

design development workshop #2



August 14-16, 2012



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DATE	August 14 -16, 2012 [,]
LOCATION	University of Oregon – SRC Bonus Room
Tuesday,	August 14, 2012
1:00 – 4:00 pm	Project User Group Meeting 8
1:00pm	Opening Comments/Project Update (Gene Mowery)
1:05pm	Student Steering Committee (More time to be allotted if needed)
1:10pm	 Welcome back Budget (36.2 M), Healthy Oregon postponed, etc Redirect budget to the Natatorium/Pool Subject Area Group Highlights Schedule
1:25pm	Review current plans and building arrangements Main Street SD Revisit Other Building DD Improvements
2:30pm	BREAK
2:40pm	Sustainable Approach / Strategies
2:50pm	Lighting Design / Daylighting / Integration Overview Overview / Introduction & Light Level changes Field Lighting Daylighting
3:20pm	Public Spaces – Design Overview Convey recommendations of the Subject Area Groups for Interior Character
3:50pm	Summarize Key Decisions
4:00pm	Adjourn

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Wednesday, August 15, 2012

ireancoady,	August 13, 2012		
8:30- 12:00pm	Integrated Design Session Presentation & Overview Mechanical Systems		
8:30am			
9:15am			
10:15am	Lighting and Daylighting		
11:00am	Other systems		
11:30am	Wrap-up		
1:00pm -5:00pm	Subject Area – Group Presentation & Break-out Sessions		
1:00pm	Large Group Presentation		
2:15pm	BREAK		
	Concurrent Break-out Sessions		
	• Aquatic		
	 Main Street – includes Control Desk, Equipment Check-out, and Main 		
2:30pm			

Thursday, August 16, 2012

5:00pm

Design Team Work Sessions and Meeting with City Building Department		
8:00am – 6:00pm	Design Team Work continued, as required	
2:00pm	Meeting with City Staff to discuss alternatives to Engineered Smoke Control	

Exercise spaces – includes Group Ex and Weights and Fitness

WORKSHOP OBJECTIVES

• Review / Adjust / Confirm Design Development Direction

Adjourn

- Confirm Project Budget
- Advance and coordinate Energy Design and Strategies





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UO Student Recreation Center Project User Group (PUG) Meeting 8 – 8/14/12

Design Development

User Group:	Dennis Munroe Kevin Marbury Mike Eyster Bryan Haunert Brent Harrison Sue Wieseke Geoff Hale Michelle Vander Heyden Derick Olsen Kristen Gleason Jen Phillips Julie Haack Rob Thallon	UO UO UO UO UO Student Student Student UO UO UO	PE & Rec PE & Rec Student Affairs PE & Rec PE & Rec PE & Rec SRC Advisory Bd ASUO SRC Student Emp Club Sports Neuroscience Chemistry Architecture	present present present present present present present
Support	Gene Mowery Emily Eng Charlene Lindsay Daren Dehle	UO UO UO UO	Planning Planning FS Cap Con FS Cap Con	present present present
Design Team	Jack Patton Jeff Schaub Emlyn Altman Otto Poticha Carl Sherwood Dave Guadagni	RDG RDG RDG PA RSA RSA	Architect Architect Lighting Designer Architect Architect Architect	present present present present present present
CMGC	Dan Pelissier	HSW	Contractor	
Student Steering				
Guests	Peg Rees	UO	PE & Rec	present (second ha

MEETING MINUTES

Diagrams and other visual information presented at this workshop and noted below are available at the UO project web site: http://pages.uoregon.edu/eeng/src.html

Student Steering Committee Comments

1. No representatives of Student Steering Committee in attendance.



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Welcome Back

- We have submitted the Schematic Design (SD) package and it has been accepted by the UO. This package included a placeholder for the Healthy Oregon program along the west edge of Main Street. Since that time it was determined that the Healthy Oregon program would not be included in the project. In addition the design team was given direction by the management group to develop the Main Street area that had been set aside for Healthy Oregon. This in effect pushed this area of the building back into SD. This meeting will present Main Street options without the Healthy Oregon program and in addition present other building areas that have been developed in the our beginning Design Development (DD) phase of work.
- 3. Healthy Oregon is postponed and we are no longer setting aside a place in the Main Street for this program. It is important to develop Main Street without this program.
- 4. The budget has changed. The Project had a direct construction cost of \$35.5 M at the end of Schematic Design and since then another \$1.2M Project Cost was added which adds \$700,000 to the direct construction cost for a new direct construction total of \$36.2M. The initial direction from the management team was to apply these extra funds back to the natatorium, but as other issues have arisen such as Healthy Oregon space and some items missed in the SD estimates the funds need to be considered on a more holistic facility view. We do want to attempt to retain natatorium program but thoughts such as looking at the north pool deck area for reductions and potential leisure pool modifications were discussed
- 5. Subject Area Group (SAG) meetings were held and significant additional information was gained from these meetings and has impacted the plans shown today.
- 6. The project team is looking at strategies for balancing the budget and will provide the contractor with a 50% DD document set for their use in updating their estimates. An updated estimate is essential for decision making as we move the design forward. The group needs to understand the design strategies and potential cost implications as we make choices for further development.

