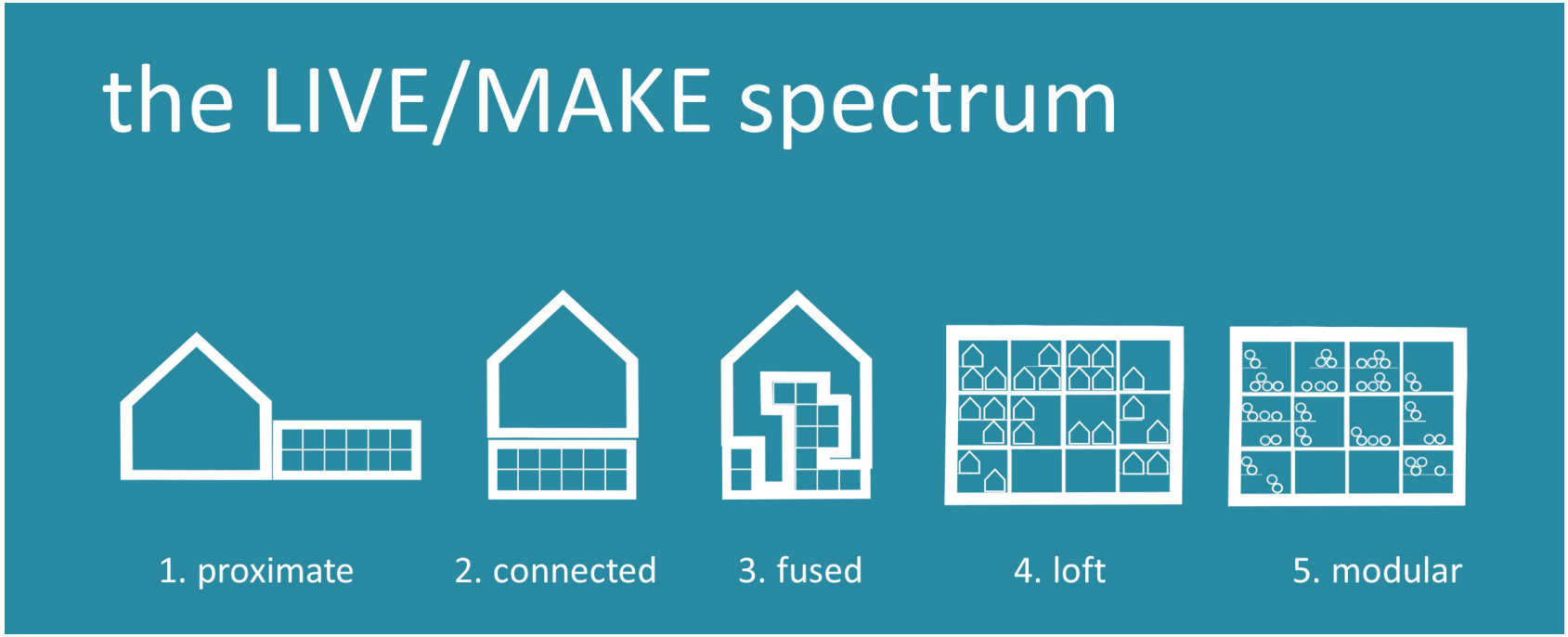
BUILDING ORGANIZATION

The process of creating a new prototype has been done with consideration of the specific requirements of the individual components and functions of the Housing and Garage components.

HOUSING CONSIDERATIONS

The residential component of the project will provide 400 beds of housing for a range of students from freshman to upper class and graduate students. Understanding the experiences of HRE on campus, and expectations from peer institutions both within Utah and the Pac 12 Conference, the design team has developed three flexible types of housing accommodation:

- Traditional doubles and singles in Semi-Suites
- Loft Type Housing
- Modular Type Housing



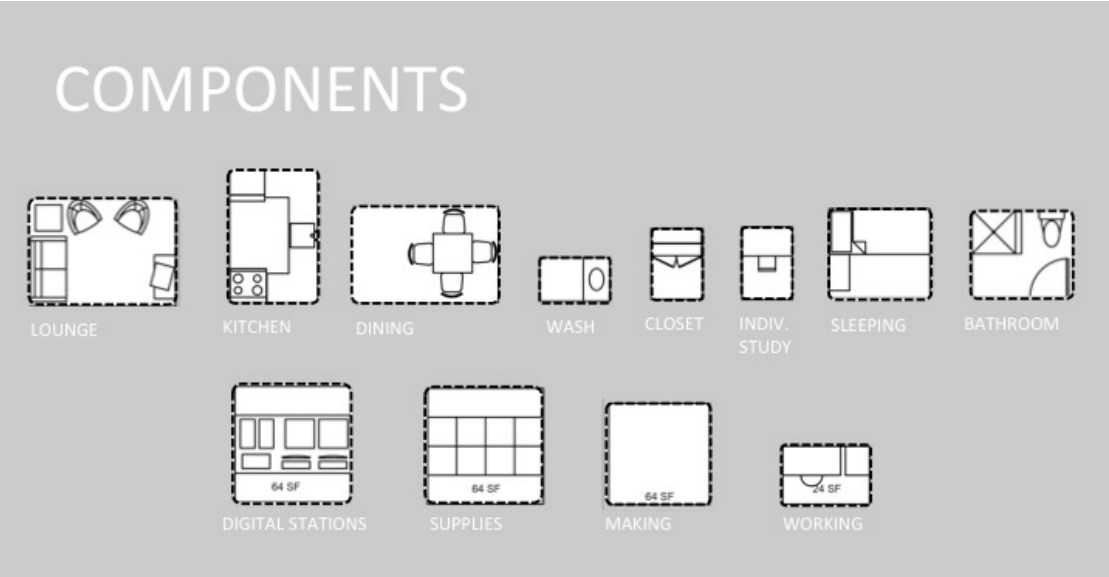
GARAGE CONSIDERATIONS

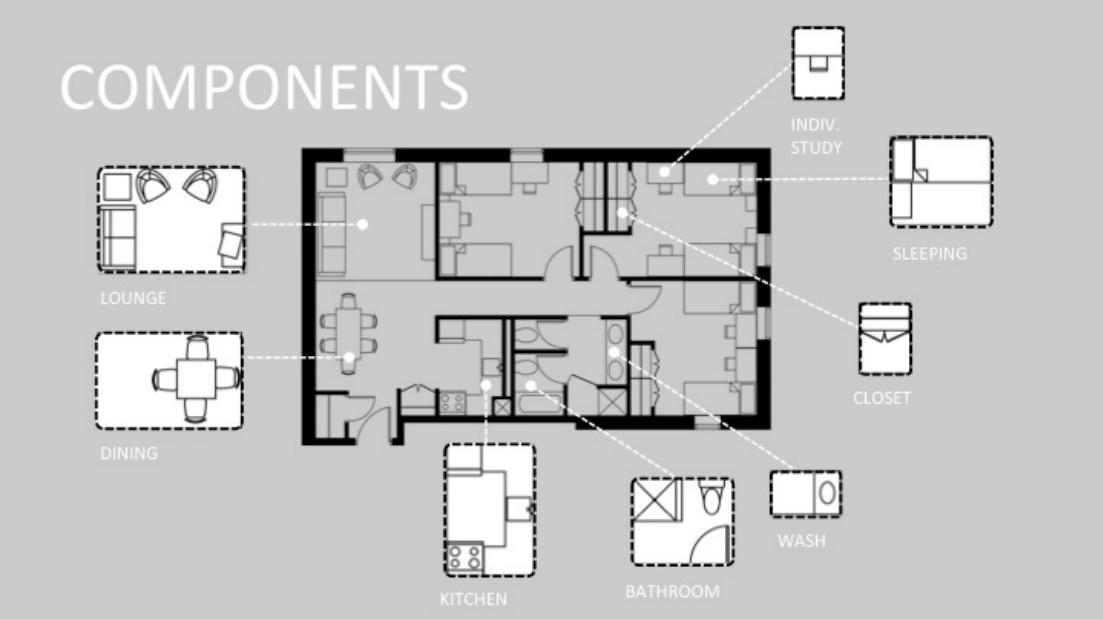
In previous work, the Lassonde Make -Live Center developed ideas about how the Garage component could function as part of the Live-Make spectrum. Visiting and studying examples in entrepreneurial communities around New York City and San Francisco, the design team began the prototyping process by seeking to understand the descrete components of the eintrpreneurial experience, and how they could be integrated into a living environment.

A key part of this analysis was a dissection of the activities a student would experience as a participant or resident in the Lassonde Make-Live Center. The purpose of this analysis was to understand ways to integrate living and making, seeking opportunities to create both efficiency and synergy of traditional housing social spaces by making them more 'garage like'.

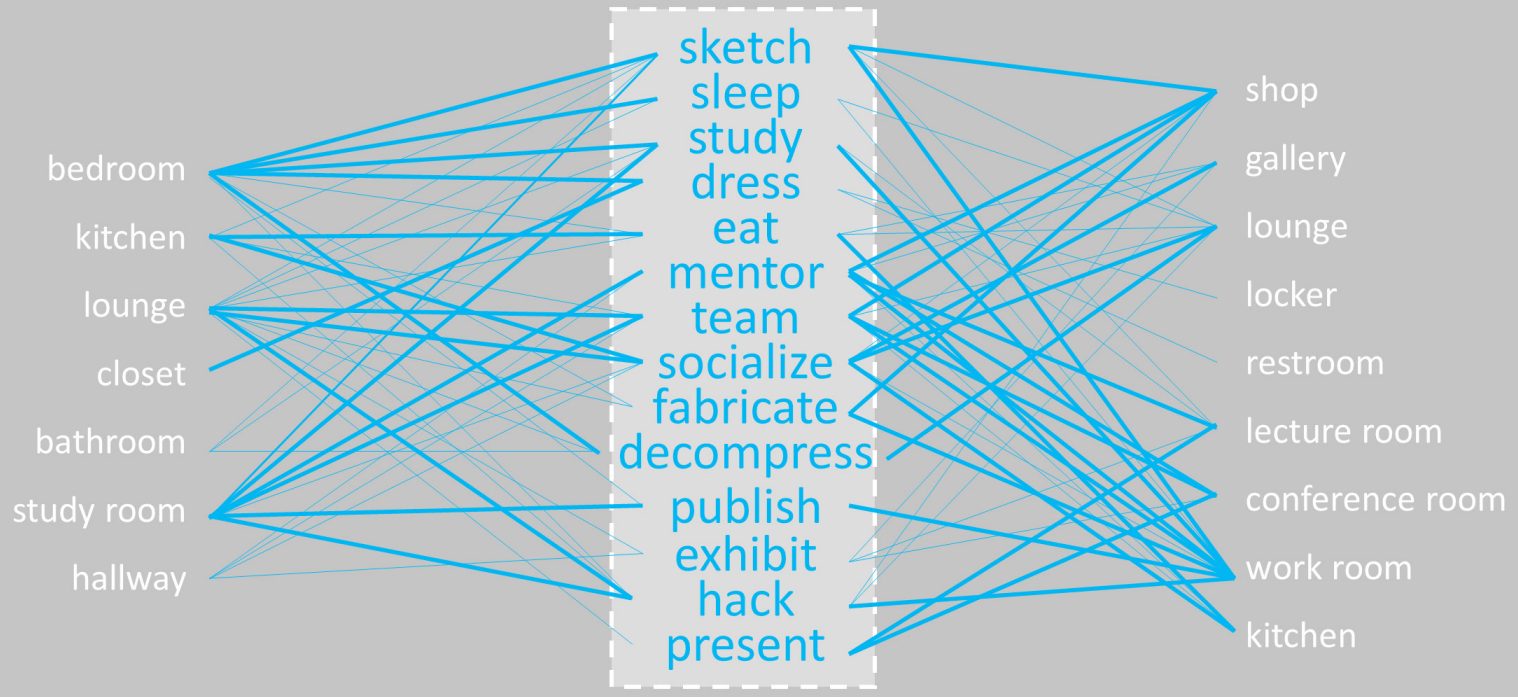
The infusion of the Garage idea, and function, into the housing creates opportunities to foster a true Make-Live environment that is flexible, efficient and that provides opportunities for more mature entrepreneurial students to mentor and guide less experienced students though their educational and entrepreneurial experience at the University of Utah.

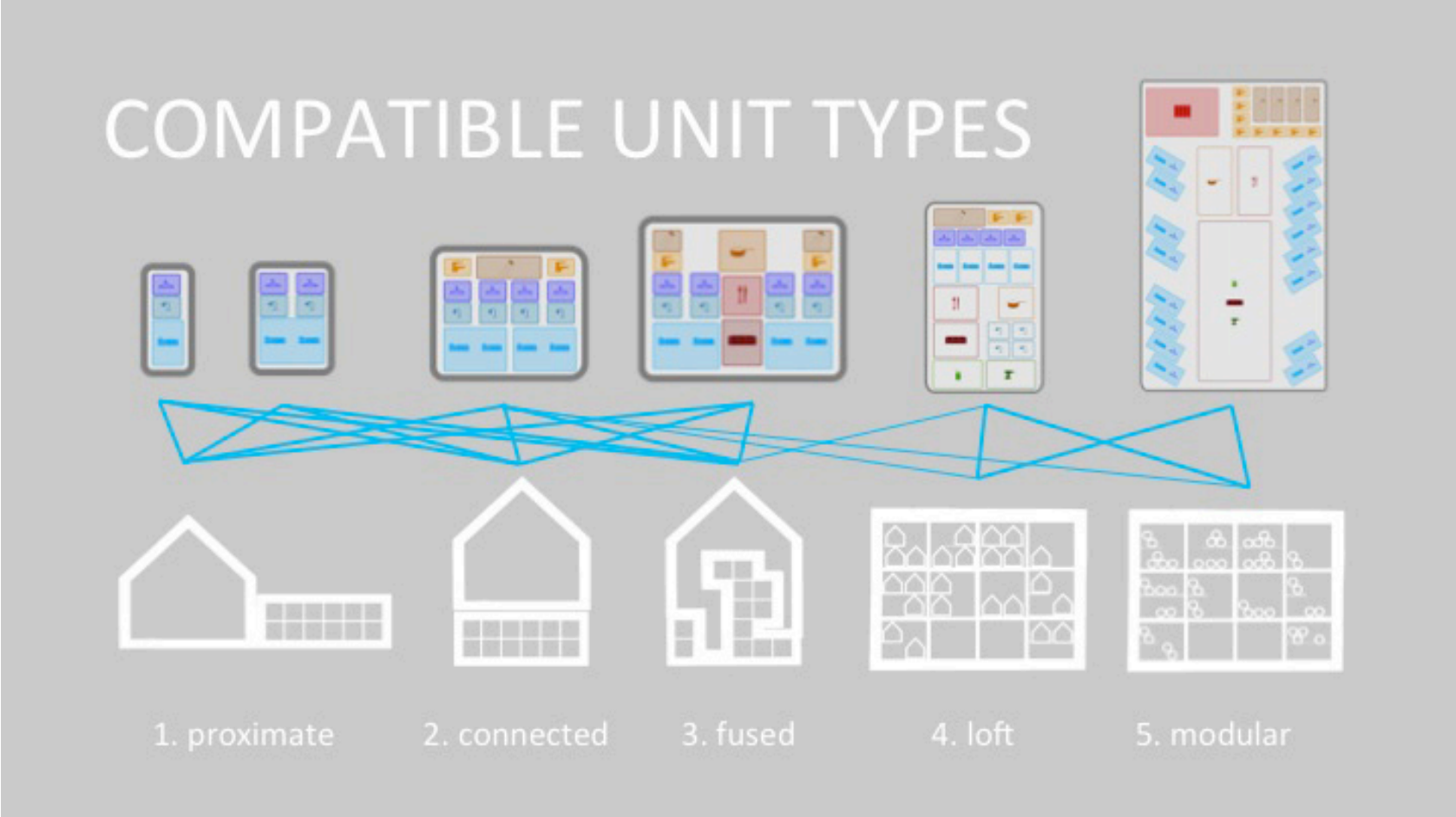
The Garage itself is envisioned as a flexible loft-like space that has the ability to accommodate a variety of individual and group activities. Much like the Foundry in Downtown Salt Lake City, or the studio space at the Architecture School, the garage will be a place of collaboration and variety. The garage will contain a mixture of closed and open work spaces that are suitable to computer work, meeting and collaboration, to making and prototyping of new ideas and products. The specific distribution and make up of the Garage space will be finalized during the design process.





CONVERGENCE





BUILDING EFFICIENCY AND THE MAKE-LIVE CENTER CONSIDERATIONS

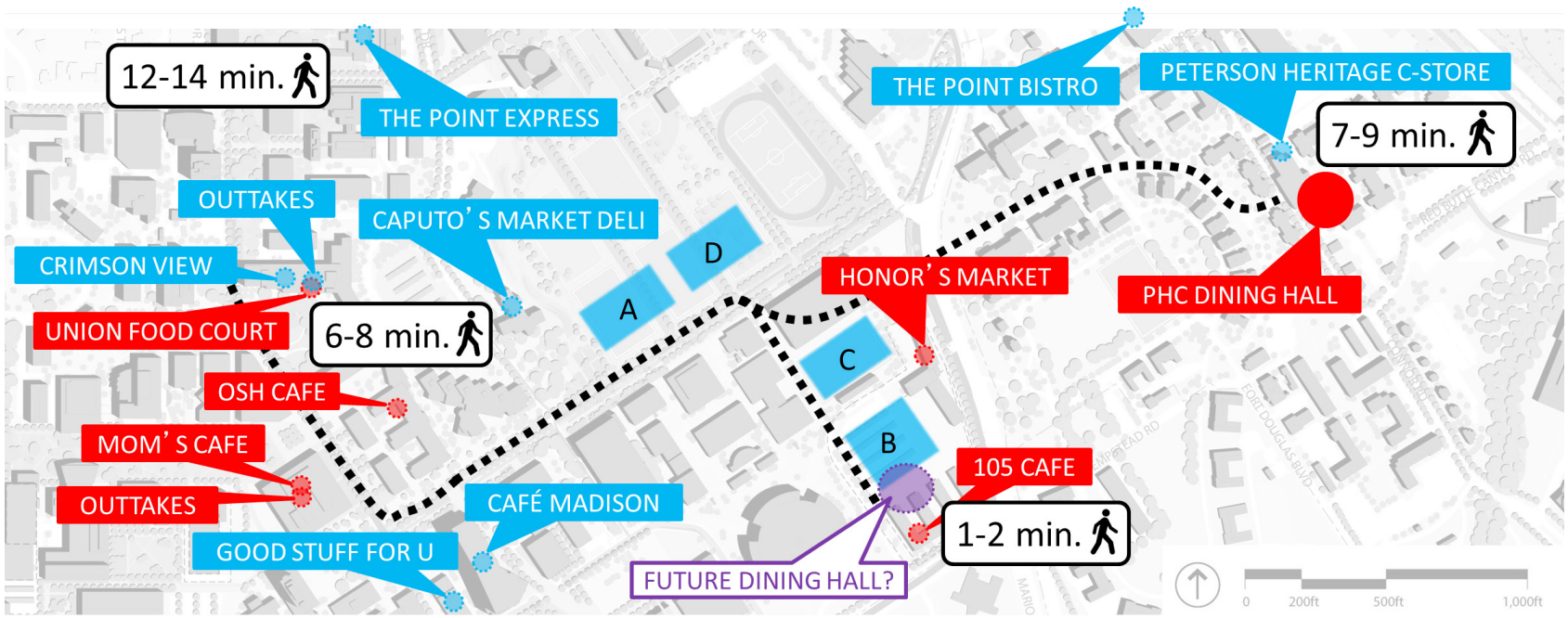
The combination of the housing and entrepreneurial garage spaces create opportunities to use space in multiple ways, therefore increasing overall building efficiency. Rethinking single use areas like living rooms in individual apartments as square footage available for the collaborative entrepreneurial experience or reducing the amount of dedicated private sleeping space in order to increase the amount of shared collaborative and entrepreneurial space are but two of the space programming and planning strategies the design team has employed to create efficiency and operational synergy.

Important to the economics and business performance of the Garage (and Housing) is the desire to create partnerships with existing campus resources. These include existing engineering and biomedical labs, and Architectural and Engineering shop spaces. While making is an important part of the entrepreneurial experience, it is not anticipated that there will be major or large scale equipment housed in the Lassonde Make-Live Center.

Finally, it is important to discuss the need for food services for the 400 residential students. Concurrent with the development of the Lassonde Make-Live Center, HRE is completing a study of residential dining needs on campus. It is recognized that current students in the Marriott Honors Housing are not adequately served by the location of current residential dining options. The creation of 400 additional beds in the general neighborhood of the Honors housing may make a stand alone dining facility more viable in the neighborhood.

It is expected that the addition of the 400 Lassonde Make-Live Center residents will help the financial viability of any new dining, however it is believed that including a new dining facility within the Lassonde Make-Live Center would change the focus of the public parts of the facility from entrepreneurship to dining, and therefore it is recommended that only a small café be included in the project.

FOOD

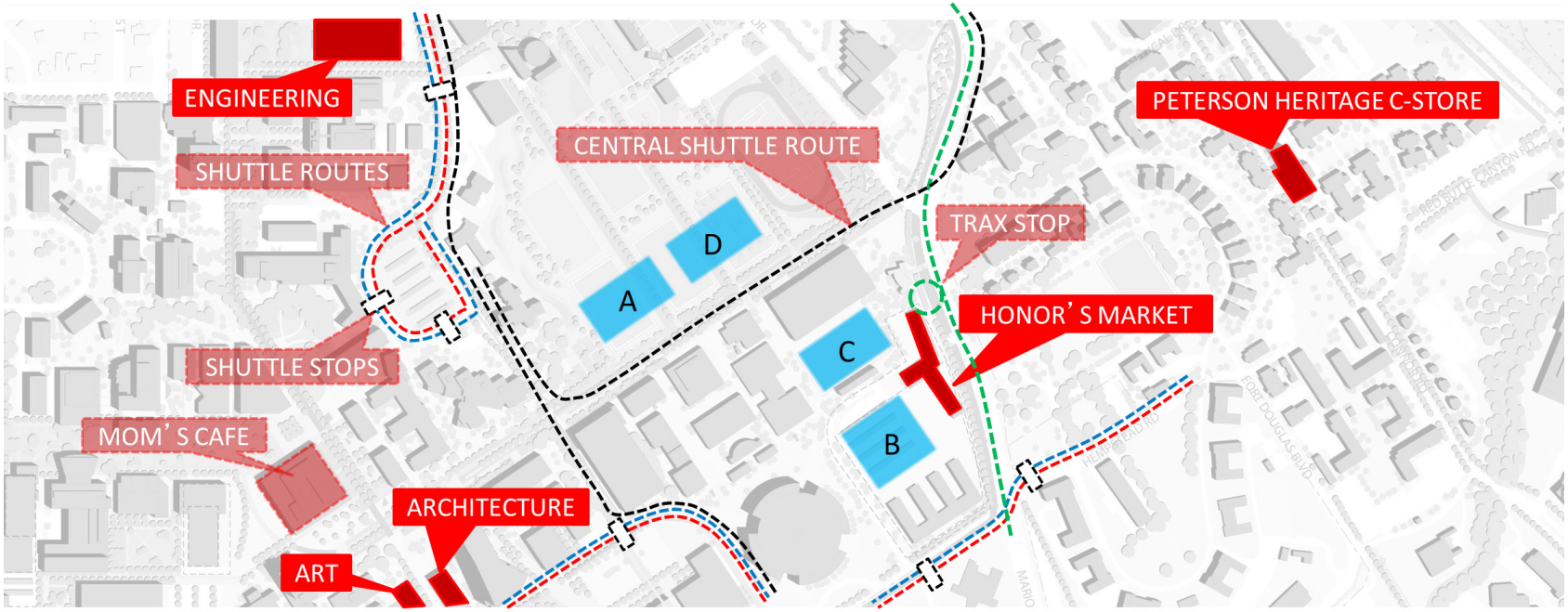


EACH SITE IS AT LEAST ADJACENT TO ONE FOOD SERVICE AND NEAR TO THREE OR FOUR. THE EXISTING DINING HALLS ARE EQUALLY FAR FROM ALL SITES.

24 HOUR FOOD

12 – 2 AM

24 HOURS



ALL SITES HAVE ACCESS TO THE 24-HOUR HONOR'S MARKET AS WELL AS LATE NIGHT PUBLIC TRANSPORTATION.

05.

SPACE PROGRAM SUMMARY AND ROOM DATA

Space Program Summary
Room Criteria Sheets
Adjacency Diagrams/Test Fits

SPACE PROGRAM DETAIL

		Quantity	Unit	Proposed NSF	Subtotal NSF	GSF
GARAGE COMMUNITY SPACE						
Community Space						
100	Entry and Lobby Area	1	800	800		
101	Pitch /Multi Media Room	2	240	480		
102	Director Hotel Offices	2	150	300		Need acoust and visual privacy
103	Mail Room	1	300	300		
104	Storage	1	150	150		
105	Breakout Rooms	4	80	320		
					2,350	3,133
Food Venue						
106	C-Store Coffee Shop	1	1,500	1,500		
					1,500	2,083
Maker Space						
107	Garage Space	*1*	*14,900*	*14,900*		
108	First Aid Station	0	45	-		Included above
109	Garage Storage	2	-	-		Included above
					14,900	16,556
Support						
110	ATM	1	-	-		In lobby
111	Vending	1	-	-		In lobby
112	Bike Storage	1	800	800		
					800	1,000
Subtotal - Community Space				**19,550**		**22,772**

SPACE PROGRAM DETAIL, CONTINUED

		Quantity	Unit	Proposed NSF	Subtotal NSF	GSF
COMMUNITY DIRECTOR APARTMENTS						
Director Apts						
200	1 BR Apartment, full kitchen, living, dining space	1	850	850		
201	2 BR Apartment, full kitchen, living, dining space	1	950	950		2,647
Subtotal - Community Director Apt. Space					***1,800***	**2,647**
STUDENT RESIDENTIAL SPACE						
Residential Space - Private						
300	240 First Years in Semi Suites (64 singles)	240	180	43,200		8 pods: 4@28, 4@32
301	80 Upper Classman in Modular	80	200	16,000		4 pods of 20
302	80 Upper Classman in Modular/ Lofts	80	220	17,600		4 pods of 20
303	12 RA Studios	12	150	1,800		distributed
		412			*78,600*	109,167
Residential Space - Shared						
304	Shared Kitchens	8	150	1,200		per pod for Semi-suites
305	Maker Space/Flr lounge	4	900	3,600		1 per floor
306	Skype Booth	5	-	-		1 per floor
307	Laundry Room	4	180	720		
					5,520	6,900
Subtotal - Student Residential Space				**84,120**		**116,067**

SPACE PROGRAM DETAIL, CONTINUED

		Quantity	Unit	Proposed NSF	Subtotal NSF	GSF
SUPPORT SPACE						
Public Support Space						
400	Public Bathrooms	2	240	480		
401	Public Bathrooms (Unisex)	2	56	112		
402	Trash Deposit Rooms	5	80	400		1/ floor
					992	1,378
Building Support Space						
403	Custodial Closets/JC	5	80	400		1/ floor
404	Building Storage	1	400	400		
405	Loading/Receiving	1	120	120		
					920	1,150
Mechanical Rooms/Trash						
406	Trash Collection Room	1	240	240		
407	Cell Phone Ant	1	100	100		
408	Mechanical Rooms	5	80	400		1/ floor
409	TEL/DATA Closets	5	45	225		1/ floor
410	Electrical Room	10	80	800		2/ floor
411	Main Mechnical/Electrical Room	1	500	500		
					2,265	3,146
Subtotal - Support Space				**4,177**		**5,674**

SPACE PROGRAM DETAIL, CONTINUED

		Quantity	Unit	Proposed NSF	Subtotal NSF	GSF
BUILDING TOTALS						
	Building Total NSF			**109,047**	**Total GSF**	**147,160**
	GSF per Bed			**359**		410 beds
OUTDOOR AMENITITES/ PROGRAM SPACE						
	Garage work/gathering area			5,000		1/3 of garage space
	Fire Pit			200		
	Seating - Café adjacent	30	15	450		
	Bike Racks	100	5	500		1/4 res pop.
	Service/loading yard	1	400	400		
					6,550	6,550
	Total Outdoor Hardscape				**TOTAL GSF**	**6,550**

ROOM DATA SHEETS

ENTRY LOBBY - 100

SPACE PROGRAM	
General Space Description:	Public Building Entry
Actual SF Area:	800
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Garage, Residential access to upper floors
Must be near to:	Must be central
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall
Doors:	Depending on layout there could be multiple entries:Doors with Card Reader. Glazed doors are preferred if allowed by code.
Floor:	Stone or Cast Concrete
Base:	Rubber
Wall:	Upgraded Material - Wood/Stone/special surfacing
Ceiling:	Wood ceiling
Ceiling Height:	12'-0" minimum
Acoustics:	Provide acoustical environment conducive to lounging, studying, and small group meetings. Locate living room so as to avoid disturbing student bedrooms. Provide sufficient acoustical finishes to control noise build-up within the space and to facilitate multiple groups holding conversations at once. Avoid undesirable acoustical effects such as flutter echo. Consider televisions, etc. regarding their impact on nearby spaces. Mitigate HVAC noise to provide an environment that is appropriate for the room's use. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	Water Station
Electrical:	(1) duplex outlet minimum every 10' along the perimeter walls, plus in floor for seating. Provide a duplex outlet at 6" below ceiling at every television location.
Lighting:	Living Rooms shall be illuminated with dimmable recessed, fluorescent down lights. Provide dimmable fluorescent pendants over the coffee table area. Fixture selection should be made so that the room feels "homey" and comfortable for the residents, not institutional.
Phone Data:	See Narrative

GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV and gaming
	Coaxial cable
	Display area on walls for student projects is desired
	Window treatments
	Staff Checkin Desk
GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables
OTHER COMMENTS AND SPECIAL NOTES	

PITCH ROOM - 101

SPACE PROGRAM	
General Space Description:	Small Conference Room
Actual SF Area:	240
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Garage
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	Desired
Doors:	One (1) 3’-0” x 7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet; 6’-0” broadloom roll or carpet tile is acceptable.
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Acoustical Treatment
Ceiling Height:	12’-0”
Acoustics:	Provide an acoustical environment conducive for conference occupancy. There should be sufficient sound isolation to provide adequate speech privacy and avoid disruptive noise intrusion. Provide sufficient acoustical finishes to avoid noise build-up and to provide good speech intelligibility. Avoid undesirable acoustical effects such as flutter echo. Mitigate HVAC noise to result in an appropriate background sound level. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	See Narrative
Lighting:	Flexible for conference, work, presentation modes
Phone Data:	Well Equiped for media, tel, data and information sharing
GROUP 1 EQUIPMENT (FIXED)	
	White board
	Window treatments

GROUP 2 EQUIPMENT (MOVEABLE)	
	(1)flexible conference table -sectional, (10) task chairs,
OTHER COMMENTS AND SPECIAL NOTES	
	ADA accessible

HOTELING OFFICES - 102

SPACE PROGRAM	
General Space Description:	Office
Actual SF Area:	150
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Front entry of Community program
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	One (1) 5’-4”x5’-4”
Doors:	One (1) 3’-0” x 7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet; 6’-0” broadloom roll or carpet tile is acceptable.
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Acoustical Ceiling Tile
Ceiling Height:	12’-0”
Acoustics:	Provide an acoustical environment conducive for office occupancy. There should be sufficient sound isolation to provide adequate speech privacy and avoid disruptive noise intrusion. Provide sufficient acoustical finishes to avoid noise build-up and to provide good speech intelligibility. Avoid undesirable acoustical effects such as flutter echo. Mitigate HVAC noise to result in an appropriate background sound level. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	(1) Fourplex outlet per workstation and (1) duplex outlet per wall
Lighting:	See Narrative
Phone Data:	(2) Voice (2) Data (1) Coaxial cable
GROUP 1 EQUIPMENT (FIXED)	
	Window treatments
GROUP 2 EQUIPMENT (MOVEABLE)	
	(1) Desk, (1) task chair, (3) guest chairs, Filing Cabinets, bookshelf, Small conf table
OTHER COMMENTS AND SPECIAL NOTES	
1. ADA accessible	

MAIL ROOM - 103

SPACE PROGRAM	
General Space Description:	Storage and work space to support residential mail needs
Actual SF Area:	300
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Entry
Must be near to:	Other community space
ARCHITECTURAL CHARACTERISTICS	
Windows:	Customer/ Student access window with roll down shutter
Doors:	Two (2) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Sealed concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	not required
Ceiling Height:	
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	See Narrative
Lighting:	See Narrative
Phone Data:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
	Mailboxes and Package Storage for 412 individual residential units, plus staff
	Work Counter
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

STORAGE - 104

SPACE PROGRAM	
General Space Description:	Storage for Residential and Building Staff
Actual SF Area:	150
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Offices Mail Room, Breakout Rooms
Must be near to:	Other community space
ARCHITECTURAL CHARACTERISTICS	
Windows:	not required
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Sealed concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	not required
Ceiling Height:	
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	See Narrative
Lighting:	Surface mounted fluorescent fixture with T8 lamps, Occupancy sensor
Phone Data:	Not required
GROUP 1 EQUIPMENT (FIXED)	
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

BREAK OUT ROOMS - 105

SPACE PROGRAM	
General Space Description:	Office/Meeting
Actual SF Area:	80
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Garage
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	Desired
Doors:	One (1) 3’-0” x 7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet; 6’-0” broadloom roll or carpet tile is acceptable.
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Acoustical Ceiling Tile
Ceiling Height:	9’-0” min
Acoustics:	Provide an acoustical environment conducive for office occupancy. There should be sufficient sound isolation to provide adequate speech privacy and avoid disruptive noise intrusion. Provide sufficient acoustical finishes to avoid noise build-up and to provide good speech intelligibility. Avoid undesirable acoustical effects such as flutter echo. Mitigate HVAC noise to result in an appropriate background sound level. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	(1) Fourplex outlet per workstation and (1) duplex outlet per wall
Lighting:	See Narrative
Phone Data:	(2) Voice (2) Data (1) Coaxial cable
GROUP 1 EQUIPMENT (FIXED)	
	White board
	Window treatments
	Full AV/Projection capability

GROUP 2 EQUIPMENT (MOVEABLE)	
	(1) conf table, (4) task chairs, bookshelf
	Full AV/Projection capability
OTHER COMMENTS AND SPECIAL NOTES	
	ADA accessible

C STORE/COFFEE - 106

SPACE PROGRAM	
General Space Description:	Shell space - University to come in and fit-out for the residential community
Actual SF Area:	1500
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Main circulation path of the residential and public community; exterior courtyard
Must be near to:	Recreation (if located in different buildings)
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall - transparency between interior and exterior
Doors:	3'-0" x 7'-0" Alum Storefront
Floor:	Sealed Concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Acoustical Ceiling Tile
Ceiling Height:	12'-0"
Acoustics:	Provide sufficient acoustical isolation between food and adjacent occupied spaces to avoid disruption. Avoid locating coffeehouse near quieter residential areas. Mitigate HVAC noise to provide an appropriate background sound level for the space. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	Per Code - Gas and Water connections to proposed equipment.
Electrical:	Provide a 100 amp, 208/120V, 3 phase, 4 wire, 42 circuit, main breaker panel dedicated to the Coffeehouse. Provide (1) Duplex outlet minimum every 10' linear feet along perimeter walls and outlets as required for A/V equipment and gaming.
Lighting:	Coffeehouse shall be illuminated with a combination of recessed down lights and decorative pendants. Provide dual level switching or dimming. Provide ceiling mounted occupancy sensors for time control.
Phone Data:	(3) voice (3) data (1) Coaxial cable plus (4) WAP
GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV and gaming
	Window treatments to match Phase 1

GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables, Tables and chairs
OTHER COMMENTS AND SPECIAL NOTES	
	Good visibility and sight-lines to the main circulation pathways of the residential community

MAKER GARAGE SPACE - 107

SPACE PROGRAM	
General Space Description:	Central Garage Space at main level
Actual SF Area:	14,900
	Contains combination of flexible and fixed elements to facilitate working, making, collaboration
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Entry to clusters, pods and lofts, Circulation, Lobby, Exterior space
Must be near to:	Must be central to the floor to build community
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall
Doors:	
Floor:	Concrete
Base:	none
Wall:	Painted (eggshell) impact resistant drywall, plywood,
Ceiling:	Exposed, Custon Treatment in 20% (lounge / kitchen areas)
Ceiling Height:	Exposed, min 16'-0"
Acoustics:	Provide acoustical environment conducive to working, lounging, studying, and small group meetings.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	near kitchens
Electrical:	See Narrative
Lighting:	See Narrative
Phone Data:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV, work and gaming
	Coaxial cable
	Display area on walls for student projects is desired
	Window treatments
	Water a several locations

GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables, Tables and chairs
	flexible meeting furniture, flexible work furniture (art/engineering benches)
OTHER COMMENTS AND SPECIAL NOTES	
	Space is to be Flexible and will be developed further in Schematic Design
	Allow in budget for 30% closed space (office/lounge), 70% open
	Provide allowance of $10/SF for Group 1 flexible, moveable wall/display system

BIKE STORAGE - 112

SPACE PROGRAM	
General Space Description:	Storage for Residents bikes
Actual SF Area:	800
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Exterior
Must be near to:	Other community space
ARCHITECTURAL CHARACTERISTICS	
Windows:	not required
Doors:	two (2) 3’-0” x 7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Sealed concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall, wall protection
Ceiling:	not required
Ceiling Height:	min 12’-0”
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	See Narrative
Lighting:	Surface mounted fluorescent fixture with T8 lamps, Occupancy sensor
Phone Data:	Not required
GROUP 1 EQUIPMENT (FIXED)	
	Stackable Bike storage for 100 Bikes
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

RD I BEDROOM APARTMENT - 200

SPACE PROGRAM	
General Space Description:	Fully accessible Resident Director Apartment with LR, Kitchen, eating area, bedroom and bathroom
Area	850 (+/-)
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Staff Areas
Must be near to:	Public entry
ARCHITECTURAL CHARACTERISTICS -	
Windows:	for each living space
Doors:	3'-0"x7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet tile, VCT in kitchen, Cer Tile in bath
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Painted impact resistant drywall
Ceiling Height:	9'-0" min or exposed (loft feel)
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, laundry facilities and building services. See acoustical narratives for specific requirements.
ARCHITECTURAL CHARACTERISTICS - KITCHEN	
Windows:	None
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Hollow Metal frame, Wood door
Floor:	Tile; Terrazzo shower pan preferred
Base:	Tile, if applicable
Wall:	Tile; Moisture resistant drywall
Ceiling:	Painted; Moisture resistant drywall
Ceiling Height:	7'-8"
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied spaces. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.

ENGINEERING SYSTEM - RA BEDROOM	
HVAC:	Packaged Terminal Air Conditioner Heat Pump
Plumbing:	NA
Electrical:	Min. (1) duplex outlet at desk and (1) duplex outlet per wall
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a “welcoming, home feeling” while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
ENGINEERING SYSTEMS	
HVAC:	See Narrative
Plumbing:	See Narriative
Electrical:	See Narrative’
Lighting:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
Bedroom	Two (2) Hanger Rods - One at 4’-0” AFF and One at 7’-0” AFF
Kitchen	Stove, Oven, Hood, Microwave, Refirgerator,Dishwasher, upper and lower wood cabinets
Bathroom	Mirror, Under sink built-in storage, Accessibility accessories, Towel hooks or bar
	provide in-uit washer dryer
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

RD 2 BEDROOM APARTMENT - 201

SPACE PROGRAM	
General Space Description:	Fully accessible Resident Director Apartment with LR, Kitchen, eating area, 2 bedrooms and bathroom
Area	950 (+/-)
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Staff Areas
Must be near to:	Public entry
ARCHITECTURAL CHARACTERISTICS -	
Windows:	for each living space
Doors:	3’-0”x7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet tile, VCT in kitchen, Cer Tile in bath
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Painted impact resistant drywall
Ceiling Height:	9’-0” min or exposed (loft feel)
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, laundry facilities and building services. See acoustical narratives for specific requirements.
ARCHITECTURAL CHARACTERISTICS - KITCHEN	
Windows:	None
Doors:	One (1) 3’-0” x 7’-0”; Solid core, Flush, Hollow Metal frame, Wood door
Floor:	Tile; Terrazzo shower pan preferred
Base:	Tile, if applicable
Wall:	Tile; Moisture resistant drywall
Ceiling:	Painted; Moisture resistant drywall
Ceiling Height:	7’-8”
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied spaces. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.

ENGINEERING SYSTEM - RA BEDROOM	
HVAC:	Packaged Terminal Air Conditioner Heat Pump
Plumbing:	NA
Electrical:	Min. (1) duplex outlet at desk and (1) duplex outlet per wall
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a “welcoming, home feeling” while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
ENGINEERING SYSTEMS	
HVAC:	See Narrative
Plumbing:	See Narriative
Electrical:	See Narrative’
Lighting:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
Bedroom	Two (2) Hanger Rods - One at 4’-0” AFF and One at 7’-0” AFF
Kitchen	Stove, Oven, Hood, Microwave, Refirgerator,Dishwasher, upper and lower wood cabinets
Bathroom	Mirror, Under sink built-in storage, Accessibility accessories, Towel hooks or bar
	provide in-uit washer dryer
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

DOUBLE BEDROOM

SPACE PROGRAM	
General Space Description:	Double Bedroom with handicap accessibility
Actual SF Area:	160 min, Ave 180 ASF for total of doubles and Singles
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Double Bedroom
Must be near to:	ADA Bathroom
ARCHITECTURAL CHARACTERISTICS	
Windows:	One (1) min 5'-4"x5'-4"
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet Tile
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Exposed construction or Painted impact resistant drywall
Ceiling Height:	minimum 9'-0"
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, from laundry facilities, and building services. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	Min. (1) fourplex outlet at each desk and (1) duplex outlet per wall. All receptacles shall be located so they meet ADA requirements and are easily accessible.
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a "welcoming, home feeling" while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
GROUP 1 EQUIPMENT (FIXED)	
	Window treatments

GROUP 2 EQUIPMENT (MOVEABLE)	
	Two (2) Beds
	Six (6) Under bed stackable storage drawers
	Two (2) Desks
	Two (2) Chairs
	Two (2) Wardrobes
OTHER COMMENTS AND SPECIAL NOTES	

SINGLE BEDROOM

SPACE PROGRAM	
General Space Description:	Single Bedroom with handicap accessibility
Actual SF Area:	120 min, Ave 180 ASF for total of doubles and Singles
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Double Bedrooms
Must be near to:	ADA Bathroom
ARCHITECTURAL CHARACTERISTICS	
Windows:	One (1) min 5'-4"x5'-4"
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet Tile
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Exposed construction or Painted impact resistant drywall
Ceiling Height:	minimum 9'-0"
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, from laundry facilities, and building services. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	Min. (1) fourplex outlet at each desk and (1) duplex outlet per wall. All receptacles shall be located so they meet ADA requirements and are easily accessible.
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a "welcoming, home feeling" while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
GROUP 1 EQUIPMENT (FIXED)	
	Window treatments

GROUP 2 EQUIPMENT (MOVEABLE)	
	One (1) Bed
	Three (3) Under bed stackable storage drawers
	One (1) Desk
	One (1) Chair
	One (1) Wardrobes
OTHER COMMENTS AND SPECIAL NOTES	

LIVING ROOM

SPACE PROGRAM	
General Space Description:	Living Room for cluster of 32 students and 1 RA
Actual SF Area:	700
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Entry to cluster, Living Room Storage, Laundry
Must be near to:	Must be central to the cluster
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall
Doors:	Depending on layout there could be two entries: Two (2) 3'-0"x7'-0"; Solid core, Flush, Metal frame, Wood or Metal door with mag hold openers and Card Reader (main entry) and One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood or Metal door with Card Reader. Glazed doors are preferred if allowed by code.
Floor:	Carpet Tile
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Wood ceiling
Ceiling Height:	9'-0"
Acoustics:	Provide acoustical environment conducive to lounging, studying, and small group meetings. Locate living room so as to avoid disturbing student bedrooms. Provide sufficient acoustical finishes to control noise build-up within the space and to facilitate multiple groups holding conversations at once. Avoid undesirable acoustical effects such as flutter echo. Consider televisions, etc. regarding their impact on nearby spaces. Mitigate HVAC noise to provide an environment that is appropriate for the room's use. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Split system heat pump, with roof mounted condenser and closet mounted fcu
Plumbing:	N/A
Electrical:	(1) duplex outlet minimum every 10' along the perimeter walls. Provide a duplex outlet at 6" below ceiling at every television location.
Lighting:	Living Rooms shall be illuminated with dimmable recessed, fluorescent down lights. Provide dimmable fluorescent pendants over the coffee table area. Fixture selection should be made so that the room feels "homey" and comfortable for the residents, not institutional.
Phone Data:	(2) Voice (2) data plus (2) WAP

GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV and gaming
	Coaxial cable
	Display area on walls for student projects is desired
	Window treatments to match Phase 1
GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables, Tables and chairs
OTHER COMMENTS AND SPECIAL NOTES	
	Do not position bedrooms adjacent to the living room.

