

5.0 DESIGN CONCEPTS

5.1 Site Concepts

In response to the goals of the BCOE and the LRDP, the following concepts have been introduced in the site planning for EBU2. Refer to the site plan on the following page for illustration of these concepts.

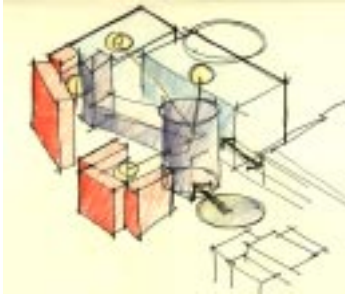
1. Courtyards and Plazas:

Develop and extend the existing BCOE courtyard as a semiprivate space for college use while developing the larger mall and plazas on the south. Continue to enhance and develop the courtyard respecting the scale, orientation and functions that exists.

Encourage pedestrian circulation on the south side of Bourns Hall toward the secondary entry for the general assignment instructional spaces. This creates an opportunity for campus plazas to connect main circulation pathways.



Site Concepts Plan



2. Entries:

Provide an entrance into EBU2 as a terminus to the BCOE courtyard and “hearth” of the college. Allow for a hierarchical sequence of spatial experiences from the largest public to the smaller, semiprivate within the building perimeter.

3. Siting the Building:

Site the new building to respond to natural forces of sun orientation and prevailing winds. Offices should be located on the north with research on the south. Use support space as a central organizing element.

Define the north edge of the site by aligning EBU2 with Bourns Hall and step back as Campus Drive curves. Respect the massing and proportions of Bourns Hall with EBU2 and create a gateway into the Engineering Precinct from Campus Drive. Define the eastern edge of the Engineering Precinct at the pedestrian path to the campus from the residence halls.

4. Connections to Bourns Hall:

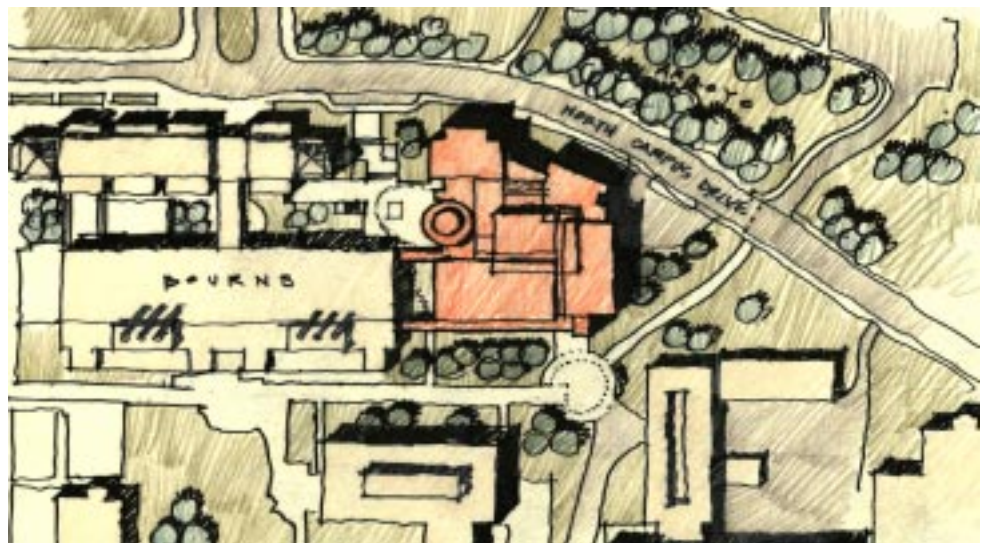
Provide a direct connection to Bourns Hall at the ground level through open courtyards and walkways. Provide a bridge connection to Bourns Hall on the second and third levels at the south wing.

5. Service:

Separate service from the main entries and provide screening of the service area. Maintain emergency vehicle access to the east and south portions of the site.

5.2 Site and Building Design

The design concept should integrate the building into the overall campus fabric, character and design. The new building should reflect the commitment that the University of California, Riverside has to a new generation of campus expansion with an emphasis on quality design, materials and landscape. EBU2 will provide a greater density of building facility than previous building projects while remaining sensitive to the inherent scale and character of the existing campus.



Site Design Plan

Landscape

Site

The project can be seen as a terminus to the existing Bourns Hall courtyard. Its proposed uses do not encourage pedestrian traffic through the building in route to other portions of the campus. Continuation of the Arroyo on the north will provide a soft, natural edge to the project, and the preservation of the eucalyptus grove on the south slope by the fire lane will give the appearance of longevity to the project. Consideration should be given to adding some *Tristania conferta* (Brisbane Box) trees to the slope presently planted with *Eucalyptus* trees.



Bourns College of Engineering courtyard view to East

Trees

The eucalyptus trees in the existing parking lot will have to be removed to accommodate the new building. In consideration of their age and stature on the campus this will not negatively impact the campus ecology. The sidewalk along North Campus Drive should be replaced with integrally colored concrete in UCR tan. The street trees should be appraised for replacement or preservation. Replacement street trees should be *Fraxinus velutina* "modesto" (Modesto ash) in accordance with the Campus Landscape Master Plan.