Current Plans

- Pattern language has continued to inform the design. Continuing goals are for dynamic spaces that support social interactions. Inclusive design, welcoming, visually connectivity, good accessibility, enough space, well supervised, great daylighting etc are key motivators.
- 8. Revisions and evolution of the design since SD:

Lower Level

- Locker rooms now have gang showers, private changing areas and added capability to hose down area. Question do we have a good comparison count between existing and proposed locker rooms for showers and lockers etc? Existing showers 12 men and 14 women (verify). The new layout has about 24 mixed private and gang or 20 showers if all private. Currently there might be more showers than are needed in the existing locker rooms.
- 2 Natatorium has modified leisure pool and added accommodations for portable / roll-out spectator seating-. Additional 1,300 sf of natatorium space was added along with 450 sf of water area to the leisure pool. Additional space is added at the north that might be too large. Most of leisure pool is 3'-6" at perimeter and 4'-0" at curved BB space. Dennis suggests a water overflow off of raised spa into leisure pool. Jack suggests a possible water curtain as a fun and interesting feature.
- Wet classroom area has changed slightly and its separation from pool continues to be OK keep focus on teaching in the wet classroom. Level of transparency between wet classroom and vestibule is a question too much might be distracting for teaching. Clear glazing will need to be tempered with window shades. Need wet and dry access to wet classroom and to pool offices.
- 4 Lifeguard office is relocated and does not have great visual access to view the whole natatorium. Consider modifying pool edge side of office with curved wall, but it is not necessary to move the office to a new location.
- 5 Add towel and locker equipment drop at corner of custodial room.
- Lockers off east entry vestibule might present an undesirable opportunity for some persons to change clothes in the vestibule. Provide bench in front of lockers similar to existing locker room set-up.



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7 East entry vestibule and hall is very wide and should be reviewed to see if space can be saved in this area.

Main Level

- 8 Locker room / showers have been changed similar to lower level locker room.
- 9 Additional weights and fitness space in now located over east entry no longer lounge space.
- 10 Main street changes include moving existing boulder onto Main Street.
- 11 Additional work at Esslinger includes: Renovation of room 50, potential for renovation of cycling studio. Two new offices at administration. Not all this is in budget
- 12 Two options for main street:

Option 1:

- Membership services at north west of Leighton Pool with two support offices
- Free zone toilets in Esslinger
- Boulder on west side of climbing wall
- Control desk inside Leighton Pool shell at south west corner and has student hub and lounge adjacent
- Laundry room next to equipment issue at south end of Main Street with space above for second level with cardio and functional training space that will overlook Main Street. The space above forms terminus to main street
- Personal training is added space within Esslinger by laundry area
- Draping and curved ceiling ribbon-like structures are proposed to be hung from the ceiling between the existing Leighton Pool structural joists. These ribbon structures would be used to tie Main Street together by linking the exiting entry to the Leighton area and then to the area south of control by having continuous elements at the ceiling plane. Currently the existing volumes and their ceilings are quite different in form, shape and height. These ribbons could be made of slatted wood members or if that becomes too dark, heavy or expensive other materials yet to be determined could be used to create the effect.

Option 2

- Cycling studio at front entry
- Boulder and fitness at west side of rock wall
- Member services at northwest similar to Option 1
- Control space further south
- Laundry at south end similar to Option 1 but less room between turnstiles and laundry. Space above laundry is similar to Option 1.

Visual 3-D imagery of Main Street and Great hall volumes

- Series of ceiling ribbons that will link entry to Leighton and Leighton to spaces beyond
- Ribbons will be interrupted by and integrated with east/west skylights.
- · Glazed screen wall separating boulder from Main Street

East Entry Facade

- East entry is evolving to reflect current plans. New opaque (combination of solid and glass) screen wall above and to south of east entry extends into building as an organizing element along edge of Great Hall. Angle of this wall is more acute than at SD.
- 9. Main Street Options 1 and 2 group reactions;
 - Option 1 like free zone
 - Option 1 turnstile location preferred
 - Option 1 Personal training suite adjacent to last racquetball court to east of enlarged cycling studio. Do not need to replace racquetball court elsewhere.
 - Option 2 like back of control desk



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- Option 2 like offices open to hall is better than opening into front desk
- Option 2 do not like cycling studio at main north entry cardio is better Other comments:
- · Make easy climbing side of boulder face away from Main Street
- · Need seating at bouldering area
- Consider cycling studio at north end of men's locker room
- Need equipment layouts on the main level by the floor openings
- Need to determine if the amount of social spaces indicated to date is appropriate of if too much area is set aside for this use.
- Need to develop basic furniture layouts to test designated social spaces

Public Spaces

- Restating what we heard from the Subject Area Groups, public spaces should be: active, invigorating, functional, unique, and should use wood and other high quality materials, while building excitement within.
- 11. Group generally likes images shown of the interior aesthetics. Creates "wow". Perhaps too much wood on ceiling need to find balance for wood between ceiling, wall and floor surfaces.

