



University of Washington **Computer Science & Engineering II:**

Feasibility Study

LMN Architecture
Urban Design
Interiors

FALL 2014

Office of the University Architect in the Office of Planning & Budgeting
College of Engineering

University of Washington **Computer Science & Engineering Feasibility Study**



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1. Introduction

Introduction - Overview

The purposes of this study are: develop a building program for a second computer science building, to define a site development program and maximize its capacity on the preferred site (see Site Identification Study Fall 2014), to assess the possible future development of the vicinity so the project development does not prevent future opportunities, and to evaluate options for realizing the program on the preferred site.

Computer Science and Engineering (CSE) ranks among the top ten programs in the nation, both at the graduate and undergraduate levels. The program is engaged in a broad range of research and interdisciplinary initiatives that produce far-reaching educational and economic benefits to the university, region and state. The program is currently largely housed in the Paul G. Allen Center for Computer Science & Engineering, which opened in 2003 and quickly became a model for new computer science buildings across the nation. Due to the success of the CSE's educational and research initiatives, the amount of space in the Allen

Center is now substantially short of current program needs; the space deficiency becomes more critically acute when considering the consistent rate of program growth. The department has grown significantly at every level (undergraduate students, graduate students, faculty, staff, postdocs, industry partners, etc.) to meet the high demand in the region for CSE graduates and research. This study defines CSE program needs based on current uses and projected growth over a ten-year horizon.

While the sheer need for additional CSE space is the driving force behind this study, other important influences include the increasingly interdisciplinary nature of the computer science programs, the overall campus need for instructional space, and the need for space to accommodate undergraduate CSE student needs. The concept identified in this study supports the evolving interdisciplinary nature of CSE programs through open and interconnected floors that mix office space, study space and flexible laboratory space.

Allen Center Atrium



Paul G. Allen Center



1. Introduction - Overview

The essential program spaces for education, research, and industry collaboration activities will drive the future evolution of engineering facilities. Connections with the high tech community are strengthened with the inclusion of an events space and additional office space for industry and interdisciplinary collaborators. Undergraduate programs are enhanced with the inclusion of new open computer labs, instructional space and student commons that are fully integrated with the overall building activity.

New program spaces seek to compliment and enhance the existing Allen Center by providing functions that are either insufficient or non-existent in the Allen Center. In addition to new research and faculty office space to accommodate growth, events space and classrooms are designed to be shared with the existing facility.

The existing Allen Center atrium is a signature space for the department and it is envisioned that the atrium will continue to be the center of the department, with primary administrative functions remaining in the Allen Center. These shared spaces create a need for the two buildings to be strongly linked and in close proximity to each other to maintain departmental continuity.

Locating the new facility on the preferred site makes it possible to maintain the cohesiveness of this department across two buildings. This location creates an opportunity to enhance a campus open space along a major pedestrian route, to create ADA access from the Burke Gilman Trail to Stevens Way and to make a strong link between the Allen Center and the new facility.

Allen Center Atrium Event



2. Site Vicinity

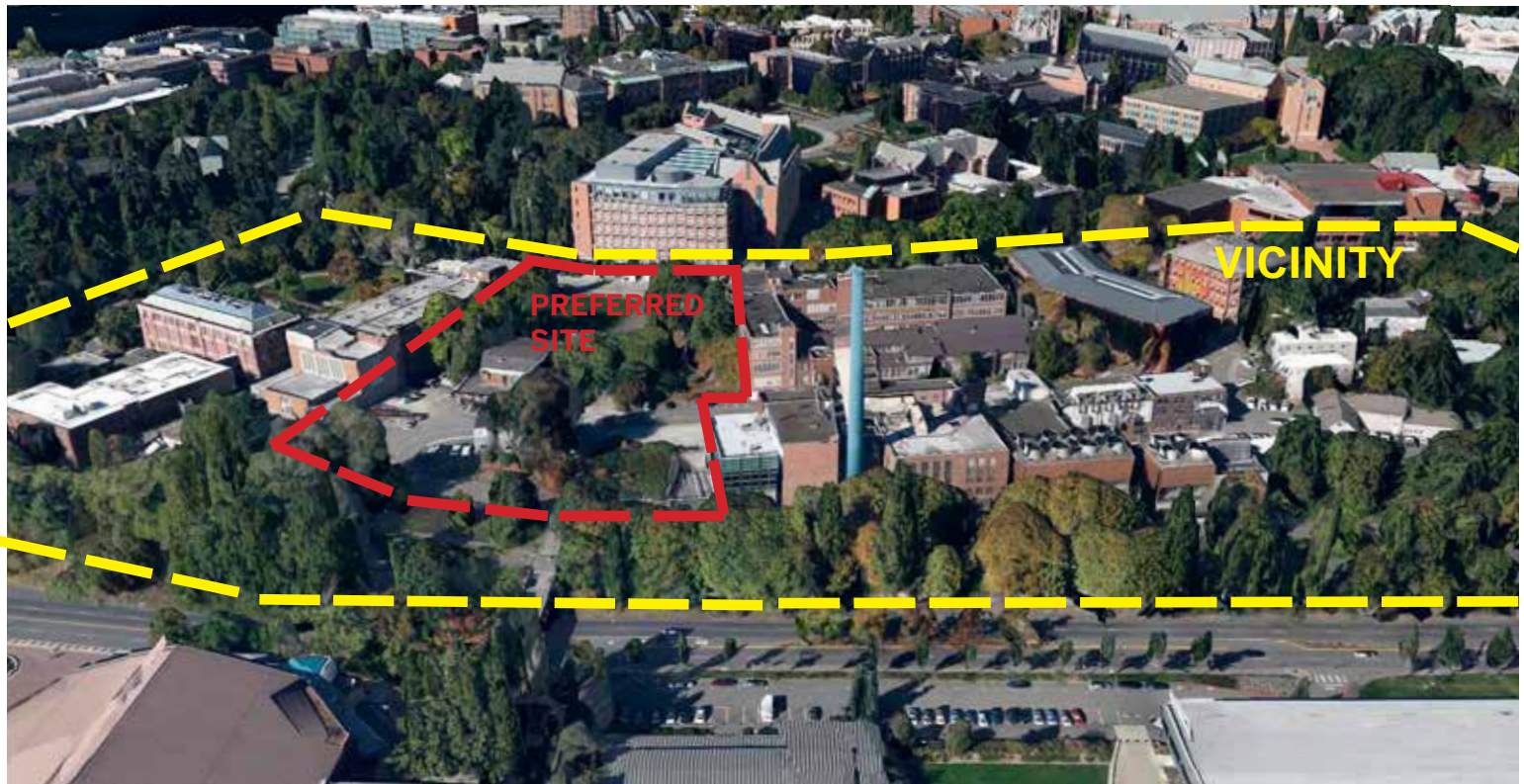
Vicinity Analysis

The area to the east of the existing Allen Center, bounded by Stevens Way, Burke Gilman Trail, Rainier Vista and the Faculty Club, is currently the home of many of the university's engineering programs, as well as the campus physical plant and facilities operations. The area has a history of engineering and facilities use dating back to the 1907 Alaska-Yukon-Pacific Exposition and some of the last original exposition buildings on campus are located within the area.

An evaluation of the constraints, influences and opportunities in this area has been undertaken to help define potential future redevelopment in order to inform this feasibility study and most effectively site the new building on the preferred site to maximize the area's future redevelopment potential. The UW's 2003 Campus

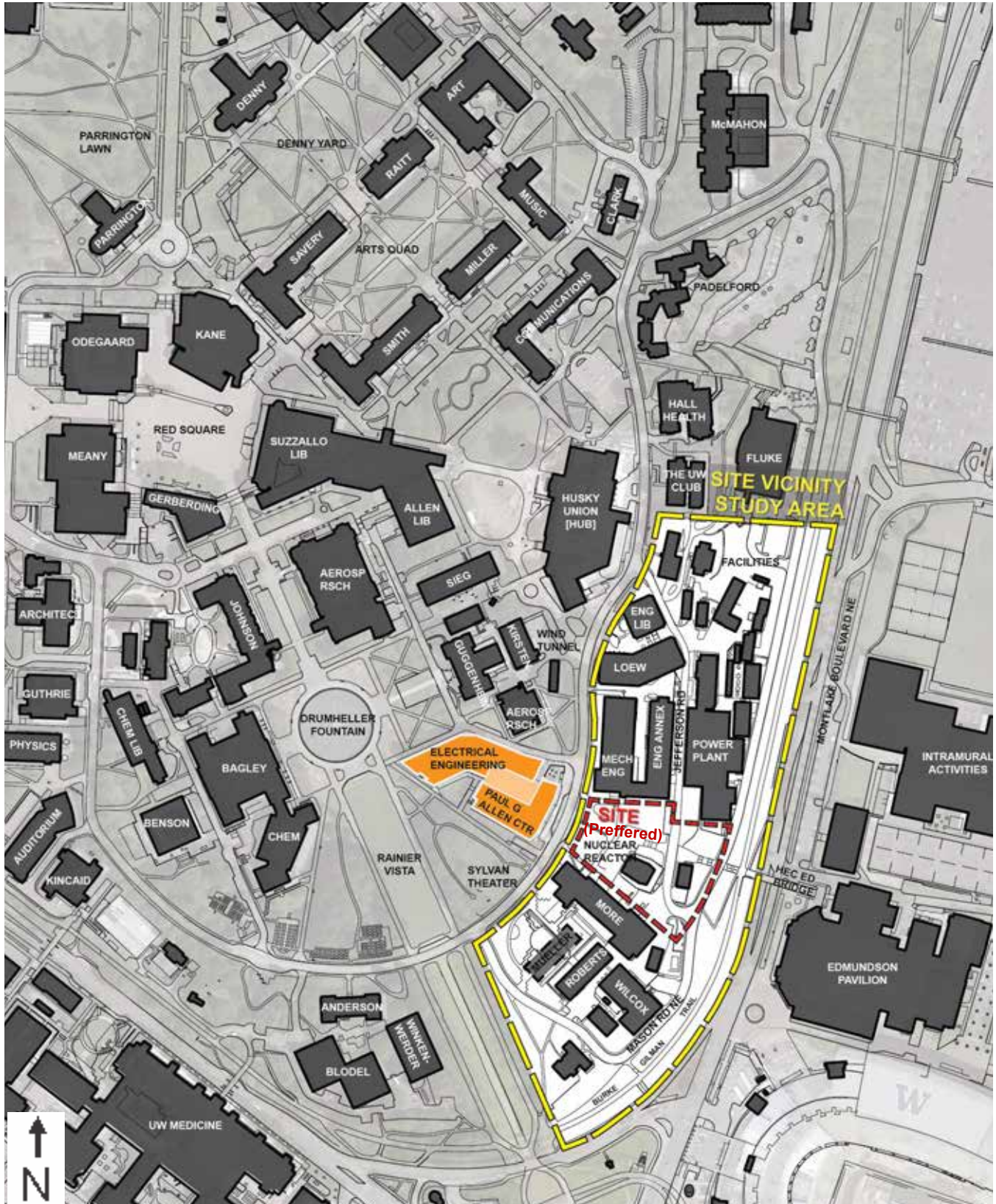
Master Plan, Burke Gilman Trail corridor design and the ongoing Campus Landscape Framework have been considered in the preparation of this report.

Aerial View of Vicinity and Preferred Site



2. Site Vicinity

Campus Context



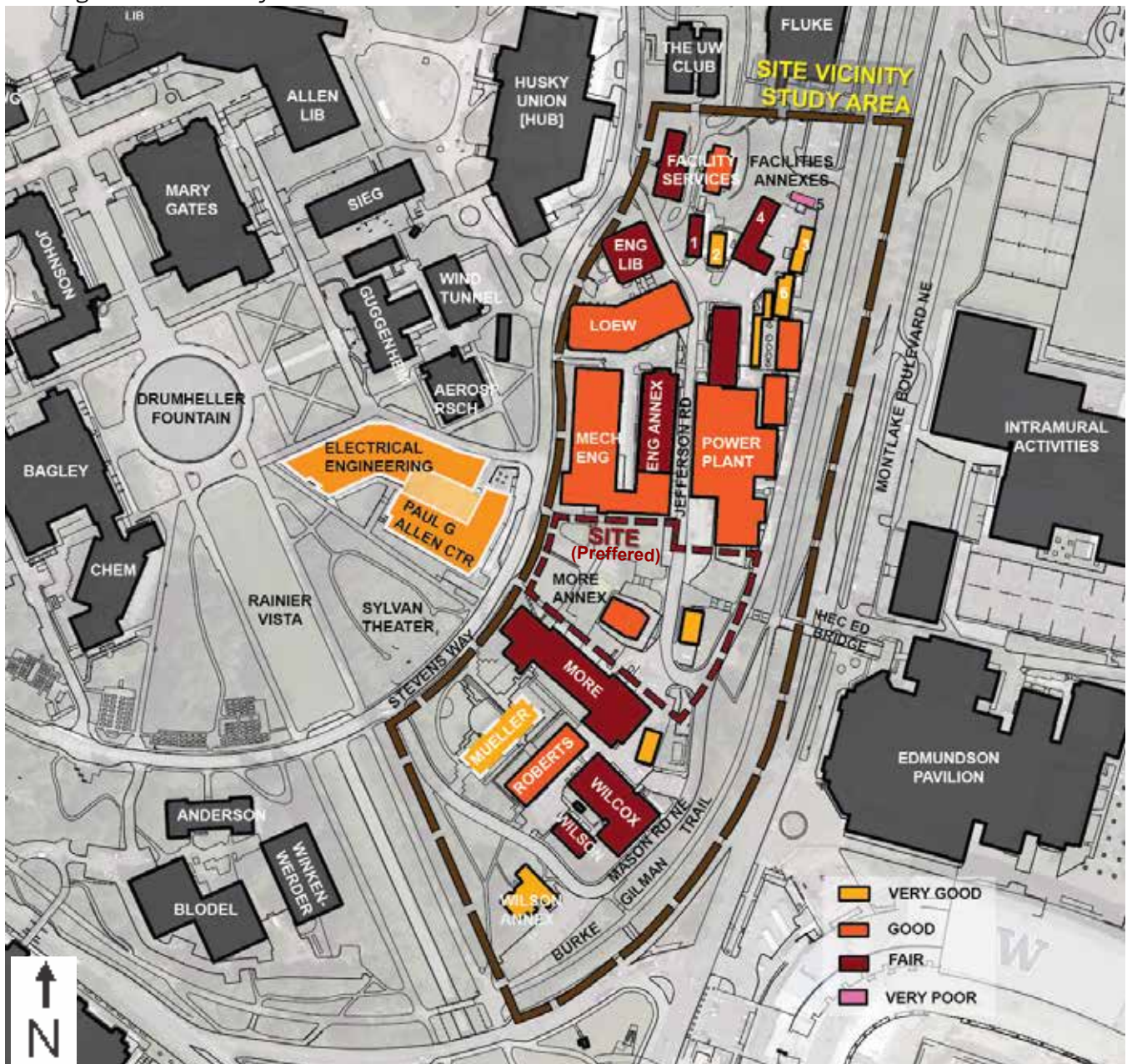
2. Site Vicinity - Existing Buildings

Existing Condition

The buildings in the site vicinity are in various conditions of repair as reported to the state in the “2013 Facilities Condition Report” as illustrated below. The Condition Report represents the status of the building structure and systems but does not represent

the functional usefulness of these buildings, many of which were built without modern infrastructure and have limited floor-to-floor heights.

