Portland State
UNIVERSITY

School of Business Administration

January 2011

ZIMMER GUNSUL FRASCA ARCHITECTS LLP

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* Participated in 2010 update. All others participated in original 2008 program.

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This report is the result of two separate efforts, a two month conversation with Portland State University's School of Business Administration faculty, students, staff and administrators in 2008 and an update in 2010 It documents those conversations as a refined building program that builds upon the work done in an earlier study in 2006 and develops a concept for the architecture which expresses the fundamental values of social and environmental stewardship. With assistance from PSU's Facilities and Planning Services, the report establishes a project budget for the given program and concept. As the building project is discussed over the coming months, it is expected that the program, concept and budget will continue to evolve. Nevertheless, this document accurately reflects the aspirations of the School of Business Administration for the site located at the time of printing.

EXECUTIVE SUMMARY

Portland State University is proposing to expand and renew it's existing home for the School of Business Administration, its most important academic program, to accommodate its rapid growth over the last 10 years, its growing array of programs and its critical ties to the regional business community. The current facility is located on Harrison Street and 6th Avenue. By locating an expansion on the existing SBA site and reusing the existing structure, the new facility is particularly symbolic of the School's international prominence in sustainability.

The ethic supporting the mission of Portland State's School of Business Administration is clear, consistent and direct. It is to research, teach and practice in a manner that advances new ideas, sustainability and environmental stewardship while partnering with area businesses to enrich the livability and economy of the region. Consequently, the new School of Business Administration building will enhance Portland State University's reputation as an institution dedicated to social, economic and environmental sustainability. The building will seek a Gold LEED certification at a minimum and aspires to achieve some petals of the Living Building Challenge. Given the School's international reputation for social and environmental stewardship, the new building will be a living laboratory for creating the next generation of leaders in the sustainable economy.

Current programming work indicates the new School of Business will be 148,000 sq ft total. The project is currently planned to be completed in 2 or 3 phases. There are three possible scenarios for phasing, with the recommended approach being in two phases. The first phase includes 53,000 sq ft of new construction and 42,000 sq ft of remodel. The project budget of the first phase is $40 Million. The project budget for the phase two remodel is $16 Million.

The School of Business is PSU's second largest academic unit and the largest supplier of business talent to the metropolitan area of any business school in the State, graduating on average 700 undergraduate and 200 graduate students each year. The School of Business offers high quality undergraduate and graduate programs, ranging from degrees in accounting to financial management to real estate. PSU's programs are in high demand and the School enjoys selectivity in its student admissions, especially for its MBA program which admitted only 30% of the applicants in the current academic year.

As the school and its programs have grown in stature, so has the demand for a facility that matches its reputation for quality. The School of Business now requires a building that can stand proudly in the company of some of the West Coast's most prestigious universities such as University of Washington, University of California–Berkeley, and Stanford—all potential competitors for outstanding students drawn to the West Coast by opportunity, lifestyle and values. The Beyond Grey Pinstripes 2009-2010 Report ranked the MBA+ program 25nd in the world, 19th in the United States and fourth on the west coast behind Stanford and Berkeley and University of San Diego for integrating social and environmental stewardship within the MBS program.

PSU business programs are known for significant industry engagement and an emphasis on pragmatic degree programs with definitive career paths such as accounting, human resource management, supply and logistics management, and finance. Employers such as Intel, Tektronix, Boeing, Nike and many small to mid-sized businesses depend on the School of Business for future talent. The Food Industry Leadership Center in the School of Business offers undergraduate and

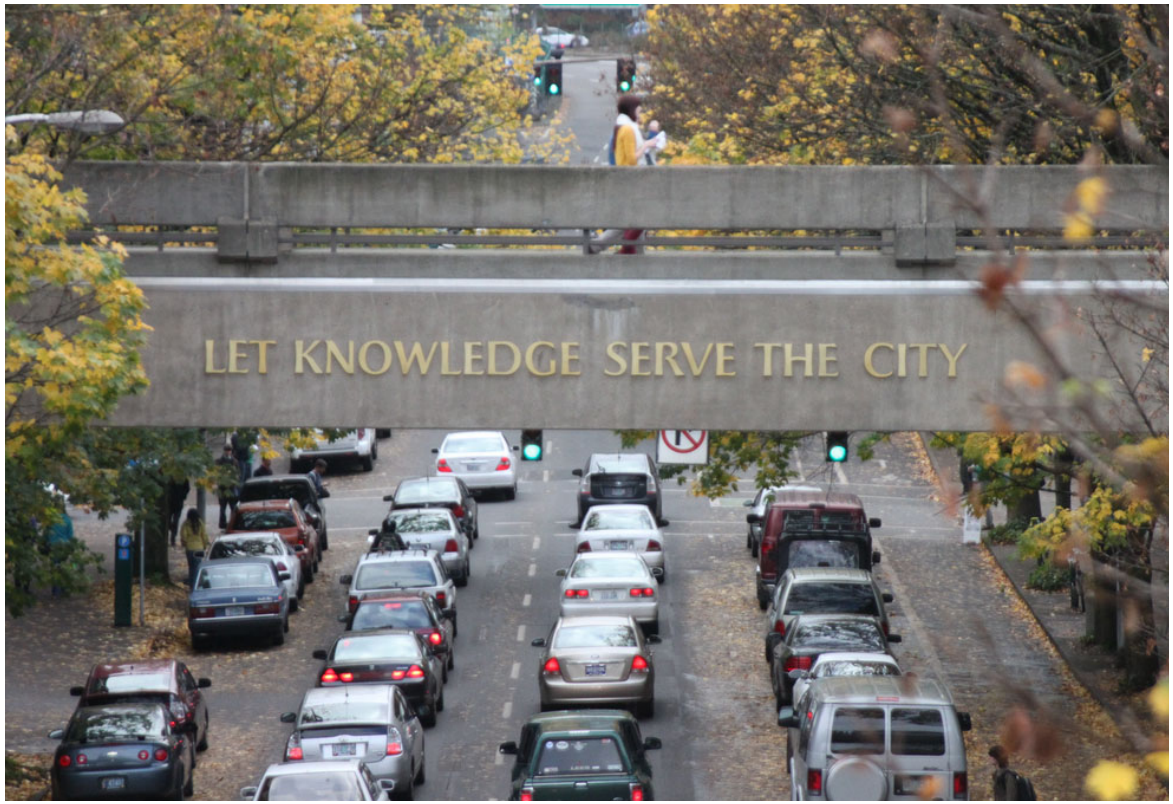
executive programs to serve the needs of this important regional industry cluster. The real estate, technology, and sustainable industries sectors are also served by programs and centers. In fall 2011 Portland State will be launching a Masters in Real Estate Development, it's fifth graduate program.

Portland State's School of Business has experienced steady growth over the past decade and now serves nearly 2,200 undergraduate and 650 graduate students. The School's 57 faculty maintain a steady research agenda with current grants from the City of Portland, HUD and EPA. Every year student teams in the MBA program complete 30-35 projects for entrepreneurs, venture capitalists, and large companies such as Intel and Nike. The Business Outreach Program provides technical business support to an equal number of primarily minority-owned businesses throughout the year.

Currently, the School occupies the eastern half of a building shared with the School of Education located on the corner of Sixth Avenue and Harrison Street. The building was constructed in l987, when enrollment was less than 1000 students. With enrollment of over 2,500 students, the school has clearly outgrown the available space, and the type of space no longer meets the program goals for the School. The School of Education, built in 1979, plans to relocate to the Fourth Avenue Building. The vacated School of Education and the School of Business Administration space will be reallocated and expanded for classrooms, specialized collaboration space for student, faculty and businesses, and seminar rooms, auditorium, conferencing space, and faculty offices, all tailored to the highly interactive and engaged faculty and student body. Particular attention will be paid to defining spaces to accommodate offices and student lounges for the graduate and undergraduate programs, the Food Industry Leadership Center, the Center for Design and Innovation for Business Sustainability, and potentially new centers. Current programming review suggests the new School of Business will be 148,000 sq ft. Retail space is not currently included in the program but is recommended to serve the dual purposes of enhancing retail services in the core campus and accommodating businesses that may wish to co-locate with the School of Business to achieve synergies for advancement of the School's programs and for business opportunities.

In conclusion, the new School of Business Administration has the potential to be a transformational step for the School, the University, and the City. Its prominent site is well served by Portland's alternative transportation system, with easy access by streetcar, light rail and bus with additional support from the university's accommodation of bicycles and Zip Car. The commitment to sustainability puts the project at the leading edge of efforts to develop a large scale net zero urban community targeting the lowest possible carbon footprint. The School of Business Administration needs a facility that will allow it to compete with other top schools for faculty and students, create an enduring statement of the importance of the program and position not just the university, but the region and the state as international leaders in business innovation and sustainability.

MISSION



The Portland State School of Business Administration (SBA) is a recognized and unique program serving graduates and undergraduates. The largest business school in the Pacific Northwest, the SBA has a mission to change lives, build community, and serve the economic and social vitality of the region. The school's vision is to be a nationally renown school of business and therefore, as an institution, it must grow and respond effectively to rapidly evolving economic and cultural opportunities.

The SBA is distinguishing itself among peers as a business school. The school was recently recognized by Beyond Grey Pinstripes, a biennial survey and alternative ranking of business schools that spotlights innovative full-time MBA programs that are integrating issues of social and environmental stewardship into curricula and research. PSU was ranked 25th overall and 4th on the West coast.

In addition, the school anticipates and nurtures economic potential in the community which is manifested in programs that:

1. Introduce students and partners to new and changing opportunities in the business world.
2. Provide critical services to regional businesses, both emerging and established.
3. Define and develop sustainable business practices.
4. Stimulate and guide the maturation of non profits and NGO's.

With the opportunity for a new building, the SBA will expose its commitment to the community it serves and will take a critical step in achieving its goal of developing a national reputation for excellence and innovation in business research and education among its academic peers, current and prospective students, and the business community.

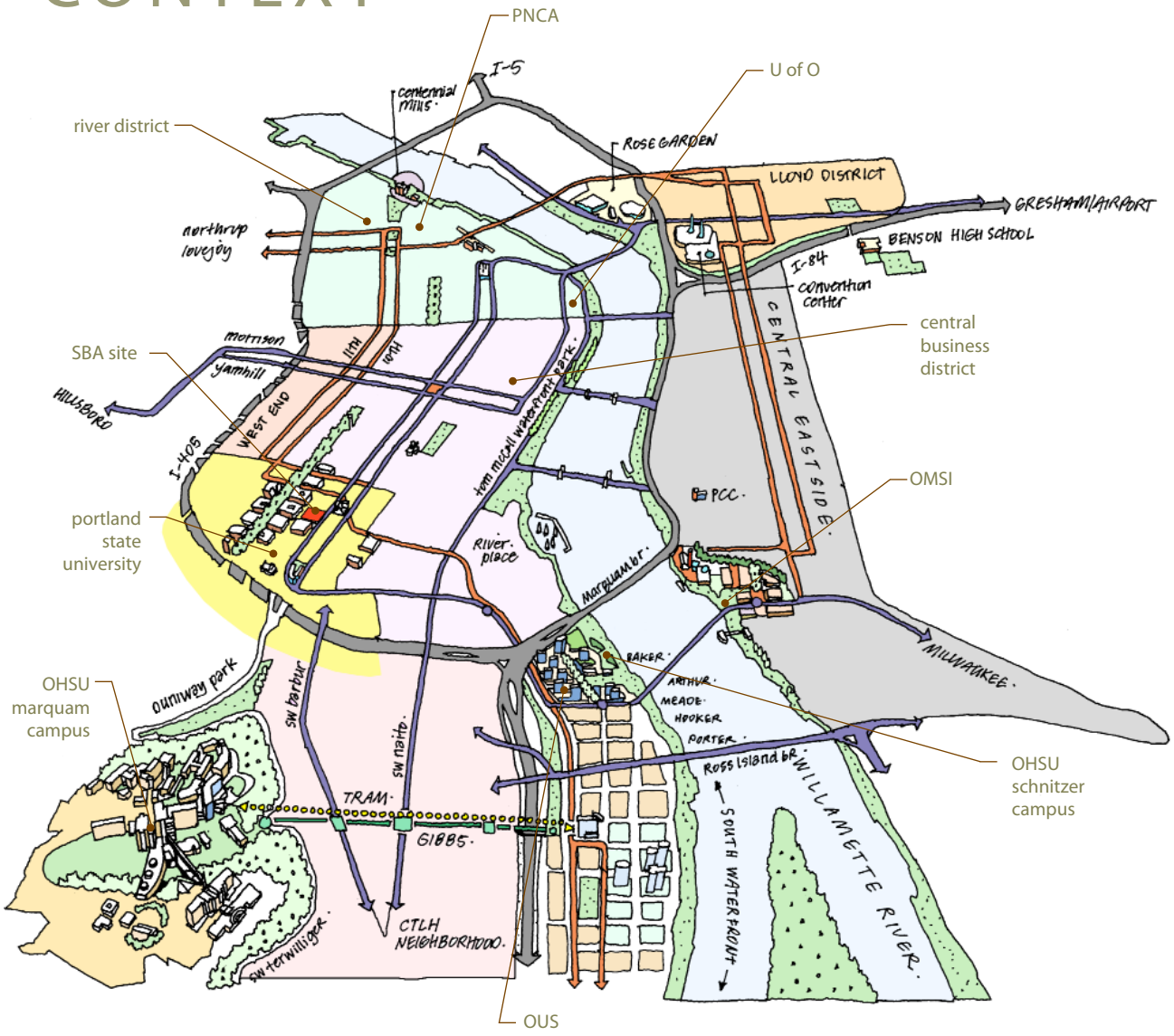
ETHIC

Sustainable Business: A continuous and holistic process that seeks to create long term economic value, improve the health and vitality of social systems, and eliminate harm to ecological systems.

As evidenced by its comprehensive mission statement, the School of Business Administration takes a broad view of its goals and, therefore, its modes of operation. The criteria for success are not based simply on economics but must also embrace social and environmental benefits simultaneously. By acting as a steward of our environment, by engaging in the education of NGO's, and by mentoring, supporting, and partnering with local businesses, the SBA nurtures and demonstrates its commitment to broader goals. This Triple Bottom Line approach–considering equally the consequences of People, Planet, and Profit–sets the SBA apart from other comparable institutions.

As a part of the commitment by PSU and the SBA to this ethic, the new facility will be a high-performance, environmentally-integrated building. The LEED™ rating system will be used as a fundamental metric for success. The Living Building Challenge sets even broader goals for such a facility and meeting this challenge is a strong aspiration of the project team.

CONTEXT



Situated on Montgomery Street and 6th Avenue, the expansion site is adjacent to the existing School of Business. The current building will be expanded and remodeled to current classroom standards and pedagogy.

Through a collaborative effort, the Portland Development Commission, Bureau of Environmental Services, Portland State University, and Gerding Edlen Development, Inc. are pursuing a multi-block plan that designates Montgomery Street as a key pedestrian corridor and incorporates sustainable stormwater management elements along the streetscape. This plan effort is known as the Montgomery Green Street Blocks. The aspirations of the Montgomery Green Street Plan are integrated into the site of the new School of Business Administration.

The adjacent MAX light rail and nearby streetcar line provide easy access to a growing regional transit network, and reinforce the School of Business Administration's ethic of comprehensive sustainability.

Ongoing connections with institutions and organizations in the city, such as OHSU, MercyCorp, and potential future relationships with partner institutions are reinforced in this central site.

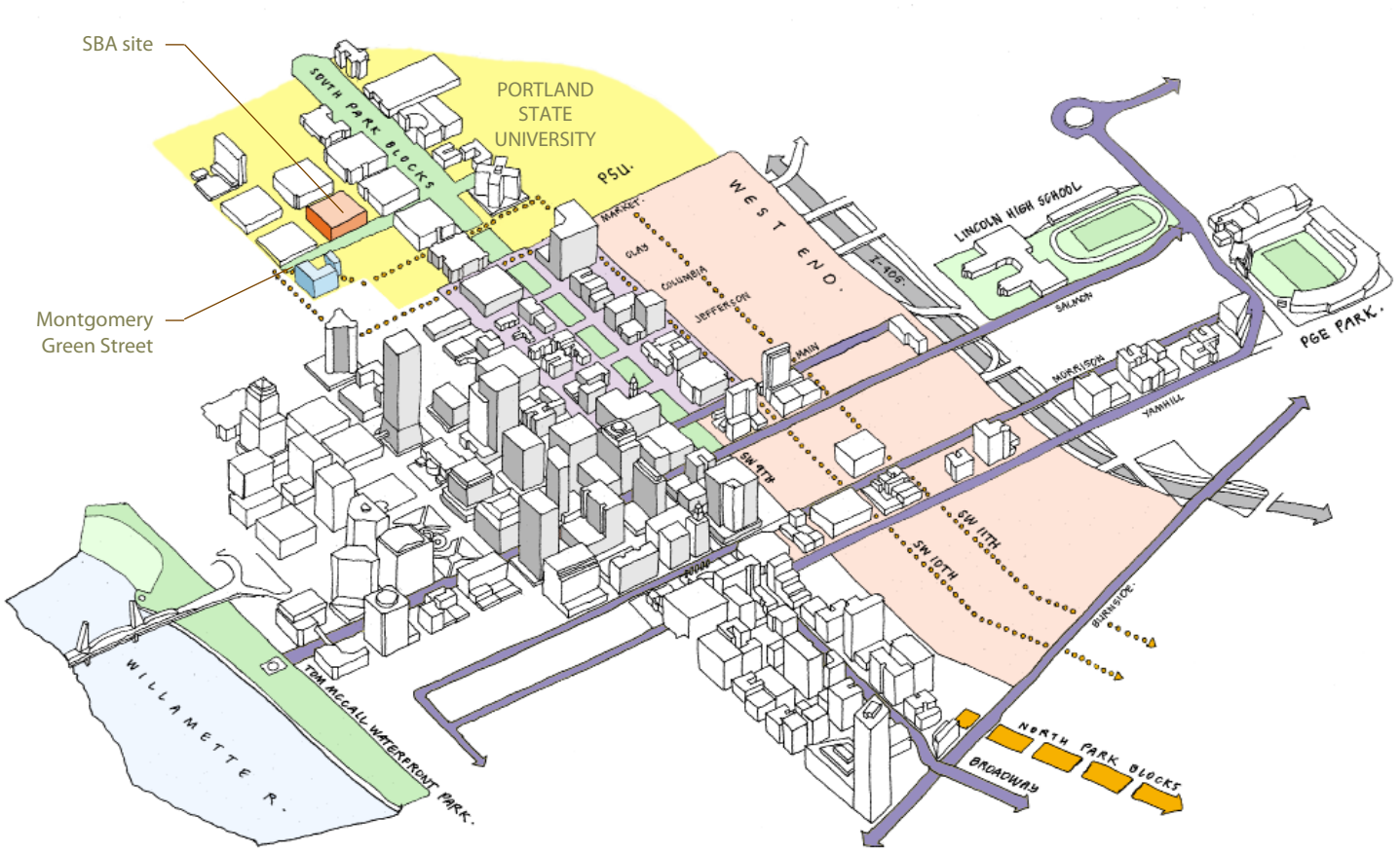
SITE ADVANTAGES

Proximate to downtown business core providing easy community access and outreach to local business

Adjacent to the Urban Center Plaza, often described as the gateway between Portland State University and downtown Portland.
It is the site where the MAX light rail green line and the streetcar lines cross.

Connected to the city and region by pubic transportation, major highways and robust bicycle and pedestrian networks.

Prominent location along Broadway Avenue, a major artery through downtown, facilitates public exposure and visitor access.



DISTRICT PLAN

URBAN FRAMEWORK

The site is connected to the campus and the city through a network of parks and green streets that demonstrate the university and city commitment to sustainable communities.

With the extension of the park blocks through the campus and a series of streets that are limited to four blocks in length, the campus core is a pedestrian friendly realm with limited conflict between pedestrians and vehicles.

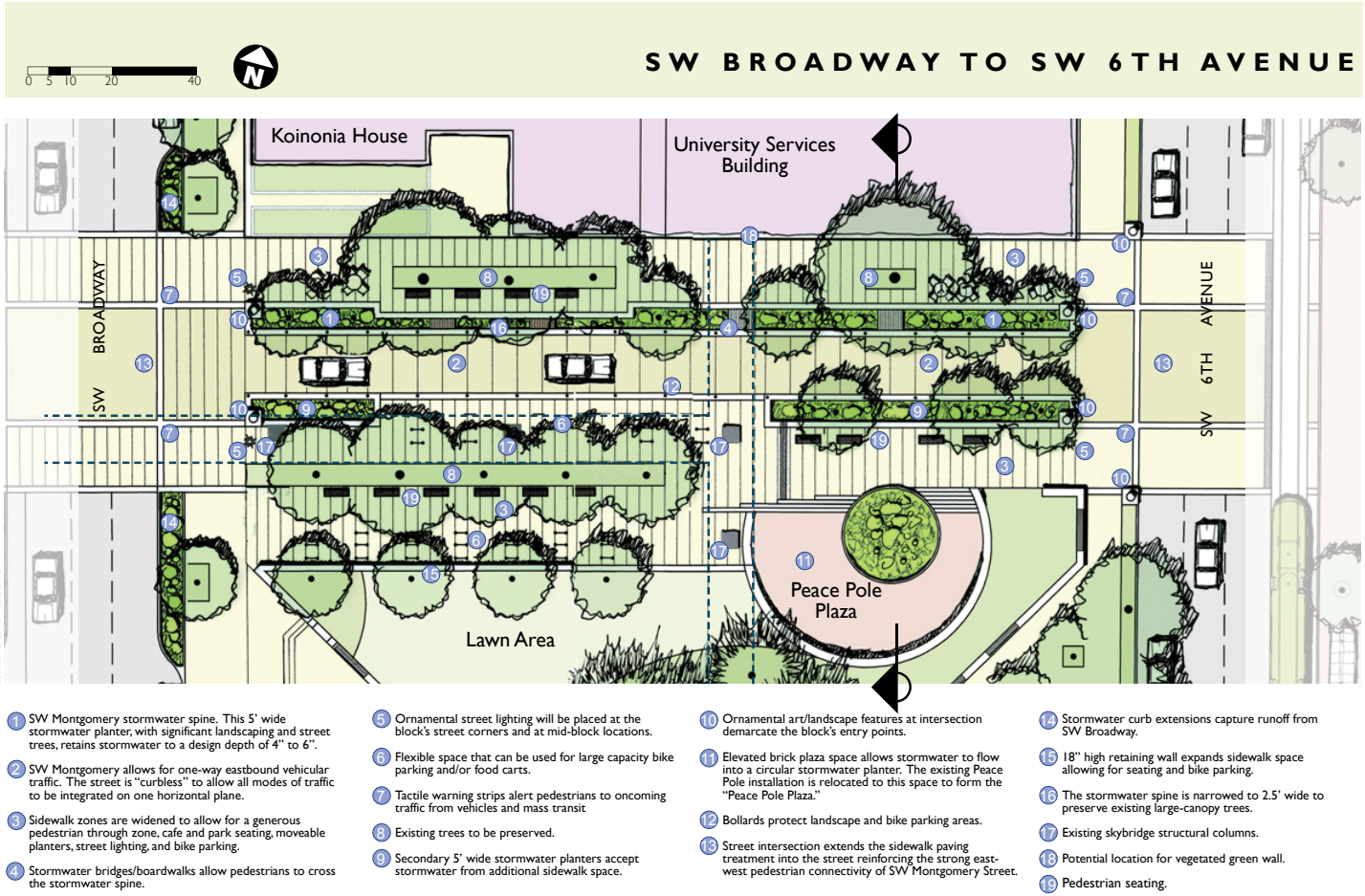
The site around the SBA has the ability to continue this framework of livability and extend it another step.

The Portland State University School of Business Administration proposes to build upon long term efforts by the Montgomery Green Street Plan to enhance the pedestrian experience, foster sustainability, and continue building community culture. The conceptual plan was documented in

open space and green streets
buildings
transit

THE MONTGOMERY GREEN STREET PLAN

October 2009 and is expected to continually evolve in the months ahead. The plan defines the Urban Center Plaza as a hub of activity with other activities radiating from it and follows Laurence Halprin's Portland Open Space Sequence concept of connecting the urban fabric with strong themes using water, landscaping, art and movement. Specific Green Street design goals include wider sidewalks, and curbless street conditions. In addition, continuous landscaped stormwater planters will create a green connection through downtown. The plan between 6th Avenue and Montgomery Street includes Peace Pole Plaza, a water feature and sculpture to showcase the runoff water on the site. The block is also planned to be host to electric car charging stations.



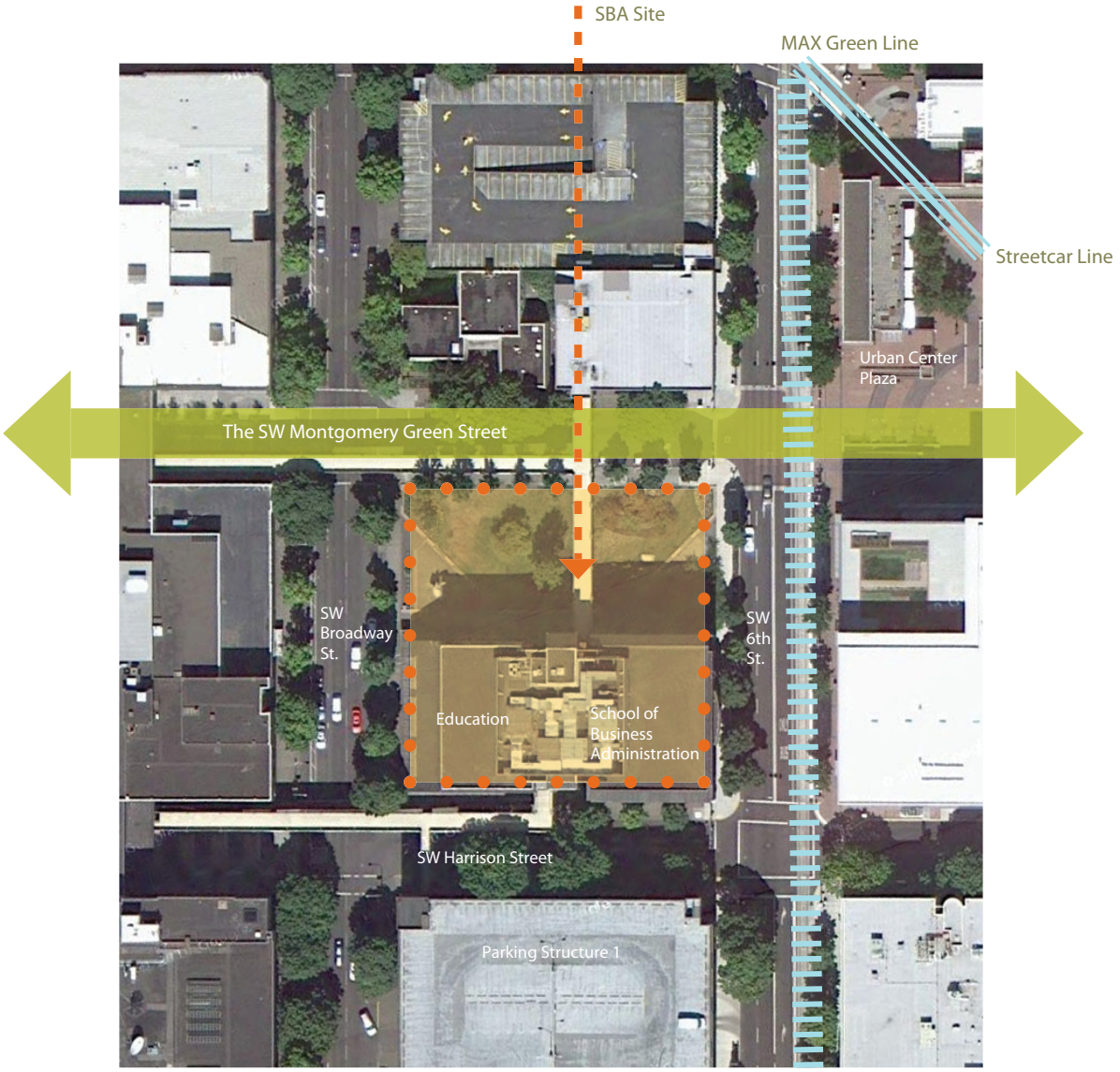
above
A page from the Montgomery Green Streets report showing the block plan at the existing School of Business Administration (October 2009)

CONTEXT

Site from Northeast

View from Site of the Urban Center Plaza

Site from Northwest



THE SITE

PROGRAM ANALYSIS

PROGRAM SUMMARY

Area Space	Existing	New	Renovation	Final
Instructional - Business School	10,514		4,820	28,920
150 Seat Auditorium (1)		4,500		
75 Seat Tiered Classrooms (4)		4,200	4,200	
50 Seat Tiered Classrooms (7)		2,800	8,400	
Instructional Support	4,102		4,360	8,910
Lobby/ Event Space		4,550		
Academic Offices / Support	7,924		13,344	13,344
Food Industry Leadership Center (FILC)	1,669	2,135		2,135
International Programs	393			
Center for Global Leadership and Sustainability (CGLS)		1500		1,500
Center for Real Estate		1500		1,500
Outreach Center - Entepreneural Center (business outreach and business programs)		1285		1,285
Shared Center			1915	1,915
Graduate Programs Office (incld. Masters in International Management)	596		3,940	3,940
Masters in International Management	1,158			
Office of the Dean	1,791		3,485	3,485
Undergraduate Programs Office	1,439		3,840	3,840
Faculty Services	1,636		1,900	1,900
Lab Network Services	931		1,170	1,170
Student Areas	1,777		6,035	8,435
Large Project Rooms		2,400		
General	0		800	800
Program Departmental Net Square Footage	33,930	24,870	58,209	83,079
Program Total Net Square Footage		29,844	69,851	99,695
Flex Space/Future program space			4,529	4,529
Remodel of existing building and utilities at connection to Phase 1		*		
Total built GSF		**42,363**	**104,837**	**147,200**

Note:
This tabulation represents the assessed program needs as of the date of printing. Ongoing refinement of all project criteria is required in order to bring the actual program within the proposed project budget.

The new addition accomodates grand special event spaces that are the public face of the school.

The addition is also an ideal location for the auditorium and tiered classrooms because the structure can be built to accomodate large column free spans and taller floor to floor heights at certain levels.

The centers are ideally located in the new addition with space for adjacent centers with some shared facilities and a direct connection with the special event spaces.

GROWTH

The growth accommodated in the proposed program addresses both historical growth that has occurred up to this point in time, and future projected growth anticipated by the SBA, both in enrollment and faculty.

With a total enrollment at 2,852 undergraduate students and almost 500 graduate students, the existing PSU facility is considerably undersized when compared to peer institutions in the state. To address historical growth, the proposed program reflects a 215% increase in overall net square footage. This includes an increase from 14,000 sf of instructional space to 34,930 SF. This new program allows for all business school classes to be taught in the new facility.

Fifty-seven offices are required to accommodate the existing faculty. The SBA faculty has grown consistently over the past decade, with annual growth rates ranging from 0% to 7%. For planning purposes, a 2% annual growth rate has been assumed for 15 years, resulting in an additional 14 offices added to the program. These offices will be flexible in their layout and, therefore, could also be used as small conference rooms, adjunct faculty space, graduate space, or similar functions in the building in the short term.

The program allows sufficient space for all classes taught by this increased faculty to be held in the facility. This projection assumes essentially constant faculty teaching loads and a classroom utilization rate of 85% (12 classes per room per week).

Centers are a very important aspect of the SBA program both in their outreach to the community as well as providing research opportunities to faculty and students. The existing centers have been programmed to allow for modest growth, and a shared center of 2000 SF has been planned with enough space to accommodate a new initiative or a more substantial expansion of an existing center.

PARKING

Given its urban environment, parking on the PSU Campus is an ongoing challenge for students, faculty and visitors. While the available and proximate transit options, including streetcar, lightrail and buses help alleviate the pressure to some degree, there is still a need for accessible parking to accommodate tenure and adjunct faculty who teach part time, graduate students who take evening classes after work, professionals who access the School's outreach programs and serve on boards, and the general student population who may choose to commute for housing or work reasons.

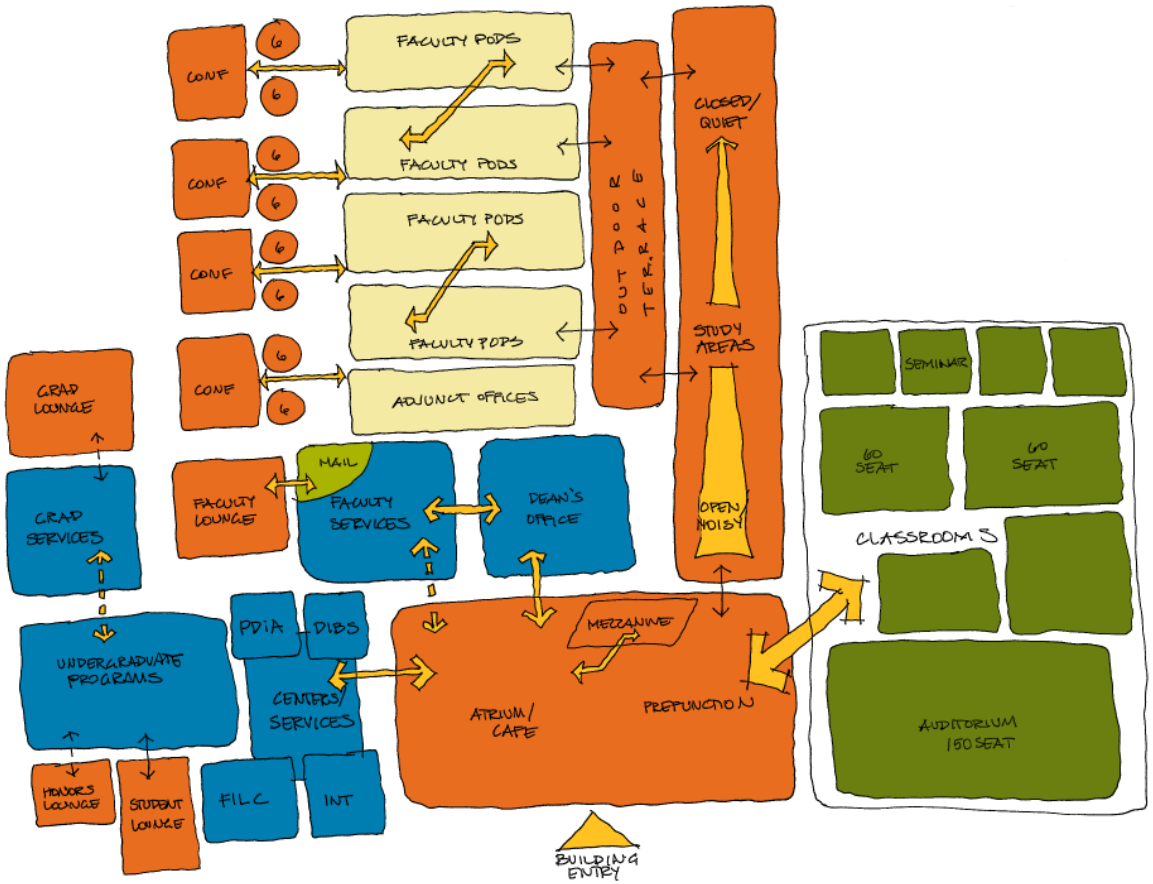
The nearest PSU parking lots are Structures One and Two. Parking Structure One is the adjacent block to the south. Parking Structure Two is the adjacent block to the north In addition, a smart park lot is located at 10th and Yamhill, an eight block street car ride from the campus.