Eucalyptus tree protection should include fencing or otherwise sequestering trees from construction activities. Water must be provided to maintain the trees in a healthy condition, and no construction materials should be stored at the base of the trees. Excavation within the drip line of the trees must be strongly discouraged except where absolutely necessary, and any trenching within the drip line must be by hand excavation only. Relocation of existing trees is not recommended.



BCOE courtyard at bridge

Paving

Coordination of the paving patterns used at Bourns Hall will unify the buildings within the Engineering Precinct. Enhancement of the paving southeast of the site, at the intersection of the fire lanes leading to Geology, Pierce Hall and Bourns Hall, will encourage pedestrians to traverse to the west. Northeast passage at this point will connect travelers to the Residence Halls. Important gathering nodes have been identified at this southeast area as well as at the south entry/exit to Bourns Hall, continuing south to the Carillon Mall. The south path intersection with the Bookstore Mall is another gathering node, dispersing pedestrians south to Carillon Mall and north to North Campus Drive. Special paving and landscape treatments can emphasize the gathering nodes, directing pedestrians to the desired routes.

Shrubs

Shrubs throughout the site should be drought tolerant, easily maintained and colorful. Whether planted near buildings or in open spaces, ultimate shrub heights should respond to window heights and security issues. The UCR campus palette as described in the Campus Landscape Master Plan should be utilized.



BCOE terrace in courtyard view west

Lighting

Site lighting consisting of pole lights, bollards, step lights and landscape lights will guide visitors through the site at night. Special fixtures at the south portion of the site will direct pedestrians to the preferred route south of the building.

Furnishings

Site furnishings are an important feature in the context of this facility. Some of the issues that need to be addressed in selection of these furnishings include: Recalling furnishings used elsewhere on campus, comfort, ADA accessibility, ease of maintenance and durability.



BCOE courtyard view west

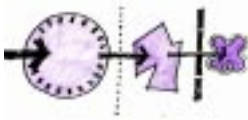
Irrigation

Irrigation should be tied into existing points of connection and a new automatic controller should be provided as a part of the project. If necessary, it may be possible to utilize the existing controller at the southeast corner of the Physics Annex. Moisture sensors should be included as a part of the required irrigation equipment, so that an accurate soil profile indicating soil moisture and oxygen can be obtained. Irrigation methods should be studied to determine the most effective method for providing complete ground plane coverage as well as an enduring deep water application for the trees.

5.3 Building Design Issues

Design Principles

The Computer Science and Engineering & Electrical Engineering departments place an emphasis on human need and issues. Their work involves “ideas, not machines” and emphasizes “people over technology.” Their commitment is in “making better places to live and work.” The following six principles add qualitative dimensions to the program and focus on encouraging human interaction and collegiality.



1. Create a hierarchy and “diversity” of interactive spaces from public to private. Enhance the different functions and needs through a careful use of scale, placement and design character. Lobbies and teaching labs define the major public space, research areas will define the semipublic space, and faculty offices will define the private space.



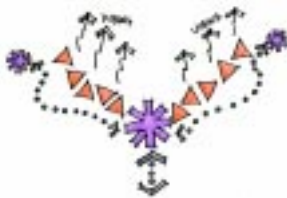
2. Provide adjacency of departmental offices in a central location to encourage interaction between the Computer Science and Engineering department and the Electrical Engineering department through a separate administration space on one floor.



3. Provide attractions at all building levels through the use of unique interactive space and program uses. Each floor should have program space which attracts faculty and encourages their interaction.



4. Integrate activities and connections between the first and second floors for flow of traffic. Facilitate the connection between Bourns Hall and EBU2. Provide clear and open connections between the first and second floors for undergraduate public uses.



5. Encourage interaction between faculty through the use of office clusters. Organize the clusters around break out spaces for convenience of meetings and discussions. Provide clear orientation and visual connection to the outdoors. Allow for north facing orientation of the offices to minimize solar gain and benefit from the views to the Arroyo and Box Springs Mountains.

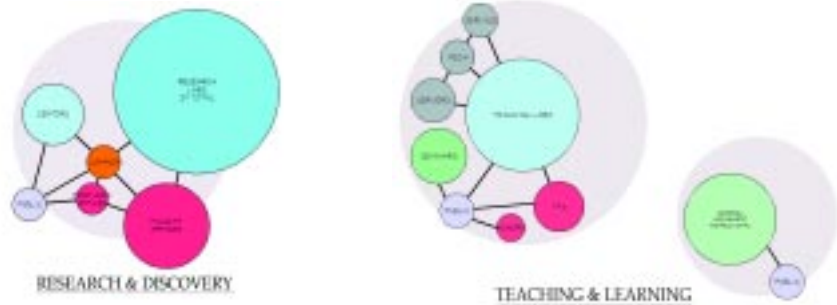


6. Develop research clusters in pods of three to four for optimum critical mass and interaction. Clusters of three to four allow for maximum flexibility and expandability while maintaining the necessary ratio of offices to labs.