Building Condition Survey



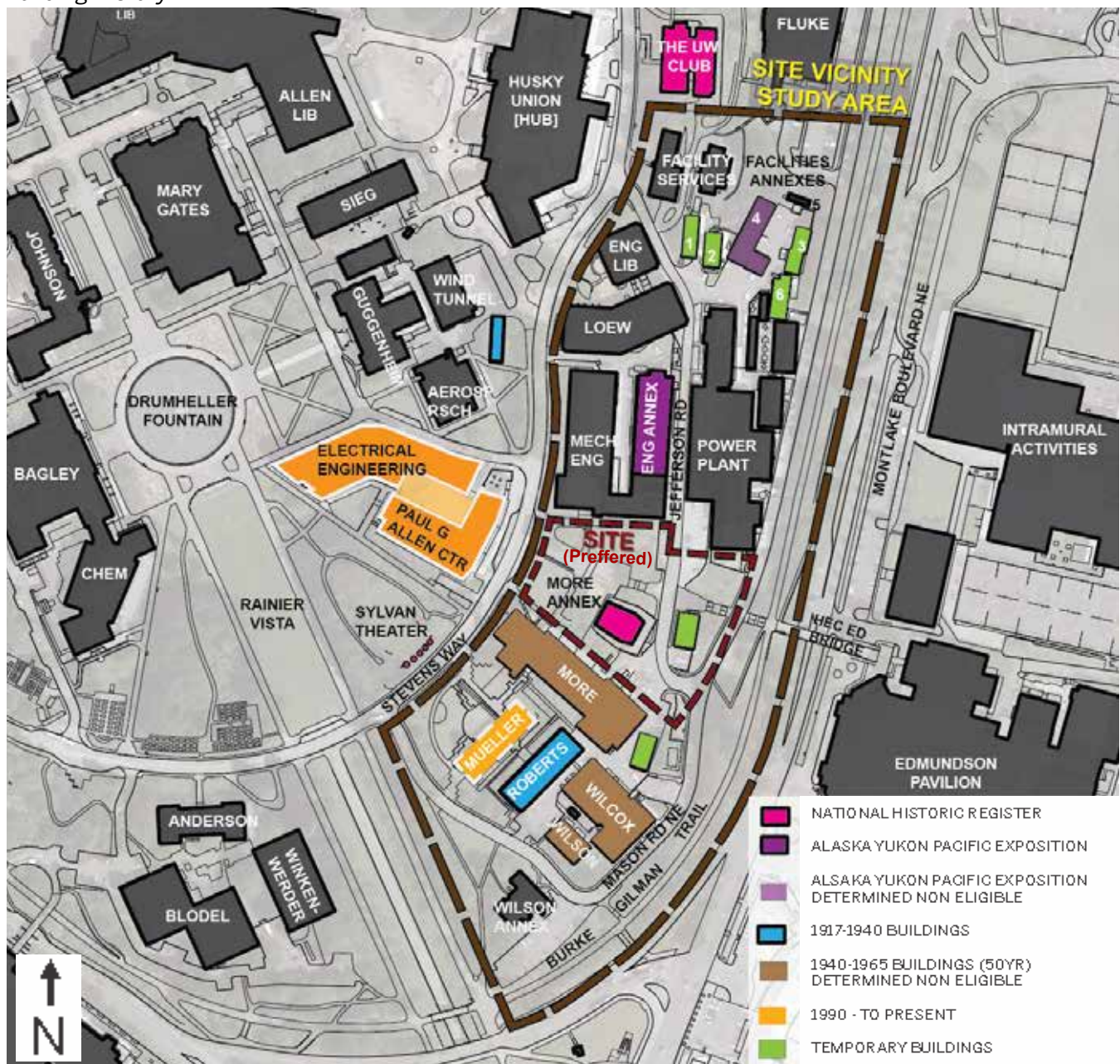
2. Site Vicinity - Existing Buildings

Building History

Many of the buildings on the site have been evaluated by the State Department of Historic Preservation for eligibility on the National Register of Historic Places. Buildings that have been evaluated by the state include: Wilson, Wilcox, More, More Annex, Power Plant and Facilities Annex 4. The illustration below indicates the approximate age of existing buildings and the determination of the state with regard to historic preservation when they have been evaluated.

The More Hall Annex is the only building in the study area listed on both the State and National Register. More Hall Annex was designed as a teaching nuclear reactor, was determined no longer necessary and has been unoccupied since 1988.

Building History



2. Site Vicinity - Existing Buildings



Roberts Hall



Mechanical Engineering South Entry



Engineering Annex



Loew Hall



More Hall Annex



More Hall Entry

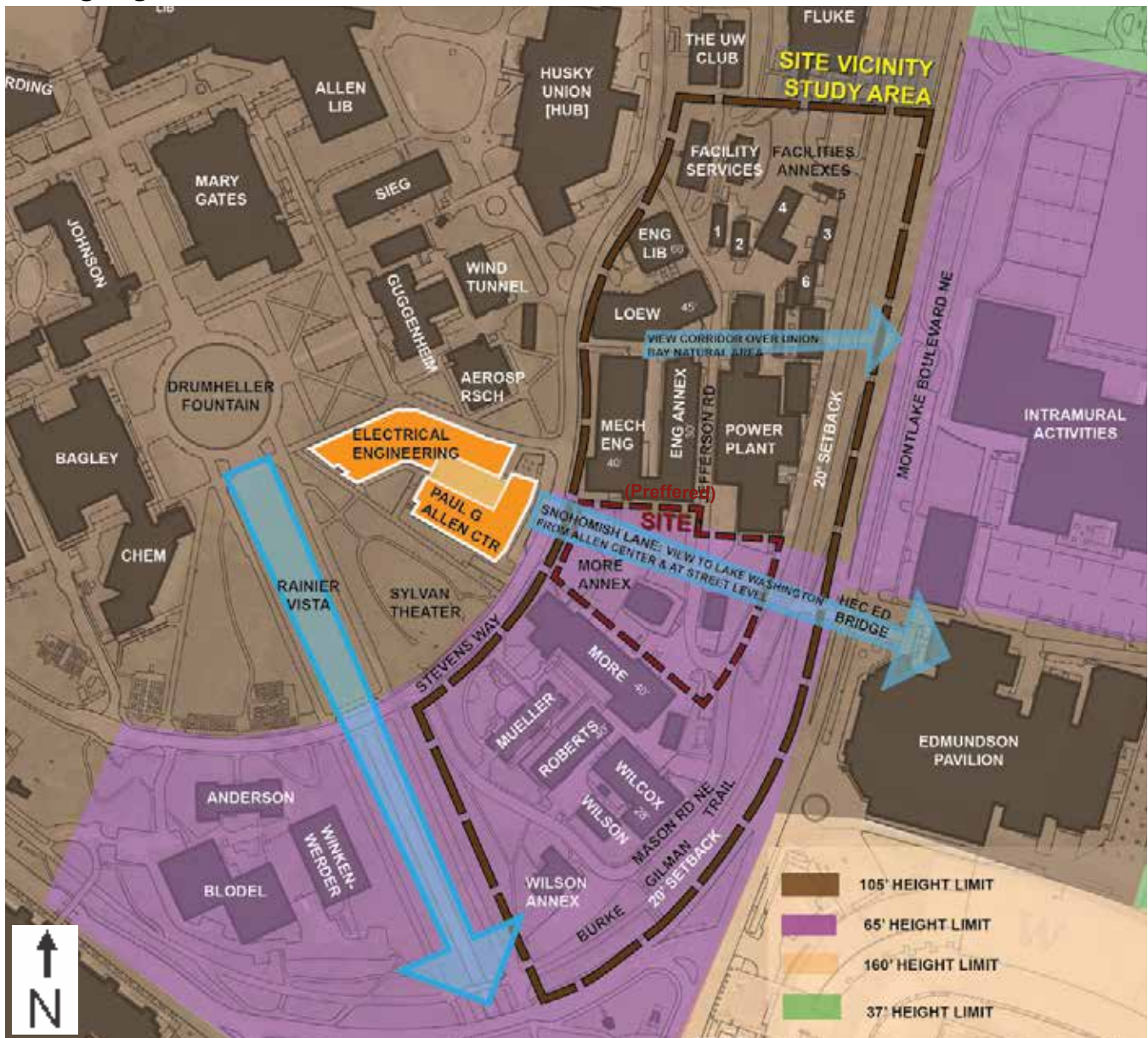
2. Site Vicinity - Heights and Views

Building Heights and Views

Building heights in the study area are limited by the 2003 Campus Master Plan to 65 feet or 105 feet depending on location. The study area is steeply sloped and views of Lake Washington occur at a few locations. Rainier Vista is an extremely important view corridor for the entire campus. Development at the edges of Rainier Vista has been held back allowing landscape to define the iconic view and public space.

The pedestrian access route along Snohomish Lane has the potential to provide glimpses of Lake Washington and the upper floors of the Allen Center provide expansive views of Lake Washington. The pedestrian route between Loew Hall and Mechanical Engineering provides glimpses of Union Bay.

Building Heights and Views



2. Site Vicinity - Open Space

Open Space

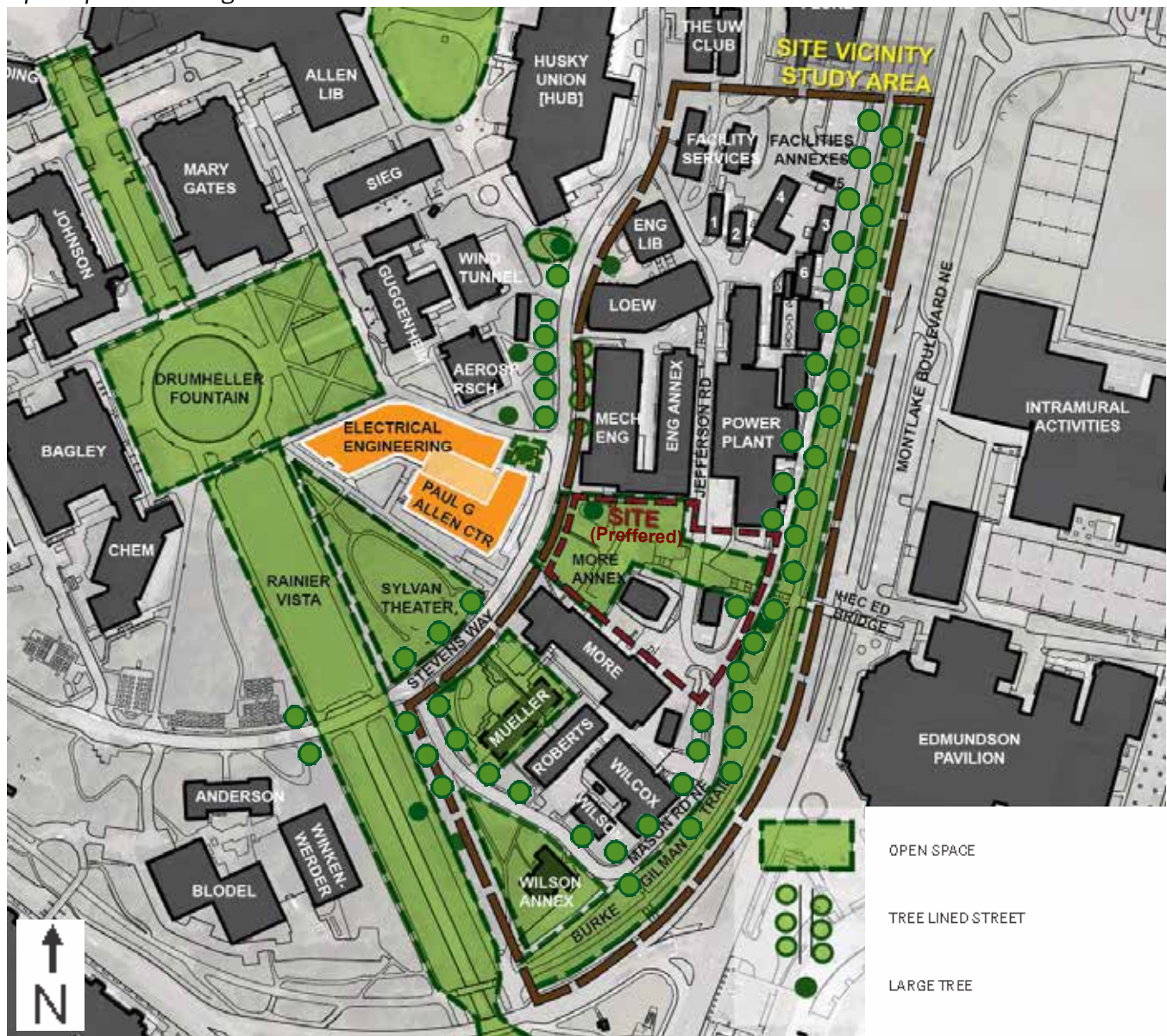
Each of the open spaces illustrated below has unique importance to the campus. Drumheller Fountain and Rainier Vista provide an iconic view of Mt. Rainier, as well as establish a major pedestrian route through the main campus. The Sylvan Theater Grove, plaza in front of Roberts Hall and green space around the Wilson Annex all reinforce Rainier Vista with a landscape buffer.

An open space within the study area is the lawn directly across from the Allen Center and the

accompanying pedestrian circulation route to the athletic facilities. A distinct avenue of large trees exists along a portion of Stevens Way and is a significant influence to the character of the open space.

The Burke Gilman Trail is an important bicycle and pedestrian path that forms the eastern edge of the study area. It is 43 feet in elevation lower than Stevens Way and is characterized by steeply sloping, forested buffers.