Portland State Parking Map

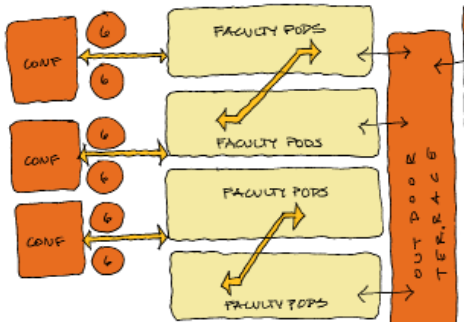
OVERALL BUILDING

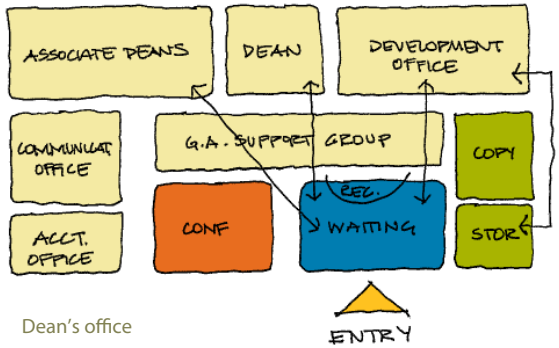
The building program was developed with the following goals:

– Provide enough teaching space to house all SBA classes
– Increase faculty space to serve tenure faculty, adjunct faculty and graduate assistants, while allowing for future growth.
– Increase the social and interaction space within the building to better serve students, faculty and guests.
– Create visible, expandable centers that enhance the school's public outreach and research opportunities.
– Design for the greatest flexibility of space to adjust for shifting needs over time.

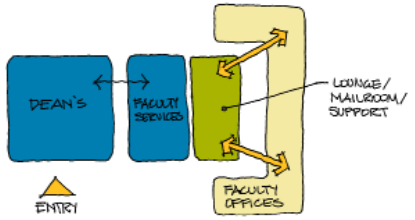


CONCEPTUAL BUILDING ADJACENCY DIAGRAM

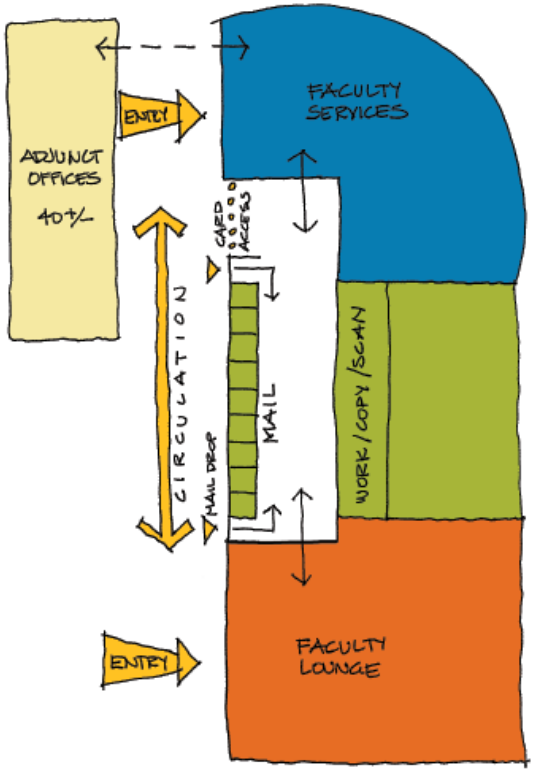




Dean's office



Dean / faculty



FACULTY OFFICES

– Faculty interaction occurs along natural pathways such as on the way to copy, restroom, coffee etc.
– Many faculty utilize a third place for collaboration and communication such as coffee shops.
– Provide all offices with access to natural light.
– Provide access to a journal library. This could be a long space with shelves that provide a collegiate feel and accessible by all faculty but is able to be secured from theft.
– Provide a sense of security for faculty areas especially considering after hours and weekends

DEAN'S OFFICE

– Provide a connection to the public and the city. Create a clear path to the Dean's office from the entry to the building. Locate the offices on a lower floor.
– It is desirable to have a community events and development space centralized in the building.
– There is a synergy between the Dean's office and faculty services that suggests co-location if possible.
– This office serves as the face to the industry, visitors and community and should be designed accordingly.

FACULTY SERVICES

– Faculty services should be located near the adjunct offices, the faculty offices and with easy access to the Dean's Office if possible.
– A high level of confidentiality is required for this office as this is where mail, tests, grades are dealt with.
– Provide space for faculty gathering and create layout space for copying, tests, and similar work in a central location.
– Most collaboration happens with 2-4 people for full time faculty; provide spaces for this to occur.

UNDERGRADUATE PROGRAMS OFFICE

– Undergraduate Student Services should be located near the building entry in a visible location. Student organizations should be located near Undergraduate Student Services.

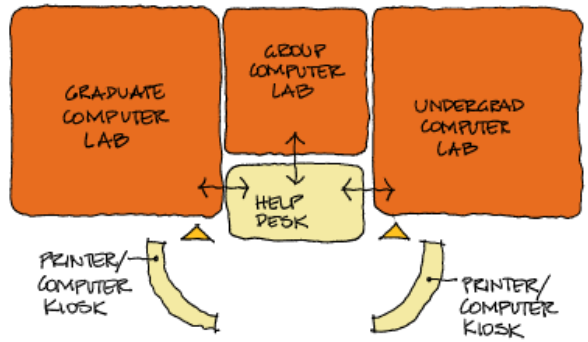
– This office draws high traffic and should be centrally located and easily accessible.

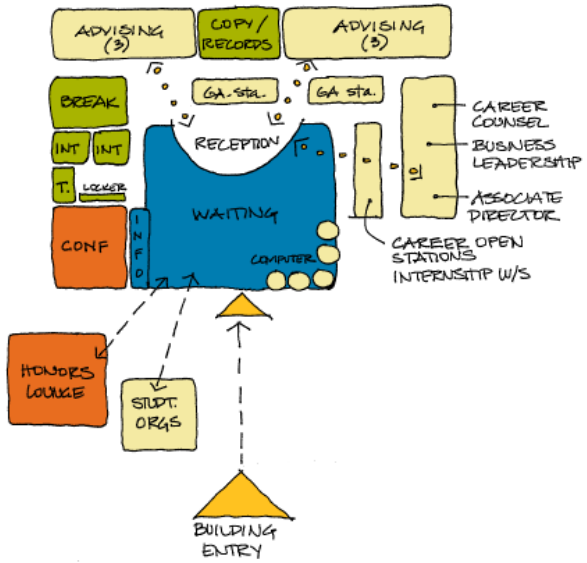
– Interview Rooms should be within undergraduate services center but could be shared with others; the rooms should be adjacent to lockers for changing into interview suits.

– Project Rooms are 4-6 person rooms off of a main quiet space; allow for transparency but with acoustic privacy and ability to darken for projection.

– Visibility from reception to all offices is important for safety and monitoring of staff.

– The waiting area should support student research with computer stations and information dissemination.



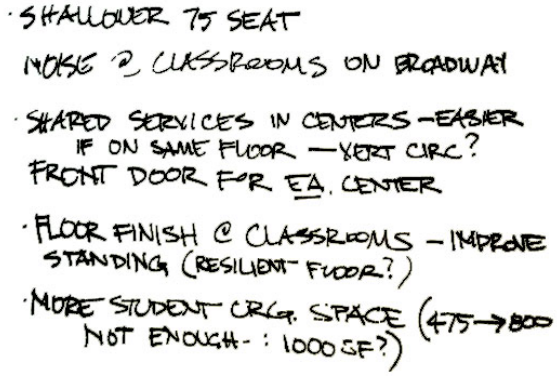


RELATIONSHIP BETWEEN GRADUATE AND UNDERGRADUATE PROGRAMS

– Consider zoning the building for graduate and undergraduate activities There may be a place where Grad/Undergrad students are brought together as well as places where they are separated

– Bridge the Academic and Business worlds: "Treat us like we are a management team"

– Maintain Northwest Values: Egalitarian, community-minded. For instance, classrooms and other spaces should be designed equally as 'good design is a fundamental right'. However the Computer Labs might be zoned to allow separation between graduate, undergraduate and group work space for pragmatic reasons. Additionally, print stations outside of computer labs could ease stress on the lab stations.



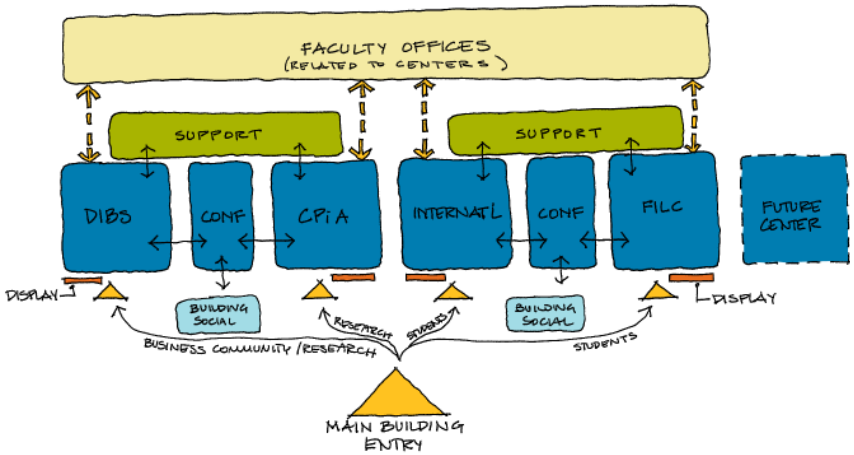
ABOVE
The issues raised during the December 1, 2010 all Faculty Meeting

CENTERS

– Centers should be designed to support naming opportunities
– FILC and CGLS Centers are accessed by high traffic of external partners and students and should be located to accommodate this traffic
– Reception areas, Conference Rooms, Kitchens, and Storage can be combined and shared between multiple Centers.
– The centers will likely evolve over time as funding and faculty interest wax and wan. The design should support this fluctuation without creating dead zones at the front door of the building?

CLASSROOMS

– Large classrooms should be located near prefunction areas to support waiting and change of class.
– As you move vertically in the building, it is desirable to move toward quieter spaces, as in the campus library.
– Study niches and waiting spaces should be located near classrooms with access to power and wireless data.



PROGRAM NOTES

– Provide roof access and display water saving features such as green roofs.
– Provide easily accessible recycling areas.
– Amenities such as coffee carts, microwaves and refrigerators, food carts/ small cafes, and outdoor seating and bike racks are desirable.
– In conference spaces provide small tables that can be joined to make larger tables to increase collaboration.
– Community events space should be flexible to serve board meetings, small lectures, events, catering, immersion program, business projects, seminars and similar gatherings.
– Local businesses who share social and sustainable practice goals should be periodically highlighted in the building through display, presentation and similar means
– Be a living showcase of sustainable businesses within the community and tell the story.
– In project rooms, provide wireless access and keyboard with desk/ or mounted screen. Spaces should be flexible to accommodate group projects and presentations and should serve faculty-faculty, faculty-student, student-student and grad-undergrad meetings.
– Parking is a major concern and difficult to find. The project needs to identify parking opportunities and access to this building from parking.
– Safety is a concern for students as well as faculty both due to theft and unwanted visitors.
– Broadway Avenue is perceived to be a very busy street; classrooms and offices with operable windows in this direction should consider implications of noise and traffic.

SPACE PROGRAM

Area	Space	Occupancy	NSF/ OCC	NSF	# of Rooms	Total NSF
Instructional - Business School						**28,920**
	Seminar Room	15	26	390	3	1,170
	General Classroom (Flat Floor)	35	25	875	4	3,500
2	Tiered Classroom	50	28	1,400	7	9,800
2	Tiered Classroom	75	28	2,100	4	8,400
	Computer Lab Classroom	30	35	1,050	1	1,050
1	Auditorium	150	30	4,500	1	4,500
	Ad Lab Studio	10	50	500	1	500
Instructional Support						**8,910**
1	Lobby / Event Space w/ Stage	150		2,000	1	2,000
2	Special Events Room	60	20	1,200	2	2,400
1	Catering Kitchen			150	1	150
	Storage			200	1	200
	Computer Lab - Undergrad	60	35	1,800	1	1,800
	Computer Lab - Graduate	40	35	1,200	1	1,200
	Computer Lab - Group			500	1	500
	Help Desk/ Office/ Storage			260	1	260
	Instructional Storage			400	1	400
Academic Offices / Support						**13,344**
	Faculty Offices	1	135	135	56	7,560
	Adjunct Faculty Offices	6	68	408	8	3,264
	Graduate Assistant Office	3	45	135	8	1,080
	Office Waiting Area	4	25	100	4	400
	Conference Room	8	25	200	4	800
	Storage			240	1	240
Outreach Center - Food Industry Leadership Center (FILC)						**2,135**
	Reception / Workstation	1		100	1	100
	Waiting / Display Area	4	25	100	1	100
	Office - Director	1		180	1	180
	Office - Assistant Director	1		150	1	150
	Office - Faculty	1		135	5	675
	Office - Program Director SLM	1		150	1	150
	Open Workstations	5	60	300	1	300
	Conference Room	8	25	300	1	300
	Copy Room/ Computer/ Storage			150	1	150
	Kitchenette			30	1	30

Area	Space	Occupancy	NSF/ OCC	NSF	# of Rooms	Total NSF
Outreach Center- Center for Global Leadership & Sustainability (CGLS)						**1,500**
	Reception / Workstation	1		100	1	100
	Waiting / Display Area	4	25	100	1	100
	Office - Director	1		150	1	150
	Office - Assistant Director	1		135	1	135
	Office - Faculty	1		135	3	405
	Open Workstations	5	60	300	1	300
	Conference Room	8	25	200	1	200
	Copy Room			80	1	80
	Kitchenette			30	1	30
Outreach Center - Entepreneural Center (business outreach and business programs)						**1,285**
	Reception / Workstation	1		100	1	100
	Waiting / Display Area	4	25	100	1	100
	Office			135	3	405
	Hoteling space			135	2	270
	Conference Room	12	25	300	1	300
	Copy Room			80	1	80
	Kitchenette			30	1	30
Shared Center (International, FMBDI and CPiA)						**1,915**
	Reception / Workstation	1		100	1	100
	Waiting / Display Area	4	25	100	1	100
	Conference Room	12	25	300	1	300
	Focus Group Room / Resource Center			135	1	135
	Copy Room			80	1	80
	Kitchenette			30	1	30
	Office - Director (Future)	1		150	1	150
	Open Workstations (Future)	5	60	300	1	300
	Office - Director (Internat'l)	1		150	2	300
	Office - Director/ Associate Director (CPiA)	1		150	1	150
	Office - Research Grad	1		135	1	135
	Office - Visitor	1		135	1	135
Outreach Center- Center for Real Estate						**1,500**
	Reception / Workstation	1		100	1	100
	Waiting / Display Area	4	25	100	1	100
	Office - Director	1		150	1	150
	Office - Assistant Director	1		135	1	135
	Office - Faculty	1		135	3	405
	Open Workstations	5	60	300	1	300
	Conference Room	8	25	200	1	200
	Copy Room			80	1	80
	Kitchenette			30	1	30

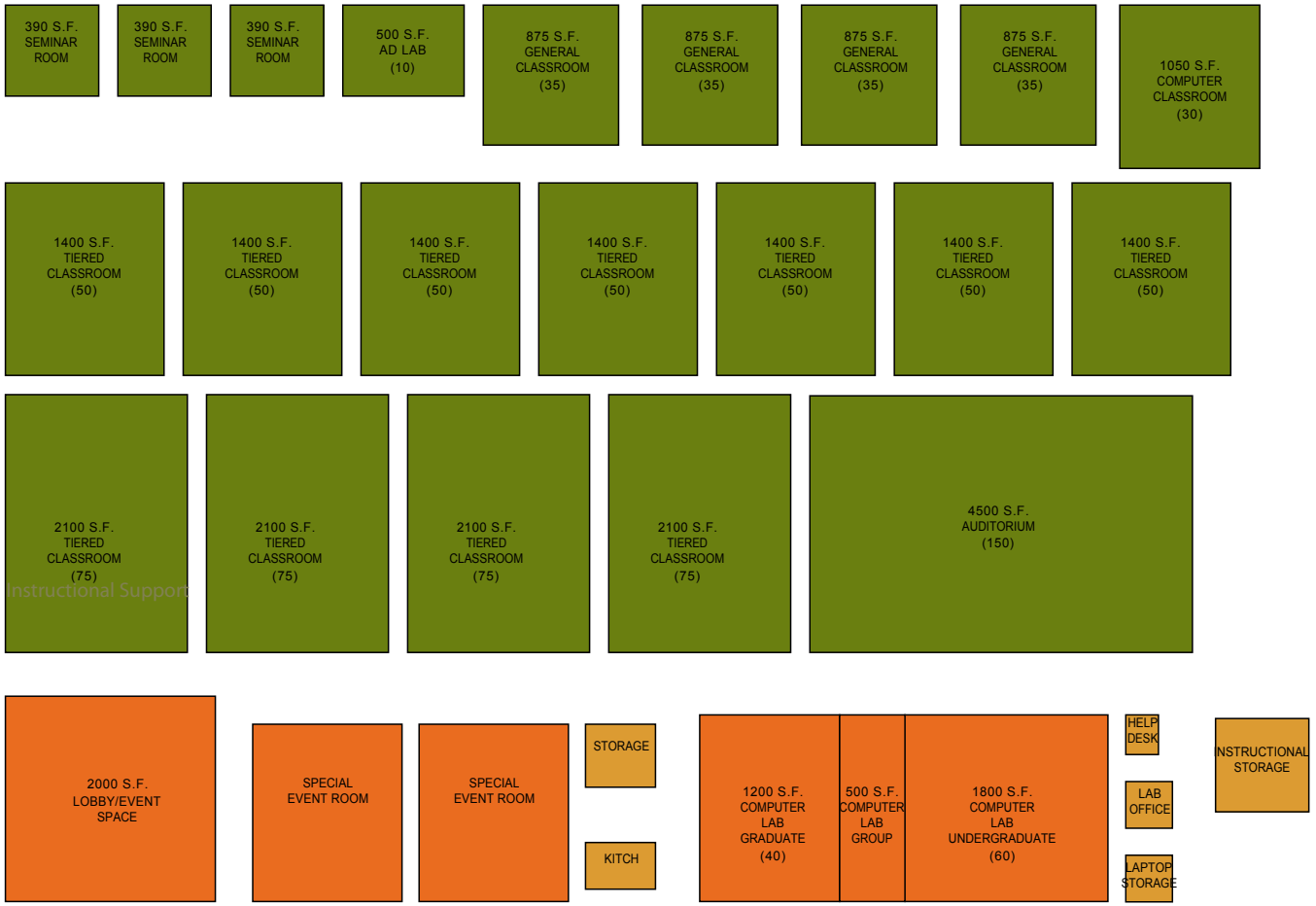
Area	Space	Occupancy	NSF/ OCC	NSF	# of Rooms	Total NSF
Graduate Programs Office (incIds. Masters in International Management)						**3,940**
	Reception / Workstations	4	50	200	1	200
	Waiting	10	25	250	1	250
	Office - Director (MBA, MIM, MSFA)	1		150	3	450
	Office - Director (Grad, Career)	1		150	2	300
	Office - Grad Programs Advisor	1		135	3	405
	Office - Faculty	1		135	5	675
	Graduate Assistant Workstations	5	81	405	1	405
	Conference Room	8	25	200	1	200
	Copy/ Supply/ Work Room	1		135	1	135
	Language Lab - MIM			135	2	270
	Graduate Lounge	25		650	1	650
Office of the Dean						**3,485**
	Reception	1		200	1	200
	Waiting	6	25	150	1	150
	Office - Dean	1		225	1	225
	Office - Associate Dean	1		180	3	540
	Office - Acct & Budgetary Office	1		150	1	150
	Office - Director, External Relations	1		150	1	150
	Office - Development	1		150	3	450
	GA Support Group	5	81	405	1	405
	Communications	1		135	3	405
	Conference Room	20	25	500	1	500
	Copy/ Supply/ Work Room	1		135	1	135
	Kitchenette			40	1	40
	Storage			135	1	135

Area	Space	Occupancy	NSF/ OCC	NSF	# of Rooms	Total NSF
Undergraduate Programs Office						**3,840**
	Waiting / Student Resource Area	10	35	350	1	350
	Reception / Workstations	3	60	180	1	180
	Graduate Assistant Work Areas	5	81	405	1	405
	Office - Associate Director, Career			135	1	135
	Office - Career Counselor			135	2	270
	Office - Manager Business Internship			135	1	135
	Office - Undergraduate Advisor			135	6	810
	Career Counseling Open Station	2	60	120	1	120
	Internship Work Study Station	1	60	60	1	60
	Advising Work Study Station	2	60	120	1	120
	Conference (Workshop)	20	25	500	1	500
	Interview Room			135	2	270
	Lockers / Changing/ Toilet			80	1	80
	Staff Break Room			135	1	135
	Copy/ Supply/ Work Room			135	1	135
	Students Record Storage			135	1	135
Faculty Services						**1,900**
	Reception / Workstation	4	60	240	1	240
	Waiting	6	25	150	1	150
	Copy/ Supply/ Workroom			270	1	270
	Office - Support Services Supervisor			135	1	135
	Mail Room			270	1	270
	Faculty Copy Room			135	1	135
	Faculty Lounge			700	1	700
Lab Network Services						**1,170**
	Office - Network Administrator			135	1	135
	Office - Lab Supervisor			135	1	135
	Open Work Area			800	1	800
	Server Room			100	1	100

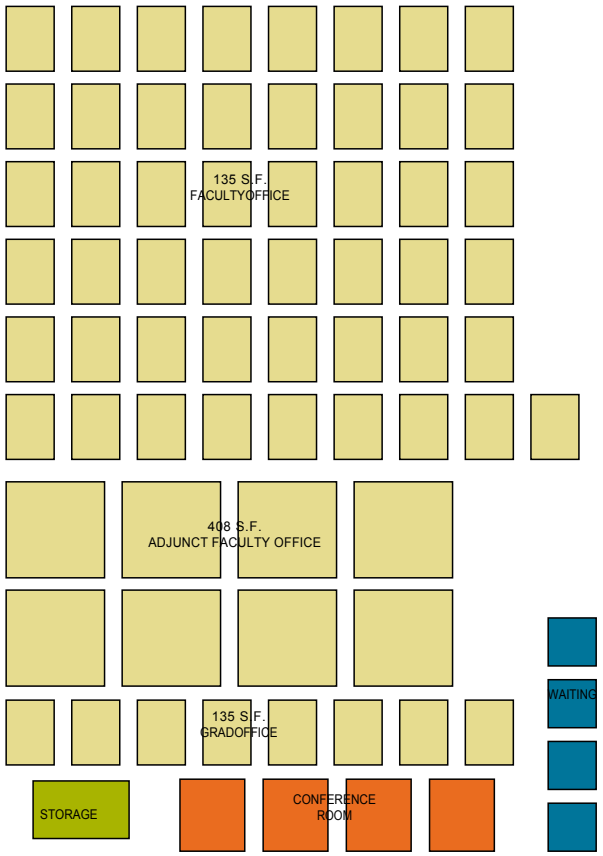
Area	Space	Occupancy	NSF/ OCC	NSF	# of Rooms	Total NSF
Student Areas						**8,435**
	Student Organizations - Office			135	3	405
	Student Organizations - Work Room	8	25	200	1	200
	Student Organizations - Storage			80	1	80
8	Large Project Room	12	25	300	8	2,400
4	Small Project Room	7	25	175	12	2,100
	Open Study Niches	5	30	150	10	1,500
	Student Lounge/ Kitchennette	25	26	650	1	650
	Honors Lounge	12	25	300	1	300
	Student Study Area	25	32	800	1	800
General						**800**
	Lactation Room			100	2	200
	General Storage			300	1	300
	Enclosed Bike storage			300	1	300
Subtotal						**83,079**
20% Circulation		Total Faculty Offices		71		99,695

GRAPHIC PROGRAM SUMMARY

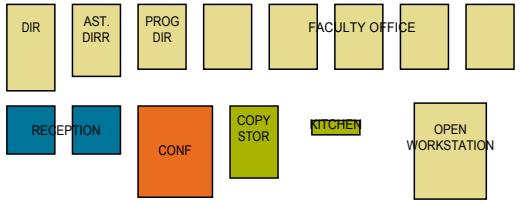
Instructional Areas



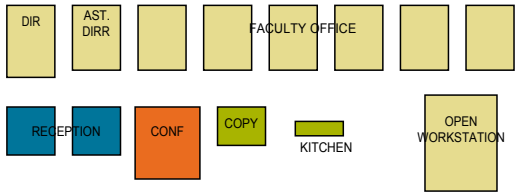
Academic Offices



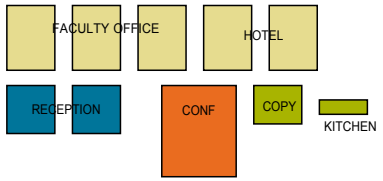
Food Industry Leadership Center



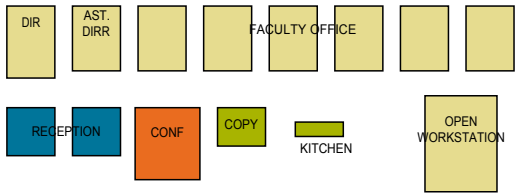
Center for Global Leadership and Sustainability (CGLS)



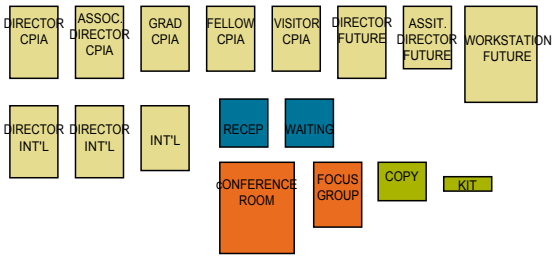
Entrepreneurial Center



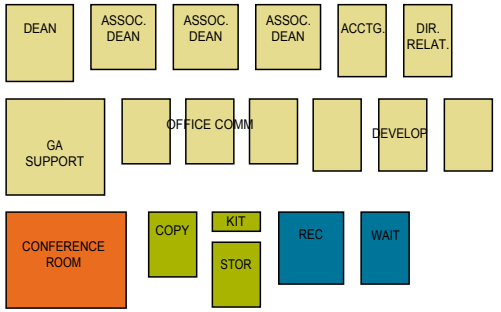
Center for Real Estate



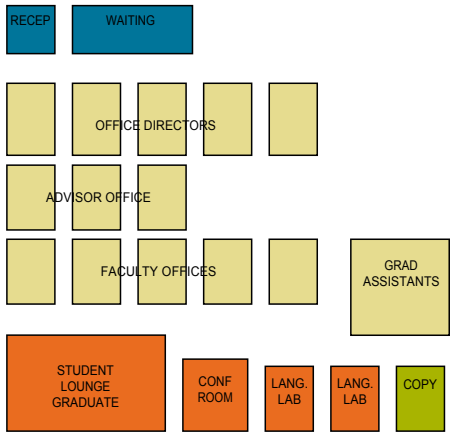
Shared Center



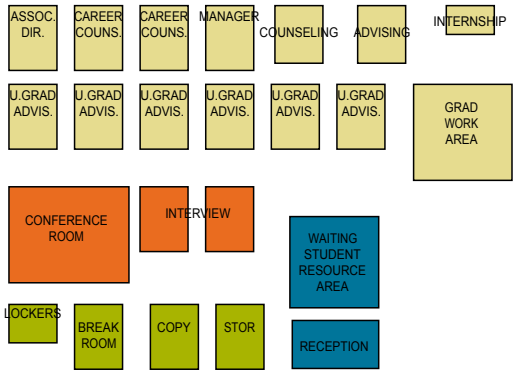
Office of the Dean

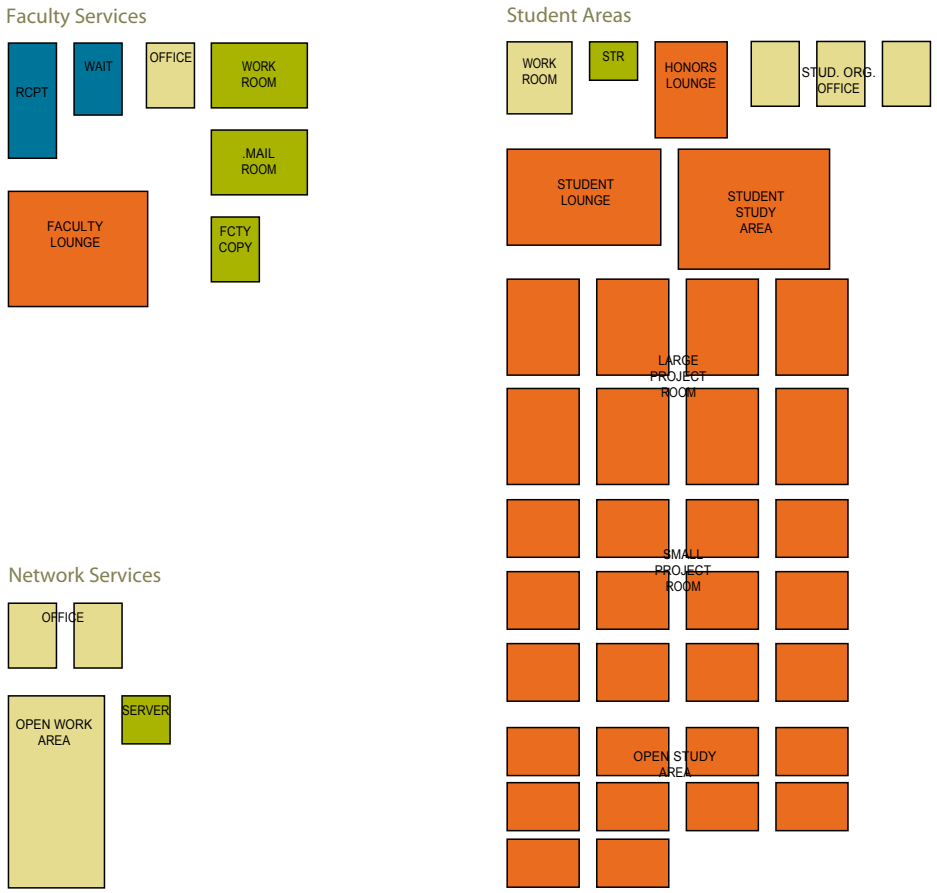


Graduate Programs Office

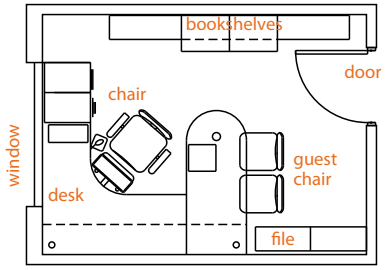


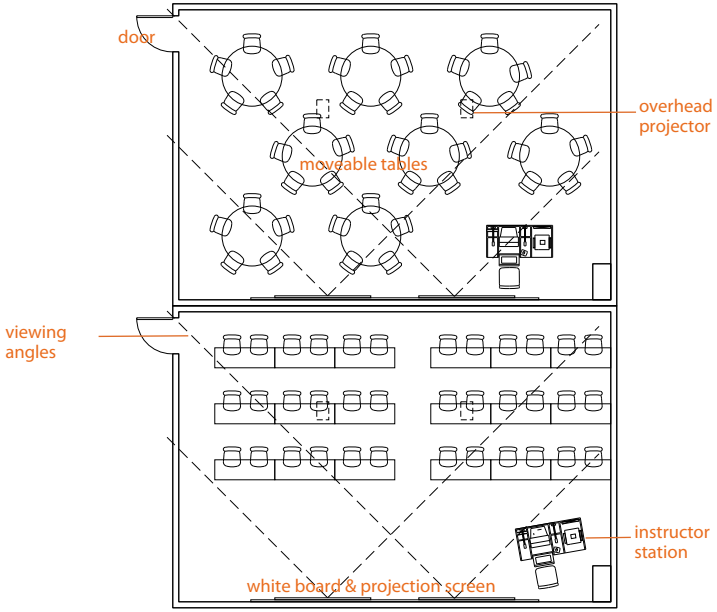
Undergraduate Programs Office




Faculty Services
RCPT
WAIT
OFFICE
WORK ROOM
.MAIL ROOM
FACULTY LOUNGE
FCTY COPY
Network Services
OFFICE
OPEN WORK AREA
SERVER
Student Areas
WORK ROOM
STR
HONORS LOUNGE
STUD. ORG. OFFICE
STUDENT LOUNGE
STUDENT STUDY AREA
LARGE PROJECT ROOM
SMALL PROJECT ROOM
OPEN STUDY AREA
General
LACTATION
GEN STOR
BIKE STOR
University Classrooms
3000 S.F. MEDIUM LECTURE HALL
6000 S.F. LARGE LECTURE HALL

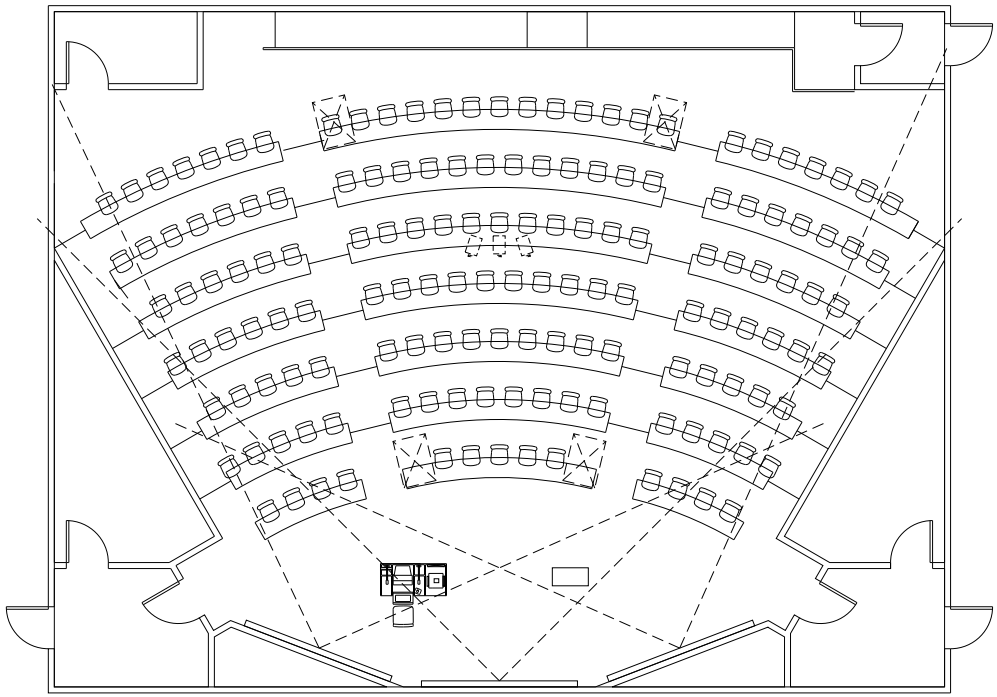
KEY





ROOM DATA SHEETS

The following pages contain examples of room types that are planned for the Portland State University School of Business. The diagrams are meant to be indicative of the general shape and layout of the rooms, but will likely be altered to work within the architecture of a final scheme. Where required, minimum dimensions are identified and should be maintained in the final placement and design of the room.