Lighting Design

- 2. Emlyn discussed the overall lighting levels proposed for the facility lesser values than approved during Programming.
- 13. Emphasis on daylighting
- 14. Visual comfort goal no glare or areas of high contrast
- 15. Fixtures: energy efficient, meet light level requirements, primarily indirect, integrated into architecture, easily maintained, and future appeal
- 16. Lamps: long life, and minimize number of lamp types.
- 17. Think ahead plan as we can for future technology.
- 18. Lighting will make the building a lantern in the area.
- 19. OK to mount replacement field lighting on building per Jeff Madsen

Budget discussion

- 20. The following scope of work items are above budget for this project. While each of these items is desirable, the PUG, out of necessity, has prioritized them in the following order (e.g.: if budget allows, design and build Item 1 first, Item 2 second, etc. And, if possible fund as many of these items as possible by achieving incremental savings throughout the project (e.g.: no one wants to cut any program to achieve budget)
 - Incremental savings might include the following.
 - Evaluate value of thermal battery
 - Review leisure pool layout and extra space at north end of Natatorium
 - Look at MEP systems
 - Item 1: Main street Activation \$\$
 - Item 2: Increase size of Natatorium \$\$
 - Item 3: Increase size of Leisure Pool \$
 - Item 4: Add 2nd floor main street above Laundry / Student Employee Lounge \$\$\$
 - Item 5: Additional Esslinger Renovations \$ (PUG noted that Room 50 is a must). It is part of the basic scope of the project.)
 - Item 6: Gym Occupant load & future Roof Patio \$\$End of Report

End of Report









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Welcome Back!

Important Milestones

- Student Referendum Passed
- May / June 2012 focused on Strategy
- Official Start to DD July 1, 2012
- Healthy Oregon postponed. Need new front door activator!
- July 2012 Meeting with SAGs
- Management Committee continued to meet

Look Ahead Schedule

- 50% Design Development
- Cost Estimate
- 100% Design Development

Welcome Back!

Budget

- \$35.5 M Direct Project Cost, increased to \$36.2 M Direct
- Where to allocate these additional resources?
 - Natatorium?
 - Replacing Healthy Oregon Space?
 - Main Street?

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Welcome Back!

- Subject Area Groups
 - Three Days of Meetings
 - Met / Discussed / Criticized by Building Area & Types of Space
 - Great data gleaned from SAGs

Current Plans & Building Arrangements



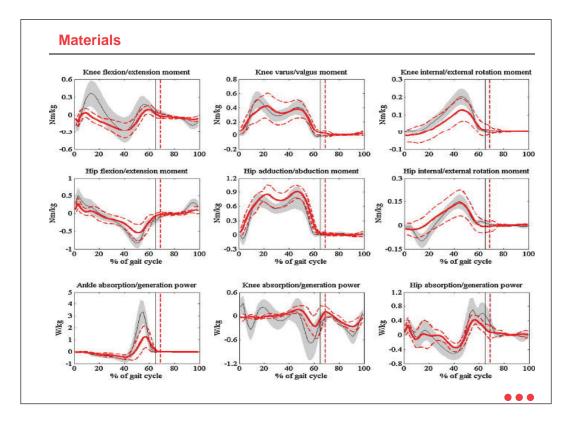
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Current Plans & Building Arrangements

- Pattern Language
 - Revisit Highly Relevant Patterns
- Main Street Revisited
 - Two Options for discussion
- Pools & Natatorium
 - Added Space in Natatorium
 - Increased size for Leisure Pool