Open Space and Large Trees



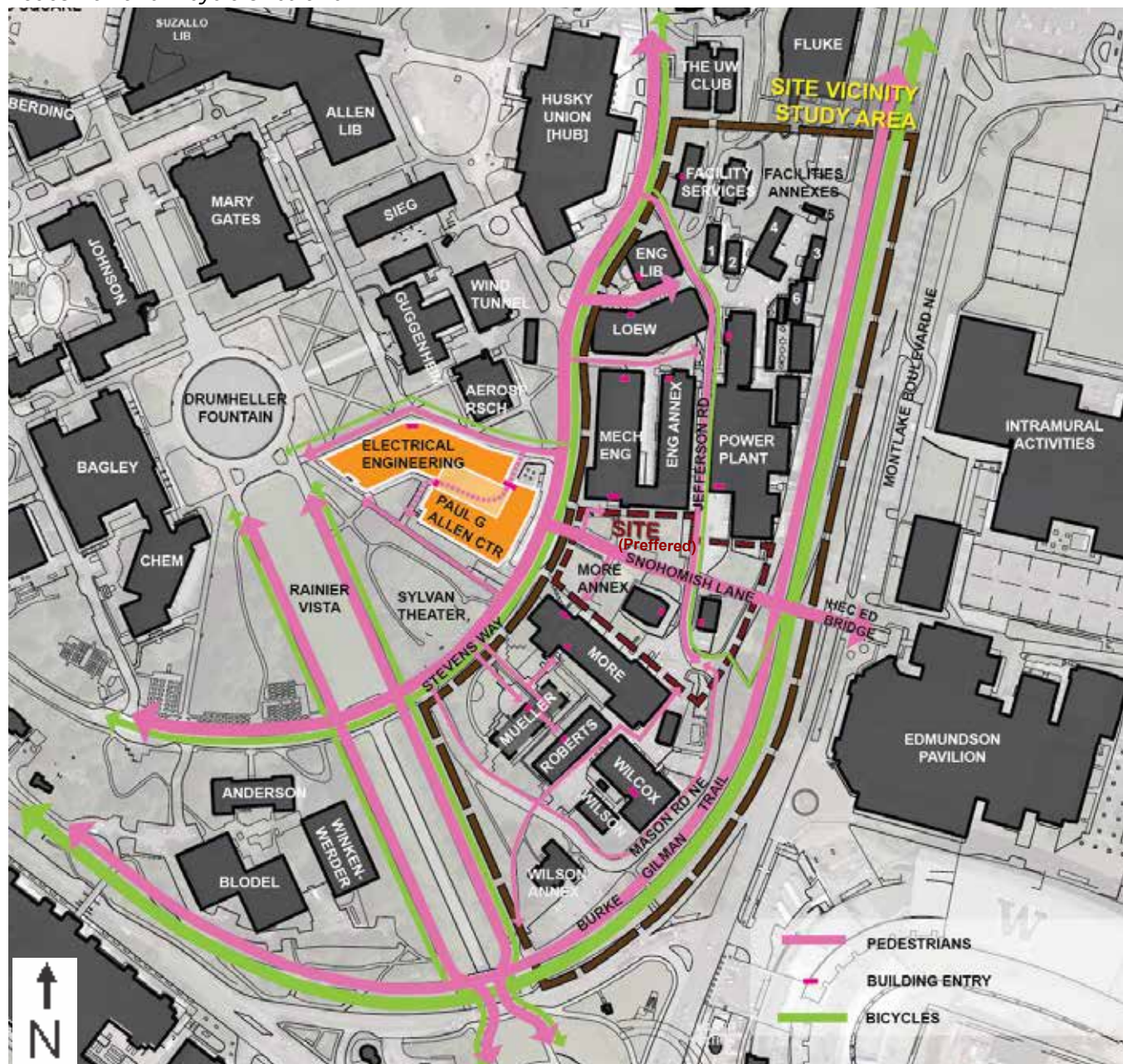
2. Site Vicinity - Circulation

Pedestrian Circulation

Pedestrian circulation in this vicinity is of paramount importance in forming access to and through it. The most dominant pedestrian route within the vicinity is Snohomish Lane, the walking route from Stevens Way to the athletic facilities located across Montlake Boulevard via the Hec Ed bridge. The southern edge of the study area borders Rainier Vista, which will experience increased pedestrian traffic when the new light rail station west of Husky Stadium opens

in 2016. The Husky Union Building at the north edge of the precinct also generates significant pedestrian traffic. Stevens Way and the Burke Gilman Trail are both heavily used pedestrian and bicycle routes along the edge of the study area, connecting residence halls and parking to the north and UW Medicine to the south. Bicycle routes leading from the Burke Gilman Trail to campus are hindered throughout the vicinity because of the steepness of the site slope.

Pedestrian and Bicycle Circulation



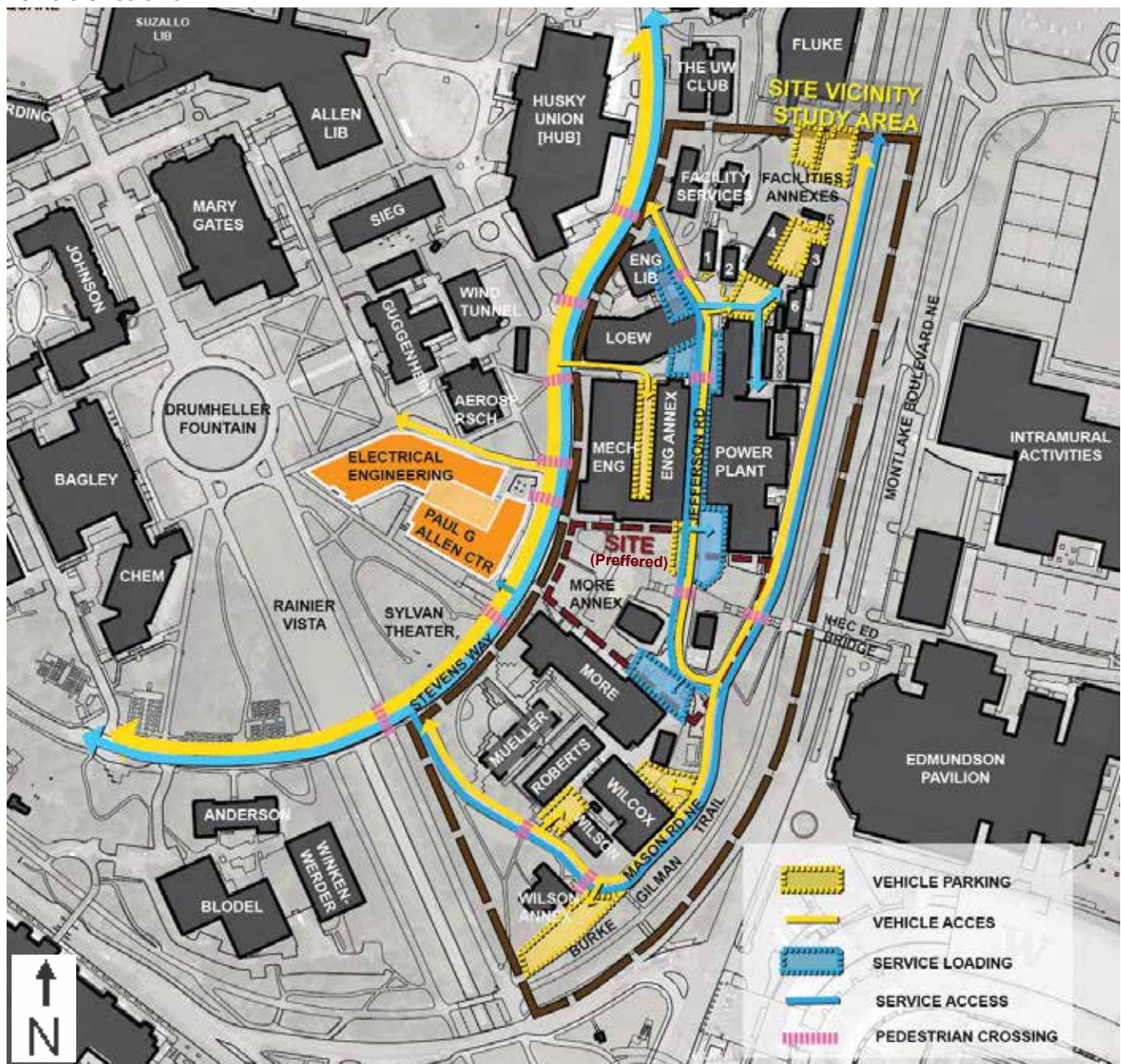
2. Site Vicinity - Circulation

Vehicle Circulation

Stevens Way is the primary passenger vehicle access route and includes major bus and bike routes, as well as pedestrian traffic through the central campus. Service access to the CSE building is provided along Stevens Way with access to the CSE loading dock at the southeast end of the building. Short term loading zones line both sides of Stevens Way in front of CSE. Stevens Way is a major arterial route on the campus and includes multiple pedestrian crossing points.

Vehicular circulation, internal to the study area, is limited to Mason and Jefferson Roads. Jefferson Road is largely used as a service route for the physical plant and loading access to other buildings in the vicinity. Mason Road provides both service and parking access to the area. Mason and Jefferson roads help divert service vehicles off of Stevens Way.

Vehicle Circulation



2. Site Vicinity - Utilities

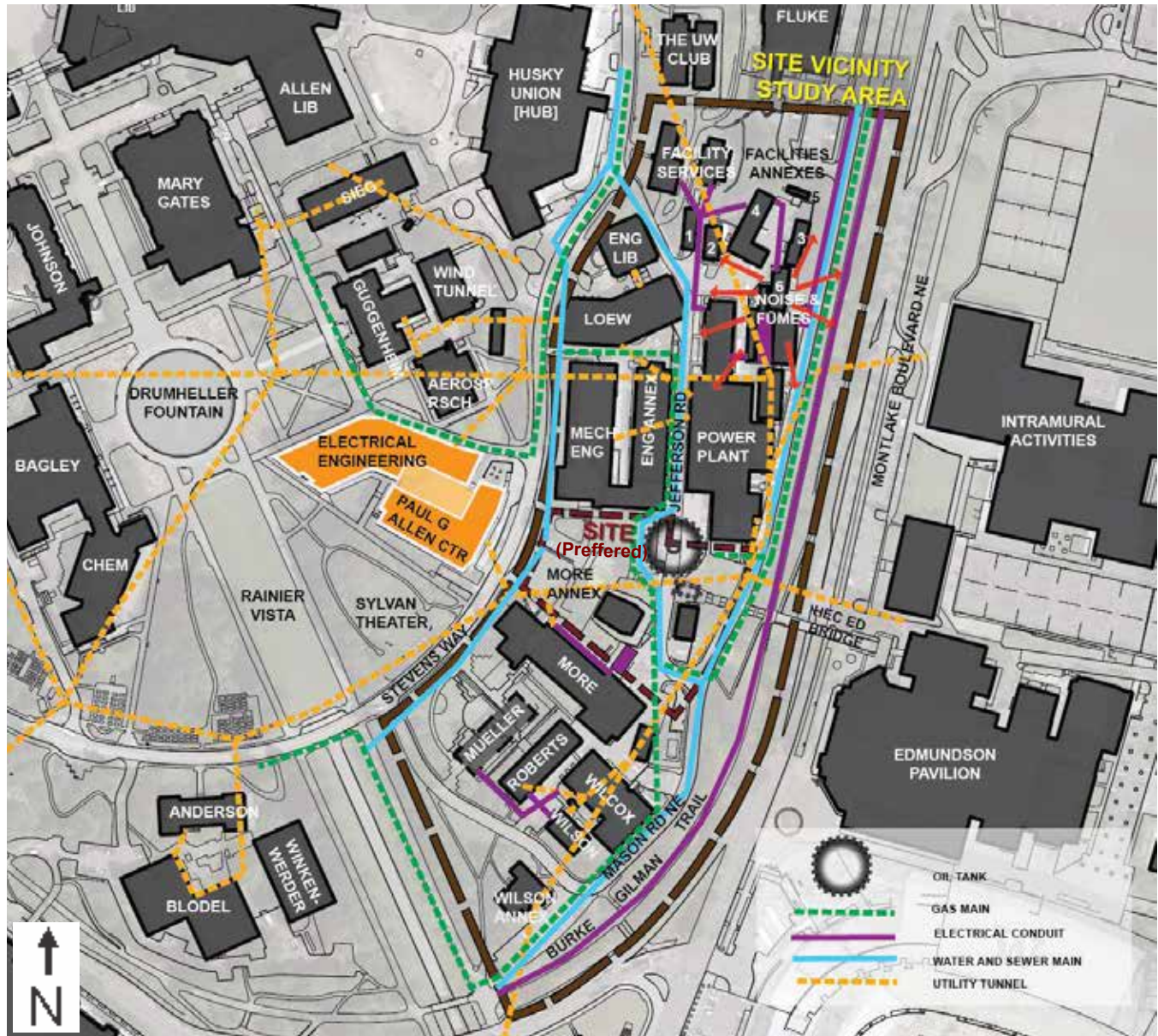
Site Utilities

The main campus utility plant is situated at the center of the study area. It provides the starting point for the campus steam tunnel system. A 100-foot diameter oil tank is buried below Jefferson Road, providing back up heating oil for the power plant every winter and fuel for the emergency generators. The campus subsurface site assessment report states that "there was no practical way to relocate the oil tank or span it structurally" and that it is essential to campus operations. An associated oil

containment tank is located to the south of the main tank and a large spill containment zone on top of the 100-foot tank is required by code.

Utilities such as water, sewer and gas typically run below Stevens Way, Jefferson Road and Mason Road. Most of the power and data is supplied through the tunnel system, however, there is some direct buried major electrical conduit in the study area.

Site Utilities



2. Site Vicinity - Character

Vicinity Character

The character of the study area changes as you move from east to west across the site. At Stevens Way, the major north/south access for the vicinity, a series of green spaces exist along a tree lined street. Further east, at Jefferson Road, there is a high density of development utilitarian in nature because of the existence of the utility plant and adjacent engineering shops and testing yards. At the eastern

most edge of the site exists a heavily wooded area, a required set back along the Burke Gilman Trail, that serves as a separation zone from Montlake Boulevard below. This heavily wooded zone wraps the corner at the Rainier Vista edge of the study area, providing a landscape buffer to the view corridor.

Vicinity Photos



Stevens Way



Burke Gilman Trail



Jefferson Road



Hec Ed Bridge

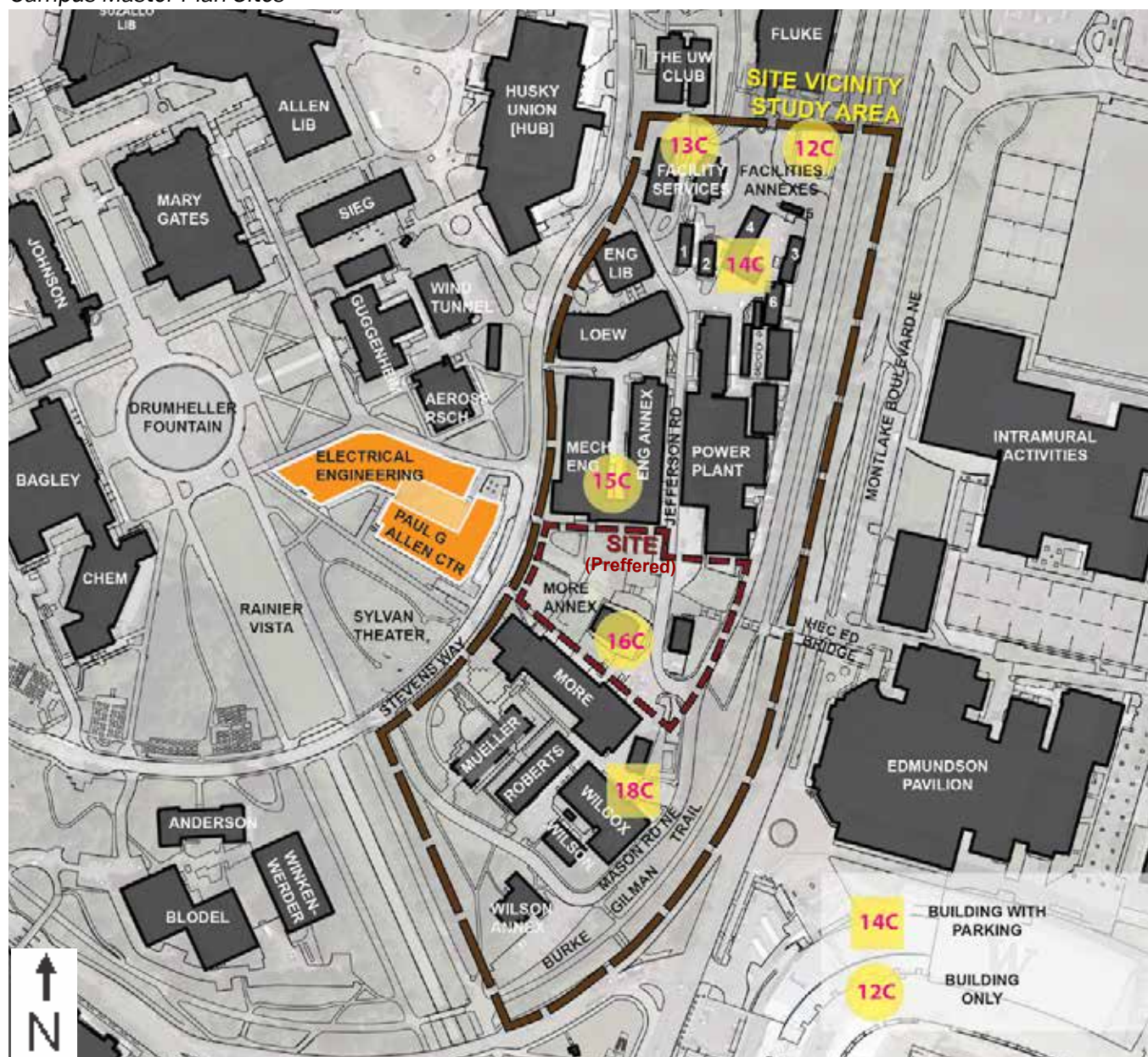
2. Site Vicinity

Maximum Building Assessment

The Campus Master Plan, completed in January 2003, projects a maximum increase in the available gross square footage of approximately 1.1 million gross square feet on 6 independent sites within the study area. This is achieved largely through demolition of existing buildings and replacement to the maximum allowable building height.