150 SEAT AUDITORIUM
3,000 SF

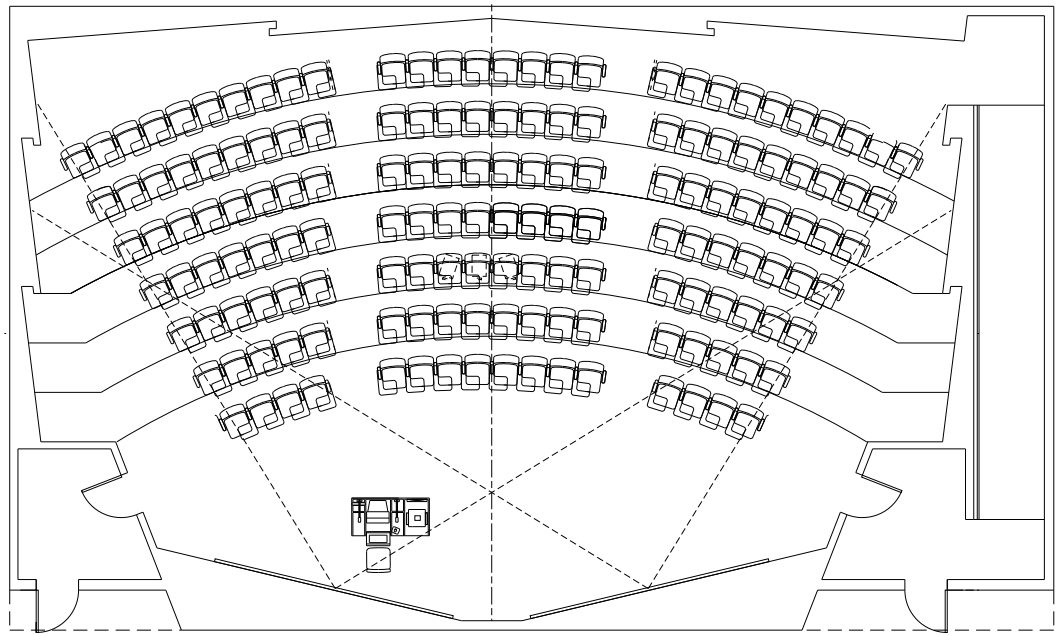
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology
outlets for laptops

furniture
moveable chairs
fixed university style tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics
provide accessible seating at multiple levels



150 SEAT AUDITORIUM
4,500 SF

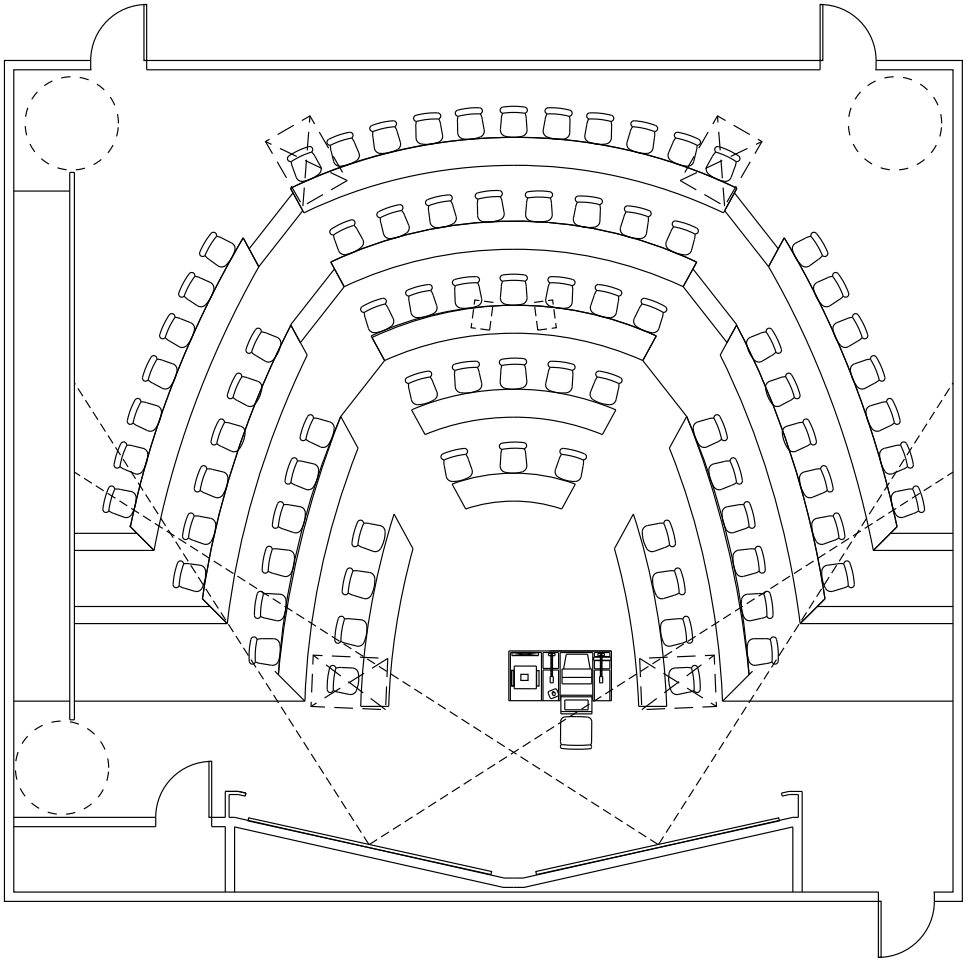
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology
outlets for laptops

furniture
moveable chairs
fixed university style tables
instructor station

equipment
white boards
projection screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics
provide accessible seating at multiple levels



75 SEAT TIERED CLASSROOM
2,100 SF

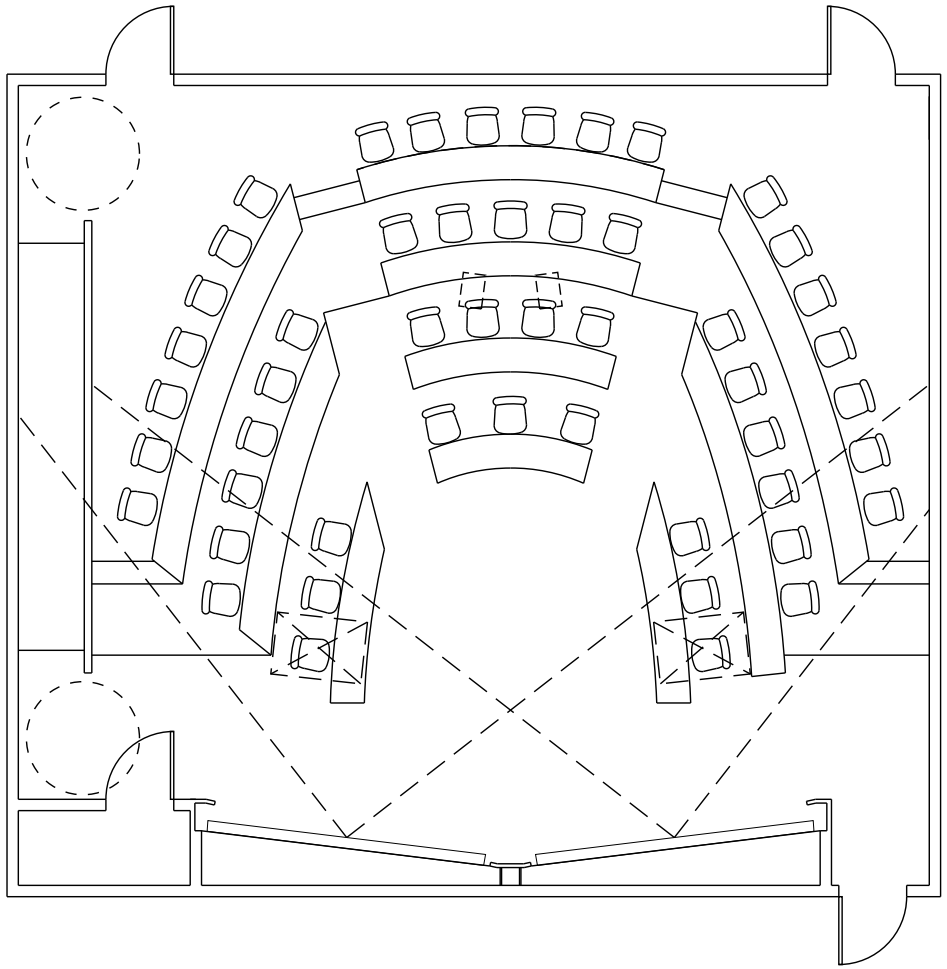
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology
outlets for laptops

furniture
moveable chairs
fixed university style tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics
provide accessible seating at multiple levels



50 SEAT TIERED CLASSROOM
1,400 SF

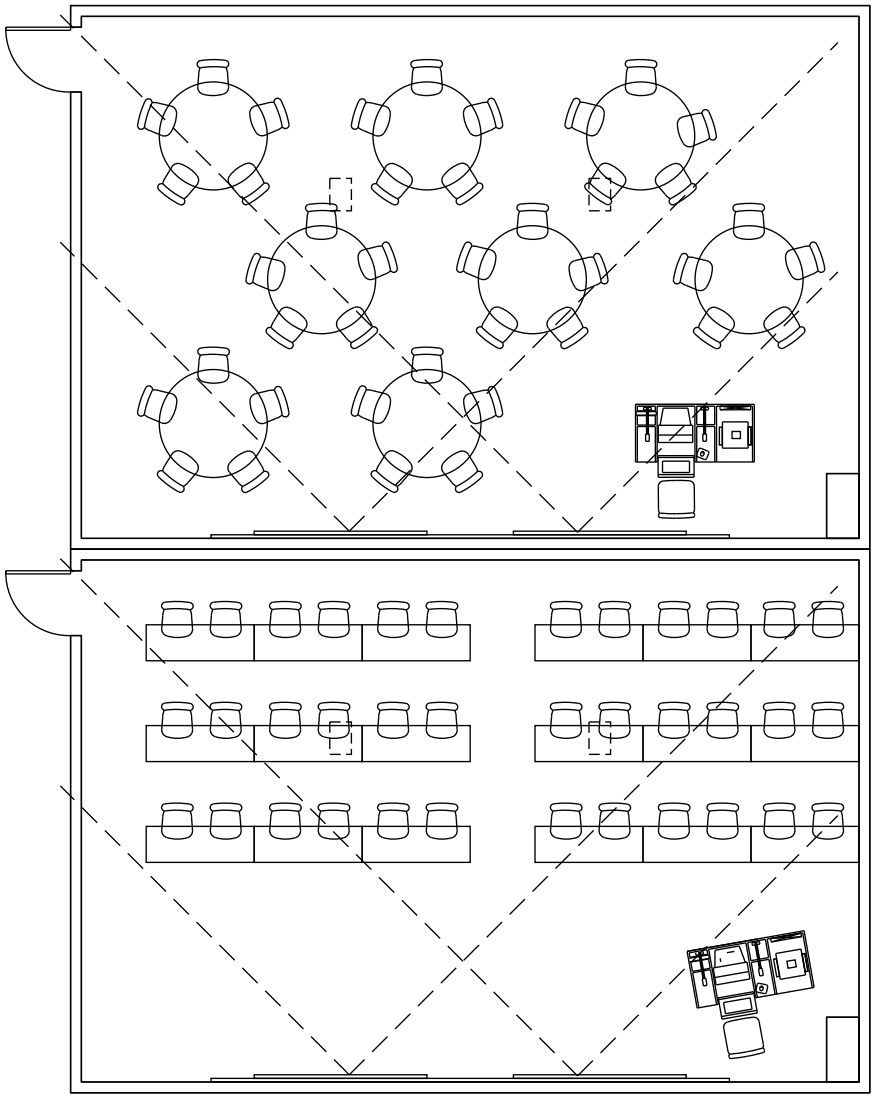
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology
outlets for laptops

furniture
moveable chairs
fixed university style tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics
provide accessible seating at multiple levels



35 SEAT CLASSROOM
875 SF

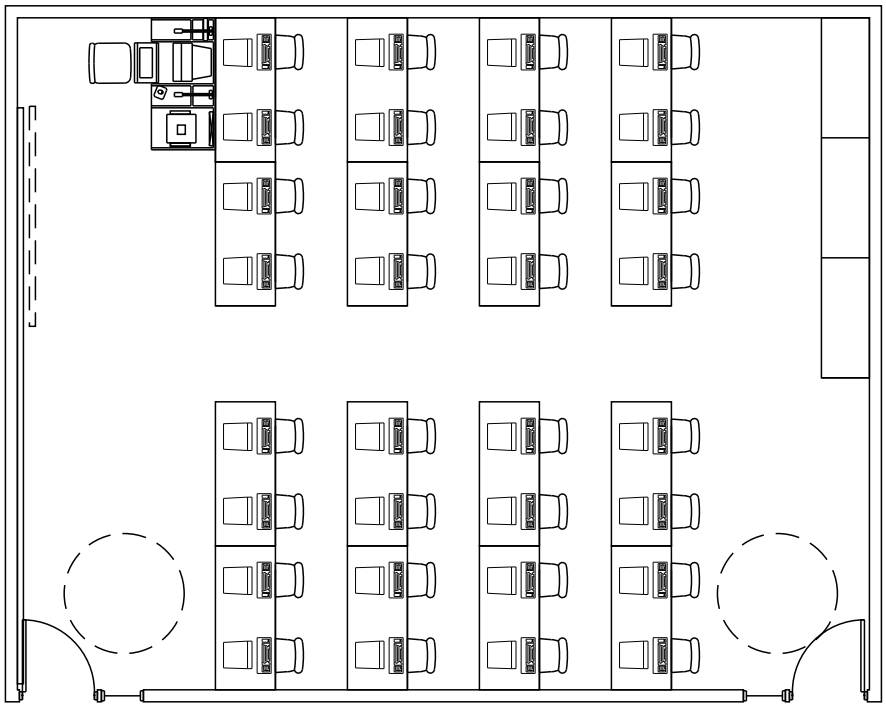
Finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 3 classroom technology
outlets for laptops

furniture
moveable chairs
moveable tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics



COMPUTER CLASSROOM
1,050 SF

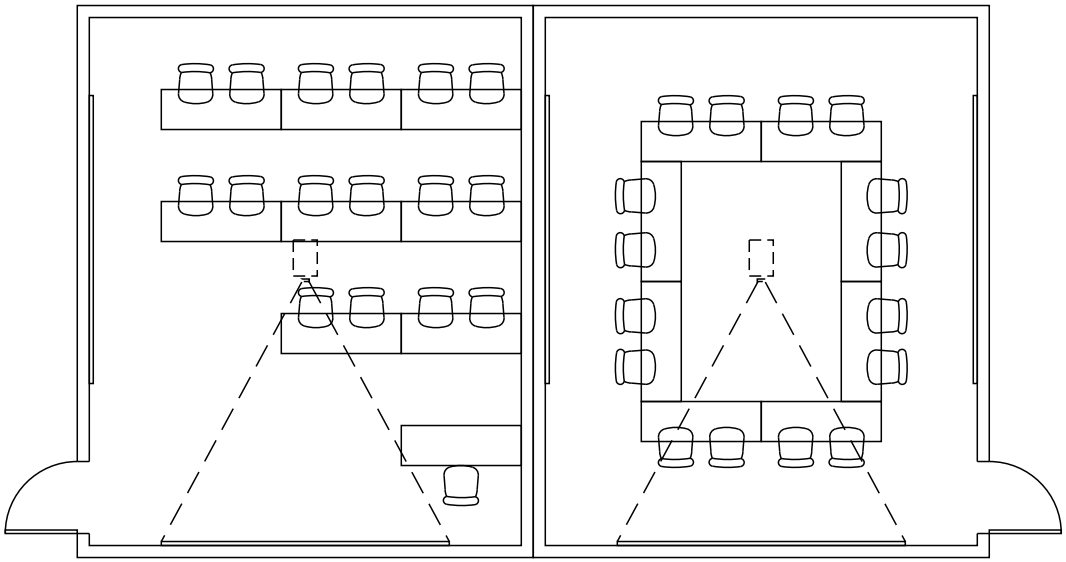
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 3 classroom technology
outlets for laptops

furniture
moveable chairs
moveable tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics



SEMINAR ROOM
390 SF

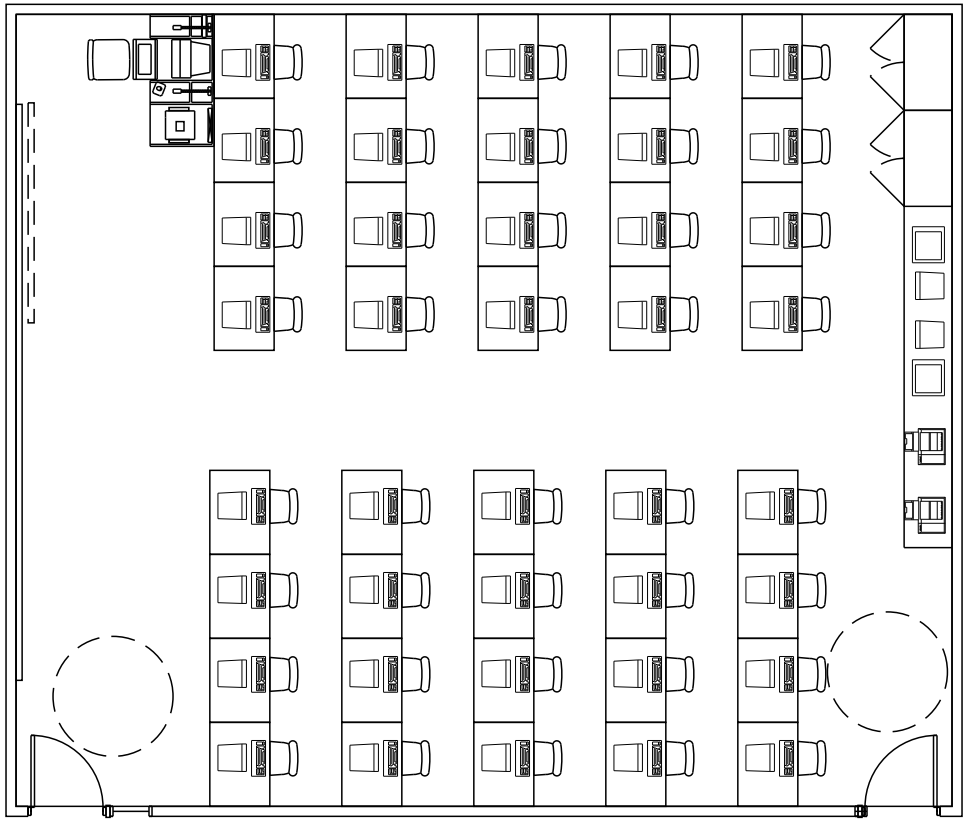
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 3 classroom technology
outlets for laptops

furniture
moveable chairs
moveable tables
instructor station

equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics



COMPUTER LAB - GRADUATE
1,200 SF

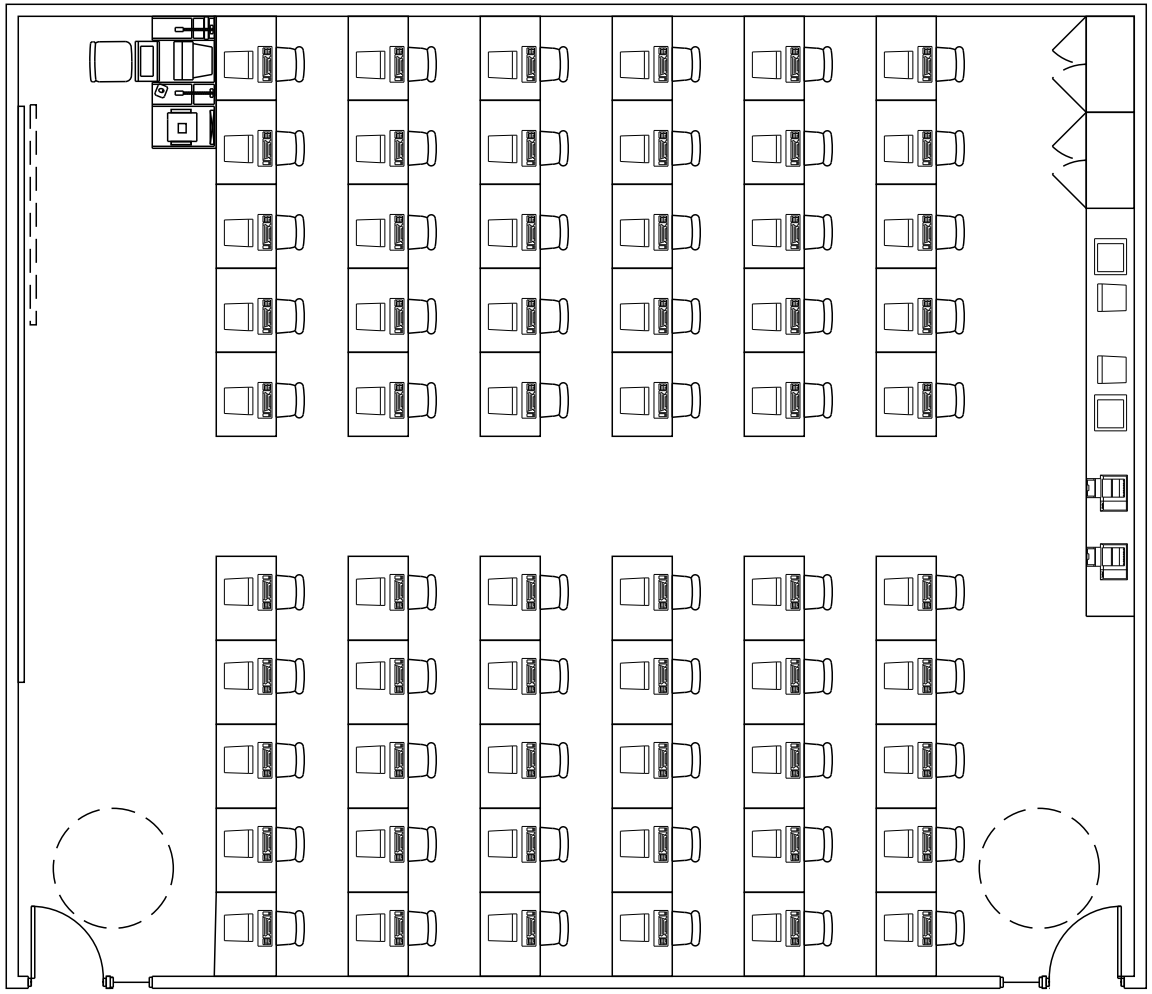
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology

furniture
moveable chairs
computer workstations
storage cabinets and work counter

equipment
white boards
projections screen
ceiling mounted projector
video capture
printers
scanners
computers with monitors and keyboard trays

special requirements
provide access to natural light
control acoustics
control glare



COMPUTER LAB - UNDERGRADUATE
1800 SF

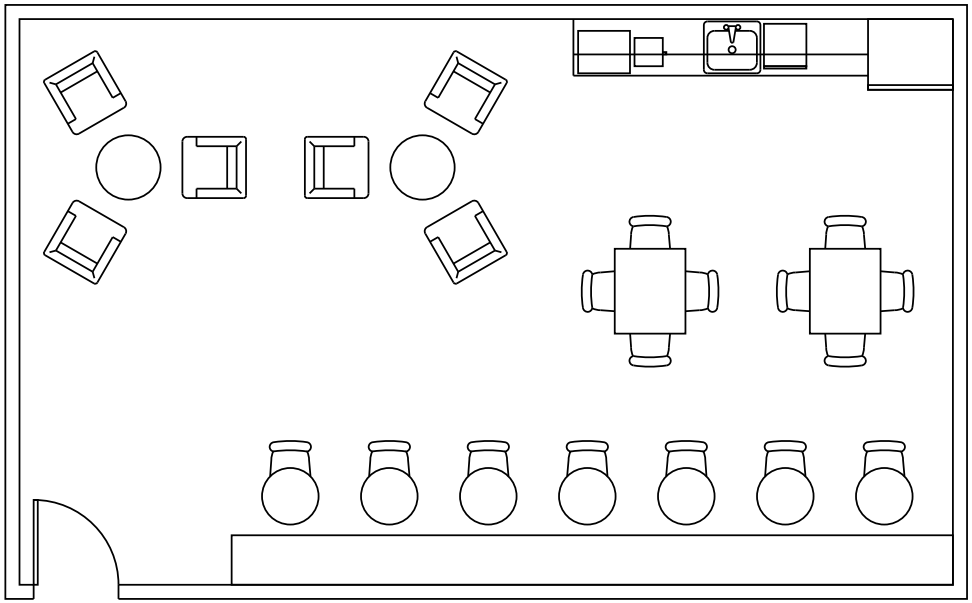
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 4 classroom technology

furniture
moveable chairs
computer workstations
storage cabinets and work counter

equipment
white boards
projections screen
ceiling mounted projector
video capture
printers
scanners
computers with monitors and keyboard trays

special requirements
provide access to natural light
control acoustics
control glare



GRADUATE LOUNGE
650 SF

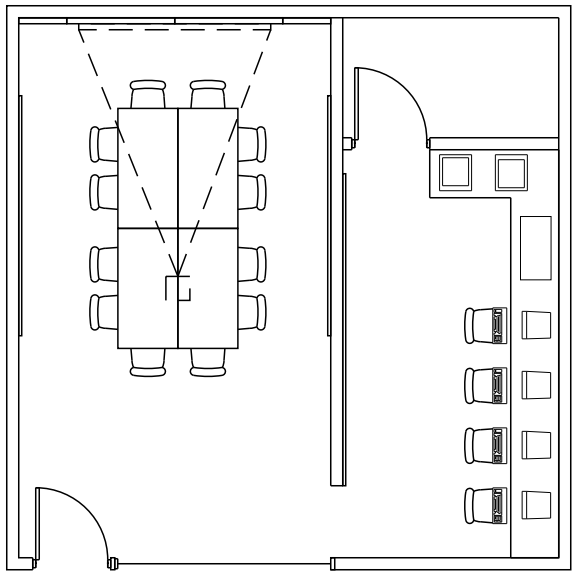
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

technology
wireless

furniture
moveable chairs
tables and chairs
storage cabinets and work counter

equipment
tack boards
refrigerator
microwave
sink
coffee maker

special requirements
provide access to natural light
control acoustics
control glare
built-in bench



AD LAB
500 SF

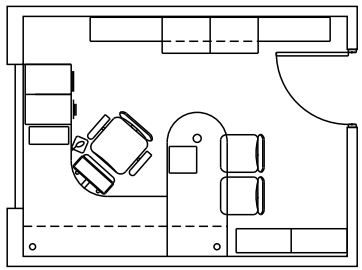
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling and gypsum board
other wood base and chair rails

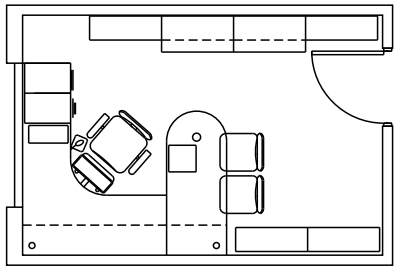
technology
wireless
level 4 classroom technology

furniture
moveable chairs
4 computer workstations
storage cabinets and work counter
tables and chairs

equipment
white boards
tack surface
projections screen
ceiling mounted projector
printers
scanners
computers with monitors and keyboard trays

special requirements
provide access to natural light
control acoustics
control glare





OFFICE
135 SF / 150 SF

finishes

floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling
other wood base and wood shelves

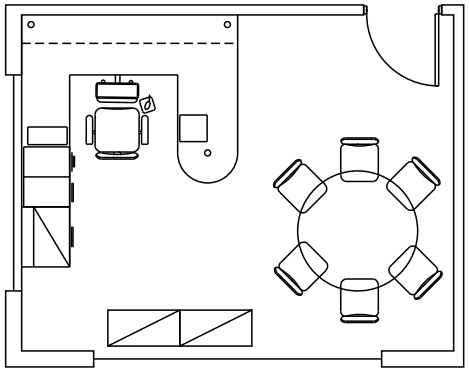
technology
wireless
data, phone and power

furniture
systems furniture
moveable chair
guest chairs
file cabinets

equipment

printers
computers with monitors and keyboard trays

special requirements
provide access to natural light and view
control acoustics
control glare



OFFICE
225 SF

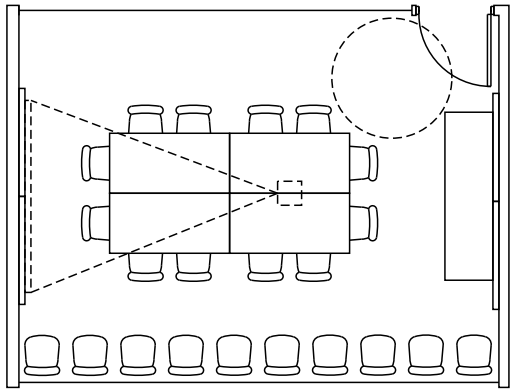
finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling ACT ceiling
other wood base and wood shelves

technology
wireless
data, phone and power

furniture
systems furniture
moveable chair
guest chairs and table
file cabinets

equipment
printer
computers with monitors and keyboard trays

special requirements
provide access to natural light and view
control acoustics
control glare



CONFERENCE ROOM
200 SF

finishes
floor carpet
walls gypsum board, painted and acoustic panel
ceiling wood slat ceiling and gypsum board
other wood base and chair rails

technology
wireless
level 3 classroom technology
outlets for laptops

furniture
moveable chairs
moveable tables
instructor station

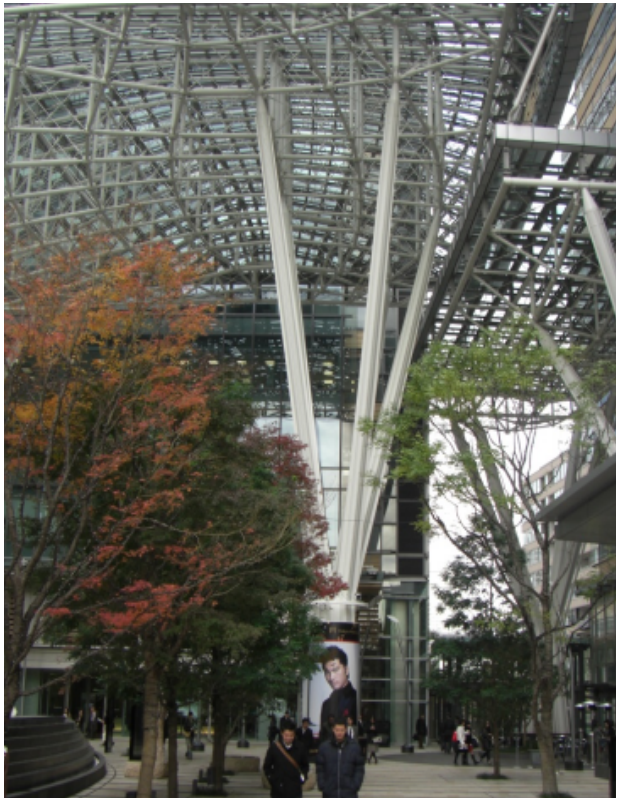
equipment
white boards
projections screen
ceiling mounted projector
video capture

special requirements
provide access to natural light
control acoustics

CONCEPTS

BUILDING AS COMMUNITY

Create a home for the PSU School of Business and its wider community with a building that reflects the spirit of the occupants, the aspirations of the community and provides inspiration that reflects the importance of higher education.

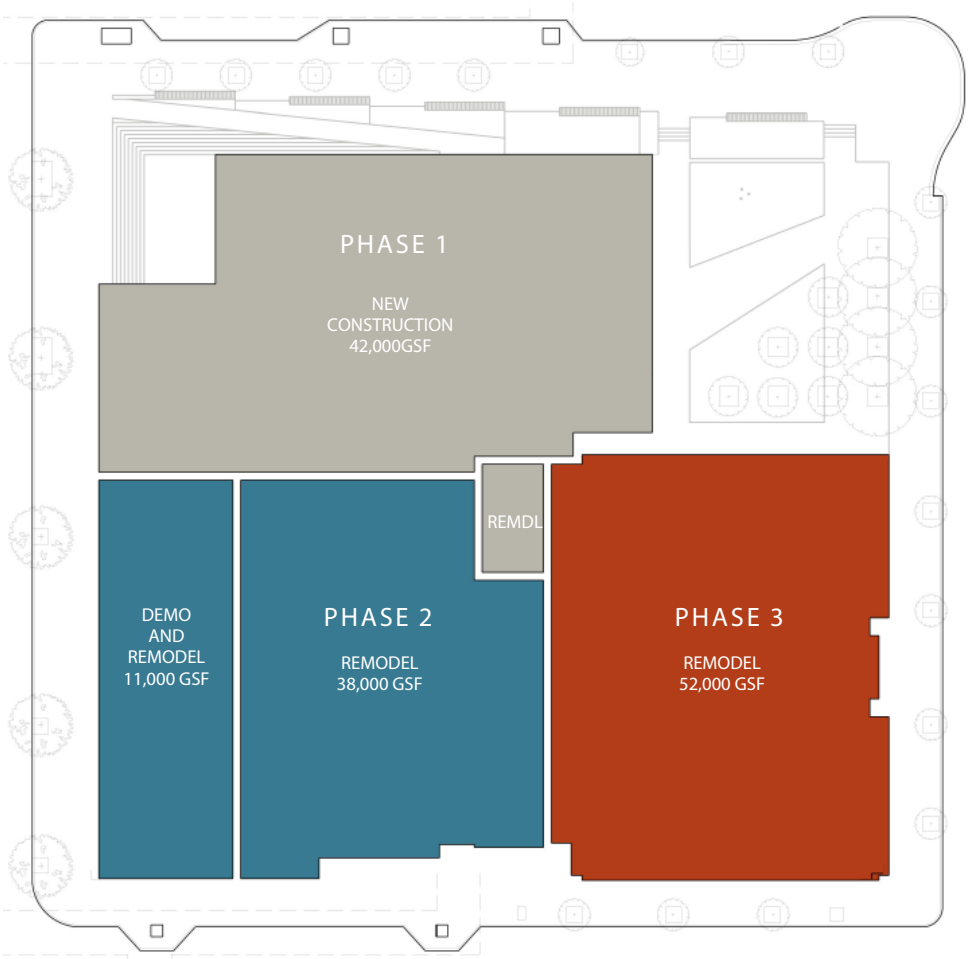


BUILDING AS ECOSYSTEM

In the same manner that an ecosystem is an interactive system established between living creatures and their environment, design an integrated facility responsive to the environment that enhances the social and economic aspects of the regional community and performs at the highest level of efficiency and functionality.