LIVING ROOM

SPACE PROGRAM	
General Space Description:	Living Room for cluster of 32 students and 1 RA
Actual SF Area:	700
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Entry to cluster, Living Room Storage, Laundry
Must be near to:	Must be central to the cluster
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall
Doors:	Depending on layout there could be two entries: Two (2) 3'-0"x7'-0"; Solid core, Flush, Metal frame, Wood or Metal door with mag hold openers and Card Reader (main entry) and One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood or Metal door with Card Reader. Glazed doors are preferred if allowed by code.
Floor:	Carpet Tile
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Wood ceiling
Ceiling Height:	9'-0"
Acoustics:	Provide acoustical environment conducive to lounging, studying, and small group meetings. Locate living room so as to avoid disturbing student bedrooms. Provide sufficient acoustical finishes to control noise build-up within the space and to facilitate multiple groups holding conversations at once. Avoid undesirable acoustical effects such as flutter echo. Consider televisions, etc. regarding their impact on nearby spaces. Mitigate HVAC noise to provide an environment that is appropriate for the room's use. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Split system heat pump, with roof mounted condenser and closet mounted fcu
Plumbing:	N/A
Electrical:	(1) duplex outlet minimum every 10' along the perimeter walls. Provide a duplex outlet at 6" below ceiling at every television location.
Lighting:	Living Rooms shall be illuminated with dimmable recessed, fluorescent down lights. Provide dimmable fluorescent pendants over the coffee table area. Fixture selection should be made so that the room feels "homey" and comfortable for the residents, not institutional.
Phone Data:	(2) Voice (2) data plus (2) WAP

GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV and gaming
	Coaxial cable
	Display area on walls for student projects is desired
	Window treatments to match Phase 1
GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables, Tables and chairs
OTHER COMMENTS AND SPECIAL NOTES	
	Do not position bedrooms adjacent to the living room.

TYPICAL BATHROOM - 300, 301, 302

SPACE PROGRAM	
General Space Description:	Typical bathroom - See space adjacency diagrams for number and layout
Actual Bathroom SF Area:	Varies, per code
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Bedrooms, modules and lofts
Must be near to:	common areas
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Tile; Terrazzo shower pan preferred
Base:	Tile, if applicable
Wall:	Tile; Moisture resistant drywall
Ceiling:	Painted; Moisture resistant drywall
Ceiling Height:	8'-0" minimum
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied spaces. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Exhaust fan
Plumbing:	Solid surface integral countertop and two (2) sink, Shower, and Toilet
Electrical:	Min (1) GFI duplex outlet
Lighting:	(1) Recessed fluorescent fixture, (1) surface mounted fluorescent fixture over mirror, Occupancy sensor for control. The design-build team shall carefully select appropriate occupancy sensor type and quantity to avoid nuisance shut down of the lights when occupants are in toilet or shower stall. Lighting controls in the bathroom shall be interlocked with the DDC system, to allow a shutdown of the fans delayed from the lighting.
GROUP 1 EQUIPMENT (FIXED)	
Bathroom	Mirror, Solid plastic floor mounted, overhead braced toilet partitions, Four (4) built-in storage cubbies (one for each student and at least 1 cu ft in size each), toilet accessories, towel hooks within changing area
GROUP 2 EQUIPMENT (MOVEABLE)	

OTHER COMMENTS AND SPECIAL NOTES	
	Compartmentalize the sinks, toilet, and shower in the bathroom layout - see space adjacency diagrams

SLEEPING POD - (SINGLE BEDROOM) - 301, 302

Note: intent of the pod is to create a flexible, modular sleeping unit that contains sleeping, study and storage

SPACE PROGRAM	
General Space Description:	Single Bedroom
Actual SF Area:	80-100 SF depending on design
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Within Modular Living Units
Must be near to:	ADA Bathroom
ARCHITECTURAL CHARACTERISTICS	
Windows:	One (1) min 5'-4"x5'-4"
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Sliding Wood door with Card Reader
Floor:	Wood
Base:	Wood
Wall:	Gyp Bd or Wood/ Fire Treated
Ceiling:	Wood/ Fire Treated
Ceiling Height:	minimum 8'-0"
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, from laundry facilities, and building services. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	N/A
Electrical:	Min. (1) fourplex outlet at each desk and (1) duplex outlet per wall. All receptacles shall be located so they meet ADA requirements and are easily accessible.
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a "welcoming, home feeling" while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
GROUP 1 EQUIPMENT (FIXED)	
	Window treatments

GROUP 2 EQUIPMENT (MOVEABLE)	
	One (1) Bed
	Three (3) Under bed stackable storage drawers
	One (1) Desk
	One (1) Chair
	One (1) Wardrobes
OTHER COMMENTS AND SPECIAL NOTES	
	Sleeping Pods are to be expolored and designed in Schematic Design. Intent is to create a flexible, relocatable "pod" for sleeping/studying that, by being compact in space allows remaining residential space to serve a social / maker space.

RA STUDIOS BEDROOM AND BATHROOM - 303

SPACE PROGRAM	
General Space Description:	Fully accessible Resident Assistant bedroom and bathroom
Actual Bedroom SF Area:	110 min
Actual Bathroom SF Area:	45 min
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Residential Space - 3 per floor
Must be near to:	Central to floor layout
ARCHITECTURAL CHARACTERISTICS - RA BEDROOM	
Windows:	One (1) 5’-4”x5’-4”
Doors:	One (1) 3’-0”x7’-0”; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Carpet tile
Base:	Rubber
Wall:	Painted impact resistant drywall
Ceiling:	Painted impact resistant drywall
Ceiling Height:	9’-0”
Acoustics:	Provide acoustical environment comfortable for sleeping and studying, with minimal noise intrusion from adjacent spaces, particularly common areas. Provide noise mitigation for HVAC system, from exterior noise, laundry facilities and building services. See acoustical narratives for specific requirements.
ARCHITECTURAL CHARACTERISTICS - RA BATHROOM	
Windows:	None
Doors:	One (1) 3’-0” x 7’-0”; Solid core, Flush, Hollow Metal frame, Wood door
Floor:	Tile; Terrazzo shower pan preferred
Base:	Tile, if applicable
Wall:	Tile; Moisture resistant drywall
Ceiling:	Painted; Moisture resistant drywall
Ceiling Height:	7’-8”
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied spaces. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.

ENGINEERING SYSTEM - RA BEDROOM	
HVAC:	Packaged Terminal Air Conditioner Heat Pump
Plumbing:	NA
Electrical:	Min. (1) duplex outlet at desk and (1) duplex outlet per wall
Lighting:	Bedroom lighting shall be illuminated with fluorescent lighting. Light fixtures shall provide a "welcoming, home feeling" while being durable to college age students. Light fixtures that provide an institutional feeling are not acceptable. Light fixtures shall be dual level switched or dimmed. Provide ceiling mounted occupancy sensors set so the fixtures must be turned on manually at the light switch to avoid nuisance activation of the lights when a resident is sleeping.
Phone Data:	One (1) voice / (2) data / (1) Coaxial cable
ENGINEERING SYSTEM - RA BATHROOM	
HVAC:	exhaust fan
Plumbing:	Floor drain; Accessible solid surface integral countertop and sink, Shower, and Toilet
Electrical:	Min (1) GFI duplex outlet
Lighting:	(1) Recessed fluorescent fixture, (1) surface mounted fluorescent fixture over mirror, Occupancy sensor for control. Occupancy sensor type and quantity must avoid nuisance shut down of the lights when occupants are in toilet or shower stall. Lighting controls in the bathroom shall be interlocked with the DDC system, to allow a shutdown of the fans delayed from the lighting.
GROUP 1 EQUIPMENT (FIXED)	
Bedroom	Two (2) Hanger Rods - One at 4'-0" AFF and One at 7'-0" AFF
	Window treatments to match Phase 1
Bathroom	Mirror, Under sink built-in storage, Accessibility accessories, Towel hooks or bar
GROUP 2 EQUIPMENT (MOVEABLE)	
Bedroom	One (1) Bed, Three (3) Under bed stackable storage drawers, One (1) Desk, one (1) desk chair, two (2) soft chairs with end table or two (2) seater sofa with coffee table.
OTHER COMMENTS AND SPECIAL NOTES	
	Provide continuous shelf above hanger rod and entry door at 7'-6" above finish floor
	Combination bathtub/shower is preferred in RA rooms if allowable by code.

SHARED KITCHEN - 304

Note - requirements apply to all residenital kitchens -2 per floor shared, 1 per loft, and one per modular and garage. See space adjacency diagrams.	
SPACE PROGRAM	
General Space Description:	Kitchen fully accessible to the greater community and for floor programing in the Semi Suites, also applies to Loft and Modular Kitchens
Actual SF Area:	150 SF, larger for modular
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Maker spaces
Must be near to:	Other community space
ARCHITECTURAL CHARACTERISTICS	
Windows:	Yes, or view to adjacent spaces, depending on layout.
Doors:	not required
Floor:	Sealed concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Painted (eggshell) impact resistant drywall
Ceiling Height:	minimum 9'-0"
Acoustics:	Separate from quieter residential areas, particularly sleeping areas. Provide adequate sound isolation to avoid disruption to nearby occupied spaces. Consider use of acoustical finishes to control noise build-up. Mitigate noise generated by HVAC and/or food preparation equipment. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	Kitchen Sink with food grinder, Dishwasher
Electrical:	(1) GFI Duplex outlet per wall and additional electrical connection for appliances listed below
Lighting:	Kitchen and food preparation areas shall be illuminated with enclosed recessed lighting fixtures utilizing T5 or T8 lamps. Provide switching to allow dual level lighting.
Phone Data:	(3) Voice (3) Data
GROUP 1 EQUIPMENT (FIXED)	
	Kitchen island is desired to maximize counter space
	Kitchen cabinets to be laminate or thermofoil and lockable. Maximize the amount of cabinets.

GROUP 2 EQUIPMENT (MOVEABLE)	
	Appliances - gas powered; commercial grade - Stove, Ventilation Hood, 27 cu ft Refrigerator/Freezer, Oven, Garbage disposal, Dishwasher
OTHER COMMENTS AND SPECIAL NOTES	

MAKER LOUNGE SPACE - 305

SPACE PROGRAM	
General Space Description:	Minii Garage Space on each floor - see garage narrative
Actual SF Area:	900
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Entry to clusters, pods and lofts, Circulation, Laundry, Kitchens
Must be near to:	Must be central to the floor to build community
ARCHITECTURAL CHARACTERISTICS	
Windows:	Curtain wall
Doors:	
Floor:	Concrete/ Carpet Tile in 20% for lounging
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Exposed, Custon Treatment in 20% (lounge/ kitchen areas)
Ceiling Height:	Exposed, min 10'-0"
Acoustics:	Provide acoustical environment conducive to lounging, studying, and small group meetings.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	near kitchens
Electrical:	See Narrative
Lighting:	See Narrative
Phone Data:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
	A/V connections for Cable TV, work and gaming
	Coaxial cable
	Display area on walls for student projects is desired
	Window treatments
GROUP 2 EQUIPMENT (MOVEABLE)	
	Lounge seating and side tables, Tables and chairs
	flexible meeting furniture
OTHER COMMENTS AND SPECIAL NOTES	

LAUNDRY - 307

SPACE PROGRAM	
General Space Description:	Laundry
Actual SF Area:	180
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Maker Lounge Space
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required.
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Hollow metal frame, Wood door
Floor:	Sealed Concrete or Vinyl sheet or tile
Base:	Rubber or Vinyl
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Painted (eggshell) impact resistant drywall
Ceiling Height:	7'-8"
Acoustics:	Provide sufficient sound isolation so that activity in the laundry room is not disruptive to nearby occupied spaces. Locate away from sleeping areas. Consider laundry equipment and piping mounting to avoid noticeable sound or vibration transmission into the building structure. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Gas-Electric Package Unit and exhaust system
Plumbing:	Connections for two (2) washing machines
Electrical:	(1) Duplex outlet per washer and (1) Duplex outlet per dryer
Lighting:	(1) Recessed fluorescent fixture with T8 lamps, Occupancy control
Phone Data:	(1) Voice (1) Data
GROUP 1 EQUIPMENT (FIXED)	
	Counter for folding clothes
	Shelf for storing unclaimed clothes
GROUP 2 EQUIPMENT (MOVEABLE)	
	Two (2) washers and two (2) dryers. Stackable units to be provided
OTHER COMMENTS AND SPECIAL NOTES	

PUBLIC BATHROOM (MEN'S & WOMEN'S) - 400

SPACE PROGRAM	
General Space Description:	Public bathrooms for community spaces
Actual Bathroom SF Area:	240
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Garage
Must be near to:	Community Space
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door
Floor:	VCT; Tile preferred
Base:	Rubber; Tile preferred
Wall:	Painted (eggshell) Moisture resistant drywall; Tile preferred
Ceiling:	Painted (eggshell) Moisture resistant drywall
Ceiling Height:	9'-0" minimum
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied space. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Exhaust system with transfer air from adjacent spaces
Plumbing:	Solid surface integral countertop and sinks, water closets, urinals, quantity as required by code
Electrical:	(2) GFI Duplex outlets near the sinks
Lighting:	Restrooms shall be provided with recessed compact fluorescent down lighting for general lighting. Linear fluorescent, wall mount light fixtures utilizing T5 or T8 lamps shall be provided for vanity lighting over the mirrors. General lighting and mirror lights shall be switched independently. Ceiling mounted occupancy sensors shall be provided for time control. The design-build team shall carefully select appropriate occupancy sensor type and quantity to avoid nuisance shut down of the lights when occupants are in toilet stall. Lighting controls in the bathroom shall be interlocked with the DDC system, to allow a shutdown of the fans delayed from the lighting.
GROUP 1 EQUIPMENT (FIXED)	
	Mirror, Solid plastic floor mounted, overhead braced toilet partitions, Soap dispenser, toilet accessories, Dyson Hand Dryers, Diaper Changing Station

GROUP 2 EQUIPMENT (MOVEABLE)	
	Trash receptacles
OTHER COMMENTS AND SPECIAL NOTES	

PUBLIC BATHROOM (UNISEX) - 401

SPACE PROGRAM	
General Space Description:	Public bathrooms for community spaces
Actual Bathroom SF Area:	56
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Garage
Must be near to:	Community Space
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	One (1) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door
Floor:	VCT; Tile preferred
Base:	Rubber; Tile preferred
Wall:	Painted (eggshell) Moisture resistant drywall; Tile preferred
Ceiling:	Painted (eggshell) Moisture resistant drywall
Ceiling Height:	9'-0" min
Acoustics:	Provide sufficient sound isolation to adjacent spaces so that bathroom activity is not disruptive to nearby occupied space. Consider locations and mountings of plumbing piping to minimize noise transfer to nearby occupied space. See acoustical narratives for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Exhaust system with transfer air from adjacent spaces
Plumbing:	Solid surface integral countertop and sinks, water closets, urinals, quantity as required by code
Electrical:	(2) GFI Duplex outlets near the sinks
Lighting:	Restrooms shall be provided with recessed compact fluorescent down lighting for general lighting. Linear fluorescent, wall mount light fixtures utilizing T5 or T8 lamps shall be provided for vanity lighting over the mirrors. General lighting and mirror lights shall be switched independently. Ceiling mounted occupancy sensors shall be provided for time control. The design-build team shall carefully select appropriate occupancy sensor type and quantity to avoid nuisance shut down of the lights when occupants are in toilet stall. Lighting controls in the bathroom shall be interlocked with the DDC system, to allow a shutdown of the fans delayed from the lighting.
GROUP 1 EQUIPMENT (FIXED)	
	Mirror, Solid plastic floor mounted, overhead braced toilet partitions, Soap dispenser, toilet accessories, Dyson Hand Dryers, Diaper Changing Station

GROUP 2 EQUIPMENT (MOVEABLE)	
	Trash receptacles
OTHER COMMENTS AND SPECIAL NOTES	

TRASH DEPOSIT ROOM - 402

SPACE PROGRAM	
General Space Description:	A Trash Room on the ground level will house a dumpster and recycling bins. On the upper level, the trash room area shall consist of a small area for trash and the collection of recyclables.
Actual SF Area:	80
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	One (1) 3'-0"x7'-0"; Flush, Hollow metal frame, Hollow Metal door
Floor:	Sealed Concrete
Base:	Rubber
Wall:	Painted (eggshell) impact resistant drywall
Ceiling:	Painted (eggshell) impact resistant drywall; ACT
Ceiling Height:	exposed, min 8'-6"
Acoustics:	Provide adequate sound isolation between trash room and nearby occupied spaces. Provide vibration isolation and/or other mitigation measures as necessary to avoid noise and vibration transmission into the building structure. Consider noise generated by moving trash and recycling bins in or out of the room. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Exhaust system
Plumbing:	Hose bib
Electrical:	(1) GFI Duplex outlet
Lighting:	Surface mount vandal resistance gasket fluorescent fixture with T8 lamps listed for wet locations, Occupancy sensor
Phone Data:	(1) voice (1) Data
GROUP 1 EQUIPMENT (FIXED)	
GROUP 2 EQUIPMENT (MOVEABLE)	
	Trash and Recycle bins
OTHER COMMENTS AND SPECIAL NOTES	
	Precautions shall be made so smells from the trash area shall not enter into the interior corridor.

CUSTODIAL CLOSET - 403

SPACE PROGRAM	
General Space Description:	Custodial Closet
Actual Bathroom SF Area:	80
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	
Must be near to:	One per floor / cluster.
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	One (1) 3'-0"x7'-0"; Flush, Hollow metal frame, Hollow Metal door
Floor:	Sealed concrete
Base:	Not required
Wall:	Painted (eggshell) drywall or CMU
Ceiling:	Not required
Ceiling Height:	Exposed
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	Exhaust system
Plumbing:	Mop Sink
Electrical:	(1) GFI Duplex outlet
Lighting:	Industrial style linear fluorescent fixture with T8 lamps and wireguard
GROUP 1 EQUIPMENT (FIXED)	
	Shelf
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	
	Provide one per floor.

BUILDING STORAGE - 404

SPACE PROGRAM	
General Space Description:	Storage to support building activities, housing needs
Actual SF Area:	400
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Building Receiving
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	not required
Doors:	Two (2) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Sealed concrete
Base:	Rubber
Wall:	CMU or Painted (eggshell) impact resistant drywall
Ceiling:	not required
Ceiling Height:	Exposed
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	No system
Plumbing:	N/A
Electrical:	Not required
Lighting:	Surface mounted fluorescent fixture with T8 lamps, Occupancy sensor
Phone Data:	Not required
GROUP 1 EQUIPMENT (FIXED)	
	8' Worksurface, base and overhead cabinets, Metal Storage Racks
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

BUILDING RECEIVING - 405

SPACE PROGRAM	
General Space Description:	Receiving and Loading for Building, incluing food servide
Actual SF Area:	120 (minimum)
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	Exterior loading area
Must be near to:	Building Storage
ARCHITECTURAL CHARACTERISTICS	
Windows:	not required
Doors:	Two (2) 3'-0" x 7'-0"; Solid core, Flush, Metal frame, Wood door with Card Reader
Floor:	Sealed concrete
Base:	Rubber
Wall:	CMU or Painted (eggshell) impact resistant drywall
Ceiling:	not required
Ceiling Height:	Exposed
Acoustics:	
ENGINEERING SYSTEM	
HVAC:	No system
Plumbing:	N/A
Electrical:	Not required
Lighting:	Surface mounted fluorescent fixture with T8 lamps, Occupancy sensor
Phone Data:	Not required
GROUP 1 EQUIPMENT (FIXED)	
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

TRASH COLLECTION ROOM - 406

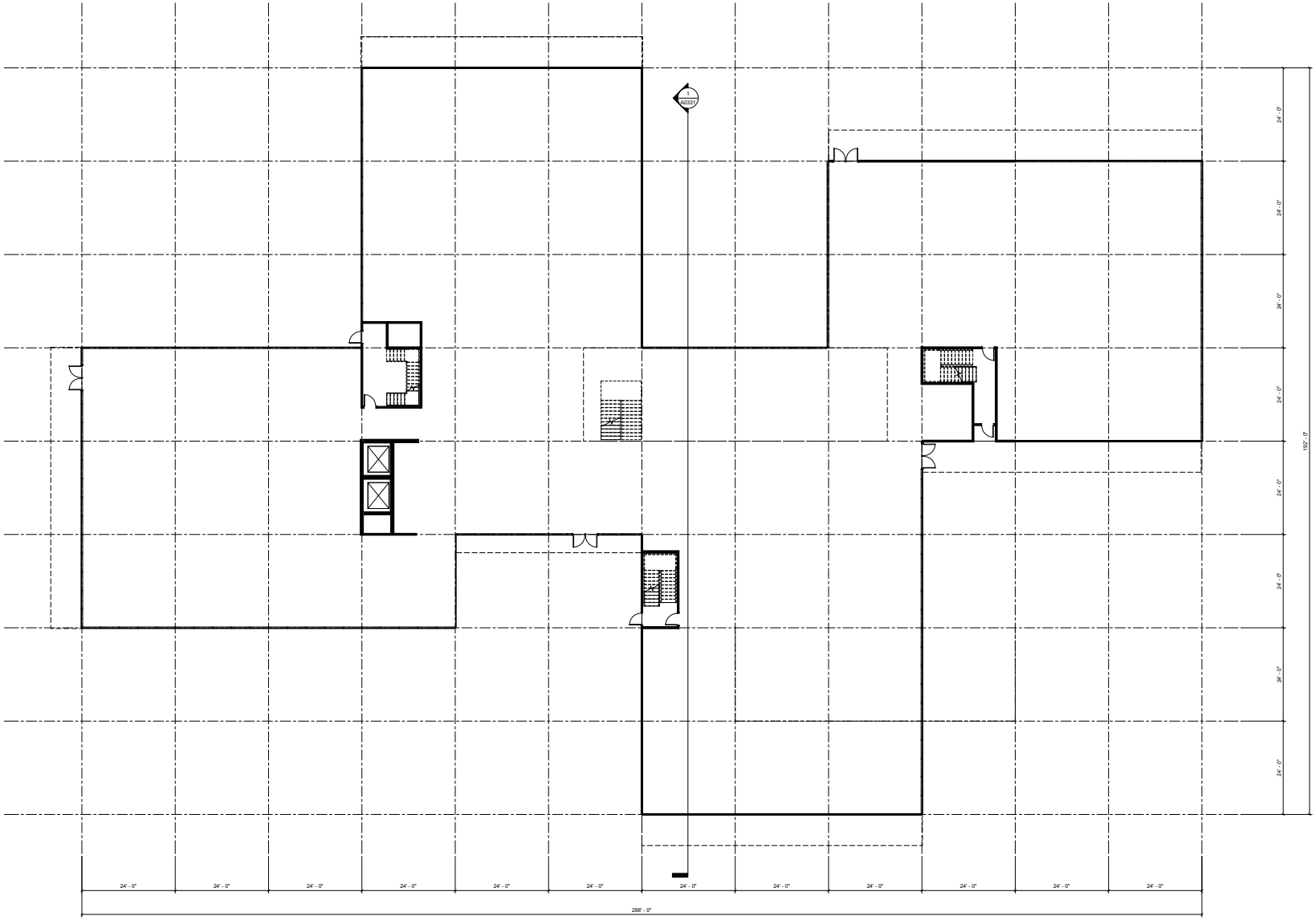
SPACE PROGRAM	
General Space Description:	A Trash Room on the ground level will house a dumpster and recycling bins
Actual SF Area:	240
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	
Must be near to:	
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	Two (2) 3'-0"x7'-0"; Flush, Hollow metal frame, Hollow Metal door, Card reader @ ground level
Floor:	Sealed Concrete
Base:	Rubber
Wall:	CMU or Painted (eggshell) impact resistant drywall
Ceiling:	Painted (eggshell) impact resistant drywall; ACT
Ceiling Height:	min 9'0"
Acoustics:	Provide adequate sound isolation between trash room and nearby occupied spaces. Provide vibration isolation and/or other mitigation measures as necessary to avoid noise and vibration transmission into the building structure. Consider noise generated by moving trash and recycling bins in or out of the room. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	Exhaust system
Plumbing:	Hose bib
Electrical:	(1) GFI Duplex outlet
Lighting:	Surface mount vandal resistance gasket fluorescent fixture with T8 lamps listed for wet locations, Occupancy sensor
Phone Data:	(1) voice (1) Data
GROUP 1 EQUIPMENT (FIXED)	
GROUP 2 EQUIPMENT (MOVEABLE)	
	Dumpster and Recycle bins
OTHER COMMENTS AND SPECIAL NOTES	
	Precautions shall be made so smells from the trash area shall not enter into the interior corridor.

CELL/MECH/ELECT/DATA/ELECT SUPPORT SPACE - 407, 408, 409, 410, 411

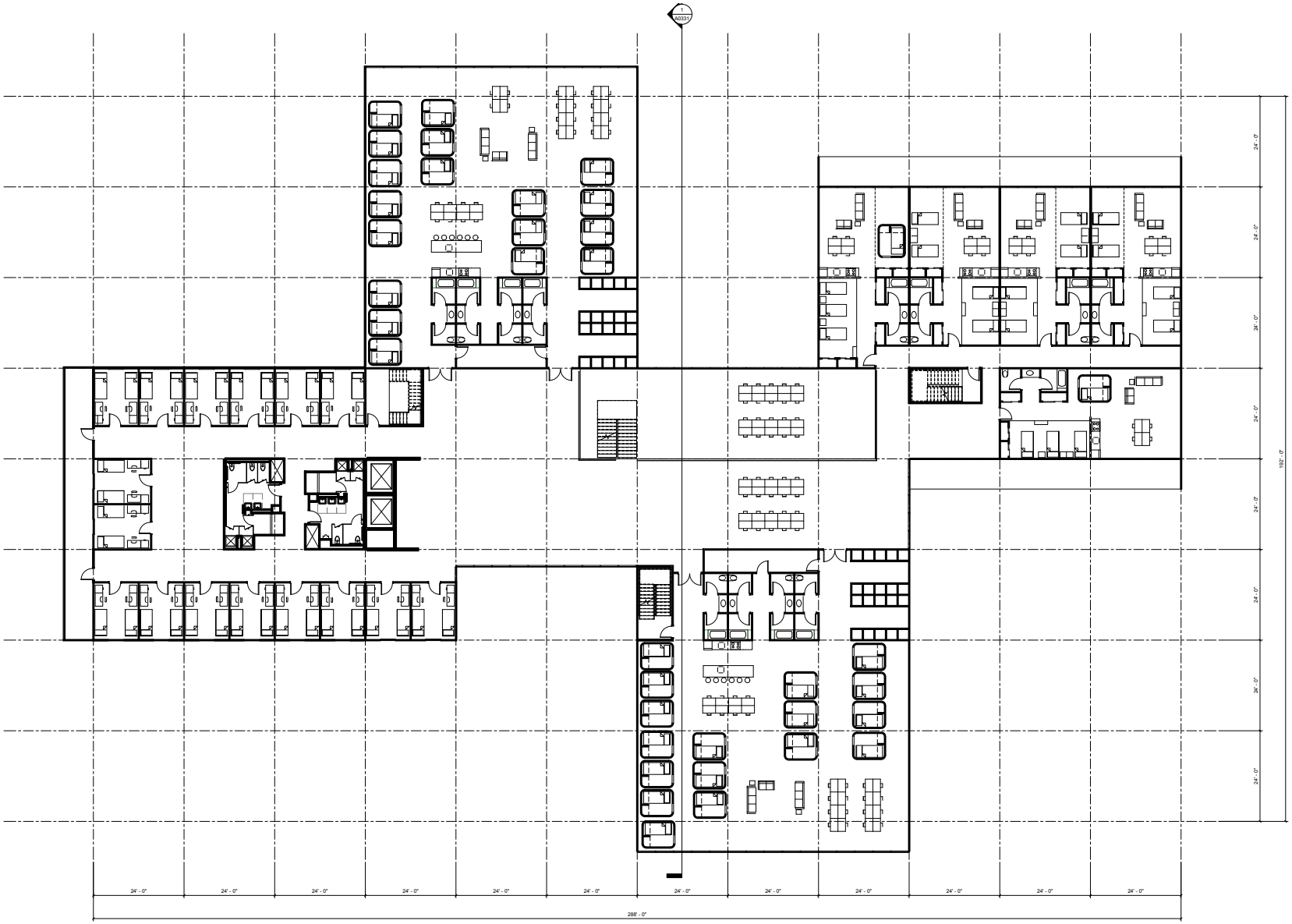
SPACE PROGRAM	
General Space Description:	Requirements for: Tel / Data Rooms, Mech Rooms, Electrical Rooms, and other required support spaces
Actual SF Area:	As Required for equipments and Code clearances
PROXIMITY & ACCESS REQUIREMENTS	
Must be adjacent to:	
Must be near to:	One mech and tel/data, 2 elec per upper floor / cluster. Main Mech and tel / data room services the ground floor.
ARCHITECTURAL CHARACTERISTICS	
Windows:	Not required
Doors:	min: One (1) 3'-0"x7'-0"; Flush, Hollow metal frame, Hollow Metal door
Floor:	Sealed concrete
Base:	Rubber
Wall:	Gyp Bd or CMU, Plywood Backboards as required
Ceiling:	Exposed
Ceiling Height:	Min 9'-0"
Acoustics:	Provide adequate sound isolation in the event that equipment generates noise. Provide acoustical absorption as necessary to reduce noise build-up. See acoustical narrative for specific requirements.
ENGINEERING SYSTEM	
HVAC:	See Narrative
Plumbing:	NA
Electrical:	See Narrative
Lighting:	See Narrative
GROUP 1 EQUIPMENT (FIXED)	
GROUP 2 EQUIPMENT (MOVEABLE)	
OTHER COMMENTS AND SPECIAL NOTES	

ADJACENCY SPACE DIAGRAMS/ TEST FITS

Based on the information compiled during the programming process, the design team took the additional step of creating overall adjacency diagrams and test fits to validate the information contained in Space Program Summary. These diagrams were utilized to develop the building systems analysis in Section 08 and the cost analysis in Section 10 contained in this document.



LEVEL 1 DIAGRAM



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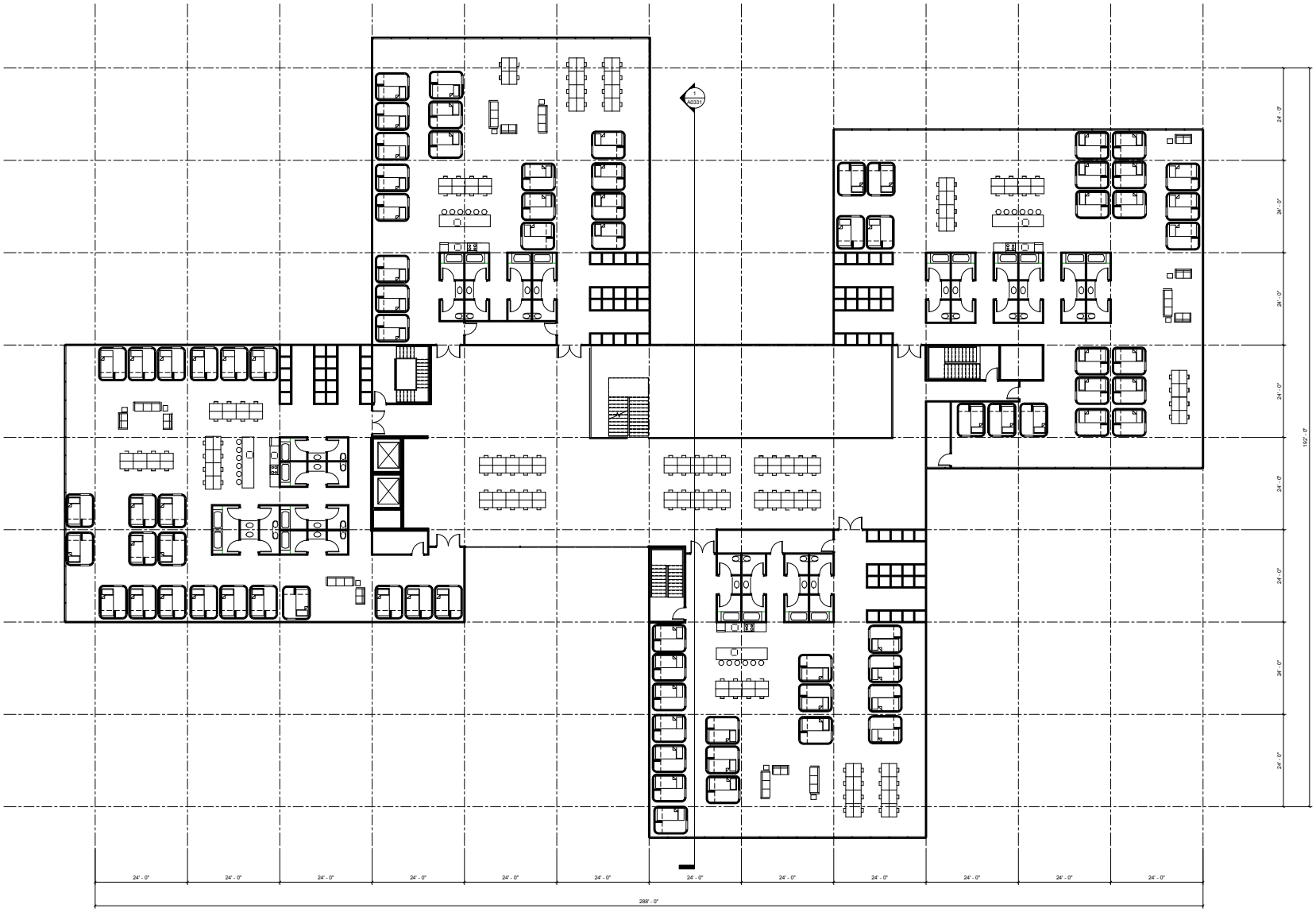
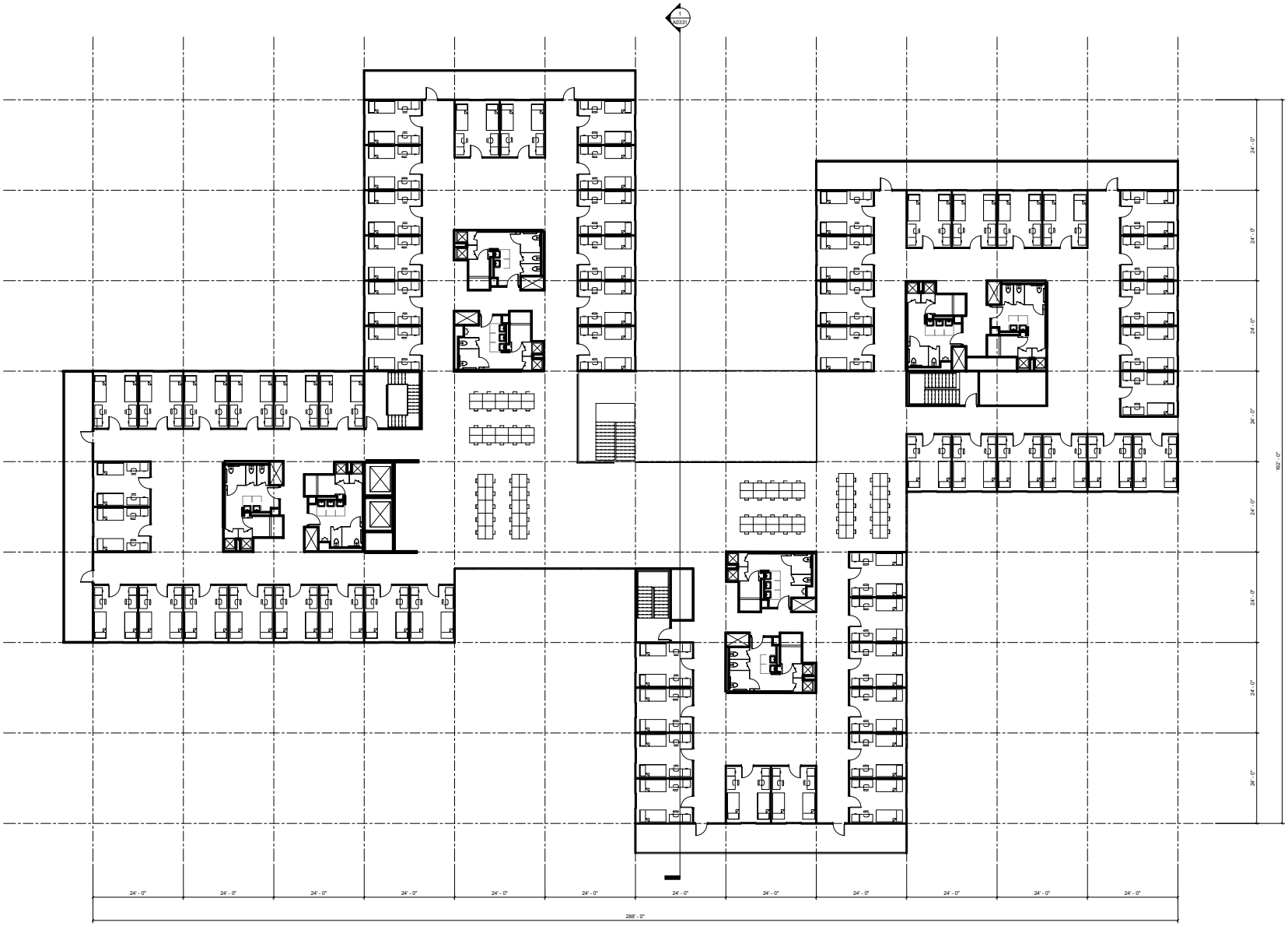
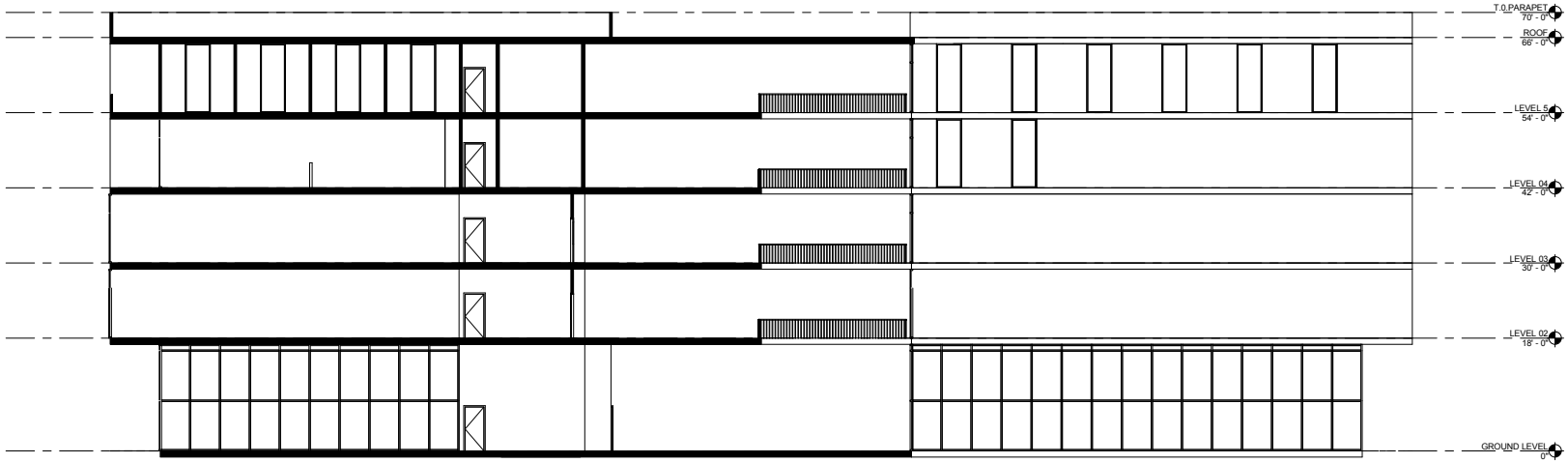


LEVEL 3 DIAGRAM

LEVEL 4 DIAGRAM



LEVEL 5 DIAGRAM


T.O.PARAPET
70' - 0"
ROOF
66' - 0"
LEVEL 5
54' - 0"
LEVEL 04
42' - 0"
LEVEL 03
30' - 0"
LEVEL 02
18' - 0"
GROUND LEVEL
0"

SECTION

06.

PROFORMA

OBJECTIVES AND METHODOLOGY

Brailsford & Dunlavey (B&D) developed a financial model to test the feasibility of the proposed Lassonde Make-Live Center and to establish the rental rates for all proposed unit types. The model analyzes capital costs, projected revenues, operating expenses, and the general economic performance of the development. B&D utilized operating expenses and capital cost assumptions that were provided by the University of Utah Housing and Residential Education and the design team.

The overarching objective of the financial analysis was to develop a right-sized program and capital budget that was fully supported by the revenue generated from the rental units. In addition, additional revenue generated by the rental units is expected to be recycled and used to support the expenses associated with the Garage space and the Lassonde programs and staff that will be part of the Lassonde Make-Live Center in general.

It is important to note that this financial model and analysis represent budget, revenue, and expense assumptions completed to date. As the project enters the design phase, it is expected that future revisions to the overall program, unit mix, construction type, rental rate structure, and operating model will be necessary. As a result, additional revisions to the model are anticipated in order to continue to ensure project feasibility and performance.

METHODOLOGY

The model includes a ten-year operating pro forma showing all operating revenues, operating expenses, debt service, and reserve transfers.

CAPITAL COSTS AND DEBT SERVICE

The proposed project is composed of the following elements and will service its debt based upon the projected overall costs and financing assumptions:

- Construction of 412 residential beds targeted to undergraduate students
  - Total project cost (including financing fees): $40,546,000
  - Portion of project that is debt-financed: $27,546,000
  - Anticipated fund-raising contribution: $13,000,000
  - Total cost per bed: $98,000
  - Total project gross square feet: 152,029
  - Total gross square feet per bed: 369

The model assumes that 68% of the total project cost will be debt-financed, with the balance of the capital budget to be funded through donations. Debt-financing assumptions include a debt term of 30 years and a fixed interest rate of 4.00%. Capitalized interest is expected to service interest-only debt payments during construction and the first 6 months of operation, with regular principal and interest payments beginning in Year 2 of the model.

REVENUES

The revenues listed in the model are generated primarily from room rentals during the fall and spring semesters. Room rates are based upon a 10% premium that is applied to anticipated rates for on-campus housing in Fall 2016. The following rental rate structure was used within the model (shown in 2016 $s):

- $5,788 per bed, per year for a double-occupancy bedroom in a traditional room
- $7,072 per bed, per year for a single-occupancy bedroom in a traditional room
- $8,323 per bed, per year for a single-occupancy bedroom in a modular unit
- $9,111 per bed, per year for a single-occupancy bedroom in a modular/loft unit

B&D assumed additional revenue would be generated for the summer months based upon a 20% occupancy rate and a 3-month rental term for the project. Also, B&D assumed an additional $100 per bed would be included, derived from the following categories:

- Recovery/damage fees
- Commissions/fees
- Interest earned
- Recovery of expenditures
- Miscellaneous revenues

The occupancy rate for the project is assumed to be 95% at opening. All project revenues are inflated at 4% annually for the first two years and 3% annually for all subsequent years.

EXPENSES

B&D calculated expenses on a per-bed basis based upon an expense budget provided by Housing and Residential Education. The expense budget included the following categories:

Housing Non-Personnel Expenses

These expenses include costs that are attributable to the operation of the housing portion of the building only. Categories include:

- Maintenance and supplies
- Telecommunications
- Utilities
- Other expense

Garage Non-Personnel Expenses

These expenses include costs that are attributable to the operation of the Garage portion of the building only. Categories include:

- Maintenance and supplies
- Telecommunications
- Utilities

Lassonde Program Personnel Expenses

These expenses include costs that are attributable to personnel costs associated with offering the range of programs that will be included in the project. Costs include both professional staff and the Resident Assistant staff under the following categories:

- Resident Assistant rent compensation
- Wages
- Benefits

Lassonde Program Non-Personnel Expenses

These expenses include costs that are attributable to non-personnel costs associated with offering the range of programs that will be included in the project. Costs are included under the following categories:

- Maintenance and supplies
- Telecommunications
- Programming
- Other

Expenses are inflated at 4% annually for all subsequent years.