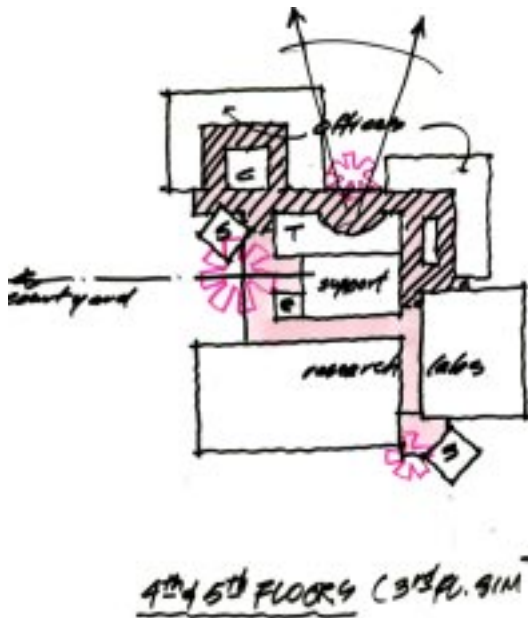
5.4 Plan Organization

The building axis aligns with the existing BCOE courtyard and forms the central organizational focus to the Engineering Precinct. This focus forms the “hearth” of the college. The ground and second levels are identified as undergraduate public space for Teaching and Learning. Both teaching labs and general assignment instructional spaces will be located on these levels. This relationship is a continuation of the existing uses in Bourns Hall.

The upper three levels are designated for the Research and Discovery uses. Research and Discovery is for faculty and graduate student research and office space. The core of EBU2 serves as an organizational lobby with core functions for elevators, stairs, toilets and lab support spaces. These adjacency diagrams, shown in more detail in Section 3.0, illustrate the relationships in each of these categories.



5.5 Research and Discovery

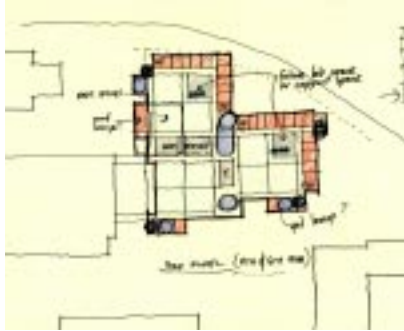


Research and Discovery layout concepts have been studied in a variety of configurations. Providing a range of space for casual interaction between faculty is critical.

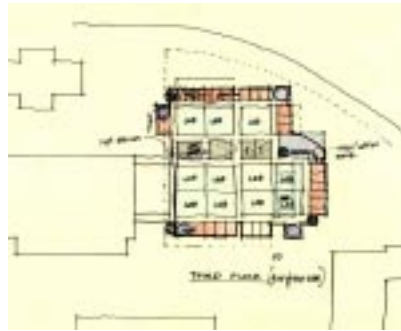
Locating research labs on the upper floors allows for increased security and privacy. Each floor should provide a ratio of two faculty offices to one research lab and maximize the lab arrangement for future expansion and flexibility. Three to four lab modules form a critical mass.

The following page illustrates a number of opportunities that exist for these arrangements and their impact on the site.

Concepts/Options



A



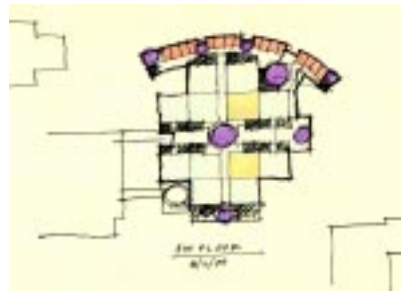
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D



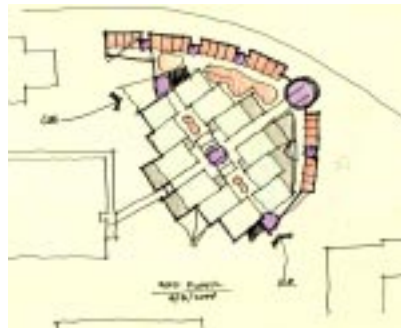
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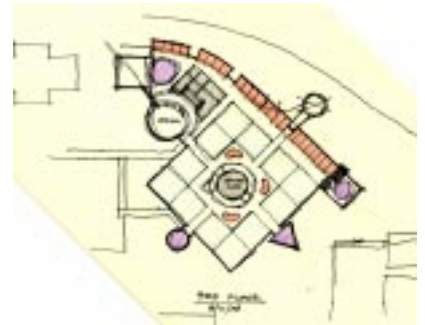
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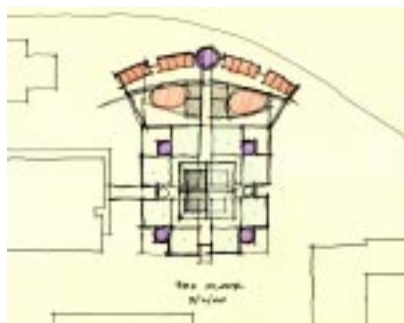
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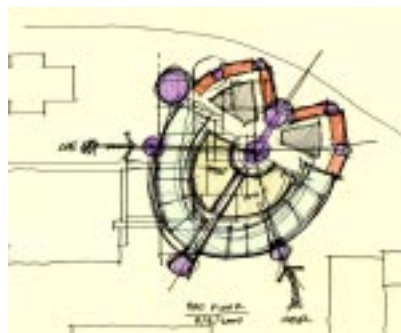
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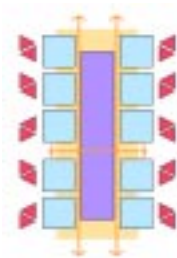
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K

Lab/Office Clusters

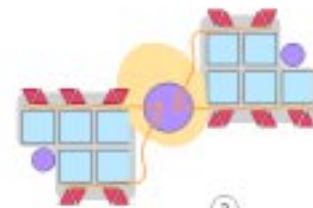
The conceptual floor plan for EBU2 is organized as an arrangement of clusters of research labs and faculty offices. The clusters meet the need for flexibility, organization, scale and privacy. Office spaces should be located on the north face of the building, allowing for minimized solar gain and taking advantage of the views to the Arroyo and Box Springs Mountains. These diagrams illustrate the opportunities for cluster arrangements reviewed by the DPP committee.