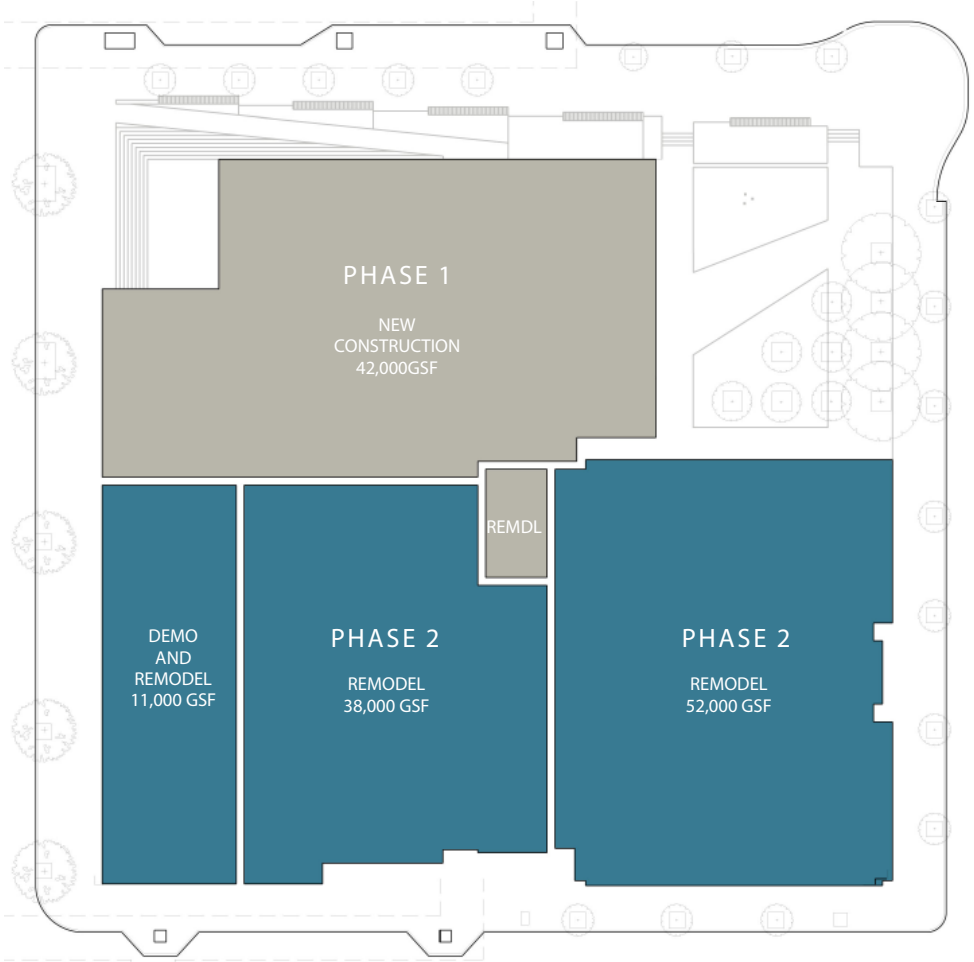
BUILDING AS PARTNER

Develop the site and district with a spirit of cooperation by encouraging partnerships with entities who agree to embody common social and environmental goals, contribute by combining property, knowledge and activities, and therefore share the development's profits and benefits.



PHASING OPTION ONE

The addition on the north side of the site can be built first with relatively minor impacts to the existing building. This allows the remodel of the existing building to be postponed until the School of Education relocates and allows the School to continue partial occupancy of the existing building while construction is finished.



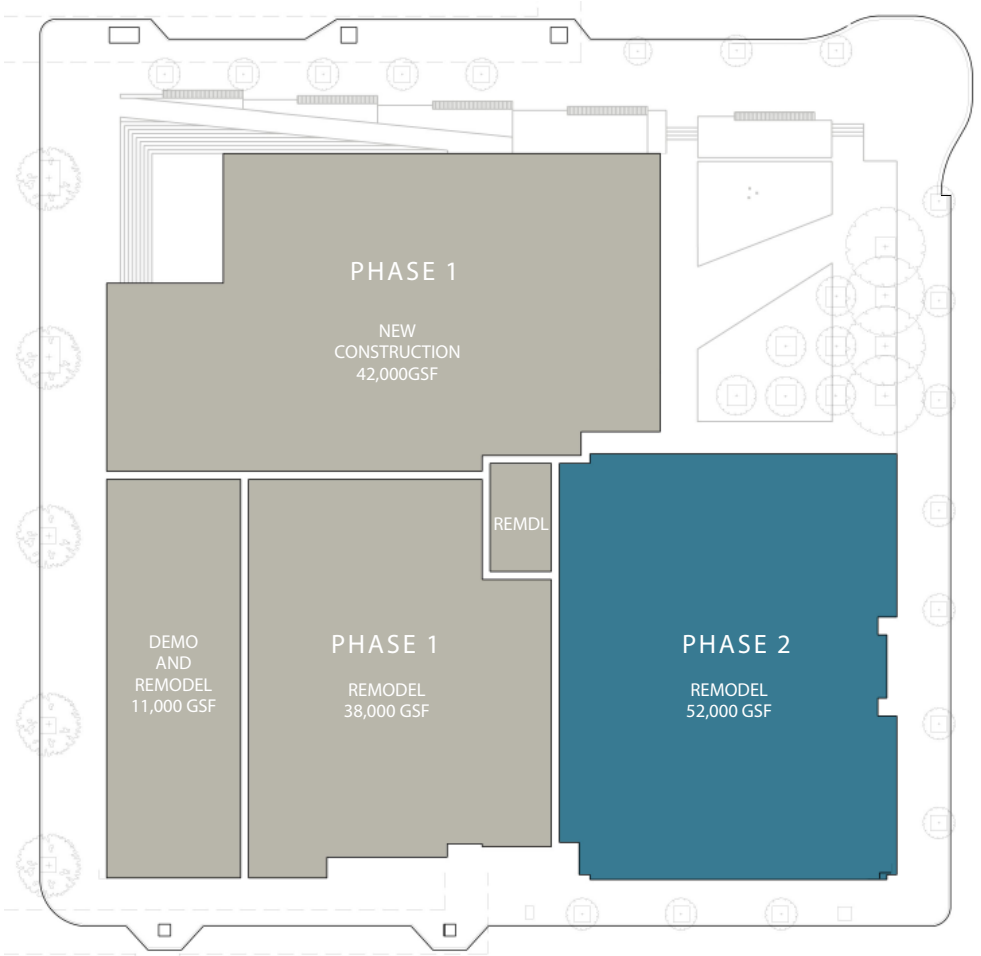
PHASING OPTION TWO

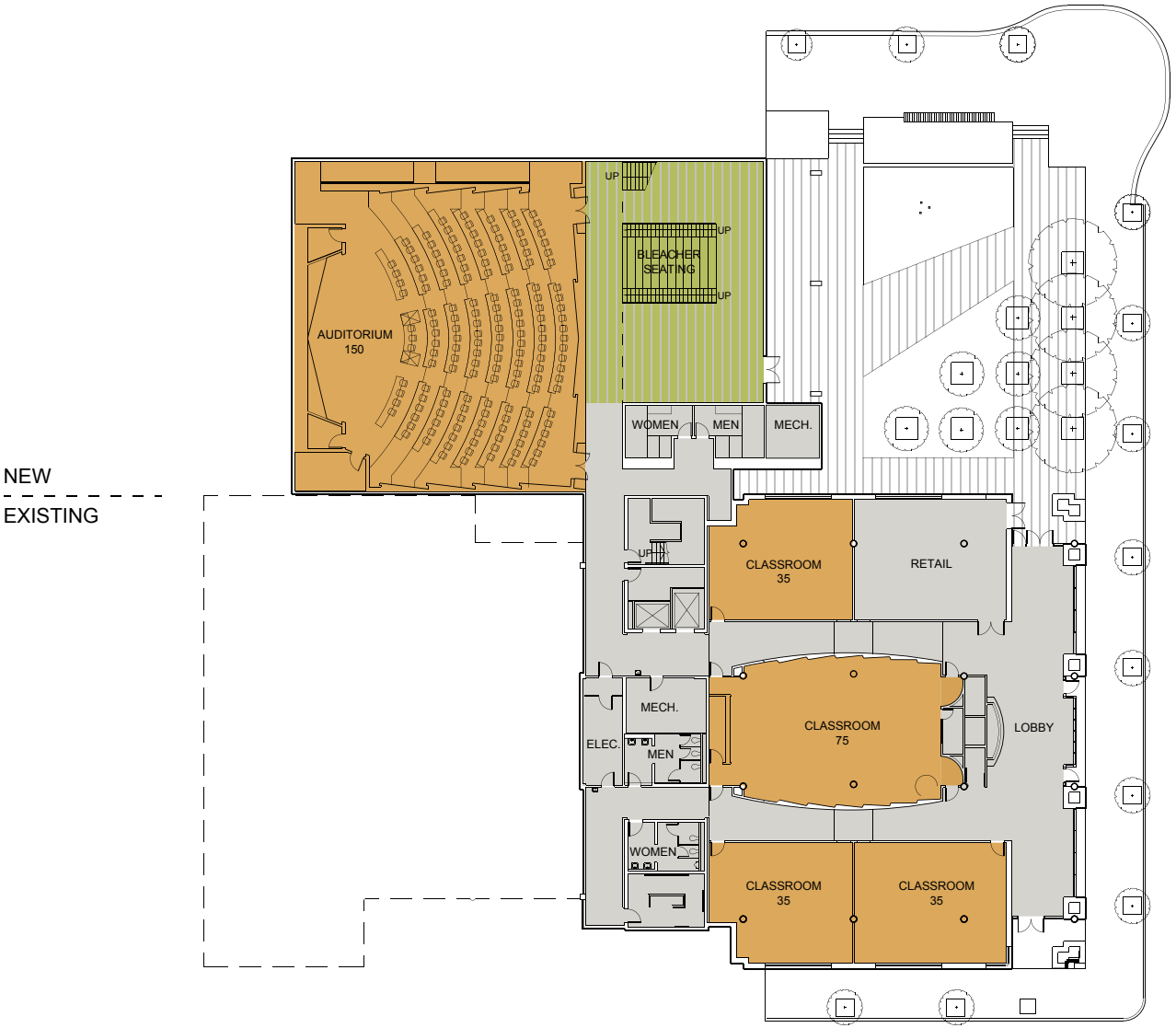
This phasing scenario builds the addition first without impacting the existing building program. The entire existing building would be remodeled and would require the School to temporarily relocate during construction.

PHASING OPTION THREE-RECOMMENDED

The recommended option is to build the addition and remodel the adjacent portion of the existing building at the same time. This allows greater flexibility for interior reconfiguration of spaces and allows the exterior architectural expression to signify one School under a single roof.

Plans call for the west end of the existing School of Education side of the building to be demolished and rebuilt with a larger structural bay to allow for large classrooms. This option allows for an economy of new construction to happen at the same time.





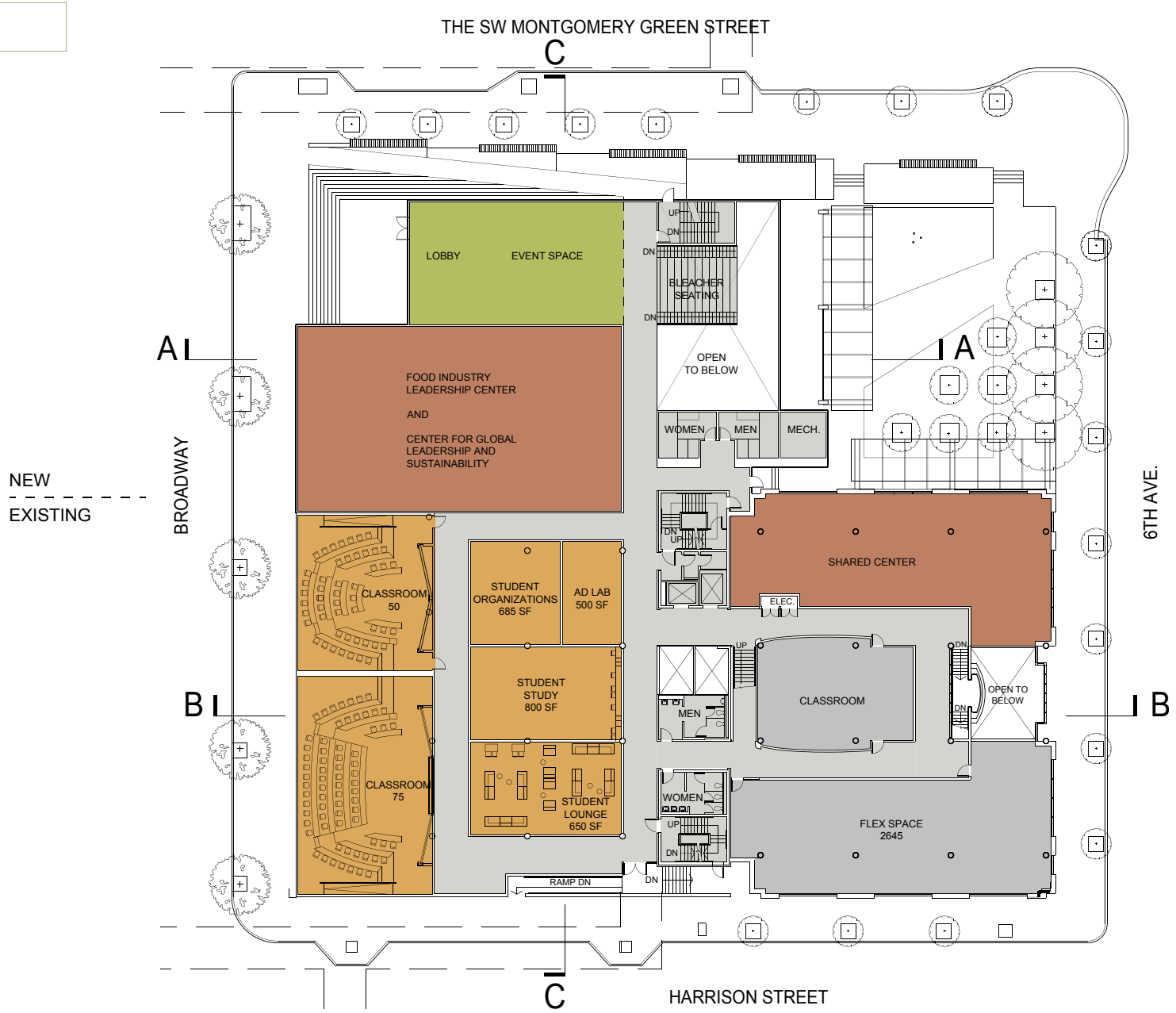
LEVEL ONE

The main building entry is diagonally across the street from the Urban Center Plaza. The entry opens to a three story atrium with a grand staircase that will serve as informal auditorium seating and a prefunction area for the large auditorium on this level Potential retail on the southeast corner of the entry plaza would activate the edge of the plaza with access to outdoor seating.

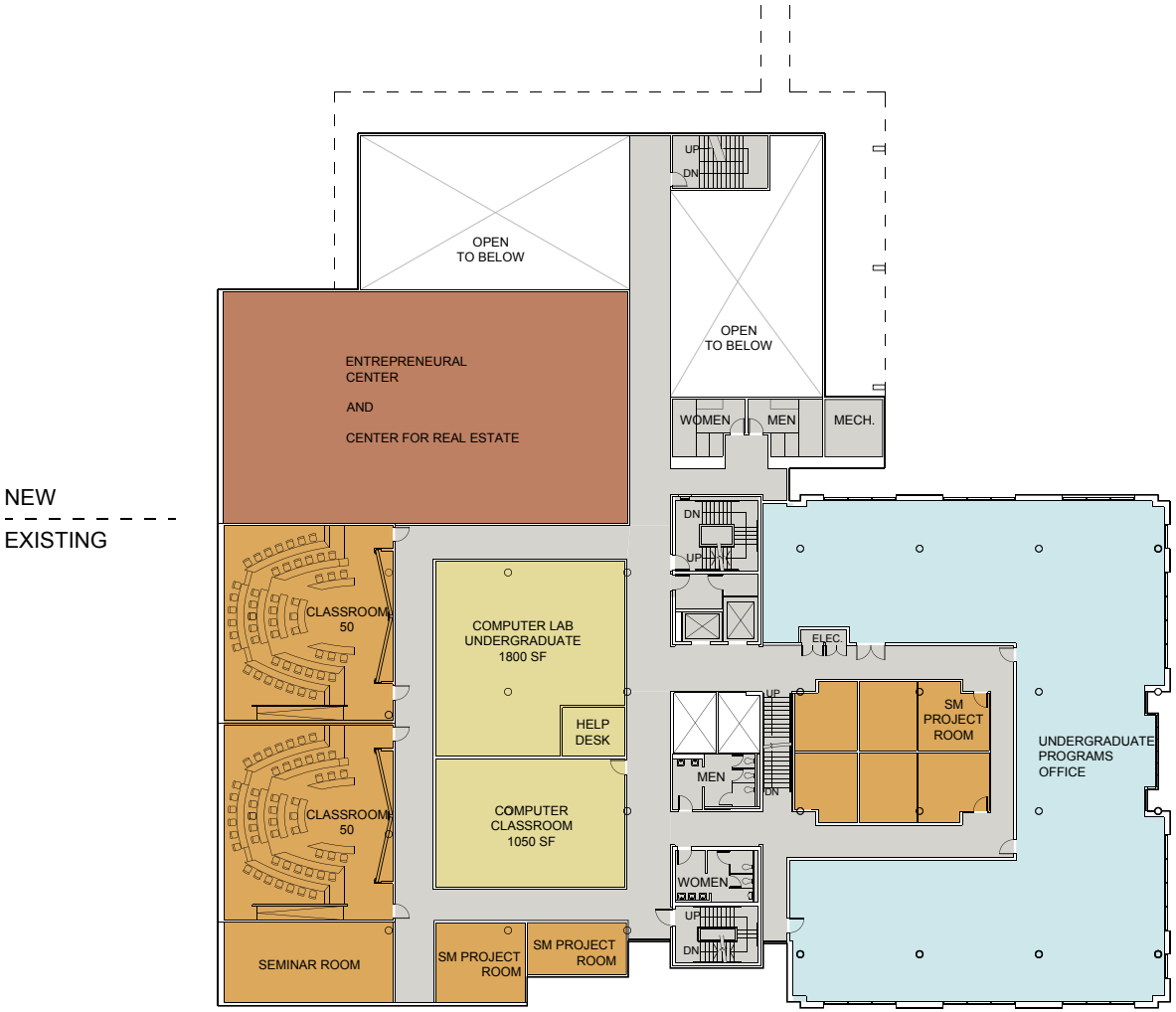
- lobby/event
- instructional
- faculty offices
- other offices
- centers
- computers

LEVEL TWO

A two story Special Event space is located at the top of the stairs with a view back across the atrium to the Urban Center Plaza. This event space also serves as a lobby for the Business Centers, accessible from Broadway Ave. The remainder of the floor houses tiered classrooms, student spaces, and flex space for future program additions.



- lobby/event
- instructional
- faculty offices
- other offices
- centers
- computers



LEVEL THREE

Level three is focused on undergraduate uses including computer labs, classrooms and the undergraduate office. In addition, two centers are located in the new addition, overlooking the Special Event space.

- lobby/event
- instructional
- faculty offices
- other offices
- centers
- computers

LEVEL FOUR

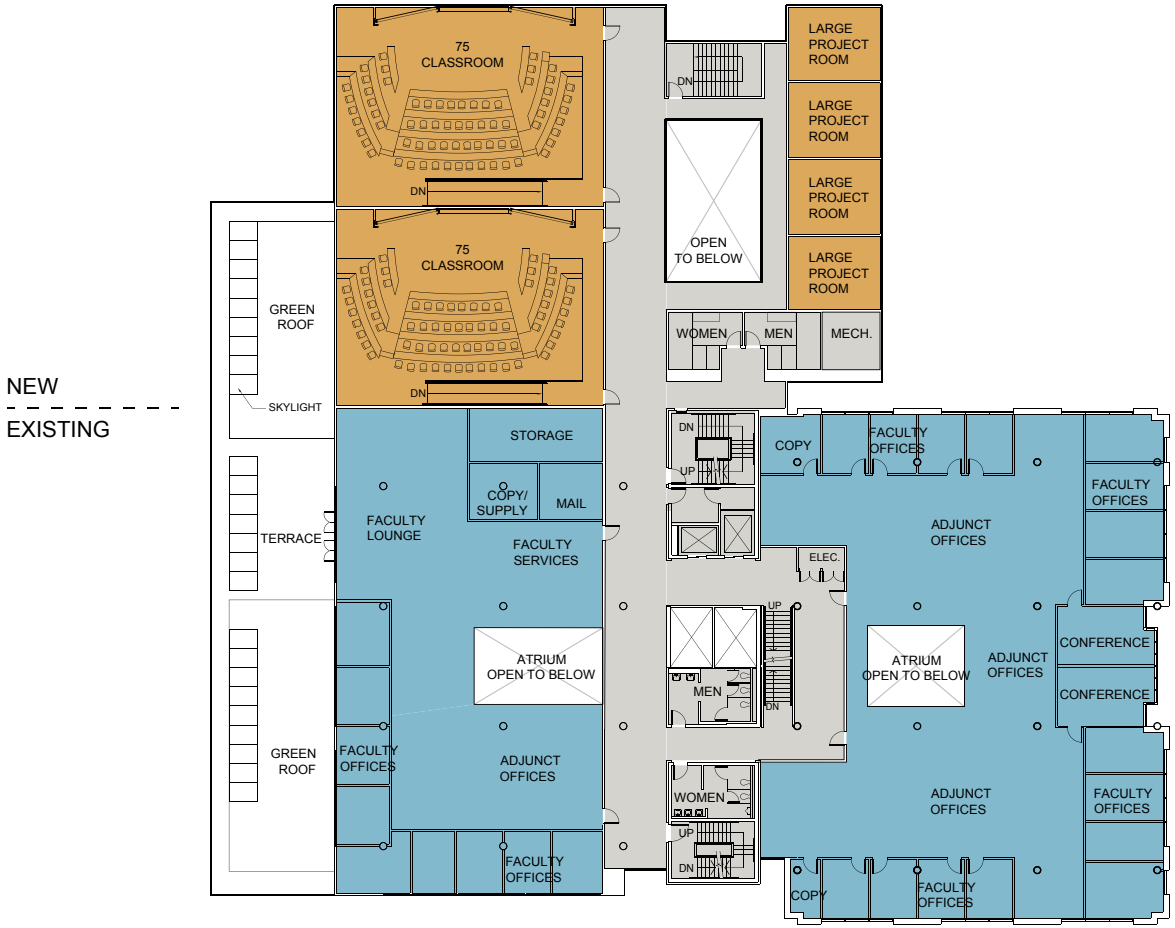
Level four contains large classrooms, project rooms that overlook the plaza and the Urban Center Plaza, Graduate Programs and computer services. Level four is where three upper level atriums begin. This floor is dedicated to more quiet, less public student spaces.

The existing sky bridge currently accesses the fourth level. The portion on the site will be removed and replaced with a smaller bridge access on the north side of the addition.

NEW

EXISTING

lobby/event
instructional
faculty offices
other offices
centers
computers



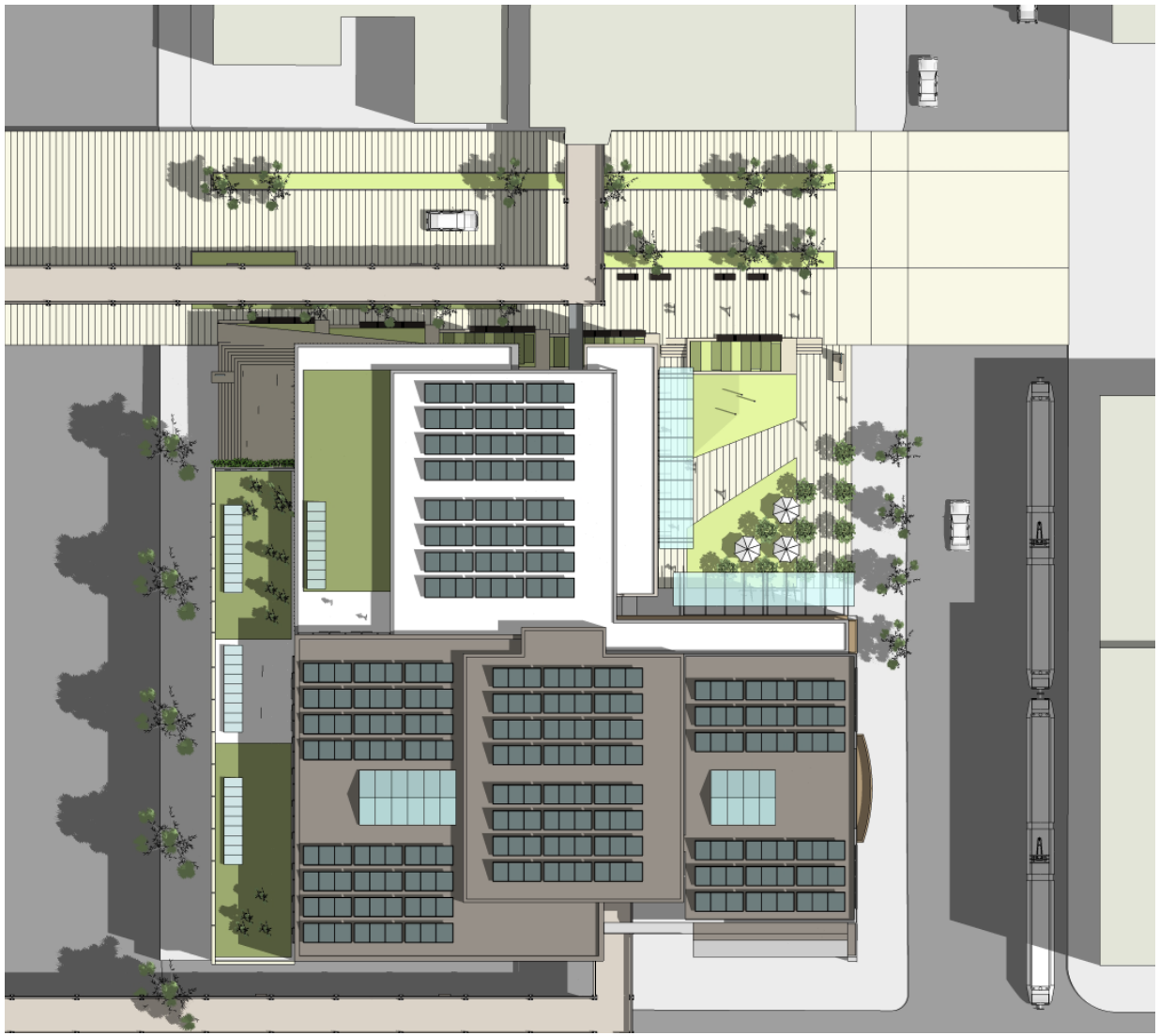
LEVEL FIVE

Level five is dedicated to faculty offices as well as classrooms. There are 3 separate openings in the floor, crowned by skylights that direct natural light into the core of the building. This level houses faculty services and a green roof terrace dedicated to faculty use.

- lobby/event
- instructional
- faculty offices
- other offices
- centers
- computers

LEVEL SIX

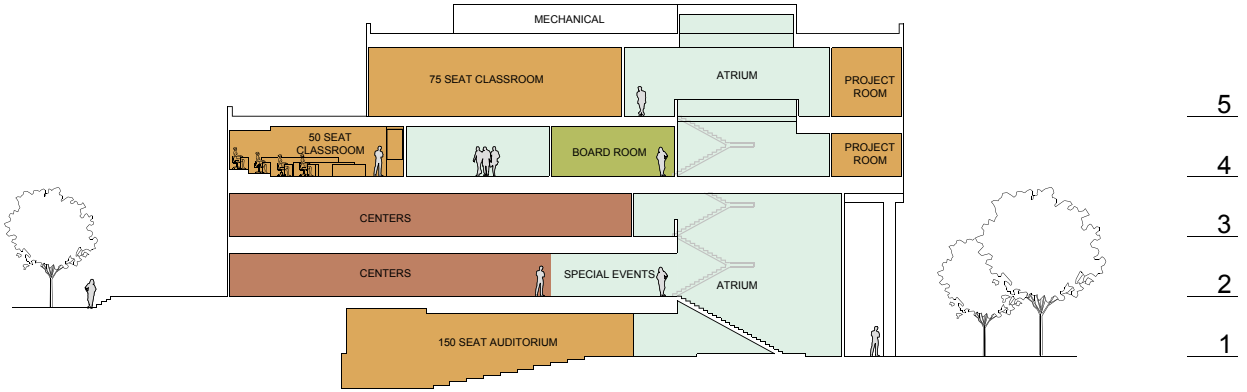
The new addition stops at Level Five and is crowned with a clerestory for the atrium, green roof, and a faculty terrace. The existing floor plate will be occupied by faculty offices and the Office of the Dean.



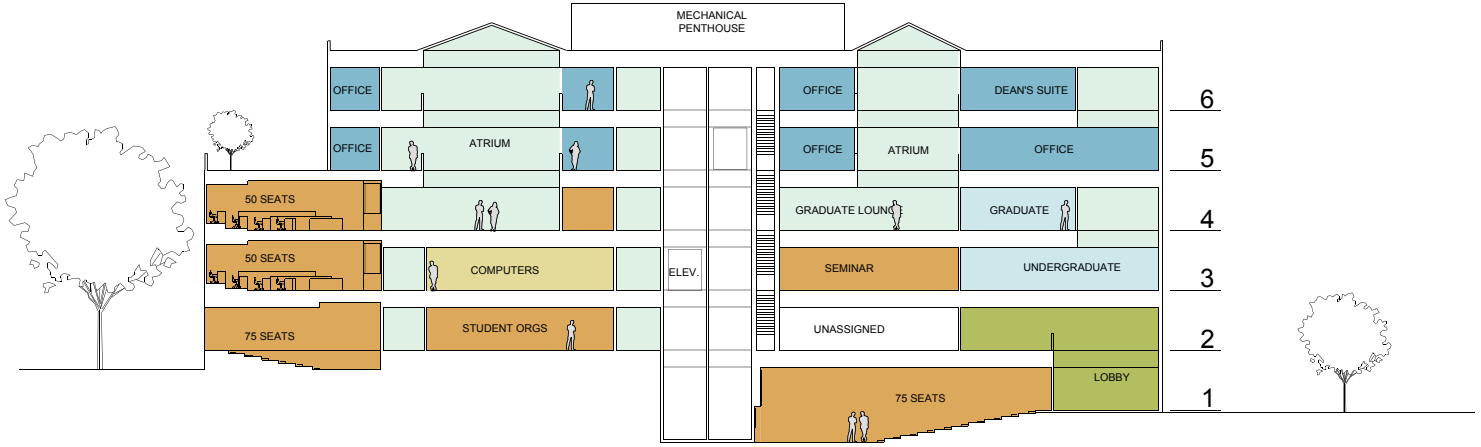
VIEW OF ROOF AND SITE

The roof space will be covered with mechanical equipment penthouses, photovoltaic panels, skylights, and greenroofs., as appropriate. This illustration indicates potential uses for the roof which will be further developed in Schematic Design.

SITE SECTIONS



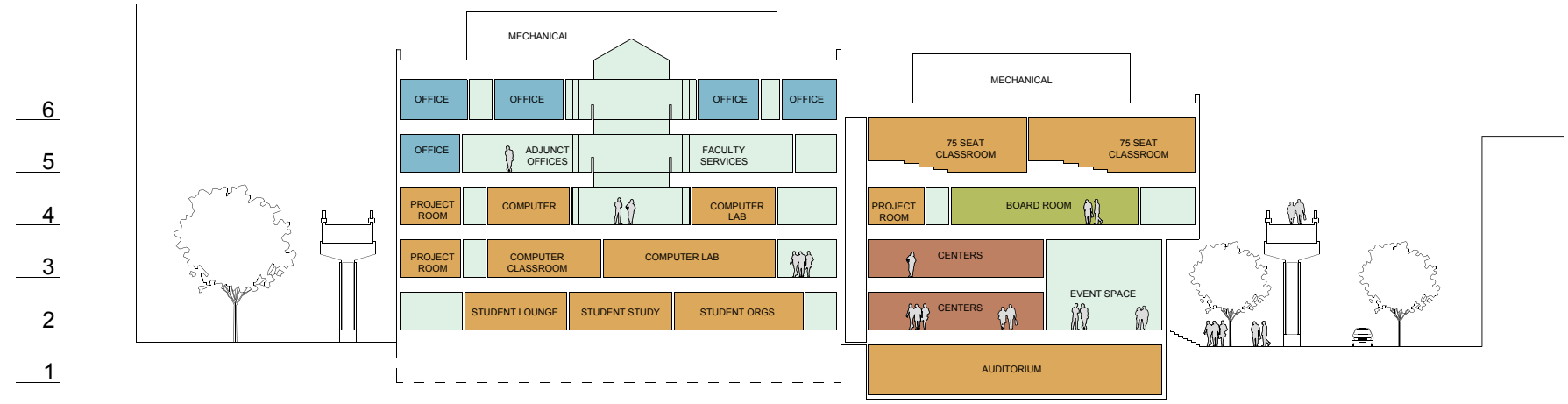
A



B

- lobby/event
- instructional
- faculty offices
- other offices
- centers
- computers

SITE SECTIONS



C

lobby/event
instructional
faculty offices
other offices
centers
computers

view of the Portland State University
School of Business Administration from
Broadway Avenue and Montgomery Street

Looking towards 6th and Montgomery
from the atrium of the new addition at the
School of Business Administration

view of the Portland State University
School of Business Administration from
6th Avenue and Montgomery Street

NARRATIVES

Create Exterior Connections and View of Interior Activity

Take advantage of Rooftop Access and Views

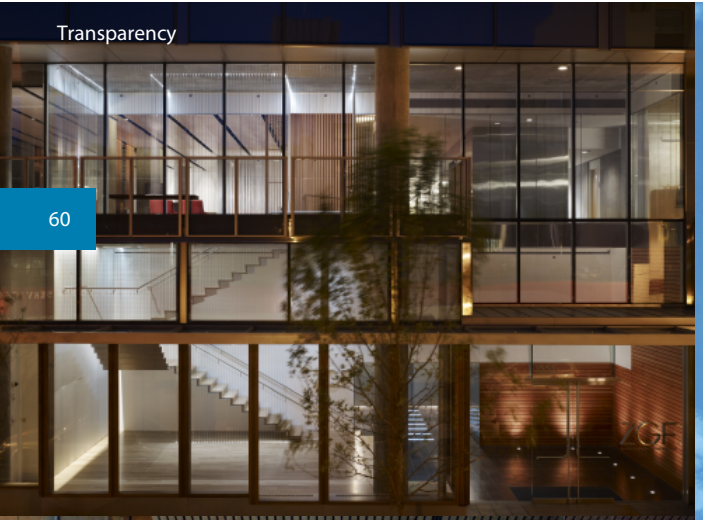
Use Atrium to Direct Light into Building

ARCHITECTURAL

To achieve the goals for the project it is imperative to design an integrated building in which all elements and systems are interwoven like an ecosystem. Every element will serve more than one task in creating the symbiotic whole.