In addition, a repair and replacement transfer line item has been included in the model and is subordinated to the debt service payment. This transfer is calculated at $175 per bed annually and is inflated at 4% per year.

SUMMARY

Based upon the above assumptions, there is significant cash flow available from the housing units that can be recycled to support the Garage space and the Lassonde programs that will be offered.

Table O4.1 displays the net operating income after housing expenses, the cash flow available for Garage and Lassonde Program expenses following debt service and reserve transfers, and the total cash flow after all anticipated operating and program expenses and debt service.

To see the model in its entirety, please see the financial model on the following pages.

Fiscal Year	NOI After Housing Expenses	Cash Flow Available For Programs	Cash Flow After All Expenses and Debt Service
2016/2017	$2,382,000	$1,100,000	$329,000
2017/2018	$2,476,000	$808,000	$6,000
2018/2019	$2,519,000	$848,000	$15,000
2019/2020	$2,588,000	$914,000	$48,000
2020/2021	$2,661,000	$984,000	$86,000
2021/2022	$2,735,000	$1,055,000	$123,000
2022/2023	$2,813,000	$1,130,000	$161,000
2023/2024	$2,892,000	$1,205,000	$199,000
2024/2025	$2,973,000	$1,282,000	$237,000
2025/2026	$3,056,000	$1,361,000	$277,000

TABLE O4.1 | DEBT COVERAGE RATIO

University of Utah
Lassonde Living and Learning Center
Financial Analysis

DRAFT 1/18/2014

DEVELOPMENT SUMMARY

1. Unit Types	Number of Units	Beds/Unit	Total Beds	Proposed Rent/Person/Year (9 months) (2016 $s)
Upperclassmen Modular/Lofts	80	1	80	$9,200
Upperclassmen Modular	80	1	80	$8,400
Traditional Single	64	1	64	$7,100
Traditional Double	176	1	176	$5,900
RA Studio	12	1	12	$0
Total	**412**		**412**	

2. Building Size (Residential)	
Net Square Footage	109,647
Core & Circulation	37,513
Total (Housing)	**147,160**
Total Square Footage/Bed	*357*

3. Project Cost	
Hard Costs	$31,889,966
Soft Costs	$9,178,000
Financing Costs	$1,727,000
Total Project Cost	**$42,794,966**
Total Cost/Bed	*$104,000*
Fundraising/Equity	$13,000,000
Project Cost (Debt-Financed)	**$29,794,966**
`	*$72,000*

4. Operating Assumptions (Housing)	
Stabilized Occupancy (Academic Year - Year 3)	95.0%
Annual Revenue Inflation (including rental rates)	4%
Annual Expense Inflation	4%
Occupancy	Aug-16

5. Financing Assumptions (Housing)	
Amount to be Financed	$29,794,966
Debt Term (years)	30
Interest Rate	4.75%
Debt Coverage Ratio (Year 1)	1.73

Project Outline Program - Residence Hall

Space	Unit SF	Quantity	Total SF	Occupants/Unit	Total Occupants
Residential Units					
Upperclassmen Modular/Lofts	220	80	17,600	1	80
Upperclassmen Modular	200	80	16,000	1	80
Traditional Single	180	64	11,520	1	64
Traditional Double	180	176	31,680	1	176
RA Studio	150	12	1,800	1	12
Residential Director Apartment	900	2	1,800		
Residential Shared Space					
Shared Kitchens	150	8	1,200	**Total**	**412**
Make Space/Floor Lounge	900	4	3,600		
Laundry Room	180	4	720		
Garage Community Space					
Community Space					
Entry and Lobby Area	800	1	800		
Pitch / Multimedia Room	240	2	480		
Director Hotel Offices	150	2	300		
Mail Room	300	1	300		
Storage	150	1	150		
Breakout Rooms	80	4	320		
Food Venue					
C-Store / Coffee Shop	1,500	1	1,500		
Maker Space					
Garage Space	14,900	1	14,900		
Support					
Bike Storage	800	1	800		
Support Space					
Public Support Space					
Public Bathrooms	240	2	480		
Public Bathrooms (Unisex)	56	2	112		
Trash Deposit Rooms	80	5	400		
Building Support Space					
Custodial Closets/JC	80	5	400		
Building Storage	400	1	400		
Loading/Receiving	120	1	120		
Mechanical Rooms/Trash					
Trash Collection Room	240	1	240		
Cell Phone Ant	100	1	100		
Mechanical Rooms	80	5	400		
Tel/Data Closets	45	5	225		
Electrical Room	80	10	800		
Main Mechanical/Electrical Room	500	1	500		
Total Net Square Footage			**109,647**		
Building Core & Circulation at Efficiency of		**74.5%**	**37,513**	40982	
Gross Square Footage			**147,160**		
Total Quantity of Occupants (Beds)			**412**		
Square Footage Per Occupant (Bed)			**357**		

Total Gross Square Footage: 147,160

Project Budget - Housing

Hard Costs		
	Building Construction Contract	
	A. Sitework & Demolition	$1,431,244
	B. Enclosed Building	$26,118,094
	C. General Conditions	$1,377,467
	D. Overhead & Profit	$964,227
	E. Design Contingency	$1,754,934
	F. Parking	$244,000
	Subtotal - Hard Costs	**$31,889,966**
Soft Costs		
	Architectural & Engineering Fees	$3,135,000
	Preliminary Costs (Planning, Survey, Geotech, etc.)	$650,000
	Cell Phone Antenna System	$294,000
	Testing & Inspection Costs	$319,000
	DFCM Management	$65,000
	User Fees	$200,000
	Commissioning	$150,000
	Furniture, Fixtures & Equipment	$1,500,000
	Project Contingency	$2,865,000
	Project Administration/Development Fees	$0
	Subtotal - Soft Costs	**$9,178,000**
Financing Costs		
	Cost of Issuance / Issuer Fees / Insurance Premium	$250,000
	Capitalized Interest Fund (CIF)	$1,800,000
	Interest Earned	($323,000)
	Subtotal - Financing Costs	**$1,727,000**
Project Equity		
	Lassonde Contribution	$7,000,000
	Additional Contributions	$6,000,000
	Total Project Cost	**$42,794,966**
	Total Project Cost / Bed	**$104,000**
	Total Debt Financed Cost	**$29,794,966**
	Total Debt Financed Cost / Bed	**$72,000**

Assumptions:

New Square Footage	147,160
Construction Cost/Square Foot (2011 $s)	$177
Number of Parking Spaces (Surface)	160
F,F&E Cost/Bed	$3,750
Project Contingency	7.5%
Project Management/Development Fees	0.00%
A/E Design Fees	8.00%
Years of Capitalized Interest	1.5

OPERATING PROFORMA

Year of Operations	1	2	3	4	5	6	7	8	9	10
Academic Year	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026
Total Beds	412	412	412	412	412	412	412	412	412	412
Total Square Footage	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160
Rental Rate Inflation	5.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Rental Revenues:										
Unit 1	$681,690	$715,774	$737,316	$766,808	$797,481	$821,405	$846,047	$871,429	$897,571	$924,499
Unit 2	$622,413	$653,533	$673,201	$700,129	$728,135	$749,979	$772,478	$795,652	$819,522	$844,108
Unit 3	$420,897	$441,941	$455,242	$473,451	$492,390	$507,161	$522,376	$538,047	$554,189	$570,814
Unit 4	$961,753	$1,009,841	$1,040,233	$1,081,842	$1,125,116	$1,158,869	$1,193,635	$1,229,444	$1,266,327	$1,304,317
RA Unit Potential Revenue	$70,795	$74,335	$77,308	$80,401	$83,617	$86,125	$88,709	$91,370	$94,111	$96,935
Other Revenues:										
Summer Revenues	$241,723	$251,392	$261,448	$271,906	$282,782	$294,093	$305,857	$318,091	$330,815	$344,047
Bad Debt Revenue Loss	($14,996)	($15,734)	($16,224)	($16,873)	($17,548)	($18,088)	($18,646)	($19,220)	($19,813)	($20,424)
Other	$41,200	$62,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200
Total Revenues:	**$3,025,000**	**$3,193,000**	**$3,270,000**	**$3,399,000**	**$3,533,000**	**$3,641,000**	**$3,752,000**	**$3,866,000**	**$3,984,000**	**$4,105,000**
Housing Non-Personnel Expenses										
Maintenance and Supplies	$151,000	$137,000	$162,000	$168,000	$175,000	$182,000	$189,000	$197,000	$205,000	$213,000
Telecom	$173,000	$180,000	$187,000	$194,000	$202,000	$210,000	$218,000	$227,000	$236,000	$245,000
Utilities	$197,000	$205,000	$213,000	$222,000	$231,000	$240,000	$250,000	$260,000	$270,000	$281,000
Management Fee	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other	$28,000	$29,000	$30,000	$31,000	$32,000	$33,000	$34,000	$35,000	$36,000	$37,000
Total Housing Non-Personnel Expenses	**$549,000**	**$551,000**	**$592,000**	**$615,000**	**$640,000**	**$665,000**	**$691,000**	**$719,000**	**$747,000**	**$776,000**
Net Operating Income	**$2,476,000**	**$2,642,000**	**$2,678,000**	**$2,784,000**	**$2,893,000**	**$2,976,000**	**$3,061,000**	**$3,147,000**	**$3,237,000**	**$3,329,000**
Annual Debt Service	$1,433,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324
Debt Coverage Ratio	**1.73**	**1.40**	**1.42**	**1.48**	**1.54**	**1.58**	**1.63**	**1.67**	**1.72**	**1.77**
R&R Transfer	$0	$0	$0	$0	$75,000	$78,000	$81,000	$84,000	$87,000	$90,000
Return on Lassonde Equity (Cash-On-Cash)	14.9%	10.8%	11.4%	12.9%	13.4%	14.5%	15.7%	16.9%	18.1%	19.4%
Cash Flow Available for Garage and Lassonde Program	1,043,000	759,000	795,000	901,000	935,000	1,015,000	1,097,000	1,180,000	1,267,000	1,356,000
Garage Non-Personnel Expenses										
Maintenance and Supplies	45,000	$27,000	$28,000	$37,000	$38,000	$60,000	$62,000	$64,000	$67,000	$70,000
Telecom	48,000	$50,000	$52,000	$54,000	$56,000	$58,000	$60,000	$62,000	$64,000	$67,000
Utilities	54,000	$56,000	$58,000	$60,000	$62,000	$64,000	$67,000	$70,000	$73,000	$76,000
Total Garage Non-Personnel Expenses	**$147,000**	**$133,000**	**$138,000**	**$151,000**	**$156,000**	**$182,000**	**$189,000**	**$196,000**	**$204,000**	**$213,000**
Lassonde Program Personnel Expenses										
RA Rent Compensation	70,795	74,335	77,308	80,401	83,617	86,125	88,709	91,370	94,111	96,935
Wages	299,000	$311,000	$323,000	$336,000	$349,000	$363,000	$378,000	$393,000	$409,000	$425,000
Benefits	116,000	$121,000	$126,000	$131,000	$136,000	$141,000	$147,000	$153,000	$159,000	$165,000
Total Program Personnel Expenses:	**$485,795**	**$506,335**	**$526,308**	**$547,401**	**$568,617**	**$590,125**	**$613,709**	**$637,370**	**$662,111**	**$686,935**
Lassonde Program Non-Personnel Expenses										
Maintenance and Supplies	26,000	$27,000	$28,000	$43,000	$45,000	$47,000	$49,000	$51,000	$53,000	$55,000
Telecom	2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Programming	79,000	$82,000	$85,000	$118,000	$123,000	$128,000	$133,000	$138,000	$144,000	$150,000
Other	2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000	$2,000
Total Program Non-Personnel Expenses	**$109,000**	**$113,000**	**$117,000**	**$165,000**	**$172,000**	**$179,000**	**$186,000**	**$193,000**	**$201,000**	**$209,000**
Total Cash Flow After Garage and Program Expenses	**$301,000**	**$7,000**	**$14,000**	**$38,000**	**$38,000**	**$64,000**	**$108,000**	**$154,000**	**$200,000**	**$247,000**

OPERATING PROFORMA

REVENUE ASSUMPTIONS

Residential Unit Assumptions:

	Type	Beds/Unit	Grand Total of Beds	Rental Rate Per Month/Bed	Lease Term	Rental Rate Per Semester	Year1 Occupancy	Year2 Occupancy	Year3&Beyond Occupancy
Unit 1	Upperclassmen Modular/Lofts	1	80	$1,022	9	$4,600	95.0%	95.0%	95.0%
Unit 2	Upperclassmen Modular	1	80	$933	9	$4,200	95.0%	95.0%	95.0%
Unit 3	Traditional Single	1	64	$789	9	$3,550	95.0%	95.0%	95.0%
Unit 4	Traditional Double	1	176	$656	9	$2,950	95.0%	95.0%	95.0%
		Beds	412						

Other Revenues Assumptions:

Spring Occupancy Adjustment:	95.0%	(100% - no adjustment)
Summer Occupancy	25.0%	(3 months)
Other/Bed (All Beds):	$100	
Bad Debt Revenue Loss (As % of Rental Revenues)	0.5%	

EXPENSE ASSUMPTIONS

Management Fee (% of gross revenue)	0%
R&R Transfer/Bed	$175.00
Expense Inflation Rate	104%
Management Fee (% of gross revenue)	

Financing Assumptions

Amount to be Financed	$29,794,966
Loan Term (Years)	30
Interest Rate	4.75%

OPERATING PROFORMA

Year of Operations	1	2	3	4	5	6	7	8	9	10
Academic Year	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021	2021/2022	2022/2023	2023/2024	2024/2025	2025/2026
Total Beds	412	412	412	412	412	412	412	412	412	412
Total Square Footage	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160	147,160
Rental Rate Inflation	5.0%	5.0%	4.0%	4.0%	4.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Rental Revenues:										
Unit 1	$681,690	$715,774	$737,316	$766,808	$797,481	$821,405	$846,047	$871,429	$897,571	$924,499
Unit 2	$622,413	$653,533	$673,201	$700,129	$728,135	$749,979	$772,478	$795,652	$819,522	$844,108
Unit 3	$420,897	$441,941	$455,242	$473,451	$492,390	$507,161	$522,376	$538,047	$554,189	$570,814
Unit 4	$961,753	$1,009,841	$1,040,233	$1,081,842	$1,125,116	$1,158,869	$1,193,635	$1,229,444	$1,266,327	$1,304,317
RA Unit Potential Revenue	$70,795	$74,335	$77,308	$80,401	$83,617	$86,125	$88,709	$91,370	$94,111	$96,935
Other Revenues:										
Summer Revenues	$241,723	$251,392	$261,448	$271,906	$282,782	$294,093	$305,857	$318,091	$330,815	$344,047
Bad Debt Revenue Loss	($14,996)	($15,734)	($16,224)	($16,873)	($17,548)	($18,088)	($18,646)	($19,220)	($19,813)	($20,424)
Other	$41,200	$62,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200	$41,200
Total Revenues:	**$3,025,000**	**$3,193,000**	**$3,270,000**	**$3,399,000**	**$3,533,000**	**$3,641,000**	**$3,752,000**	**$3,866,000**	**$3,984,000**	**$4,105,000**
Housing Non-Personnel Expenses										
Maintenance and Supplies	$151,000	$137,000	$162,000	$168,000	$175,000	$182,000	$189,000	$197,000	$205,000	$213,000
Telecom	$173,000	$180,000	$187,000	$194,000	$202,000	$210,000	$218,000	$227,000	$236,000	$245,000
Utilities	$197,000	$205,000	$213,000	$222,000	$231,000	$240,000	$250,000	$260,000	$270,000	$281,000
Mangement Fee	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Other	$28,000	$29,000	$30,000	$31,000	$32,000	$33,000	$34,000	$35,000	$36,000	$37,000
Total Housing Non-Personnel Expenses	**$549,000**	**$551,000**	**$592,000**	**$615,000**	**$640,000**	**$665,000**	**$691,000**	**$719,000**	**$747,000**	**$776,000**
Garage Non-Personnel Expenses										
Maintenance and Supplies	45,000	27,000	28,000	37,000	38,000	60,000	62,000	64,000	67,000	70,000
Telecom	48,000	50,000	52,000	54,000	56,000	58,000	60,000	62,000	64,000	67,000
Utilities	54,000	56,000	58,000	60,000	62,000	64,000	67,000	70,000	73,000	76,000
Total Garage Non-Personnel Expenses	**$147,000**	**$133,000**	**$138,000**	**$151,000**	**$156,000**	**$182,000**	**$189,000**	**$196,000**	**$204,000**	**$213,000**
Lassonde Program Personnel Expenses										
RA Rent Compensation	70,795	74,335	77,308	80,401	83,617	86,125	88,709	91,370	94,111	96,935
Wages	299,000	311,000	323,000	336,000	349,000	363,000	378,000	393,000	409,000	425,000
Benefits	116,000	121,000	126,000	131,000	136,000	141,000	147,000	153,000	159,000	165,000
Total Program Personnel Expenses:	**$485,795**	**$506,335**	**$526,308**	**$547,401**	**$568,617**	**$590,125**	**$613,709**	**$637,370**	**$662,111**	**$686,935**
Lassonde Program Non-Personnel Expenses										
Maintenance and Supplies	26,000	27,000	28,000	43,000	45,000	47,000	49,000	51,000	53,000	55,000
Telecom	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Programming	79,000	82,000	85,000	118,000	123,000	128,000	133,000	138,000	144,000	150,000
Other	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
Total Program Personnel Expenses:	**$109,000**	**$113,000**	**$117,000**	**$165,000**	**$172,000**	**$179,000**	**$186,000**	**$193,000**	**$201,000**	**$209,000**
Total Expenses	**$1,290,795**	**$1,303,335**	**$1,373,308**	**$1,478,401**	**$1,536,617**	**$1,616,125**	**$1,679,709**	**$1,745,370**	**$1,814,111**	**$1,884,935**
Net Operating Income	**$1,734,205**	**$1,889,665**	**$1,896,692**	**$1,920,599**	**$1,996,383**	**$2,024,875**	**$2,072,291**	**$2,120,630**	**$2,169,889**	**$2,220,065**
Annual Debt Service	$1,433,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324	$1,883,324
Debt Coverage Ratio	**1.21**	**1.00**	**1.01**	**1.02**	**1.06**	**1.08**	**1.10**	**1.13**	**1.15**	**1.18**
R&R Transfer	$0	$0	$0	$0	$75,000	$78,000	$81,000	$84,000	$87,000	$90,000
Total Cash Flow After All Expenses	**301,000**	**6,000**	**13,000**	**37,000**	**38,000**	**64,000**	**108,000**	**153,000**	**200,000**	**247,000**

OPERATING PROFORMA

REVENUE ASSUMPTIONS

Residential Unit Assumptions:

	Type	Beds/Unit	Grand Total of Beds	Rental Rate Per Month/Bed	Lease Term	Rental Rate Per Semester	Year1 Occupancy	Year2 Occupancy	Year3&Beyond Occupancy
Unit 1	Upperclassmen Modular/Lofts	1	80	$1,022	9	$4,600	95.0%	95.0%	95.0%
Unit 2	Upperclassmen Modular	1	80	$933	9	$4,200	95.0%	95.0%	95.0%
Unit 3	Traditional Single	1	64	$789	9	$3,550	95.0%	95.0%	95.0%
Unit 4	Traditional Double	1	176	$656	9	$2,950	95.0%	95.0%	95.0%
		Beds	412						

RA Unit Assumptions:

Spring Occupancy Adjustment:	95.0%	(100% - no adjustment)
Summer Occupancy	25.0%	(3 months)
Other/Bed (All Beds):	$ 100.00	
Bad Debt Revenue Loss (As % of Rental Revenues)	0.5%	

EXPENSE ASSUMPTIONS

R&R Transfer/Bed	$175.00
Expense Inflation Rate	104%
Management Fee (% of gross revenue)	0%

Financing Assumptions

Amount to be Financed	$29,794,966
Loan Term (Years)	30
Interest Rate	4.75%

University of Utah
Lassonde Living and Learning Center
Financial Analysis

DEBT SERVICE

Academic Year	Principal	Principal	Coupon	Interest	Total P+I	CIF	Earnings	Net New D/S
2014 / 2015	29,794,966	-	-	-	-	(450,000.00)		-
2015 / 2016	29,794,966	-	-	-	-	(900,000.00)		-
2016 / 2017	29,794,966	468,062.64	4.75%	1,415,260.86	1,883,323.50	(450,000.00)	-	1,433,323.50
2017 / 2018	29,326,903	490,295.61	4.75%	1,393,027.89	1,883,323.50	-	-	1,883,323.50
2018 / 2019	28,836,607	513,584.66	4.75%	1,369,738.85	1,883,323.50	-	-	1,883,323.50
2019 / 2020	28,323,023	537,979.93	4.75%	1,345,343.57	1,883,323.50	-	-	1,883,323.50
2020 / 2021	27,785,043	563,533.97	4.75%	1,319,789.53	1,883,323.50	-	-	1,883,323.50
2021 / 2022	27,221,509	590,301.84	4.75%	1,293,021.66	1,883,323.50	-	-	1,883,323.50
2022 / 2023	26,631,207	618,341.17	4.75%	1,264,982.33	1,883,323.50	-	-	1,883,323.50
2023 / 2024	26,012,866	647,712.38	4.75%	1,235,611.12	1,883,323.50	-	-	1,883,323.50
2024 / 2025	25,365,153	678,478.72	4.75%	1,204,844.78	1,883,323.50	-	-	1,883,323.50
2025 / 2026	24,686,675	710,706.46	4.75%	1,172,617.04	1,883,323.50	-	-	1,883,323.50
2026 / 2027	23,975,968	744,465.01	4.75%	1,138,858.49	1,883,323.50	-	-	1,883,323.50
2027 / 2028	23,231,503	779,827.10	4.75%	1,103,496.40	1,883,323.50	-	-	1,883,323.50
2028 / 2029	22,451,676	816,868.89	4.75%	1,066,454.61	1,883,323.50	-	-	1,883,323.50
2029 / 2030	21,634,807	855,670.16	4.75%	1,027,653.34	1,883,323.50	-	-	1,883,323.50
2030 / 2031	20,779,137	896,314.49	4.75%	987,009.01	1,883,323.50	-	-	1,883,323.50
2031 / 2032	19,882,822	938,889.43	4.75%	944,434.07	1,883,323.50	-	-	1,883,323.50
2032 / 2033	18,943,933	983,486.68	4.75%	899,836.82	1,883,323.50	-	-	1,883,323.50
2033 / 2034	17,960,446	1,030,202.30	4.75%	853,121.20	1,883,323.50	-	-	1,883,323.50
2034 / 2035	16,930,244	1,079,136.91	4.75%	804,186.59	1,883,323.50	-	-	1,883,323.50
2035 / 2036	15,851,107	1,130,395.91	4.75%	752,927.59	1,883,323.50	-	-	1,883,323.50
2036 / 2037	14,720,711	1,184,089.72	4.75%	699,233.78	1,883,323.50	-	-	1,883,323.50
2037 / 2038	13,536,622	1,240,333.98	4.75%	642,989.52	1,883,323.50	-	-	1,883,323.50
2038 / 2039	12,296,288	1,299,249.84	4.75%	584,073.66	1,883,323.50	-	-	1,883,323.50
2039 / 2040	10,997,038	1,360,964.21	4.75%	522,359.29	1,883,323.50	-	-	1,883,323.50
2040 / 2041	9,636,074	1,425,610.01	4.75%	457,713.49	1,883,323.50	-	-	1,883,323.50
2041 / 2042	8,210,464	1,493,326.49	4.75%	389,997.02	1,883,323.50	-	-	1,883,323.50
2042 / 2043	6,717,137	1,564,259.49	4.75%	319,064.01	1,883,323.50	-	-	1,883,323.50
2043 / 2044	5,152,878	1,638,561.82	4.75%	244,761.68	1,883,323.50	-	-	1,883,323.50
2044 / 2045	3,514,316	1,716,393.51	4.75%	166,930.00	1,883,323.50			1,883,323.50
	1,797,922	1,797,922.20	4.75%	85,401.30	1,883,323.50			1,883,323.50
		$29,794,965.53	**-**	**$26,704,739.51**	**$56,499,705.04**	**(1,800,000.00)**		**$56,049,705.04**

07.

CODE CONSIDERATIONS

Applicable Codes
Referenced Standards and Regulations
Building Code Summary

APPLICABLE CODES/ STANDARDS/REGULATIONS

- 2012 International Building Code (IBC)
- 2012 International Fire Code (IFC)
- 2012 International Plumbing Code (IPC)
- 2012 International Mechanical Code (IMC)
- 2011 National Electrical Code (NEC)
- 2009 International Energy Conservation Code (IECC)
- 2009 ANSI/A117.1
- 2010 ADAAG (ADA)
- 2012 International Fuel Gas Code (IFGC)

BUILDING CODE SUMMARY

The Lassonde Make-Live Center will be a new construction project located on the University of Utah campus in Salt Lake City, Utah. Project parameters are as follows: 412 beds, +/-20,000 square feet of garage space, and 152,000 gross square feet.

Site

Centrally located along the north side of the HPER mall; the site is undeveloped and currently home to temporary surface parking. Adjacencies include the Carolyn Tanner Irish Humanities Building to the northwest, open space/play fields to the north, and the HPER North Building to the southeast. Central playing fields are a planned future development that will surround the site on the north and east sides.

Building Occupancy

- The primary occupancy for the building is Residential Group R-2. This is based on the permanent nature of the residential use and unit types fitting the description of congregate living facilities, dormitories, and apartment houses. The secondary occupancies – primarily garage space - may be classified as assembly group A-3, B, or to a lesser degree F-1 (based on type of work that may be performed in garage) and M if food or other products are to be sold in the building. The A-3 classification is based on the occupant load of the garage spaces possibly being greater than 49 and requiring (2) exits.
- As per 2012 IBC – walls separating dwelling and sleeping units in the same building and walls separating dwelling and sleeping units from other occupancies shall be constructed as a 1-hr fire partition.

Building Type

- Per the developed prototype(s), it is anticipated that the building will be five (5) stories above grade (70') with floor plates as large as 30,000 square feet. Based on allowable height and areas in table 503 it is likely that the required type of construction may need to be Type IB in order to attain the necessary number of stories and height. Type IIA is a possibility -- however group R occupancies of Type II construction cannot be more than 4 stories above grade or be taller than 65 feet – even when equipped with an automatic sprinkling system.

  All areas of the building are to be fully sprinkled.

Allowable Height and Area

Per Table 503 of the IBC - the tabular allowable area for an R-2 and A-3/B building is as follows:

TABLE 503, IBC

GROUP	TYPE (max height)	
	IB (160)	IIA (65)
A-3	11	3
	UL	15,500
B	11	5
	UL	37,500
R-2	***11***	*4
	UL	*24,000

- Per type IB construction, an area modification will not be necessary.
- Based on the program prototype plans the gross square footage for the building is as follows:

	A-3	B	R-2	Total
Ground Level	15,000	4,000		29,000
Level-2	1,250		26,000	30,750
Level-3	1,250		26,000	30,750
Level-4	1,250		26,000	30,750
Level-5	1,250		26,000	30,750
Total	20,000	4,000	104,000	152,000

Sprinkler and Fire Alarm

- Group R-2 occupancies are required to be equipped with automatic sprinkling system and fire and smoke alarms throughout.

Interior Space dimensions - Residential

- Habitable spaces, other than a kitchen, shall not be less than 7 feet in any plan dimension. Ceiling height is to be a minimum of 7 feet 6 inches.
- Every dwelling unit shall have no fewer than one room that shall have not less than 120 square feet of net floor area. Other habitable rooms shall have a net floor area of not less than 70 square feet. Kitchens have no minimum requirement.
- Efficiency dwelling units must meet the following criteria:
- a living room of not less than 220 square. An

additional 100 square feet shall be provided for each occupant in excess of two.

- The unit shall be provided with a separate closet, kitchen, bathroom, watercloset, lavatory, and bathtub or shower.

Occupant Loads

- Based on the proposed prototype and space list for the building occupant load factors were applied to the various program components to arrive at an assumed maximum occupant load of 1,052 (600 A-3, 40 B, and 412 R2 occupants). These numbers will need to be reevaluated during the design phase based on the final occupancy classification and square footages. For programming purposes.
- For group R-2 – one means of egress is permitted within and from individual dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkling system.

Accessibility

- This building is to be designed and constructed to be accessible in accordance with the 2012 IBC and ANSI/ICC A117.1 as a minimum. It is the design team's intent to integrate accessibility throughout to the greatest extent possible.
- Based on the anticipated use and number of dwelling and sleeping units - per section 1107 of the IBC, for group R-2 occupancy similar to dormitories – it is estimated that a minimum of 5 Accessible units shall be provided. All other dwelling and sleeping units shall be Type B units.

Plumbing Fixtures

- Based on the assumed occupant load and table 2902.1 the minimum number of required plumbing fixtures was established. See Table 2902.1.

TABLE 07.1.2 | PLUMBING FIXTURE REQUIREMENTS

Occupancy	Occupant Load	Assumed 50/50 male-female	Water Closets - Male		Water Closets - Female		Lavatories		Bathtubs / Showers		Drinking Fountains		Service Sink
A-3	600	300	1 per 125	2.4	1 per 65	4.6	1 per 200	3.0	-	-	1 per 500	1.2	1
B	40	20	1 per 25 (first 50) + 1 per 50	0.4	1 per 25 (first 50) + 1 per 50	1.4	1 per 40 (first 80) + 1 per 80	1.5	-	-	1 per 100	0.4	1
R-2	412	206	1 per 10	20.6	1 per 10	20.6	1 per 10	41.2	1 per 8	51.5	1 per 100	4.1	1
Total	1052			23.4		26.6		45.7		51.5		5.7	3

08.

BUILDING SYSTEM PERFORMANCE CRITERIA

Structural
Mechanical
Plumbing and Fire Protection
Electrical

STRUCTURAL

INTRODUCTION TO PRIMARY GOALS OF SYSTEM DESIGN

The University of Utah Lassonde Make-Live Center seeks to create a collaborative space which nurtures future entrepreneurs by combining living and learning in a single adaptable space. The primary goals of the structural design are:

- Allow for floor loads suitable to variable occupancy and consistent with University Design Standards;
- Minimize number of internal walls and columns to enable rapid reconfiguration of internal spaces;
- Allow for flexibility in future point loads and hanging loads;
- Minimize construction cost while meeting the program requirements;
- Minimize construction schedule;
- Use proven materials and systems;
- Integrate structural design with Architecture and MEP services.

The following report presents a comparison of possible structural systems applicable to the program requirements. Two structural options are selected for further development, each with their own advantages and disadvantages. Conceptual structural drawings are provided in the Appendix for each option sufficient for preliminary cost estimation.

Program Requirements

The following assumptions define the structural program of the concepts described in this report and are illustrated in Figure S1:

- 24'-0"x24'-0" grid
- 5 floors
- 18'-12'-12'-12'-12' floor-to-floor height, total height = 66'
- 10' clear height desired
- Clustered, non-rectangular floor plan
- Hybrid program: garage at ground floor, mixed modular and dorm occupancy for L2-L5
- Approximately 160,000 GSF
- Code minimum seismic performance
- No high occupancy assembly spaces (>300 persons) as this would change the structural Risk Category from II to III

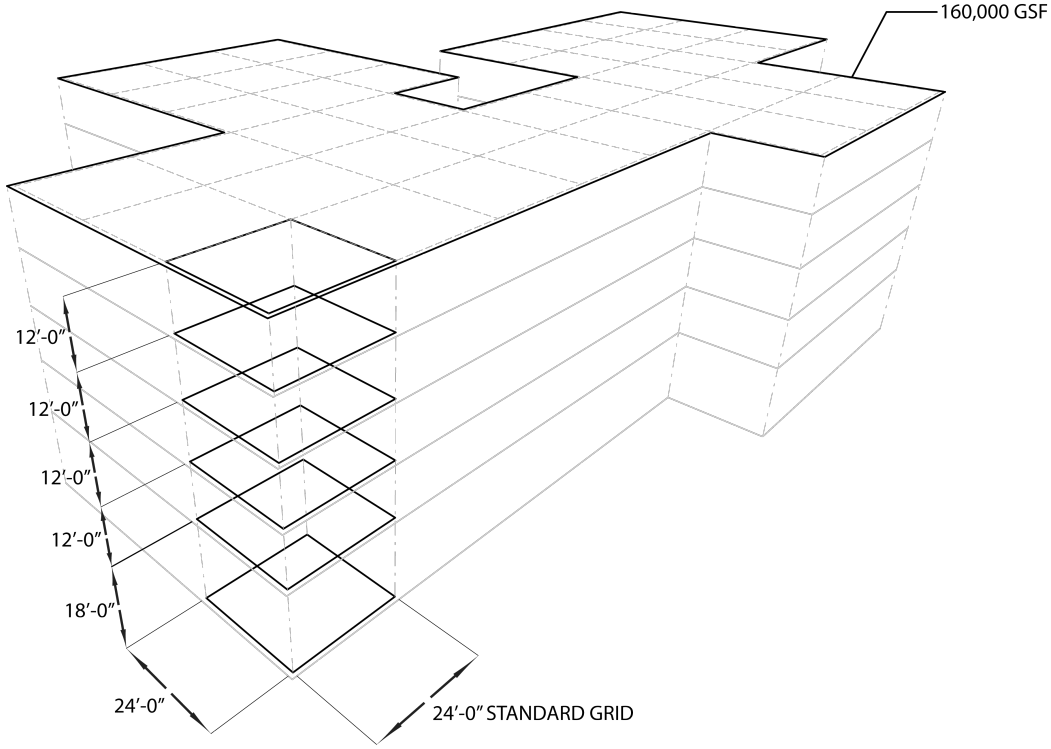


FIGURE S1 | DIAGRAM OF PROGRAM ASSUMPTIONS FOR STRUCTURAL DESIGN

Impact of Development Goals on Structure

The goals of the project are substantially different than a typical dormitory and lead to increased structural demands. Changing occupancy from a more traditional dormitory, with separated residential and working components, to a unique and fully modular approach consistent with the programming goals leads to increases in typical structural element loads. This general impact is illustrated in Figure S2 for various structural systems.

Spatial arrangement of residential and working spaces also has an impact on structure. Where the heavier working spaces are contained on the lowest level the impact on structure is minimal. As the heavier spaces are distributed throughout the structure, the number of structural elements impacted is greater. This is illustrated in Figure S3. In a fully modular system where all spaces need to be designed for the largest load, loads to all structural elements are increased. Thus, there is a first cost increase to allow for complete flexibility in future space planning.

Code requirements also limit the total building height for conventional residential structures built of wood or light gauge steel framing. The overall height of the planned building can limit the potential structural systems to concrete or steel systems allowed as illustrated in Figure S4.

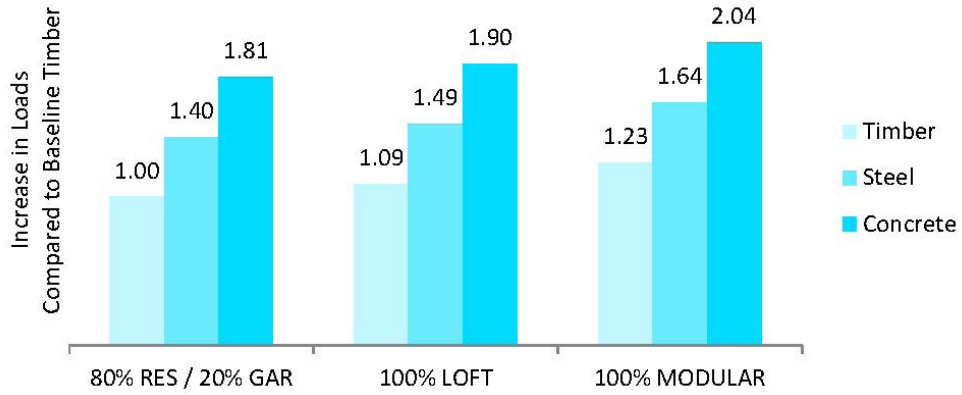


FIGURE S2 | BUILDING LOADS WITH DIFFERENT SYSTEMS AND OCCUPANCIES

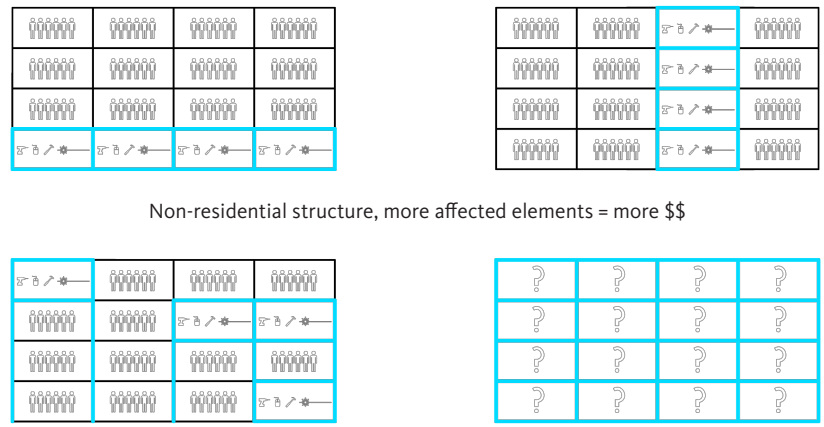


FIGURE S3 | SPATIAL DISTRIBUTION OF WORKING SPACES

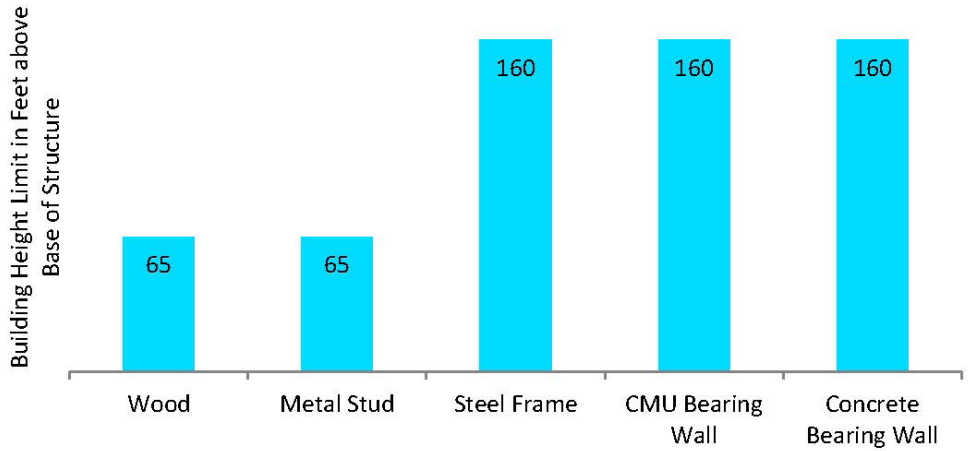


FIGURE S4 | CODE HEIGHT LIMITS FOR VARIOUS STRUCTURE TYPES

STRUCTURAL DESIGN CRITERIA

Based on the program assumptions and project goals, the following outline structural design criteria are recommended (all loads to be confirmed by final design engineer):

Codes and Standards

- 2012 International Building Code with State of Utah H.B. 310 Construction Code Amendments and Title 18 Salt Lake City Ordinances
- State of Utah DFCM Section 3.4 Structural Design Standards
- ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
- ACI 318-11 Building Code Requirements for Structural Concrete
- AISC 360-10 Specification for Structural Steel Buildings
- AISC 341-10 Seismic Provisions for Structural Steel Buildings
- NEHRP Seismic Design Technical Briefs (recommended best practice)

Superimposed Dead Loads

- MEP + miscellaneous = 10 psf
- Heavy raised floor system (optional, not included in preliminary sizing) = 20 psf

Live Loads

- Garage level = 80 psf plus 20 psf for removable partitions per DFCM §3.4 for offices, reducible
- Residential levels = 80 psf plus 20 psf for removable partitions per DFCM §3.4 for offices (allows for modular or traditional occupancy on all floors), reducible
- Minimum 2000 lb concentrated hanging or bearing load
- Storage rooms = 125 psf, non-reducible
- Service rooms = 125 psf, non-reducible

Seismic Loads

- Site Class C, to be confirmed by geotechnical investigation
- Risk Category II
- Ss = 1.22 g, S1 = 0.45 g
- Sds = 0.81 g, Sd1 = 0.41 g
- Seismic Design Category D
- Seismic Importance Factor Ie = 1.00

Snow Loads

- Salt Lake County Snow Load Factors per Utah IBC amendment :
- Po = ground snow load = 43 psf
- S = change in ground snow load with elevation 63 psf/ 100ft
- Ao = base ground snow elevation = 4.5ft/1000
- Risk Category II
- Snow Importance Factor Is = 1.00

Wind Loads

- Risk Category II
- Basic Wind Speed V = 115 mph
- Exposure Category C
- Wind Importance Factor Iw = 1.00

Other Requirements

- Maintain planning layout flexibility within center of floor plate by locating lateral walls or bracing at the perimeter of the floor plate, where possible
- Provide in-situ flexibility for post-installed systems, coring, and future openings

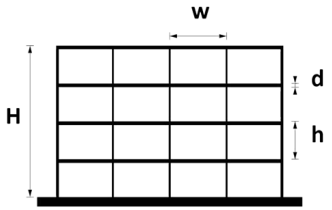
STRUCTURAL SYSTEMS DESCRIPTION AND COMPARISON

This section describes the possible structural gravity and lateral systems that could be used for this building. Certain systems are not well suited for the particular flexibility requirements of the program. Based on a comparison of systems two options are recommended to be considered for future development: a concrete flat slab system with shear walls, and a steel moment frame system. The concrete system provides the thinnest structural depth while the steel moment frame system provides the highest degree of flexibility in space planning and reconfiguration.

Gravity Systems

Bearing Wall Systems

The following systems rely on closely spaced bearing walls and are typically used for high density residential construction. The bearing walls align vertically over the height of the structure and are best suited for identical floor plans on every level. These systems are not well suited for the modular or reconfigurable floor plans which are required for this program.



BEARING WALL
w limited (10'-15')
Minimum **H**, **h**, and **d**
Minimum façade area
Very limited flexibility
Timber, Metal Stud, CMU, ICF
Lateral Structure $

FIGURE SX1 | BEARING WALL CONSIDERATIONS

Timber stud wall with plywood shear walls and timber joists – Timber structures are commonly used for high-density residential buildings similar to the proposed building. While this type is the most common and likely the least expensive for a dormitory, it also requires a large number of load bearing walls in order to be cost-effective. These bearing walls would need to continue vertically through the entire structure which does not fit the project goals of allowing a reconfigurable or modular residential layout. In addition, the maximum height of a timber structure in Seismic Design Category D is 65'. The maximum height is often increased by making the first floor a stiff reinforced concrete or CMU podium level and measuring the 65' from the top of the podium. A concrete podium also provides protection against termites.

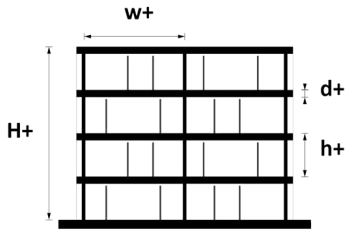
Light-gauge steel stud wall with steel sheet shear walls and steel joists – An alternate to a timber bearing wall system is a light-gauge steel bearing wall system. This is less common and typically more costly than a timber system for high-density residential buildings but has been used in some cases. The advantages of this system over timber construction are increased longevity, increased durability in termite environments, and reduced combustible material. This system is subject to the same 65' height limit as a timber building in Seismic Design Category D.

Insulated concrete forms (ICF) with precast hollowcore floors – ICF buildings are also commonly used for high-density residential buildings. The ICF system is a stackable form system for creating reinforced concrete bearing walls with the benefit of using the formwork as insulation for the final building envelope. This essentially creates a concrete bearing wall system with concrete shear walls and is subject to the same code requirements. This system is typically used with precast hollowcore floors for rapid construction. Hollowcore floors do not easily allow for post-installed anchors.

Reinforced concrete masonry units (CMU) with precast hollowcore floors – CMU buildings are also common but do not have the added benefit of insulated formwork. CMU is easily and rapidly constructed and can be made to have similar performance to reinforced concrete bearing wall buildings. This system is also commonly combined with precast hollowcore floors for rapid construction. Hollowcore floors do not easily allow for post-installed anchors.

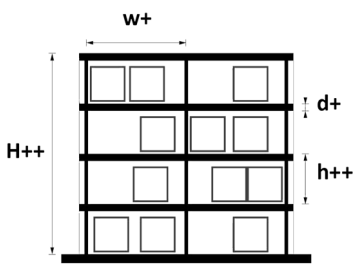
Frame Systems

The following systems are post and beam or slab systems which allow for longer spans and fewer vertical structure elements. These systems are best for modular and reconfigurable floor plans which vary from one floor to the next but are not typically used in residential construction due to their higher cost for a level of flexibility not typically required. These systems are recommended for the Lassonde Make-Live Center building due to their higher degree of planning flexibility and in-situ flexibility.