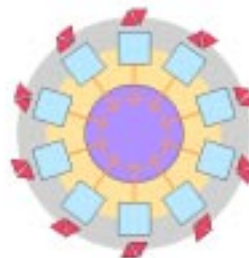
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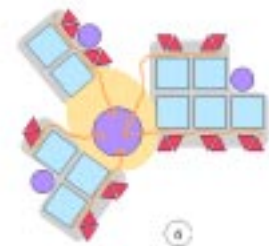
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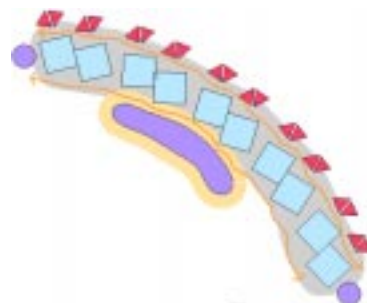
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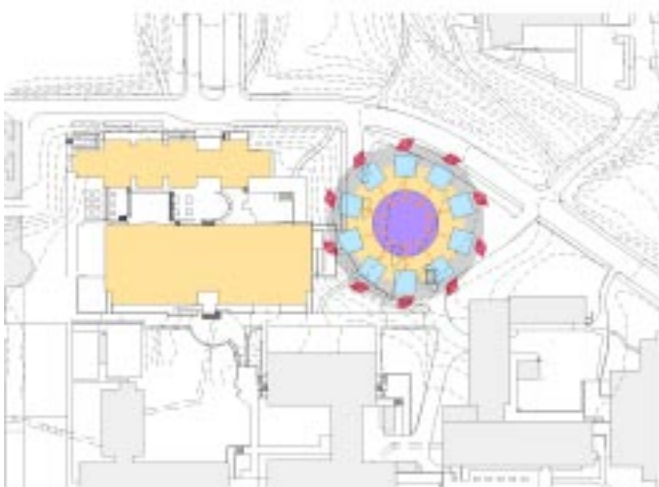
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Lab Clusters on Site

These illustrations test the feasibility for placing various lab cluster arrangements on the site. Although the site poses several restrictions, it is able to accommodate several design solutions for lab cluster arrangements. These clusters were reviewed and discussed by the DPP committee with several conclusions. It was agreed that the faculty preferred to be clustered together for convenient interaction. The offices prefer north orientation to take advantage of the views and north daylight. The research labs need to be clustered in groups of three to four for convenience and flexibility. It is very important to provide interaction spaces throughout the plan as is illustrated by the purple nodes in these diagrams.

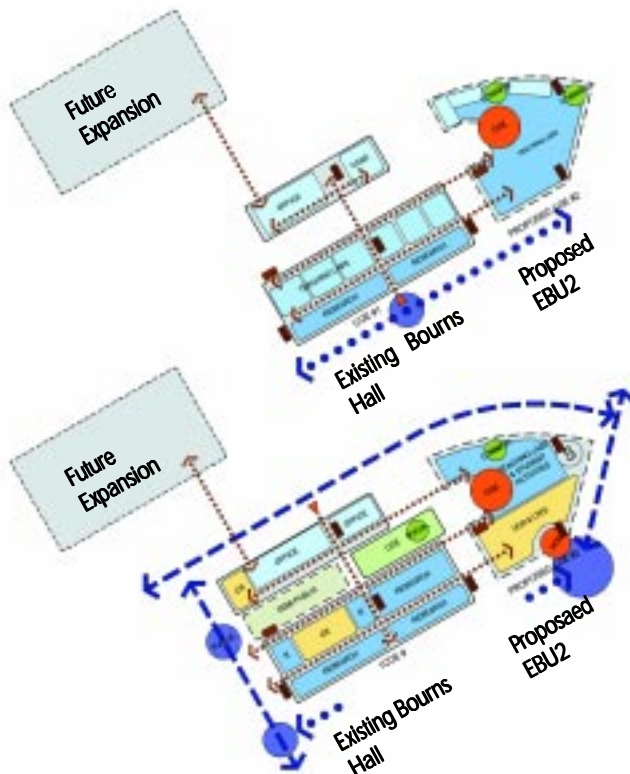


5.6 Teaching and Learning



The Teaching and Learning category in the plan organization includes general assignment instructional space and teaching labs. The teaching labs should be located on the first and second floors that align with the existing Bourns Hall. These spaces have a greater degree of undergraduate use and need less privacy and security. The alignment with the existing Bourns Hall is a natural extension of the existing teaching labs.