The overall expression of the facility should be a reflection of the School of Business and of the region as a whole. Therefore:

– The spatial organization will reflect the egalitarian nature of the Northwest and the function of the School and University. Large community spaces at the heart of the facility will be open to everyone and accessible to the community.
– Social interaction will be supported through transparent walls, outwardly focused spaces, and various scales of interaction areas open to faculty, students and visitors. A prominent social arm will be extended to the community with a focus on supporting and growing outreach programs. The facility will be designed to be warm and welcoming.
– The addition will be designed to integrate with the goals of the Montgomery Green Street Plan.
– The aesthetic expression will recognize the community, region, function and values through natural, durable materials including local, recycled and reclaimed products. The process of creating the building will give special consideration to local, disadvantaged and leveraged opportunities to realize the greatest economic and social opportunities. Wood, masonry, and glazing to allow views to the Urban Center Plaza will be combined to create a uniquely Northwest architecture that enhances the ethic of the SBA.
– Materials will be selected for their regional character, durability and low maintenance to reduce the use of cleaning products, limit the replacement over time, and improve the quality and timelessness of the building.


Transparency


Curtainwall with operable windows

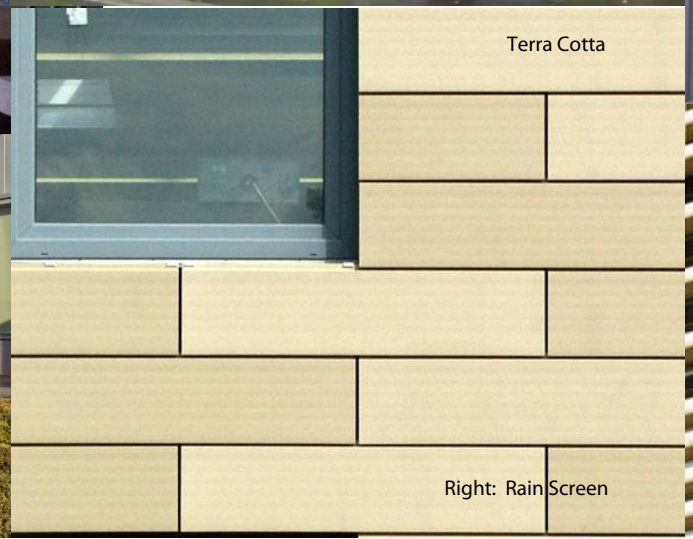

Existing facade: brick and precast


Wood


Living wall


Existing facade: metal panels


Photovoltaic Panels and Green Roof


Terra Cotta
Right: Rain Screen

Use Regional and Natural Materials such as Wood and Stone to Reflect the Northwest Culture

ENVIRONMENTAL GOALS

The new School of Business Administration will achieve a LEED certification as defined by the United States Green Building Council.

The project stakeholders aspire to meet the Living Building Challenge, an emerging paradigm that encourages truly sustainable levels of building performance rather than simply reducing impact.

The Living Building Challenge is composed of six performance areas, or Petals: Site, Energy, Materials, Water, Indoor Quality, Beauty and Inspiration. Projects may apply for individual Petal designation by satisfying the requirements within that Petal, or for Living Building Status by attaining all the requirements within that system.

Every effort will be made to achieve the ultimate goal of a Living Building. Certain requirements, such as those requiring Net Zero Energy use and Net Zero Water use, will be particularly challenging in this highly urban and conspicuous location and will require the commitment and dedication of all involved parties. Achievement of this goal would likely be a first for an institutional building, a first for an urban building, and a tremendous testament to the ethic of the SBA and PSU.

Given its alignment with their mission and the potential to communicate social and environmental responsibility to the community through this facility, the School of Business Administration and Portland State University view the Living Building Challenge as a fitting , challenging, and highly exciting goal for this facility.

LEED NC v 2009 Checklist

PSU SBA Addition and Remodel

16-Nov-10

0	58	45	9	Total Project Points	Certified 40-49, Silver 50-59, Gold 60-79, Platinum 80+
Y	?Y	?N	N		
0	20	3	3	**Sustainable Sites**	
Y				c Prereq 1	Construction Activity Pollution Prevention
	1			d Credit 1	Site Selection
	5			d Credit 2	Development Density & Community Connectivity (5 points)
			1	d Credit 3	Brownfield Redevelopment
	6			d Credit 4.1	Alternative Transportation: Public Transportation Access (6 points)
	1			d Credit 4.2	Alternative Transportation: Bicycle Storage & Changing Rooms
		3		d Credit 4.3	Alternative Transportation: Low-Emitting and Fuel-Efficient Vehicles (3 points)
	2			d Credit 4.4	Alternative Transportation: Parking Capacity (2 points)
			1	c Credit 5.1	Site Development: Protect or Restore Habitat
			1	d Credit 5.2	Site Development: Maximize Open Space
	1			d Credit 6.1	Stormwater Design: Quantity Control
	1			d Credit 6.2	Stormwater Design: Quality Control
	1			c Credit 7.1	Heat Island Effect: Non-Roof
	1			d Credit 7.2	Heat Island Effect: Roof
	1			d Credit 8	Light Pollution Reduction

0	6	9	0	**Water Efficiency**
Y				d Prereq 1	Water Use Reduction: 20% Reduction
	2			d Credit 1.1	Water Efficient Landscaping: Reduce by 50% (2 points)
	2			d Credit 1.2	Water Efficient Landscaping: No Potable Water Use or No Irrigation (2 points)
		2		d Credit 2	Innovative Wastewater Technology (2 points)
	2			d Credit 3.1	Water Use Reduction: 30% Reduction (2 points)
		3		d Credit 3.2	Water Use Reduction: 35% Reduction (3 Points)
		4		d Credit 3.2	Water Use Reduction: 40% Reduction (4 Points)

0	8	24	4	**Energy & Atmosphere**
Y				c Prereq 1	Fundamental Commissioning of the Building Energy Systems
Y				d Prereq 2	Minimum Energy Performance
Y				d Prereq 3	Fundamental Refrigerant Management
	2			d Credit 1.1	Optimize Energy Performance: 14% new or 10% Existing (2 points)
	2			d Credit 1.2	Optimize Energy Performance: 18% new or 14% Existing (2 points)
	2			d Credit 1.3	Optimize Energy Performance: 22% new or 18% Existing (2 points)
		2		d Credit 1.4	Optimize Energy Performance: 26% new or 22% Existing (2 points)
		2		d Credit 1.5	Optimize Energy Performance: 30% new or 26% Existing (2 points)
		2		d Credit 1.6	Optimize Energy Performance: 34% new or 30% Existing (2 points)
		2		d Credit 1.7	Optimize Energy Performance: 38% new or 34% Existing (2 points)
		2		d Credit 1.8	Optimize Energy Performance: 42% new or 38% Existing (2 points)
			2	d Credit 1.9	Optimize Energy Performance: 46% new or 32% Existing (2 points)
			2	d Credit 1.10	Optimize Energy Performance: 46% new or 32% Existing (2 points)
	1			d Credit 2.1	On-Site Renewable Energy: 1%
	1			d Credit 2.2	On-Site Renewable Energy: 3%
		1		d Credit 2.3	On-Site Renewable Energy: 5 %
		1		d Credit 2.4	On-Site Renewable Energy: 7 %
		1		d Credit 2.5	On-Site Renewable Energy: 9%
		1		d Credit 2.6	On-Site Renewable Energy: 11%
		1		d Credit 2.7	On-Site Renewable Energy: 13 %
		2		c Credit 3	Enhanced Commissioning (2 points)
		2		d Credit 4	Enhanced Refrigerant Management (2 points)
		3		c Credit 5	Measurement & Verification (3 points)
		2		c Credit 6	Green Power (2 points)

Y	?Y	?N	N	**Materials & Resources**
0	8	4	2	
Y				d Prereq 1	Storage and Collection of Recyclables
	1			d Credit 1.11	Building Reuse: Maintain 55% of Existing Walls, Floors, & Roof
		1		d Credit 1.12	Building Reuse: Maintain 75% of Existing Walls, Floors, & Roof
			1	d Credit 1.13	Building Reuse: Maintain 95% of Existing Walls, Floors, & Roof
			1	d Credit 1.2	Building Reuse: Maintain 50% of Interior Non-Structural Elements
	1			c Credit 2.1	Construction Waste Management: Divert 50% from Disposal
	1			c Credit 2.2	Construction Waste Management: Divert 75% from Disposal
	1			c Credit 3.1	Material Reuse: 5%
		1		c Credit 3.2	Material Reuse: 10%
	1			c Credit 4.1	Recycled Content: 10% (post-consumer + 1/2 pre-consumer)
		1		c Credit 4.2	Recycled Content: 20% (post-consumer + 1/2 pre-consumer
	1			c Credit 5.1	Regional Materials: 10% Extracted, Processed, and Mfg Regionally
	1			c Credit 5.2	Regional Materials: 20% Extracted, Processed, and Mfg Regionally
		1		c Credit 6	Rapidly Renewable Materials
	1			c Credit 7	Certified Wood

0	10	5	0	**Indoor Environmental Quality**
Y				d Prereq 1	Minimum IAQ Performance
Y				d Prereq 2	Environmental Tobacco Smoke (ETS) Control
		1		d Credit 1	Outdoor Air Delivery Monitoring
		1		d Credit 2	Increased Ventilation
	1			c Credit 3.1	Construction IAQ Management Plan: During Construction
	1			c Credit 3.2	Construction IAQ Management Plan: Before Occupancy
	1			c Credit 4.1	Low-Emitting Materials: Adhesives & Sealants
	1			c Credit 4.2	Low-Emitting Materials: Paints & Coatings
	1			c Credit 4.3	Low-Emitting Materials: Flooring Systems
	1			c Credit 4.4	Low-Emitting Materials: Composite Wood & Agrifiber Products
	1			d Credit 5	Indoor Chemical and Pollutant Source Control
	1			d Credit 6.1	Controllability of Systems: Lighting
		1		d Credit 6.2	Controllability of Systems: Thermal Comfort
	1			d Credit 7.1	Thermal Comfort: Design
	1			d Credit 7.2	Thermal Comfort: Verification
		1		d Credit 8.1	Daylight and Views: Daylight 75% of Spaces
		1		d Credit 8.2	Daylight and Views: Views for 90% of Spaces

0	6	0	0	**Innovation in Design**
	1			d Credit 1.1	Innovation or Exemplary Performance
	1			d Credit 1.2	Innovation or Exemplary Performance
	1			d Credit 1.3	Innovation or Exemplary Performance
	1			d Credit 1.4	Innovation in Design
	1			d Credit 1.4	Innovation in Design
	1			d Credit 2	LEED Accredited Professional

0	4	0	0	**Regional Priority**
	1			d Credit 1.1	Regionally Defined Credit (WEc2 Innovative Wastewater Technology)
	1			d Credit 1.2	Regionally Defined Credit (MRc1.1(75%) Building Reuse)
	1			d Credit 1.3	Regionally Defined Credit (MRc3 Material Reuse)
	1			d Credit 1.4	Regionally Defined Credit (MRc7 Certified Wood)

other regional credits

SSc3 Brownfield (does not qualify)

THE RULES:

1. All elements of the Living Building Challenge are mandatory

2. Many elements have temporary exceptions to acknowledge current market limitations. These exceptions will be modified or removed as the market evolves.

3. Living Building Designation is based on actual, rather than modeled or anticipated performance. Therefore, buildings must be operational for one year prior to being evaluated.

Summary of Prerequisites

Number	Category	Prerequisite
One	Site Design	Responsible Site Selection
Two	Site Design	Limits to Growth
Three	Site Design	Habitat Exchange
Four	Energy	Net Zero Energy
Five	Materials	Materials Red List
Six	Materials	Carbon Footprint
Seven	Materials	Responsible Industry
Eight	Materials	Appropriate Materials Radius
Nine	Materials	Construction Waste
Ten	Water	Net Zero Water
Eleven	Water	Sustainable Water Discharge
Twelve	Indoor Environmental Quality	Civilized Work
Thirteen	Indoor Environmental Quality	Source Control
Fourteen	Indoor Environmental Quality	Ventilation
Fifteen	Beauty & Inspiration	Design for Spirit
Sixteen	Beauty & Inspiration	Inspiration and Education

As imagined by the local community in conversations about this building:

Imagine, two multi- block districts both in Portland, Oregon—one in the North end of China Town—the other on the PSU Campus including PSU's new school of Business— both connected by the new North/South Light Rail Line

Imagine the eco block districts

Imagine utilizing dense, mixed use, urban sustainable principles–Imagine living buildings, the first new zero urban community to be built in the world on this scale generating the lowest possible carbon footprint

Imagine a development that maximizes our alternative transportation system including walking, bicycling, streetcar and light rail thus enabling a true 20 minute lifestyle

Imagine construction only with 100% locally sourced materials

Imagine developments that embrace a sustainable and equitable environmental, social, and economic future. Today is the day to stop imagining and start creating!

As envisioned by the Green Building Council:
Imagine a building informed by its eco-region's characteristics, and that generates all of its own energy with renewable resources, captures and treats all of its water, and uses resources efficiently and for maximum beauty.

STRUCTURAL

Summary

The proposed project consists of the construction of the new School of Business Administration building as well as renovations and additions to the existing School of Business Administration/School of Education building. The existing building is located at 615/631 SW Harrison Street, Portland, Oregon on the southern half of the block bounded by SW Broadway on the west, SW 6th Avenue on the east, SW Montgomery Street on the north, and SW Harrison Street on the south. Construction of the proposed work will be divided into 2 major phases to allow continued use of the existing building while the new building is constructed.

The intent of this narrative is to provide an overview of the proposed structural systems and requirements; it is intended to be used as a reference in developing pre-schematic pricing for the proposed project and to demonstrate that the project is structurally feasible. We have reviewed the existing building drawings and the programming drawings provided by Zimmer Gunsul Frasca Architects.

Phase 1

The initial phase of construction will include the new School of Business Administration building. This will be a 5 story building which will contain several large tiered classrooms as well as offices, event spaces, and project rooms. The floor levels of the new building will align with the existing building to the south. The new building will be structurally independent from the existing building with respect to both gravity and lateral loading. This will require a seismic separation at the interface between the two structures where the corridor crosses from one building to the other. The width of the seismic joint depends on the stiffness of the lateral system of the new building which has not been analyzed; we anticipate that the required joint width would be approximately 12" to 20" at the roof for a building of this height.

Foundation

At the time of writing of this narrative, a current geotechnical investigation report is not available. However, we anticipate based on the prevailing conditions in the area and the foundation design of the existing structure that the building will be supported on conventional spread footings. The structural drawings for the existing building indicate allowable soil bearing pressures of 3,500 and 4,000 psf. For this narrative we have assumed that allowable bearing pressures of 4,000 psf can be obtained. Refer to the attached foundation plan sketch for additional pricing information. A geotechnical investigation should be performed early in the design phase to confirm our assumptions.

The project site slopes nearly 10 feet from the west to the east side of the proposed building. The first floor of the new building is aligned with the first floor of the existing School of Business Administration which is on the eastern half of the block. The lowest level of the School of Education is the second floor which is 12'-6" above the first floor. As a result, the foundations of the new building will be significantly below the existing site grades and the adjacent existing foundation at the north side of the School of Education. Therefore we anticipate that excavation shoring will be required at the south side of the new building starting at grid 7 on sheet 'S2' of the existing 1979 structural drawings and running to the west. It appears that it will be possible to open cut the west and north sides of the excavation at the new building provided the sidewalks can be closed during construction. The existing column footings at the School of Education appear to be located so that they will not be undermined by the new work and will not surcharge the shoring or new basement wall.

Due to the elevation change across the site, concrete basement walls will be required at the first floor of the new building on the south, west, and north sides of the building. The wall at the north side of the building will transition from a full story-height basement wall to a partial story-height concrete retaining wall from west to east.

Structural Frame

The building will be a steel framed structure with composite steel floor beams and concrete topping on metal deck. The floor framing will be supported by wideflange steel columns. In order to achieve a column free space at the large first floor tiered classroom, columns above this space will be transferred out by a one-story high transfer trusses. The truss will be located within the wall at the second floor level and will clear span the large first floor classroom in the east-west direction. The top chord of the truss will be located at the level of the third floor framing and the bottom chord will be located at the level of the second floor framing. The top and bottom chords will be wideflange members and the truss web members will either be wideflange or square tube members. The truss web members will be configured to allow a door at each truss near the center of the truss span.

At the second and third floors, typical floor beams will span in the north-south direction between the transfer

ABOVE
view of exposed SMARTBEAMS installed at the Les Shwab headquarters in Bend, Oregon.

truss and the column lines at the exterior of the building. Due to the span lengths, the typical floor beams will be SMARTBEAMS; the openings thru the webs of the SMARTBEAMS can be used for routing mechanical ductwork which will help maximize the ceiling heights. The floor framing at the fourth and fifth floors will be similar to the second and third except that instead of the transfer trusses the beams will be supported on girders. The interior girders at levels four thru the roof will span approximately 30 feet in the east-west direction and will be supported by columns that will bear on the transfer truss at the third floor level. The fourth floor beams at the north side of the building will cantilever to support the 5th floor and roof framing above. Due to the large cantilever, it will be important as design move forward to take into account both the stiffness and vibration characteristics of this framing to ensure good floor performance and occupant comfort.

Columns at the north and east sides of the building at the atriums will provide gravity support for the floor levels above the atrium as well as out of plane support for the curtainwall system.

An existing pedestrian bridge runs thru the footprint of the proposed building and connects to the fourth floor of the existing building. The bridge will be removed to the point where it intersects the existing pedestrian bridge that is parallel to Montgomery Street. A short segment of bridge will be required to reconnect the existing bridge to the new building.

Lateral Force Resisting System

The Lateral Force Resisting System (LFRS) encompasses the primary structural elements of the building that resist wind and seismic loadings. The system will consist of the floor and roof diaphragms, drag beams, and the vertical elements of the LFRS, which will be special steel concentrically braced frames and special reinforced concrete shear walls. Because the seismic base of the building will occur at the foundation level, the basement walls at the ground floor will need to be considered as part of the LFRS. The basement walls will also impart an unbalanced horizontal soil force to the building structure due the partially buried configuration of the building. Refer to the attached framing plan sketches for possible braced frame locations and schematic pricing information. Frame locations and brace orientations will need to be coordinated with wall openings as design moves forward.

Phase 2

Existing Building Description

The second phase of construction will include the renovation and addition to the existing building. The existing building was initially constructed in 2 phases. The drawings for the first phase were dated 1979 and include the concrete walls around the main stairs and elevator and the floors to the west, currently the School of Education. The drawings for the second phase were dated 1986 and include the portion of the building to the east of the main stairs and elevator, currently the School of Business Administration. The resulting building is a six-story building that is approximately 100'x200' in plan and currently contains mostly classroom and office space. The building steps down from west to east so that the lowest floor level of the School of Education is level 2 while the lowest floor level of the School of Business Administration is level 1.

The structural system of both parts of the existing building are very similar. The floors are 2-way post tensioned slabs supported on concrete columns. The floor to floor heights are typically 12'-6". The building is braced laterally against seismic and wind loading by several 8" reinforced concrete walls that are centrally located within the building area. The building is supported on spread footings.

Renovation

The renovation of the existing building will include the addition of atriums in both the east and west parts of the building that will extend from the fourth floor thru the roof. The atrium in the west part of the building will be approximately 16' x 30' and the atrium in the east part of the building will be approximately 16' x 20'. Since the existing floor and roof slabs are post tensioned with unbonded tendons, special procedures will need to be used to cut any floor openings. Typically this will require shoring the slab to provide vertical support while work is performed, opening holes in the slab to gain access to the tendons, heating the tendons to relieve the force in the tendons, cutting the tendons after the force has been relieved, cutting the slab and separating the tendons at the edge of the new opening so that they can be anchored, casting concrete around the new tendon anchorages, re-stressing the tendons, and removing the shoring. There are also proprietary methods to cut the tendons without heating that may be used. In addition to the new openings for the atriums, a new opening for a stair will be created on the east side of the main mechanical chase. The renovation will also include the replacement of mechanical systems. Since the floor and roof slabs are post-tensioned, an allowance should be provided in the budget for locating the existing post tensioning tendons using ground penetrating radar in areas where mechanical equipment is anchored to the slabs. The addition of the west atrium will also require new mechanical support at the roof level since the existing rooftop mechanical units are located above the proposed atrium.

Addition/Slab Extension

The floor slabs at the west side of the building will be extended at the third, fourth, and fifth floor levels. The floor slab at the third floor will be cut back as shown on the attached plan sketches using a similar procedure as described above for cutting the new atriums. New floor beams and concrete topping on metal deck will be used to create the slab extensions. The new floor areas will be supported by new steel columns at the perimeter of the slab and the existing 18" diameter concrete columns that occur on grid 5 of the 1979 drawings. The new columns at the perimeter of the slab will require new spread footings. The existing columns on grid 5 will be reinforced with carbon fiber wrap in order to increase their axial capacity, and the footings supporting these columns will be extended to increase their capacity. The existing columns on grid 3 of the 1979 drawings will be completely removed.

Seismic Upgrade Commentary

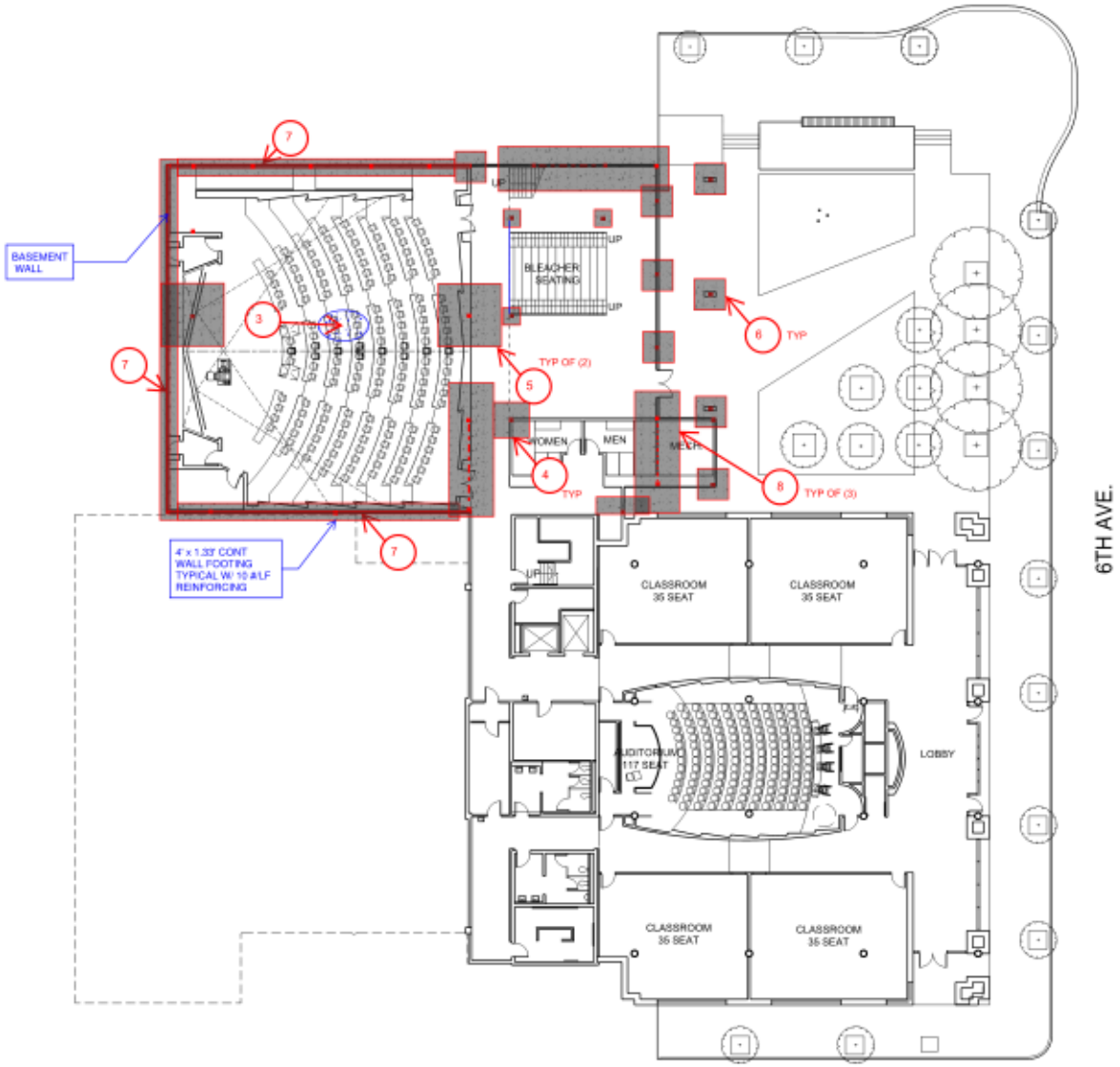
The criteria governing the requirement for seismic upgrades is contained in the City of Portland Building Regulations. Title 24.85, "Seismic Design Requirements for Existing Buildings", outlines the various changes to a building that can trigger a seismic upgrade. Relevant criteria include changing more than 1/3 of the building floor area to a higher Occupancy Classification, increasing the Occupant Load by 150 people or more (or, alternately, more than 10% of current Occupant Load), and increasing the seismic force in any element by more than 10% or decreasing the seismic resistance of any element. Based on the current scope of renovation it appears that these criteria will generally not be exceeded and so a seismic upgrade will not be required. The exception to this will be the floor slabs which will have their capacity to act as diaphragm elements reduced when the new atrium and stair openings are added. This will require structural analysis to show that the existing slabs meet the current code level forces for diaphragms. New drag struts will be required at the stair opening which is being added next to an existing concrete shear wall.

As design moves forward it is possible that changes or development of the design will trigger a seismic upgrade. If this occurs, Title 24.85 allows that the upgrade may be performed to ASCE 31, "Seismic Evaluation of Existing Buildings", instead of the current building code. Since the existing building was originally designed under the 1976 Uniform Building Code, it is considered under ASCE 31 to be a "Benchmark Building" and will not require a full ASCE 31 evaluation. Only the non-structural and geological hazards will need to be considered.

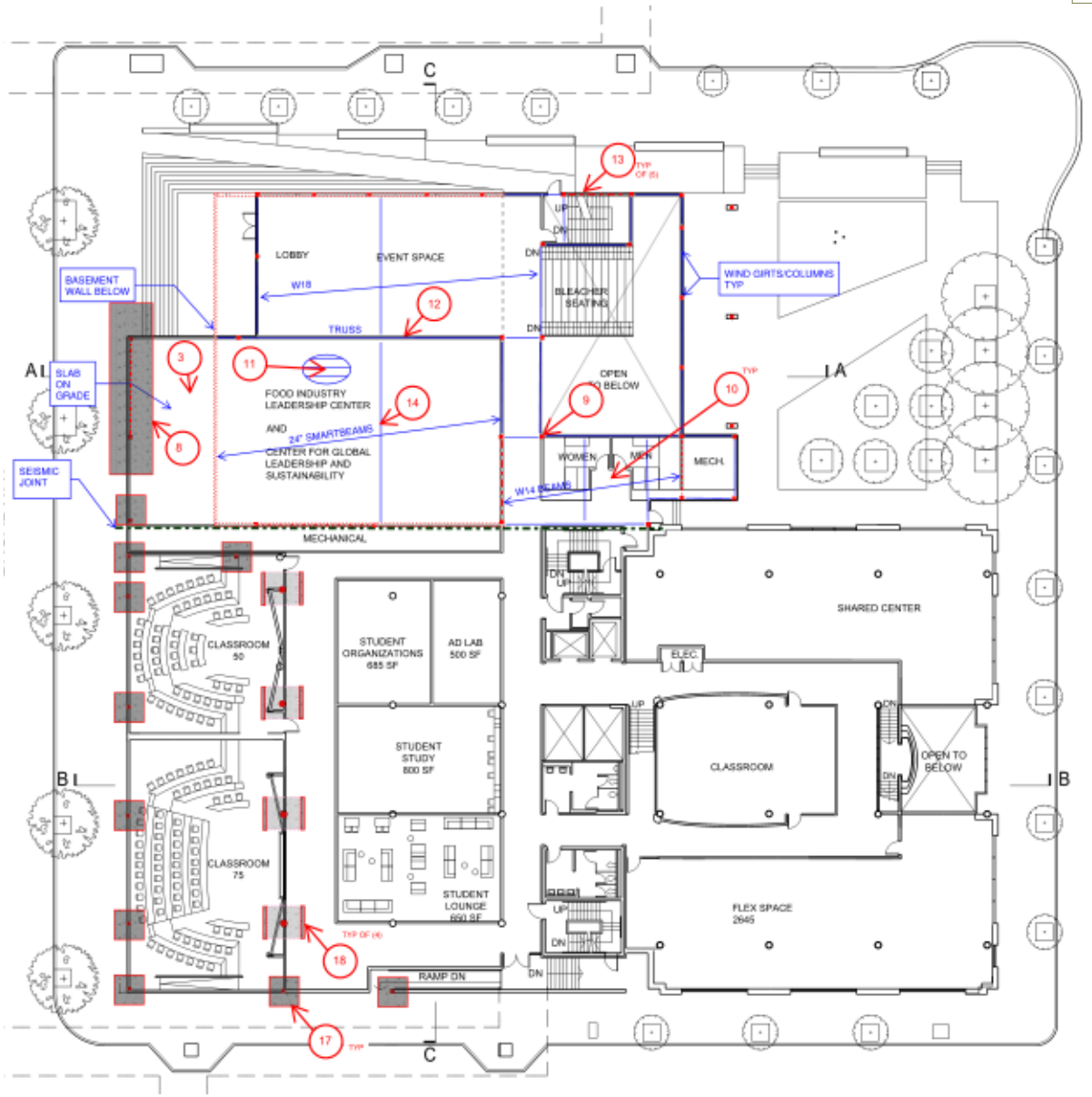
We recommend setting up a meeting with the City of Portland BDS early in the design phase to discuss the planned renovations of the existing building and confirm their acceptance of the design approach that we have described in this narrative.

ESTIMATING NOTES	
①	ALL CONCRETE TO HAVE f'c = 4,000 PSI AT 28 DAYS
②	COLUMN FOOTINGS TO HAVE 50 #/CYD REINFORCING STEEL
③	5" SLAB ON GRADE REINFORCED WITH #4 AT 18" O.C. EACH WAY OVER VAPOR BARRIER OVER 12" GRANULAR MATERIAL.
④	8'X8'X2' FOOTING TYPICAL AT INTERIOR COLUMNS
⑤	14'X14'X3' FOOTING TYPICAL AT COLUMNS SUPPORTING TRUSS
⑥	7'X7'X1.5' FOOTING TYPICAL AT EAST FACADE
⑦	BASEMENT WALLS 18" THICK CONCRETE WITH 6 #/SF REINFORCING STEEL
⑧	BRACED FRAME FOOTINGS 10' WIDE X 3 FOOT THICK X FRAME LENGTH + 20 FEET LONG TYPICAL WITH 200 #/CYD REINFORCING STEEL
⑨	WIDEFLANGE COLUMNS - 3 #/SF FLOOR AREA
⑩	COMPOSITE FLOOR BEAMS - 6.5 #/SF FLOOR AREA
⑪	2.5" CONCRETE TOPPING ON 3" X 20 GAGE COMPOSITE STEEL FLOOR DECK REINFORCED WITH 6X6 W2.1XW2.1 WELDED WIRE FABRIC.
⑫	FULL STORY TRANSFER TRUSS, ~ 800 #/LF
⑬	STEEL SPECIAL CONCENTRICALLY BRACED FRAME, ADD 5 #/SF FLOOR AREA
⑭	SMARTBEAMS, 6.5 PSF AT FLOOR, 4.5 PSF AT ROOF INCLUDING WEIGHT OF SUPPORTING WIDEFLANGE GIRDERS
⑮	1.5" X 20 GAGE ROOF DECK
⑯	MECHANICAL PENTHOUSE, STEEL FRAMED, 7 #/SF PENTHOUSE AREA
⑰	FOOTINGS AT PERIMETER COLUMNS, 7'X7'X1.5' AVERAGE, WIDEFLANGE STEEL COLUMN, 50 #/LF AVERAGE
⑱	EXTEND FOOTING SIZE BY 1 FOOT ON 2 OPPOSING SIDES, CARBON FIBER WRAP COLUMNS AT LEVELS 2 THRU 4.
⑲	CUT NEW OPENING INTO EXISTING POST TENSIONED SLAB, REFER TO STRUCTURAL NARRATIVE FOR ADDITIONAL INFORMATION.
⑳	CUT BACK EXISTING SLAB REFER TO STRUCTURAL NARRATIVE FOR ADDITIONAL INFORMATION.