FRAME
w large (30'-45')
Increased **H**, **h**, and **d**
Increased façade area
Moderate flexibility
Steel, Concrete Slab, Precast
Lateral Structure $+

FIGURE SX2 | FRAME WALL CONSIDERATIONS



FRAME W/ MODULES
w large (30'-45')
Largest **H** and **h**
Largest façade area
Max flexibility
Steel, Concrete Slab, Precast
Lateral Structure $++

FIGURE SX3 | MODULAR FRAME WALL CONSIDERATIONS

Cast-in-place (CIP) concrete flat slab – Flat slab construction is also commonly used in taller residential construction as it combines minimum structural depth with the benefit of taller construction than wood framed structures. For short spans it is often combined with drop panels to minimize slab thickness and weight. This system is cast in-situ with formwork and shoring required, taking longer than a precast system. The system benefits from a small edge cantilever to balance the weight of the interior spans and a cantilevered slab edge can be gained for minimum additional cost. CIP concrete systems allow for post-installed anchors however flexibility for openings, cores, and anchorage locations is limited.

CIP concrete post-tensioned (PT) flat slab – Flat slab construction can be made lighter and more efficient by including post-tensioning. The post-tensioning balances the dead loads of the system and reduces the thickness of the floor slab. The post-tensioning process is labor and time intensive but is commonly used for taller buildings. There is less flexibility in future penetrations or anchorage in a PT flat slab than a conventionally reinforced flat slab due to the post-tensioning. The reduced slab thickness can also lead to punching shear problems at the columns and drop panels may be required.

CIP concrete PT frame with slab – A concrete beam and slab system is efficient where longer spans are required. The concrete beams are typically post-tensioned to minimize depth. This system is lighter than an equivalent flat slab system but it requires deeper beams which may require higher floor to floor heights. This system is not typically used in residential construction where larger clear spans are not required. This system also has higher formwork costs than a flat slab.

Precast concrete frame with hollowcore floors – A total precast concrete system can rival a steel frame in speed of erection as no formwork or shoring is required. These systems require deeper beams which may require higher floor to floor heights and often require corbels on the columns. Cantilevers are difficult in total precast systems. Long spans can be achieved with precast systems. Precast shapes are typically prestressed and any anchors or penetrations need to be carefully planned prior to casting which limits future flexibility.

Steel frame – Steel frame systems are the quickest systems to erect. Long clear spans can be achieved with a steel system. This system is significantly lighter than a concrete system and can reduce foundation costs. The slab and beam system easily accommodates future anchorage requirements and slab penetrations. Edge cantilevers often require field welding.

A summary comparison of these systems is provided in Table S2.

Lateral Systems

Lateral systems can be grouped into three general types, bearing wall systems, braced frame systems, and moment frame systems. These are illustrated in Table S1.

TABLE S1 | COMPARISON OF LATERAL SYSTEM TYPES

	System	Key Points
Bearing Wall Systems	Timber Shear Wall	Only used in timber or light frame buildings Many walls required and cannot be modified
	Concrete Shear Wall	Most efficient for concrete buildings Less wall lines required Walls interfere with space planning
Braced Frame Systems	Concentric Braced Frame and Buckling Restrained Braced Frame (BRBF)	Stiff system and less brace lines required Brace lines interfere with space planning More efficient than moment frames
	Eccentric Braced Frame	More flexible than BRBF Brace lines interfere with space planning More efficient than moment frames
Moment Frame Systems	Steel Moment Frame	No wall or brace lines Deep beams required, welded connections More flexible than wall or braced systems Typically uses more steel than BF systems
	Concrete Moment Frame	No wall or brace lines Deep beams and costly detailing Not recommended
	Biaxial Distributed Bolted Steel Moment Frame (ConX)	No wall or brace lines Shallow beams with simple connections Low diaphragm demands and torsion

Foundation Systems

Selection of foundation systems is dependent on the soil conditions which must be confirmed by a site-specific geotechnical investigation. For the purposes of this concept design, the following conservative soil parameters have been assumed for the design of spread footings:

- Modulus of subgrade reaction: 100 psi/in
- Allowable bearing pressure: 4500 psf
- Vertical soil spring stiffness over 100 sf footing: 1700 ksf/ft

No estimation of the performance of piled foundations has been made as part of this concept design.

Where possible, spread footings are recommended underneath gravity columns. However, if a piled foundation is required under shear walls the effect of differential settlement below gravity column spread footings should be investigated. Grade beams should be provided between spread footings to tie the foundation together, but may not be required is slab-on-grade can be used instead. Tension piles may be required underneath shear walls or braced frames to resist significant uplift forces and are more expensive than spread footings. Based on information received thus far, a mat foundation is not necessary for a framed system but may be an efficient solution for a bearing wall system with closely spaced walls.

High-Level System Comparison

Table S2 compares possible building systems according to the following criteria:

Structure weight and foundation demands– Structural weight drives foundation demands and design so a lighter building will result in foundation savings.

Seismic base shear – Seismic base shear is related to the total weight of the building and the stiffness of the lateral system. A lighter building or lateral system with higher force modification factor, R, will result in a savings in lateral system requirements.

Structure depth – Structure depth impacts floor to floor heights. Frame systems have deeper floor depths than flat slab systems. Structure depth is given for the lesser of the max system span and 24' as well as the particular building design criteria.

Range of economical span – Larger spans generally lead to greater flexibility in planning and reconfiguration of spaces. Frame systems generally have greater economical spans than flat slab systems.

Maximum height – Certain building systems are limited in height by code requirements when used in high seismic regions and may not be allowed depending on the total height of the building.

Installation and Point-load flexibility – Flexibility in installation and point loads refers to capacity of the structural floor to accommodate post-installed anchors or coring for services after the structure is completed.

Slab and wall opening flexibility – This refers to large openings in floor slabs and walls for risers, stairs, or other floor openings which may be required at initial occupancy or renovated at a later date. All openings in concrete shear walls and slabs should be planned prior to construction.

Plan layout flexibility – Frame systems have the best layout flexibility due to large clear spans between columns. Moment frames provide the best flexibility for lateral systems as there are no structural wall or brace elements required.

Construction schedule – Generally, cast-in-place concrete construction is slower than bolted steel or precast concrete construction because in-situ formwork is required and the concrete must be shored while it cures.

Based on the comparison outlined in Table 2, two options have been selected to develop in sufficient detail for preliminary costing and are presented in the following sections: a cast in place concrete system (flat slab plus shear walls) and a steel moment frame.

TABLE S2 | COMPARISON MATRIX OF DIFFERENT STRUCTURAL SYSTEMS

Building System	W (kips)	Vs (kips)	Depth	Span	Height	Plan Flex	Install Flex	Time
Wood stud wall	6,000	923	6”	10’-15’	≤ 65’	1	2	2
Metal stud wall	6,000	923	8”	10’-15’	≤ 65’	1	2	2
ICF + precast	19,000	3,800	9”	15’-25’	≤ 160’	1	0	2
CMU + precast	19,000	3,800	9”	15’-25’	≤ 160’	1	0	2
Option 1: Flat slab + SW	**24,000**	**4,800**	**10”**	**20’-30’**	**≤ 160’**	**2**	**1**	**2**
PT slab + SW	18,000	3,600	8”	20’-30’	≤ 160’	2	1	1
PT frame + SW	17,000	3,400	24”	30’-45’	≤ 160’	2	1	1
Precast frame + SW	17,000	3,400	24”	30’-45’	≤ 160’	2	0	3
Option 2: Steel MF	**10,000**	**1,250**	**22”**	**20’-45’**	**≤ 160’**	**3**	**3**	**3**

W: Total building weight

Vs: Seismic design base shear

Depth: Interior depth of structural system, for the lesser of max system span and 24’

Span: Optimal span for structural system

Height: Allowable structure height, can be increased for wood and metal stud buildings with a reinforced concrete podium level

Plan Flex: Flexibility in plan arrangement (0 = no flexibility, 3= best flexibility)

Install Flex: Future flexibility in coring, drilling, etc. after completion of structure (0 = no flexibility, 3 = best flexibility)

Time: Estimated construction time for structure (1 = longest, 3 = shortest)

ALTERNATES

Base Option: Concrete Flat Slab + Shear Walls

A traditional solution for high density residential construction with large clear spans is a concrete flat slab system. This provides the following advantages:

- Minimum structural depth for span;
- No fireproofing required;
- Post-installed anchors can be used in conventionally reinforced slab;
- Moderate flexibility in future space planning;
- Allows for small cantilevers at the edge of the building for minimum added cost or depth;
- Structural diaphragm is very strong and stiff which is advantageous for non-rectangular floor plates;
- May be possible to embed conduits within the slab depth.

The system has the following disadvantages:

- The structure is very heavy relative to other systems with comparable spans, leading to larger columns and foundations;
- Conventionally reinforced slabs can be more susceptible to creep deflections over time than post-tensioned concrete or steel structures;
- Seismic forces are larger, requiring significant shear walls;
- System is slower to build than steel or precast systems due to required formwork and shoring;
- Shear walls are required which impact space planning;
- Piles may be required under shear walls to resist uplift.

The proposed shear wall layout is illustrated in Figure S5. Shear walls have been located around the perimeter of each arm of the building in order to minimize torsional response of the building. Where possible, walls have been located at partition walls shown on the architectural plans. Large openings and edges of the building are reinforced with an edge beam as illustrated in Figure S6 in order to limit deflection of façade elements and overcome punching shear limitations at edge panels. This spandrel beam can also be upturned if allowed by the architectural cladding concept, as an upturned spandrel beam may be easier to construct.

A steel tie beam is required at the wall of the atrium to ensure that the buildings move together, otherwise a movement joint may be required between buildings.. The benefit of this additional tie beam is demonstrated in Figure S7. Shear walls should be continuous through building height. Many large window/door openings in shear walls will reduce system effectiveness.

A pipe sleeve of up to 8” in diameter can be placed close to each column for drainage and fire protection pipes. Slab openings for service risers should be limited in dimension to 3’x3’ so that edge beams are not required. Large penetrations should not occur on both sides of a shear wall if possible so that the diaphragm has sufficient length to transfer force into the wall. Electrical and data conduit can easily be accommodated within the center of the concrete slab. This system also provides a minimum 2-hr floor separation.

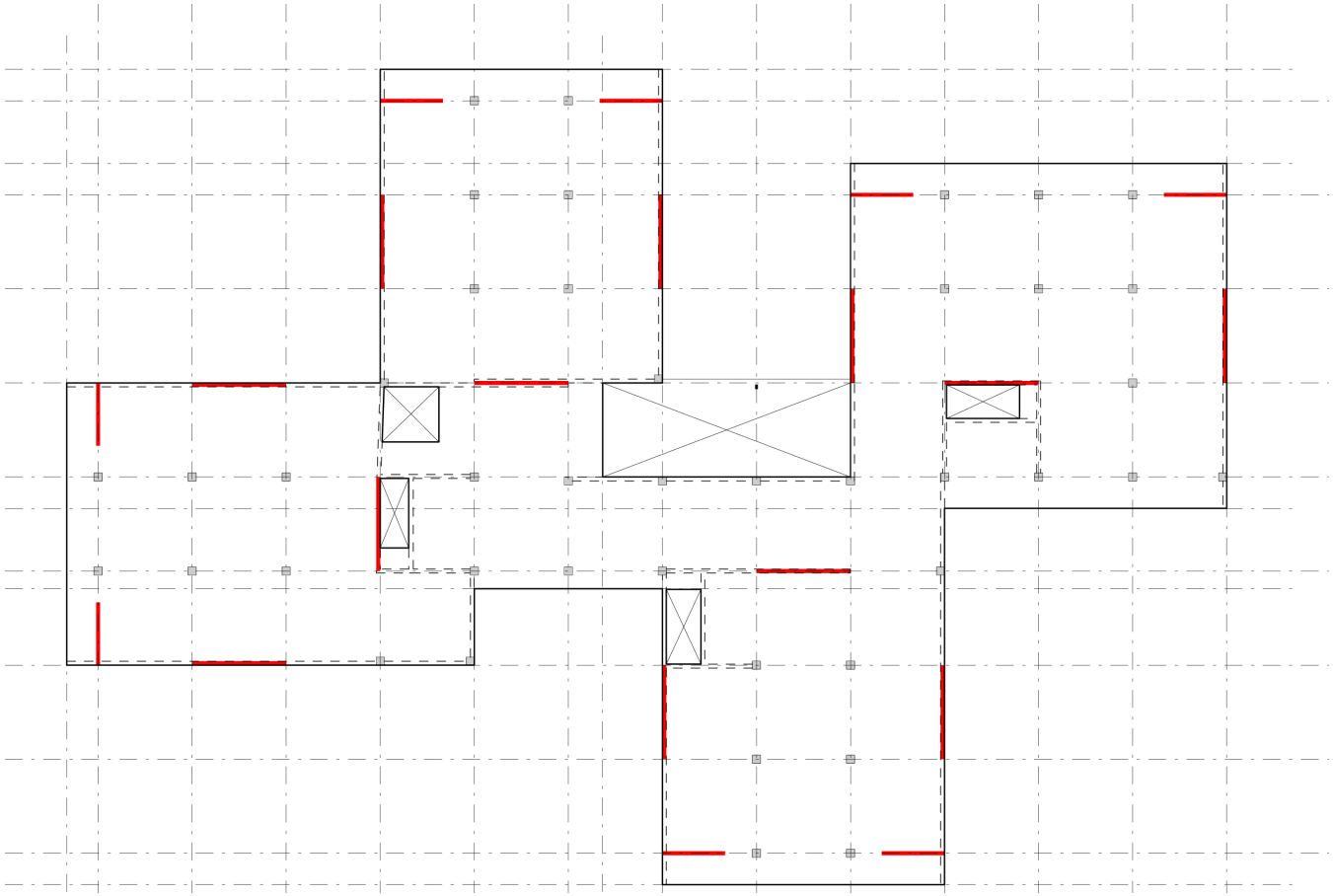


FIGURE S5| TYPICAL FLOOR PLAN FOR CONCRETE FLAT SLAB WITH SHEAR WALLS, RED LINES INDICATE SHEAR WALL LINES

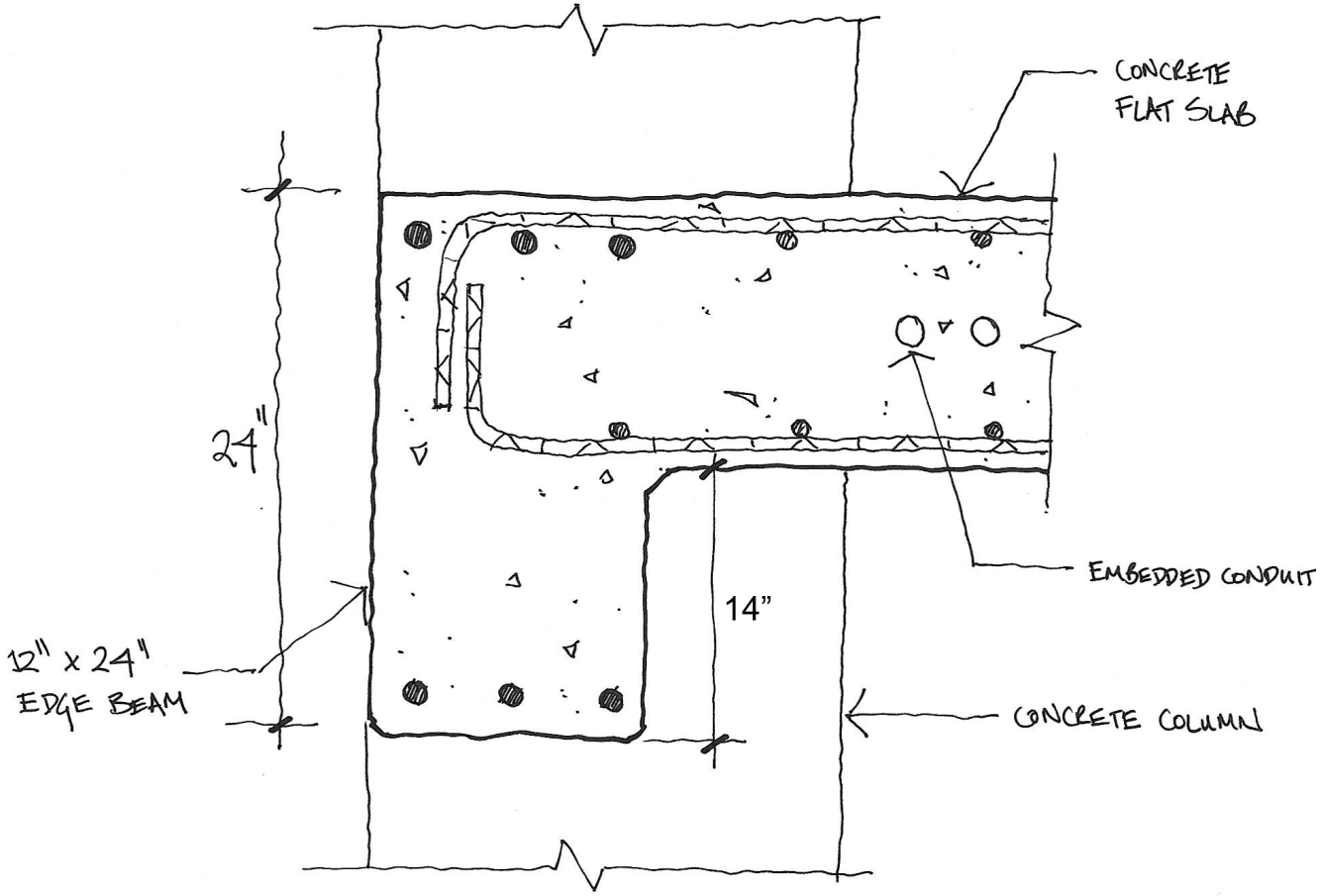


FIGURE S6 | TYPICAL EDGE DETAIL FOR CONCRETE FLAT SLAB OPTION SHOWING DOWNTURNED EDGE BEAM

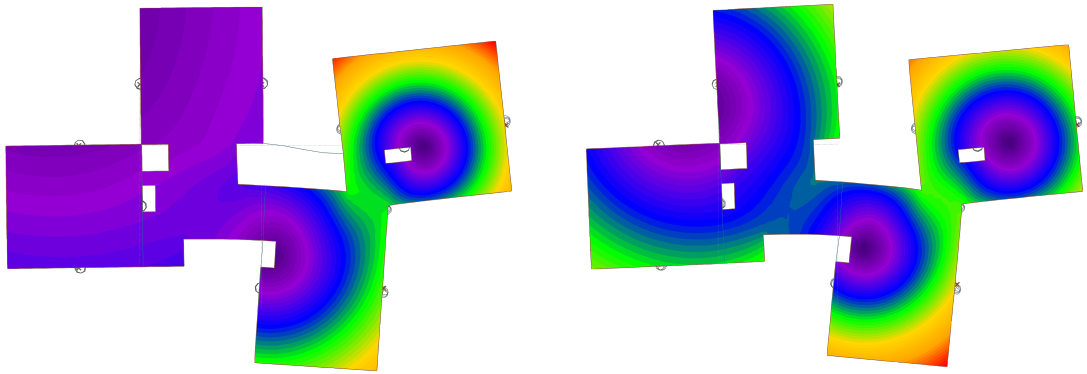


FIGURE S7 | COMPARISON OF DIAPHRAGM RESPONSE WITH (LEFT) AND WITHOUT TIE BEAM (RIGHT)

Base Option: Quantities

Materials

All concrete shall be normal weight with 28-day compressive strength of 4500 psi as prescribed by DFCM §3.4. All reinforcing shall be ASTM A615 Grade 60 except for longitudinal boundary element reinforcing in shear walls which shall be ASTM A706 Grade 60. Allow 15% additional reinforcing to quantities noted to account for lap splices. Quantities do not include reinforcing added per contractor's means and methods. All quantities below are given for code minimum seismic design requirements and do not include enhancements for improved seismic performance.

Foundation Elements

All foundation quantities listed are preliminary for the purposes of costing and shall be confirmed following a geotechnical investigation. See Appendix structural drawings for preliminary foundation plan.

- Tension piles may be required below shear walls to resist uplift
- 3' thick pile caps below shear walls, 200 lb/cy typical reinforcing
- 12'x12'x3' thick spread footings below columns, 175 lb/cy typical reinforcing
- 24"x30" concrete grade beams connecting footings and pile caps, 150 lb/cy typical reinforcing
- 5" to 6" slab on grade, #4 @ 12" o.c. each way

Gravity Elements

See Appendix structural drawings for preliminary framing plan.

- 24"x24" concrete columns, 200 lb/cy typical reinforcing
- 10" two-way conventionally reinforced concrete flat slab, 3 psf typical reinforcing, conduit may be embedded in slab thickness
- 12"x24" concrete beams at edges and openings, 300 lb/cy typical reinforcing
- Lateral Elements
- See Appendix structural drawings for preliminary framing plan and typical shear wall elevations.
- 14" thick concrete shear walls between L1 and L2, reinforcement as noted
- 12" thick concrete shear walls between L2 and roof, reinforcement as noted

Alternate Option: Distributed Steel Moment Frame (ConX System)

An alternative to the traditional concrete flat slab approach is the ConX steel moment frame system illustrated in Figure S8 and Figure S9. This provides the following advantages:

- Distributed moment frame in two directions minimizes foundation demands and piles are not required;
- No walls or braced frames are required, maximizing layout flexibility;
- Distributed frame minimizes torsional response, reduces diaphragm demands, eliminates code required 1.3x redundancy factor;
- Distributed frame minimizes frame member depth compared with perimeter moment frame system;
- ConX connection system eliminates all field welding of moment frame connections including stub cantilevers, expediting construction time;
- Significantly lighter than concrete system, reducing seismic loads and minimizing foundation demands;
- Greater flexibility in future slab openings and hanging loads over a concrete system;
- 2” metal deck with 3-1/4” lightweight concrete fill provides 2-hr minimum fire rating.

The system has the following disadvantages:

- Frame system is deeper than a concrete slab system and may require larger floor to floor height or reduced clear height;
- Steel needs to be fireproofed;
- Proprietary system is not easily competitively procured, though there is precedent use in a University of California, Merced housing project as well as hospital and military buildings where many of the same competitive bid requirements apply.

Figure S10 illustrates a preliminary plan of the distributed moment frame system. There are many more lateral elements in comparison to the concentrated shear wall system which has the effect of reducing the slab diaphragm forces and minimizing the impact of the non-rectangular floor plate. A tie beam is required at the wall of the atrium to ensure that the buildings move together, otherwise a movement joint may be required between buildings.

Figure S11 illustrates the typical edge section of the structure and shows the difference in structural depth versus a concrete slab system. The total structure depth at L2 is 27” while the total structure depth at levels L3 and above is 22”. Conduit for electrical and data distribution should be routed below concrete filled metal deck and poke up into the slab as required. 3-1/4” of lightweight concrete is provided in order to have sufficient depth for embedded conduit as well as increased capacity for point loads. This assembly provides a 2-hr floor separation.

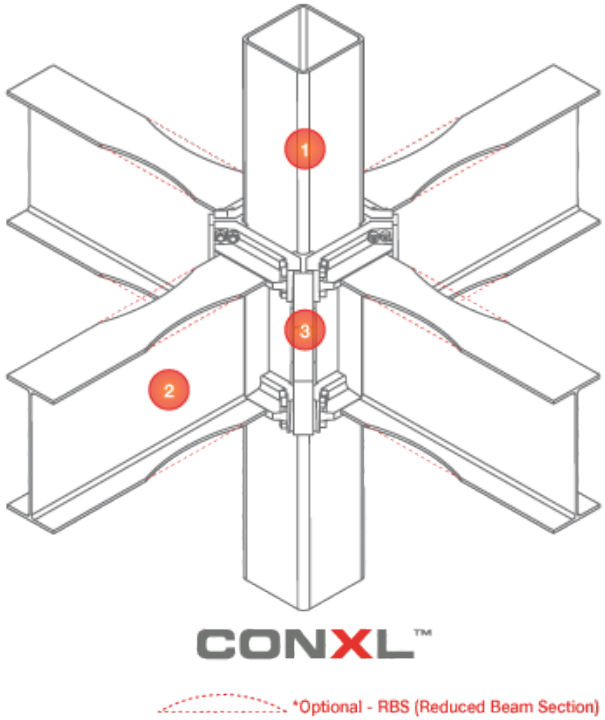


FIGURE S8 | CONXL 300 BOLTED MOMENT FRAME CONNECTION SCHEMATIC

FIGURE S9 | CONSTRUCTION DETAILS OF CONX SYSTEM

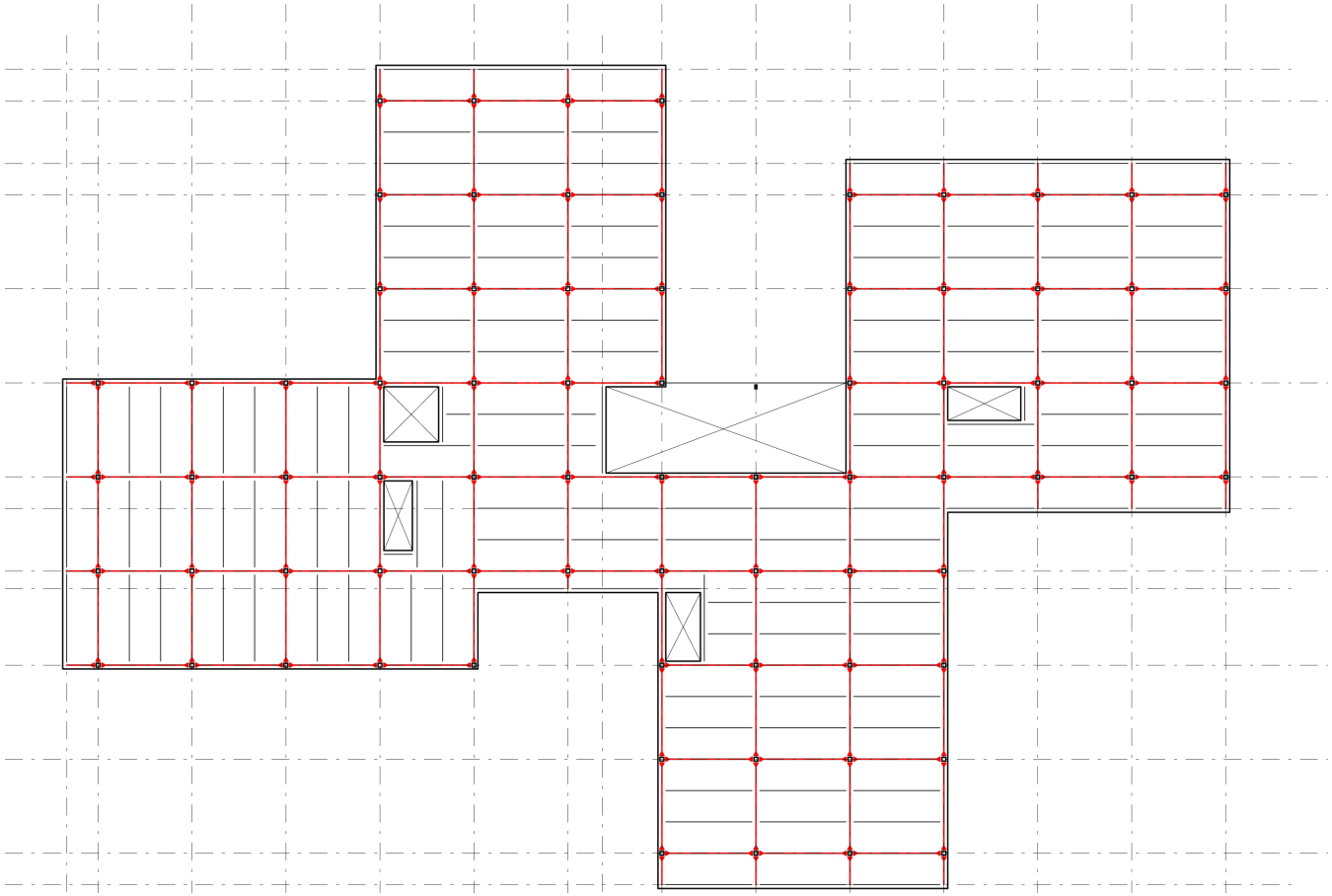


FIGURE S10 | TYPICAL FLOOR PLAN FOR CONX STEEL MOMENT FRAME STRUCTURE, RED LINES INDICATE LATERAL MOMENT RESISTING FRAMES

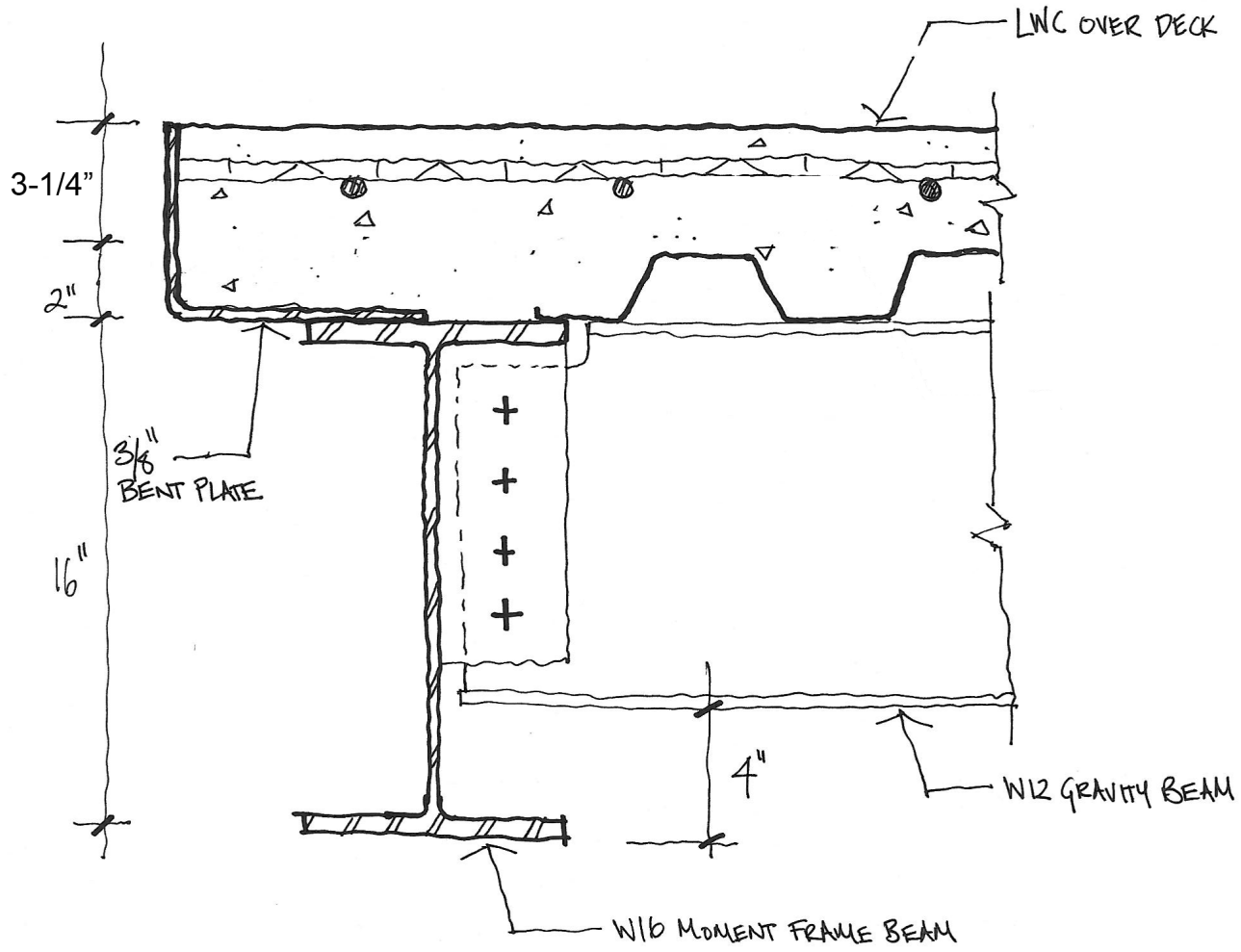


FIGURE S11 | TYPICAL EDGE DETAIL OF STEEL STRUCTURE

Alternate Option: Quantities

Materials

Foundation concrete shall be normal weight with 28-day compressive strength of 4500 psi as prescribed by DFCM §3.4. Concrete fill on metal deck is light weight concrete with 28-day compressive strength of 4000 psi and density of 110 pcf. All concrete reinforcing steel shall be ASTM A615 Grade 60. Structural steel shall be as follows:

- Wide flange shapes: ASTM A992 Grade 50
- HSS shapes: ASTM A500 Grade B
- Plates: ASTM A572 Grade 50
- Miscellaneous channels and angels: ASTM A36

Include allowance for miscellaneous deck angles, closure plates, and bottom flange bracing for perimeter and moment frame beams. All quantities below are given for code minimum seismic design requirements and do not include enhancements for improved seismic performance.

Foundation Elements

All foundation quantities listed are preliminary for the purposes of costing and shall be confirmed following a geotechnical investigation. See Appendix structural drawings for preliminary foundation plan.

- 10'x10'x2'-6" spread footings below columns, 150 lb/cy typical reinforcing
- 24"x30" concrete grade beams connecting footings with encased steel wide flange moment frame beams, 150 lb/cy typical reinforcing
- 5" to 6" slab on grade, #4 @ 12" o.c. each way

Gravity Elements

See Appendix structural drawings for preliminary framing plan.

- W12x19 infill framing beams as noted on plan
- 3-1/4" lightweight concrete fill over 2" deep 18 gauge metal deck with #4 @ 12" o.c. each way diaphragm reinforcing or equivalent wire mesh reinforcement
- Weld (1) 4"x3/4"Ø shear stud per foot over all steel beams supporting concrete filled metal deck
- Stub cantilever beams to match moment frame beams, use ConXL 300 connection

Lateral Elements

See Appendix structural drawings for preliminary moment frame plan and typical moment frame elevations.

- Moment frame beams as noted on plans and elevations, use ConXL 300 connection for all moment connected beams
- All HSS columns are filled with 4000 psi normal weight concrete

FIGURE 12 | EXAMPLES OF PROJECTS USING THE CONX SYSTEM (CLOCKWISE FROM TOP): THE CROSSING, UC MERCED HOUSING 4, 550 MORELAND.

Project References for ConX System

The Crossing, San Bruno, CA

- 517,000 sf; two buildings; 5 stories
- 10.4 psf steel tonnage
- 6 month duration

550 Morland, Santa Clara, CA

- 368,000 sf; two buildings; 8 stories
- 11.6 psf steel tonnage
- 6 month duration

UC Merced Housing 4: The Summits

- $50M; 364 beds; 110,000 sf; 5 stories
- 14.5 psf steel tonnage
- 11 week duration

ITEMS FOR CONSIDERATION IN FUTURE PHASES

Provide Cast-in Anchors for Flexibility

To provide optimal flexibility in distribution of services and hanging loads, anchors can be cast into the underside of the concrete slab or concrete filled metal tech to provide pre-defined anchorage points. These anchors can be placed at 2' to 4' centers throughout areas which may need future flexibility in hanging loads. Anchors can also be provided in the floor surface if required for anchorage of the modular sleeping units. Use of cast-in anchors in lieu of allowing post-installed anchors would allow post-tensioning to be used in the CIP slabs which can reduce the weight and depth of a concrete slab system. An example from Hilti is shown in Figure S13 but similar products are available from multiple manufacturers. Other options include localized cast-in channels.

Installation Procedure for HCI-MD

1. Prior to pouring concrete, drill a hole through the metal deck, using the specified diameter metal hole saw.

2. From the topside of the deck, place the plastic sleeve through the hole.

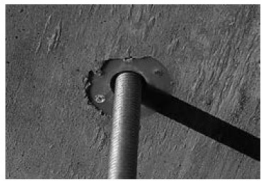
3. By stepping on the head of the anchor (or by using a hammer), push it through the hole until the anchor plastic sleeve snaps into place (i.e. the deck is between the sleeve and the flange of the anchor). After all inserts are installed, pour the concrete.

4. After the concrete has properly cured and achieved its design compressive strength, install the threaded rod, ensuring full thread engagement. (Note: Rod may be installed prior to concrete pour, but should not be loaded or disturbed until concrete has cured and achieved its design compressive strength.

Installation Procedure for HCI-WF

1. Prior to pouring the concrete over the wood form, place the anchor (nails down) on the surface of the wood form.

2,3. Drive the anchor down until flush with the surface of the wood form. When all anchors are installed, pour the concrete. When wood form is removed, the three break-off nails usually remain. Wearing eye protection, remove these nails.



4. After the concrete has properly cured and reached its design compressive strength, install the threaded rod, ensuring full thread engagement.

FIGURE S13 | HILTI CAST ANCHOR PRODUCTS AND SAMPLE INSTALLATION PROCEDURE

Coordination of Structure with Architecture and Services

Close coordination of the structure with architecture and building services can often reduce the depth of ceiling spaces, particularly in steel framed structures where services can be routed within the depth of the beams. Coordination of shear wall locations with architectural and service cores can minimize the impact of required lateral wall elements on layout flexibility, weighed against the ceiling height and MEP impacts of a deeper structure.

Increase Structural Grid Dimension

With concrete and steel frame systems the structural grid can readily be increased beyond 24'. Future design may consider the advantages of larger structural spans to enable a higher degree of internal flexibility.

Improved Seismic Performance and Resilience

The University has expressed interest in possibly improving the seismic performance and resilience of the building in order to potentially serve as a shelter and base of operations in the event of a devastating earthquake. There are a number of ways to increase the performance of the building beyond code minimum performance which are described below and summarized in Table S3.

Arup recommends that the minimum requirements of the building code be met in all cases so that a Design Review is not mandated by the code. A Design Review can result in significantly longer design schedule and significantly higher design and review fees which are not necessary if higher performance is Owner-prescribed rather than mandated by the jurisdiction and the Owner engages a sufficiently competent and experienced structural design firm.

Increase Structural Seismic Importance Factor (I=1.5)

This is the simplest approach which changes the importance factor for structural elements from 1.0 to 1.5. This increases all seismic structural design loads by 50% and will reduce the amount of damage that the structure is expected to undergo during a design level earthquake. This approach is simple to apply in design and should not result in higher structural design fees. However, it often results in overdesign of structural members versus a targeted performance-based design approach.

The actual performance of the structure is only inferred from the intent of the code provisions and is not verified by analysis nor significantly substantiated by past building performance. Further, non-structural elements may be more susceptible in a building that has been strengthened without consideration of increased detailing requirements and forces for non-structural elements.

Increase Risk Category (RC-IV)

Increasing the Risk Category from II to IV will increase the seismic importance factor from 1.0 to 1.5 but it also triggers increased nonstructural detailing and force requirements which can lead to better performance of nonstructural elements during an earthquake. This approach is also simple to apply as it is the same as the code minimum requirements for an essential structure such as a hospital or emergency response center and all requirements are prescriptive and codified.

However, similar to the pervious approach, the improved performance of structural and nonstructural elements is not verified and often results in overdesign versus a performance-based design approach.

Performance-based Earthquake Design (PBD) Approach

A performance-based design (PBD) approach differs from conventional prescriptive code approaches by evaluating all structural elements for specific performance acceptance criteria at defined risk levels and earthquake return periods. This allows the Owner to select a targeted level of structural and non-structural performance at specific return periods and the design engineer verifies that all elements satisfy this performance as closely as possible, accounting for the inherent uncertainties in structural design and analysis.

This approach can often result in construction cost savings over simply increasing the design forces by 1.5 since the design of elements is targeted to a specific performance and are thus optimally designed. There is additional design and analysis work involved, including additional geo-seismic studies and ground motion generation.

Arup recommends that all code minimum provisions required for a Risk Category II building be incorporated if higher performance is desired. This will minimize the permit review requirements for a PBD approach. It is not recommended to use PBD to reduce code minimum requirements as it is unlikely to result in savings given a simple and regular building.

Resilient Earthquake Design (RED) Approach

While a PBD approach considers the performance of structural elements, a Resilient Earthquake Design (RED) approach considers the holistic design and performance of the building inclusive of the surrounding environment where it affects the resiliency and function of the building following an earthquake. While including all of the benefits of a PBD approach for structural design, a RED approach extends the evaluation beyond structural elements to include:

- Targeted performance of nonstructural elements such as MEP equipment, partitions, and building contents;
- Impact of potential disruption to utility infrastructure and connections to the building following an earthquake;
- Impact of poor-performing surrounding buildings on the intended performance of the building, including building access;
- Integration of building intended performance with post-earthquake function within a Campus-wide contingency plan.

With a holistic resilient design approach, the post-earthquake functionality of the building is targeted rather than simply the structural performance. This approach is best used for buildings which are expected to be functional following an earthquake and higher performance can be achieved using this methodology. Arup has developed a resilient earthquake design framework called REDi which can be used to guide the Owner, stakeholders, and design team through this design process.

TABLE S3 | COMPARISON OF BUILDING PERFORMANCE FOR DIFFERENT DESIGN APPROACHES FOLLOWING A DESIGN BASIS EARTHQUAKE (10% PROBABILITY OF EXCEEDANCE IN 50 YEARS)

Sample Resiliency Goals	**Code**	**I=1.5**	**RC-IV**	**PBD**	**RED**
Minimize risk of collapse and provide life-safety	✓	✓	✓	✓	✓
Minimize risk of injury			✓	✓	✓
Economic repair of structural elements		✓	✓	✓	✓
Economic repair of nonstructural elements			✓	✓	✓
Immediate re-occupancy of building				✓	✓
Continued operation of equipment					✓
Redundancy if utilities disrupted					✓
Quantify and minimize probable financial loss over life of building					✓
Integrate post-earthquake function with Campus contingency plan					✓
Minimize impact of poor performing surrounding buildings					✓

✓ Probable

✓ Verified and Targeted

Code: Minimum expected code performance of Risk Category II buildings

I=1.5: Expected performance of building with Seismic Importance Factor Ie = 1.5 but no increase in nonstructural component requirements

RC-IV: Expected performance of Risk Category IV buildings

PBD: Targeted performance of performance-based designed building

RED: Targeted performance of resilient building

MECHANICAL

INTRODUCTION

The University of Utah Lassonde Make-Live Center is a 400 bed dormitory coupled with at least 20,000 squqre feet of flexible "making/garage" space to support the entrepreneurial goals of the combined living-learning environment.

The goals of the concept HVAC system design, then, are as follows:

- Provide a flexible HVAC system that can be modified to suit any of the three residential space planning approaches.
- Provide for life-safety systems in the Atrium area
- Provide for specialized exhaust systems for the working spaces within the common areas
- Provide an allowance for ground floor flexible "garage" spaces
- Provide an energy efficient system to support the University of Utah's carbon neutrality and high performance building goals.

DESIGN CRITERIA

Site/Campus Criteria

The prevailing design standard on the University of Utah campus is the State of Utah, Department of Administrative Services, Division of Facilities Construction and Management Design (DFCM) Requirements, with the University of Utah Supplement. Please refer to especially the latter document for preferred manufacturers and construction quality requirements.

These documents reference the following prevailing codes:

- 2012 International Building Code
- 2012 International Mechanical Code
- 2012 International Plumbing Code
- 2009 International Energy Conservation Code
- 2011 National Electrical Code

The site is served by campus utilities, namely a chilled water distribution loop and high temperature hot water distribution loop. These services will enter the building and have heat exchangers to decouple the campus systems from the Housing-controlled building systems. It is understood that the following are the blended rates for campus utilities:

- Electricity: $0.0884 billable for Housing
- Chilled Water: $11.60/MMBTU
- High Temperature Water: $9.26/MMBTU

It is understood that all systems associated with the campus utilities shall meet the University of Utah standards, whereas the Housing group may choose to use high-end residential quality equipment as appropriate on the building systems.

The outdoor air design criteria for Salt Lake City, UT are as follows:

- Heating – 0°F dry bulb (University of Utah requirement), 18.9°F dewpoint (99% exceedance in 2013 ASHRAE Handbook, Fundamentals)
- Cooling – 97°F dry bulb, 62°F mean coincident wetbulb (University of Utah requirement)
- Dehumidification – 57.5°F dewpoint with 73.1°F mean coincident dry bulb (1% exceedance in 2013 ASHRAE Handbook, Fundamentals)
- Elevation: 4750 feet above sea level.