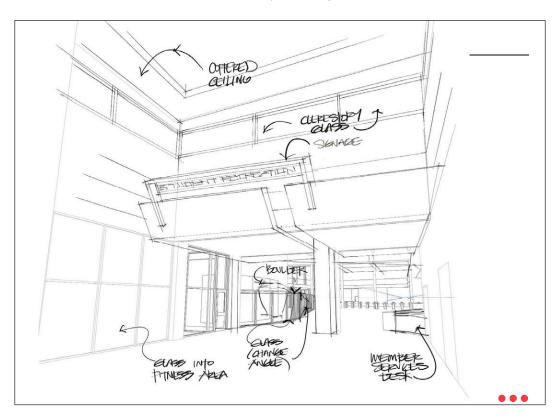
Current Plans & Building Arrangements

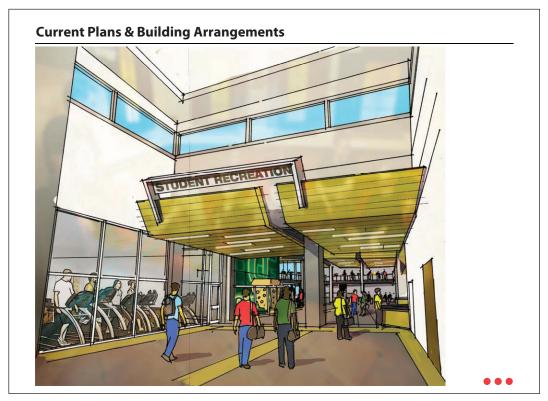
- Overall Building Design Improvements
 - Revit View of the Building Model
 - Main Street Concept Vignettes
 - Screen Wall
 - Great Hall Vignette