5.7 College Integration and Expansion



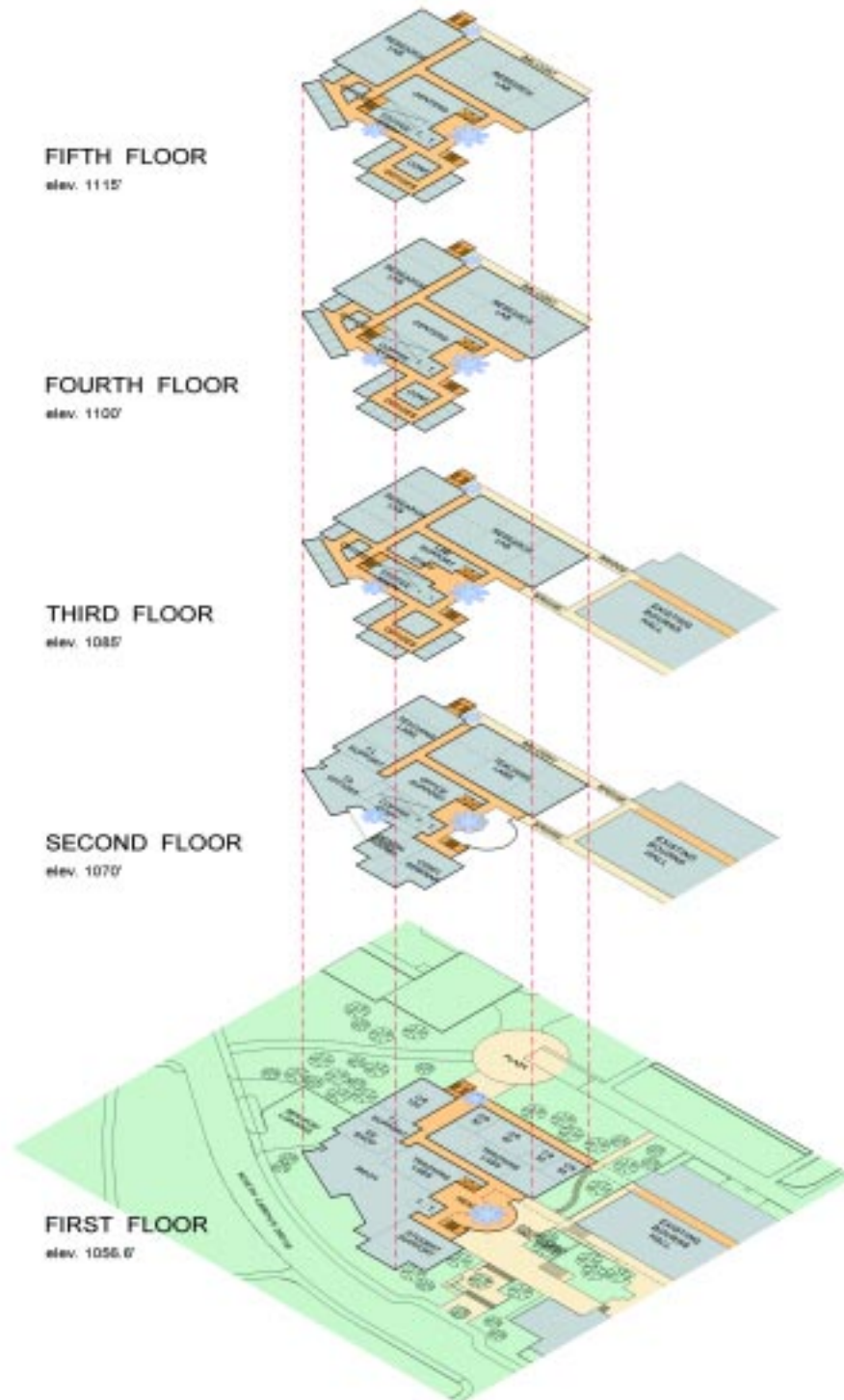
These diagrams reflect the existing Bourns Hall, the proposed Engineering Building Unit 2 and future development of BCOE within the LRDP Engineering Precinct.

The Second Floor has a direct relationship to Bourns Hall research and office spaces. This floor has a bridge connecting the existing Bourns Hall north and south wings. Teaching labs and seminar rooms will be located on this floor.

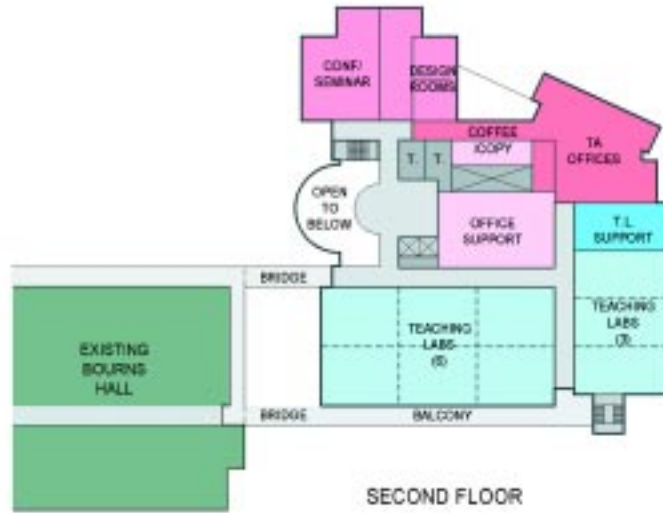
EBU2 will also have a bridge connection to Bourns Hall on the third floor. This floor will have the department chair offices in addition to research labs and faculty offices.