Building Systems Criteria

The internal design criteria are as follows:

TABLE M1 | INTERNAL DESIGN CRITERIA

Location	Assumed Occupancy Density (1)	Minimum Ventilation (1,2)	Lighting allowance (3)	Small Power allowance
Sleeping Quarters	100 sf/person	11 cfm/person. With an allowance for 2 times this rate in case there is a gathering.	0.38	0.75 (4)
Central common areas	40 sf/person	10 cfm/person	0.73	1 (5)
Conference area	20 sf/person	6 cfm/person	1.23	0.5 (6)
Computer Laboratory	40 sf/person	15 cfm/person	1.71	1.2 (7)
Study space	40 sf/person	15 cfm/person	1.06	1 (5)
Main Building Lobby/ Common Break area	40 sf/person	15 cfm/person	0.73	0.5 (5)
Toilets	Per count	25 cfm per stall exhaust	0.98	0.2
Kitchenette	N/a: transient occupancy	0.3 cfm/sf exhaust	0.73	2650 W (8)
Making-space/ Shop-type classrooms	40 sf/person	0.5 cfm/sf exhaust and makeup	1.59	1.2 (9)

(1) All listed items are from ASHRAE Standard 62.1-2013.

(2) All multi-occupant spaces with occupancy density 40 sf/person or lower have CO2 monitoring to turn down ventilation air to a minimum 0.06 cfm/sf when possible.

(3) From ASHRAE 90.1-2013 Space-by-Space Lighting Method Allowances

(4) 1 laptop + 1 flat screen per person + 0.3 W/sf allowance for other student-provided appliances

(5) 1 laptop per person + 0.25 W/sf miscellaneous building-owned equipment

(6) 0.5 laptops per person

(7) 80% diversity on 1 laptop and 1 flatscreen active per person.

(8) 1 microwave oven, 1 coffee maker, 1 refrigerator

(9) Estimate to be confirmed against machinery to be installed.

- All small power estimates are based on ASHRAE Handbook Fundamentals for average running-power and assume modern Energy-Star types of appliances with auto-idle and auto-sleep cycles.
- At the recommendation of local mechanical engineers (Colvin Engineering Associates), no humidification is provided. Cooling coils are used to control upper relative humidity to 65% or less.

As there is no exterior architectural design as yet as part of this concept approach, the design calculations have assumed a 40% glazed exterior.

SYSTEMS DESCRIPTION

Overview

The main systems include hydronic systems, steam systems, comfort conditioning systems for the residential areas, comfort conditioning for the common areas, comfort conditioning and fume containment systems for the ground floor, and an atrium smoke exhaust system.

The primary energy efficiency measures that are recommended include:

- Heat recovery from exhaust air to preheat ventilation airstreams
- Premium efficiency fans
- Use of fan-wall type systems for staging of fans while maintaining University-required redundancy
- Variable frequency drives on fan and pumping systems to ramp motor energy usage to match minimum required to meet the load
- Low resistance filters
- Carbon Dioxide monitoring in all multi-occupant spaces (more than 2 people) for turndown of outside air quantities to save on fan and heating/cooling energy.
- The use of local water-based cooling and heating systems in the space to respond to building envelope loss and localized heat generation because pumping energy is less than fan energy to move the same amount of heat content to a location in the building.
- Heat recovery from steam generator blowdown and waste condensate recovery.

Hydronic Systems

It is the intent of the current design intent to use the campus chilled water and heating hot water utilities.

- Chilled water demand from campus: 300 tons, assumed to be 44°F supply and 60°F return
- High Temperature Water (HTW) demand from campus: 3900 MBH

The campus HTW system serves the building heating hot water and the production of steam for humidification (See below). The campus HTW system will also feed the domestic hot water heat exchangers (2780 MBH). Please see the Plumbing portion of the report for more details. The HTW heat exchangers reside in an external vault per new University standards.

Redundant water-to-water heat exchangers each sized for 100% of load will be provided per Utah State design requirements page 22 for facilities greater than 30,000 sf and University of Utah requirements page 302. Redundant run/standby building-side pumps with variable frequency drives for each of the systems will be provided as follows:

- Chilled water base-mounted pumps with variable frequency drives: 335 gpm each (225 tons), building side primary system will run at 44°F supply and 60°F return. This system will serve cooling coils in the air handlers, fan coil units, and CRAC units.
- Heating hot water base-mounted pumps: 165 gpm each (3300 MBH), building side primary system will run at 180ºF supply, 140°F return. This system will serve heating coils in the air handlers and reheat coils in the ground floor VAV systems. These pumps are on emergency power to ensure that heating is available for the ventilation system serving the sleeping quarter areas, and that internal pipes are protected from freezing.
- Sensible cooling loop inline pumps: 190 gpm (80 tons), secondary system will run at 60°F supply and 70°F return to serve the valence cooling units. Temperatures are set to ensure sensible-only cooling to avoid risk of condensation.
- Compensated heating loop inline pumps: 65 gpm (650 MBH), secondary system will run at 120°F supply and 100°F return to serve the radiators and the upper floor common area reheat coils. The temperatures are set in order to keep radiator surface temperatures below the temperature at which skin can burn with persistent contact. Having this separate loop also allows the loop temperature to be reset downwards responsively while keeping flow turbulence up in the building envelope heating devices, since the load on these devices is proportional to temperature differential between indoors and outdoors. These pumps are on emergency power to ensure heating is available for sleeping quarter areas.

Within the Building: Piping shall be ASTM A53, Grade B, Schedule 40, black steel pipe for 2” and larger. ASTM A53, Grade A, Schedule 40, black steel pipe for 1.5” and smaller. Provide screwed 150lb malleable iron fittings for 2” and smaller and 150 lb malleable iron fittings with mechanical grooved pipe cuples or ASTM A234 standard weight forced steel butt weld fittings for larger piping. All building-side and chilled water piping shall be insulated with fiberglass one-piece pre-formed pipe insulation with ASJ jacket. All HTW piping shall be insulated with calcium silicate with all purpose jacket. All pumps, air separators and chemical treatment pots shall be insulated per the University standards. All piping shall be laid out in a reverse return system, with drain valves at low points and manual air vents at high points, with automatic air vents only allowed within mechanical rooms.

Exterior to the building: Use Thermacor DuoTherm 505 pre-insulated pipe.

BTU Meters on chilled water and heating water shall be Fluxus ADM 7407 Liquid Ultrasonic Digital Flowmeter per the University standards.

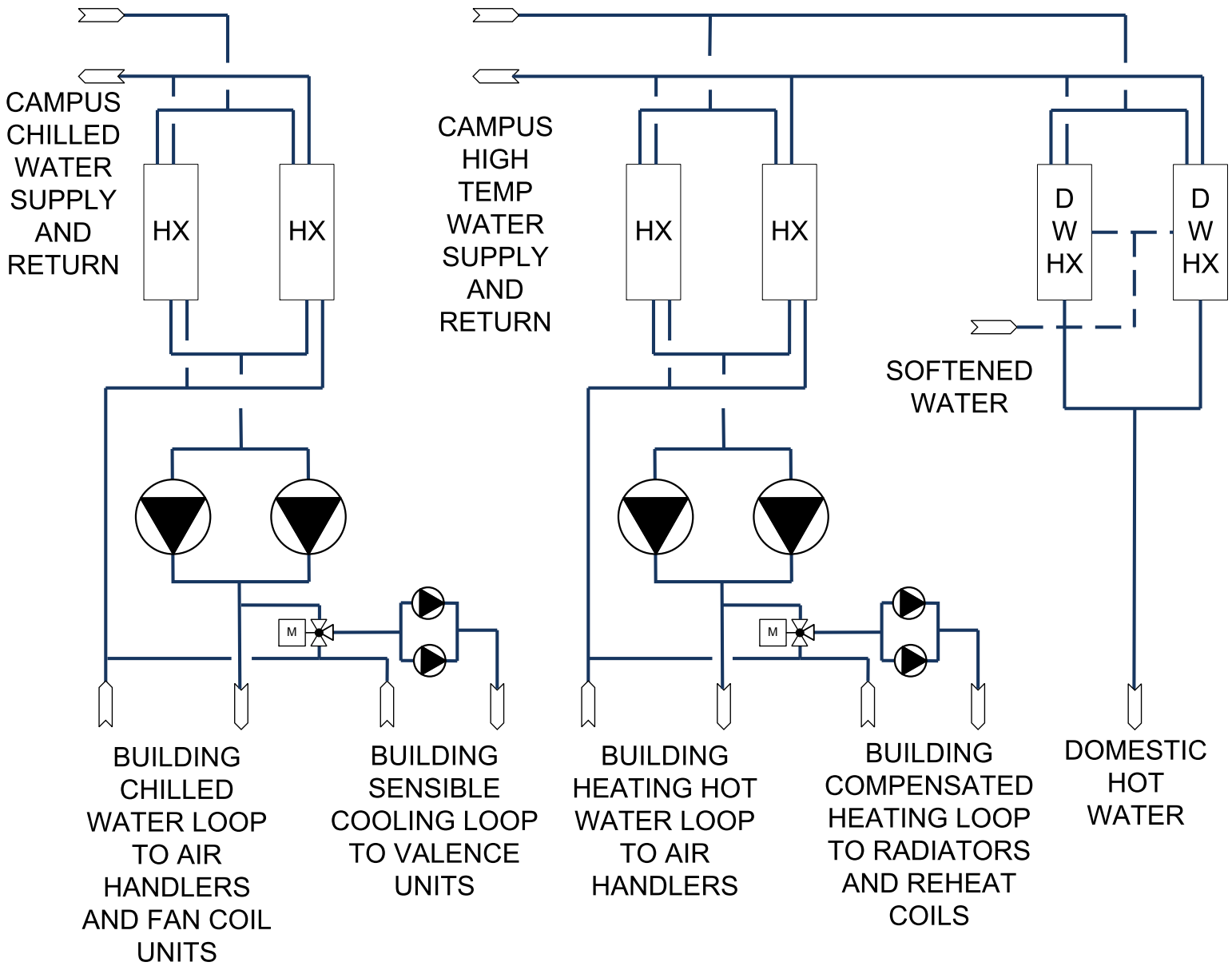


FIGURE M1 | HYDRONIC SYSTEMS DIAGRAM

Comfort Conditioning for the Residential Areas

The proposed approach for the HVAC systems is to provide a dedicated outside air system (DOAS) to provide ventilation air to all residential floors 24 hours per day based on the anticipated occupancy type and to provide local water-fed cooling and heating units as necessary to meet the load. This design approach gives the greatest flexibility for the future to convert between alternate dormitory space planning approaches, as piping is easier to reconfigure as compared to large cooling ducts. There are a number of alternates with regard to the physical aspects of serving the ventilation air into the space, which are listed in a separate section below.

All 4 upper dormitory floors are served by an air handling unit sized for approximately 18,000 cfm in a heated penthouse on the roof. It is understood that the building is already near its height limitations, so the unit has been kept as low as possible, although this implies a wider footprint. The units will include preheat coil with on-pipe recirculation pumping system, heat recovery for energy savings, MERV 8 prefilters, MERV 14 Final filters, , cooling coil, reheat coil, steam injection humidifier, and supply and exhaust fan arrays with variable frequency drives. The fan arrays must contain a minimum of 2 fans each sized at 50% of load per good practice for sleeping quarters in freezing climates. It is recommended that fan-wall systems be considered to give better part-load performance, to have easier maintenance when fans need to be replaced, and to give a greater level of redundancy for this system. This unit is on optional emergency power to ensure ventilation to sleeping quarters during power loss, but it does not operate during fire mode.

Generally speaking, a baseline of ventilation is provided to all residential zones in order to meet the cfm/sf requirements for the space. Carbon dioxide monitoring will be provided in each multi-occupant modular zone in order to ramp up outside air in the event that a party is taking place – slightly upsized ducts will allow up to 2 times the normal ventilation flow in any given wing of the floor. One ventilation VAV box will be provided for each residential wing. Toilet exhaust and kitchenette exhaust from all sleeping quarter areas of the residential floors represents all of the required exhaust from the sleeping quarter areas. The locations will also have a VAV box each, and occupancy sensors will allow the toilet exhaust to drop to 10 cfm/stall when the room is unoccupied for more than 30 minutes. Exhaust is pulled through the heat recovery devices by the air handler exhaust fan before discharge.

The use of local cooling and heating units is proposed to allow for flexibility in reconfiguration in the future. Valence cooling systems are mounted at the wall-ceiling interface and are served through a sensible-cooling piping distribution loop. As warm air at the ceiling is cooling, it enters the top of the valence unit and then drops out the bottom in a cool but not cold airstream into the space. Valence units can be used for heating if metal ceiling surfaces are likely to be warm-able for a convective-radiant heating solution, but as many of these spaces are likely to be left with bare exposed ceilings as an architectural approach, the proposed heating for the rooms comes from radiators below the windows to offset any building envelope heat loss through heated updraft. All DOAS air will be heated to room temperature before entering the space when the building envelope radiators call for heating, otherwise they shall be run in a dehumidification mode to offset latent gains and to provide auxiliary air-based cooling to the spaces.

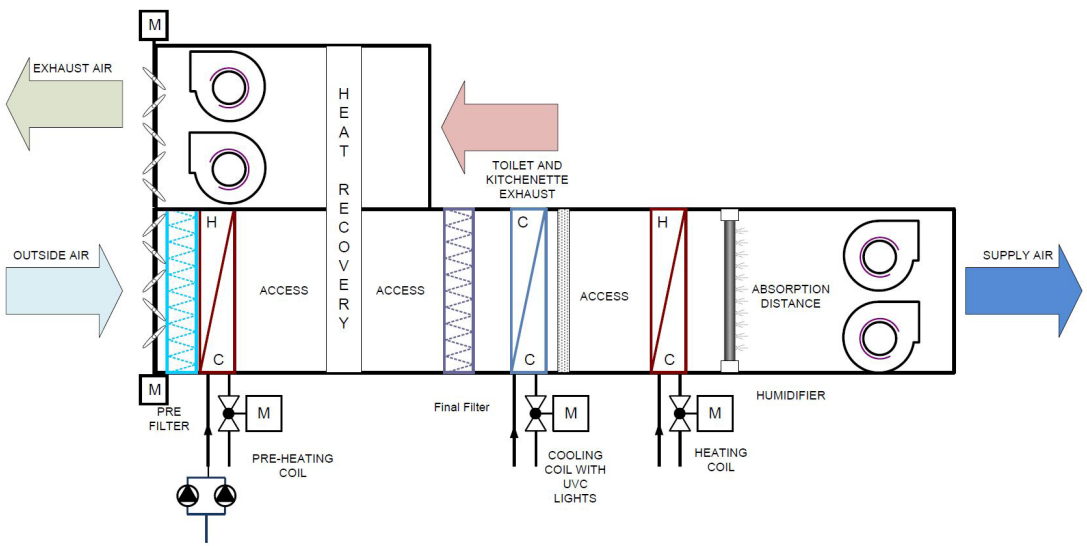


FIGURE M2 | DIAGRAM OF THE DOAS AIR HANDLING UNIT

FIGURE M3 | PHOTO OF VALENCE SYSTEM AT CEILING-WALL INTERFACE.

Comfort Conditioning for the Residential Floor Common Areas:

The central common area of the residential floors is anticipated to be a break room that might host working sessions or parties. This stack of areas is served by an independent all-air overhead VAV system which can be respond to increased heat load related to either occupancy or operating equipment. It shall be assumed that VAV boxes are sized for a maximum of 1500 cfm in normal mode and at no more than 60% of full stated box capacity. This will allow the boxes to override to 100% to accommodate air flow for the fire mode. The unit is sized for approximately 38,500 cfm to serve the four floors in normal mode. In fire mode, this unit runs at 67,000 cfm. This unit incorporates an air-side economizer, heat recovery devices for energy savings, MERV 8 prefilters, MERV 14 Final filters, preheat coil with on-pipe recirculation pumping system, cooling coil, reheat coil and supply and return fan arrays with variable frequency drives (see previous note regarding fan walls). This unit is on emergency power for makeup air operations during the atrium smoke control mode.

An allowance for 15,000 cfm of spot exhaust has been provided through a separate dedicated exhaust riser and fan. It is assumed that the exhaust will not be considered "product-conveying" under the International Mechanical Code.

The electrical and telecommunications rooms on the residential floors will be served by chilled water fan coil units on emergency power. Allow for 500 cfm per electrical and telecommunications room on each floor.

Comfort Conditioning and Fume Control for the Ground Floor Areas

At the moment, there is not a full space plan for the ground floor, however the original intent was to have a mix of spaces to support the entrepreneurial objectives of the Lassonde Make-Live Center's

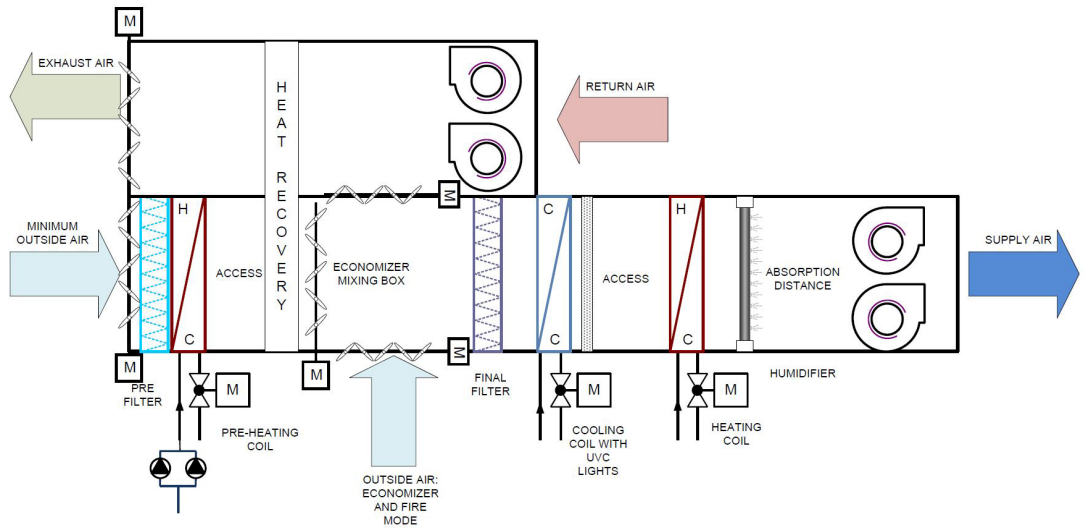


FIGURE M4. DIAGRAM OF VAV AIR HANDLING UNIT.

program. It is assumed that the main mechanical and electrical incoming services rooms will be at this level, and that there will be a main central lobby with an informal break/meeting area available at the bottom of the atrium. For estimating purposes to set upper limits on costs, we have assumed that each wing of the ground floor is dedicated to a different occupancy type as follows, and therefore each wing has its own system:

- Lobby Area and Open study zone- 14,000 cfm normal mode, 28,000 cfm fire mode
- Conference area- assumed to be a mix of sizes with overall ability to convert to high density seating for professional presentations. -- 13,500 cfm, 28,000 cfm fire mode
- Making space – assumed to house the majority of odor and fume- causing equipment- 8,500 cfm supply and exhaust, 17,000 fire mode.
- High intensity computer laboratory/classroom – 4500 cfm with 2 CRAC units @ 2000 cfm each for the server room, 10,000 cfm fire mode.

While the specific occupancies or locations might change, this approach will give a good coverage for the types of spaces that have been discussed for the ground floor "garage." For the moment, all of these areas are assumed be served by an overhead VAV system to give greatest flexibility to convert to other occupancies. It shall be assumed that VAV boxes are sized for a maximum of 1500 cfm in normal mode and at no more than 60% of full stated box capacity. This will allow the boxes to override to 100% to accommodate air flow for the fire mode. Additionally, a chilled water piping infrastructure shall been provided to provide a 2" tap (20 tons) into every wing to allow flexibility for a additional spot cooling unit to be added in the future.

The units on the ground floor are configured similar to the unit serving the residential common area.

These units are all on emergency power and are operational as makeup air during the atrium smoke control mode.

- The mechanical, plumbing and electrical spaces of the ground floor will be served by chilled water fan coil units. The cost estimate shall allow for the following:
- Main Electrical room: 2000 cfm, on emergency power
- Mechanical/plumbing incoming services room: 1000 cfm
- Fire pump room: 1500 cfm, on emergency power
- Miscellaneous storage or equipment rooms: allow for 6 additional fan coil units sized for 500 cfm each.
- In addition, it is anticipated that there will be some type of toilet core, so the cost estimate shall provide for an exhaust fan sized for 1500 cfm (i.e. 900 sf toilet block).

Atrium Smoke Control System

It is not yet decided whether the central stack of common areas will be a 5-story atrium, although it is the architectural preference to do so. Therefore, for cost estimating purposes, the design incorporates an atrium smoke control system with an exhaust fan sized for 150,000 cfm on the roof. The fan will have a variable frequency drive for balancing and will be on emergency power for fire mode. Note that the makeup at the ground floor level will come from the ground floor air handling units and makeup on the 4 residential floors is provided through the common areas air handler and is used to assist with exit sign visibility and egress path tenability on the balconies.

It should be noted that the building is not a high rise building, so therefore, there is no pressurization system for the stairwells,

Alternates to Be Considered

It is strongly recommended that at the next phase, energy analysis, first cost comparisons, and life cycle cost analysis (inclusive of maintenance costs) be performed on the following alternates:

Alternate M0A: VAV system in residential zones

This alternate is a first-cost and life-cycle cost baseline comparison.

Equipment to Add:

- Residential DOAS air handler is replaced with a 45,500 cfm VAV air handler similar to that provided for the common areas. VAV boxes with reheat coils are provided for every dormitory room for zonal control, and are provided in modular and loft spaces to limit the largest unit to 1500 cfm.

Equipment to Delete:

- The water-based valence cooling and radiator-based heating in the sleeping quarters would be eliminated
- The sensible-cooling and compensated heating loops, their pumping, and heat exchangers would be eliminated.

Alternate M0B: onsite cooling and heating plant

This alternate is a first-cost and life-cycle cost baseline comparison.

Equipment to Add:

- 2 centrifugal chillers at 180 tons each, with cooling towers, primary pumps, and condenser water pumps to suit.
- 2 @ 2340 MBH heating hot water boilers with flues to roof and primary pumps
- 2@ 1250 MBH steam boilers with flues to roof and steam condensate recovery system.
- 2780 MBH of Domestic hot water heaters with flues to roof.

Equipment to Delete:

- Chilled water and HTW connections and heat exchangers for the 4 pumping systems.

Alternate M1A: overhead distribution paths in sleeping quarters

This alternate is the lowest cost scheme and therefore is the baseline. This scheme runs ventilation and all piping overhead. For certain architectural approaches, this would be visible. This system would also require pods to have transfer fans built into them. See larger format drawings for more details on intent.

Alternate M1B: raised floor distribution paths in sleeping quarters

This alternate uses the raised floor for distribution of DOAS ventilation air as well as the sensible loop and compensated loop piping. The first cost analysis would have to include the cost of installation of the raised floor, floor diffusers, and modifications to the pod for a ventilation opening that could align with a floor tile below. See larger format drawings for more details on intent.

Alternate M2: air-to-air heat recovery devices

It is recommended that further dialogue with the University Facilities personnel be pursued to determine preferences for heat recovery devices and that a quick life-cycle cost analysis be performed to determine whether it is necessary to have total heat (sensible + latent) heat recovery in enthalpy wheels or membrane-type exchangers (which have higher maintenance costs) versus heat pipes or sensible heat exchangers.

Alternate M3: solar thermal heating

This alternate is proposed as a possible option to support the campus' renewable energy goals to provide a portion of the heating hot water for the building.

Alternate M4: systems to support use of building as base of operations during an emergency

Housing has expressed an interest in using the building as a base of operations during an emergency. This is available effectively for no cost:

- The design already has the building-side heating hot water pumps on emergency power to provide heating of the building envelope and ventilation air for the sleeping quarters.
- The sleeping quarter ventilation systems is on emergency power for best practice reasons.
- The atrium smoke control system requires that all other air handlers be active as makeup during a fire, so these are also on the emergency power system.

This combination of design features essentially means that the building can run its heating and ventilation systems at full load on emergency power, so long as HTW is still being provided from the campus utilities.

ITEMS FOR CONSIDERATION IN FUTURE PHASES

The following items should be considered during the next phase:

- Selection of residential area distribution alternate
- Resolution of life cycle cost analysis
- Atrium smoke control system verification
- Ground floor space planning for placement of mechanical rooms versus noise-sensitive locations
- Coordination of louver positions
- Confirmation that assumed campus utility capacities are available
- Confirmation of ground floor program, internal loads, and specialty exhaust requirements
- Confirmation of "making"-type activities that will go on within the Modular residential zones for purposes of providing spot exhaust
- Confirmation of "making"-type activities that will go on within the residential floor common areas for purposes of providing spot exhaust

PLUMBING & FIRE PROTECTION

INTRODUCTION

The University of Utah Lassonde Make-Live Center will be a new construction project located on the University of Utah Campus. Project assumptions are as follows: 400 bed dormitory coupled with at least 20,000 square feet of "garage" or "making" space.

The goals of the Concept Plumbing Systems Design are as follows:

- Promote the value of water efficiency through the use of water-efficient plumbing fixtures certified to be at least 20% more efficient without sacrificing performance. Decrease in water use will reduce strain on existing water resources and infrastructure.
- Provision of semi-instantaneous heat exchangers in lieu of storage type water heaters to reduce heat loss from storing hot water and sized to accommodate peak hour demand.
- Maximized non-recirculated hot water lines to only fifteen (15 feet) and provision of a variable speed hot water recirculating pumps with "Electronic Commutated Motor" (ECM) technology for maximum efficiency to achieve up to 80% energy savings.
- Possible reclaiming of water softener backwash water for water re-use.

DESIGN CRITERIA

Site/Campus Criteria

The prevailing design standard on the University of Utah campus is the State of Utah, Department of Administrative Services, Division of Facilities Construction and Management Design Requirements, with the University of Utah Supplement. These documents reference the following standards:

- 2012 International Building Code (IBC)
- 2012 International Fire Code (IFC)
- 2012 International Plumbing Code (IPC)
- 2009 ANSI A117.1 – Standard for Accessible and Usable Buildings & Facilities
- 2013 NFPA 13 – Standard for the Installation of Sprinkler Systems
- 2013 NFPA 14 – Standard for the Installation of Standpipe and Hose Systems
- 2010 NFP 20 – Standard for the Installation of Stationary Pumps

Building Systems Criteria:

It is anticipated that utilities will come from adjacent campus site utility systems. Preliminary calculations show the following demands from the building:

- Normal Cold Water Demand: 300 GPM, with a minimum of 6" water connection from the site water main.
- Sewage Flow: A total of 1204 drainage fixture units (DFU). It was assumed that there will be four (4) of 6" sanitary building drains connections to the site sanitary sewer system.
- Storm Drainage Area: A total of 32,795 square feet of drainage areas with twelve (12) 6" storm drainage connections to the site storm drainage systems.
- High Temperature Water (HTW) Demand for Plumbing: 2780 MBH
- Sized for the following Hot Water Demand: Domestic (Housing) – 110 GPM; Common Area (Coffee Bar, Laundry, and Public Toilets) – 55 GPM.
- Fire Water Demand: 1,000 GPM, with a minimum of 6" fire water connection from the site water main.

Domestic Hot & Cold Water System:

Domestic cold water shall be connected to the site domestic cold water system. Based on the information gathered from the University of Utah's Design Requirements, it was assumed that there is an available 80 psig at the building site. The building shall be provided with a building meter and backflow prevention devices. A pressure regulating station shall be provided if the existing pressure exceeds 80 psig.

Since the 2012 International Plumbing Code does not recommend velocities in excess of 5 to 8 feet/second, the domestic hot and cold systems shall be sized using a maximum velocity of 4 feet/second at peak design flow and a minimum allowable pressure loss of 1 psi per 100 feet of pipe. Although the University of Utah's Design Requirements calls for a minimum of 15 psig at the farthest connection in the building, a minimum of 20 psig shall be used to comply with the requirements of IPC 2012 – Table 604.3.

Two (2) sets of dual alternating water softeners will be provided to supply water to the domestic heat exchangers and the high temperature water-to-steam generators used to serve the HVAC humidifiers (See mechanical portion of report). Preliminary size of the water softeners is based on a peak flow of 150 GPM each set.

Domestic hot water for the housing will be provided by three (3) semi-instantaneous hot-water-to-hot-water heat exchanger, two working units and one (1) stand-by/alternating unit, sized at 55 GPM each or 50% each of the total water demand. Water will be heated to 140°F to prevent legionella and will be distributed at 120°F via hot water supply and return system. A duplex hot water recirculating system with pumps, one working-one alternating will be provided.

A dedicated semi-instantaneous hot-water-to-hot-water heat exchanger with a capacity of 55 GPM will be provided for the common area, such as coffee bar, laundry, public restrooms and any facilities requiring hot water to support the conference location. Water will be heated to 140°F and distributed at 120°F via hot water supply and return system. Electric hot water booster heater will be provided for laundry if the machines are believed to require 180°F.

All domestic hot and cold water piping shall be copper type L and shall be insulated.

Sanitary Waste & Vent System:

Sanitary waste and vent will be sized based on total connected fixture units per the total plumbing fixtures as shown on architectural plans and using IPC Section 709 for pipe sizing. Sanitary waste piping shall be sized, piped and routed to 5-foot outside of building and connected to the site sanitary waste system.

All horizontal sanitary waste & vent piping below the roof shall be insulated up to the vertical riser connection. All horizontal drainage piping shall be sloped at 2%.

Storm Drainage System:

Storm drainage system shall be sized based on 2"/hr. rainfall intensity and IPC Table 1106. A dedicated secondary or emergency overflow drain system will be provided and shall be routed to discharge above grade at face of building. All horizontal primary and emergency overflow drains below the roof shall be insulated up to the vertical riser connection. It is assumed that the roof shall be provided with a snow-melting system by others. Primary storm drainage system shall be piped, sized and routed to 5-foot outside of the building perimeter and connected to the site storm drainage system. All horizontal drainage piping shall slope at 2%. All horizontal and vertical storm drainage piping above the ceiling shall be insulated.

Provision for heat-tracing the storm drainage piping below the roof will be an option to be discussed with facilities personnel.

Natural Gas:

The building will be provided with standard pressure natural gas for use for laundry dryers located at the ground floor Common Area. A gas meter room will be provided at Level 1, which will also house the gas pressure regulators, shut-off valves and seismic valve.

Fire Protection System:

The building will be provided with a combined standpipe system that supplies both hose connection and automatic sprinkler system. Flow rate shall be based on the standpipe demand of 500 GPM for the first standpipe and 250 GPM for additional standpipe, up to a maximum of 1000 GPM. Since the standpipe demand is greater the sprinkler system demand, the standpipe demand will be used.

Per NFPA 14, a minimum residual pressure of 100 psig is required at the outlet of the hydraulically most remote 2-1/2" hose connection. Since the assumed available pressure at the building site was 80 psig, a fire pump shall be required to provide the 100 psig residual pressure. A set consisting of an electric fire pump and an electric jockey pumps shall be sized to provide 1000 GPM at a minimum of 100 psig at the most remote standpipe riser.

Another option, subject to approval by authorities having jurisdiction, is the provision of a Class 1 dry standpipe system, if piping will be viewed as subject to freezing.

Plumbing Fixtures:

- Water Closet: Vitreous china, siphon jet, floor mount, water conserving unit, with 1.28 GPF, manual flush valve.
- Lavatory: Wall-hung or counter-top, vitreous china, with 0.50 GPM flow restrictor, manual faucet.
- Shower or Bathtub: With pressure and temperature balancing valve and rated at 1.50 GPM.

- Urinal: Wall-hung, vitreous china, 0.125 GPF, manual flush valve.
- Kitchen Sink: Single compartment, stainless steel sink with 1.50 GPM manual faucets.
- Service Sink: Enameled cast iron, floor mounted with 1.50 GPM manual faucet.
- Hose Bib: Chrome-plated polished with vacuum breaker, non-freeze type.
- Floor drains and floor sinks: Duco cast iron body.

Irrigation System:

a) A separate metering system for irrigation will be provided and will be discussed under Irrigation System by the Landscape Consultant.

SYSTEM DESCRIPTION:

Domestic Cold and Hot Water System:

An incoming 6" cold water pipe was assumed to be entering the building from the south side and will be routed to the Plumbing Equipment Room where the water softeners and heat exchangers are located. Backflow protection devices and sub-water meters will be provided on the supply side of the water softeners and the domestic cold water supply. Softened water will be provided for the heat exchangers and mechanical equipment.

Hot and cold water supply through the building will be supplied via an upfeed system at each wing of the building, with the main cold and hot water supply and return piping located at the ceiling of Level 1. Hot water supply and return risers will be provided at each toilet core, located as close to the plumbing fixtures requiring hot water supply. All hot and cold water shall be insulated within the building per University standards.

The Common Area will be provided with a dedicated cold water supply and hot water supply and return system.

Cold water riser will be extended to the roof where water supply is required.

Sanitary Waste & Vent System:

Each wing and toilet core will be provided with several sanitary waste and vent risers that will be collected at the ceiling of Level 1. Main house sanitary drainage will be provided at each wing and routed to a location and discharged out of the building at four (4) locations.

Storm Drainage System:

It was assumed that each wing of the building will be provided with three (3) sets of 4" primary and secondary roof drains. 6" primary drains will discharge out of the building at twelve (12) locations, while the secondary drains will discharge at face of building or at curb face. All vertical risers and horizontal piping under the roof shall be insulated.

Per DCFM Design Requirements, an on-site detention system for storm water needs to be provided. It is our assumption that the storm drains from the building will be routed to this on-site detention system under Civil's scope of work.

Sub-Soil Drainage System:

Per DCFM Design Requirement, sub-soil drainage or foundations drains are required on all foundation walls. Detail of installation is as shown on DCFM Design Requirement – Division 7. Pending receipt of geotechnical report to determine the recommended flow and pipe size of the foundation drains, it is currently assumed to use a 4" perforated pipe. The sub-soil drainage system will be routed and connected to the site storm drainage system. Prior to connection the site storm drainage system, a backwater valve in a valve box shall be provided, to prevent water from entering the sub-soil drainage system in case of overflowing site storm drainage system.

Natural Gas:

The building will be provided with standard pressure natural gas to supply the demand of the dryers in the Laundry Area. There is no information at this time for the number and capacity of the dryers, but for purposes of this narrative, we are assuming that a minimum of 3" natural gas line will be adequate.

Fire Protection System:

A separate 6" fire water line will be routed to the proposed fire pump room and connected to the fire pump. It was assumed that the fire pump discharge will be an 8" and will be routed at the ceiling of Level 1 and extended to each exit stairwell. A 6" fire riser and a 3" drain riser will be provided at each exit stairwell, where a 2-1/2" hose connection and the sprinkler control valve assembly is provided at each level. Each fire riser will be provided with shut-off valves. A hub drain will be provided at the base of each stairwell, and will be used to discharge the sprinkler drain.

ALTERNATES:

Domestic Cold and Hot Water System:

1. Raised heating of domestic hot water to 140°F and supplied at120°F, in lieu of heating to 120°F and supplied at110°F as called out in the DFCM Design Requirements, University of Utah Supplement – Section 3.5 – Mechanical.

   Advantage: Prevention of Legionnaires' disease.

   Fact: Studies done by World Health Organization confirmed the fact that legionellae are found in hot water tanks. It was found that L. peumophilia has been shown to be able to withstand temperatures of 122°F for several hours, thus, it is our recommendations to heat the water to 140°F and supply it at 120°F.

2. Reduced domestic water velocity from 5-8 feet/sec to 4 feet/sec.

   Advantage: Prevent corrosion of pipe due to high velocity.

   Fact: Studies show that high water velocities in water were one of the causes of "pin-holes" on water piping.

3. Increase the minimum water pressure at the farthest plumbing fixture connection from 15 psig as shown on DFCM Design Standards, to 20 psig.

   Advantages:

   (a) To comply with majority of plumbing fixture manufacturers' recommendations to use a minimum of 20-25 psig pressure for their plumbing fixtures, i.e. flushing of water closets or urinals; and

   (b) To comply with the requirements of IPC 2012 – Table 604.3, to use a minimum of 20 psig for some fixtures.

4. Subject to review and approval by DCFM, provision of sub-metering for utilities, for the following areas:

   a) Housing.

   b) Common Area.

5. Utilizing the water softener backwash water for re-use.

   Advantage: If acceptable to authorities having jurisdictions, the backwash water from the softener can be dumped into the storm water detention system and can be filtered and treated for re-use for non-potable water use like flushing toilets and urinals or irrigation.

Storm Drainage System:

1. Utilizing the on-site detention system for storm water for irrigation water supply.

   Advantage: The storm water can be filtered and pre-treated for re-use for irrigation system, in lieu of slowly releasing the water to the site's main storm drainage system. This will reduce the water consumption from the City's water system.

2. In lieu of just insulating the storm drainage piping above the ceiling and below the roof level, we recommend provision of heat-tracing the storm drainage piping at this level.

   Advantage: The DCFM Standards did not show he provision for snow-melting at the roof; thus, it will be advantageous to provide heat tracing of the piping, to guarantee that snow will not cause clogging of pipes.

Fire Protection System:

1. The DCFM Standards showed the requirement for automatic sprinkler system but did not show provision of standpipe system for the building, but standpipe system is required per IBC and NFPA 14. We had indicated a combined standpipe and automatic sprinkler system as the basis of design, but if due to freezing condition, and if acceptable to authorities having jurisdiction, the use of Dry Standpipe System is also acceptable by code & NFPA 14.

   Advantage: If the standpipe and automatic sprinkler risers and piping can be a separate system; the water supply and pressure for the standpipe could be provided by the Fire Department via pumper trucks; there is adequate flow and street pressure from the site water main to supply the automatic sprinkler system; and the authorities having jurisdiction will approved it, there is a possibility that the fire pump package can be deleted.

Vacuum Plumbing System:

1. 1) If acceptable to DCFM and Authorities Having Jurisdiction, possible replacement of the conventional waste and vent system with vacuum plumbing system.

   Advantage: This is a new technology that can be submitted as "engineered plumbing system", but there is a potential for reduced pipe sizes and deletion of the venting system.

   Some Disadvantages: Plumbing fixtures selections will be limited and will only be those recommended by the Vacuum Plumbing System manufacturer. Will require equipment room for the vacuum pumping system.

ISSUES FOR CONSIDERATION IN FUTURE PHASES:

1. Coordination with Geotech Engineer for the recommended capacity and size of the sub-soil drainage system.
2. Coordination with the Architect for the number and location of roof, overflow and balcony drains and other details relating to roof.
3. Coordination with Authorities Having Jurisdiction, the Fire Department, or the Fire-Life safety Consultant, for the final fire protection system that needs to be provided for the building.
4. Coordination with Laundry Consultant and Irrigation Consultant for their utility requirements.
5. Coordination with Civil Engineer for the location, pressure (as applicable), pipe size and capacity of all utilities connecting to the site utility systems and the possible re-use of the water from the detention system.

ELECTRICAL

INTRODUCTION

The University of Utah Lassonde Make-Live Center is a 400 bed dormitory coupled with at least 20,000 of flexible making space to support the entrepreneurial goals of the combined living-learning environment.

The goals of the concept Electrical system design, then, are as follows:

- Provide safe and reliable power
- Provide flexibility to accommodate future space planning changes
- Plan for ease of maintenance

DESIGN CRITERIA

Site/Campus Criteria

The prevailing design standard on the University of Utah campus is the State of Utah, Department of Administrative Services, Division of Facilities Construction and Management Design Requirements, with the University of Utah Supplement. These documents reference the following prevailing codes:

- 2012 International Building Code
- 2011 National Electrical Code

Other national standards:

- NEMA - National Electrical Manufacturer Association
- IEEE - Institute of Electrical and Electronic Engineers
- IESNA - Illuminating Engineering Society of North America
- EIA - Electronic Industry Association
- TIA - Telecommunication Industry Association
- ADA - Americans with Disabilities Act
- NFPA - National Fire Protection Association
- ANSI - American National Standards Institute
- UL - Underwriters Laboratories Inc.
- OSHA - The Occupational Health and Safety Act

The site is served by campus utilities. A Medium Voltage (MV) feeder will be provided from the Campus Central Plant. MV feeder will terminate in the primary switch of an external pad mounted, oil filled transformer per University's requirements. (see also Alternate E3 - provide indoor unit substation in lieu of outdoor MV pad-mounted transformer as mentioned above.) Power transformers will transform the MV service to usable 480/277V and 208/120V 3 phase 4 wire systems that will distributed to all the buildings loads.

It is anticipated that the building load will be approximately 7W per/s-ft, but will depend on the smoke exhaust strategy of the atrium. This allows for 1.5W/sf for lighting, 2W/sf for small power 3.5W/sf for mechanical as Chilled water is from the central plant. This would range between 750 KVA and 1600 KVA depending on the overall size of the building, the type of equipment installed for "making" and the final design of the atrium smoke control system. Emergency load ranges from 300-600 KVA depending on the smoke control systems.

It is understood that all systems served by the campus shall meet the University of Utah standards, whereas the Housing group may choose to use high-end residential quality equipment and fixtures as appropriate.

SYSTEM DESCRIPTION

Electrical Power Distribution System

Power Distribution System will consist of the following:

- Power distribution system equipment consisting of normal, emergency and stand-by system power, lighting and power panelboards. Emergency and stand-by system equipment will be connected to emergency/stand-by generator via separate automatic transfer switches as required by NEC.
- All normal power panelboards will be connected to the main distribution system equipment.
- All emergency power panelboards and equipment will be connected to emergency main distribution panel.
- All stand-by system panelboards and equipment will be connected to stand-by system main distribution panel.
- Emergency and stand-by distribution panels will be connected to the generator system via separate ATS switches.
- Separate Fire Alarm System ATS switch will be provided with all required appurtenances and connections.
- 480V – 208/120V, High Efficiency Harmonic mitigation transformers will be provided as required for all 208/120V lighting and power panels serving living rooms and data equipment. It is recommended that there be local step-down of 480/208-120V due to distances and voltage drop. All panelboards and their feeders connected to the secondary side of the transformers will be provided with 200% rated neutral.
- Voltages as follows will be used:
  - 480V, 3 phase for motors 3/4 hp or larger
  - 277V, 1 phase for lighting fixtures
  - 120V, 1 phase for receptacle outlets and power, Low Voltage System equipment and devices, motors smaller than ½ hp.

Emergency and Stand-by Power System

The generator system shall be designed to have approximately 30% spare capacity. Load shedding of non-essential stand-by loads will be provided as required so as not to exceed the generator system capacity.

An exterior, critical grade diesel generator with sub-base tank will be located outside near the Utility yard, to serve emergency and stand-by systems. Diesel fuel storage should be for 24 hours per the DFCM requirements , or reduced to 8 hours per the University Design Guidelines at the University's

direction. As Housing has mentioned the possibility of using the facility as a base of operations during emergency events, it may be prudent to provide the larger capacity.

These building emergency systems will include the following:

- Building emergency lighting and exit signs.
- Fire Alarm System
- Atrium smoke exhaust systems
- AHU's
- Fire pump
- Elevator (if required)
- Ejector pumps
- Sump pumps
- Security Systems
- HVAC heating hot water pumps
- Building Management Systems
- Other optional standby loads as requested by University of Utah

Metering

Metering will be provided as per the requirements of LEED, and in accordance with the University of Utah's standards.

Provisions shall be provided on level 1 workspace areas for check metering to allow for portions of the space to be leased to others to support start up companies.

Mechanical Equipment

Power panels for mechanical equipment will be provided as required. The panels will be used to supply power to individually mounted control equipment for mechanical systems (HVAC units, fans, pumps, elevators, etc.).

Receptacles

The following general rules describe the provision of the receptacles:

- Adequate number of ground fault circuit interrupter receptacles in each toilet/bathroom.
- One duplex receptacle for each 20 linear feet of mechanical and electrical rooms.
- Special purpose receptacles as required.
- Living quarters will be fitted out to comply with or exceed code requirements. A grid of floor boxes will be provided for the modular option for connection to the individual seeping units.
- Convenience outlets will be provided for each 50 linear feet of corridors and service areas for cleaning and maintenance.
- Power for kitchen and other special equipment, miscellaneous low voltage equipment and devices will be as required by respective consultants.
- Final receptacle outlet locations, types, quantities and methods of power feed will be determined and coordinated with the architect and University.

Lighting

The lighting levels will be designed in accordance with the recommendations of the Illuminating Engineers Society (IES) and the lighting power density will be in accordance with University of Utah's Policy Guidelines for Sustainable Practices.

High efficient fluorescent/LED fixtures will be provided in all areas.