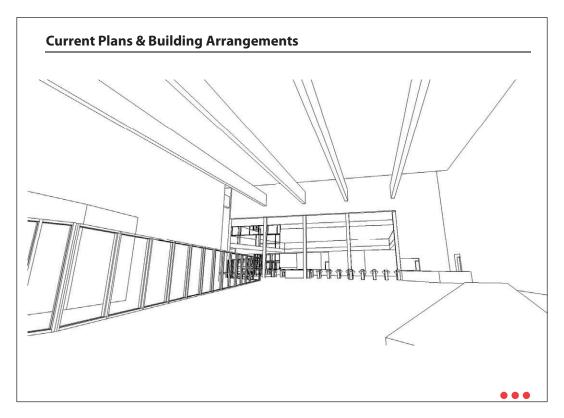


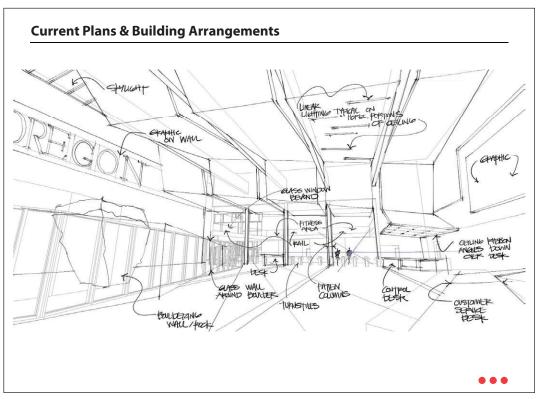






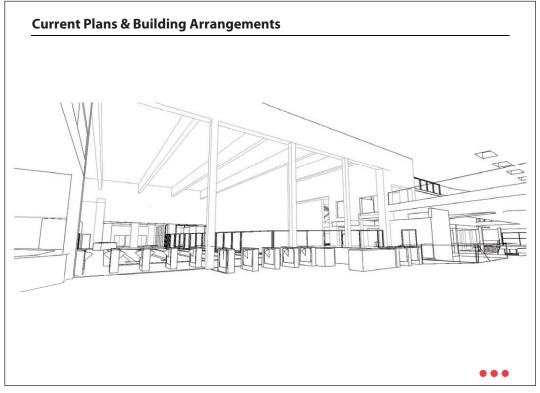




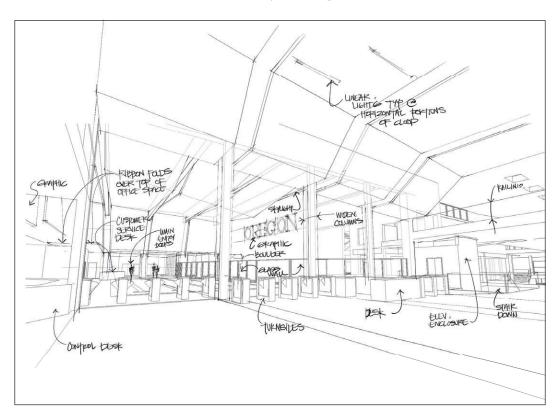




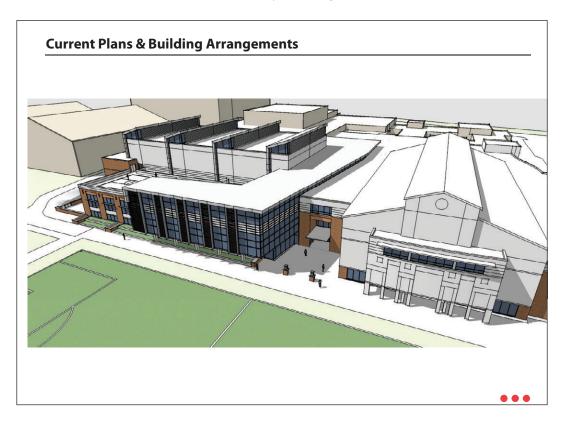


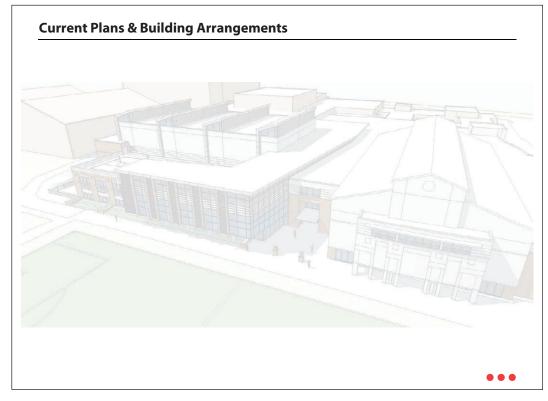




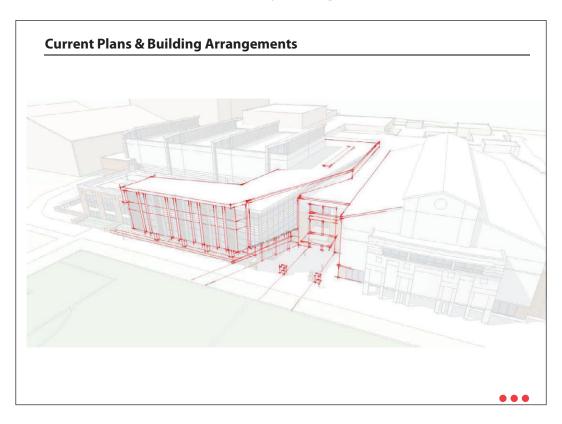


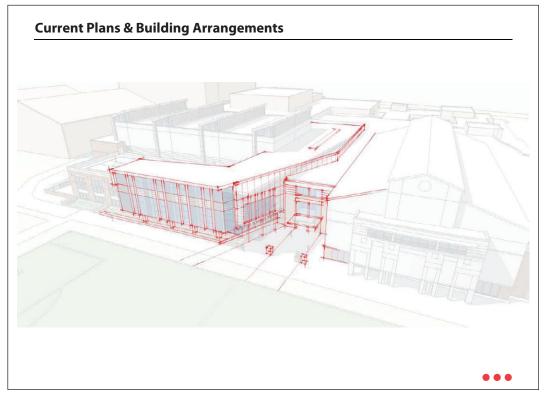




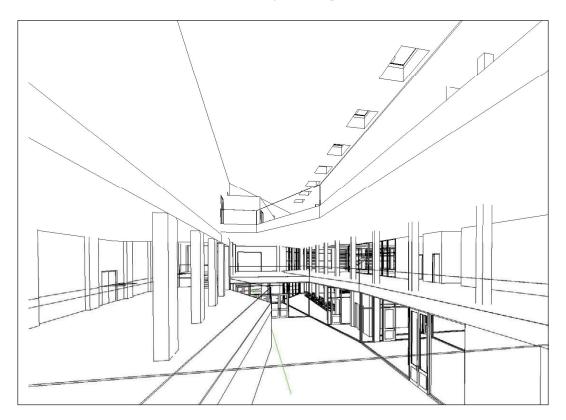


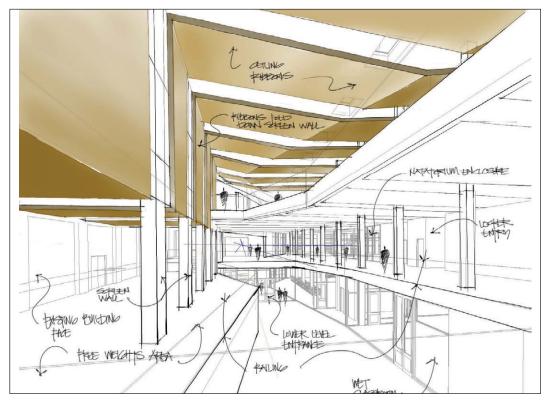






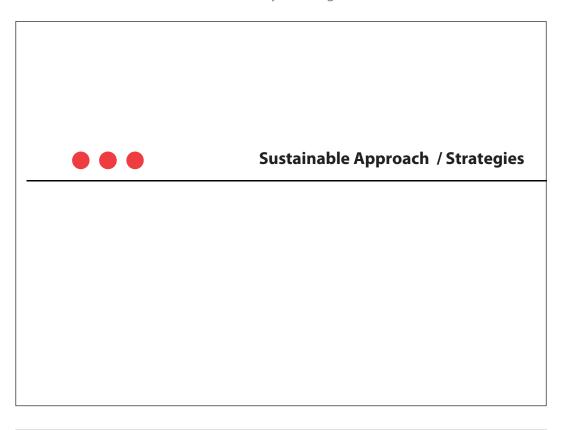








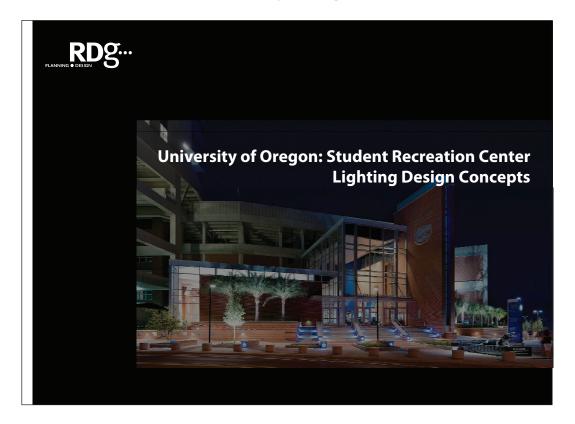
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Sustainable Approach / Strategies

- Focused on High Performance and Low Energy Demand
- Leighton Pool Tank Reuse (Water, Energy Storage)
- Photovoltaic Power System (Energy)
- Solar Hot Water (Energy)
- Daylighting (Energy, Healthy Building)
- Lighting Controls (Energy)
- Natural Ventilation (Energy, Comfort, Healthy Building)
- CFD Analysis (Energy Reduction, Natural Ventilation)
- Energy Analysis (Metrics / Direction)

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Presentation Agenda

- Key Lighting Factors
- Inspiration at the University of Oregon
- Lighting Examples
 - Exterior
 - Main Street / Great Hall
 - Fitness Area
 - Gymnasium
 - Natatorium
 - Multi-purpose Studios
 - Spin Studio
 - Locker Rooms





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Key Lighting Factors

- Use daylighting wherever possible
- Visual Comfort No glare or areas of high contrast
- Fixtures
 - Energy efficient
 - Meet light level requirements
 - Primarily indirect illumination
 - Aesthetically integrated to enhance architecture
 - Easily maintained
- Lamps
 - Long life
 - Minimize number of lamp types