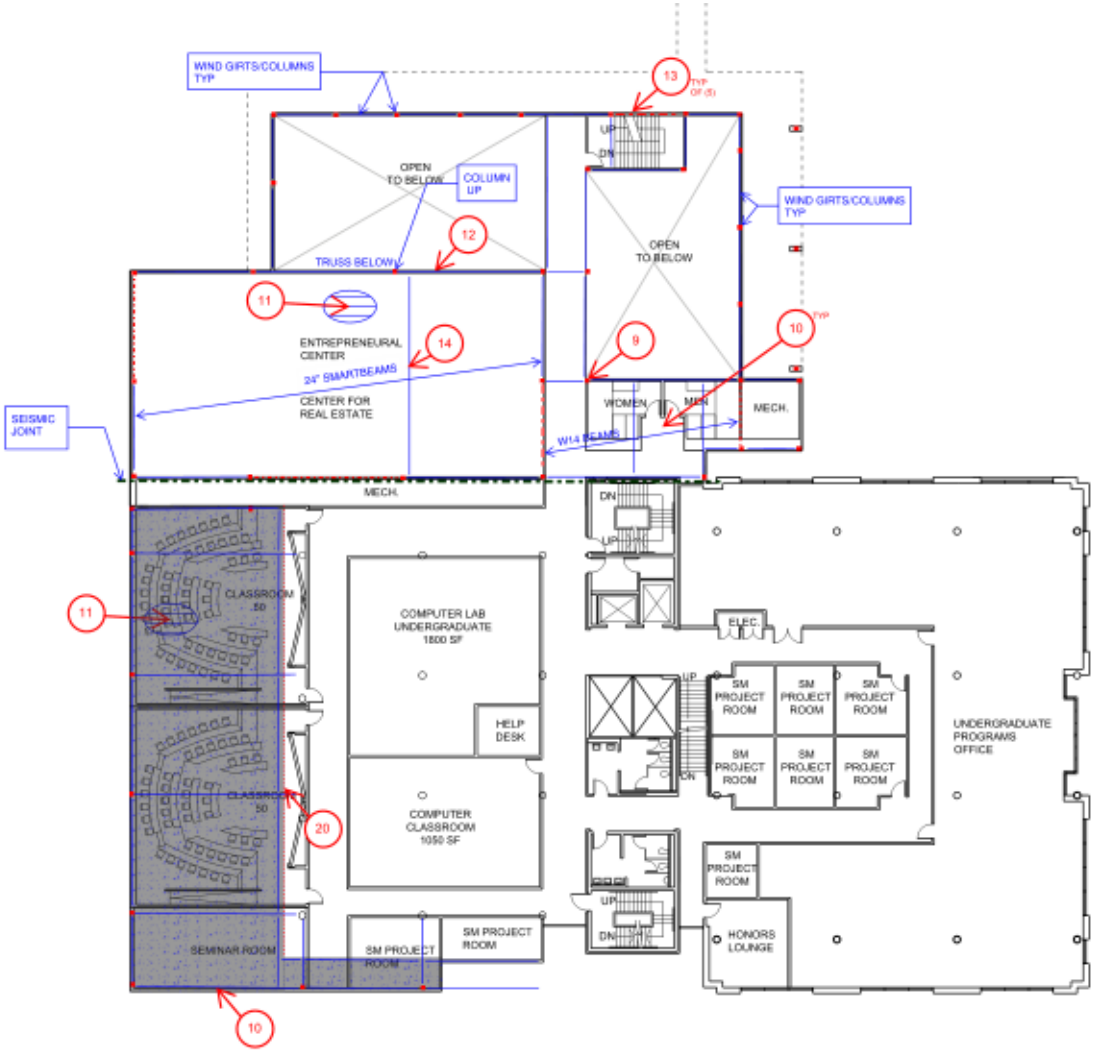
LEVEL ONE
STRUCTURAL NOTES



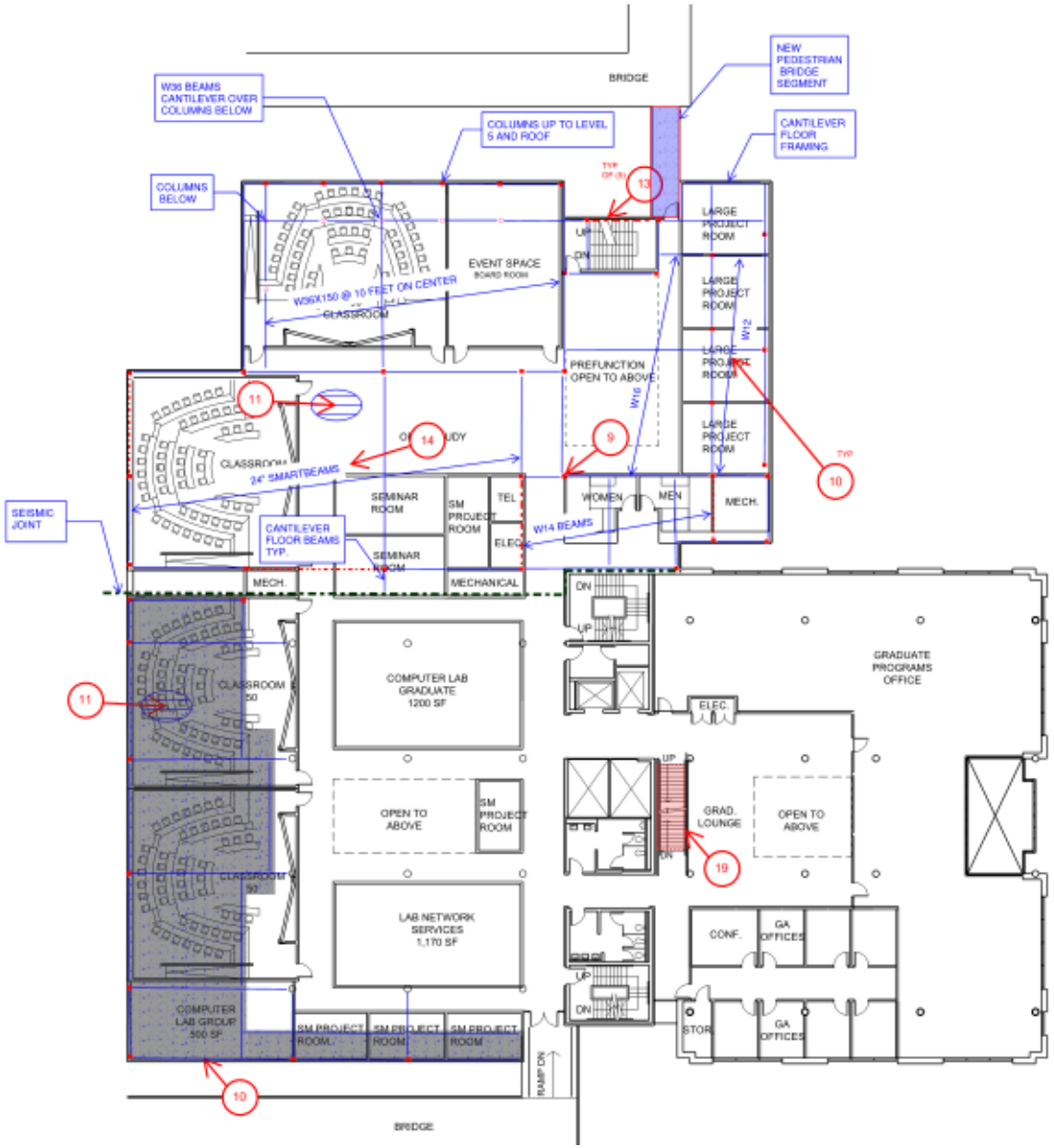
LEVEL TWO
STRUCTURAL NOTES



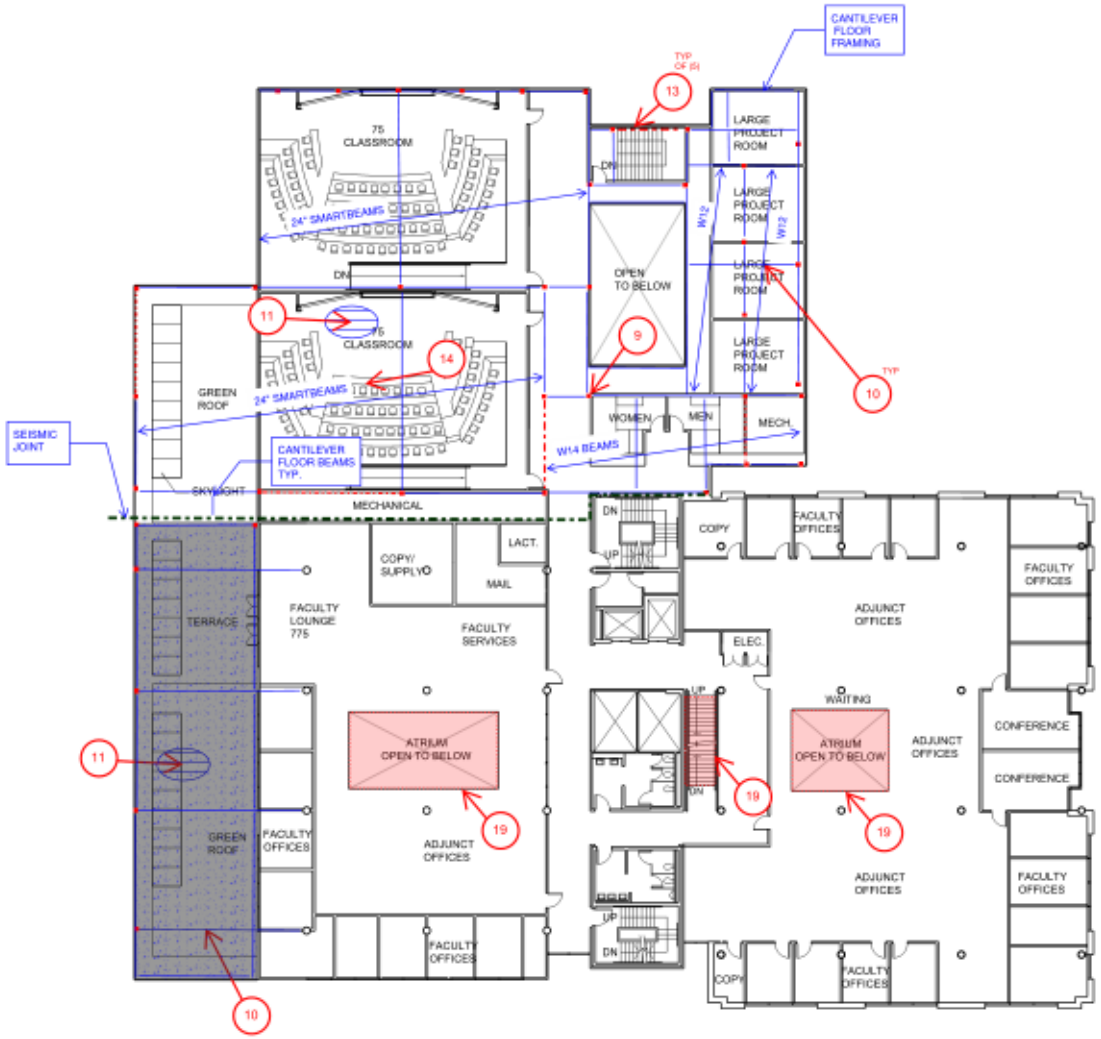
LEVEL THREE
STRUCTURAL NOTES



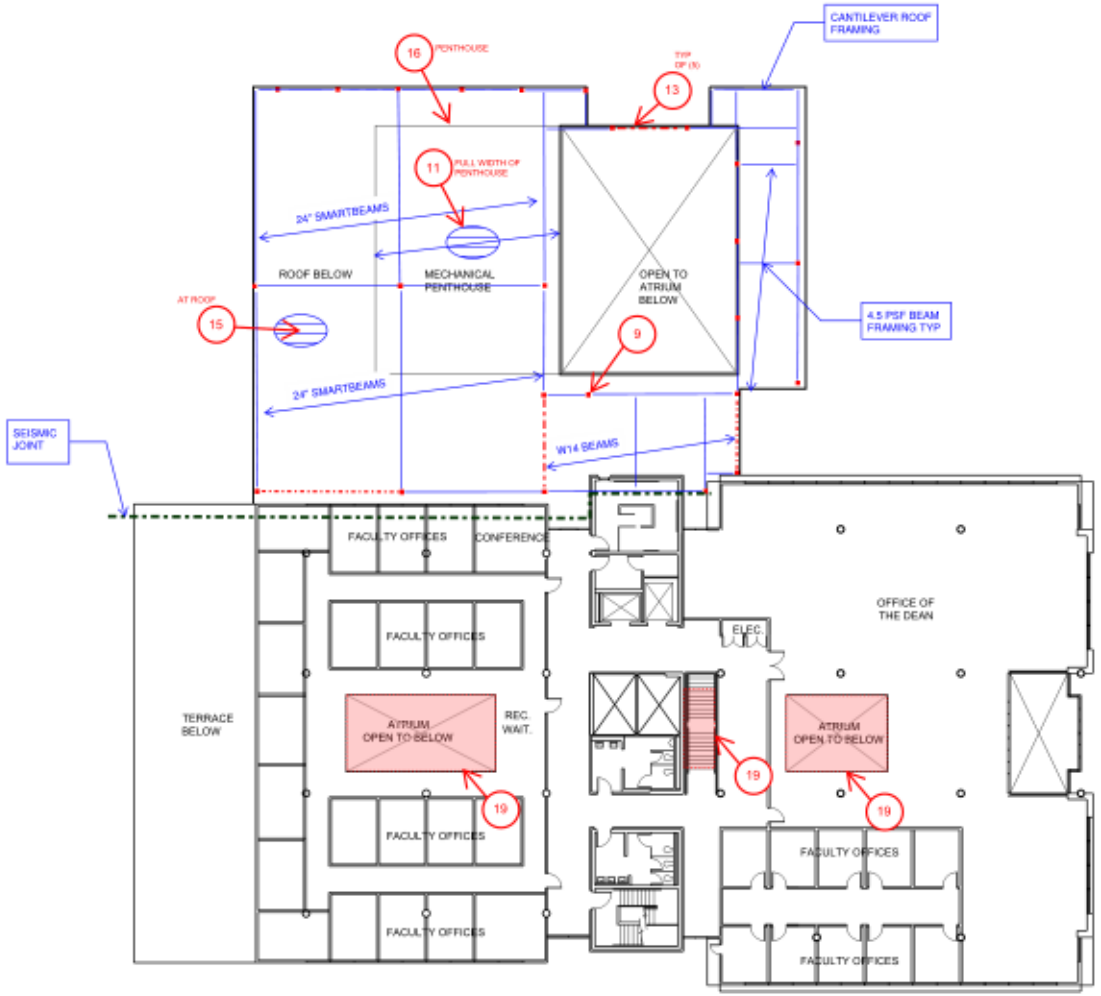
LEVEL FOUR
STRUCTURAL NOTES



LEVEL FIVE
STRUCTURAL NOTES



LEVEL SIX
STRUCTURAL NOTES



MECHANICAL

BUILDING SYSTEMS GOALS

Comfort

The first and foremost priority of the design team will be to provide an HVAC system that meets or exceeds all of the requirements of the building users in terms of comfort.

Indoor Air Quality

The building systems will be designed to provide exceptional indoor air quality with a high degree of user control through the use of natural ventilation, high-efficiency filtration, pretreatment of outdoor air, exhaust of contaminants, and operable windows.

Energy

The design will be highly energy efficient, and will use a combination of technologies to reduce energy in a simple and elegant way.

The project may be required to comply with Oregon House Bill 2620, requiring a minimum of 1.5% of the construction to be devoted to solar energy technologies.

Costs

An integrated and thoughtful application of a systems approach to the building will make it possible to achieve low energy use at no or little added construction costs. The design team will endeavor to lower heating, cooling and lighting requirements through better building shell design so that the more efficient systems are smaller and thus affordable.

EXISTING BUILDING SYSTEMS

The PSU School of Business Administration and School of Education buildings were constructed in two phases. The School of Education building was constructed in 1979 in Phase I and comprises approximately 42,000 square feet of classroom and office space. The School of Business Administration building was constructed as an addition in 1986 in Phase II, and consists of 50,000 square feet of classroom and office space.

The buildings are served by three air handlers located on the roof. Air handler, ASU-1 serves the School of Education and is a variable volume control system with a maximum airflow of 36,000 CFM with a chilled water cooling coil and no heating coil.

Air handler, ASU-2 serves the School of Business Administration with a 38,600 CFM variable volume system with a chilled water cooling coil and a hot water heating coil.

A third air handler, ASU-3, serves the third floor of the School of Business Administration which has computer labs and is a variable volume system with a maximum airflow of 11,174 CFM with chilled water cooling coil and hot water heating coil. The chilled water is provided to the unit from a dedicated air-cooled water chiller located on the roof.

As shown in the photos on the next page, the rooftop equipment is aging and beyond its operational life. All of the rooftop air handling equipment and ductwork is located in the center of buildings within a screened enclosure. Access around the equipment is difficult, and the tight pack makes it impossible to consider installation of any new equipment without first removing the existing equipment.

Supply air from the units is routed down a mechanical shaft to pressure independent variable volume terminal units with hot water reheat serving the building thermostat zones. Return air for the entire building feeds back to the air handlers through above ceiling plenums which direct connect into the building core mechanical shafts. Building return air in the shafts is not ducted, but the shafts serve as the air conduit.

Chilled water is provided to ASU-1 & 2 from the campus central chiller plant. Heating water is provided from a steam converter in the building mechanical room with steam provided from the campus central plant.

Campus steam, condensate, and chilled water piping route in the skybridge on SW Montgomery on the north side of the building block. The building is currently fed from a piping drops in the skybridge on the NW corner of the building. The pipes route from the NW corner at Montgomery and Broadway underground (direct bury configuration) and enter the building at the north wall adjacent to the central corridor.

The master campus utility plan calls for steam, condensate, and chilled water to feed from the skybridge south into the SBA building, and also to intersect the site vault on the northeast corner of the block. The vault routes under 6th Ave, and master plan shows steam and chilled water utilities feeding east to the ASRC building.

The domestic hot water is provided by an electric hot water heater located in the building mechanical room.

NEW BUILDING SYSTEMS

MECHANICAL SYSTEMS OPTIONS

Several mechanical systems are outlined for consideration for the renovation and expansion of the SBA, based on resource/ energy efficiency, and ability to be implemented in phased construction. The systems will support phased renovation of the entire 104,000 square feet and a 42,000 square foot expansion on the northwest corner of the block.

1. Air Systems:

Dedicated outside air systems with local space heating and cooling: This concept involves use of 100% outside air system, sized for ventilation and dehumidification of perimeter zones, and basic conditioning of small core zones and large conference and gather areas. The air supply system is sized at approximately .40 - .55 CFM per square foot of building, and delivers 62°F – 65°F air for ventilation, to chilled beams, and for full conditioning in designated spaces. The larger lecture halls and meeting spaces will be configured with displacement ventilation which is compatible with the supply temperatures of the ventilation air handler. Perimeter zones will be cooled with either active chilled beams or chilled water radiant cooling panels with ceiling fans. Perimeter heating will be achieved with hydronic perimeter finned tube or ceiling radiant panel heating devices. Small core spaces will be conditioned with cooling only variable volume terminal units, sized to cool internal loads with supply temperatures as high as 65°F.

The concept can be implemented with either a single 70,000 CFM, heat recovery ventilation unit, or a phased approach can be used with a 53,000 CFM unit serving the first phase and a 28,000 CFM unit serving the final phase. In each case, the rooftop unit will be a custom air handler, handling supply and exhaust, incorporating heat recovery with a heat wheel, or heat exchanger, filters, variable speed fans, and cooling and heat coils. Additional heating needs to be considered downstream of the cooling coils to provide reheat after the cooling coils operate to appropriately dehumidify the supply air.

Because the proposed new air systems deliver a smaller quantity of air per square foot to the existing building spaces than the original systems, reuse of the existing shafts for supply, return and exhaust air transport is a feasible concept. The ductwork can be reused, and a cost allocation should be provided for resealing and insulating ductwork within the shafts. Adequate space in the shafts is available for the work within the shaft without destroying the integrity of the shaft walls on each floor. All distribution ductwork, terminal control devices in the ceilings on each floor will be removed and replaced back to the duct penetrations at main shafts. New fire smoke dampers and other life safety devices will be installed at all shaft and other life safety boundaries.

Natural ventilation will be explored and incorporated with operable windows where it is feasible. In these spaces, sensors in the windows will shut off all HVAC systems when windows are open on the assumption that the open windows will be providing appropriate HVAC when they are open. Building atriums will be considered for hybrid natural ventilation which double as smoke purge systems.

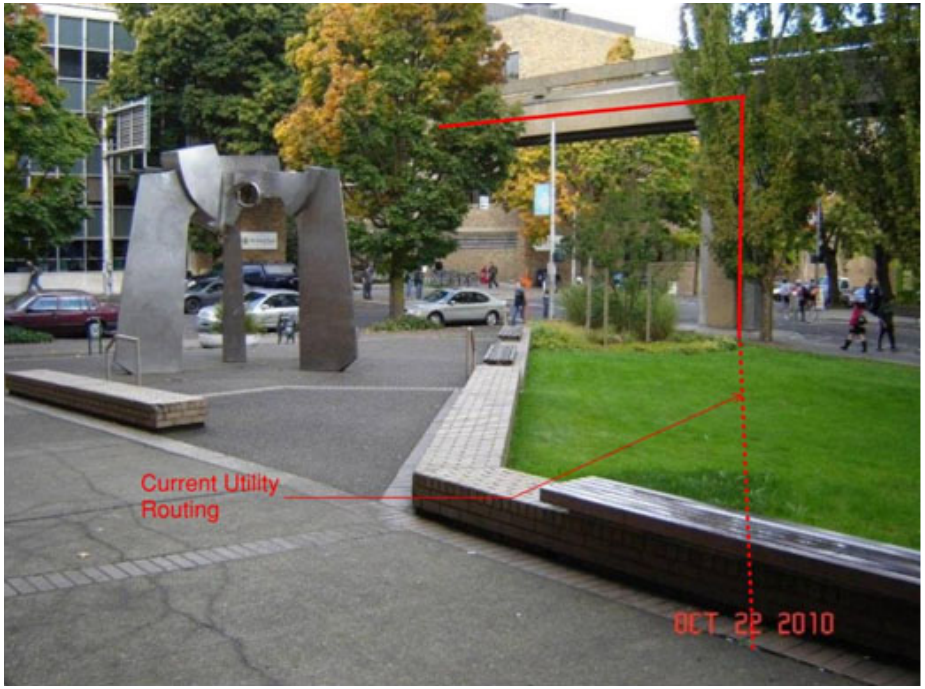
Four building atriums are currently planned, two in the expansion extending through two and three floors, and two in the renovation extending through the top three floors. Smoke purge systems will be installed for each atrium, which introduce high volumes of air at the bottom atrium level and exhaust it out of the top level. The two renovation space atriums present a challenge because they are within the core of the building, which makes it difficult to define an inlet air passage to the atrium.

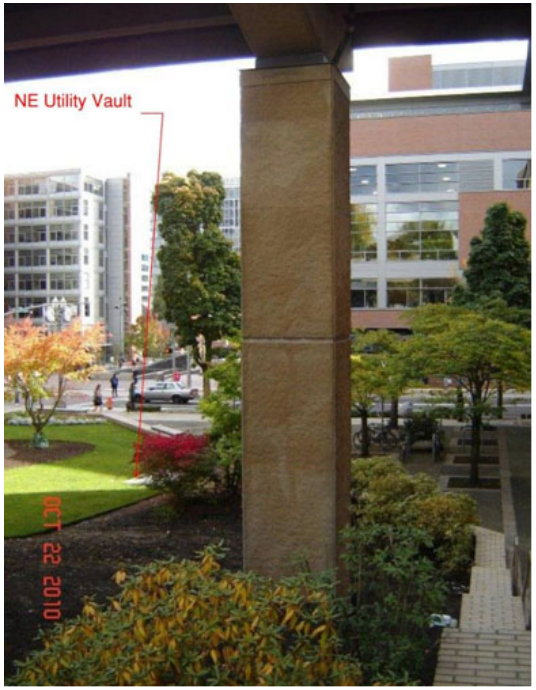
HVAC air systems will be controlled for night purges during the warm season when nights are cool. Night flushing will allow the cool night air to efficiently drop the temperature of the building mass and provide an inertia of cooling well into the subsequent warm days.

2. Heating and Cooling:

The campus heating and cooling is served from a central plant and distributed through pipes to campus buildings. Below is an outline of the baseline heating and cooling concept along with alternatives which should be considered based on results of life cycle cost analysis.

Extension of Campus Steam / Chilled Water Infrastructure: The baseline concept for building heating and cooling involves extending the campus steam and chilled water utilities to feed the new and renovated buildings. The current underground pipe routing must be removed because it conflicts with the foundation work in the first phase of construction. The photo below shows the current utility routing from skybridge to building.





Temporary heating / cooling needs to be provided to refeed the existing building heating and chilled water systems. This can be achieved with rented boilers / chillers, or with a temporary routing of campus steam/chilled water to a central point of connection. The final steam, condensate, and chilled water routing will come from the north skybridge through the upper level of the phase I expansion building and reconnect to the new equipment in the renovation project. Branch taps from the piping will route to an underground vault in the northeast corner of the block (shown in the photo below) where the four pipes will be valved and capped in accordance with the campus masterplan for future extension to the ASRC building.

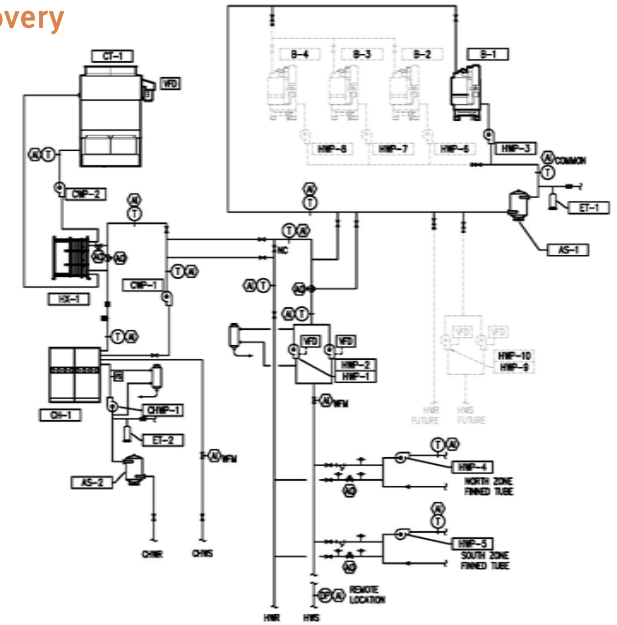
Overall heating peak heating loads of between 4000 MBH and 5000 MBH should be planned for. In the baseline heating concept, a single 5000 MBH U-tube heat exchanger, sized for complete expansion and renovation, will be located in a designated mechanical space to convert campus steam to heating water. Variable speed pumps will circulate heating water to the main ventilation air handlers and to all perimeter heating devices. Heating water delivery temperature will be reset based on demand of the system. Existing equipment (shown in photo below) is old and in need of replacement, and not suitable for reuse.

Peak chilled water loads for the combined renovation/expansion projects are projected to be between 325 and 375 tons depending on occupancy and internal loads. Campus piping will intersect with building chilled water piping in the same mechanical space containing the heating water heat exchanger, and variable speed building chilled water pumps will distribute chilled water to the ventilation air handlers and to each of the distributed chilled beams or radiant panels.

Alternative Heating and Cooling Concept – Heat Recovery Chillers:

An alternative to using the campus utilities may be considered if higher energy efficiency is a priority. Utilizing water cooled chillers to cool the buildings and recovering the chiller heat as the primary source of building heating will provide a more energy efficient building heating system. Chillers in this concept will be optimally loaded through chilled water heat recovery coils in the central exhaust air stream. Chillers will operate in summer to meet cooling demand, rejecting any heat needed to the heating water system, and moving the remainder of the heat to the cooling tower. In the transition and heating months, the chillers will operate at tailored loads to meet heating needs. High efficiency boilers will be used only as peak capacity heating or backup heating devices. The main heating and cooling loads stated above are the same for either concept.

Heat Recovery System

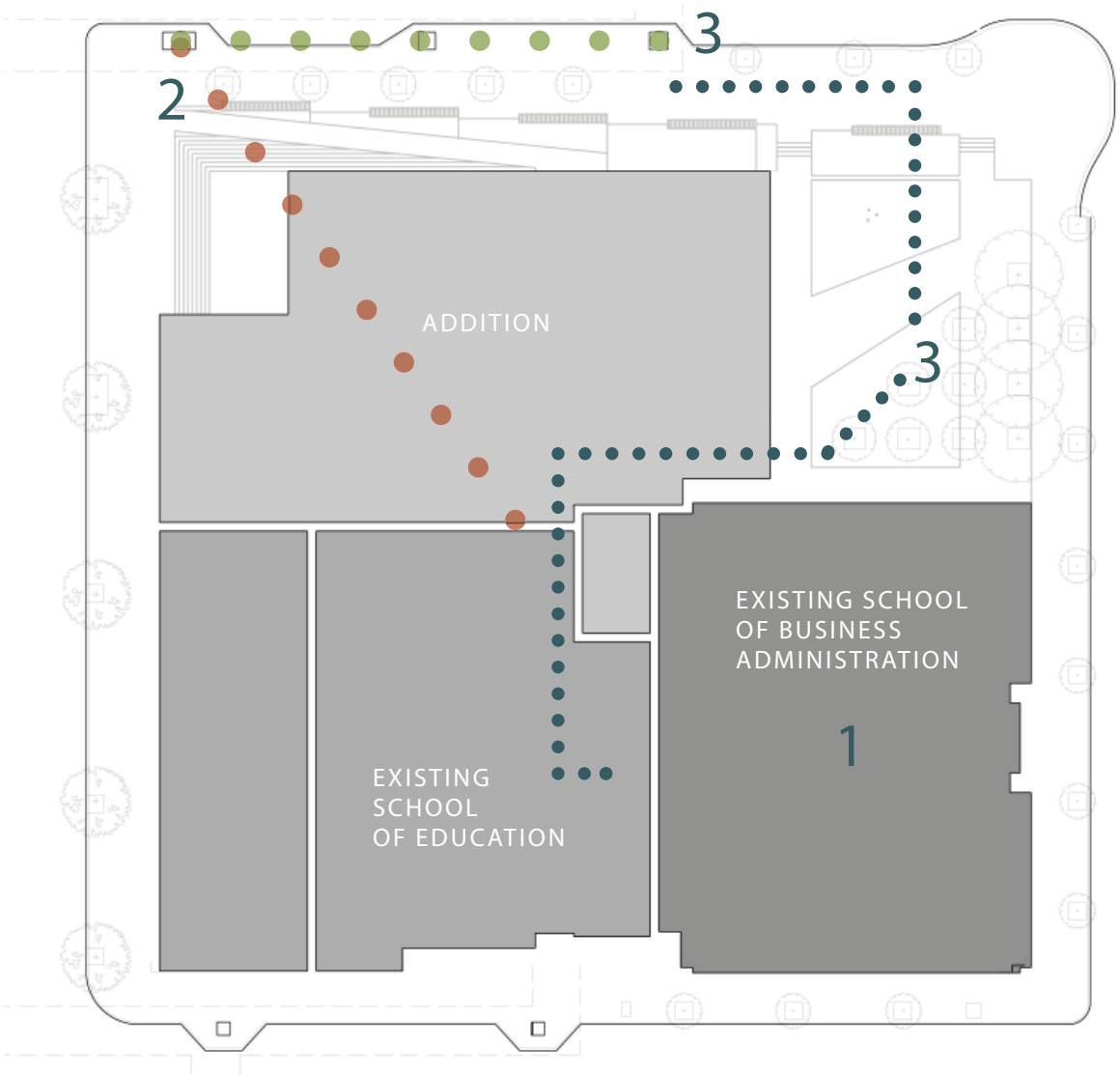


Alternative Heating and Cooling –Ground Coupled Heat Pumps: An additional alternative to using the campus utilities is to use a closed loop ground source heat pump system for building heating and cooling. Given that the campus central cooling system is equipped with well water cooling, a local ground source system does not appear practical as it will result in additional site costs without significant energy benefit. Heating with a ground source system does provide superior energy efficiency to the campus central steam plant, but it offers only marginal efficiency improvements to the conventional heat recovery system, but at a significant cost add. For these reasons, pursuit of ground coupled heating should not be given further consideration.

Atrium / Lobby Heating: Energy efficient and effective heating for large entry lobbys/ atrium in the expansion will be accomplished with hydronic, hot water radiant in-slab system. This concept effectively heats the people at the ground level and provides good comfort in large volumes.

3. Water / Plumbing:

Energy and Water Use Strategies: Due to the low quantity of plumbing fixtures and water use in the new building plan, strategies such as rainwater harvesting and solar thermal hot water heating are not anticipated to yield an appropriate return on investment. Low water use fixtures, including waterless urinals and dual flush toilets will be employed in the building, and are approved fixtures by the PSU facilities group.

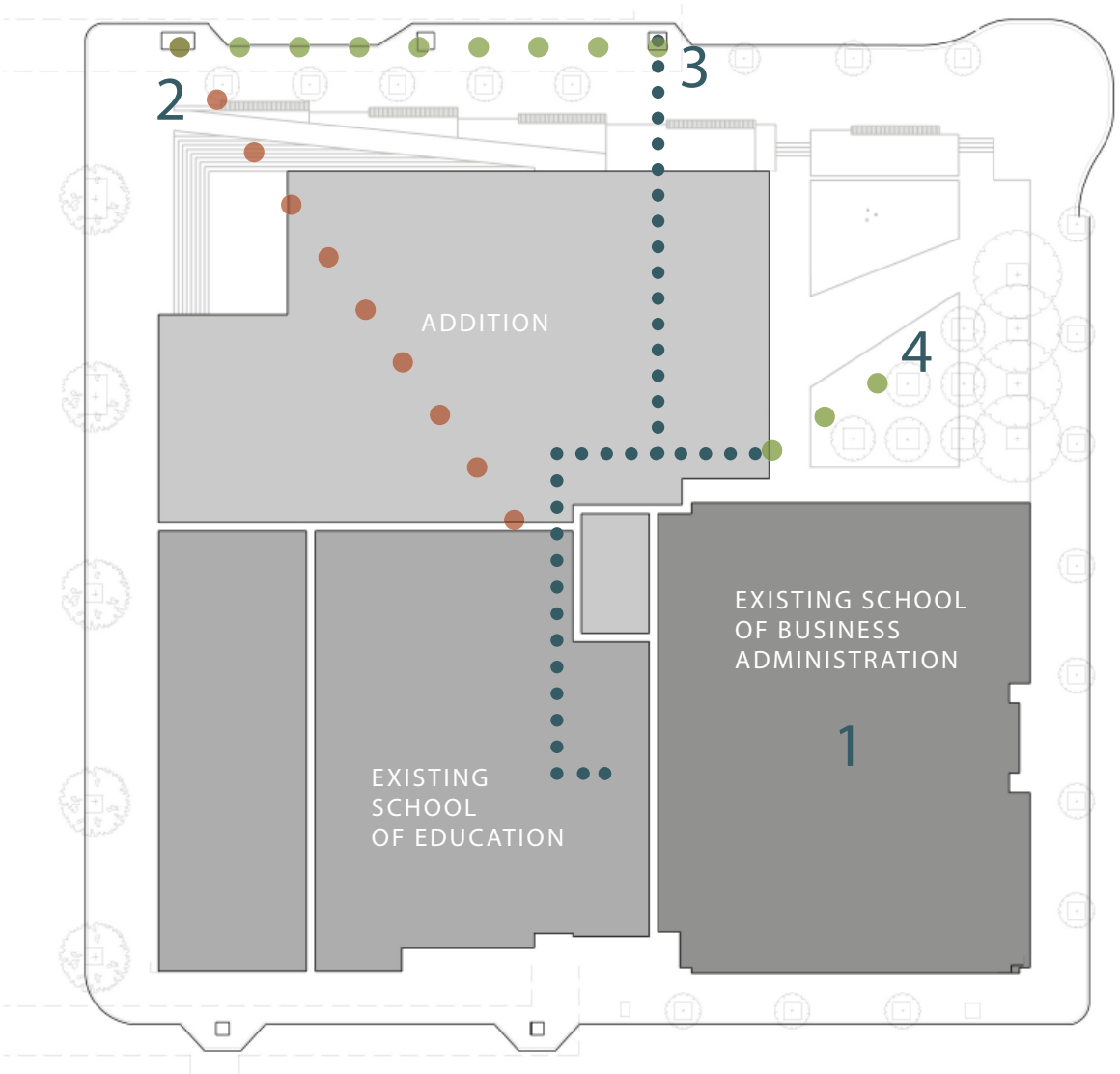


CAMPUS UTILITIES- PHASING OPTION ONE

1. Rent or run a temporary chiller and/or boiler

2. Remove and cap buried CHW and steam lines.

3. Drop CHW and steam lines from skybridge and route through a utilidor to existing vault then to new School of Business Administration.