The First Floor serves as the main entrance for both EBU2 and general assignment instruction spaces. Each of these entries are to be distinct and separate. Existing relationships to the BCOE courtyard and general classroom space are illustrated.

5.8 Concept Building Design



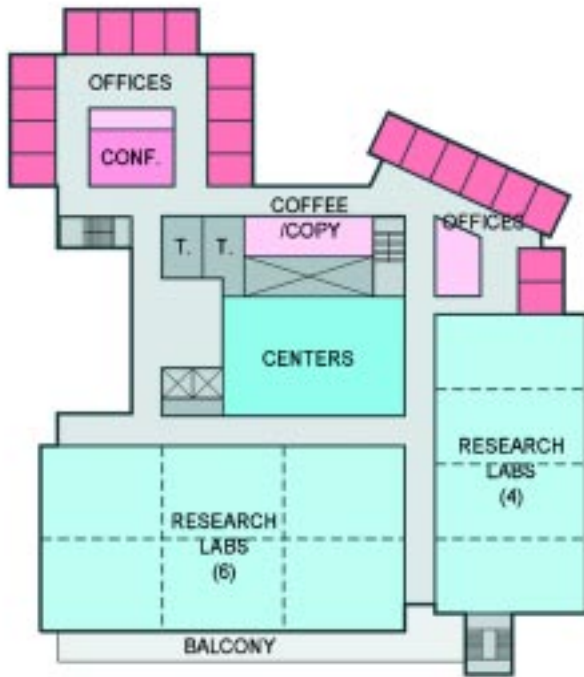
Concept Floor Plans



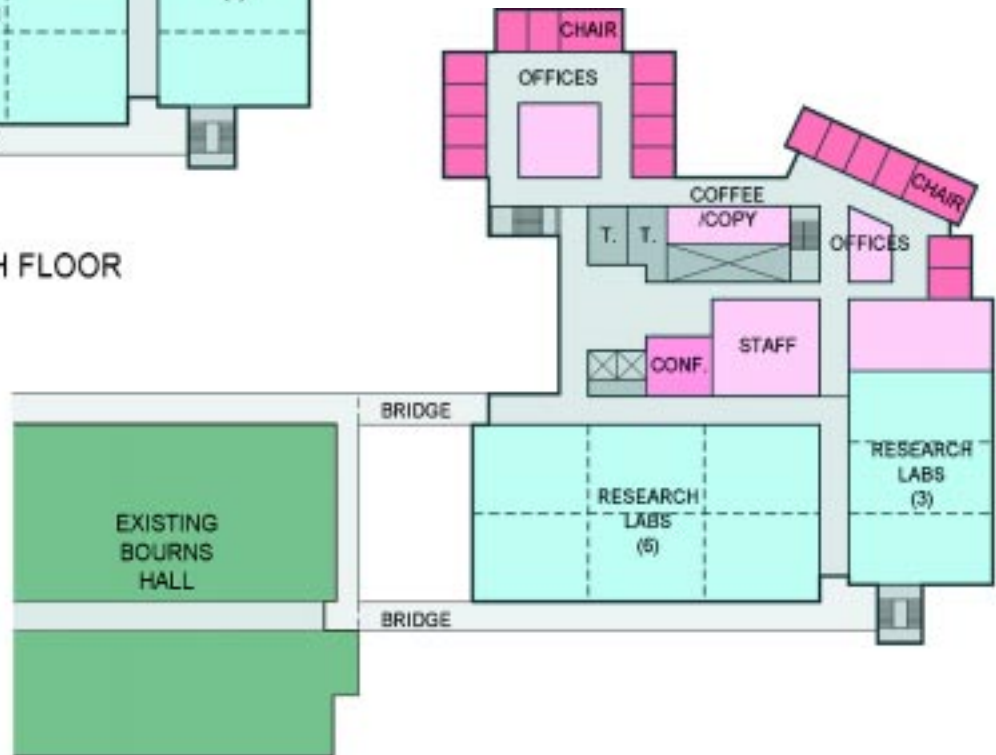
SECOND FLOOR



FIRST FLOOR



FOURTH/FIFTH FLOOR



THIRD FLOOR

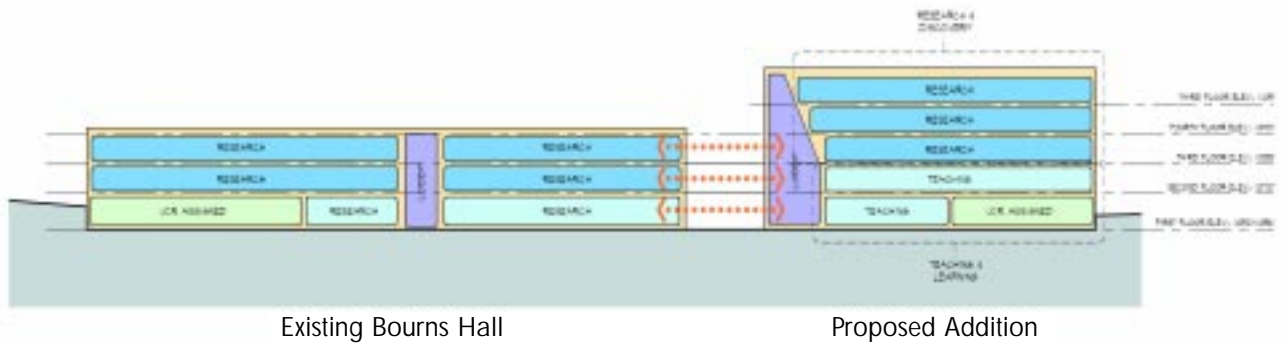
Building Program by Floor

FLOOR LEVEL	QTY	TOTAL	
First Floor			
Resource Area/Reading Room	1	1,200	
Student Study	1	1,200	
Clubs and Honors	1	1,530	
Teaching Labs	5	6,000	
Teaching Lab Support	1	1,200	
General Assignment Instructional Space	5	5,356	
Service/ Mechanical			
Subtotal First Floor asf		16,486	
Second Floor			
Conference Room/Seminar	1	2,400	
Conference Room Support (Break-Out)	1	600	
Design Rooms	2	800	
TA Offices	81	3,240	
Teaching Labs	9	10,800	
Teaching Lab Support	1	1,200	
Subtotal Second Floor asf		19,040	
Third Floor			
Research Labs	9	10,800	
Research Support Space	3	420	
Faculty Offices	15	2,100	
Chairs Offices (EE & C.S.)	2	560	
Post Doc. Scholars	9	540	
Administrative Staff (EE & C.S.)	9	1,080	
MSO Mgmt Serv. Officer	2	280	
Copy/Supply	1	140	
Workroom	1	140	
Department Storage	2	280	
Conference	1	280	
Faculty Lounge	1	500	
Graduate Lounge	1	400	
Subtotal Third Floor asf		17,520	
Fourth Floor			
Research Labs	10	12,000	
Research Support Space	2	280	
Faculty Offices	20	2,800	
Post Doc. Scholars	7	420	
Copy/Supply	1/2	70	
Workroom	1/2	70	
Conference	1	280	
Centers/CRIS	1	2,400	
Subtotal Fourth Floor asf		18,320	
Fifth Floor			
Research Labs	10	12,000	
Research Support Space	2	280	