The following lighting levels will be provided:

Area	Workplane (footcandles)
Corridors	7 - 20
Interior Seating Areas	10 - 20
Restrooms	20 - 30
Store	30 - 50
Workshop	30 - 50 - 75
Open floor space	20 - 30
Stairwells	10 - 20

Open living areas will be designed for general illumination of the space. Each fixture will be provided with DALI dimming ballast which will allow for complete flexibility when the space is modified/ rearranged.

Separate task lighting will be provided in the fixed furniture locations. Individual desk lamps will be provided for individual study area. Lounge areas will be combinations of floor/table lamps.

Lighting Control

Lighting control/ management system will be installed providing flexible and efficient means to control the lighting through local manual override low voltage switches and/or automatic occupancy sensors with day-lighting control features.

All areas other than common areas will be provided with either wall or ceiling mounted motion sensors. Perimeter fixtures will be linked to photocells to maximize day-lighting and to reduce the need for artificial light in these areas.

Emergency lighting will be provided in accordance with National Life Safety Code (NFPA 101). The system will be designed to provide a safe means of egress from the building in the event of failure of the normal power.

Grounding System

The main switchboards will be provided with a grounding bar connected to ground electrodes. The grounding system will be designed to provide effective grounding to enable protective devices to operate within a specified time during fault conditions, and to limit touch voltage under such conditions.

All extraneous conducting metal work within the building will be bonded. Equipment grounding wires will be distributed from the main switchboard ground bar to electrical panels and equipment located throughout the buildings as required.

A dedicated grounding system will be provided to communication closets.

Lightning Protection

The building will be provided with a complete lightning protection system consisting of lightning rods at roof level and connections to down conductors. These will terminate in the independent grounding electrode network. The system will be provided in compliance with requirements of NFPA 780 and UL 96A.

Fire Alarm System

The building will be provided with a Fire Alarm System as follows.

The fire alarm system will be an voice evacuation addressable type. This system will consist of a Fire Alarm Control Panel (FACP) located in the main electrical room and remote annunciator panels located as required by code and the University of Utah.

The system will interface with the sprinkler system and be capable of monitoring all flow and tamper switches in the building.

On automatic detection of smoke and/or fire, the system will shut down HVAC system fans over 2000 CFM, recall elevators, release held open smoke/fire doors and unlock fail safe doors provided with electric locks.

Each electrical closet, mechanical room, top of stairwell, held open smoke/fire door shall be provided with smoke detectors.

Each room used for sleeping purposes and each area in the immediate vicinity of such room will be provided with combination smoke and heat detectors with a local sounder. Smoke detection will signal local alarm only. Heat detection will signal fire alarm system.

Area smoke detectors will be provided outside of living and sleeping units in common spaces, recreation rooms, lounges, dining and storage rooms.

Duct smoke detectors will be provided for air handling system units as required by code. Heat detectors will be provided for supplementing smoke detectors in elevator shafts and elevator machine rooms.

Strobe devices will be installed in public toilets, corridors, lobbies, dining areas and other areas of common usage and in some selected suites designated for use by handicapped persons.

Fire alarm system audible devices will consist of speakers located throughout the building as required to notify building occupants in the event of a fire alarm.

Manual pull stations will be located at all floor fire exits.

Fire Extinguisher Monitoring System shall be provided per University Standards.

Fire Alarm Control Panels will be tied into the Central Station as per University of Utah's Standards.

Support for Low Voltage Systems

As part of electrical work, the following will be provided for Telecommunication, Security, Cable TV, Audio/Visual and other Low Voltage Systems:

Power for equipment and devices provided by other trades.

Empty conduit systems as required.

Specific requirements for the Low Voltage Systems (power requirements, locations of equipment and devices, conduit and raceway system sizes, quantities, etc.) will be determined by the respective system designers.

Maintenance and Servicing

The building design will allow adequate access for maintenance and servicing. In particular:

Equipment will have adequate access for withdrawal of components.

All points requiring inspection and servicing will be fully accessible and provided with code required working clearances.

Large or heavy system components will be removable via elevators, access hatches and corridors sized for component removal and/or replacement.

ALTERNATES

Alternate E1: Photo Voltaic Panels on roof

PV arrays can be located on the roof. An Inverter would be located on the top floor for conversion from DC to AC power so it can be consumed by the building.

Alternate E2: Photo Voltaic Panels shading devices above surface parking

PV arrays can be located on framing structures above the parking spaces and can double as sun shades.

The following chart shows the anticipated energy generation versus first cost for such systems.

Option	E1	E2
Location	Roof	Carport
Gross Area	32,800	131,918
Coverage	70%	60%
Active PV Area (sf)	22,960	79,151
Assumed DC Rating (W/sf)	16	16
Output (kWh AC/kW DC)*	1298	1298
PV System Rating (kW DC)	367	1266
Annual Generation (kWh AC)	476,833	1,643,804
Unit Energy Cost ($)	0.0884	0.0884
Energy Cost Saving ($)	42,152	145,312
Unit Cost of PV ($/W)**	4	5
Installed Cost of PV ($)	1,469,440	6,332,064
Assumption for Incentives	30%	30%
Final Cost of PV ($)	1,028,608	4,432,445
Simple Payback (yrs)	24	31

* Assumes 77% efficiency for inverters etc

** Added cost for E2 due to car port

Alternate E3: Indoor Unit Substation

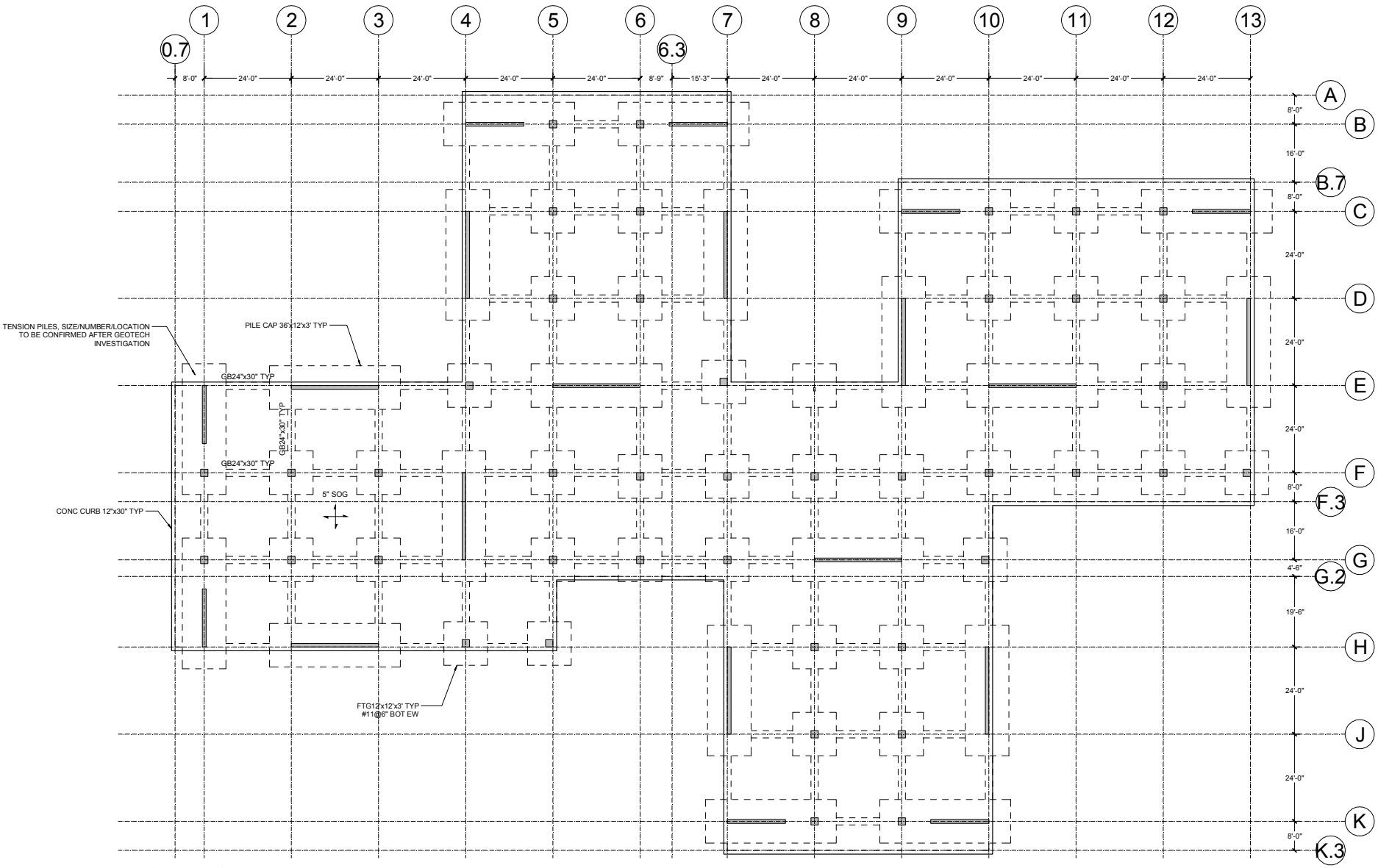
ITEMS FOR CONSIDERATION IN FUTURE PHASES

The following items should be considered during the next phase:

- Verification of building loads (normal and emergency)
- Electrical room equipment layouts
- Coordination of services thru building
- Lighting layouts and photometric calculations
- Resolution of whether PV alternate would be pursued to assist with campus renewable energy goals to move towards carbon neutrality.

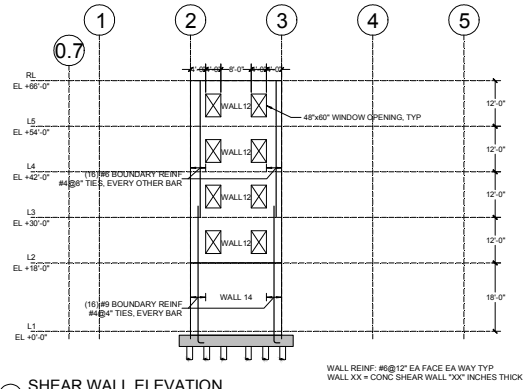
08.A

APPENDIX FOR BUILDING SYSTEM PERFORMANCE CRITERIA - SUPPLEMENTAL DIAGRAMS

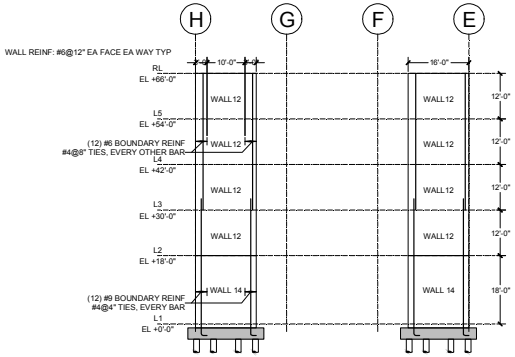


1 FOUNDATION PLAN
1/32" = 1'-0"

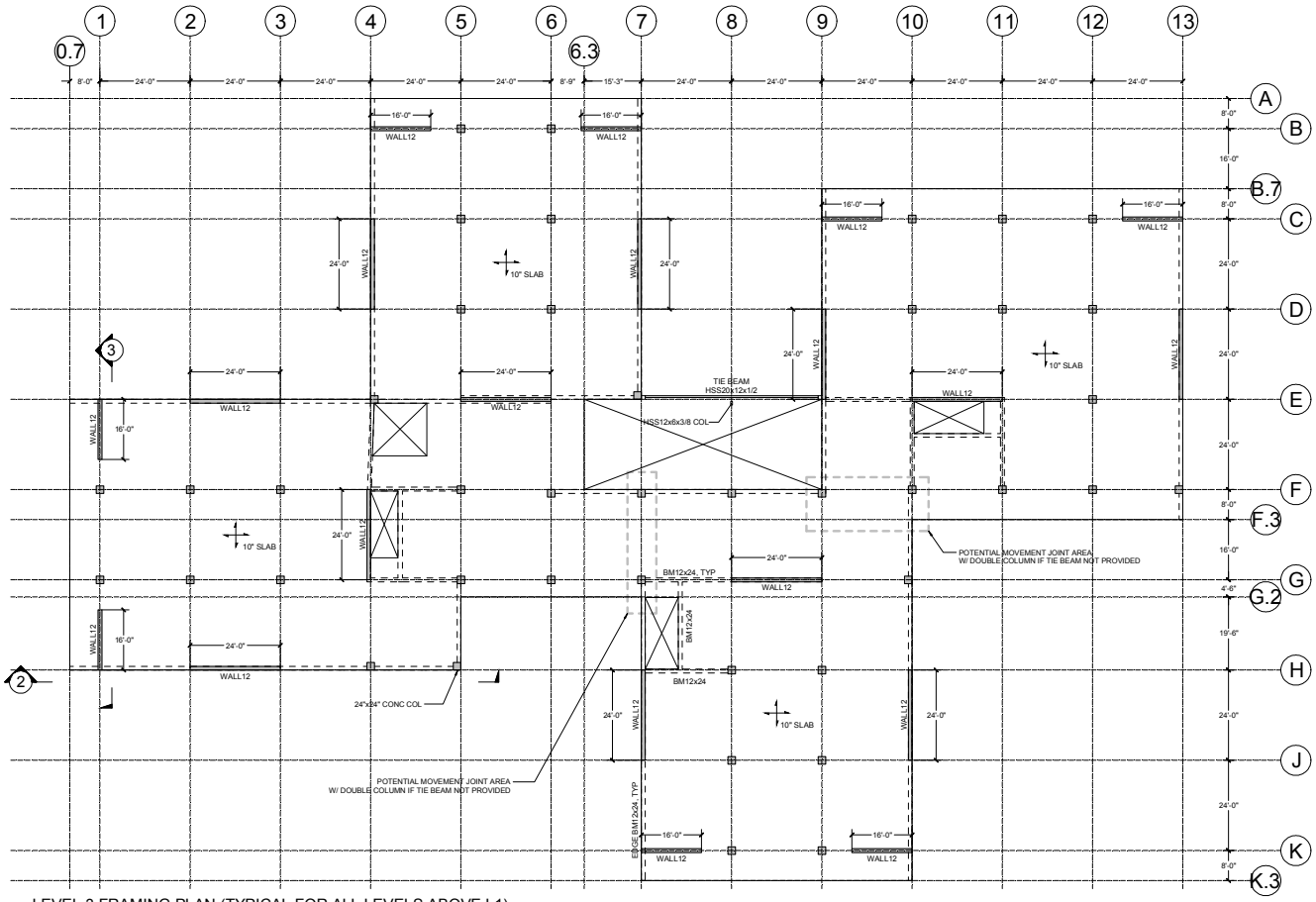
OPTION 1: CONCRETE SYSTEM



2 SHEAR WALL ELEVATION
1/32" = 1'-0"

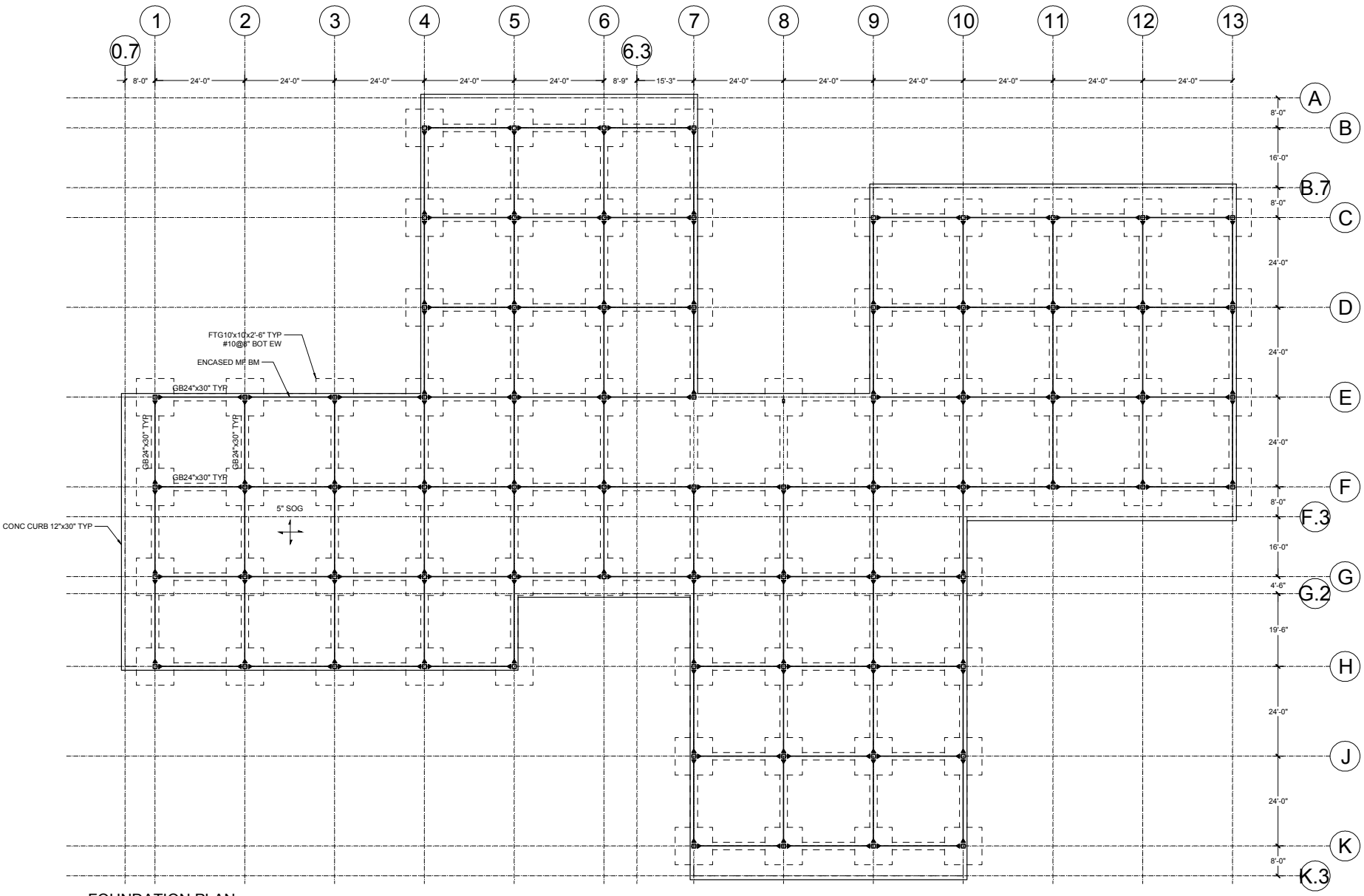


3 SHEAR WALL ELEVATION
1/32" = 1'-0"



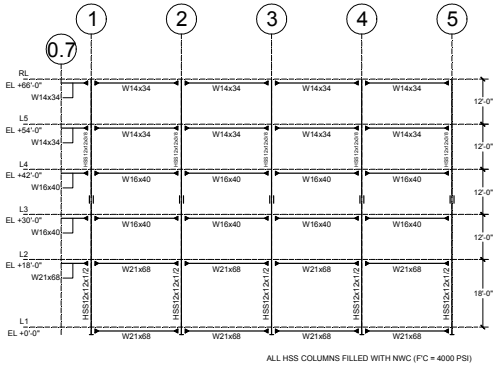
1 LEVEL 3 FRAMING PLAN (TYPICAL FOR ALL LEVELS ABOVE L1)
1/32" = 1'-0"

OPTION 1: CONCRETE SYSTEM

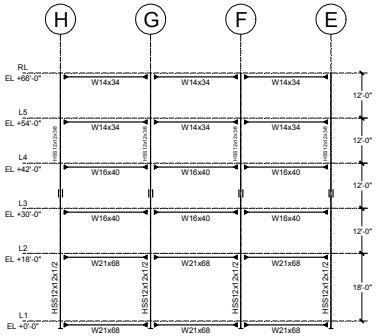


1 FOUNDATION PLAN
1/32" = 1'-0"

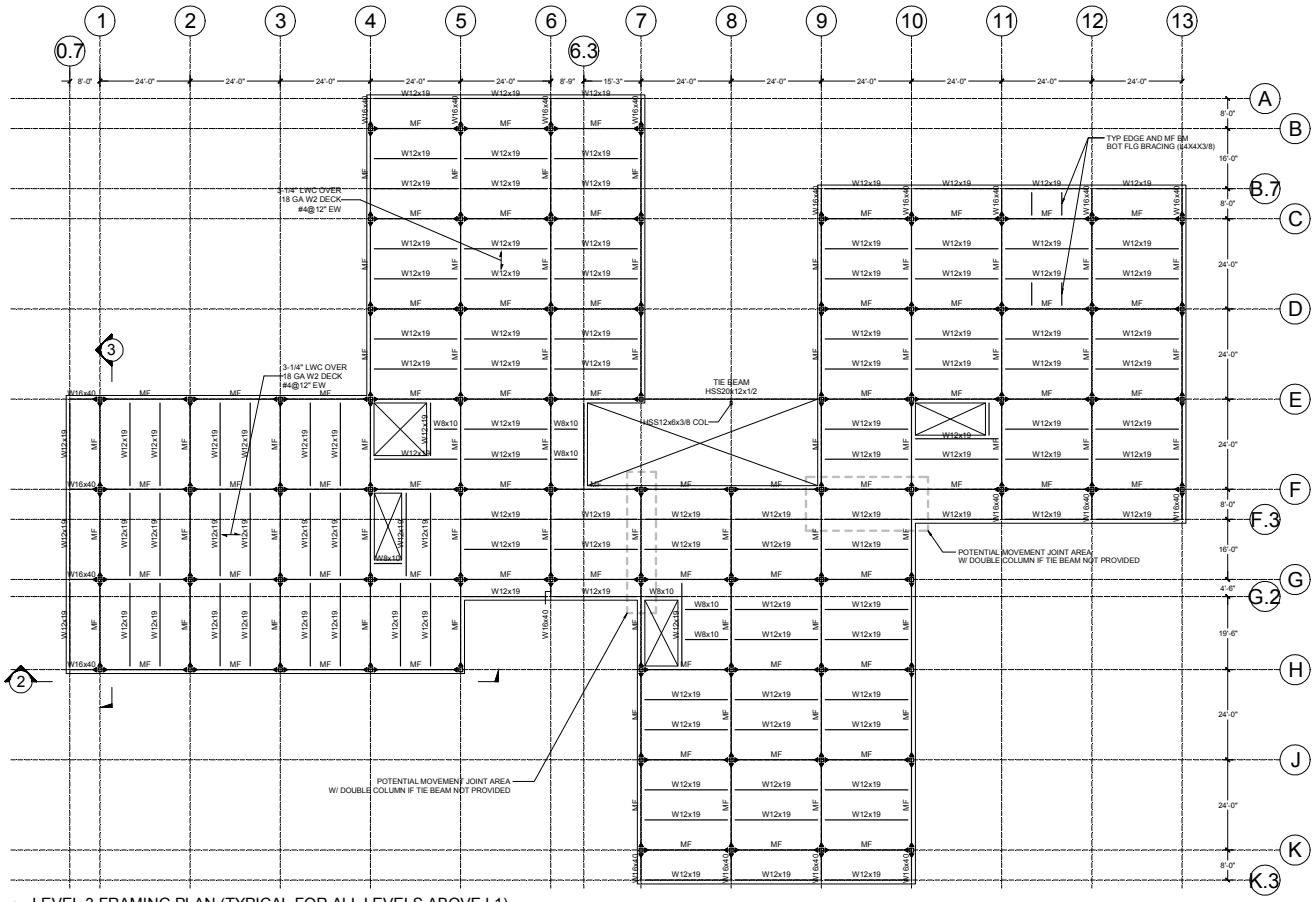
OPTION 2: STEEL CONX SYSTEM



2 MOMENT FRAME ELEVATION
1/32" = 1'-0"

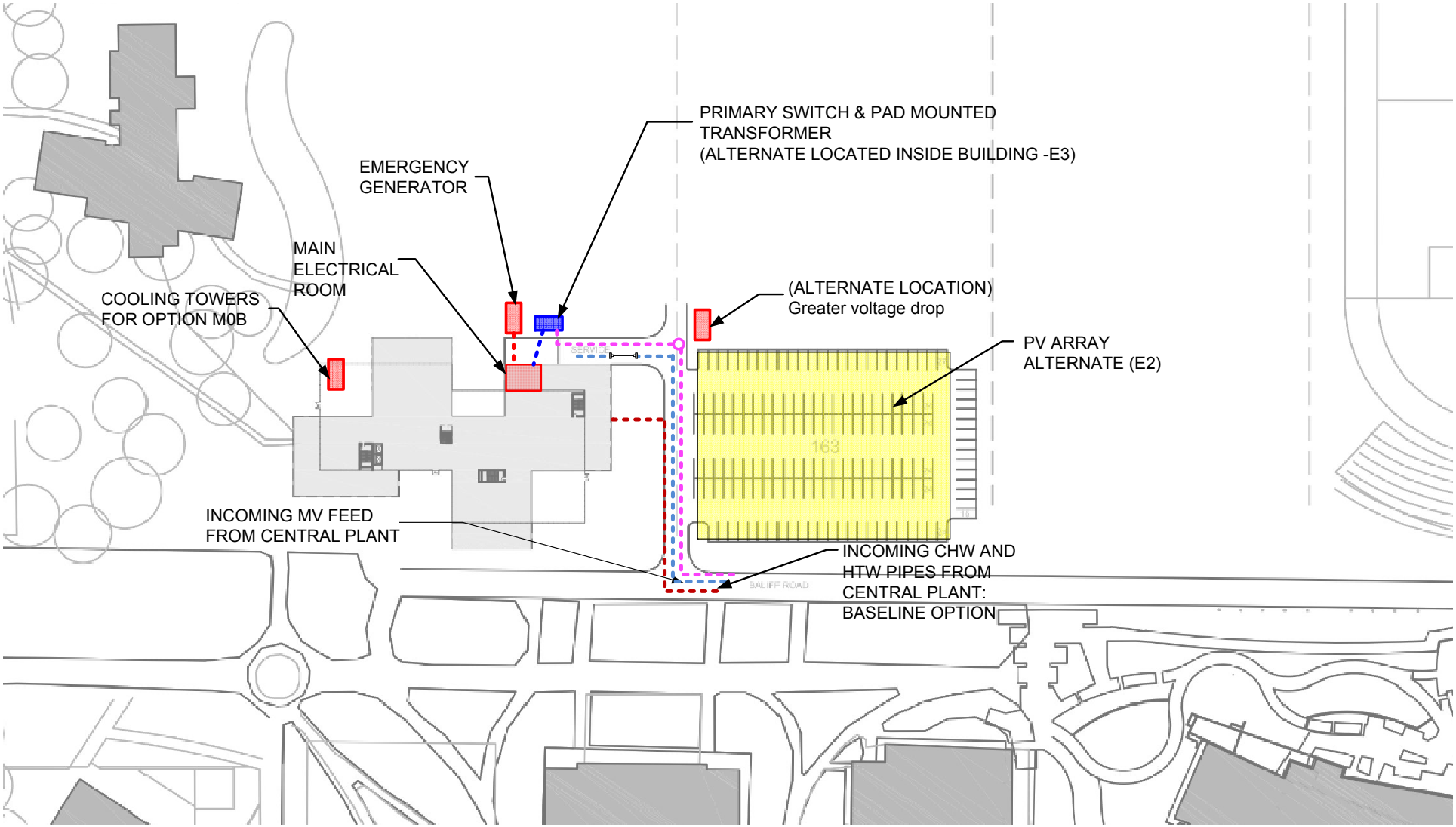


3 MOMENT FRAME ELEVATION
1/32" = 1'-0"

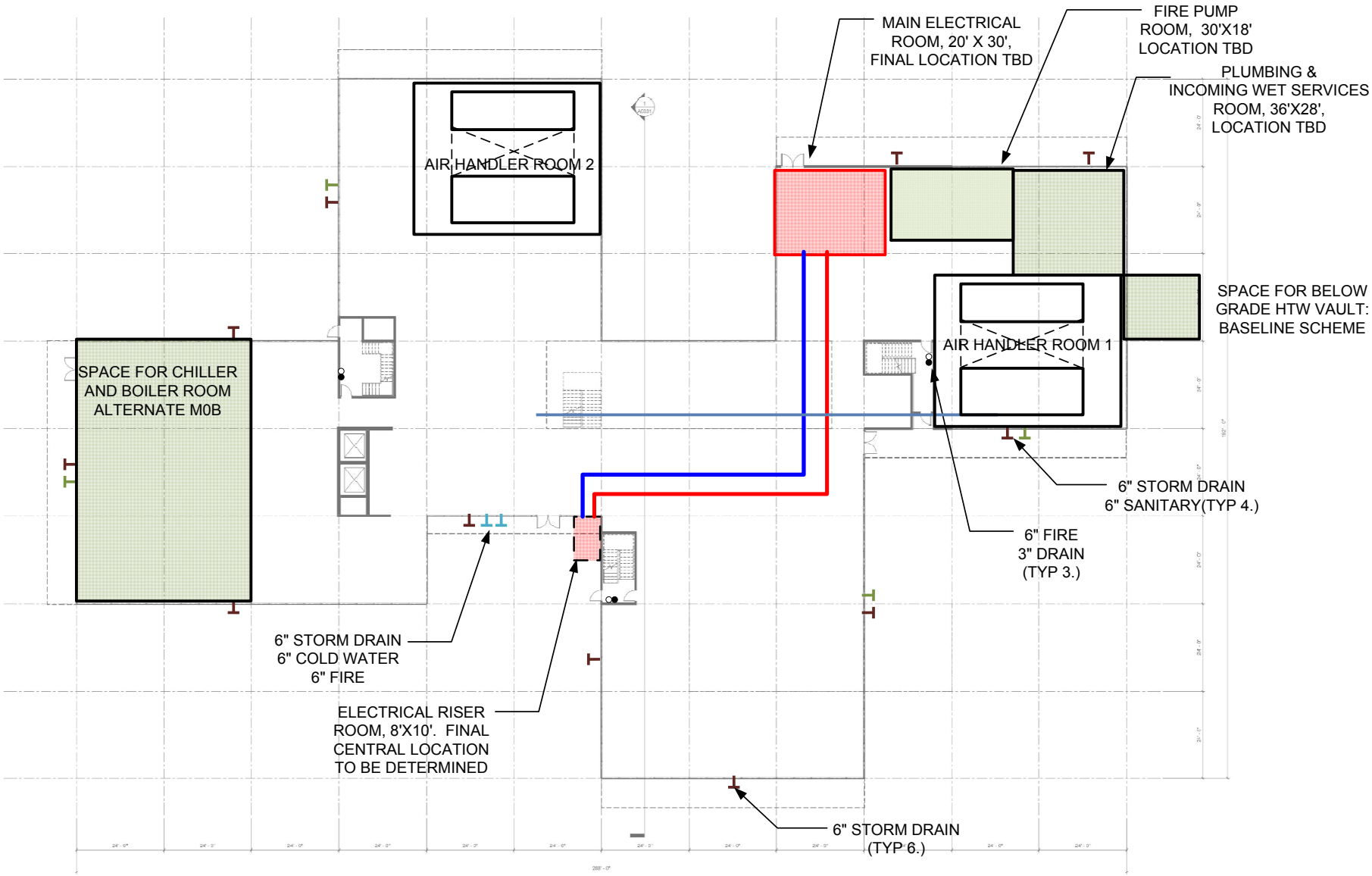


1 LEVEL 3 FRAMING PLAN (TYPICAL FOR ALL LEVELS ABOVE L1)
1/32" = 1'-0"

OPTION 2: STEEL CONX SYSTEM



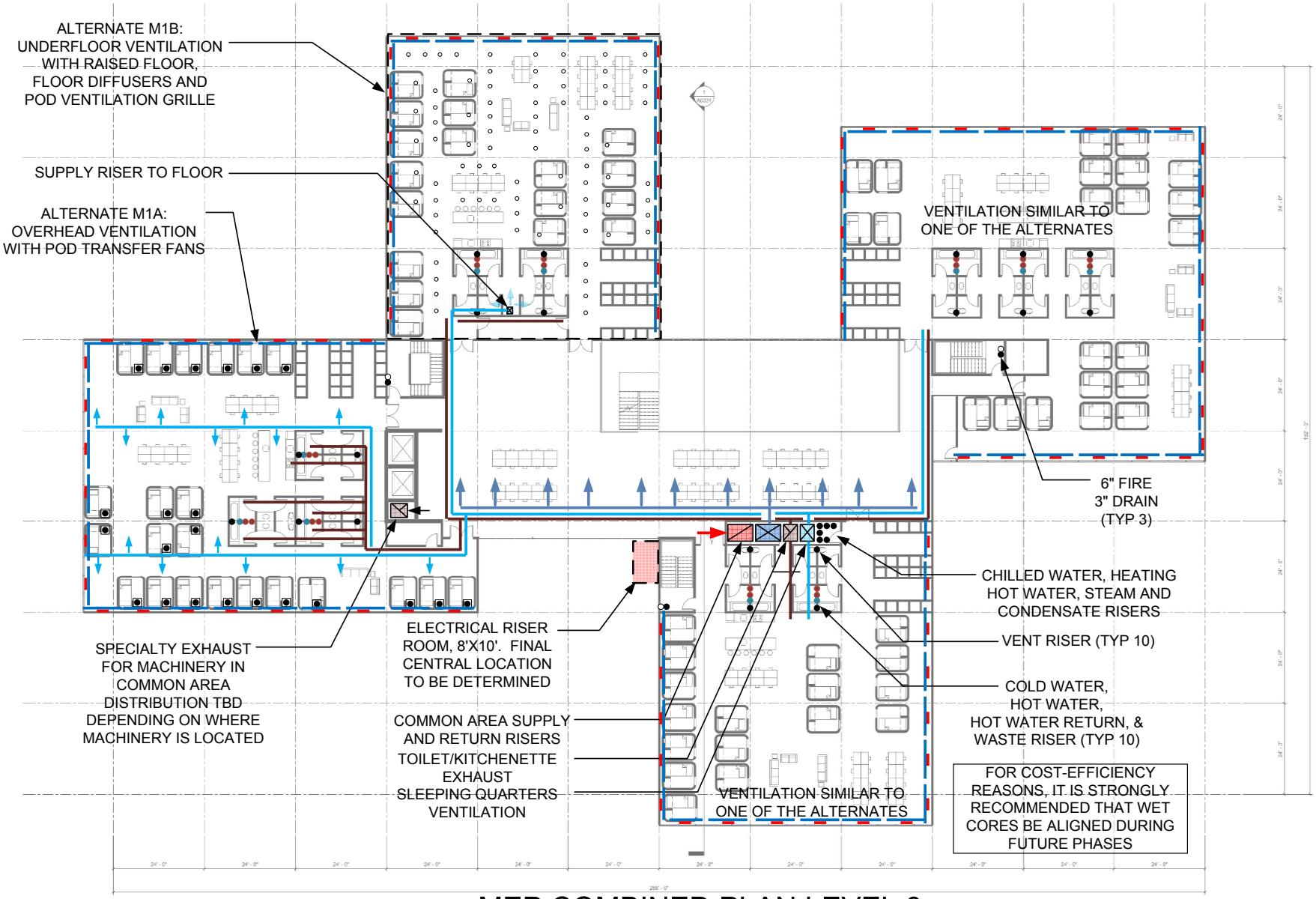
COMBINED MEP SITE PLAN



1 LEVEL 1 FLOOR PLAN
3/32" = 1'-0"

MEP COMBINED PLAN

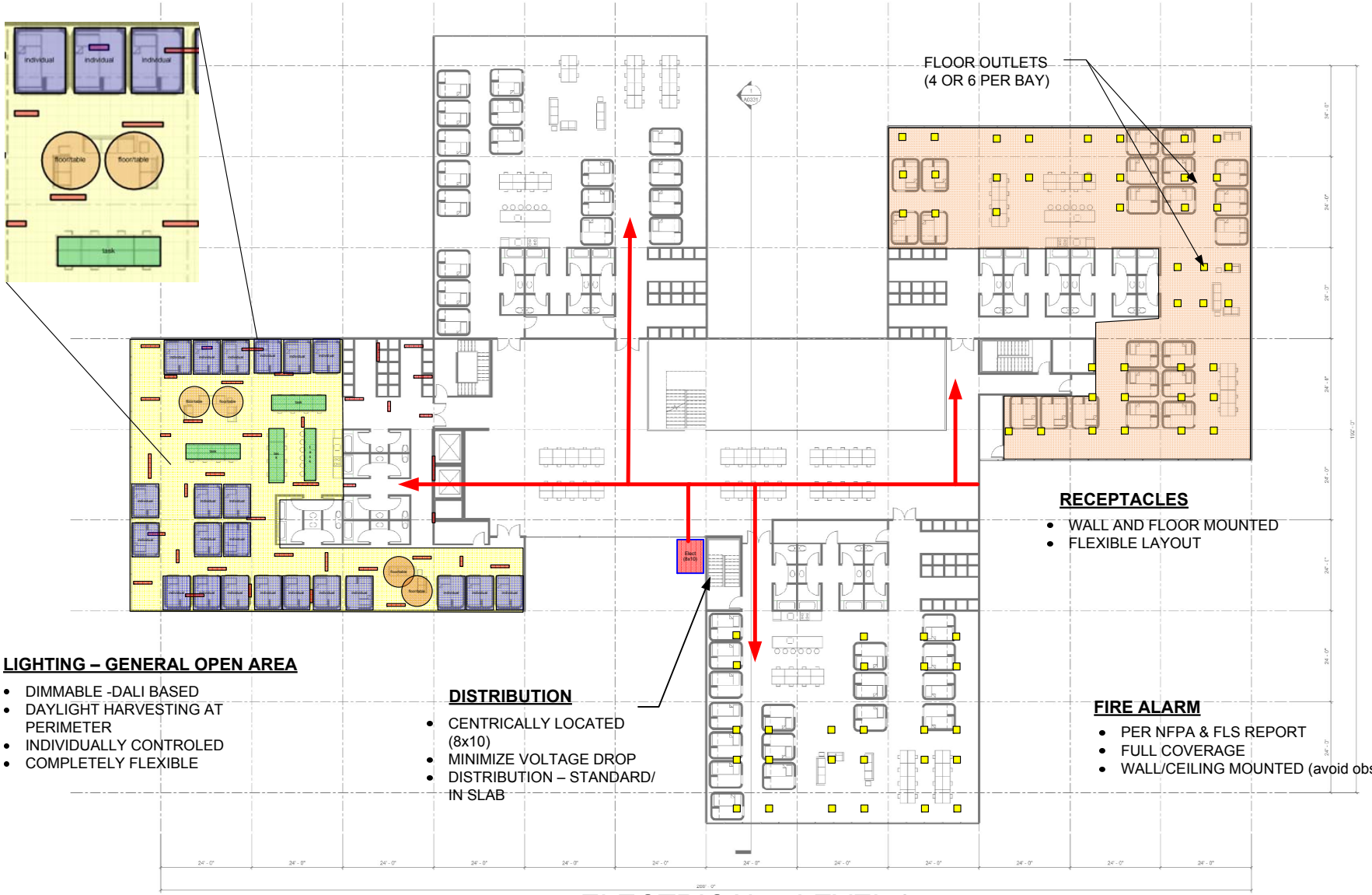
GSF: 25,920 | TOTAL GSF: 146,880 | TOTAL BEDS: 428



MEP COMBINED PLAN LEVEL 3

1 LEVEL 03 (sheet)
3/32" = 1'-0"

GSF: 30,000 | 80 BEDS | TOTAL GSF: 150,000



RECEPTACLES

- WALL AND FLOOR MOUNTED
- FLEXIBLE LAYOUT

LIGHTING – GENERAL OPEN AREA

- DIMMABLE -DALI BASED
- DAYLIGHT HARVESTING AT PERIMETER
- INDIVIDUALLY CONTROLED
- COMPLETELY FLEXIBLE

DISTRIBUTION

- CENTRICALLY LOCATED (8x10)
- MINIMIZE VOLTAGE DROP
- DISTRIBUTION – STANDARD/ IN SLAB

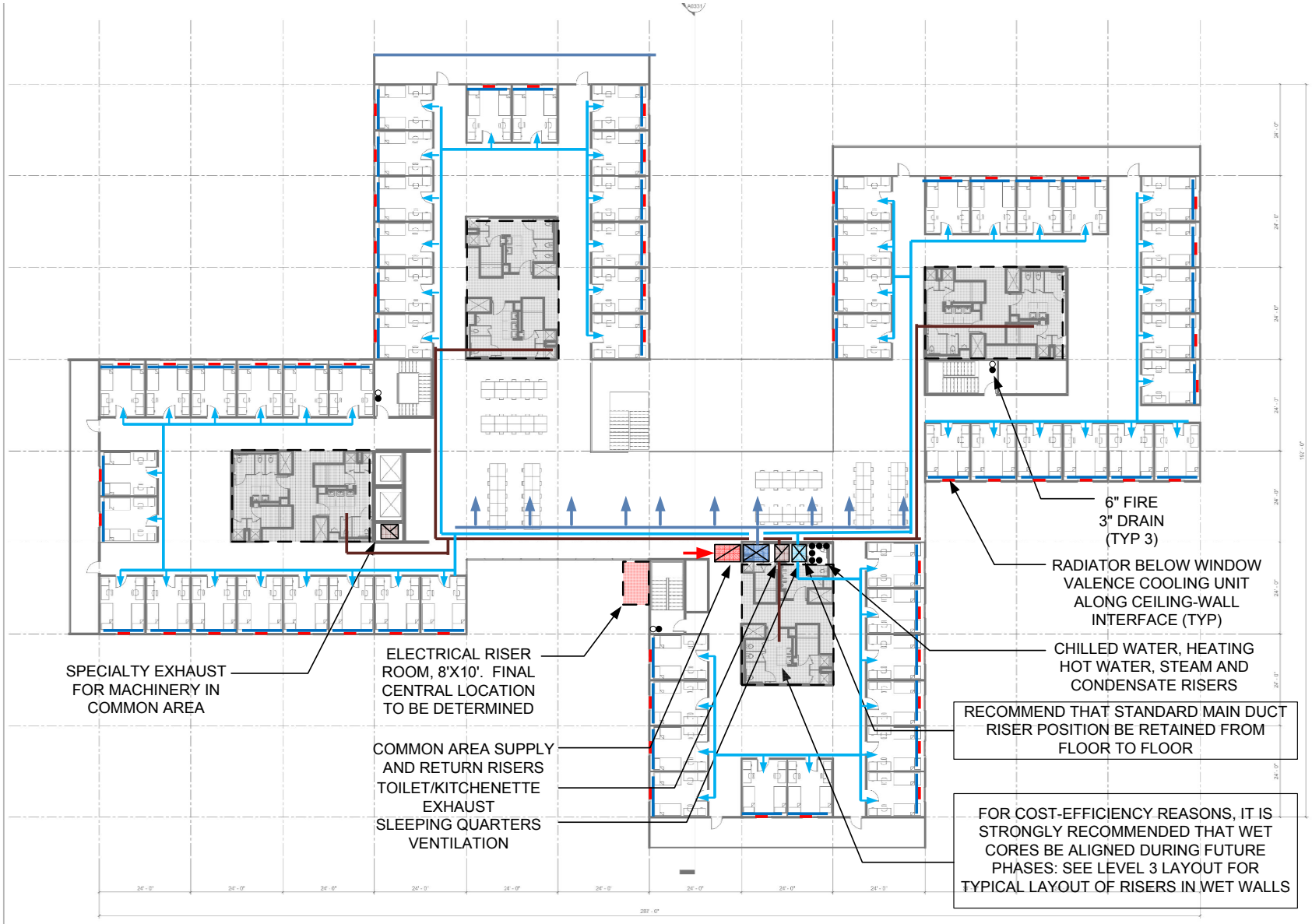
FIRE ALARM

- PER NFPA & FLS REPORT
- FULL COVERAGE
- WALL/CEILING MOUNTED (avoid obstacles)