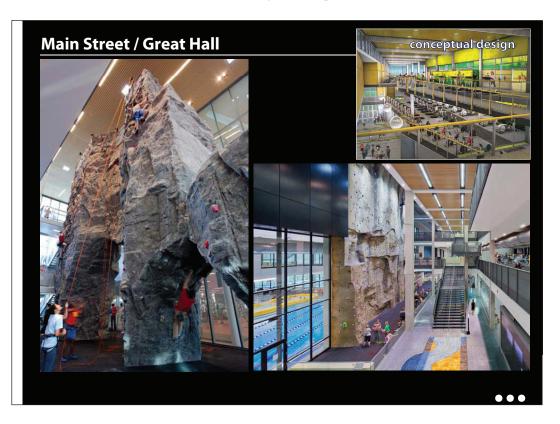








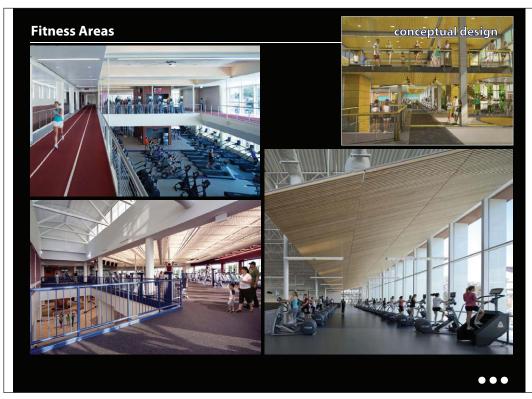




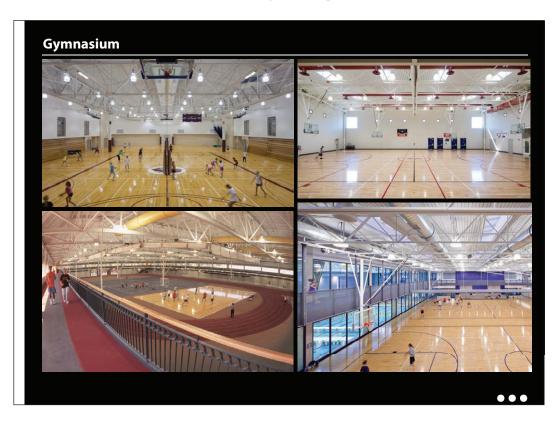






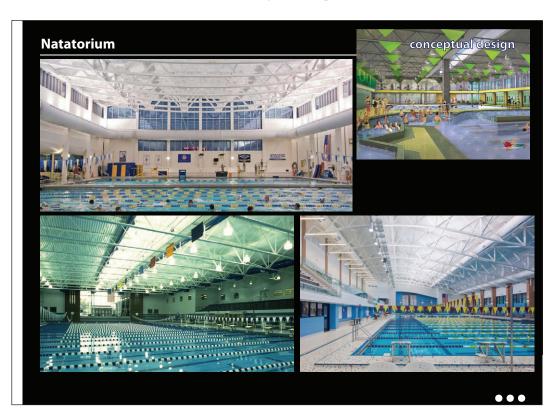


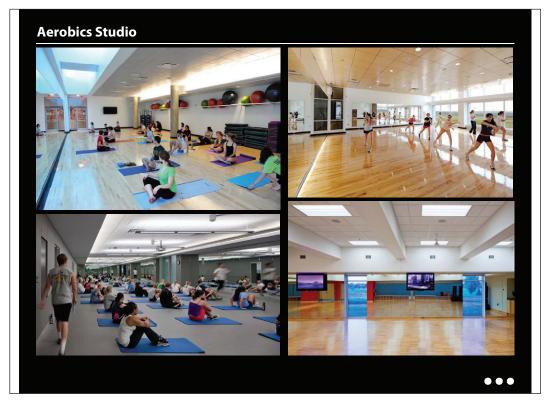




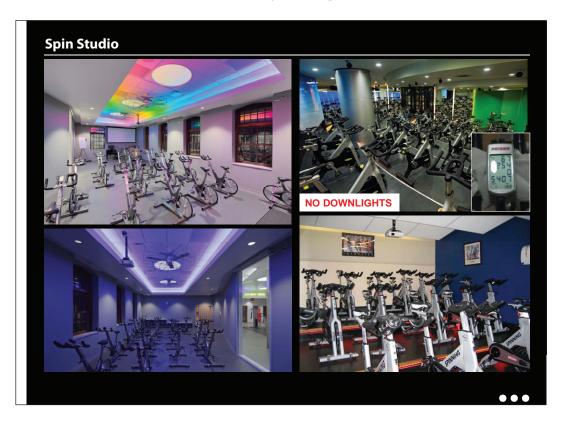
















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Sustainable Approach / Strategies

- Field Lighting
 - Modify one light pole
- Daylighting
 - Skylights
 - Building Perimeter

Public Spaces - Overview



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Public Spaces - Overview

• SAG's Input for Public Spaces













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Trends

- •Controlled Color!
- Simple bold moves
- Provocative
- Youthful
- •Integration of art/architecture/message/graphics
- •Experiential...kinetic...lights...change
- Projection...motion graphics
- •Materials of the earth...wood, metal