The diagram below illustrates the location of these 6 sites and the table on the following page indicates the approximate maximum new area on each site, as well as the amount of area that would be demolished under this scenario, imagined for analytical purposes only.

Campus Master Plan Sites



2. Site Vicinity

2003 Campus Master Plan Preliminary Square Footage Estimates

Site (description)	Max. Allowable Height		Max. Envel. Est'd	Demo'd SF	General Use
	Feet	Est'd Floors			
12C (South of Fluke Hall)	105	8	96,800		A
13C (Adjacent Faculty Center)	105	8	17,600		A
14C (Physical Plant Offices)	105	8	360,000	44,756	A/T
15C (Eng. Annex)	105	8	303,200	125,896	A
16C (Nuclear Reactor, undergrnd.)	65	5	100,000	6,677	A
18C (Rain. Vista/Robts. Hall)	65	5	241,000	50,328	A
Vicinity Wide Total Available Sites			1,118,600	227,657	

General Use: A=Academic T=Transportation

3. Site Analysis - Site Identification

The UW engaged in a rigorous site selection analysis during the course of two separate studies: UW CSE II Site Identification Report and UW More Hall Annex Site Development Assessment. The CSE II Site Identification Report evaluated all available sites in the UW Central Campus and concluded the analysis with the subject site as the preferred alternative. The More Hall Annex (MHA) Site Development Assessment analyzed the site development capacity of the preferred site as well as MHA relocation options. This document examines the feasibility of siting the second CSE building at the preferred alternative.

3. Site Analysis - Constraints

Site Constraints and Opportunities

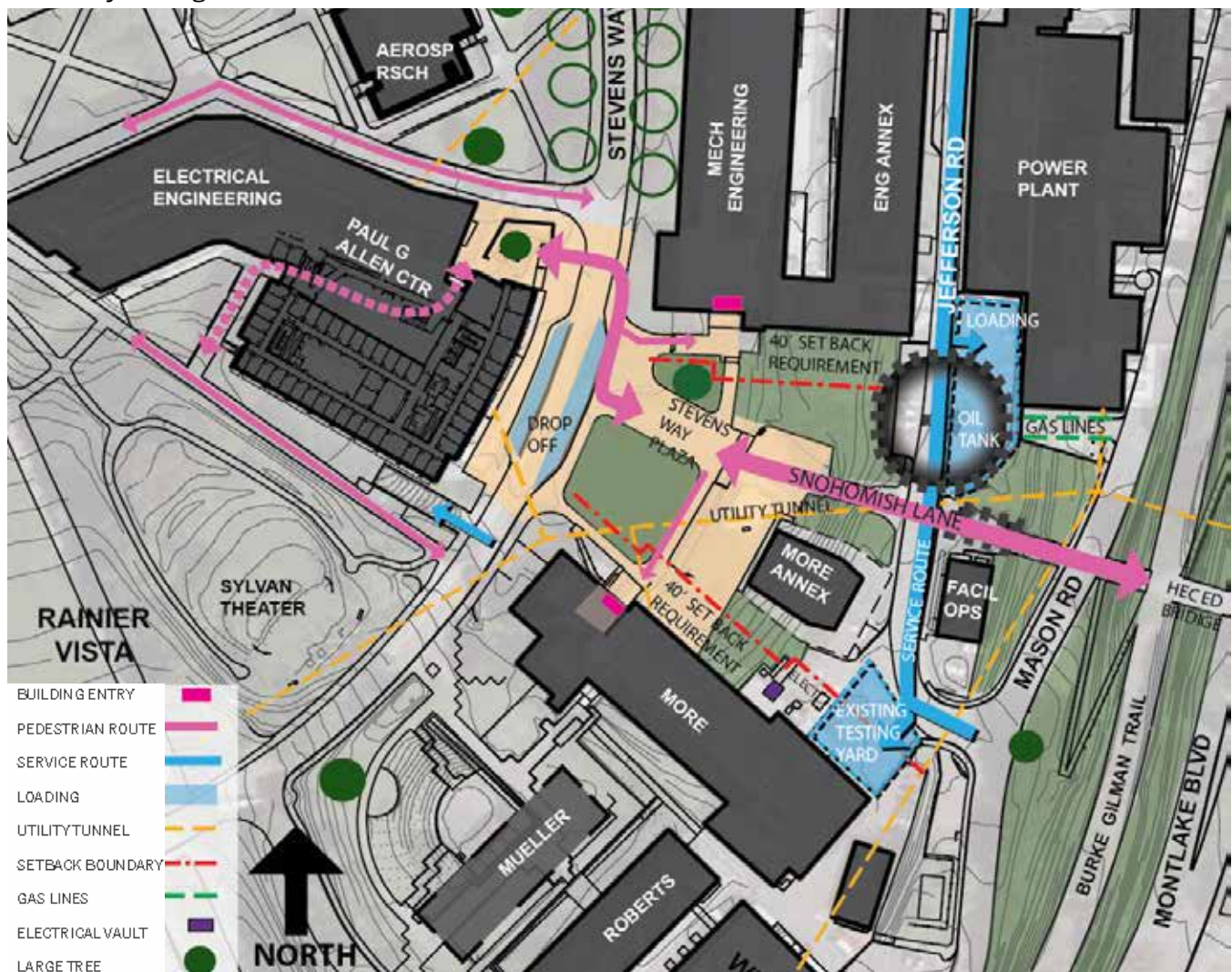
Analysis of existing site conditions on the preferred site provides the framework for establishing the maximum development capacity of this location. This analysis has led to an understanding of multiple constraints and opportunities that significantly impact the development of the site.

The site slopes steeply from Stevens Way, dropping 35 feet to Mason Road. Portions of the site are vegetated, including the presence of moderately mature trees. There is a level open space at the elevation of Stevens Way that serves as a significant transition

space for pedestrian traffic along Snohomish Lane to the main campus. There is an existing modular facilities operations building on the site as well as the More Hall Annex, a decommissioned former nuclear reactor.

The existence of a 100 foot diameter oil tank and associated spill containment zone at Jefferson Road is a major constraint to development on the north edge of the site. In addition, the campus pedestrian route and view corridor along Snohomish Lane need to be preserved as well as a large tree located south of Mechanical engineering.

Site Analysis Diagram



3. Site Analysis - Constraints

The major gas lines that feed the power plant occur above grade between the oil tank and Mason Road.

Because of these existing conditions, the footprint of a building on this site must be located to the south of Snohomish Lane. In the preferred scheme the More Hall Annex and Plant Operations Annex 7 Building located in this area would need to be demolished to provide a sufficient building area. A more detailed discussion on the More Hall Annex building would need to take place to address possible mitigation strategies to any adverse action affecting More Hall Annex.

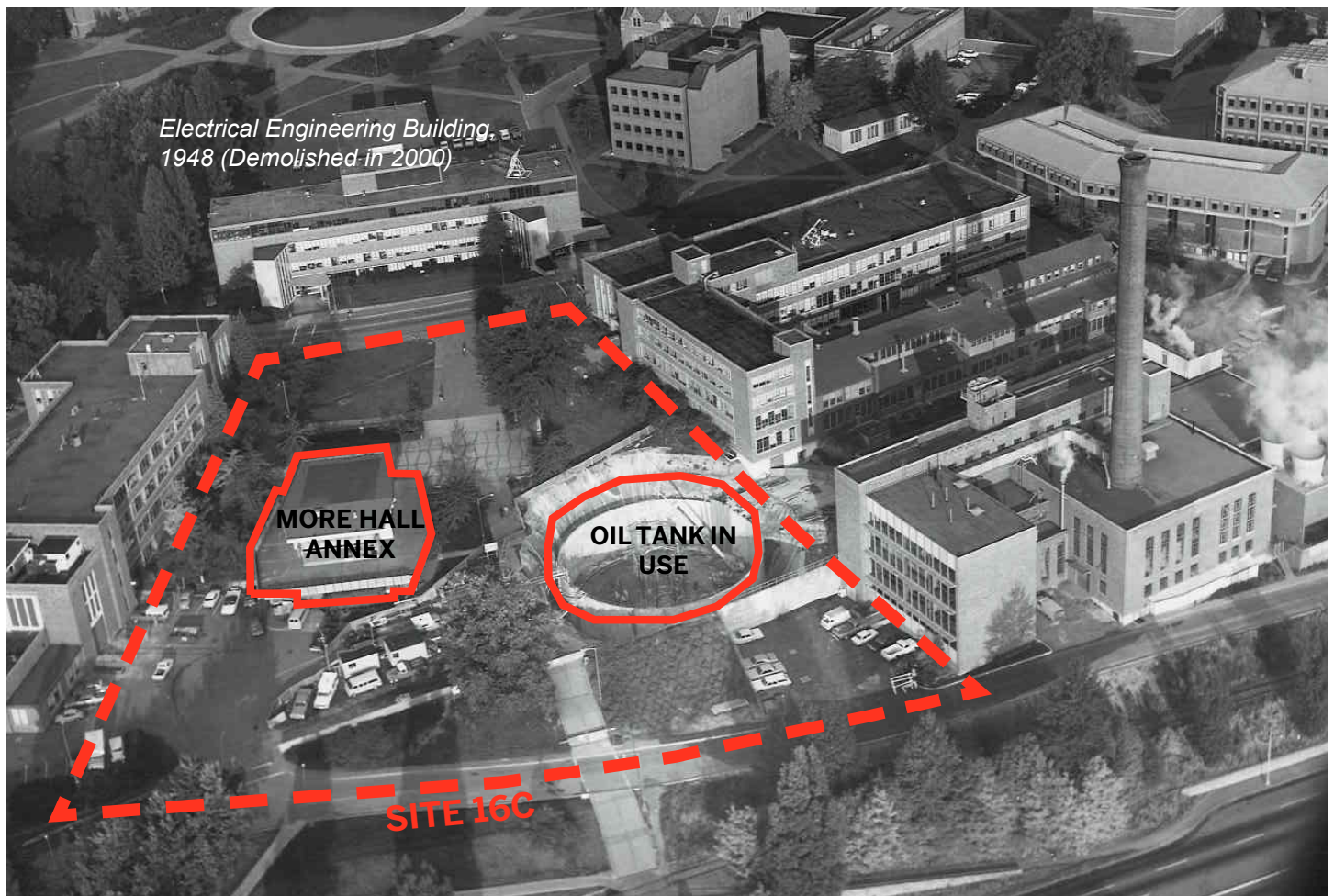


Photo From East: Major Site Constraints

3. Site Analysis-Opportunities

Site Opportunities

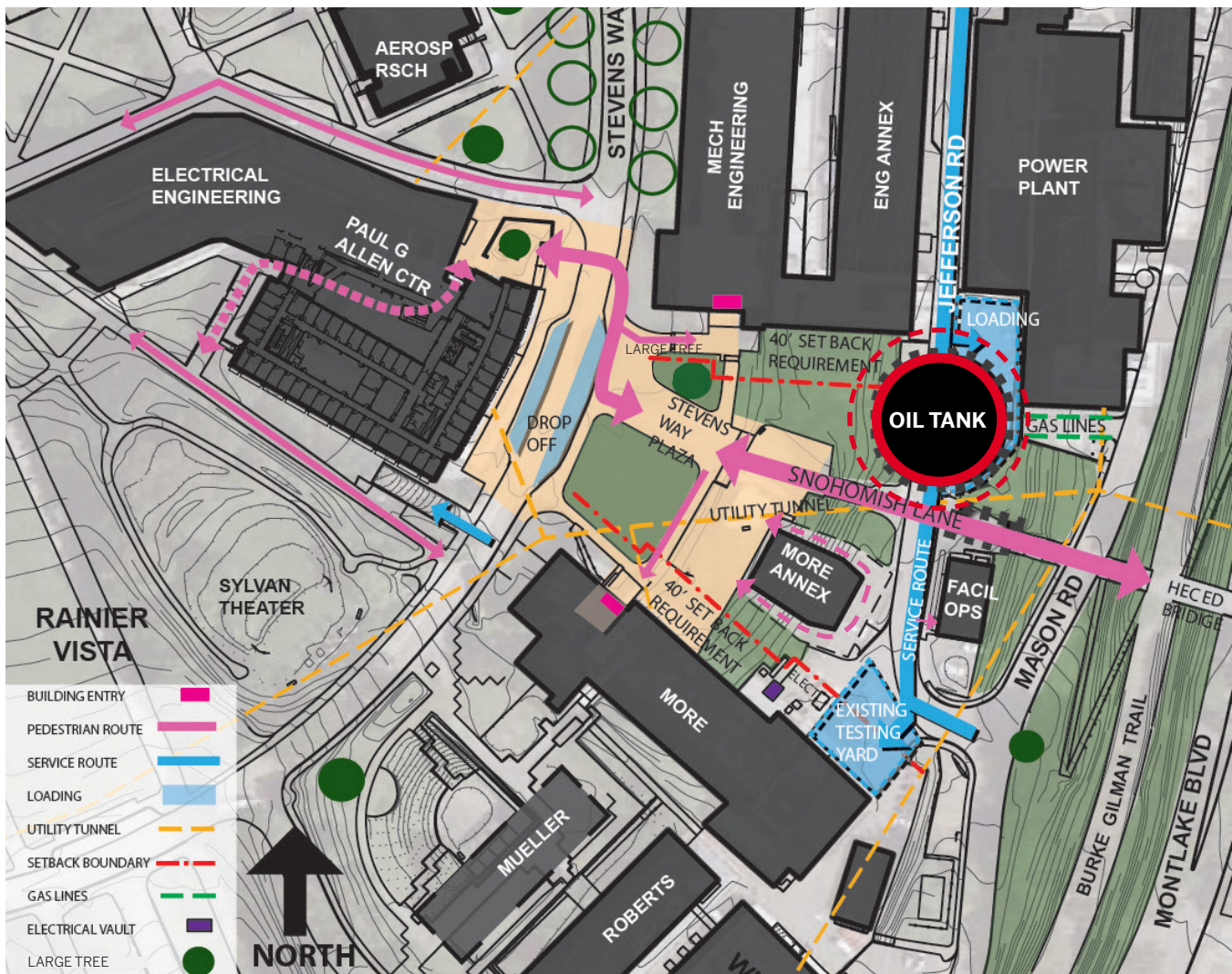
Campus circulation paths and multiple building entries converge where the preferred project site intersects Stevens Way. This provides a unique opportunity to create a “mixing zone” that develops a sense of an outdoor community space that links the CSE expansion, Mechanical Engineering and More Hall to the existing Allen Center.