Faculty Offices	20	2,800	
Post Doc. Scholars	7	420	
Copy/Supply	1/2	70	
Workroom	1/2	70	
Conference	1	280	
Centers/CCSE & CCN	2	2,400	
Subtotal Fifth Floor asf		18,320	
Total Assignable Area:	89,686 asf	Gross @ 59%	152,010 sf

Vertical Section Organization

The conceptual vertical organization of EBU2 consists of a five story building with the first floor set on grade level equal with the existing Bourns Hall. The second and third floor levels should align with Bourns Hall.

Locating the general assignment instructional space and teaching labs on the ground floor, as well as providing an active function on the ground floor enhances access and exiting.



5.9 Massing

The relationship of EBU2 to Bourns Hall suggests that the massing of the building provide a strong edge along North Campus Drive that defines the entrance to the Engineering Precinct. The building should step back as North Campus Drive curves along the north edge of the site. The building should also step vertically at the top floor either through manipulation of the plan, or by changing the exterior material selection and/or pattern. This addresses “human scale” issues without violating the concept of a strong building edge.

The massing should be further articulated by stepping the mechanical penthouse back from the south edge of the building. Material selection might be different here as well. Further, programmatic zones may be collected and expressed in the articulation of the building massing.



Northwest View



Southwest View

Massing Model



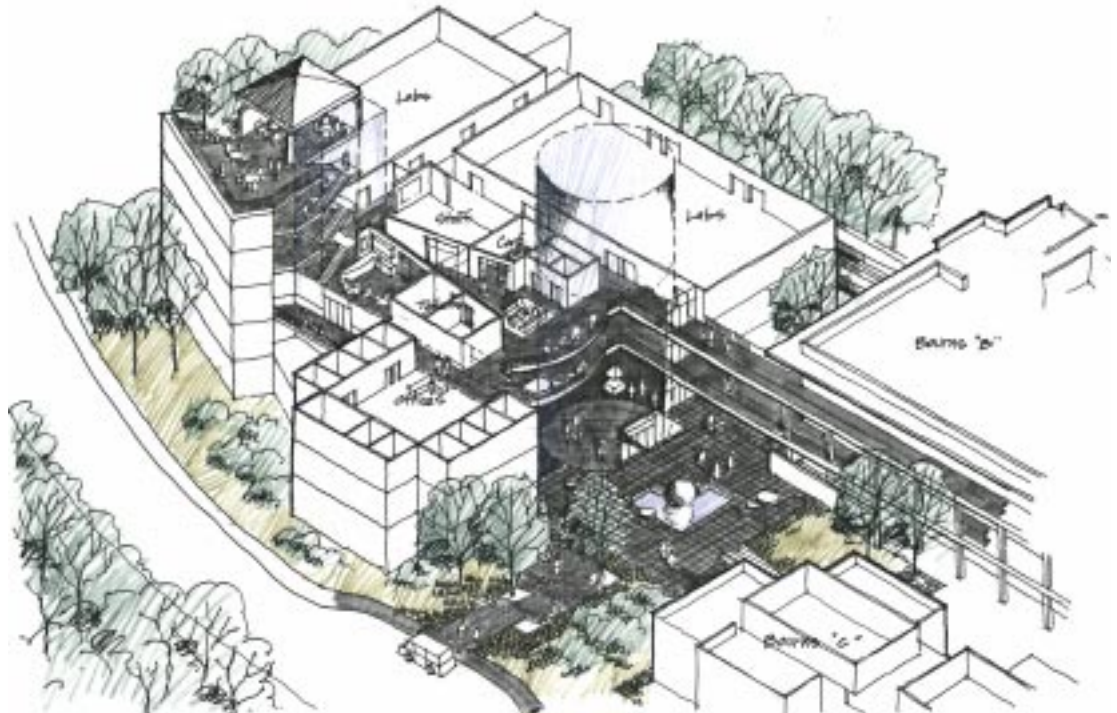
Exterior Building Design

The following concepts should be designed and adhered to during the development of the exterior building design.