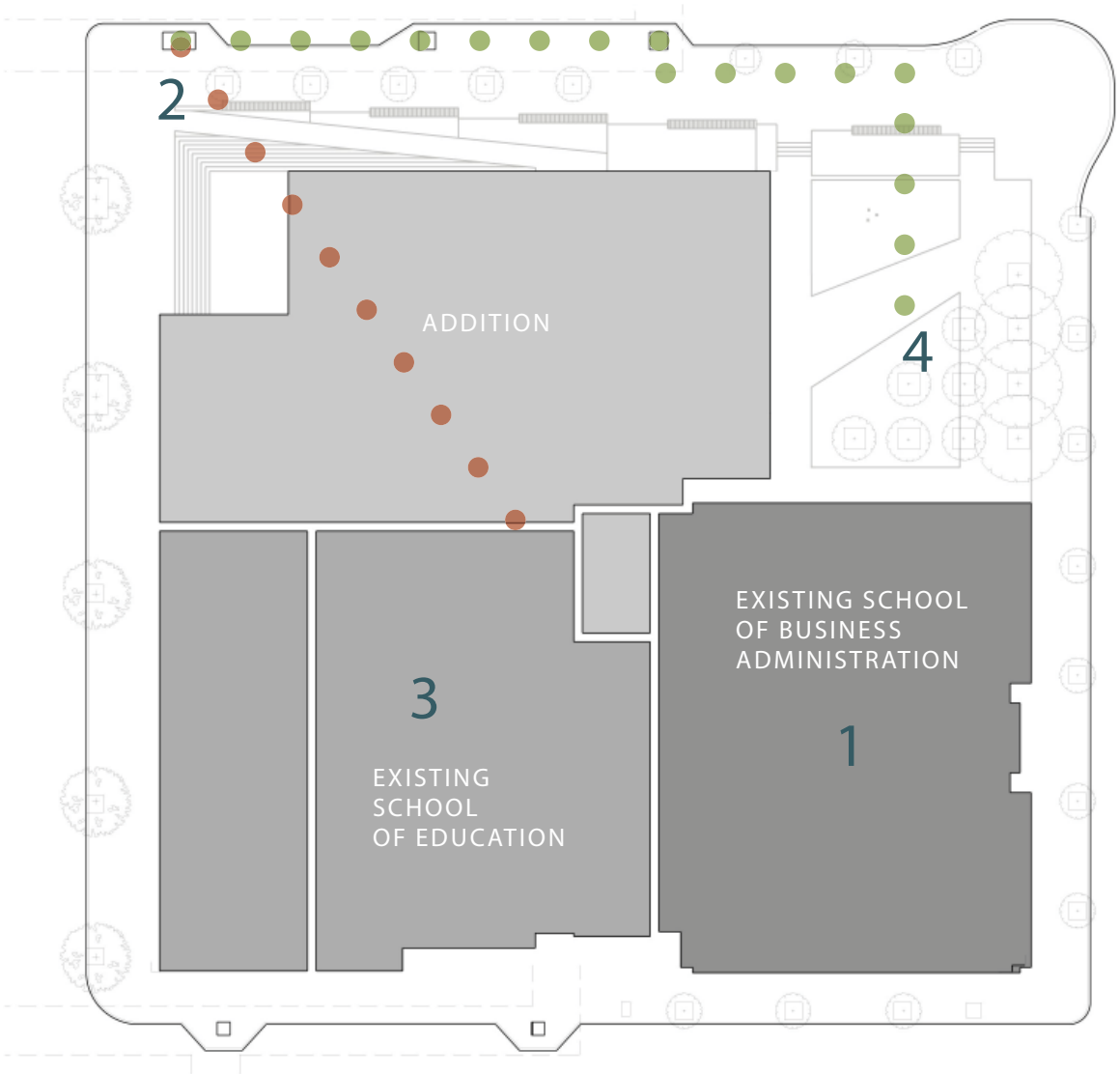
CAMPUS UTILITIES- PHASING OPTION TWO

1. Rent or run a temporary chiller and/or boiler

2. Remove and cap buried CHW and steam lines.

3. Extend existing CHW and steam lines to new School of Business Administration through the bridge on Level Four.

4. University extends to vault.



STAND ALONE SYSTEM- PHASING

1. Rent or run a temporary chiller and/or boiler

2. Remove and cap buried CHW and steam lines.

3. Install new boiler and chiller at the School of Education and connect with existing School of Business. Build addition and remodel the School of Education.

4. University extends to vault.

ELECTRICAL

EXISTING BUILDING ELECTRICAL SYSTEMS

The PSU School of Business Administration and School of Education buildings were constructed in two phases. The School of Education building was constructed in 1979 in Phase I and comprises approximately 42,000 square feet of classroom and office space. The School of Business Administration building was constructed as an addition in 1986 in Phase II, and consists of 50,000 square feet of classroom and office space.

The electrical service for the buildings is fed from a PGE vault in the sidewalk on the NE corner of the SBA building. The path of the service conduits from the vault follows along the north edge of the building then turns south and enters the building approximately just west of the existing skybridge. It is recommended that an exact locate be performed on these conduits as they provide power to both the School of Education and SBA portions of the existing building.

The main electrical service equipment is located on the first level of the School of Education building. It is a 2000A, 120/208V fused switchboard with no main disconnect. This equipment serves both existing buildings via 1200A bus risers that in turn feed branch panels in electrical closets on each floor. It also feeds all HVAC equipment and elevators in the two buildings. This equipment is near the end of its service life and we recommend it be replaced.

Emergency power for both buildings is provided by a 20kW diesel generator on the roof that feeds an automatic transfer switch and branch panel. This system provides backup power for egress lighting and fire alarm systems. The generator is also nearing the end of its service life.

NEW BUILDING ELECTRICAL SYSTEMS

The following electrical systems are recommended for the renovation and expansion of the SBA, based on increase footprint, resource/ energy efficiency, and ability to be implemented in phased construction. The systems will support phased renovation of the entire 92,000 square feet and a 38,000 square foot expansion on the northwest corner of the block.

When the expansion is constructed, it is recommended that a new, 1200A, 277/480V service be coordinated with the utility to ultimately serve all three portions of the final building. The higher voltage will keep the size of the service down and allow for smaller feeders to serve HVAC equipment, elevators, lighting, and other large loads. Smaller distribution transformers will need to be provided in order to serve 120/208V loads such as receptacles and electronic equipment.

In terms of phasing, the bus riser in the SBA building along with HVAC and elevator loads remaining in service will need to be back-fed with 120/208V from a transformer off of the new service. This will allow for the demolition of the existing distribution equipment in the School of Education while keeping the SBA side operational. When the existing buildings are remodeled, it is recommended that all of the electrical equipment (bus risers, panels, lighting) be replaced.

For emergency power, a new approximately 70kW diesel generator providing 277/480V power is recommended along with an associated automatic transfer switch. This generator will provide emergency power to loads such egress lighting in corridors, exit lights, and the fire alarm system. If the owner desires backup power for non-emergency loads, and additional automatic transfer switch will be need to segregate life safety loads from optional standby loads. A 24 hour supply of fuel will be stored above grade in a skid mounted belly tank under the generator.

Switches and receptacles are recommended to be heavy duty industrial grade (Hubbell HBL series). Devices will have nylon cover plates except in high use areas where they will have stainless steel cover plates. Receptacles on emergency power will be red with red plates.

All line voltage wiring within the building is recommended to be in metallic raceway. Metal Clad cable may be permitted in lieu of conduit and wire if allowed by the owner in unexposed locations only and not for homeruns. All branch circuit wire will be thermo-plastic insulated, soft-drawn copper. Underground conduits recommended to be PVC and will be buried a minimum of 24” below grade.

High efficiency fluorescent fixtures are recommended to be used as the main lighting source throughout the building. LED lighting should be used where practical such as for task lighting and on the exterior.

Lighting controls are recommended to include occupancy sensors, daylight dimming systems and dual level switching at a minimum. All occupied spaces larger than 100 square feet will be provided with dual switching to permit selection of more than one light level.

TELECOMMUNICATIONS

EXISTING BUILDING TELECOMMUNICATIONS SYSTEMS

There are currently (4) 4" conduits coming into the first floor underground at the center of the North wall of the building. These conduits contain high pair count copper, fiber, and other miscellaneous low voltage cabling.

The conduits run outside directly North about 15' where they enter a telecommunications vault. From there the conduit run Northwest to one of the support columns of the overhead bridge, up the column and West to the admin building area.

The conduits appear to contain the main telephone feed for the building (see photos below) which looks to be an 1800 pair cable. It appears as if this cable is being used but it may be abandoned in place (if PSU is using VoIP in this building). If it is the main building feed for a centralized PBX, the phones in the building will have to be taken down until the cable is re-routed and re-installed.

The fiber may be the main backbone connection to the other buildings on campus and the connection to the PSU network and will need to be addressed.

ABOVE
Pull box in basement in room at North wall. The 1800 pair cable is the large black one. The fiber is installed in the orange innerduct. The other cables could be fire alarm, etc.

APPENDIX

OUS SPACE STANDARDS

WIRING STANDARDS

UNIVERSITY CLASSROOM TECHNOLOGY

Oregon University System

FACILITIES STANDARDS AND GUIDELINES

8.01 INTRODUCTION

The purpose of Chapter VIII is to set forth standards and planning guidelines to be used in the physical development, evaluation, and assignment of spaces of institutions in the State System. The standards are flexible and must be interpreted consistent with the **mission**, **goals**, and **objectives** of the institution. Physical requirements and limitations, such as the confines of existing spaces in remodeling, as well as outsize equipment which should be noted in programs and evaluations, may necessitate deviations from the guidelines.

8.02 SPACE STANDARDS

The facility needs of an institution are projected on the basis of the mission, approved programs of an institution and enrollment projections. (Refer to Section 7.02)

Three biennia enrollment projections, which are used to project instruction *and* related space, need to be reliable because the planning and construction of a facility typically has a lead time of at least five or six years. If appropriate, more than one enrollment projection for which assumptions and reliability are stated should be made to target planning period. For facility needs, enrollment projections must be reconciled with enrollment ceilings established by the Board.

The facility needs of an institution are projected on the basis of the mission, approved programs of an institution and enrollment projections (refer to Section 7.02).

Three biennia enrollment projections, which are used to project instruction *and* related space, need to be reliable because the planning and construction of a facility typically has a lead time of at least five or six years. If appropriate, more than one enrollment projection for which assumptions and reliability are stated should be made to target planning period. For facility needs, enrollment projections must be reconciled with enrollment ceilings established by the Board.

Projection Standards - Projection standards are for use in the institution's planning process and the Board's Office of Administration, Facilities Division in estimating total space needs of an institution and may not reflect an exact spatial configuration for any one category because it may vary depending on the special characteristics of the functions housed.

Design Guidelines - Design guidelines are for use by institutional personnel and planning consultants in identifying optimums of unit size and efficiency in the design of proposed facilities.

8.03 CLASSROOM SPACE USE OBJECTIVES

Classrooms are defined as general purpose instructional rooms with equipment suitable for lecture, discussion and dry-demonstration formats. Rooms which are known as lecture halls, classrooms and seminar rooms are all expected to be subject to regular central assignment in order to achieve utilization at the maximum practical level. The objective shall be to achieve at least the following minimum hours of scheduled occupancy of classrooms and student stations as an average on an institution-wide basis:

Classroom Scheduled Occupancy	*Classroom Student Station Scheduled Occupancy*
33 hours per week	20 hours per week (which is a Classroom Student occupancy of 60 percent for 33 hours per week of Classroom scheduled occupancy)

8.04 CLASSROOM PROJECTION STANDARD

Classroom space needs will be projected on the basis of student stations in conformance with classroom space use objectives (Section 8.03). Area requirements will be determined utilizing a norm of 16 square feet per student station including related service areas (weighted mean derived from survey of the typical distribution of classroom sizes and related service areas). This standard will generally provide adequate space for student seating and related area such as audio/visual and instructional equipment.

8.05 CLASSROOM DESIGN GUIDELINES

The number of square feet per station in general purpose classrooms will vary with the size of the room and the type of station, ranging from chairs around a table in a seminar room to a fixed-seat lecture hall. Additional square footage for special equipment may be required. This guideline is based upon usage of standard seat spacing of 42" from back to back and 26" from center to center. Adjustments will need to be made if the size of the student station installed differs from the above standard. Typical classroom sizes are:

No. of Student Stations	*Sq. Ft. per Student Station*	*Sq. Ft. Area of Room*
15	20	300
20	17.5	350
25	16	400
30	15	450
40	14.2	568
50	13.5	675
60	13	780
80	12	960
100	11	1,100
125	10	1,250
200	9	1,800

8.06 Class laboratories are defined as rooms used by regularly scheduled

CLASS LABORATORY SPACE USE OBJECTIVES

classes, which require special-purpose equipment for student participation, experimentation, observation, or practice in a field of study.

The expected utilization of laboratory space at each institution shall be the maximum practicable level. The objective shall be to achieve at least the following minimum hours of scheduled occupancy of laboratories and laboratory student stations as an average on an institution-wide basis:

	Class Laboratory Scheduled Occupancy	*Class Laboratory Student Station Scheduled Occupancy*
Lower Division	22 hours per week	18 hours per week (which is a Class Laboratory Student Station Scheduled Occupancy of 80 percent for 22 hours per week of Class Laboratory Scheduled Occupancy)
Upper Division	16 hours per week	12 hours per week (which is a Class Laboratory Student Station Scheduled Occupancy of 75 percent for 16 hours per week of Class Laboratory Scheduled Occupancy)

8.07 CLASS LABORATORY PROJECTION STANDARD

Class laboratory space needs will be projected on the basis of student stations in conformance with laboratory space use objectives (Section 8.06). Area requirements will be determined by the discipline, the character of special-purpose equipment, the number of students expected to be served, and any associated service area requirements.

8.08 CLASS LABORATORY DESIGN GUIDELINES

The design guidelines for class laboratories vary with the academic discipline and must conform to the student station size, equipment and service requirements. Examples of area allowances for some disciplines, including the student station and the ancillary service areas, are as follows:

Discipline	*Net Assignable Square Feet per Student Station (fully developed academic program)*
Animal Science	160
Chemical Engineering	160
Electrical Engineering	110
Theater	100
Chemistry	68
Dairy Science	68
Geology	68
Physics	65
Plant Pathology	65
Anthropology	50
Zoology	50
Business Administration	32
Speech	32

8.09 OTHER INSTRUCTION RELATED FACILITIES STANDARDS

There are instructional spaces on most campuses, which are used for instructional programs not included within the previously identified categories outlined in this chapter. These include spaces such as open laboratories, music practice rooms, individual study laboratories, drama facilities, museums and galleries related to the instructional program. The justification of these facilities is related directly to the mission and guidelines for the institution and the areas are determined by an analysis of the specific requirements.

Examples of groupings of disciplines are suggested below, but space entitlement for each institution must be justified by programmatic needs.

Group I - Disciplines suggested which have very little, if any, special instructional space needs:
- Economics
- History
- Sociology

Group II - Disciplines suggested which have minimal special instructional space needs:
- Business Administration
- English
- Political Science

Group III - Disciplines suggested which have moderate special instructional space needs:
- Applied Science
- Entomology
- Foreign Languages
- Vocational Training

Group IV - Disciplines suggested which have considerable special instructional space needs:
- Chemistry
- Engineering
- Health Sciences
- Physics

Group V - Disciplines suggested which have extensive special instructional space needs:
- Art
- Drama
- Music
- Zoology

8.10 OFFICE FACILITIES PROJECTION STANDARDS

Office facilities include both offices and office related service areas. An office is defined as a room or suite of rooms equipped with desks, chairs, files, bookcases, word processing equipment, etc., that is assigned to one or more persons primarily for the performance of administrative, clerical or faculty duties, other than the meeting of classes. (The projection standard includes active office service areas such as reception-waiting areas, conference rooms directly associated with instructional and administrative office, file rooms and work rooms.) An office service area is defined as an area which directly supports an office (or group of offices) as an extension of the activities in an office. Included would be conference rooms, waiting areas, work rooms, file rooms, etc.

Office facility needs will be projected at an institutional level based upon the number of FTE faculty (including post doctoral fellows and employed graduate students), staff, (the head count of) and non-employed (advanced) graduate students. The projection standard, which will include all office and office related facilities, is 190 net assignable square feet per FTE faculty, staff and non-employed (advanced) graduate students (three non-employed (advanced) graduate students head count equals one FTE for purposes of office facilities projections).

8.11 OFFICE FACILITIES DESIGN GUIDELINES

The following office facilities design guidelines will be used except where special equipment, such as pianos and drafting tables, requires larger areas. When office facilities sizes and lay-out are determined, it is important that flexibility be maintained so that assignments can be made without regard to rank for efficient functioning and ease of reassignment.

A. Faculty offices *(academic)*:

	Sq. Ft. per Station
(Senior) Faculty (Instructor-Professor)	135
Department Head	150
Employed Graduate (and/or Teaching Assistant) Student	65

B. Administrative offices *(academic and non-academic)*:

Presidents	300
Vice Presidents/Deans	225
Assoc./Ass't. Vice Presidents/Director	180
Professional/Technical/Management	135

C. Staff offices *(non-academic)*:

Support Personnel	90

D. Other:

Non-employed Graduate Students	50

E. Office Service Areas

1. Areas with Minimum Space Requirements

Conference rooms	20
Waiting areas	10

2. Other Support Areas (no minimum space requirements. Spaces and area to be determined by program needs).
- Photocopy rooms
- FAX machines area
- Terminal/micro computer room
- Work room
- Computer printer room
- Filing areas
- Storage areas

8.12 LIBRARY STANDARD

Libraries are defined as a room or group of rooms used for the collection, storage, circulation, and use of books, periodicals, manuscripts, and other reading or reference materials.

Libraries in the State System are to be programmed to provide for the space outlined below. Stack space and non-book material space will be based on the estimated size of collections six years following the completion of a facility or facility addition. Do not include warehouse operations.

Library Reader Space - Reader stations are to be provided for 15% of the Fall Term FTE undergraduate students and 25% of the Fall Term FTE graduate students at all institutions. Reader station space will allow 25 square feet for each FTE undergraduate student and 30 square feet for each FTE graduate student.

Faculty Research Reader Space - Research space standards are outlined under Section 8.15 RESEARCH STANDARD. In addition, there is an entitlement of 15 square feet of carrel space in the library for each FTE faculty identified primarily in Groups I and II of Section 8.15, such as the humanities, social sciences, etc. There is an entitlement of three square feet of carrel space for each FTE faculty identified primarily in Groups III, IV and V of Section 8.15, such as the life, physical and behavioral sciences, agriculture, etc.

Stack Space - The following allowances, which reflect a higher percentage of bound periodicals at Health Science and Law libraries will be used in providing stack space:

	NASF/Volume	
HS & Law	*All Others*	
100,000 volumes	0.12	0.10
next 900,000 volumes	0.08	0.07
next 1,000,000 volumes	0.05	0.05

or by:

	Volumes/NASF	
HS & Law	*All Others*	
100,000 volumes	9	10
next 100,000 volumes	10	12
next 800,000 volumes	12	14
next 1,000,000 volumes	15	16

Non-Book Material - The following space allowances, which have been developed by measuring collections and the space required for storing, handling and using non-book materials, will be used in projecting their space needs.

Item	*Formula Items per Sq. Ft. of Floor Space Suggested Standard*	*Space to be Allotted in Minimum Units of Square Feet*
Microcards	6,000	10
Microprints	1,400	10
Microfiche 4"x6"	2,500	10
Microfiche 3"x5"	6,000	10
Microfilm reels	60	10
Film strips	200	10
Slides	700	12
Transparencies	500	10
Motion picture reels	12	12
Video tape reels	3	10
Computer tape reels	9	10

Item	*Formula Items per Sq. Ft. of Floor Space Suggested Standard*	*Space to be Allotted in Minimum Units of Square Feet*
Tape reels	30	10
Phonograph records	75	10
Picture files	500	10
Maps	50	30
Pamphlets	150	10
Test files	150	10
Multi-media kits	9	10
Government documents	50	10
Unbound periodicals	15 bibliographical units	10

Archives - Space requirements for collection will be submitted by institutional librarian.

Manuscripts - Space requirements for collection will be submitted by institutional librarian.

Library Services and Administration - An additional area equal to 25% of the space generated by the reader and stack space will be allocated for library services and administration.

8.13 COMPUTER FACILITIES

Computer facility needs beyond instruction and research vary at each institution and may or may not be separated into instructional, research and administrative components. Inasmuch as the amount of equipment may range from input/output terminals to centralized system-wide components, space requirements will reflect the equipment housed and the size of the supporting staff.

Technological advances may reduce the area required for equipment or permit expansion of capabilities without increasing facilities.

8.14 SPECIAL SERVICE FACILITIES

In general, facility projection and space standards are associated with specific functions. Special and independently administered services such as central printing and duplicating, media production, animal quarters, central mail service, hazardous materials, cafeterias independent of student unions and housing, museums, parking structures, and intercollegiate athletics which are not identified elsewhere in these standards and guidelines, will be programmed in accordance with institutional needs. These spaces are in addition to other spaces provided such as office and office related service areas.

8.15 RESEARCH STANDARD

These standards recognize research as a broad category of activities including, but not limited to, creative inquiry, sponsored projects, applied research, clinical trials, product development, non-sponsored projects, etc. The definition of the amount of research space generated by an institution is dependent on these unique characteristics:

1. Consistency with the mission of the institution.
2. Level of involvement in research.
    a. Consistency with teaching appointments for “instruction and related research”.
    b. Levels of grant funded research in addition to that which can be integrated with research expected as a part of an instructional appointment.
3. Types of facilities required to carry out the research.
    a. The facilities will vary from complex wet and dry laboratories to reading rooms to outdoor field studies.

Research space requirements will vary over time within an institution and a process should be established to recalculate and redistribute this resource on a regular basis.

The entitlement to the space by any one individual or department is responsive and flexible; it must relate to the extent of faculty involvement in research, the level of research and the needs of the discipline. It is implicit that under-utilized research space should be promptly reassigned by the appropriate administrator.

Departments will be expected to share, as far as practical, specialized equipment as well as common and/or interdisciplinary support space. It is expected that the design and layout of research space will allow for maximum flexibility for reassignment.

The derivation of research space entitlement will require officials at each institution to develop a distribution of the programs into the appropriate space projection group as outlined hereinafter. The space entitlement is a function of the number of FTE researchers where FTE researcher is defined as the sum of the professors, associate professors, assistant professors, instructors, research assistants unclassified, research associates, graduate teaching and research assistants, as well as one-third of the graduate students associated with the activity but not included above. (Classified support personnel associated with research do not generate space but are accommodated by the proper Group assignment of the FTE researcher.) See also 8.12 LIBRARY STANDARD, Faculty Research Reader Space. Office facilities associated with research appointments are provided for in Section 8.10, OFFICE PROJECTION STANDARD.

The Group distribution outlined below is based upon functions required by research undertaking. Groups II through V include research activities which require minimal to extensive amounts of laboratory, laboratory service, studio and studio service space for research, while Group I includes disciplines with primarily library and office space needs only. The disciplines for each Group are subject to adjustment to a higher, lower or inter-group level depending upon the substantiated differing character of the research.

All functions of the research activity are included within the space standard (i.e., core laboratories, related service areas, etc.).

Group I - Research activities with primarily library and office associated space needs only.

Group II - Office-based research activities requiring computer support, group project rooms, reading/study areas. Limited service and support needs. This group generates 50 square feet per FTE researcher.

Group III - Research activities using small individual studios, shared rehearsal facilities, production studios and project areas. Accommodates both solo and group activities. Specialized facilities often used on a shared basis for teaching, research, and performance activities. Special storage facilities required. Also included are combination office/laboratory based research activities. Laboratories, project rooms or observation/practice facilities often are shared among several research teams. Limited service areas with some special storage needs. This group generates 150 square feet per FTE researcher.

Group IV - Research activities generally requiring fewer laboratory services and less bench space for individual work stations. Greater proportion of core laboratories shared among research teams, often housing bulky experimental apparatus. Requires service areas and support space ranging from 10% to 25% of core laboratories. Faculty and graduate students also involved in field research. This group generates 350 square feet per FTE researcher.

Group IV - Research activities generally activities in complex wet and dry laboratories, typically assigned to research teams. High density of utility services, fume hoods, other built-in equipment, bench space, and movable equipment. Requires service areas and support space ranging from 25% to 50% of core laboratories. Large individual studios for faculty and graduate student creative activity, usually occurring on a solo basis, would also be included in this group. Specialized support areas required for specific equipment based on techniques, such as photography, computing arts, or media editing. This group generates 500 square feet per FTE researcher.

8.16 PHYSICAL EDUCATION AND RECREATIONAL SPORTS ACTIVITIES FACILITIES

Physical Education areas are those used principally by students and faculty for physical education instruction.

Recreational activity areas are those that are used for physical recreational sports, which include intramural sports, club sports and open recreation.

Physical Education activity and support areas are used frequently for recreational sports activities. It is expected that many of the areas used for instruction be available for recreation. Facility requirements for the categories may be combined for translation into an overall facility program.

Intercollegiate athletic team areas (other than Club Sports) are used for inter-institutional team sports and are not available, nor included in the guidelines for P.E. and recreational sports space needs. At the regional universities it is expected that there will be some use of athletic fields for physical education and/or recreational sports.

(It is acknowledged that larger institutions may experience somewhat more intensive use of facilities due to diversity of recreational sports activities offered.)

8.17 PHYSICAL EDUCATION AND RECREATIONAL SPORTS PROJECTION STANDARDS

Space needs for physical education instructional areas and recreational sports activities shall be made on the basis of Fall Term FTE total undergraduate and graduate enrollment. The projection standards are:

1. Indoor space is projected at 16 square feet per FTE student as defined above. This includes the activity areas and the ancillary service areas of lockers, showers, dressing rooms, etc. The space allocation must be made in units of complete teaching stations/activity areas. The minimum facility should be projected on the basis of a 3,000 FTE student enrollment as defined above.

B. Outdoor activity areas are projected at 100 square feet per FTE student as defined above. The space allocation must be made in units of complete teaching stations/activity areas for all types of field sports. The areas need to be convenient to locker and shower rooms, and those areas used for classes should be within a ten-minute walking distance from academic classrooms. The minimum total facility should be projected on the basis of a 3,000 FTE student enrollment as defined above.

8.18 PHYSICAL EDUCATION AND RECREATIONAL SPORTS DESIGN GUIDELINES

Recreation Sports Areas - In addition to the indoor and outdoor areas outlined in "A" and B" above, there may be provisions to allow for additional square footage in sports fields and buildings for recreational sports activities as appropriate to meet the specific needs of the institution.

The design guidelines should conform to recognized planning criteria such as those outlined in publications by the American Association for Health, Physical Education, and Recreation, the National Intramural-Recreational Sports Association (NIRSA), and other standard sources.

8.19 STUDENT HEALTH SERVICES STANDARD

The type of health service facilities required is usually a matter of institutional policy as well as proximity to and working arrangements with local hospitals. They include such areas as examination/ treatment rooms, observation rooms, laboratories, reception-waiting areas, supply rooms, and infirmary facilities. The latter are appropriate primarily at larger institutions.

Space projections of this category should be based upon the number of people served, typically on the basis of one to one and a half square feet per Fall Term FTE student. Office facilities for physicians and supporting staff is projected under Section 8.10 OFFICE PROJECTION STANDARD.

8.20 STUDENT UNION FACILITIES

The functions which student union facilities house and the composition of the university community served may vary considerably from one campus to another but they exhibit an overall balance in relation to the size of the student body. Student unions are institutional centers that provide services as required and/or desired by the users to complement those provided in the community.

A nominal level of student union facilities may include the following functions:

1. Organizational Activities
    a. Publications
    b. Rooms for meetings
    c. Organizations and interest groups - offices, workspace and storage
    d. Broadcast - radio, television
2. Recreation
    a. Active - table tennis, bowling, etc.
    b. Passive - lounge, music listening, television viewing, etc.
    c. Hobbies - crafts, arts, etc.
3. Socio-Cultural
    a. Galleries
    b. Auditoria
    c. Ballrooms
    d. Etc.
4. Administration
5. Food Service
    a. Cafeteria
    b. Snack Bar
    c. Dining Room
    d. Service
6. Specialized Services
    a. Bookstores
    b. Concessions
    c. Etc.
7. Building Service Areas
    a. Circulation
    b. Lobbies
    c. Restrooms
    d. Janitor Closets
    e. Loading Docks
    f. Etc.

Other student controlled recreation facilities, (outdoor program, canoe facilities, etc.) including some off-campus facilities (boathouse) may be considered outside the guidelines.

8.21 STUDENT UNION FACILITIES PROJECTION STANDARDS

Space needs are developed using Fall Term student FTE as a base, the projecting on a straight line with a minimum of 18 usable square feet per Fall Term student FTE for institutions with 2,400 FTE enrollment to 12 usable square feet per Fall Term student FTE for those with 20,000 or more FTE enrollment. An institution with fewer than 2,400 Fall Term student FTE may use the standard for 2,400 or provide a smaller amount of space as appropriate to the needs of the institution.

8.22 STUDENT UNION FACILITIES DESIGN GUIDELINES

Design Guidelines are the area required for a student union must be responsive to the services expected to be provided, and varies with the size of the institution.

8.23 RESIDENTIAL HOUSING STANDARD

It is expected that institutions will provide a reasonable amount of residential housing to supplement living accommodations available within the community. While projections of need may be appropriate for an individual institution, diversity of student populations and campus locations do not lend themselves to system-wide standards.

Residential housing areas may include food service, as well as central food storage, furniture storage, and maintenance as appropriate for the institution. The facilities must be adequate to carry out the mission of the housing department and to compliment the mission of the institution.

Administration of the college/university housing and/or dining facilities is designed to make the physical environment attractive, conductive to academic success, functional, in compliance with codes (such as the Americans with Disabilities Act), and provide safety features.

Guidelines for housing facilities:

1. Administrative facilities must include: Private offices for counseling, interviewing, or other meetings of a confidential nature; office, reception, and storage space sufficient to accommodate assigned staff, supplies, equipment, library resources, and; conference space.
2. Residential facilities, whether residence halls, apartments or other living accommodations (i.e., Family Student Housing) may be furnished and must be maintained in a manner designed to provide for security, comfort, and an atmosphere conducive to study, growth, and development. Public, common, study, lounge, meeting, and recreational areas must be provided and adequately furnished to accommodate the number of residents that use them. Any remodeling or new construction must comply with existing standards for accessibility.
3. Residential facilities must provide for adequate custodial work and storage space in close proximity to the area of custodial responsibility and provide laundry facilities in close proximity to residential facilities. Family housing facilities should also consider day care facilities.
4. Residential facilities, whether residence halls, apartments, or other living accommodations must consider food service areas and its relationship in supporting the housing program. This may include vending machines, small communal kitchens and dining areas, kitchenettes in the room, central food service cafeteria, convenience stores or snack shops and or satellite arrangements for food service support. Food service must be viewed at least as a convenience, and in some cases a necessity to residential living.
5. Other support activities should be considered including bicycle storage, personal locked storage, mailrooms, recycling areas, loading docks, etc. All facilities should include telecommunication services such as cable TV, computer network access and basic telephone system. Recreational facilities for children of families living in institutional housing should also be provided.
6. Residential facilities also include infrastructure improvements such as lighting systems, landscaping, pathways and walks, and utilities. Parking and roadways must also be considered.

8.24 PHYSICAL PLANT SERVICE AREA STANDARD

Areas required for the operation and maintenance of the campus physical plant are identified in two categories: for the support of (1) central service functions and (2) building custodial functions.

1. Central Service Functions - This encompasses all of the areas used for buildings and grounds operation and maintenance, including heating plants, service shops, garages, storerooms, and warehouses. Central and building area required for the delivery, pick-up and holding/storage of materials should be included also, and should be located in conjunction with custodial areas outlined in 2 below. The area is calculated at 6% of the net assignable square feet of the buildings fully served. It may or may not include various auxiliary enterprise areas or structures and other areas such as agricultural facilities. If these are included, they should be in proportion to the amount of service rendered. Additional area may be required for vehicle/equipment storage in areas where snow conditions preclude leaving the equipment outdoors.
2. Building Custodial Functions - This encompasses all of the area used for regular custodial functions, including deliveries of supplies, collection and pick-up of waste and materials for recycling within each building. The area is calculated as approximately one percent (1.%) of the usable area of a building, excluding mechanical rooms. To allow for satisfactory and efficient use and storage of equipment and supplies, the basic custodial area should have the following minimal characteristics for those buildings requiring custodial services:

A. An approximately 120 square foot custodial supply and equipment room, including utility sink, close to an elevator (if applicable) on the main floor.

B. An approximately 40 square foot custodial supply and equipment room, including utility sink, close to the elevator (if

applicable) on all other floors.

C. For all floors with 15,000 usable square feet or more, an additional supply closet adjacent to the restrooms.

8.25 CHILD CARE FACILITIES

Childcare facilities provide services for student, faculty, and staff families. The primary function of childcare facilities is to provide care for children while their parents may attend classes, study, and work. In addition, they may provide opportunities for practicum, research, and observational experiences for faculty and students. Although state facilities are exempt from state licensing requirements and standards, **all** campus childcare facilities will adhere to these standards.