1 LEVEL 03 (sheet)
3/32" = 1'-0"

ELECTRICAL – LEVEL 3

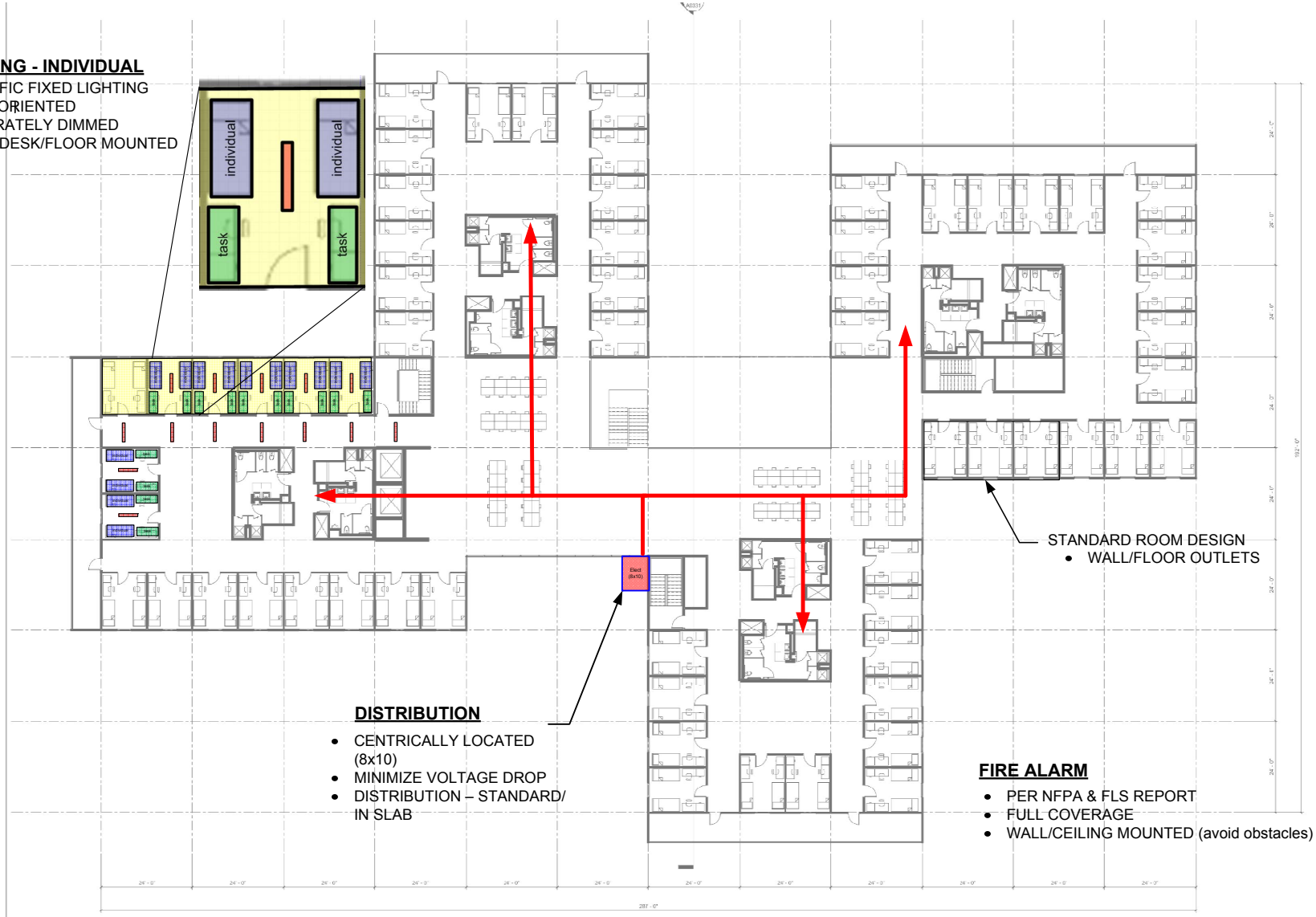
GSF: 30,000 | 80 BEDS | TOTAL GSF: 150,000



MECHANICAL PLAN- LEVEL 5

1 LEVEL 5
3/32" = 1'-0"

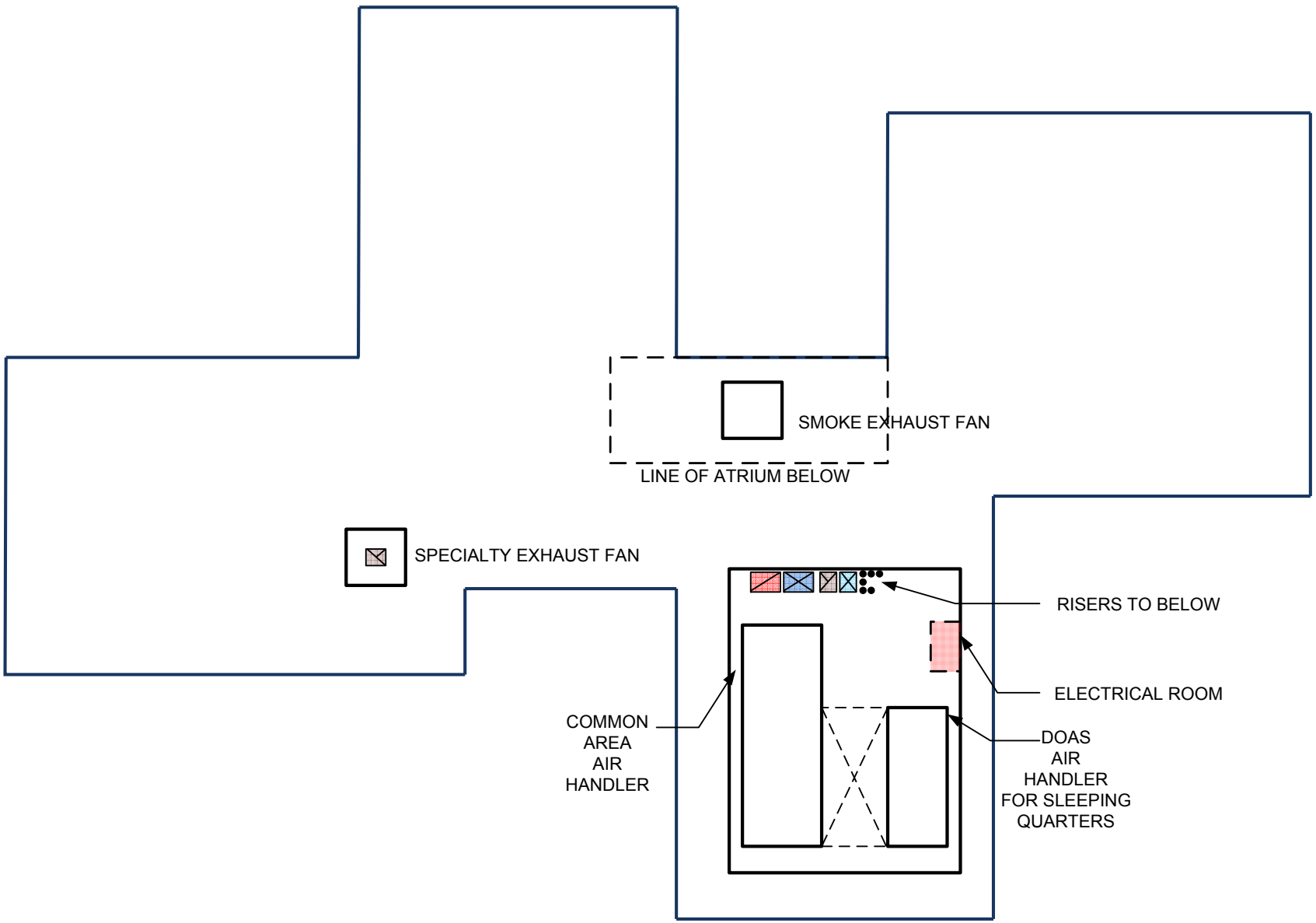
GSF: 30,000 | 116 BEDS | TOTAL GSF: 150,000



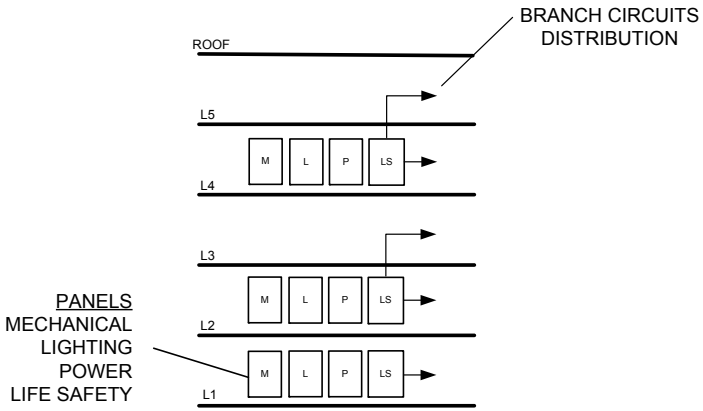
ELECTRICAL – LEVEL 5

1 LEVEL 5
3/32" = 1'-0"

GSF: 30,000 | 116 BEDS | TOTAL GSF: 150,000



MEP COMBINED ROOF PLAN



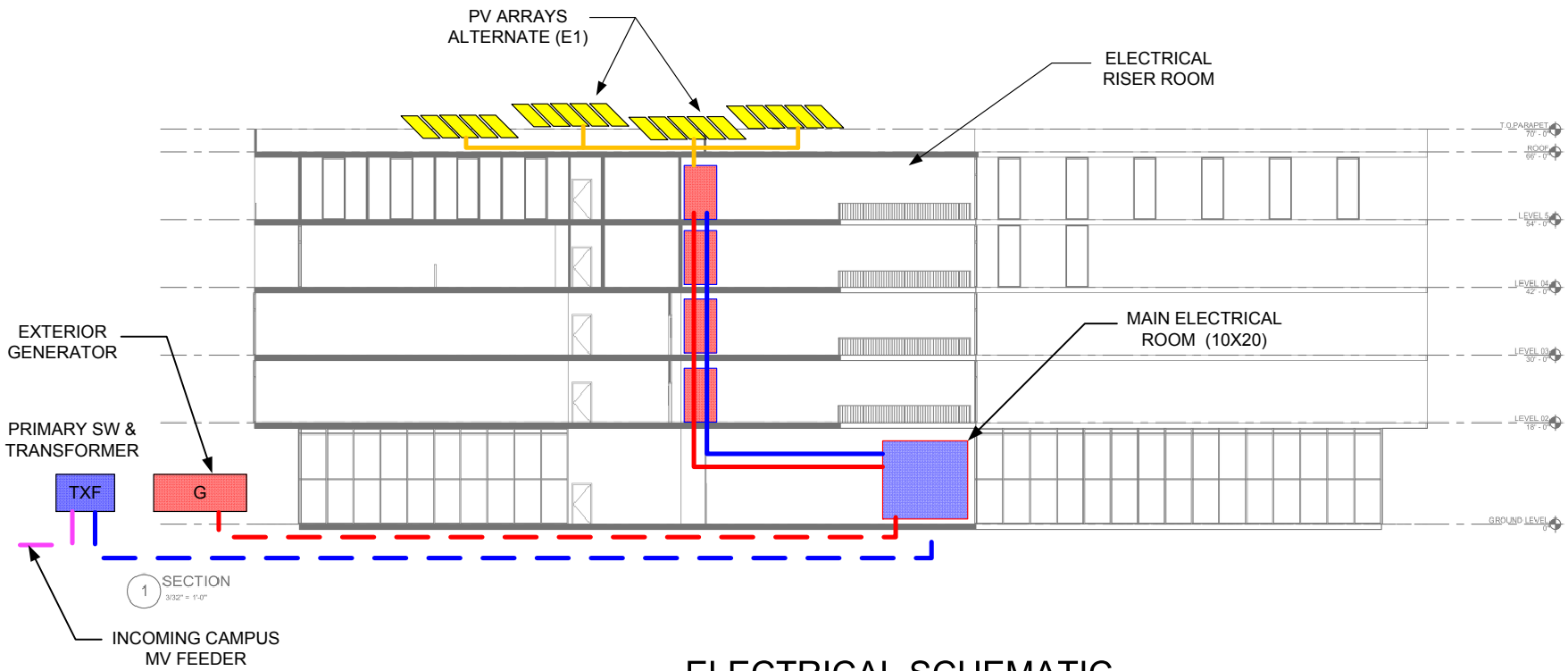
LOAD ESTIMATE (100 - 200k s-ft)

- 750-1600 KVA NORMAL
- 300-600 KW EMERGENCY (depending on smoke evac)

POWER DENSITIES:

- LIGHTING – 1 W/s-ft
- SM POWER – 1.5 W/s-ft

480V SUBSTATION
EMERGENCY GENERATOR
NORMAL RISER
EMERGENCY RISER
MEDIUM VOLTAGE SERVICE
RISER/ELECTRICAL ROOM



ELECTRICAL SCHEMATIC

N.T.S.

09.

SUSTAINABILITY GOALS

Site
Building Systems
High Performance Building Rating System
LEED Checklist
Energy Modelling

INTRODUCTION

The Lassonde Make-Live Center will provide a new type of collaborative living and working environment on the University of Utah campus. The 152,000 ft2 building will house space for 400 residential units and 20,000 ft2 of work areas (aka “the garage”). From a sustainability perspective, the project has a series of unique challenges and opportunities as a result of the mixed program. Occupants of the building are expected to spend an extended amount of time inside the building and therefore the project team has prioritized issues of human experience and integrated building design through attention to occupant comfort, and creation of a healthy and productive environment.

During the Programming Phase for the Lassonde Make-Live Center, the project’s stakeholders and designers determined the following sustainable design priorities for the project (in order of preference):

1. Human Experience
   - Visual and thermal comfort
   - Daylight and views
   - Healthy environment
2. Integrated Building Design
   - Optimize use of single space for multiple purposes
   - Design with first principles
3. Education & Visibility
4. Operations & Maintenance
   - Ensure sustainability over time
   - Reduce operating costs
5. Innovation
6. Energy Conservation
   - Reduce electrical usage
   - Minimize heating and cooling need
7. Water Conservation
   - Reduce water consumption
8. Materials & Furniture
   - High quality
   - Comfortable
9. Flexibility
   - Design for future innovation
10. Benchmarking

In addition to the project goals established by the team, the state of Utah requires that all

construction projects comply with the Department of Facilities and Construction Management Design Requirements . The project must also meet the University of Utah sustainability goals; though there are questions on how these may be applied to this unique program. Please see Atelier Ten's recommendations on goals and strategies for the project as summarized in the following sections.

The sustainability requirements for the project are as follows:

- Achieve LEED Silver Certification
- Achieve the following credits in the LEED rating system
    - WE Credit 1.1: Water Efficient Landscaping: Reduce by 50%
    - EA Credit 3: Enhanced Commissioning
    - EA Credit 5: Measurement & Verification
    - EQ Credit 3.1: Construction IAQ Management Plan: During Construction
    - EQ Credit 4.1: Low-Emitting Materials: Adhesives and Sealants
    - EQ Credit 4.2: Low-Emitting Materials: Paints and Coatings
- Perform 40% better in energy performance than a code compliant building.
- Complete an energy model to demonstrate the building design performance relative to a code compliant building.
- Model building systems to analyze and make selection based on life-cycle cost.
- Include meters and sub-meters in the building to measure energy consumption on an on-going basis.
- Document Sustainability Charrette Summary, Life Cycle Cost Analysis, LEED submittals and Submittal Comments, Commissioning Report, and the Energy Analysis to comply with High Performance Building Requirements.

The project is required to achieve a LEED Silver certification, but Atelier Ten recommends that the team target a LEED Gold certification. Based on the Lassonde Make-Live Center's combined sustainability requirements and aspirations, Atelier Ten has compiled a series of recommended sustainability goals for the project. Site energy and water use are expected to have major implications on the overall sustainability of the project.

In addition, for LEED certification, it is expected that Sustainable Sites, Indoor Environmental Quality and Material and Resources are the areas where the Lassonde Make-Live Center will do well. Energy Efficiency and Water Efficiency are more challenging, but are important in Utah's climate.

CLIMATE ANALYSIS

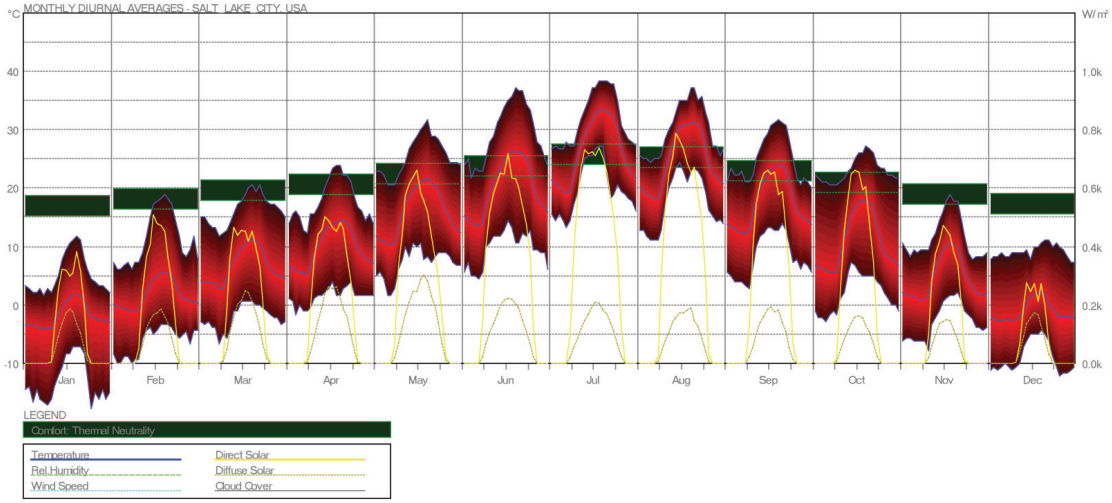
Any design that attempts to respond to the local environmental condition must be based on a close analysis of that climate. The degree to which the building needs to provide shelter and how the requirements for shelter change over the day and year, directly influence the optimal design of the building and its systems. Critical climate factors are air temperature, humidity, and solar radiation. The following section of this study graphs annual weather data for Salt Lake City. Statistically average data is used, which has been compiled over a long time span so that no abnormal weather is included.

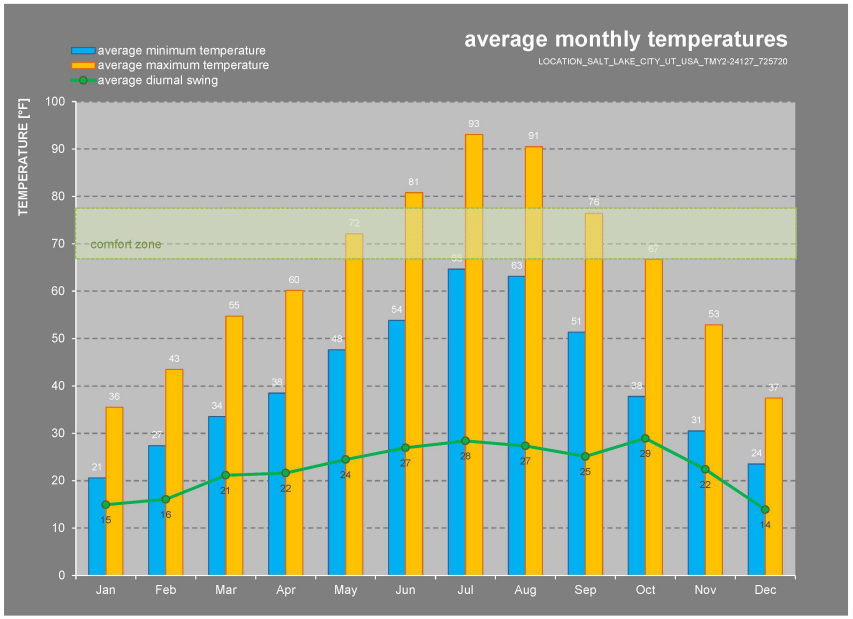
MONTHLY DATA

The graph below shows in green the temperature band at which building occupants would feel comfortable. The red areas show the range of daily temperature fluctuations for each month of the year. The blue line in this graph shows the average daily temperature range. What is immediately apparent from this data is that for most of the year the temperatures are below the comfort band, indicating that heating needs will dominate the conditioning requirements throughout the year. In the summer months, however, average temperatures exceed the comfort zone. In summer and winter there is a large difference between daytime and nighttime temperatures, indicating that a strategy using thermal mass might be effective for cooling.

AMBIENT TEMPERATURES

The graph below shows the minimum, maximum and average temperatures for each month in a statistically average year. While maximum temperatures in June through August are near 100°F, the data also shows that the average temperature during this period is in a more comfortable range of 67-79°F. Minimum temperatures can be as low as 40°F during this period, showing that heating may be required at night even during the summer. The winter period also clearly indicates a heating demand with minimum





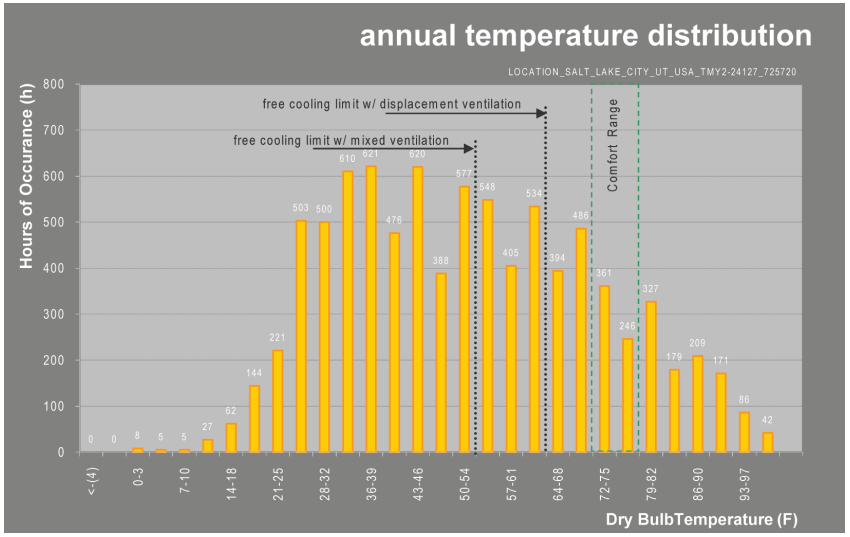
temperatures close to 0°F in January. The average temperature for this statistically average year is 52.3°F, confirming that this site is in a heating dominated climate. This graph also shows that there are large temperatures swings between day and night, which again indicates a potential for using thermal mass to heat and cool the building.

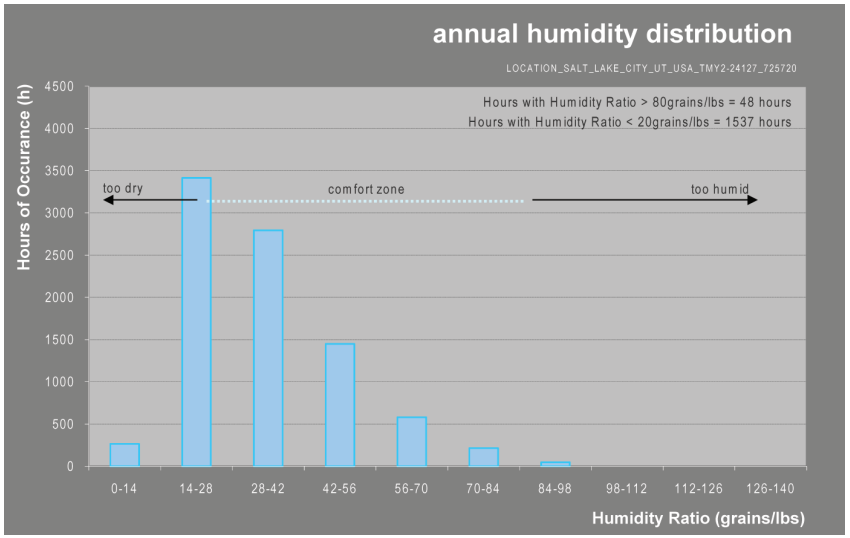
TEMPERATURE FREQUENCIES

Another way of looking at annual temperature distribution is to chart annual temperature frequency. The graphs below show that out of 8,760 hours in a year, 1,014 hours are above 82°F and therefore warmer than the comfort zone. 6,650 hours are below 68°F and thus require heating, confirming that this is a heating dominated climate. The temperature drops below freezing for 1,475 hours per year, showing that this climate is very cold. For 1,093 hours annually the weather is in the comfort zone without any conditioning. The small number of hours that fall within the comfort zone show that active conditioning will be needed most of the year.

HUMIDITY FREQUENCIES

Thermal comfort is not only affected by air temperature, but also by the amount of humidity in the air. The graph of humidity frequencies shows that humidity in Salt Lake City exceeds the maximum comfortable level of 80 grains/bulb for only 48 hours per year. This indicates that high humidity will not be a major concern, and that in a typical year dehumidification will not be necessary.





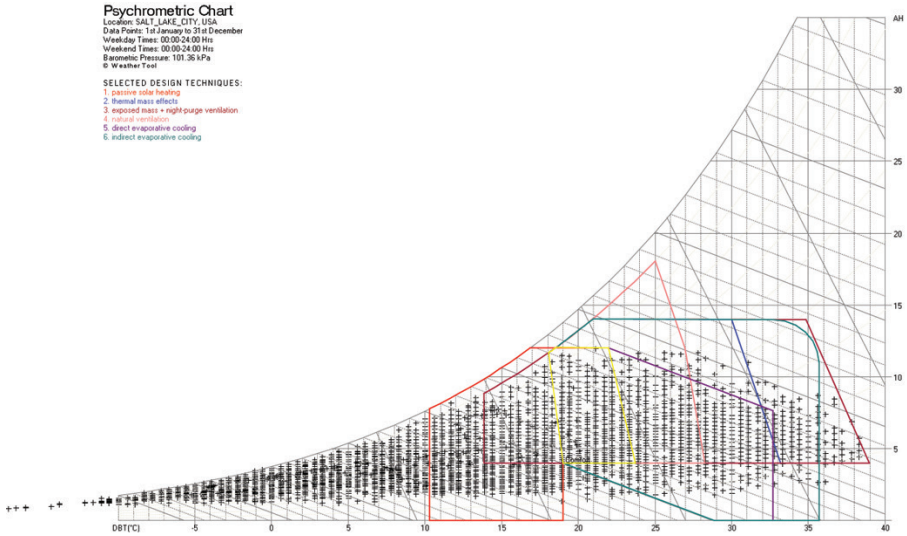
PSYCHROMETRIC CHART

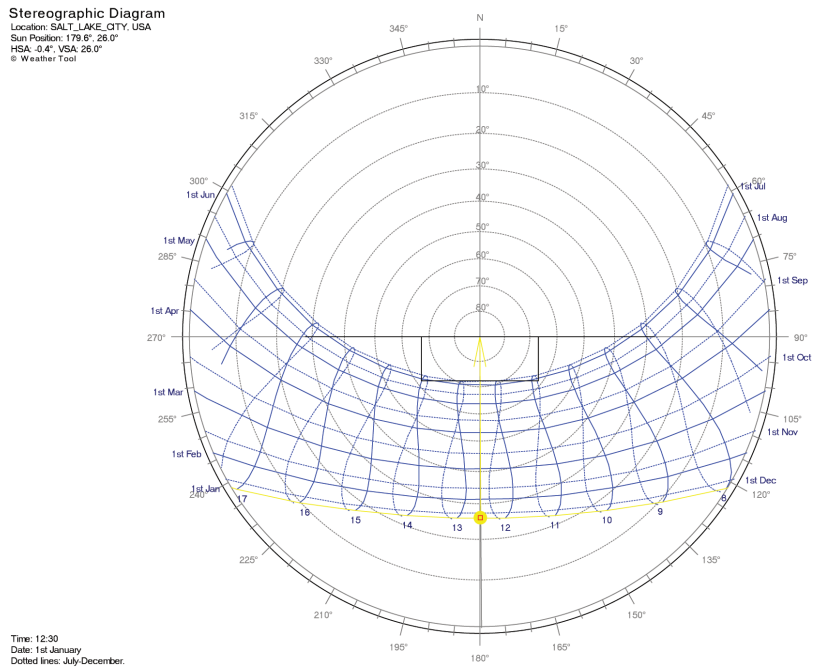
Since humidity and temperature both affect comfort, they should be analyzed simultaneously. The psychrometric chart below displays the relationship between dry bulb air temperature (x-axis) and humidity (y-axis). The range of temperatures and humidities that most people consider comfortable is outlined in yellow. The annual weather data for this site, plotted on the psychrometric chart, shows that humidity is low, seldom rising above the comfortable level of 12.0 g/kg or 80 grains/lb. Most of the data points fall to the left of the comfort zone, indicating a need for heating. A smaller number fall to the right of the comfort zone, indicating that temperatures are above a comfortable level.

SOLAR PATH DIAGRAM

Heating and cooling requirements are greatly influenced by the amount of solar radiation available. Solar heat gain can beneficially offset heating requirements in one season while detrimentally increasing cooling requirements in another. The amount of solar heat gain within a space depends on the size and orientation of openings in relation to the position of the sun. A sun path diagram maps the movement of the sun by plotting solar azimuth (compass direction) and altitude (vertical sun angle) throughout the year. The sun path diagram for this site shows that in summer months the sun is high in the sky (altitude of 73°) at noon, and in mornings and evenings comes from the northeast and northwest respectively. In the winter the sun has a very low altitude (altitude of 26° at noon) and travels during the day from southeast to southwest.

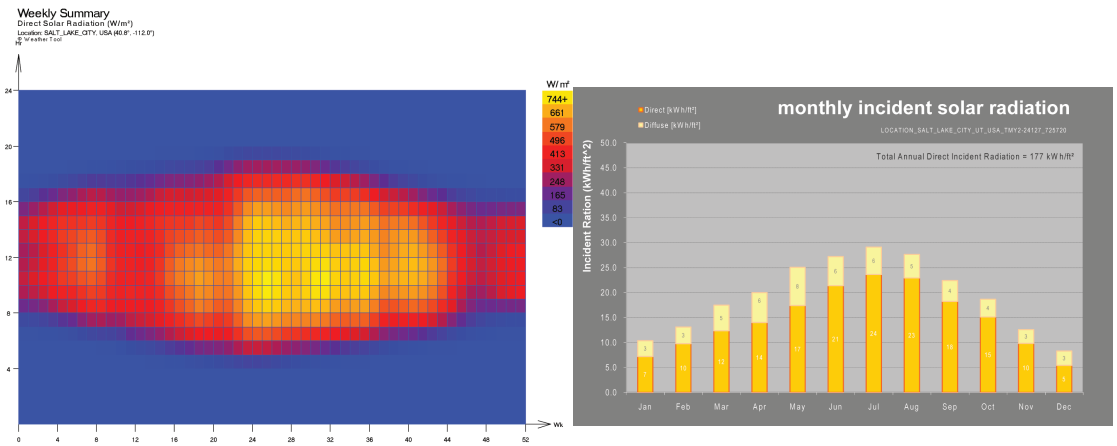
This means that south-facing windows are well positioned to collect solar radiation in the winter. Minimizing windows to the east will help avoid overheating in summer. Large western windows will require screening to minimize late day solar gain during the summer.





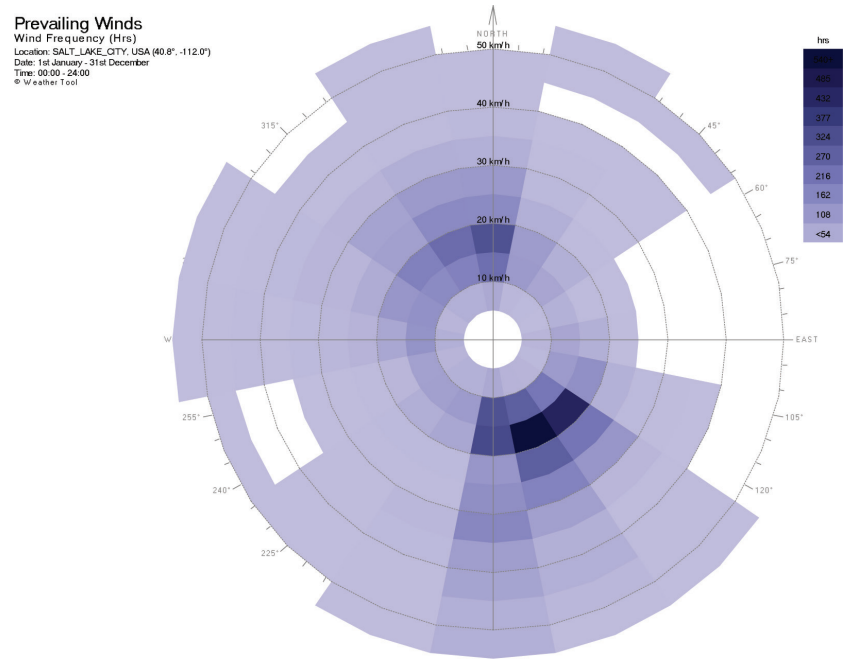
INCIDENT RADIATION

While the solar path diagram is a useful tool to analyze the direction of incident solar radiation, it does not evaluate the intensity of this radiation. The amount of solar radiation is influenced by cloud cover and other atmospheric factors. In the graph below left, the available incident solar radiation is plotted for each hour of the day (y-axis) and each week of the year (x-axis). The data shows that the highest amount of direct horizontal solar incident radiation is available from mid-June to early September. The monthly solar incident radiation (shown in the graph below right) shows the split between direct and indirect solar radiation. The majority in this climate is direct, with a total annual incident radiation of 177 kWh/ft2.



ANNUAL WIND PATTERN

A map of annual wind speed and direction indicates that the velocity of wind (areas at the outer region of the graph below) is highest from the south, while the prevailing wind direction (the darker areas) is the north and southeast. While the weather information is taken near Salt Lake City, wind occurrences on a particular site are greatly affected by local obstructions. Thus, the available wind data should be considered as indicative of general trends only.



SITE & LANDSCAPE

There are several sustainable opportunities associated with the Lassonde Make-Live Center site. The Lassonde Make-Live Center has a highly visible location and can be easily accessed by alternative means of transportation. The project location will minimize the transportation carbon emissions.

In addition, choices made with respect to the landscape design can reduce water use, minimize levels of fertilization and phosphorous, provide habitat, mitigate urban heat island effect, and provide a sense of connection to local ecology. Site lighting should be designed to be as efficient as possible by directing light to where it is most useful and provide no more illumination than necessary for safety and way finding.

OPPORTUNITIES

- Location on the HPER Mall provides access to pedestrian paths, bicycle routes, and shuttles.
- The HPER Mall has the capacity to retain the project's stormwater runoff
- Campus stormwater infrastructure can meet the project's irrigation demand by supplying irrigation-grade non-potable water.
- The Lassonde Make-Live Center site can provide comfortable outdoor space and expand building occupants' working and living area during months with comfortable outdoor temperatures.
- Adjacent fields are potential locations for a geothermal system.

CHALLENGES

- Provide usable outdoor space while minimizing hardscape area.
- Design lighting to provide a safe setting at night without overlighting and contributing to light pollution.

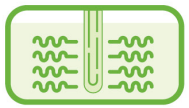
CODES & GUIDELINES

- The University of Utah has established a guideline of acceptable plants for the campus that includes many native/adapted species.

RECOMMENDED GOALS

- Use campus non-potable water to eliminate potable water use for irrigation
- Achieve SSc4.2 by providing bicycle parking for 5% of FTE
- Achieve SSc6.1 Stormwater Design - Quantity Control: Reduce stormwater runoff by 20% over previously developed conditions
- Achieve SSc6.2 Stormwater Design - Quality Control: Develop stormwater plan to remove 80% of TSS
- Achieve SSc7.1 Heat Island Effect: Non-Roof: Use high albedo paving or provide shade on at least 50% of all hardscape
- Achieve SSc8: Light Pollution Reduction: Meet building light trespass requirements and exterior lighting requirements in accordance with ASHRAE 90.1 - 2007

SITE & LANDSCAPE STRATEGIES

	Create comfortable outdoor spaces
	Use campus-suppled non-potable water for all landscape irrigation demands
	Mitigate heat island effect through use of light-colored or shaded hardscape
	Provide support for alternative transportation
	Connect to HYPER mall to manage site stormwater
	Design exterior lighting to provide a safe environment with minimum light trespass and efficient fixtures
	Consider using adjacent fields for geothermal wells

BUILDING MASSING & ENVELOPE

The massing and envelope of a building is crucial to its environmental performance and to human experience inside the building. If well-designed it can reduce heat loss and gain, thereby decreasing the amount of energy and equipment needed to condition the interior space. The design of the fenestration can provide daylight to interior spaces which decreases the need for electric light. Views to the outside can also provide a sense of connection to the surroundings and visual stimulation to those working in the building.

The Lassonde Make-Live Center program is unique because the building will be used around the clock and must be visually and thermally comfortable during day and night as a workspace and residence. The project team is considering locating a series of sleeping "pods" within a larger building shell to address these different programmatic conditions. It will be beneficial for the design team to establish the different lighting and thermal conditioning requirements for each of these space types.

OPPORTUNITIES

- Orient building as close to N-S-E-W as possible to make shading most effective.
- Design floors with a thin floorplate for daylight access.
- Locate floors with combined 'pods' and workspaces on the upper levels with access to toplight. This daylighting strategy will enable flexibility to rearrange interior space without detriment to daylight availability or energy performance.
- Reduce nighttime energy use by minimizing conditioned volume: insulate pods and condition only residential spaces throughout the night. Let temperature in the larger volume of the garage fluctuate.
- Locate enclosed, cellular spaces on the building interior, with open workspaces and circulation located at the perimeter to maximize internal daylight distribution.

CHALLENGES

- If deep floorplate is used, optimize geometry for daylight by introducing courtyards or atria and designing floorplate geometry to increase access to perimeter walls.
- Recommend different envelope specifications for the building shell and the interior pods and consider how these impact conditioning strategies and volumes of conditioned air.
- Recommend different thermal conditioning criteria for the larger spaces within the building shell and the smaller spaces within the pods.
- Optimize the building for both daytime and nighttime visual and thermal comfort.
- Increase perimeter surface area for daylight access without incurring an energy penalty from heat loss.

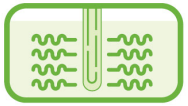
CODES & GUIDELINES

- Residential spaces must have access to perimeter walls.
- Massing and envelope decisions will contribute to requirement for 40% energy savings over a code compliant building.

RECOMMENDED GOALS

- Maximum 60ft floorplate depth
- Continuous insulation throughout
- Exterior walls: R-25 to R-30
- Roof: R-30 to R-40
- Glazing SHGC: 0.27 or better
- Glazing U-value: 0.3 or better
- Provide daylight to 75% of regularly occupied spaces
- Provide views from 90% of regularly occupied spaces

SITE & LANDSCAPE STRATEGIES

	Create comfortable outdoor spaces
	Use campus-suppled non-potable water for all landscape irrigation demands
	Mitigate heat island effect through use of light-colored or shaded hardscape
	Provide support for alternative transportation
	Connect to HYPER mall to manage site stormwater
	Design exterior lighting to provide a safe environment with minimum light trespass and efficient fixtures
	Consider using adjacent fields for geothermal wells

WATER CONSERVATION

Water conservation is an important environmental goal, not only because fresh water is a valuable natural resource, but also because of the energy required to distribute water from its source to the areas where it is used. Conserving water is especially important in the western United States, where the supply of fresh water is not expected to increase in proportion to the rapidly expanding population. Atelier Ten recommends, at minimum, specifying efficient fixtures, which would significantly reduce the building's water use at little or no added cost.

OPPORTUNITIES

- The residential showers will provide a large source of greywater which could be reused to meet the building's flushing demands.
- Depending on the types of activities within the "Garage," there may be additional process water which could be reused to meet non-potable demands.

CHALLENGES

- The project will have a large potable water demand for residential use.
- The process water demands of the building are largely unknown. The project team should try to reduce these demands wherever possible and identify opportunities for non-potable water use or reuse.

CODES & GUIDELINES

- LEED Prerequisite requires a minimum 20% reduction in domestic water use over a LEED baseline.
- LEED WEc1.1: 50% reduction in potable water use for irrigation.

RECOMMENDED GOALS

- Reduce domestic water use by a minimum of 30% - 40% over the LEED baseline
- Minimize potable water use by optimizing cooling tower cycles for cooling towers and evaporative condensers
- Identify all building water streams and opportunities for reuse

WATER REDUCTION STRATEGIES

	Install water efficient fixtures with the following flush and flow rates: toilet: 1.28 gpf, dual flush urinal: waterless /0.125 gpf faucet: 0.5 gpm with sensor showerhead: 1.5 gpm
	Reuse greywater to meet 100% flushing demand
	Identify process water demands and opportunities for reduction and/or reuse
	Install ENERGY STAR certified clothes washers and dishwashers
	Minimize potable water use for cooling tower or evaporative cooling makeup
	Collect cooling coil condensate for reuse
	Use campus-supplied non-potable water to meet irrigation demand

ENERGY PERFORMANCE

The residential component of the program is approximately eight times larger than the garage space and is expected to determine, to a large extent, the overall energy use of the building. A graphic breakdown of Lassonde Make-Live Center use can be seen in the pie chart below. Plug and miscellaneous equipment, domestic hot water and space heating usage are expected to drive the energy use of this building.

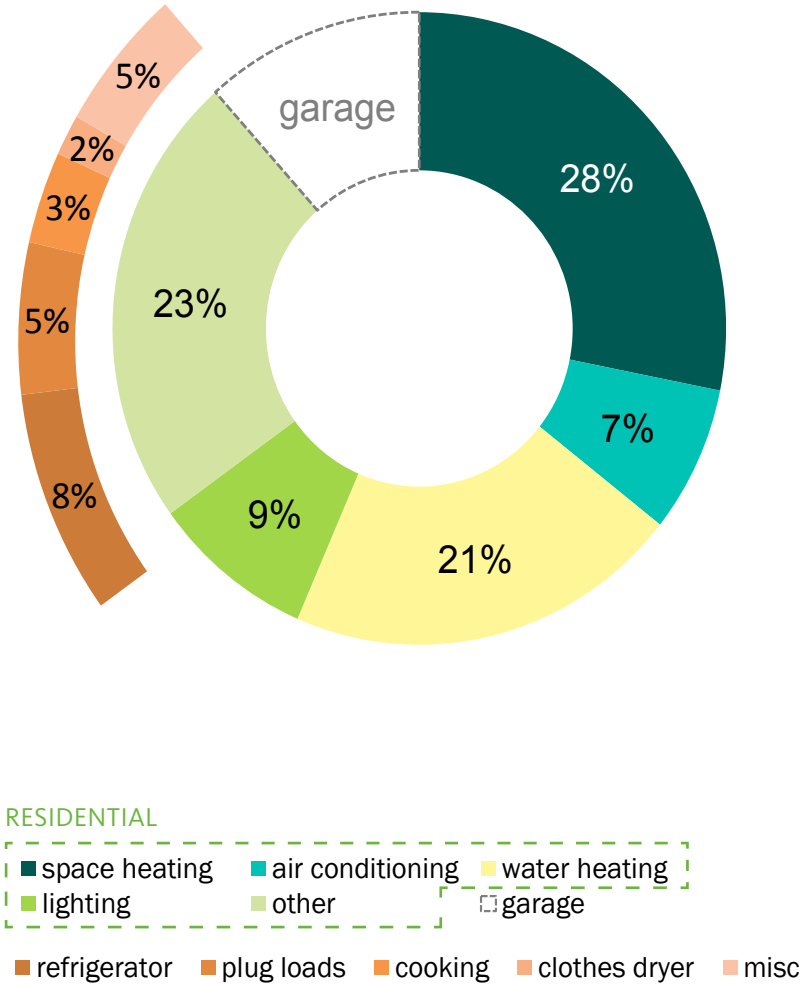
The breakdown of end energy use within the 'garage' is still largely unknown and is likely to vary depending on how the space is used over time. It is recommended that the design team focus on controlling the operational energy of the space through centralized controls and occupancy sensors in order to reduce overall energy use while accommodating a large range of equipment types.

OPPORTUNITIES

- The integrated residential and academic program may allow sharing of lighting and HVAC systems because students will be in one space or the other, but not both simultaneously. This strategy can reduce system redundancy.
- Use of occupancy sensing controls for HVAC, lighting and plug loads can reduce overall energy use in the garage and residential spaces.
- Reclaimed heat from the shower drains can provide hot water preheat and/or low grade heat for space conditioning.
- Radiant floor systems may allow for the most flexibility and change over time.

CHALLENGES

- Aligning the MEP distribution within a flexible, open floor plan without over distributing services and creating redundancy.
- Providing infrastructure for a large number of unknown equipment requirements.



CODES & GUIDELINES

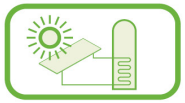
- LEED silver rating and a minimum of 10% annual cost savings
- LEED EAc3: Enhanced Commissioning
- LEED EAc5: Measurement and Verification
- 40% energy savings over a code compliant building

RECOMMENDED GOALS

- Limit Energy Use Intensity to 25 - 50 kBtu/SF/YR.
- Reduce electricity use of the building by 50%.
- Achieve an energy cost reduction of 25% - 35% over ASHRAE 90.1 - 2007
- Reduce carbon emissions by 15-35%

ENERGY STRATEGIES

Refer also to strategies in the "envelope" section

	Design low energy HVAC system such as: under floor air distribution (UAD) and radiant systems
	Recover domestic waste heat for use in water preheat or low grade space heating
	Identify occupants' true needs and level of energy awareness
	Raise occupant awareness their role in energy conservation through green education
	Implement an ENERGY STAR equipment purchasing policy for all relevant equipment and appliances
	Use occupancy controls to manage operational energy for HVAC, lighting, equipment and appliances
	Install energy efficient lighting
	Provide sensors for daylight dimming in all daylit spaces and occupancy sensors throughout
	Use solar hot water to meet domestic hot water demand and/or space conditioning
	Meet LEED requirements for Enhanced Commissioning and Measurement & Verification

HUMAN HEALTH & MATERIALS

Occupants within any building are exposed to air pollutants generated by indoor air sources. These pollutants generally include VOCs emitted from a variety of sources such as construction materials, finishes, furnishings, cleaning products, carpets, paints and sealants. Recent studies have linked the quality of the indoor environment to occupant health, and in some cases has been shown to directly impact occupant performance.