1. Provide a beautifully designed and well crafted addition to the existing Bourns Hall.
2. The image of EBU2 should reflect the contextual, picturesque standard established by Bourns Hall and the Science Library.
3. Compliment the existing structures by a careful integration of similar building materials and similar features such as sunscreens and arcades, without competing with or mimicking the existing context.
4. Develop a sensitive and well designed expression of a science research facility that softens the technical nature of the facility and addresses the human factor in the research by emphasizing a people oriented research and learning environment.
5. Provide careful attention to the building's proportion and scale while seeking a timeless design expression free from current trends and cliches through a thoughtful and well crafted facility.
6. Select exterior cladding materials such as brick, per the campus standard, with window systems and secondary cladding materials such as metal panel or concrete or stone. The materials should be well detailed so that the building will age gracefully and with specifications that meet or exceed the campus design standards.
7. Compose the materials such that the vision and scale of the elevations reflect the contextual patterns surrounding the project. Care should be taken to coordinate the

- scale of the exterior composition with the new and existing buildings.
8. Enhance building entries and lobbies by providing inviting design features using quality materials, weather protection, places to meet and sit, landscaping, quality lighting, signage and graphics, and similar elements.
 9. Shield the buildings mechanical features (penthouse, air intakes, exhaust stacks, etc.) from primary view. Integrate screen walls and penthouse elements into the massing composition.
 10. Provide inviting exterior seating areas shaded by trees.



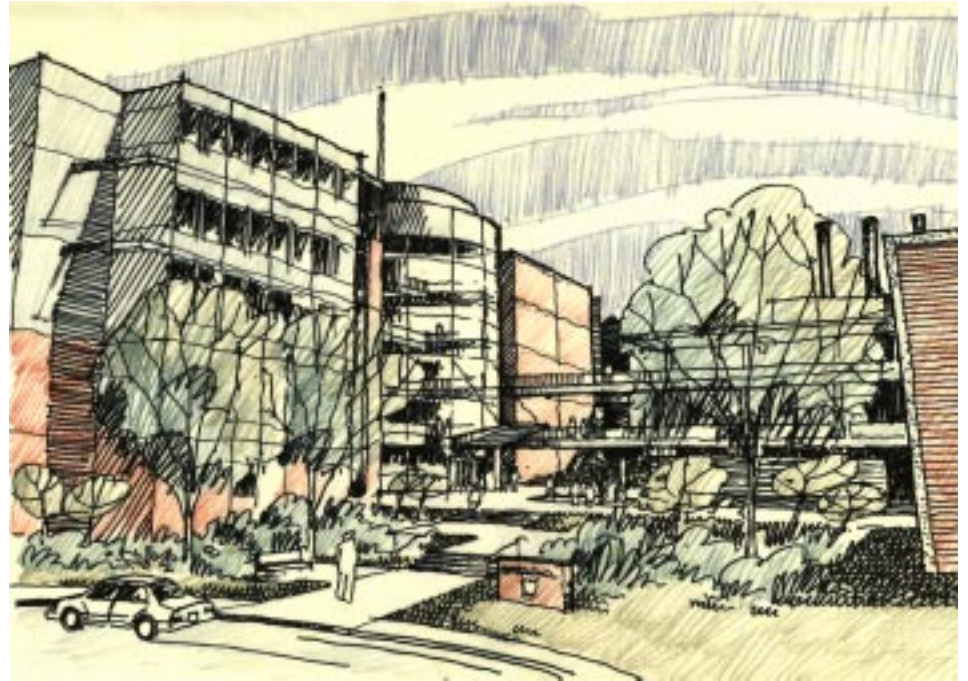
Interior Building Design

The following concepts should be considered during the development of the interior design phases of the project:

1. Interior corridors should terminate at a window or glazed exit condition for access to natural light and campus or Arroyo views. Fenestration should be sized appropriately for the solar orientation to provide additional passive energy control.
2. Design interactive areas with care to maximize the opportunity for chance meetings and interchange of ideas. Include elements such as places to sit, white boards, and tack surfaces.
3. Enhance the entry lobby and major circulation with a variety of spatial experiences (double height lobby with overlook from second level circulation), and through quality design, building materials and colors.
4. Utilize glass enclosed stairs to promote building transparency, increase quality of space, and preserve sense of security during off hours.
5. Use high quality materials and building systems in all teaching and research lab areas and integrate into overall building design features. Create a friendly and stimulating work environment.
6. Provide corridors that widen at entries into laboratories creating a variety of spaces and experience within corridors.



View East from Existing
Bourns Courtyard



View from Vehicle
Drop Off to Courtyard



Ariel View from Northwest