Portland State University
OIT-CNS—Networking & Telecommunications Services

TELECOMMUNICATIONS CABLING/WIRING
INSTALLATION & RELATED FACILITIES STANDARDS

GENERAL WIRING INSTALLATION STANDARDS:

All wiring and cabling work at PSU shall comply with the ANSI/EIA/TIA 568 Commercial Building Telecommunications Wiring Standard, all relevant EIA/TIA Technical Systems Bulletins, and the recommended installation procedures in the BICSI TDM Manual. Based on these standards, practices and procedures, all outlets, jacks, terminal blocks and horizontal station wiring shall be Enhanced Category 5 compliant and installed as a "Structured Cabling System".

More specifically, the horizontal station wire shall be Enhanced Category 5, UTP, 4-pair. The cable jacket shall comply with Article 800 NEC for use as plenum or non-plenum wire, and all cabling and wiring installation shall comply with appropriate code for plenum or non-plenum requirements.

For all PSU voice and data communications installations, PSU uses an open architecture design. Communications outlets at workstation and other jack locations shall minimally consist of three gang wall plates equipped with three 8-pin modular (RJ-45) jacks. ***The preferred standard for communications outlets in new construction is four gang wall plates equipped with four 8-pin modular (RJ-45) jacks.*** PSU has standardized on the following CpmmScope workstation components: UNF-MFMV Series faceplates (2P, 3P, 4P, 6P); UNJ500 modular jacks; UNSMB-4P connecting blocks; and UNF-FR106-4P mounting frames. Horizontal station wire shall extend from communications outlets to associated terminal closets and shall be terminated on Intermediate Distribution Frames (IDF's) using CommScope Enhanced CAT5 modular patch panels for data. All terminated station wiring shall be properly labeled at the outlet faceplate and the IDF.

Terminal closet material standards include the following: 7' x 19" Chastworth racking system including wire management and tray, CommScope Enhanced CAT5 patch panels & Corning fiber optic connectivity housings and panels.

The riser system shall consist of multi-mode & single-mode fiber and Category 3 copper riser cable. The recommended fiber cable is multi-mode, graded-index optical fiber with a nominal 62.5/125 micron core/cladding diameter and single-mode fiber. The copper riser shall be solid copper, 24 AWG, twisted-pair Category 3 backbone cable. The cable jacket shall comply with Article 800 NEC for use as plenum or non-plenum wire, and all cabling and wiring installation shall comply with appropriate code for plenum or non-plenum requirements.

All technicians performing horizontal and riser cabling or wiring work must be certified or otherwise qualified in the installation of Enhanced Category 5 wire, jacks, patch panels and terminal blocks. While contractors may choose to use less qualified personnel or workers who are not Category 5 certified for "wire pulling or rough in" work, all wire termination work must be performed by technicians who are certified Enhanced Category 5 installers and testers. Contractors may be asked to provide documentation or similar evidence that technicians are qualified Enhanced Category 5 installers and are current with ANSI/EIA/TIA standards. Failure to provide such evidence or documentation could result in the disqualification of the contractor and termination of the work order, service order, or installation agreement or contract.

The above standards describe the general cabling and wiring guidelines to be adhered to by all contractors performing telecommunications cabling and wiring work at PSU. Any exceptions to these standards will be duly noted in the specific Scope of Work for each project. Any deviation from these standards that is not specifically allowed by OIT-CNS—Networking & Telecommunications Services (NTS) or otherwise delineated in the Scope of Work could be grounds for disqualification of Contractor and termination of the installation agreement/contract.

QUALITY CONTROL & ASSURANCE REQUIREMENTS:

Testing and Documentation

Contractor shall test all cabling and wiring installed with an approved Enhanced Category 5 tester performing a link test to at least 155 MHz following TSB-95 to support a minimum of 100Mbs Ethernet. Contractors shall test all installed fiber strands for cable integrity using a bi-directional Power Meter with a controlled light source at a wavelength of 850nm & 1300nm for multimode and 1310nm & 1550nm for single mode. Contractor shall record all test results. Any installations that fail the testing shall be corrected and retested. All recorded results and related testing documentation, including those showing test failures, shall be provided to NTS on disk. NTS reserves the right to randomly test the Enhanced Category 5 throughput at various installation locations to ensure the accuracy and completeness of contractor testing. Should any of these tests fail, NTS may withhold all, or some portion, of the payment due Contractor for wiring installation work.

Housekeeping and General Clean-up

Contractor shall ensure that all work areas are left in a clean, safe condition at the end of each workday or shift as well as at the end or completion of the entire project. Contractor is responsible only for that work they perform and resulting cleanliness or safety issues. Prior existing conditions are the responsibility of PSU.

Qualifications, Professionalism and Behavior of Contractor Employees

All technicians and other contractor employees performing work on PSU premises shall be highly qualified, skilled professionals who behave in a professional and courteous manner at all times. Contractor employees must have the ability to plan and organize their work efficiently and communicate effectively with NTS staff and other customer contacts in the field.

NTS places a strong emphasis on good customer service and fully expects all of its contractors and vendors to endorse this service ethic when deploying technicians and other employees on the PSU campus. All contractor technicians and employees shall wear appropriate work attire on the job and shall present themselves in a professional manner in terms of attire and overall appearance. At least one technician or employee per work group shall wear attire that includes the contractor or vendor logo, business name, etc.

Warranty

Contractor must guarantee installation work, must warranty the fiber materials, and is required to describe the nature of Contractor's guarantee in the Bid Response or Quote submitted for this solicitation. ***The minimum warranty period for horizontal station wiring work shall be 2 years if PSU provides the materials and five years if the Contractor provides the materials. Fiber installation warranty shall be 10 years for labor and materials***. The warranty shall cover manufacturing defects in material and workmanship under normal and proper use, application assurance, and the installation of all materials.

QUALITY CONTROL & ASSURANCE REQUIREMENTS: (cont'd.)

Protection of Existing Equipment

All existing and active networking and telecommunications hardware installed in PSU campus buildings shall be protected prior to the start of any construction. ***It shall be Contractor's responsibility to effectively protect the owner's network and telecommunications facilities, equipment, and materials from dust, dirt and any other damage during construction.*** Contractor shall take no action that will interfere with, or interrupt, existing building network and telecommunications services unless previous arrangements have been made with NTS or the appropriate building owner's representative. If any shutdown of network or telecommunications services or systems is required for Contractor to perform work, Owner's personnel will perform shutdown of affected systems. Contractor must provide Owner with a minimum of three (3) days' advance notice for such system shutdowns. ***Should Contractor cause network or telecommunications services or systems to be interrupted in any way, Contractor shall be solely responsible for all costs associated with satisfactorily restoring or replacing services or systems to include all labor and materials required to restore or replace services or systems.*** All service or system restoration or replacement by Contractor must be approved by NTS.

COMMUNICATIONS FACILITIES REQUIREMENTS:

Main Switchroom for Telephone and Data Networking Equipment

The main telephone equipment switchroom typically houses the telephone switch (PBX) cabinets; equipment racks for data networking equipment; UPS equipment; the wall field for cross-connecting the equipment cables, riser cables, intracampus BET cables, and ILEC/CLEC entrance cables; a work station; and storage space for maintenance spares, tools and test equipment.

At PSU, there are typically two types of switchrooms: 1) the main switchroom which houses the central PBX cabinetry that serves the entire campus; and 2) satellite switchrooms for remote PBX cabinets that are connected via leased or PSU owned outside plant facilities back to the main campus switchroom. Since the main switchroom for the campus is in place and rather permanent in nature, this facilities requirement addresses ***satellite switchrooms which typically are required for new off campus buildings or similar major facilities construction projects*** where it's more efficient and effective to install remote PBX cabinets versus extending additional cable plant facilities to serve extensions directly off the main PBX.

The minimum size requirement for a satellite switchroom is 10' x 15'. Minimum clear height in the room shall be 8 feet without obstructions. The access door to the room shall be at least 36 inches wide and 80 inches high, with doorsill, and shall be fitted with a lock. A minimum of two walls should be covered with rigidly fixed (3/4 trade size) A-C plywood preferably void free, 8ft. high, capable of supporting attached equipment. Plywood should be either fire rated or covered with two coats of fire retardant paint.

A separate power supply circuit serving the switchroom shall be provided and terminated in its own electrical panel. Power supply (including lights) in the switchroom shall be on emergency power. Power shall be sufficient to support the equipment load and supporting facilities for the switchroom. A 1-½ trade-size conduit shall be provided from the switchroom to the building grounding electrode.

The preferred location for the switchroom is the first floor (or ground floor) or a basement or sub-basement. It is desirable to locate the switchroom close to the main backbone network and building outside telephone company cable entrance site for ease of connectivity to these network and distribution facilities.

When selecting the room site, avoid locations that are restricted by building components that limit expansion such as elevators, core, outside walls or other fixed building walls. Ease of accessibility to the space is

important for the delivery of large equipment. The switchroom shall be located away from sources of electromagnetic interference at a distance that will reduce the interference to 3.0 V/m throughout the electromagnetic frequency spectrum. Special attention shall be given to electrical power supply transformers; motors and generators; x-ray equipment; radio, cell phone or radar transmitters; and induction sealing devices. The switchroom shall be located with ready access to the main HVAC delivery system to ensure sufficient airflow and cooling.

HVAC shall be provided on a 24 hours a day, 365 days-per-year basis. The temperature and humidity shall be controlled to provide continuous operating ranges of 64° F to 72° F with 30% to 55% relative humidity. The ambient temperature and humidity shall be measured at a distance of 5 feet above the floor level, after the equipment is in operation, at any point along the equipment aisle. A positive pressure differential with respect to surrounding area should be provided.

The switchroom shall be provided with the proper fire suppression system. Appropriate portable fire extinguishers shall be provided and maintained within the switchroom. They should be located as close as practicable to the switchroom entry or exit. Additionally, some form of temperature alarm system should be installed to provide an early warning to a remote monitoring site of temperatures exceeding 75° F.

The interior finishes of the switchroom shall be light in color to enhance room lighting. The floors, walls and ceiling shall be sealed to reduce dust. Flooring materials having antistatic properties shall be used. Lighting shall be a minimum of 540 lx (50 candles) measured 3 feet above the finished floor in the middle of equipment aisles between cabinets. One or more switches located near the entrance door to the room shall control the lighting. ***Lighting fixtures shall not be powered from the same electrical distribution panel as the telecommunications equipment in the room***. Emergency lighting and signs should be properly placed in the room where absence of light would hamper emergency exit.

Terminal Closets for Telephone and Data Networking Equipment

There shall be at least one terminal closet per floor. Additional closets should be provided when the floor area exceeds 10,000 sq. ft. or the horizontal distribution distance to the workstation exceeds 90 meter (300 ft). There are typically two size scenarios for terminal closets: 1) the ideal situation where there is ample space to provide a minimum closet size of 10 ft. by 8 ft. with a single door at least 30 inches wide and 80 inches tall, opening out; and 2) the limited space scenario where the closet size should be a minimum of 7 ft. wide and 30 inches deep, both of which are inside dimensions, provided the closet is accessed via double doors which swing out away from the closet. ***In either scenario, the closet should be at least 8 feet high.***

Each closet shall have sufficient power and lighting. PSU's minimum power requirements are two dedicated 20 amp duplex power outlet per closet. Power supply (including lights) in the closet shall be on emergency power. Additionally, **each closet shall have adequate airflow to ensure that operating temperatures do not drop below 50° F or exceed 80° F.**

Closets shall be "centrally located" on each floor, or located so that horizontal station wires runs to user work stations and phones do not exceed 200 feet. The preferred standard for station wire is 150 feet.

Each closet shall have sufficient sleeves, slots, conduits, or similar floor penetrations necessary to allow for ease of installation of telecommunications cabling and wiring. Such penetrations shall be properly firestopped per the applicable building codes. A minimum of two walls should be covered with rigidly fixed (3/4 trade size) A-C plywood preferably void free, 8ft. high, capable of supporting attached equipment. Plywood should be either fire rated or covered with two coats of fire retardant paint.

COMMUNICATIONS FACILITIES REQUIREMENTS: (cont'd.)

Horizontal Pathways

Horizontal pathways and spaces consist of structure that conceal, protect and support horizontal cables between the workstation outlet and the telecommunications terminal closet. When designing a building, the layout and capacity of the horizontal distribution systems must be thoroughly documented in the floor plans and other building specifications.

Every ceiling distribution system must provide proper support for cables from the telecommunications terminal closet to the work areas it serves. ***Ceiling panels, support channels (T-bars), and vertical supports are NOT proper supports.*** Ceiling conduits, raceways, cable trays, and cabling must be suspended from or attached to the structural ceiling or walls with hardware or other installation aids specifically designed to support their weight. The pathways must have adequate support to withstand pulling the cables and be installed with at least 3 inches of clear vertical space above the ceiling tiles and support channels (T-bar) to ensure accessibility.

Conduit

Conduit types include electrical metallic tubing, rigid metal conduit, and rigid PVC. Conduits shall be of the type permitted under the appropriate electrical codes. **Metal flex conduit is not recommended due to cable abrasion problems and is not covered in this standard**. Fish tape or pull cord/string shall be installed in all conduits.

Any single conduit run extending from a telecommunications terminal closet shall not serve more than three communications outlets. Conduit shall be sized per Table 1.1 and be incrementally increased in size from the furthest outlet toward the telecommunications closet. No section of conduit shall be longer than 30 m (100 ft) or contain more than two 90° bends between pull boxes. A third bend may be acceptable in a pull section without derating the conduit's capacity if the run is not longer than 10 m (33 ft) or the conduit size is increased to the next trade size.

TABLE 1.1

CONDUIT			NUMBER OF CABLES								
INTERNAL DIAMETER		TRADE SIZE	WIRE O.D. mm (in)								
Mm	(in)		3.3 (.13)	**4.6 (.18)**	5.6 (.22)	6.1 (.24)	7.4 (.29)	7.9 (.31)	9.4 (.37)	13.5 (.53)	15.8 (.62)
15.8	0.62	½	1	**1**	0	0	0	0	0	0	0
20.9	0.82	¾	6	**5**	4	3	2	2	1	0	0
26.6	1.05	1	8	**8**	7	6	3	3	2	1	0
35.1	1.38	1 ¼	16	**14**	12	10	6	4	3	1	1
40.9	1.61	1 ½	20	**18**	16	15	7	6	4	2	1
52.5	2.07	2	30	**26**	22	20	14	12	7	4	3
62.7	2.47	2 ½	45	**40**	36	30	17	14	12	6	3
77.9	3.07	3	70	**60**	50	40	20	20	17	7	6

COMMUNICATIONS FACILITIES REQUIREMENTS: (cont'd.)

Pull Boxes

Pull boxes shall be used for the following purposes:

a) Fishing the conduit run.

b) Pulling the cable to the box and then looping the cable to be pulled into the next length of conduit.

Pull boxes shall be placed in an exposed manner and location, and readily accessible. Pull boxes shall not be placed in a fixed, false ceiling space unless immediately above a suitably marked, hinged panel.

A pull box shall be placed in a conduit run where:

1) the length is over 30 mm (100 ft);
2) there are more than two 90° bends; or,
3) if there is a reverse bend in the run.

Boxes shall be placed in a straight section of conduit and not used in lieu of a bend. The corresponding conduit ends should be aligned with each other.

Surface Raceway

Surface raceway, consisting of base, cover, couplings, elbows, and similar fittings, mounts directly on wall surfaces at appropriate work levels to provide a continuous perimeter pathway. Telecommunications outlets are located in cover fittings along the raceway. The electrical contractor shall provide faceplates for the surface raceway.

The practical capacity for telecommunications wiring in perimeter raceways ranges from 30% to 60% fill depending on cable-bend radius. The pathway size shall be calculated as follows: the summation of the cross-sectional area of all cables divided by the percent (expressed as a decimal fraction) of fill.

Grounding and Bonding

Grounding shall meet the requirements of the NEC and additionally grounding bonding shall conform to ANSI/TIA/EIA-607. When applicable, horizontal cabling and connecting hardware must be grounded and bonded in compliance with ANSI/NFPA 70 requirements and practices. When grounding telecommunications cabling, ensure that the installation conforms with proper practices and codes (ANSI/TIA/EIA-607, ANSI/NFPA 70, and local building codes).

An approved ground is available at the telecommunications terminal closet for:

- Cross-connect frames.
- Patch panel racks.
- Active telecommunications equipment.
- Test apparatus used for maintenance and testing.

ANY QUESTIONS ABOUT THESE STANDARDS SHOULD BE DIRECTED TO DAN WALSH, PSU TELECOMMUNICATIONS TECHNICAL SERVICES MGR. AT 503/725-4434.

PORTLAND STATE UNIVERSITY

Classroom Technology Standards Document

This document has been adopted as the Classroom Technology Standards document by Portland State University. Any work done outside this scope needs to be documented and approved by the OIS Instructor Support Services. These standards apply to new building projects and any technology upgrades to classrooms throughout the PSU Camps. To discuss Technology Standards, contact Doug McMartney at 503-725-9110.

This document includes:

I. **Purpose and Goals Overview.**
II. **LEVEL ONE TECHNOLOGE ROOM, with room description, pathway Standards, and budgeting pricing.**
III. **LEVEL TWO TECHNOLOGE ROOM, with room description, pathway Standards, and budgeting pricing.**
IV. **LEVEL THREE TECHNOLOGE ROOM, with room description, pathway Standards, and budgeting pricing.**
V. **LEVEL FOUR TECHNOLOGE ROOM, with room description, pathway Standards, and budgeting pricing.**
VI. **Layout Diagrams**

I. Purpose and Goals Overview

Instructor Support Services has been given the responsibility to standardize, implement, and support classroom technology in new and remodeled classrooms for Portland State University camps, and other buildings leased for instructional purposes. Our goal is to install technology tools permanently in the classroom and remotely support them to reduce delivery cost and down time. It is vital that as we plan new building projects, that we standardize the methods that we use to make rooms "technology ready". Instructors need to find familiar configurations when they are asked to teach in a new or remolded room on campus.

In the event that budgets will not allow for the installation of all the necessary presentation equipment for every room at time of construction, we must provide adequate pathway and design vision to easily transform general classrooms into media equipped rooms as funding permits. It is equally important to establish criteria for the environment in the classroom such as data, lighting, and acoustics. Technology may change but many constants will remain. New projection technology will require connectivity between teaching station, audiovisual sources, and a ceiling mounted projectors for the foreseeable future.

The current model for general classrooms includes a permanently located technology podium that houses a computer, VCR/ DVD Combo, a Document camera, an A/V Switcher/Controller, and Audio System. It is also networked via Ethernet to a help desk which can log into the room's control system for immediate remote assistance and diagnostic analysis.

The control system allows for data exchange between the control system and the help desk and allows for remote management, security, and control of room technology equipment and functions.

With this type of technology available to instructors, in a consistent and easy-to-operate teaching station, we believe instructors will be less intimidated and therefore more likely to utilize the tools.

Placing the centrally managed audio, display, and computing equipment permanently in the room, reduces labor and maintenance cost to the university, It also empowers instructors with the tools they need with help desk assistance available within seconds of a problem.

Equipment purchases will be administered through ISS for technology-equipped classrooms so that standards, responsibility, and continuous plant funding can more efficiently be facilitated. Following initial capital investment, a plant fund of at least 10% of the value of the classroom hardware is needed each year for equipment renewal and replacement. Continuing equipment replacement will cut the labor-intensive costs of repair and maintenance, permit the staff to devote more time to faculty than to hardware, and support the image of the college as having modern equipment and facilities.

Purchases not approved or administered through ISS may not be supported by the department.

Regardless of the available funding for classroom technology, it is necessary to include the proper conduit, data, and electrical services to easily upgrade lesser equipped rooms to higher levels of technology.

II. Level ONE Technology Room

Room Description

A level one room is one that has a ceiling mounted data projector, controlled by its own remote control unit, and is feed one RGBHV signal, and one computer audio signal, from a wall plate mounted at work table heath, near the teaching station. This level of system can NOT be remotely controlled or monitored.

Pathway Standards

(1) **Wall Box** A one gene deep electrical box (or mud ring if open wall) at work table heath to a minimum of 1.5 inch conducted (or pathway if open wall/ceiling) to data projector location.

(2) **Projector Power** A duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 12 feet away from a 6 Ft. screen and 16 Ft. from an 8 Ft. screen. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by ISS prior to installation.

Budgeting Pricing

EQUIPMENT	COUST
Data projector	2500.00
Alarm	75.00
Projector mount	125.00
Wall plate	40.00
Cabling& connectors	50.00
Electric install	1000.00
Equipment in install	1000.00

TOTAL $4790.00

Level ONE -A Technology Room

Room Description

A level ONE-A room is one that has a ceiling mounted data projector, controlled by its own remote control unit, and is feed one RGBHV, one computer audio, one left/right Audio, one Video single, from a wall plate mounted at work table heath, near the teaching station. This level of system can NOT be remotely controlled or monitored.

Pathway Standards

(1) **Wall Box** A two gene deep electrical box (or mud ring if open wall) at work table heath to a minimum of 1.5 inch conducted (or pathway if open wall/ceiling) to data projector location.

(2) **Projector Power** A duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 12 feet away from a 6 Ft. screen and 16 Ft. from an 8 Ft. screen. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by ISS prior to installation.

Budgeting Pricing

EQUIPMENT	COUST
Data projector	2500.00
Alarm	75.00
Projector mount	125.00
Wall plate	60
Cabling& connectors	50.00
Electric install	1000.00
Equipment in install	1200.00

TOTAL $50100.00

III. Level Two Technology Room

Room Description

A level two room is one that has a ceiling mounted data projector, controlled by an Extron MediaLink panel, and is feed one RGBHV, one computer audio signal, one left/right Audio, one Video, and one control signal from a wall plate mounted at work table heath, in the front of the room, to the side of the projector screen away from the entry door. The MediaLink panel requires two Network lines, one for remote operation of the panel, and one terminated on the panel to provide network access to any device plug into the panel.

Pathway Standards

(1) **Wall Box** A four gene deep electrical box (or mud ring if open wall) at work table heath to a minimum of 1.5 inch conducted (or pathway if open wall/ceiling) to data projector location. . ½" Conduit (or pathway if open wall/ceiling) for speaker wires will be needed to both the right and left side of projector screen. . Plenum rated wire is required if ceiling is plenum rated

(2) **Projector Power** A TWO duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 12 feet away from a 6 Ft. screen and 16 Ft. from an 8 Ft. screen. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by ISS prior to installation.

Budgeting Pricing

EQUIPMENT	COST
Medialink Contour	$900.00
15 pin HD & Audio Module	$64.00
A/V in Module	$64.00
Net Module	$36.00
Black Panel	$14.00
Audio AMP	$300.00
Mounting Bracket	$70.00
Volume Control Module	$270.00
Midialink Programming	$100.00
Speaker & Mounts	$260.00
T Bar Mount	$100.00
Projector Mount	$150.00
Video Projector & alarm	$2,600.00
Installation (Outside)	$1,550.00
PSU Work	$1,200.00
PSU Network (two lines)	$100.00

TOTAL $7778.00

IV. LEVEL THREE TECHNOLOGE ROOM

Room Description

A level three room is one that has a ceiling mounted data projector, controlled by an Extron 5 IP switcher, mounted in a fixed podium/Media Center, Other equipment mounted in the podium are a PC computer, a DVD/VCR Combo, Document Camera, and Voice Reinforcement System. Signals between podium and projector are, one RGBHV, one Video, and one control signal. The podium will be placed in the front of the room, to the side of the projection screen away from the entry door.

Pathway Standards

(1) **Floor Box/Wall Box** A Spider Manufacturing (Hubbell) CFB-501 floor box will be installed in the front corner of the room, away from the eatery door, beneath the teaching station location. The placement will be a minimum of 5.5 feet from each wall to allow for ADA requirements. The floor box will accept a 1 ½" low voltage conduit for AV wiring, a ¾" conduit for dedicated 20 amp 110v power service, and a 1" low voltage conduit for data. The standard floor box is Spider Manufacturing (Hubbell) CFB-501. It is necessary for the contractor or manufacturer to provide a 1 ½" opening on the end of the floor box to accommodate the specified 1 ½" conduit for pass through.

If a floor box is not possible, a two gene deep wall box (or mud ring if open wall), the duplex power outlet, the data jacks, will be placed in the wall near the floor by the podium.

(2) **Floor Power** A duplex 110v outlet should be mounted in the covered floor box in the designated teaching station location. The outlet will require an isolated 20 amp breaker.

(3) **Phone/Data** A minimum of fore data outlets should be routed and installed into the covered floor box.

(4) **LV Conduit** Supply a minimum 1 ½" low voltage conduit from the floor box and routed into the space above a suspended ceiling. A maximum of two 90 degree sweeps will be allowed in the 1 ½" conduit. No hard angles will be accepted.

(5) **Projector Power** A duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 12 feet away from a 6 Ft. screen and 16 Ft. from an 8 Ft. screen. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by ISS prior to installation.

(6) **Speaker lines** ¾ Conduit (or path way if open wall), from AV box to locations, 16" to the right and left of the projection screen.

Budgeting Pricing

#	EQUIPMENT	COST
1	Podium / Media Center, with switcher/control, DVD/VCR Doc Cam, PC computer	$12,000.00
2	Speaker & Mounts	$260.00
3	T Bar Mount	$100.00
4	Projector Mount	$150.00
5	Video Projector & Alarm	$2,500.00
6	Installation (Outside)	$2,000.00
7	PSU Electrical Work	$1,500.00
8	PSU Network (four lines)	$200.00

TOTAL $18,710.00

V. LEVEL FOUR TECHNOLOGE ROOM

Room Description

A level FOUR room is one that has a ceiling mounted HD projector (native 16 X 9), controlled by an AMX controller, mounted in a fixed podium/Media Center, and an additional equipment rack. Equipment mounted in the podium is a PC computer, a DVD/VCR Combo, Document Camera, and Voice Reinforcement System, Quid Image Splatter, and RGB Switcher. Signals between podium and projector are, one RGBHV, one Video, and one control signal. The podium will be placed in the front of the room, to the side of the projection screen away from the entry door.

Pathway Standards

(1) **Floor Box/Wall Box** a Spider Manufacturing (Hubbell) CFB-501 floor box will be installed in the front corner of the room, away from the eatery door, beneath the teaching station location. The placement will be a minimum of 5.5 feet from each wall to allow for ADA requirements. The floor box will accept a 1 ½" low voltage conduit for AV wiring, a ¾" conduit for dedicated 20 amp 110v power service, and a 1" low voltage conduit for data. The standard floor box is Spider Manufacturing (Hubbell) CFB-501. It is necessary for the contractor or manufacturer to provide a 1 ½" opening on the end of the floor box to accommodate the specified 1 ½" conduit for pass through.

If a floor box is not possible, a two gene deep wall box (or mud ring if open wall), the duplex power outlet, the data jacks, will be placed in the wall near the floor by the podium.

(2) **Floor Power** a duplex 110v outlet should be mounted in the covered floor box in the designated teaching station location. The outlet will require an isolated 20 amp breaker.

(3) **Phone/Data** A minimum of fore data outlets should be routed and installed into the covered floor box.

(4) **LV Conduit** Supply a minimum 1 ½" low voltage conduit from the floor box and routed into the space above a suspended ceiling. A maximum of two 90 degree sweeps will be allowed in the 1 ½" conduit. No hard angles will be accepted.

(5) **Projector Power** a duplex power outlet must be provided at the projector location mounted facing downward on the ceiling surface. The outlet will be approximately 35 feet from a 20 feet. screen and. The outlet should be centered on the screen. This specification may vary depending on final equipment choice and exact location will be specified by ISS prior to installation.

(6) **Speaker lines** ¾ Conduit (or path way if open wall), from AV box to locations, 16" to the right and left of the projection screen.

Budgeting Pricing Small Venue (less than 150 seats)

	DESCRIPTION	Cost
1	Podium / Media Center, with switcher/control, DVD/VCR Doc Cam, PC & Mac computers, AMX Controller, and Panel	$15,500
5	AMX Programming	$1,000.00
6	Image Splitter	$7,000.00
7	Speaker & Mounts	$500.00
8	Audio Power Amp	$500.00
9	T Bar Mount	$100.00
10	Projector Mount	$150.00
11	Single Chip DLP HD 6,000 Lumens Video Projector & Alarm	$8,500.00
12	Installation (Outside)	$2,500.00
13	PSU Electrical Work	$1,500.00
14	PSU Network (four lines)	$200.00

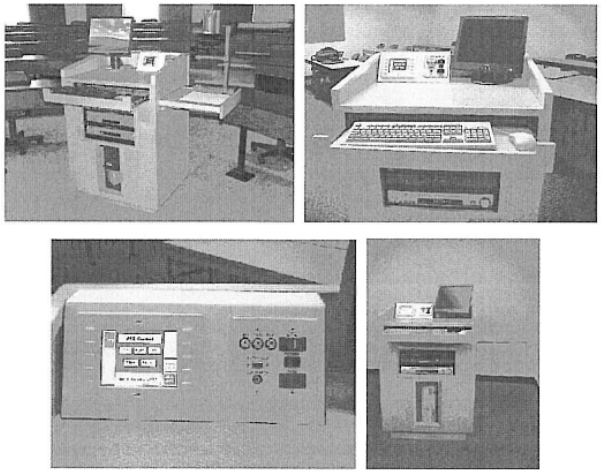
TOTAL $37,450.00

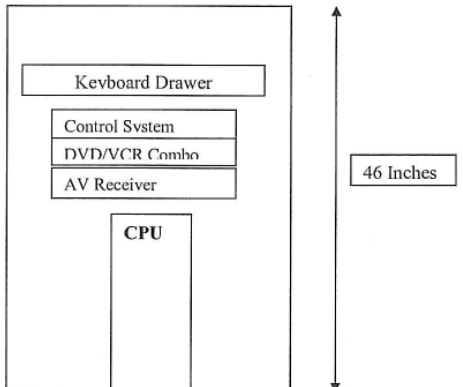
Budgeting Pricing Large Venue (more than 150 seats)

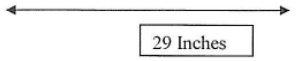
	DESCRIPTION	Cost
1	Podium / Media Center, with switcher/control, DVD/VCR Doc Cam, PC & Mac computers, AMX Controller, and Panel	$15,500.00
2	AMX Programming	$1,000.00
3	Image Splitter	$7,000.00
4	Speaker & Mounts	$500.00
5	Audio Power Amp	$500.00
6	T Bar Mount	$100.00
7	Projector Mount	$150.00
8	3 chip DLP HD 10,000 lumens Video Projector & Alarm	$40,000.00
9	Installation (Outside)	$2,500.00
10	PSU Electrical Work	$1,500.00
11	PSU Network (four lines)	$200.00

TOTAL $69,450.00

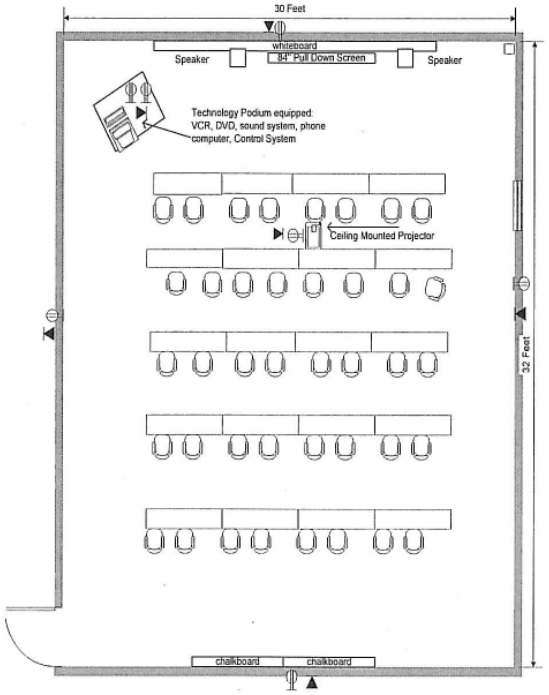
The Technology Podium System



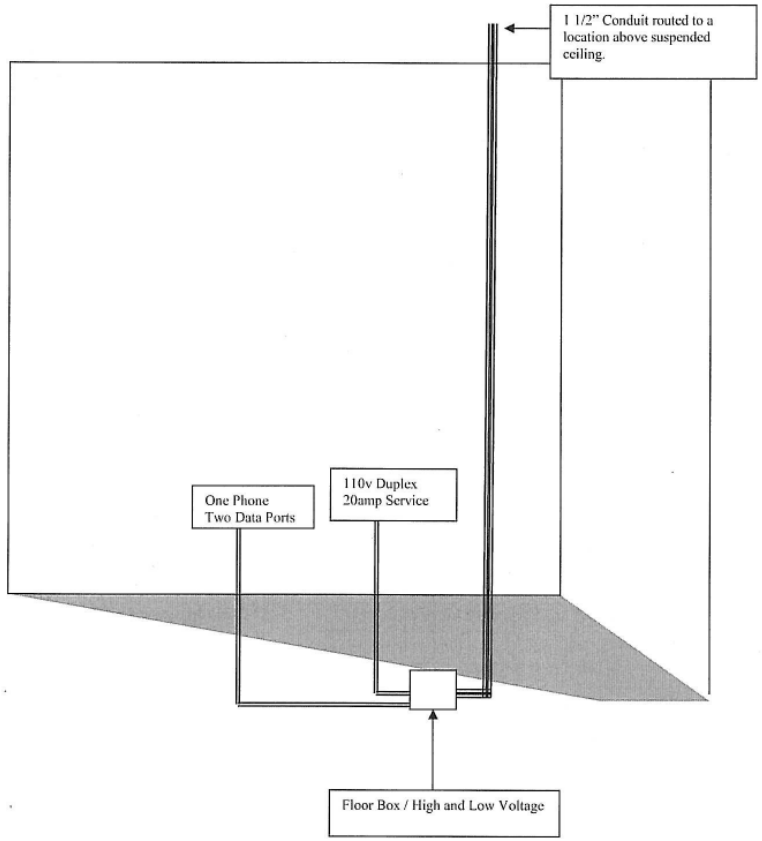




Standard General Purpose Room



Wall Elevation View



General Lighting Zone Diagram

This diagram illustrates lighting zone requirements in a technology equipped environment. A minimum of four independently switched zones are represented. Main room lighting (blue zone 1) provides general lighting in the room. Screen lighting (yellow zone 2) includes fixtures that may illuminate the projection screen area. Wall washes (grey zone 3) are fixtures that illuminate the white boards and chalk boards. Teaching station (magenta 4) is a fixture that can illuminate the teaching station while the room lights are dimmed. Low voltage lighting interface is desirable. Otherwise the main lighting control should be mounted near the teaching station with an entry switch near the door. Lighting fixtures should not be low hanging reflective instruments. These types of fixtures place limits on location and sight lines of ceiling mounted projectors.