Development of Snohomish Lane, the existing campus pedestrian connection from the center of campus to the athletic facilities presents an opportunity to improve accessible access and to enhance a significant campus link. Views of Lake Washington and beyond will be enhanced with slight realignment of the Snohomish Lane view corridor, providing additional views from the level of Jefferson Road.

The steepness of the site allows a building to be sited so that its lower level(s) have access to daylight. The Stevens Way building entry level can extend over Jefferson Road with enough clearance for passenger and service vehicles. Loading dock facilities can be accessed from Jefferson Road. Structure, exit stairs and bicycle parking can be accommodated in the area between Jefferson and Mason Roads.

Minimum setbacks are required to adjacent buildings (40') and the Burke Gilman Trail (20'). Access to a major service and testing yard serving More Hall needs to be maintained or relocated. The existing utility tunnel below the site is approximately 17 to 20 feet below grade and may restrict the depth of the building to a single story below grade.

Site Influences



3. Site Analysis

More Hall Annex

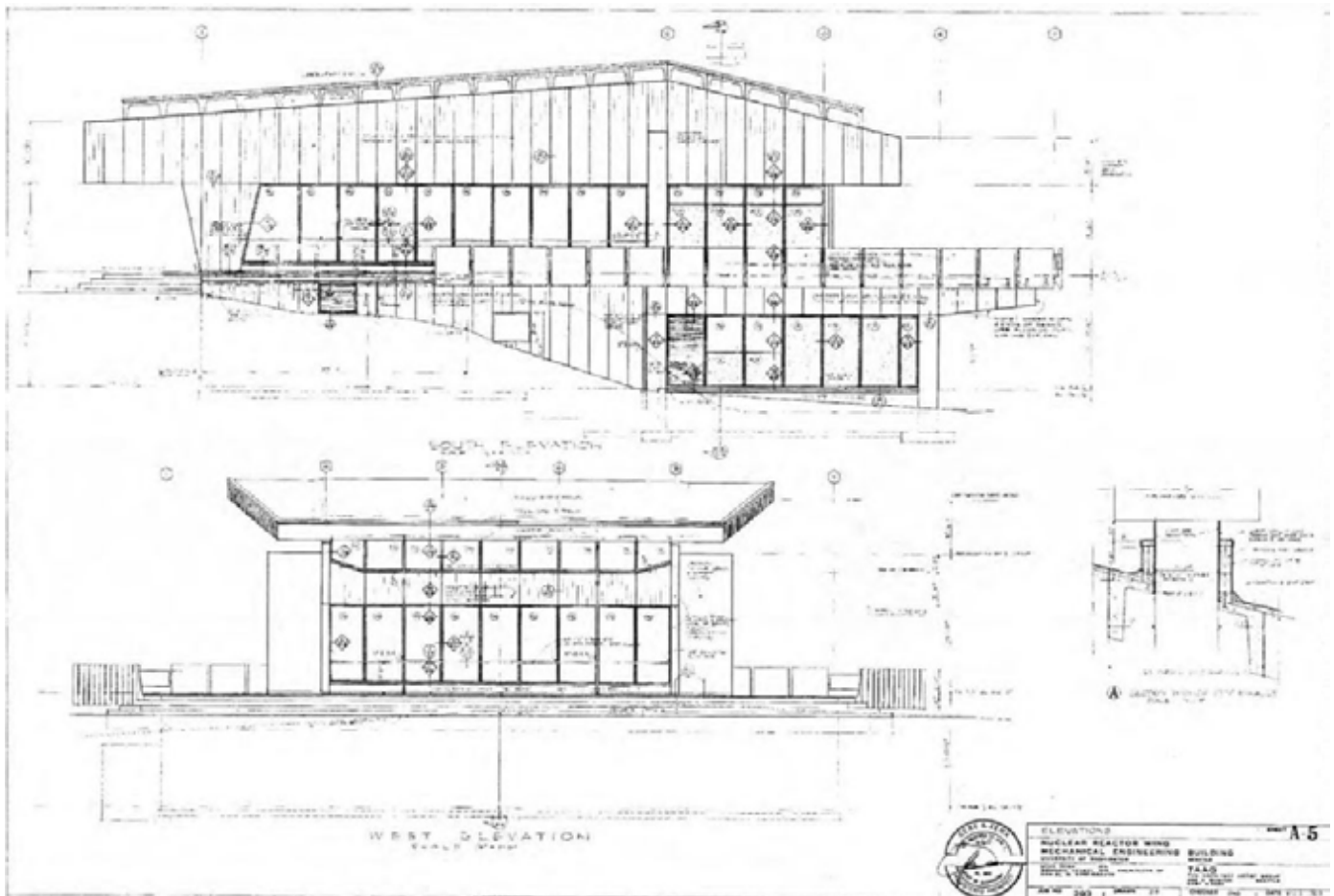
The preferred site for the second CSE building contains the More Hall Annex, originally designed to house a teaching nuclear reactor. In part, the building's historic significance is based on its "connection to the broad patterns of the development of nuclear energy", as identified by the National Register of Historic Places. More Hall Annex is on the Washington Heritage Register and the National Register of Historic Places.

Designed by Wendell Lovett, Gena Zema and Daniel Streissguth, all UW Architecture Faculty, it is a modern building and is intended to stand apart from the surrounding brick buildings with a large entry plaza,

expressed concrete structure and glass observation area. The engineering programs no longer require this type of facility and it was decommissioned in 1988 and has remained unoccupied since that time.

More Hall Annex Building Elevations

Wendell Lovett, Daniel Streissguth and Gene Zema



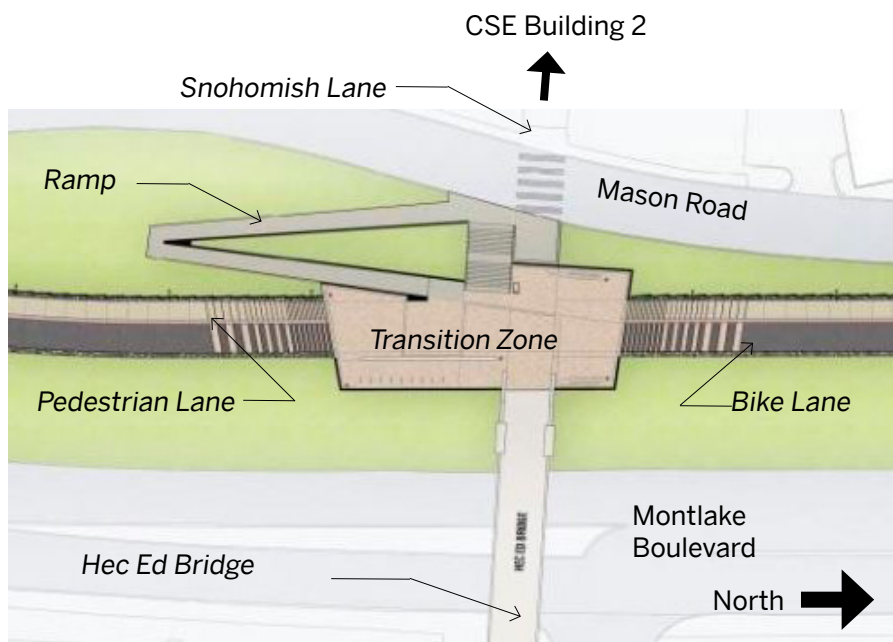
3. Site Analysis-Related Plans

Concurrent Campus Planning Efforts

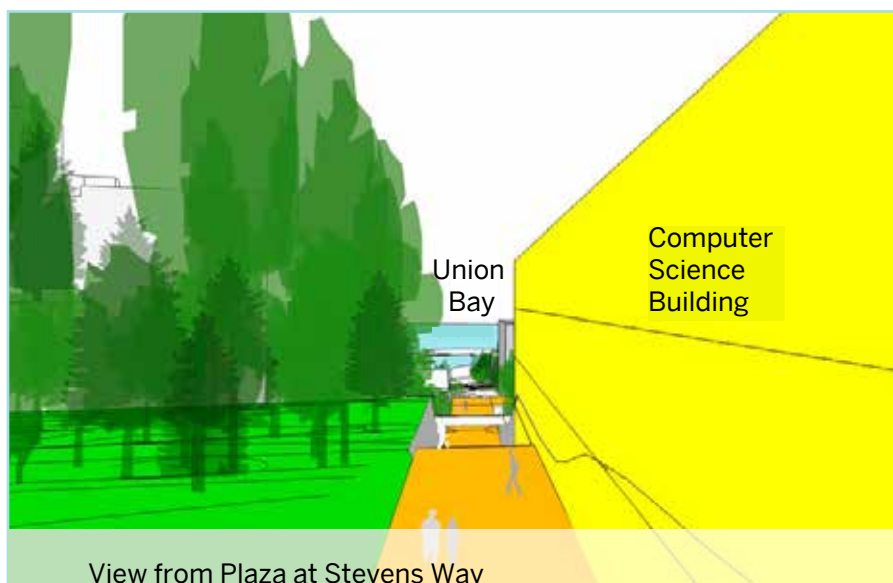
The current work on the Landscape Framework Plan and Burke Gilman Trail Corridor Design have both been considered in the site and concept design for the new CSE building.

The Burke Gilman Trail design plan would create a zone of transition for Snohomish Lane where the Hec Ed Bridge meets the trail and continues up the hill onto the campus. Accessible access from the Bridge to Mason Road should be studied further.

The Landscape Framework Plan is exploring a concept for the Hec Ed Bridge across Montlake Blvd. to be replaced and realigned with a view corridor to Lake Washington between the Hec Edmundson Pavilion and the Graves Building. This view corridor is evident up to the level of Jefferson Street. The realignment of the bridge would create an opportunity to fully integrate the pedestrian path with the proposed new CSE building.



Burke Gilman Trail Corridor Design by PLACE



Concept for Snohomish /Lake Washington View Corridor at Pedestrian Connection Design by MVVA

3. Site Analysis-Site Capacity

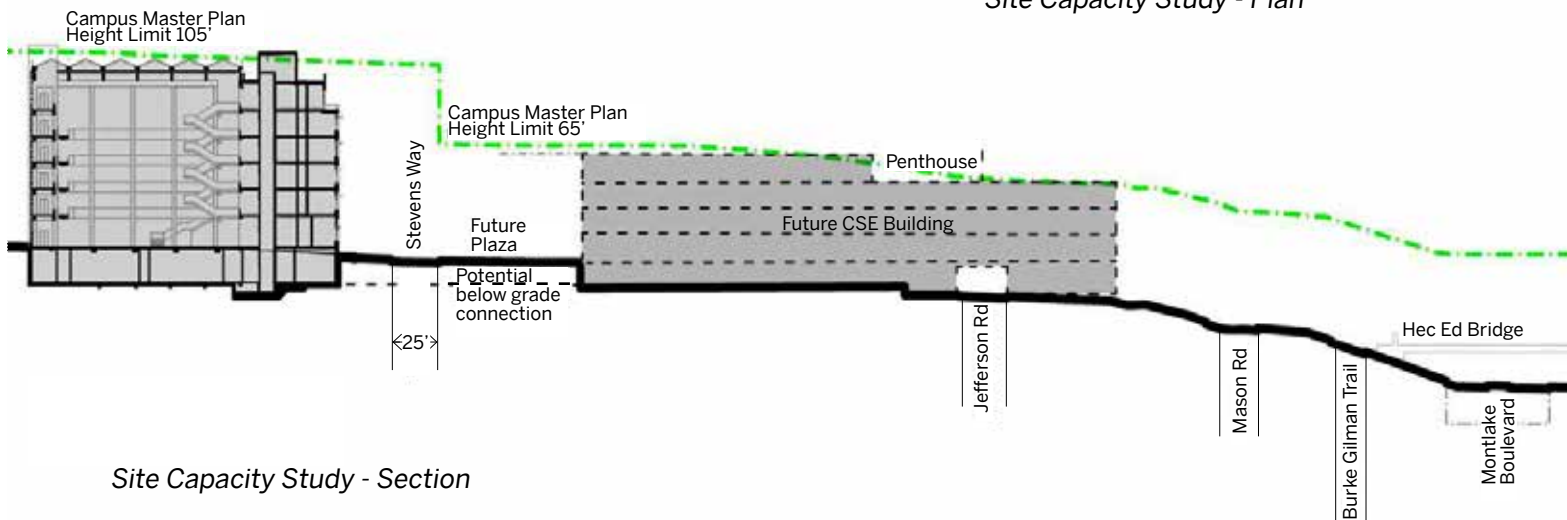
Site Capacity

An initial review of a footprint and section appropriate for the preferred site indicates that the maximum development capacity is approximately 132,500 GSF. The foot print is based on the idea that the upper levels of the building could span over Jefferson Road and the lowest level could be partially buried near Stevens Way. The top level of the building is a partial story in order to respond to the height limitation of 65' defined by the Campus Master Plan. A penthouse for air handling

equipment could be included to take advantage of an allowed exception to the height limit. The lowest level of the building has the potential to be linked to the existing Allen Center by way of a tunnel under Stevens Way should that be desired. The maximum site capacity identified by the Campus Master Plan for this site (#16C) is 100,000 GSF at 5 levels, but does not include a basement. The envisioned site expands beyond what the CMP site anticipated by spanning Jefferson Road.