The project team has established a goal to create a high quality working and living environment. A key component in meeting this goal will be the use of green materials throughout the project; especially with regard to interior finishes and furnishings. Material selection has a direct impact on occupant health and productivity as well as the project's overall carbon footprint. As the design team selects materials for the project, there are several environmental issues to consider:

- environmentally responsible material criteria
- embodied carbon and high volume materials
- interior finishes and occupant health

OPPORTUNITIES

- The garage aesthetic lends itself to limited use of porous materials (which can collect contaminants and contribute to poor IAQ)
- The envelope design of the residential pods can be optimized to block external noise
- The highly visible project can be a showcase for innovative materials
- The University can market the 'healthiest' indoor environment through attention to the quality of indoor material selection.

CHALLENGES

- Working spaces may require spray hoods or policies on indoor VOC allowance to maintain good indoor air quality.
- Acoustic control in open spaces with hard surfaces may be challenging.
- Determine critical material attributes and research materials that meet both aesthetic and sustainable criteria.
- Ensure that building mechanical system can accommodate a full building flush out.

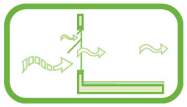
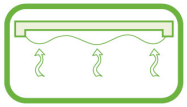
CODES & GUIDELINES

- EQc3.1: Construction IAQ Management Plan: During Construction
- EQc4.1: Low-Emitting Materials: Adhesives & Sealants
- EQc4.2: Low-Emitting Materials: Paints & Coatings

RECOMMENDED GOALS

- Achieve MRc4: Use recycled content materials for at least 20% of project material cost
- Achieve MRc5: Use regionally sources materials for at least 20% of project material cost
- Achieve MRc2: Divert at least 75% of construction waste from landfill
- Achieve MRc7: Use FSC certified wood for at least 50% of project wood material cost
- Achieve EQc4 and specify low-emitting materials for the following:
  - Paints & Coatings
  - Adhesives & Sealants
  - Flooring Materials
  - Wood Composite

HUMAN HEALTH & MATERIALS STRATEGIES

	Recycled content materials
	Regionally sourced materials
	Maximize construction waste diverted from landfill
	Optimize IAQ through construction IAQ management and full building flush out
	FSC certified wood
	Low-emitting materials
	Design interior acoustics to address HVAC background noise, sound isolation, reverberation time and sound reinforcing and masking.

10.

COST ANALYSIS

Detailed Estimate

DRAFT PROJECT COST ESTIMATE

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	BUILDING COST SUMMARY (INCLUDES SITE OPTION A)			
02	SITEWORK & DEMOLITION		$ 9.73	$ 1,431,244
03	CONCRETE		$ 34.87	$ 5,131,593
04	MASONRY		$ -	$ -
05	METALS		$ 3.91	$ 575,418
06	WOODS & PLASTICS		$ 4.25	$ 625,430
07	THERMAL & MOISTURE PROTECTION		$ 15.07	$ 2,218,048
08	DOORS & WINDOWS		$ 7.68	$ 1,129,462
09	FINISHES		$ 18.74	$ 2,757,385
10	SPECIALTIES		$ 0.77	$ 113,222
11	EQUIPMENT		$ -	$ -
12	FURNISHINGS		$ 1.86	$ 273,040
13	SPECIAL CONSTRUCTION		$ 21.75	$ 3,200,000
14	CONVEYING SYSTEMS		$ 2.58	$ 380,000
15	MECHANICAL		$ 37.71	$ 5,549,636
16	ELECTRICAL		$ 28.30	$ 4,164,862
	SUBTOTAL		$ 187.21	$ 27,549,338
	GENERAL CONDITIONS	5%	$ 9.36	$ 1,377,467
	OVERHEAD & PROFIT	3.5%	$ 6.55	$ 964,227
	DESIGN CONTINGENCY		$ 11.93	$ 1,754,934
	TOTAL CONSTRUCTION COST		**$ 215.04**	**$ 31,645,966**
	ADDITIVE ALTERNATE #1 CHILLED BEAMS			$ 947,985
	ADDITIVE ALTERNATE #2 STEEL CONX SYSTEM			$ 2,222,646
	PARKING (160 STALLS @ $1,525 PER STALL)			$ 244,000

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
02	**SITEWORK**			
	Demolition			
	Remove Asphalt Parking Lot	90000 SF	$ 0.69	$ 62,100
	Remove Curb & Gutter	2200 LF	$ 3.50	$ 7,700
	Remove Sidewalk	3000 SF	$ 0.89	$ 2,670
	Concrete Saw-Cutting	430 LF	$ 2.65	$ 1,140
	Asphalt Saw-Cutting	430 LF	$ 1.45	$ 624
	Subtotal for Demolition			**$ 74,233**
	Earthwork			
	Clear & Grub Site	90000 SF	$ 0.39	$ 35,100
	Site Excavation	23333 CY	$ 5.00	$ 116,667
	Site Grading	90000 SF	$ 0.31	$ 27,900
	Haul Off Site	23333 CY	$ 6.00	$ 140,000
	Building Excavation	3153 CY	$ 6.00	$ 18,920
	Backfill & Compact	1041 CY	$ 12.50	$ 13,007
	Haul Off Site	2113 CY	$ 6.00	$ 12,676
	Building Grading	28379 SF	$ 0.31	$ 8,798
	Gravel Under Slab	590 TON	$ 24.00	$ 14,152
	SWPPP	1 LS	$ 15,000.00	$ 15,000
	Subtotal for Earthwork			**$ 402,219**
	Site Utilities			
	Storm Drain	970 LF	$ 33.65	$ 32,641
	Detention Storage	1 LS	$ 100,000.00	$ 100,000
	Storm Drain Manholes/ Boxes	15 EA	$ 1,150.00	$ 17,250
	8" Water Line	560 LF	$ 33.65	$ 18,844
	Sewer Line	660 LF	$ 34.65	$ 22,869
	Gas Line	420 LF	$ 39.00	$ 16,380
	6" High Pressure Gas Re-route			NIC
	Manhole	2 Ea	$ 3,680.00	$ 7,360
	Subtotal for Site Utilities			**$ 215,344**
	Site Improvements	61621 SF	$ 12.00	**$ 739,449**
	TOTAL SITEWORK			**$ 1,431,244**
03	**CONCRETE**			
	Continuous Footings	165 CY	$ 305.00	$ 50,295
	Spot Footings	543 CY	$ 315.00	$ 171,108
	Grade Beams	466 CY	$ 480.00	$ 223,488
	Tension Pile/Deep Foundation System	28379 SF	$ 10.00	$ 283,793
	Pile Cap	817 CY	$ 325.00	$ 265,441
	Concrete Columns	509 CY	$ 580.00	$ 295,365
	Shear Walls	17488 SF	$ 24.68	$ 431,607
	Foundation Walls	9591 SF	$ 19.68	$ 188,758
	Board Formed/Architectural Concrete Upgrade	9427 SF	$ 12.65	$ 119,252
	Slab on Grade	28379 SF	$ 3.89	$ 110,395
	2-Way Slab & Beams	5149 CY	$ 580.00	$ 2,986,700
	Vapor Barrier Under Slab	28379 SF	$ 0.19	$ 5,392
	TOTAL CONCRETE			**$ 5,131,593**

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
04	**MASONRY**			
	TOTAL MASONRY			**$ -**
05	**METALS**			
	Penthouse Roof Structure (7 LB/SF)	21000 LB	$ 1.75	$ 36,750
	Misc. Steel	3150 LB	$ 2.60	$ 8,190
	Penthouse Roof Deck	3000 SF	$ 2.25	$ 6,750
	Upgraded Metal Pan Stairs	960 SF	$ 98.00	$ 94,080
	Metal Pan Stairs	2955 SF	$ 54.50	$ 161,048
	Upgraded Freestanding Railing	725 LF	$ 275.00	$ 199,375
	Freestanding Railing	390 LF	$ 125.00	$ 48,750
	Wall-mounted Railing	315 LF	$ 65.00	$ 20,475
	TOTAL METALS			**$ 575,418**
06	**WOOD & PLASTICS**			
	Carpentry:			
	Wood Plates & Blocking	147160 SF	$0.25	$ 36,790
	Subtotal for Carpentry			**$ 36,790**
	Millwork	147160 SF	$4.00	**$ 588,640**
	TOTAL WOOD & PLASTICS			**$ 625,430**
07	**THERMAL & MOISTURE PROTECTION**			
	Rigid Foundation Insulation	9591 SF	$1.45	$ 13,908
	Rigid Wall Insulation	43751 SF	$1.65	$ 72,190
	Rigid Roof Insulation	28379 SF	$3.05	$ 86,557
	R-19 Wall Insulation	43751 SF	$0.65	$ 28,438
	Sound Batt	101938 SF	$0.44	$ 44,853
	Single-ply Roof Membrane	28379 SF	$3.15	$ 89,395
	Air/Weather Barrier	43751 SF	$2.75	$ 120,316
	Foundation Waterproofing	9591 SF	$3.60	$ 34,529
	Fiberglass Mat Gyp Wall Sheathing	43751 SF	$1.65	$ 72,190
	Metal Wall Panel, Cement Board (60% Exterior)	43751 SF	$35.00	$ 1,531,299
	Flashing & Sheet Metal	4410 SF	$6.50	$ 28,665
	Metal Roof Cap	2205 LF	$9.65	$ 21,278
	Firestopping & Caulking	147160 SF	$0.25	$ 36,790
	Caulking & Sealant	147160 SF	$0.25	$ 36,790
	Roof Hatch	1 EA	$850.00	$ 850
	TOTAL THERMAL & MOISTURE PROTECTION			**$ 2,218,048**
08	**DOORS & WINDOWS**			
	Interior Solid Core Wood Door - Single	248 EA	$1,020.00	$ 252,960
	Interior Solid Core Wood Door - Double	11 EA	$1,650.00	$ 18,150
	Sliding Closet Door	32 EA	$850.00	$ 27,200
	Exterior Double Door	4 EA	$3,850.00	$ 15,400
	Exterior Single Door	13 EA	$1,850.00	$ 24,050
	Garage Overhead Door	1 EA	$7,650.00	$ 7,650
	Exterior Curtain Wall (40% Exterior)	12660 SF	$55.00	$ 696,300
	Interior Glazing	2500 SF	$30.50	$ 76,250
	Mirrors	1080 SF	$10.65	$ 11,502

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	TOTAL DOORS & WINDOWS			**$ 1,129,462**
09	**FINISHES**			
	Interior Partition Wall	101938 SF	$1.65	$ 168,198
	Exterior MS Wall	72919 SF	$3.60	$ 262,508
	Gypsum Wallboard	276795 SF	$1.31	$ 362,601
	Floors	147160 SF	$4.50	$ 662,220
	Acoustic Ceiling Tile	1730 SF	$2.75	$ 4,758
	Susp. Gyp Ceiling	31349 SF	$3.80	$ 119,126
	Wood Ceiling	6400 SF	$20.00	$ 128,000
	Ceiling Acoustic Treatment	240 SF	$40.00	$ 9,600
	Unspecified Ceiling	107441 SF	$3.50	$ 376,044
	Wall Coverings	147160 SF	$2.20	$ 323,752
	Rubber Base	16990 LF	$1.45	$ 24,636
	Paint Ceiling Structure	147160 SF	$0.89	$ 130,972
	Paint Gyp. Walls	308144 SF	$0.52	$ 160,235
	Paint/Stain Doors	291 EA	$85.00	$ 24,735
	TOTAL FINISHES			**$ 2,757,385**
10	**SPECIALTIES**			
	ADA Toilet Partition	10 EA	$850.00	$ 8,500
	Toilet Partition	15 EA	$800.00	$ 12,000
	Shower Screen/Partition	30 EA	$800.00	$ 24,000
	Grab Bars	10 SETS	$195.00	$ 1,950
	Bathroom Accessories	80 EA	$165.00	$ 13,200
	Shower Curtain	74 EA	$95.00	$ 7,030
	Shower Seat	10 EA	$265.00	$ 2,650
	Fire Extinguisher Cabinet	14 EA	$278.00	$ 3,892
	Bike Storage	1 LS	$5,000.00	$ 5,000
	Identifying Devices	1 LS	$25,000.00	$ 25,000
	Stackable Bike Storage (100 Bikes)	1 LS	$10,000.00	$ 10,000
	TOTAL SPECIALTIES			**$ 113,222**
11	**EQUIPMENT**			
	Residential Appliances			NIC
	Laundry Equipment			NIC
	C-Store/Coffee Shop Equipment			NIC
	TOTAL EQUIPMENT			**$ -**
12	**FURNISHINGS**			
	Loose Furniture			NIC
	Roller Shades	6330 SF	$8.65	$ 54,755
	Group 1 Flexible, Movable Wall Display System	14900 SF	$14.65	$ 218,285
	TOTAL EQUIPMENT			**$ 273,040**
13	**SPECIAL CONSTRUCTION**			
	Premanufactured Bed/Desk Pod	160 EA	$20,000.00	$ 3,200,000
	TOTAL SPECIAL CONSTRUCTION			**$ 3,200,000**
14	**CONVEYING SYSTEMS**			
	5 Stop Elevator	2 EA	$127,500.00	$ 255,000

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Freight Elevator - 5 Stop	1 EA	$125,000.00	$ 125,000
	TOTAL CONVEYING SYSTEMS			**$ 380,000**
15	**MECHANICAL**			
	HVAC			
	Air Handler 18,000 CFM	4 EA	$155,700.00	$ 622,800
	Air Handler 38500 CFM	1 EA	$333,025.00	$ 333,025
	Air Handler 14,000 CFM	1 EA	$128,100.00	$ 128,100
	Air Handler 13500 CFM	1 EA	$123,775.00	$ 123,775
	Air Handler 8500 CFM	1 EA	$77,525.00	$ 77,525
	Air Handler 4500 CFM	1 EA	$41,425.00	$ 41,425
	Chiller 180 ton	2 EA	$145,000.00	$ 290,000
	Boilers 2340 MBH	2 EA	$36,500.00	$ 73,000
	Ductwork	147160 LB	$4.85	$ 713,726
	Ductliner	104484 SF	$1.65	$ 172,398
	Registers/ Grills	470 EA	$185.00	$ 86,950
	CRAC Unit	2 EA	$12,500.00	$ 25,000
	Pumps 335 GPM	4 EA	$7,850.00	$ 31,400
	Pumps 165 GPM	4 EA	$5,650.00	$ 22,600
	Inline Pumps 190 GPM	4 EA	$2,650.00	$ 10,600
	Inline Pumps 65 GPM	4 SF	$1,950.00	$ 7,800
	Exhaust Fans	12 EA	$1,650.00	$ 19,800
	Air Separator	2 EA	$2,850.00	$ 5,700
	Expansion Tank	2 EA	$4,150.00	$ 8,300
	Chemical Feed	2 EA	$1,650.00	$ 3,300
	Cabinet Unit Heaters	8 EA	$2,650.00	$ 21,200
	Perimeter Heat Radiators	314 EA	$948.00	$ 297,672
	Fan Coil Units	19 EA	$2,950.00	$ 56,050
	VAV with Re heat	60 EA	$1,450.00	$ 87,000
	HVAC Piping	147160 SF	$2.85	$ 419,406
	Temperature Controls	147160 SF	$2.65	$ 389,974
	Test and Balance	400 HR	$64.50	$ 25,800
	Subtotal HVAC			**$ 4,094,326**
	Smoke Evacuation System	1 Allow	$250,000.00	**$ 250,000**
	Fire Protection:	147160 SF	$2.85	**$ 419,406**
	Plumbing			
	Water Closet	80 EA	$782.00	$ 62,560
	Urinal	5 EA	$702.00	$ 3,510
	Lavatory	25 EA	$620.00	$ 15,500
	Counter-mount Sink	54 EA	$650.00	$ 35,100
	Drinking Fountain	4 EA	$620.00	$ 2,480
	Bath Tub/Shower	54 EA	$2,450.00	$ 132,300
	ADA Shower	10 EA	$1,450.00	$ 14,500
	Shower	20 EA	$1,250.00	$ 25,000
	Double Basin Sink w/ Disposal	31 EA	$850.00	$ 26,350
	Supply Outlet	26 EA	$125.00	$ 3,250
	Laundry Supply	20 EA	$125.00	$ 2,500
	Mop Sink	5 EA	$440.00	$ 2,200

CSI #	DESCRIPTION	UNIT QTY	UNIT COST	
	Floor Drain	84 EA	$125.00	$ 10,500
	Boiler 2740 MBH	1 EA	$44,100.00	$ 44,100
	Domestic Circulation Pumps	2 EA	$4,650.00	$ 9,300
	Expansion Tank	2 EA	$4,150.00	$ 8,300
	Storage Tank	2 EA	$8,650.00	$ 17,300
	Supply Piping	13360 LF	$10.65	$ 142,284
	Drain, Vent Piping	10498 LF	$16.50	$ 173,210
	Roof Drain	32 EA	$185.00	$ 5,920
	Roof Drain Piping	2560 LF	$16.50	$ 42,240
	Clean & Flush Lines	1 LS	$7,500.00	$ 7,500
	Subtotal Plumbing			**$ 785,904**
	TOTAL MECHANICAL			**$ 5,549,636**
16	**ELECTRICAL**			
	Service & Distribution			
	Building Service & Distribution w/ Emergency	147160 SF	$5.34	$ 785,834
	15 KV Switch - Four Way	1 EA	$47,158.26	$ 47,158
	208/120V Step-Down Transformer	1 EA	$57,653.04	$ 57,653
	480/277V Step-Down Transformer	1 EA	$40,708.70	$ 40,709
	Site Distribution Feeders	500 LF	$198.00	$ 99,000
	Subtotal Service & Distribution			**$ 1,030,354**
	Power:	147160 SF	$1.95	**$ 286,962**
	Lighting:	147160 SF	$8.00	**$ 1,177,280**
	Telecommunication System:	147160 SF	$4.35	**$ 640,146**
	Fire/Smoke System:	147160 SF	$2.05	**$ 301,678**
	Special Systems:	147160 SF	$4.95	**$ 728,442**
	TOTAL ELECTRICAL			**$ 4,164,862**

11.

APPENDIX

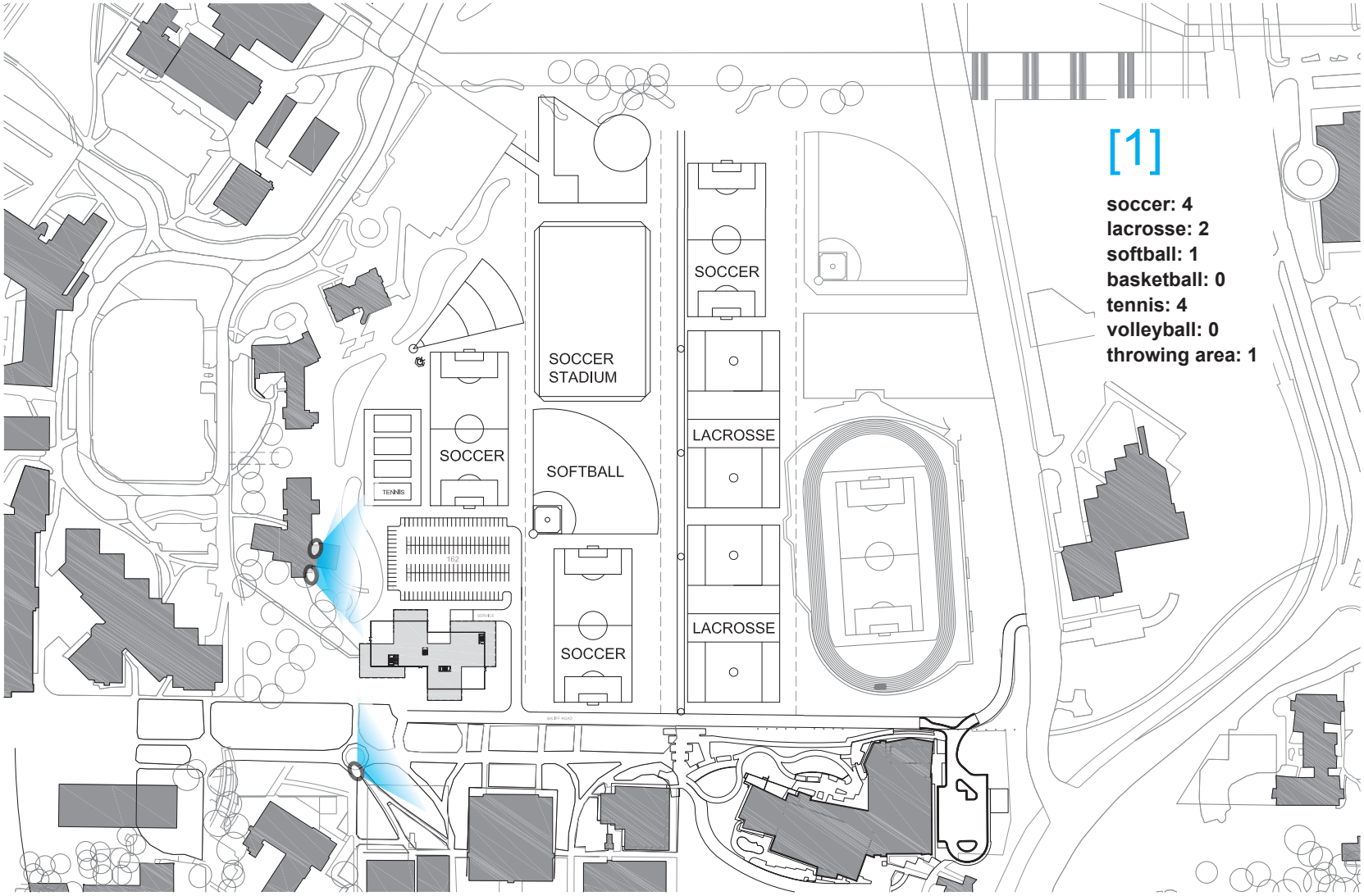
Humanities Building View Study
Structured Parking Analysis

HUMANITIES BUILDING VIEW STUDY

During the Work Sessions on November 18th and 19th, 2013, when the preferred Site A was identified and shared with the Board of Trustees, the University requested a study be performed regarding the impact the Lassonde Make Live Center would have on the Carolyn Irish Tanner Humanities Building to the west of the Site A. Two options were explored. The first option was where the building would be oriented east to west, parallel to HPER mall. The second option was where the building would be oriented north to south perpendicular to HPER mall.

These options were presented to the Steering Committee during the first part of December, and the approval of Site A with the east west orientation was given to the design team in late December.

The caveat to this decision was that consideration be given to structured underground parking in lieu of the surface parking shown in the following images. One option to be considered is beneath the building and the second to the north of the building beneath the future play fields.



THE UNIVERSITY OF UTAH

LASSONDE ENTREPRENEUR CENTER
AND RECREATION FIELDS SITE PLAN

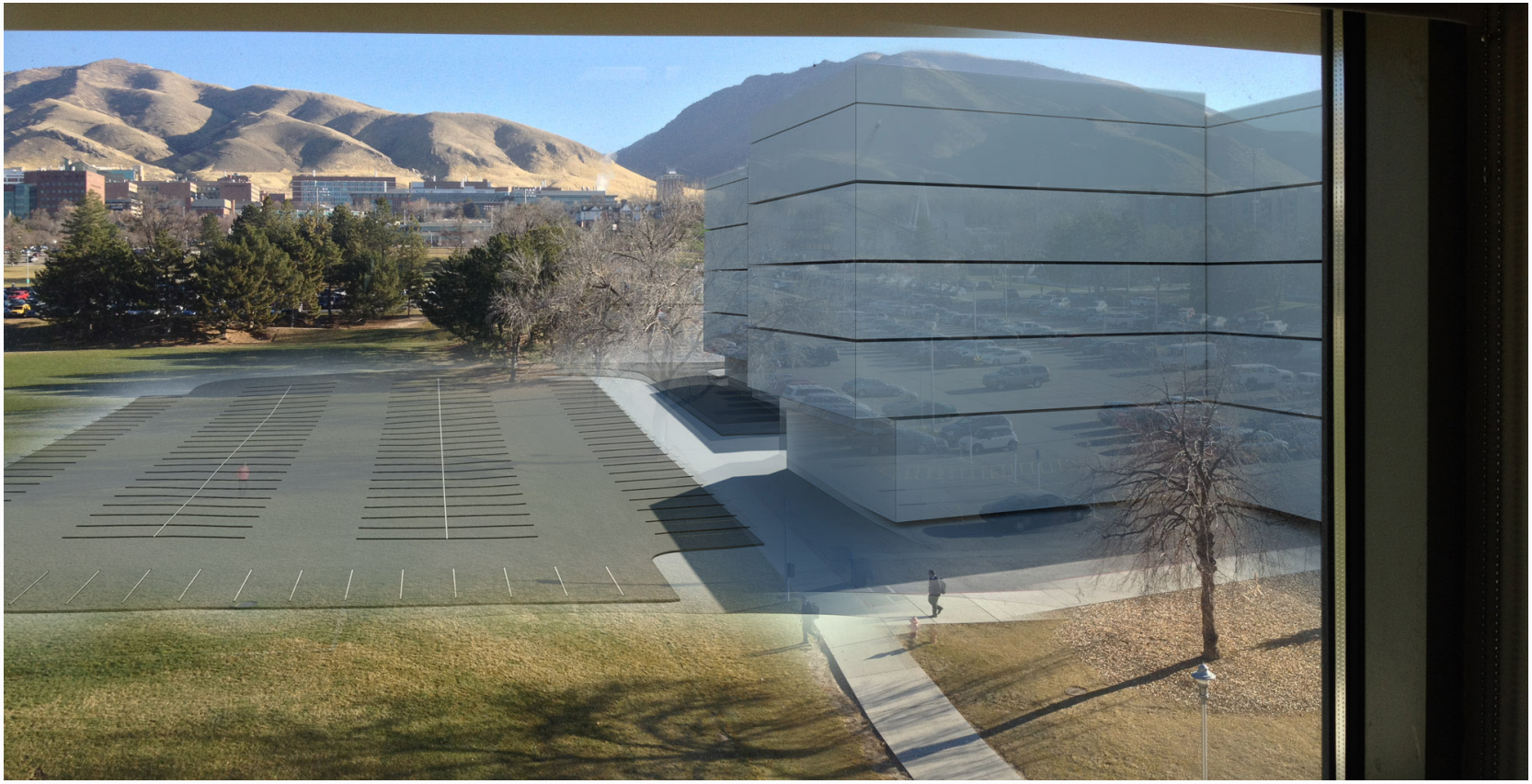
12 / 10 / 2013

eda CANNONDESIGN VCBO

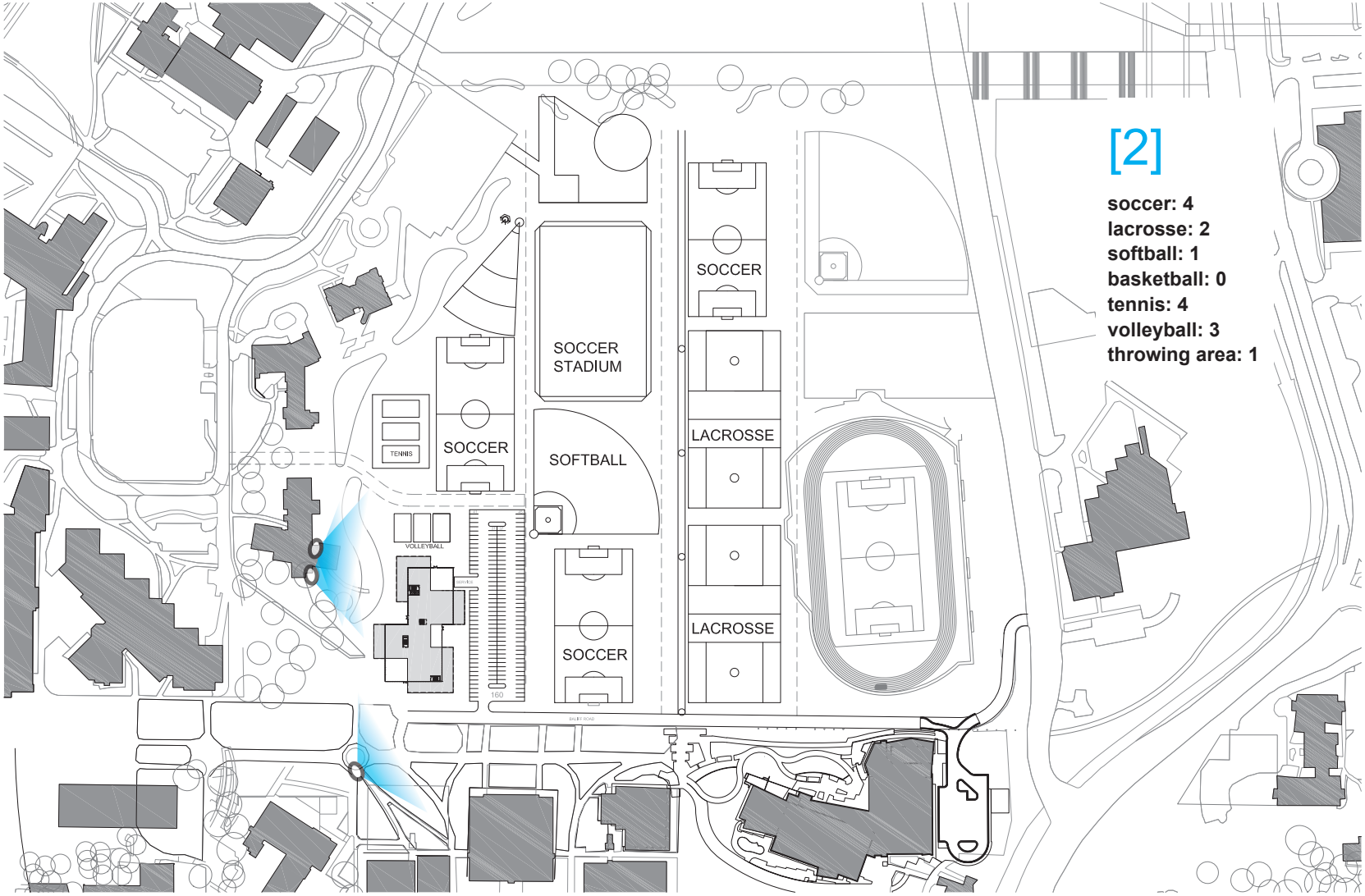
50' 100' 500'

view from Carolyn Tanner Irish Humanities Bldg. Level 3, exterior terrace

view from HPER Mall



view from Carolyn Tanner Irish Humanities Bldg.
4th level _ south east corner



THE UNIVERSITY OF UTAH

LASSONDE ENTREPRENEUR CENTER
AND RECREATION FIELDS SITE PLAN

12 / 10 / 2013

eda CANNONDESIGN VCBC

50' 100' 500'

view from Carolyn Tanner Irish Humanities Bldg. Level 3, exterior terrace

view from HPER Mall

view from Carolyn Tanner Irish Humanities Bldg.
4th level _ south east corner

STRUCTURED PARKING ANALYSIS

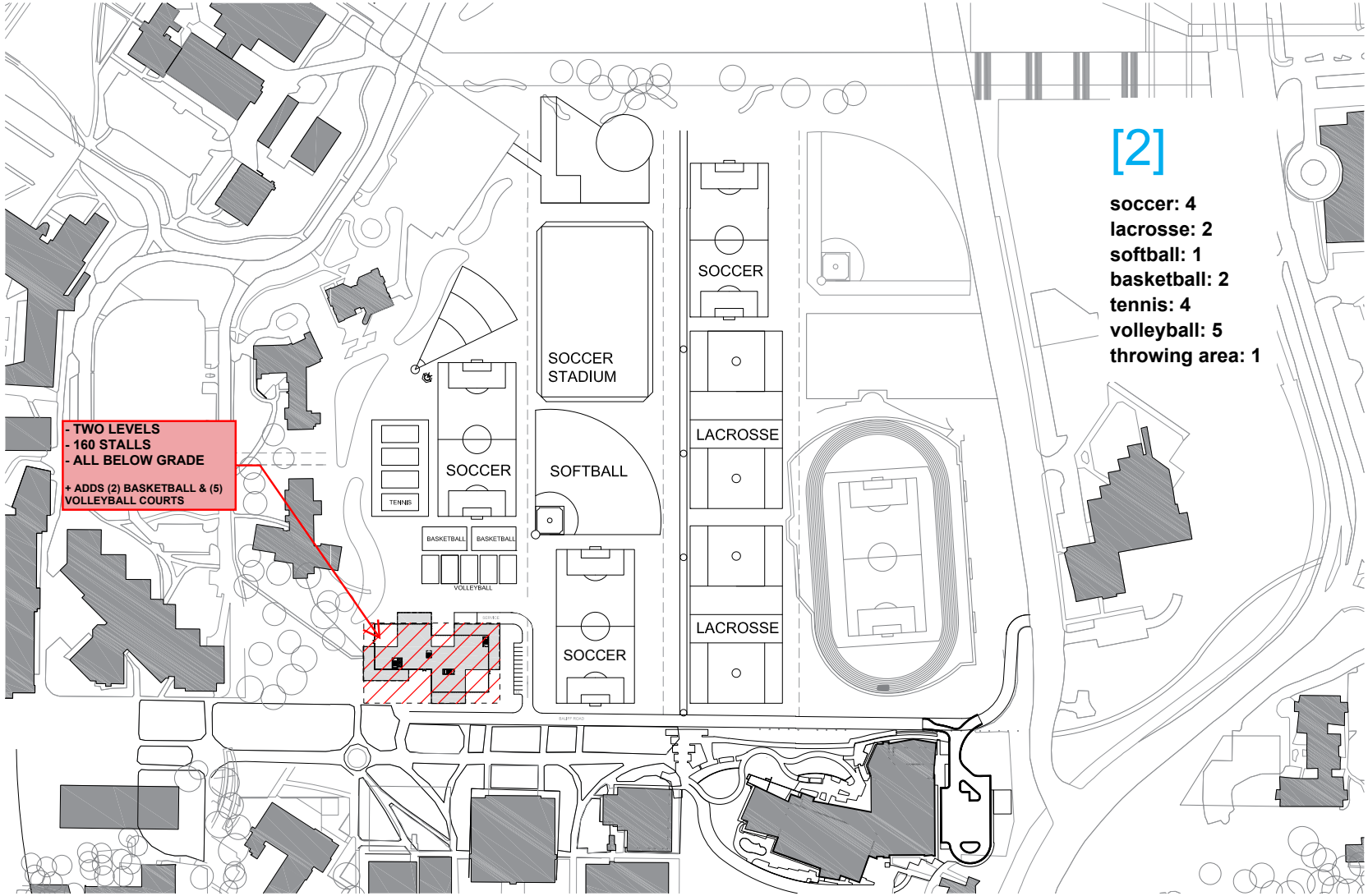
The following two diagrams show the locations of the proposed structured parking locations under consideration. Both options assume 160 stalls.

The first is assumed to be two levels of underground parking beneath the Lassonde Make Live Center. It is assumed that two levels will be required to fit beneath the building footprint. There is a complexity factor included in the square foot cost to coordinate with the building structure. It should be noted, however, the construction cost and schedule for the building will be impacted by this approach.

The second is assumed to be single level located to the north of the building. This approach will be partially underground to accommodate future play fields on top. The existing grades anticipate that this option will day light on the west end.

In terms of conceptual level costs, the expectation is that the single level parking structure would be approximately $70-80/ SF. Based upon a 360 SF stall, the cost would be approximately $28,000/stall, not including turf and sports field equipment above. This conceptual number includes structure and waterproofing only. The single level cost also assumes that the structure will be open. For the two story structure under the building, the expectation would be for the cost to be $65-75/SF or approximately $27,000/stall. This is due to the greater efficiency of the two story scheme versus a single story scheme and the impact of the play fields above the structure. In either case, the cost range for the 160 stall structured parking is approximately in the $4,320,000 to $4,480,000 range.

To be certain, with a greater design effort, efficiencies can be explored for both options in the next phase of design.



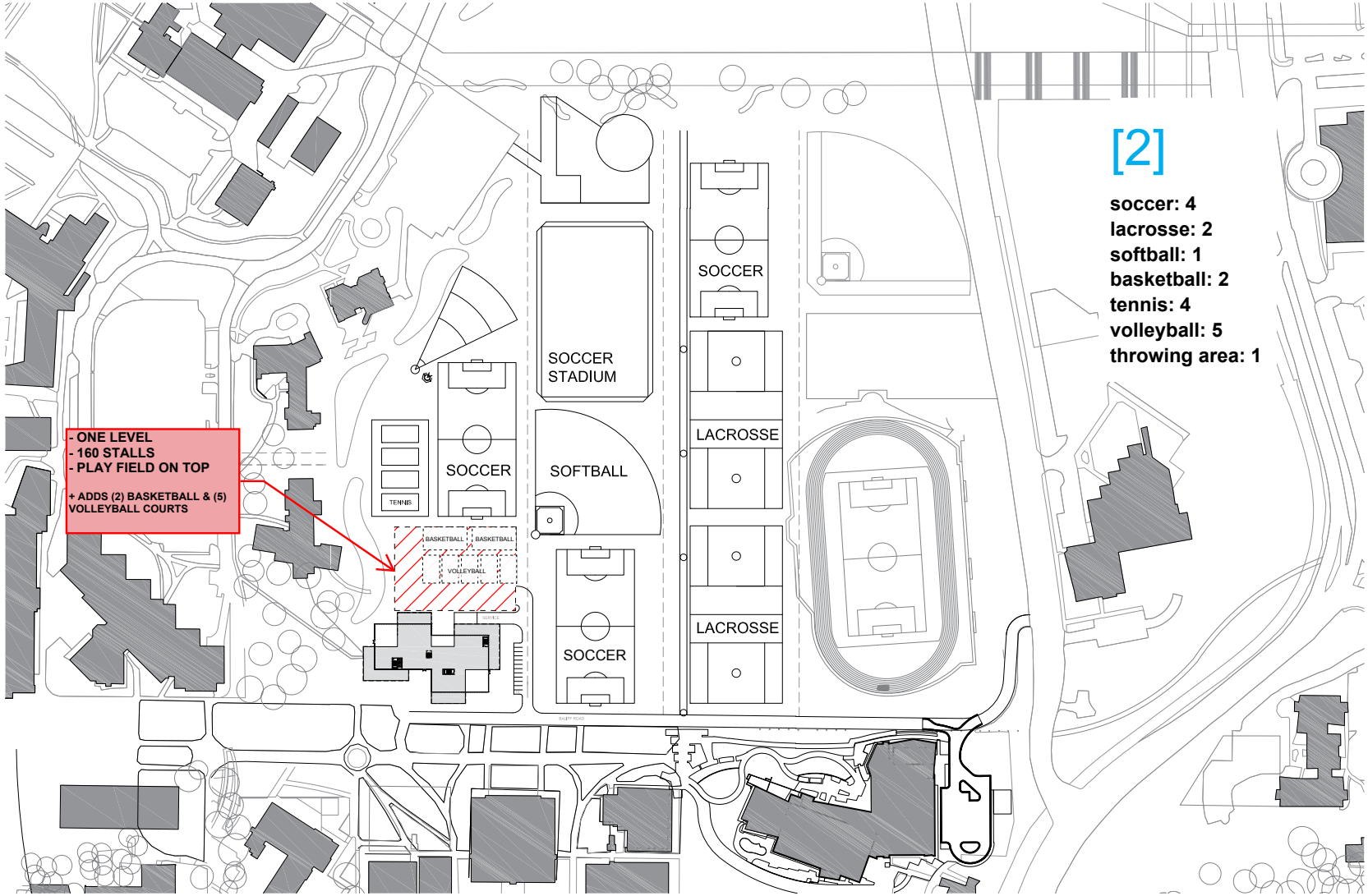
THE UNIVERSITY OF UTAH

LASSONDE ENTREPRENEUR CENTER
AND RECREATION FIELDS SITE PLAN

12 / 02 / 2013

50' 100' 500'

eda CANNONDESIGN VCBC



THE UNIVERSITY OF UTAH

LASSONDE ENTREPRENEUR CENTER
AND RECREATION FIELDS SITE PLAN

12 / 02 / 2013

50' 100' 500'

eda CANNONDESIGN VCBC

in association with CANNONDESIGN

UNIVERSITY OF UTAH - LASSONDE MAKE/LIVE CENTER

Schedule

Proposed Schedule Spring 2014

Task	Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Meetings	2/4/2014			2/25/2014			3/18/2014			4/8/2014			4/29/2014			5/20/2014		
	Phase	SD	SD	SD	SD	SD	SD	SD	SD	SD	SD	DD	DD	DD	DD	DD	DD	DD	DD
		SD Kickoff			Plans & initial site/massing Sustainability Charrette?			Refinement of plans / massing systems			Pierre Lassonde Finalize plans, skin studies	Begin DD							
		Working Committee			Working Committee			Working & Steering			Working Committee			Working & Steering			Working Committee		
A	Vision/Mission	Define mission/vision			Confirm alignment with vision									Confirm alignment w/vision					
B	Strategic Goals	Define strategic goals			Confirm Strategic Goals									Confirm strategic goals					
C	Sustainability	Set sustainability goals			Sustainability Charrette			Run preliminary energy model			LEED checklist			Confirm LEED goals			Run updated energy model		
D	Site Utilities	Discuss plan/define parameters						Confirm analysis						Confirm site strategies			Confirm analysis		
E	Building Vision	Review building program			Review design options			Establish design direction			Present final concept			Confirm design direction			Review design		
F	Review - U of U																		
G	Review - DFCM (+ fire marshall)																		
H	Review - CMGC																		
I	Schedule Management	Set completion goals			Update schedule			Update schedule			Update schedule			Confirm project schedule			Update schedule		
J	Scope Management	Set scope parameters						Review scope parameters						Confirm scope criteria					
K	Cost Management	Set/confirm preliminary budget target			Target cost reviews			Target cost reviews			Schematic phase estimate			Review SD phase estimate			50% CD-1 Estimate		
L	Quality Control	Set QA/QC expectations and BIM standards			Preliminary code & 50% QA/QC review						100% QA/QC review			Initiate phase QA process			Code & 50% QA/QC Review		
M	Submittal Dates	Confirm project deliverables						50% SD Submittal			100% SD Submittal			Confirm project deliverables			50% DD submittal		
N																			
	Meetings	▼			▼			▼			▼			▼			▼		
	Meeting Numbers	1			2			3			4			5			6		

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6/10/2014
7/1/2014
7/22/2014
8/12/2014
9/2/2014
9/23/2014
10/14/2014
DD
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Wrap up DD
Wrap up CD
Working & Steering
Confirm alignment w/vision
Confirm strategic goals
Update LEED compliance
Confirm site strategies
Review design
Update schedule
Review scope parameters
Targeted cost reviews
100% QA/QC Review
Working Committee
Update LEED checklist
In review
Present DD design
Agency & shops review
100% DD submittal
50% CD-1 (Mass Ex./Utilities/Ftng&Found.)
Confirm schedule
Confirm scope criteria
Review DD & CD-1 estimates
Initiate phase QA process
Confirm project deliverables
Working & Steering
Confirm alignment w/vision
Confirm strategic goals
Review LEED compliance
Confirm design direction
Working Committee
Run updated energy model
Present 100% CD-1 Mass exc. & site utilities
Present 100% CD-1 Footing & Foundation package
Update schedule
Review scope parameters
50% CD-2 estimate
QA/QC review
100% CD-1 (Mass Ex./Utilities/Ftng&Found.)
CD-1 Bid
Working & Steering
Confirm alignment w/vision
Confirm strategic goals
Update LEED compliance & checklist
CA coordination
Review Design
Update schedule
Confirm scope criteria
100% CD-2 & 50% CD-3 estimate
QA/QC review
50% CD-2 Submittal + Confirm deliverables
Working Committee
Run updated energy model
Review design
Update schedule
Review scope parameters
100% CD-3 estimate
QA/QC review
Working & Steering
Update LEED checklist
Present 100% CD-2 (Balance of work package)
100% CD-2 Submittal (balance of work)
CD-2 Bid
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