Site Capacity Study - Plan

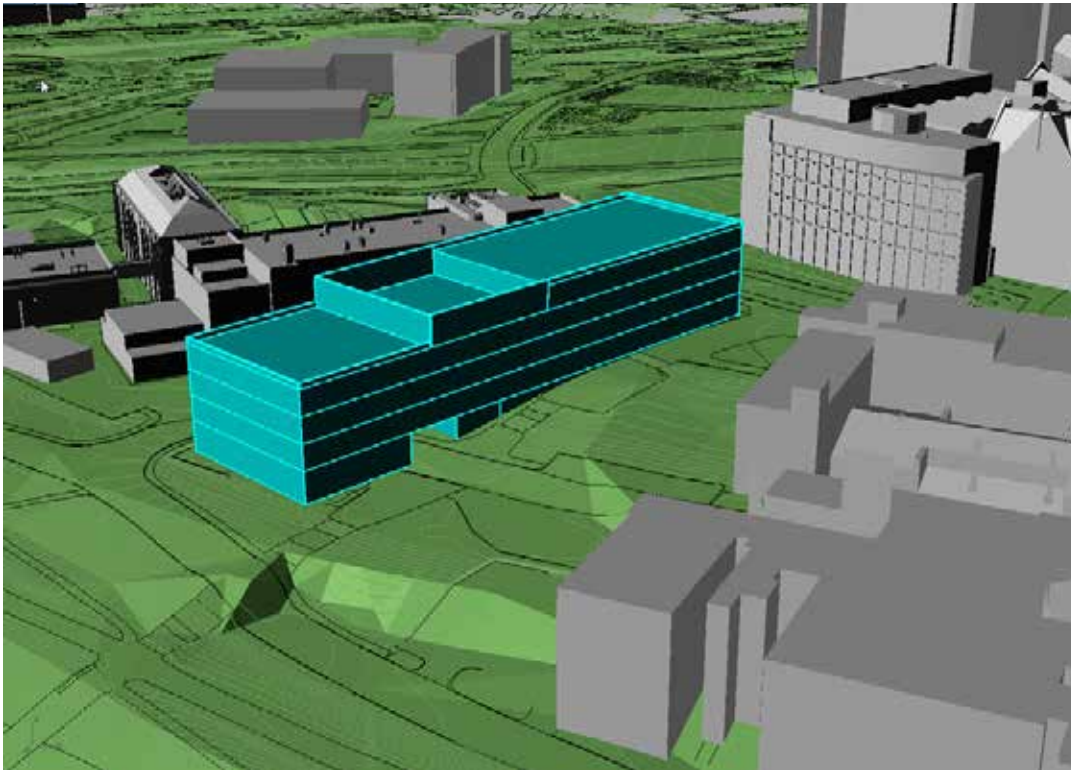


Site Capacity Study - Section

3. Site Analysis-Max Building Area

Maximum Building Area

Basement	26,000 GSF
Level 1	28,500 GSF
Level 2	28,500 GSF
Level 3	28,500 GSF
Level 4	14,000 GSF
Penthouse	7,000 GSF
TOTAL GSF	132,500 GSF



Site Capacity Study - Massing

Site Program

Detailed program requirements for this site include;

- a minimum set back of 40 feet from surrounding buildings to allow unprotected openings per the 2012 International Building Code,
- a 20 foot set back from the Burke Gilman Trail, as required by the Campus Master Plan,
- a minimum of 16'-6" road clearance (Per Seattle DOT requirements) over Jefferson and Mason Roads,
- replacement of 55 existing bike parking (per UW transportation) spaces located along Snohomish Lane,
- Requirement for new short term covered bicycle parking spaces and long term secure bicycle parking spaces shall be based on expected occupancy and are to be determined
- ADA campus access through the site must be developed.
- Clearances around the existing oil tank and containment zone must be maintained.
- Set back from Stevens Way to allow visibility of and access to More Hall entry and Mechanical Engineering entry.

4. Program Space

Goals

The goal of the programming process was to identify the space needs of the department for the next 10 years, including the types of space required and the qualities of the space desired.

The programming process began with an initial vision statement from Hank Levy, Professor and Chair of the Computer Science and Engineering department. The LMN team also participated in an interactive retreat for all CSE faculty to discuss the project and explore future requirements. This resulted in a clearer picture of both the deficiencies as well as the successes of the existing CSE space. Goals for the project were established and opportunities to enhance existing programs were identified.

Initial goals for space in a new building include the following:

1. Interdisciplinary and Collaborative Space

- Over the last decade, a key change for the department has been in the type and scale of research carried out by the department. The work is increasingly interdisciplinary, experimental, and large scale. CSE is engaged in major research efforts in embedded sensors for health care and energy savings, in synthetic biology, in games for education and scientific discovery, in technology for the developing world, in data-driven science across the university, in large mobile robots, and in human collaboration with other departments at UW and with local industry. Interdisciplinary and collaborative spaces are crucial for the department's future.

2. Instructional Spaces

- A 200 seat lecture space is needed for large department classes, colloquia and events. The desire is for an intimate space with fewer rows and a low rake. The room should include a stage area and high quality data projection. A small lobby area for pre- or post-talk gatherings is also desired.
- 100 seat classrooms for undergraduate classes are needed.
- Seminar rooms and small classrooms for 40 people are needed.

Allen Center Student Study Area



3. Undergraduate Focus

- Undergraduate teaching/open computer labs with access to natural daylight are desired to improve the quality of undergraduate facilities.
- An undergraduate commons that can be used as a study, work, and student-interaction area should be provided to give the undergraduates a sense of ownership and belonging.
- Undergraduate advising could be separated from graduate advising and moved to the new building to provide support for undergraduates and a reception presence at the entry to the new building.
- Teaching Assistant offices are needed and should be located near undergraduate study space.

4. Event Space/Career Center

- The need for a large event space for technical meetings, industrial career fairs, and presentations from industry collaborators and local high-tech companies with associated kitchen and storage space was identified. Department faculty, student, and staff meetings are all too large, or soon will be, to hold meetings in the current space, Gates commons. The events space should be designed to accommodate all these types of meetings, and include a moveable wall to accommodate multiple large meetings.
- Several small rooms are needed for student job interviews.

4. Program Space

5. Vacate Seig Hall

- The department currently occupies about 8,800 ASF in Seig Hall, used for teaching the capstone computer animation courses, housing the Center for Game Science, providing lab space for graphics courses, and providing generic office and research space on an as-needed basis. These activities need modern research space and better integration with the rest of the CSE teaching and research programs. Providing space in the new building will create an opportunity to meet the needs of these vital and expanding programs. The vacated space will be reassigned to another department once the new building opens.

6. New Faculty

- Provide office space for an additional 30 full time faculty and associated postdocs, graduate students, researchers, staff and non-department academic and industrial collaborators.

7. Machine Room

- A machine room with sufficient power/cooling for racks of dense computer and storage servers. CSE faculty, students and staff experiment with server design, create prototypes, and manipulate hardware in various ways to deploy and experiment with future types of computing systems that cannot be imagined today. Despite the increased use of cloud computing by CSE and others, the need still exists for state-of-the-art compute clusters in-house that can be fully accessed and physically controlled.

8. Shop

- A shop for the manufacture and manipulation of physical objects is desired. The shop would support items such as 3D printers, laser cutters, drill presses, milling machines, and common tools.

9. Connection to Existing Facility

- A crucial consideration is that the new building be a logical extension and within close proximity to the existing Allen Center, which will remain the center of the department. The goal is not to replicate but to enhance the existing Allen Center space with new spaces that are either insufficient or non-existent in the Allen Center, in light of growth and new research and educational initiatives. The Allen Center Atrium and Gates Commons will continue to be the principal social/technical gathering spaces for the department, and the main administrative offices will remain on the first floor of the Allen Center.

10. Quality of Space

- Like the Allen Center, the new space should be more of an “office building” than a typical science research lab. The new space should be designed to be compatible with and comparable to the Allen Center in terms of quality, office size, availability of natural daylight, etc. It should not create a cultural challenge for department space assignment and the two buildings should be considered equally desirable. To the extent possible, the new building should create a seamless and virtual extension of the current building.
- Lab space should be designed to provide future flexibility for evolving programs.

11. A Securable Design.

- It should be possible to separately secure floors or to separate “public” spaces (like classrooms) from department research spaces.

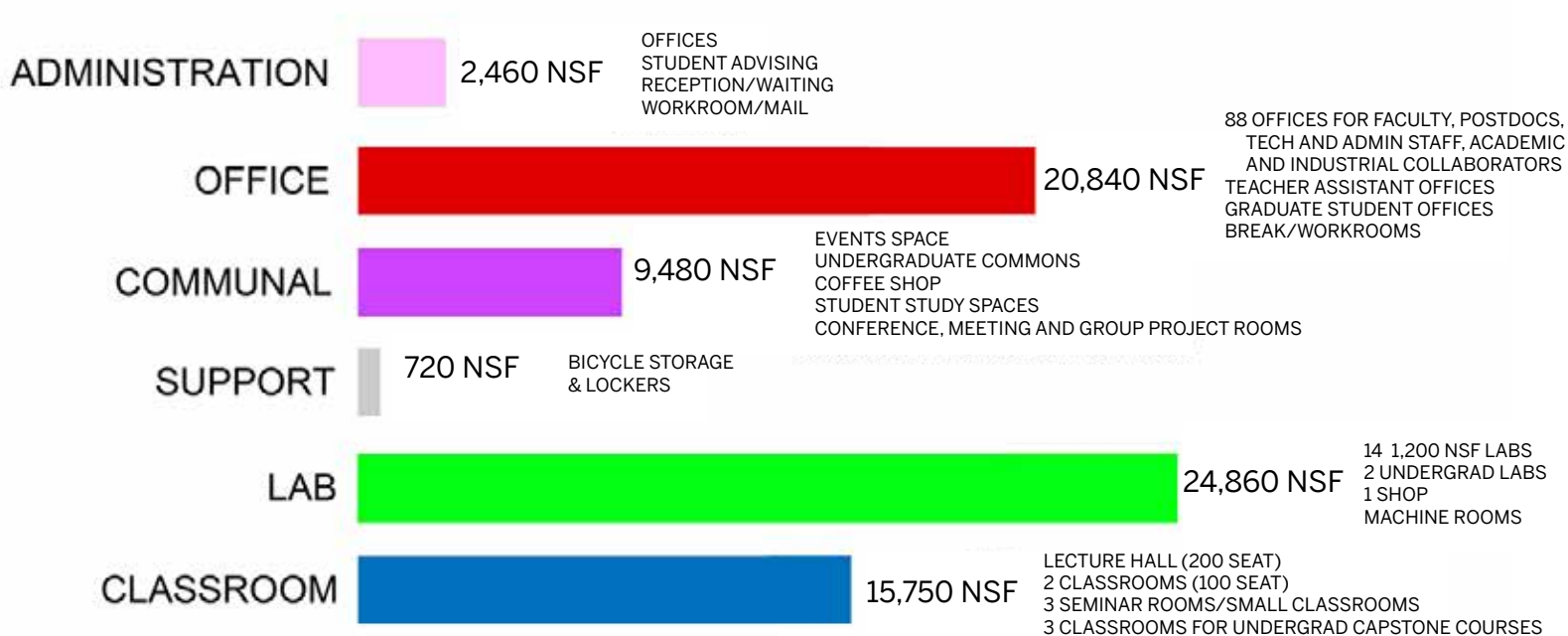
4. Program-Space Types

Preliminary Space List

Faculty and staff in key departments and programs were interviewed in order to get an idea of the different types and uses of spaces they currently have or will require. A detailed room list was developed from this input. Each of the types of program space maintain a balance of area between classrooms, labs, office and support spaces. The program was then simplified to reflect generic space types that could be easily adjusted to suit the needs of an evolving program.

A room list is included on the following page and a detailed version of the room list is provided in the appendix of this report.

Program Area Summary



4. Program-Simplified Room List

Preliminary Room List

Progr No.	Space	No. of Stations	Sq. Ft./ Station	Sq. Ft./ Room	No. of Rms	Total Sq. Ft.
CLASSROOM SPACE						
1.10	Lecture Hall, tiered (control & sound locks)	200	18	3,600	1	3,950
1.11	Prefunction/Lobby for lecture hall	200	7	1,400	1	1,400
1.20	Classroom, 100 seat	100	25	2,500	2	5,000
1.31	Storage for Large Classrooms	1	150	150	1	150
1.40	Seminar, 40 person	40	25	1,000	3	3,000
1.80	Capstone Work Room	30	25	750	3	2,250
Subtotal General Instruction		571			11	15,750
LAB SPACE						
2.10	Lab space (general)	20	60	1,200	11	13,200
2.11	Lab Space (High Bay)	20	60	1,200	3	3,600
2.12	Support (editing, testing, storage, etc)				1	1,060
1.70	Open Undergrad Lab	60	30	1,800	2	3,600
5.40	Machine Room	1	1,100	1,100	1	1,100
5.41	Machine Room, Small	1	400	400	2	800
5.50	Shop				1	1,500
Subtotal Workrooms					21	24,860
COMMUNAL						
4.10	Events Space	250	15	3,750	1	3,750
4.11	Breakout/ Interview Rooms	8	15	120	4	480
4.12	Kitchen/Prep/Storage					800
5.10	Coffee Shop				1	660
5.20	Student Study Spaces					840
5.30	Undergraduate Commons	80	15	1,200	1	1,200
6.24	Conference Room (S & M)				5	1,750
Subtotal Events Center						9,480
SUPPORT SPACE						
5.51	Bicycle Storage & Lockers					720
Subtotal Support Space						720
OFFICE SPACE						
6.10	Office	1	160	160	88	14,080
6.14	Graduate Student Offices					3,720
6.17	TA Consulting Offices	1	120	120	10	1,200
6.20	Break/Work/Print/Mail/Storage					1,840
Subtotal Office Space					98	20,840
ADMINISTRATION						
6.50	Office/Reception/Waiting/Support					2,460
Subtotal Administration						2,460
TOTAL ASSIGNABLE AREA						74,110
BUILDING GROSS AREA		Assume Efficiency:	57%	130,018		
NON-ASSIGNABLE SPACES						
	Mechanical Rooms and Shafts			5.75%		7,476
	Electrical			1.00%		1,300
	Telecommunications/Data			0.90%		1,170
	Toilet Rooms			2.40%		3,120
	Janitors Closets & Storage			0.40%		520
	Central Trash & Recycle Collection			0.40%		520
	Recycle Stations			0.15%		195
	Circulation and Lobby			23.00%		29,904
	Interior/Exterior Walls & Structure			9.00%		11,702
Subtotal Non-Assignable				43.00%		55,908

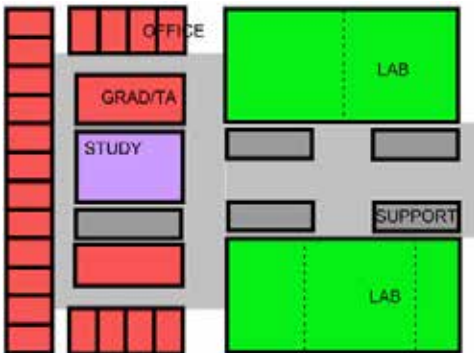
4. Program-Lab/Office Relationships

Lab-Office Relationships

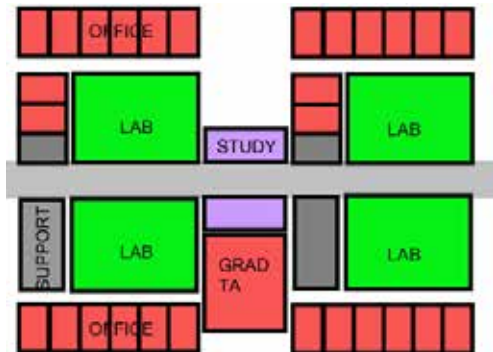
The relationship of office space to lab space is of critical importance to the research groups. Three versions of this relationship were reviewed and it was agreed that the “neighborhood” organization was most desirable.

Lab Security

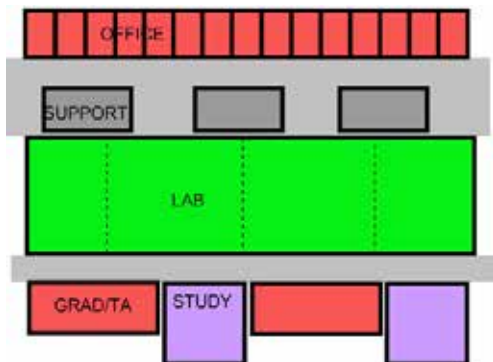
Models for creating a secure environment were studied and it was desired that the option to secure a floor be included at this stage of development.



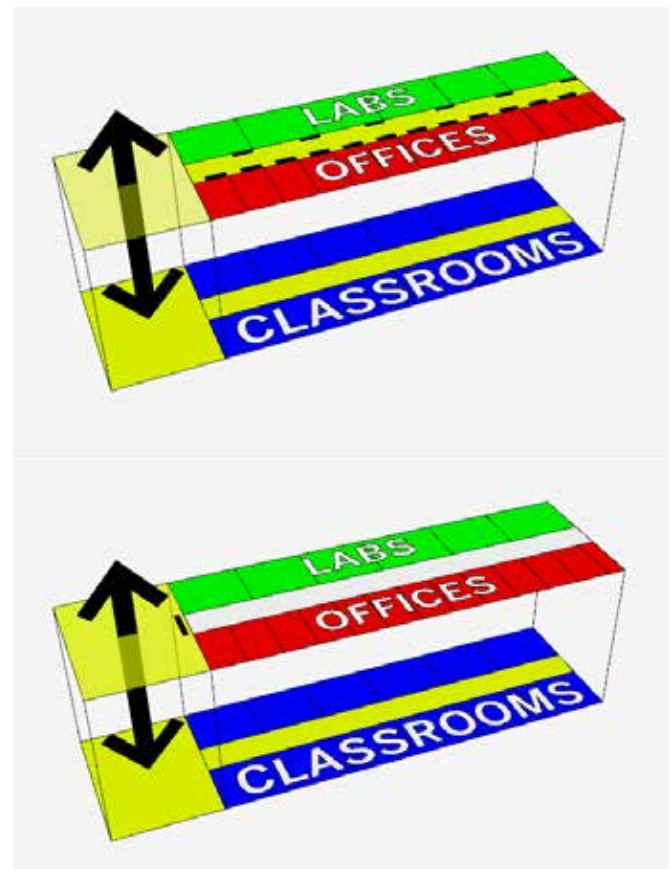
Cloister



Cluster



Neighborhood



4. Program-Program Space by Floor

Stacking Diagram

The relationship of program spaces by building floor level was studied in the form of stacking diagrams. A preferred diagram is presented below.

The large classrooms, event space and high bay labs are located at the entry level and a partially below grade level, in order to take advantage of a potential for higher floor to floor dimensions. Administrative areas are located at the Stevens Way entry level to provide a clear main entry reception area. Public access to the events center and classrooms are easily provided from the main entry point along Steven Way.

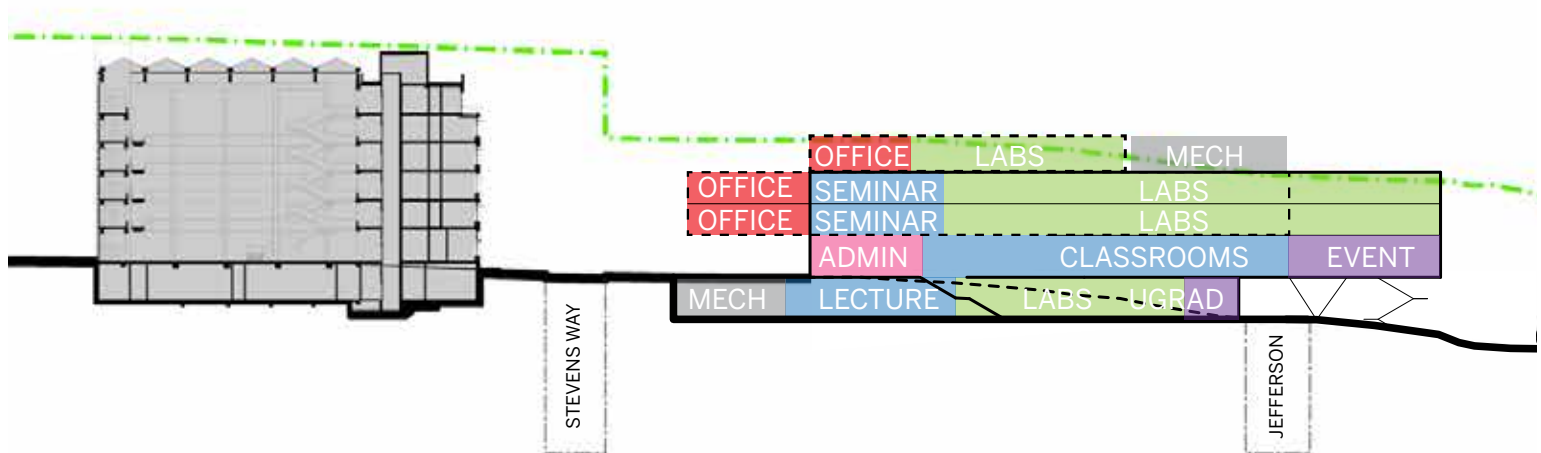
The below grade level takes advantage of the sloping site to provide entry from Jefferson and access to

daylight. Loading dock and building operation facilities can also be accessed from Jefferson. This level roughly corresponds to the basement level of the existing Allen Center, creating a opportunity to connect the two buildings under Stevens Way.

Labs and office space are located on the upper floors, out of the flow of campus traffic and taking advantage of daylight and views. Seminar Classrooms are intended to serve the research programs and are co-located with the labs.

Mechanical equipment on the roof will be minimized to reduce the impact on views from the upper floors of the Paul Allen Center.

Site Section



5. Building Concept A

Initial development

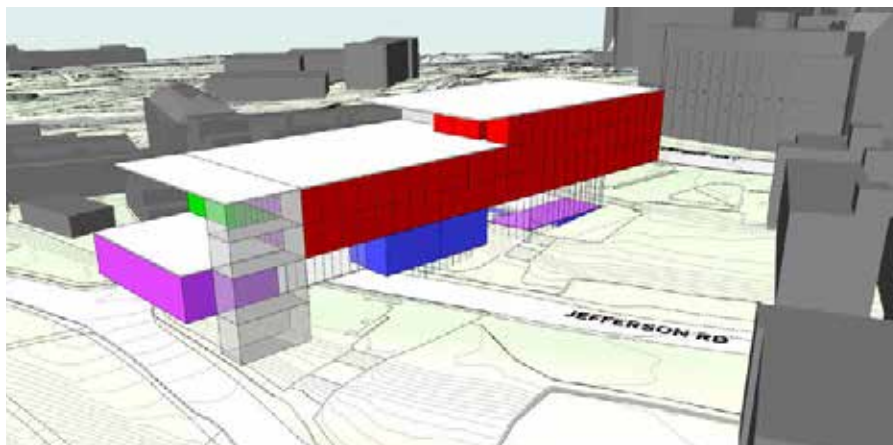
The combination of the program on the preferred site resulted in the three initial building diagrams presented here.

Scheme A

Scheme A is a 5-story scheme that holds the north and south edges of the building footprint tight and projects over the ground floor at the Stevens Way Plaza and Jefferson Road in order to maximize the building area. The scheme lines the north and south edges of the building with lab and office space to maximize daylight in spaces that are occupied for long hours. Communal space occurs in the center of the plan with openings between floors to link the floor levels together and provide daylight from above. It is challenging to provide enough exterior perimeter for daylight to the interior spaces in this scheme.



Scheme A Site Plan



Scheme A Perspective View



Scheme A Floor Plans

5. Building Concept B

Scheme B

Scheme B has the same basic plan configuration as A, but opens the center of the building by angling the north edge to be parallel with the pedestrian link. The offices are grouped in clusters at the perimeter of the building for access to daylight and views and allow interior communal spaces to open to the pedestrian link. In this scheme the upper floors span over Jefferson Road to the east to maximize building area. Office clusters and the events center project to the north providing opportunities for the building to interact with and provide covering over portions of the pedestrian link.



Scheme B Site Plan



Scheme B Perspective View



Scheme B Floor Plans

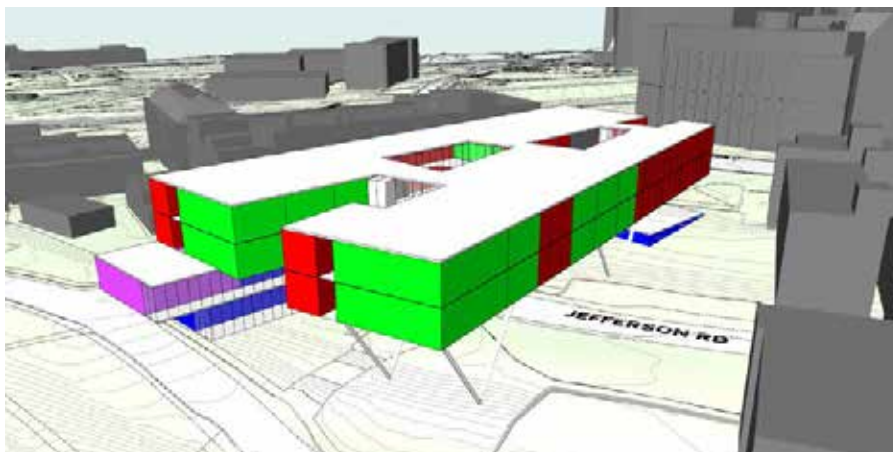
5. Building Concept C

Scheme C

Scheme C opens up further than B to the pedestrian link, spanning over, incorporating and engaging the pedestrian path underneath the building. The south bar of the building is grounded into the hillside and the north bar is expanded across the site to align parallel to a view corridor to Lake Washington. The expanded floor plate allows the program to be accommodated in 4 stories, eliminating the partial 5th floor of A and B. Large light wells and openings through the center of the building allow daylight to reach the ground plane as well as the interior spaces of the building. Lab space and office space is alternated along the edges of the building to create a fully integrated “neighborhood” relationship with opportunities for interaction between faculty of different areas of study and students. Views and access between labs, offices and student study spaces exist throughout the floor, creating a lively and interactive environment.



Scheme C Site Plan



Scheme C Perspective View



Scheme C Floor Plans

5. Building Concept-Preferred Scheme

Final Scheme

Scheme C was chosen for further development because it better integrates the heart of the CSE program on two floors, allowing interaction and collaboration to occur naturally through the daily activities in the building. It also more fully integrates the site program with the building, creating space for an accessible route along the campus pedestrian link.



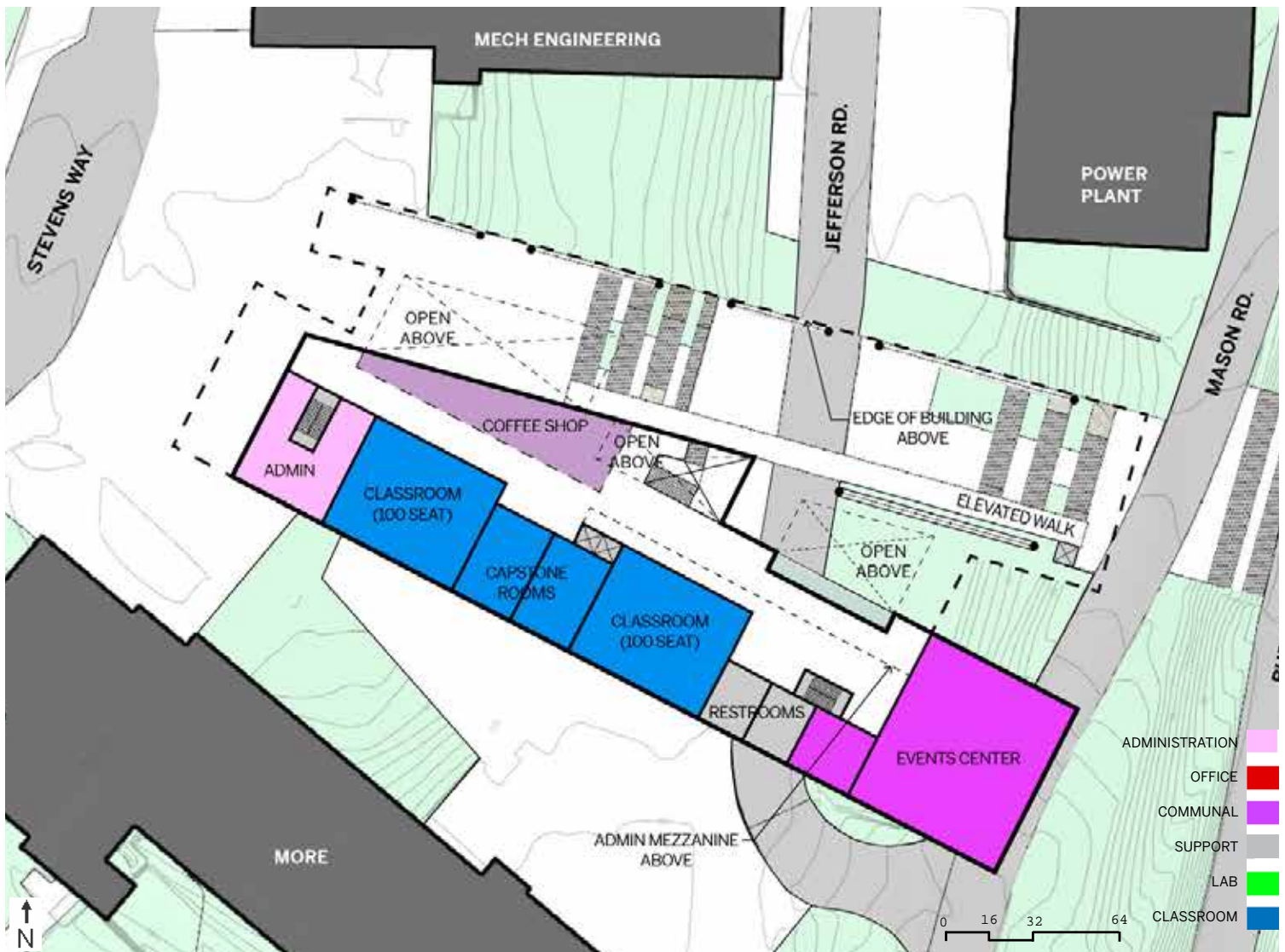
SITE PLAN

5. Building Concept-Preferred Scheme



GROUND LEVEL
27,865 GSF

5. Building Concept-Preferred Scheme



5. Building Concept-Preferred Scheme



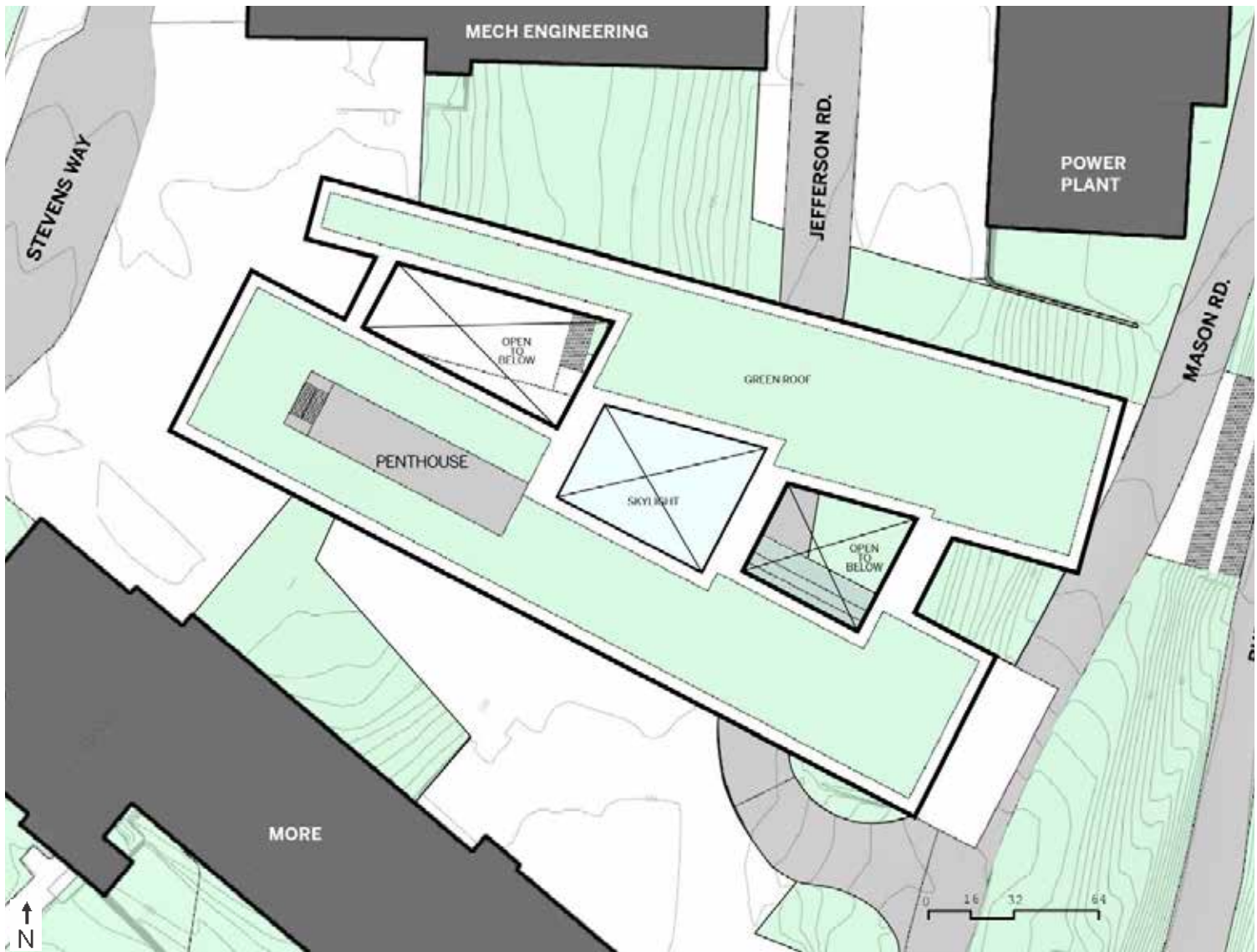
LEVEL 2
37,756 GSF

5. Building Concept-Preferred Scheme



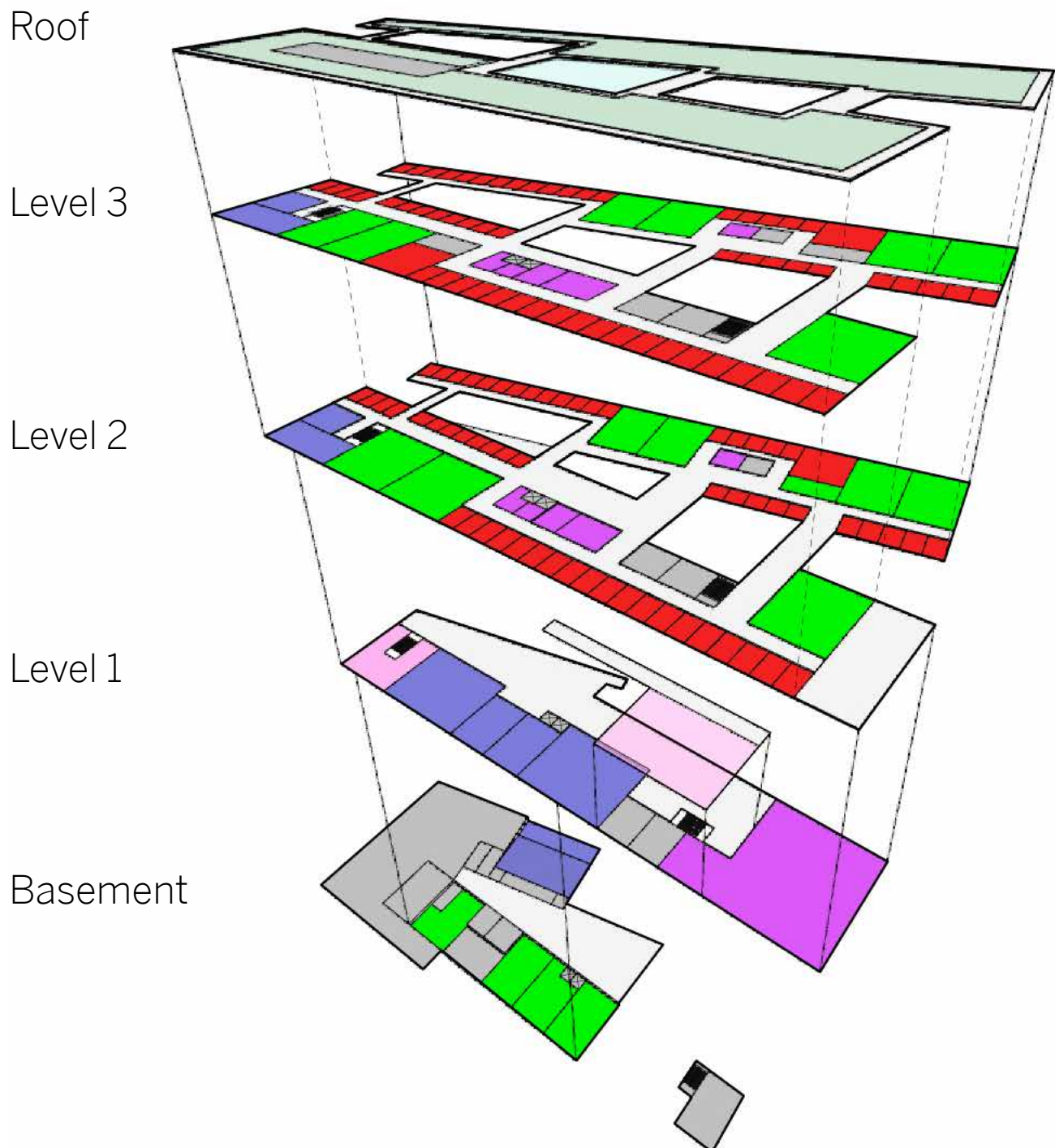
LEVEL 3
36,426 GSF

5. Building Concept-Preferred Scheme



ROOF
2,150 GSF

5. BuildingConcept-Preferred Scheme



6. Cost Estimate

Construction Cost

A preliminary construction cost estimate for a new CSE building was prepared by an independent professional cost estimator, The Robinson Company, based on the building concept design presented in this report. Construction duration of 22 months was assumed. The estimated construction cost is summarized by components below. This cost may be +/-%, given the very preliminary nature of the building concept

Facility Construction:

A10	Foundations	\$1,213,000
A20	Basement Construction	\$2,014,000
B10	Superstructure	\$5,812,000
B20	Exterior Closure	\$6,545,000
B30	Roofing	\$1,622,000
C10	Interior Construction	\$4,307,000
C20	Stairs	\$343,000
C30	Interior Finishes	\$3,623,000
D10	Conveying	\$668,000
D20	Plumbing Systems	\$1,565,000
D30	HVAC Systems	\$7,108,000
D40	Fire Protection Systems	\$717,000
D50	Electrical Systems	\$5,640,000
E10	Equipment (built in)	\$326,000
E20	Furnishings (built in)	\$1,248,000
G10	Site Preparation	\$800,000
G20	Site Improvements	\$2,318,000
	Total Direct Construction	\$45,869,000
	General Conditions (8.50%)	\$3,899,000
	Subtotal	\$49,768,000
	Estimating/Design Contingency (12.00%)	\$5,972,000
	Subtotal	\$55,740,000
	General Contractor Overhead & Profit (7.00%)	\$3,902,000
	Unescalated Total Construction Cost – Dec 2013	\$59,642,000
	Escalation to Midpoint Construction – Jul 2016 (11.25%)	\$6,709,000
	Escalated Total Construction Cost – Jul 2016	\$66,351,000

6. Cost Estimate

Project Cost

A factor of 1.52 is applied to the construction cost in order to establish a total project cost estimate. The multiplier was provided by the university's Capitol Projects Office, utilizing historic data to determine an average factor for new building project costs. This project cost factor accounts for "soft costs" associated with the project including Washington State sales tax, fees, furnishings, equipment, permits, testing and inspections, contingencies, management, and artwork. The following table escalates construction cost for each year in a five year period and then applies the 1.52 factor to calculate the estimated project cost for each year.

	Date of Construction Midpoint*	Escalation Factor per Year	Escalated Total Construction Cost	Escalated Total Project Cost (1.52 x Constr. Cost)
Escalated to	July 2016	4.5%	\$66,351,000	\$100,854,000
Escalated to	July 2017	4.5%	\$69,337,000	\$105,392,000
Escalated to	July 2018	3.5%	\$71,764,000	\$109,081,000
Escalated to	July 2019	3.0%	\$73,917,000	\$112,354,000
Escalated to	July 2020	3.0%	\$76,134,000	\$115,724,000

* Start of construction would be 11 months prior.

7. Appendix-Preliminary Room List

UW Computer Science & Engineering Expansion

Preliminary Room List

Progr No.	Space	Sieg Exist. Room #	Sieg Exist. Area	No. of Stations	Sq. Ft./ Station	Sq. Ft./ Room	No. of Rms	Total Sq. Ft.
GENERAL INSTRUCTION								
1.10	Lecture Hall, tiered			200	18	3,600	1	3,600
1.11	Prefunction/Lobby for lecture hall			200	7	1,400	1	1,400
1.12	Control Room for Lecture Hall			1	150	150	1	150
1.13	Sound Locks for Lecture Hall			1	100	100	2	200
1.20	Classroom, tiered			100	25	2,500	1	2,500
1.30	Classroom, flat floor			100	25	2,500	1	2,500
1.31	Storage for Large Classrooms			1	150	150	1	150
1.50	Seminar, 40-person			40	25	1,000	3	3,000
1.70	Open Undergrad Lab			60	30	1,800	2	3,600
1.80	Capstone Work Room	327	717	30	25	750	3	2,250
Subtotal General Instruction				733			16	19,350
WORKROOMS (RESEARCH LABS)								
Animation								
2.10	Animation Lab	329	878	20	60	1,200	1	1,200
2.11	Animation Class/Lab w/ stage	332	708	30	30	900	1	900
2.12	Animation Research Lab			5	60	300	1	300
2.13	Control Room			1	240	240	1	240
2.14	Sound Booth, Medium			5	40	200	1	200
2.15	Sound Booth, Small			2	50	100	1	100
2.16	Video Editing			2	80	160	1	160
2.17	Storage	332C	83	1	200	200	1	200
2.18	Art Room	332B	144	1	300	300	1	300
Center for Game Science								
2.20	Research Lab	324, 325	588,886	20	60	1,200	2	2,400
2.21	Testing Room			1	160	160	1	160
Graphics & Vision								
2.30	Graphics & Vision Lab	322	886	40	60	2,400	1	2,400
2.31	Blackout Studio			1	400	400	1	400
Computer Engineering & Ubiquitous Computing								
2.50	Electronics lab			1	2,000	2,000	1	2,000
2.51	Application (mock up) lab			20	60	1,200	1	1,200
2.52	Lab Service/ control room			1	200	200	1	200
2.53	Demonstration space			1	700	700	1	700
Robotics								
2.60	Robotics Research			1	1,200	1,200	3	3,600
Big Data								
2.70	Collaborative Research Area			20	60	1,200	1	1,200
Subtotal Workrooms				195			108	17,860
EVENTS/ CAREER CENTER								
4.10	Events Space			250	15	3,750	1	3,750
	divisible into separate conference room							
4.11	Breakout/ Interview Rooms			8	15	120	4	480

7. Appendix-Preliminary Room List

UW Computer Science & Engineering Expansion Preliminary Room List

Progr No.	Space	Sieg Exist. Room #	Sieg Exist. Area	No. of Stations	Sq. Ft./ Station	Sq. Ft./ Room	No. of Rms	Total Sq. Ft.
4.12	Kitchen/Prep			1	300	300	1	300
4.13	Storage			1	500	500	1	500
Subtotal Events Center				260			7	5,030

SUPPORT SPACE

5.10	Coffee Shop			1	300	300	1	300
5.11	Coffee Shop Seating			24	15	360	1	360
5.20	Student Study Spaces (small)			4	15	60	6	360
5.21	Student Study Spaces (medium)			8	15	120	4	480
5.30	Undergraduate Commons			80	15	1,200	1	1,200
5.40	Machine Room			1	1,100	1,100	1	1,100
5.41	Machine Room, Small			1	400	400	2	800
5.50	Shop			1	1,500	1,500	1	1,500
5.51	Bicycle Storage			1	400	400	1	400
5.52	Bicycle Lockers & Showers			1	160	160	2	320
Subtotal Support Space				122			20	6,820

OFFICE SPACE

Faculty & Student Offices

6.10	Tenure Office			1	160	160	30	4,800
6.11	Teaching Faculty			1	160	160	8	1,280
6.12	Adjunct/Affiliate Faculty			2	80	160	15	2,400
6.13	Postdocs			2	80	160	15	2,400
6.14	Graduate (PhD) Students			1	64	64	30	1,920
6.15	5th Year Masters Students			15	40	600	3	1,800
6.16	PMP Student Space			0	0	0	0	0
6.17	TA Consulting Offices			10	120	1,200	1	1,200

Support Space - Faculty

6.20	Work Room			1	200	200	2	400
6.21	Printer Room			1	50	50	6	300
6.22	Mail Room			1	200	200	1	200
6.23	Breakroom/Kitchen			1	350	350	2	700
6.24	Conference Room (small)			10	25	250	3	750
6.25	Conference Room (medium)			20	25	500	2	1,000
6.27	Storage Room			1	120	120	2	240

Research & Technical Staff

6.40	Office - Research Staff			1	160	160	12	1,920
6.41	Office - Technical Staff			1	160	160	8	1,280

Administration

6.50	Office - Lead			1	160	160	2	320
6.51	Office - Staff			1	120	120	12	1,440

7. Appendix-Preliminary Room List

UW Computer Science & Engineering Expansion

Preliminary Room List

Progr No.	Space	Sieg Exist. Room #	Sieg Exist. Area	No. of Stations	Sq. Ft./ Station	Sq. Ft./ Room	No. of Rms	Total Sq. Ft.
6.52	Reception			1	80	80	1	80
6.53	Workstation			1	80	80	1	80
6.54	Waiting			1	300	300	1	300
6.55	Files/Storage/Copy			1	240	240	1	240
Subtotal Office Space				78			166	25,050
TOTAL ASSIGNABLE AREA							321	74,110
BUILDING GROSS AREA		Assume Efficiency:		57%				130,018

NON-ASSIGNABLE SPACES			
	Mechanical Rooms and Shafts	5.75%	7,476
	Electrical	1.00%	1,300
	Telecommunications/Data	0.90%	1,170
	Toilet Rooms	2.40%	3,120
	Janitors Closets & Storage	0.40%	520
	Central Trash & Recycle Collection	0.40%	520
	Recycle Stations	0.15%	195
	Circulation and Lobby	23.00%	29,904
	Interior/Exterior Walls & Structure	9.00%	11,702
	Subtotal Non-Assignable	43.00%	55,908