Central Form





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Color



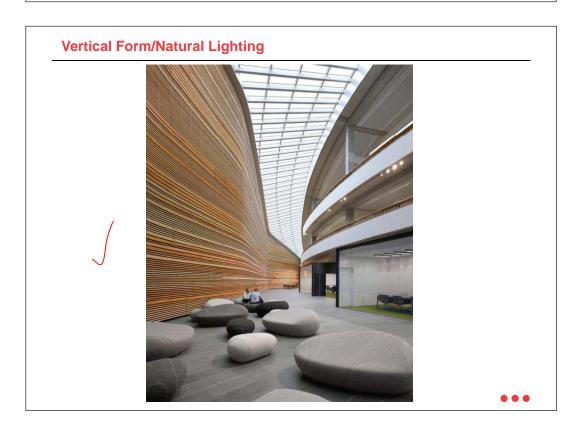
Color



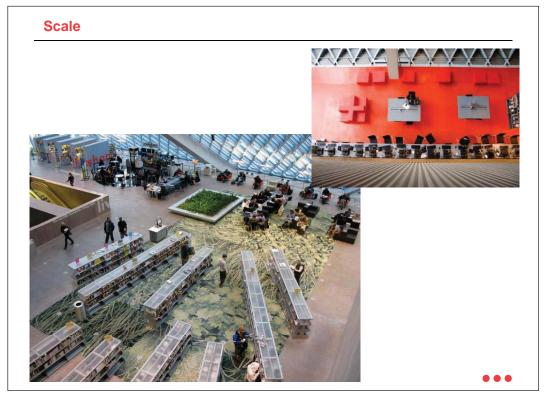












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Super-Graphics



Super-Graphics



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Super-Graphics



Super-Graphics

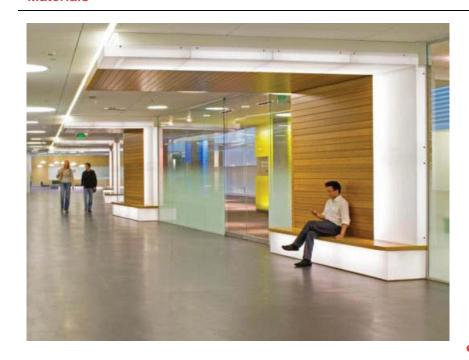


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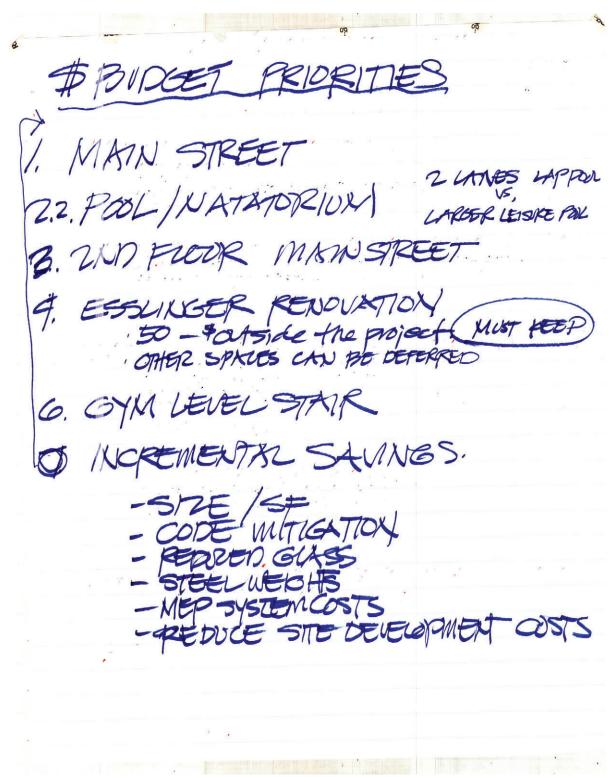
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Materials

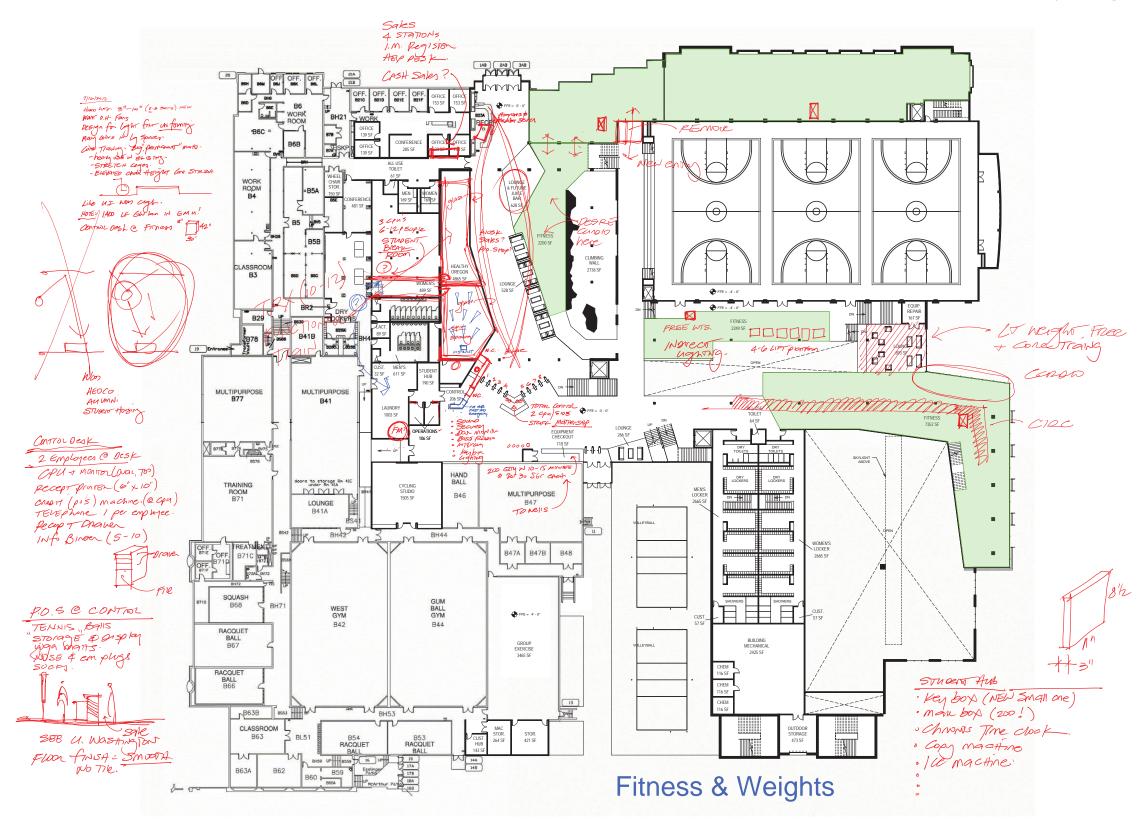


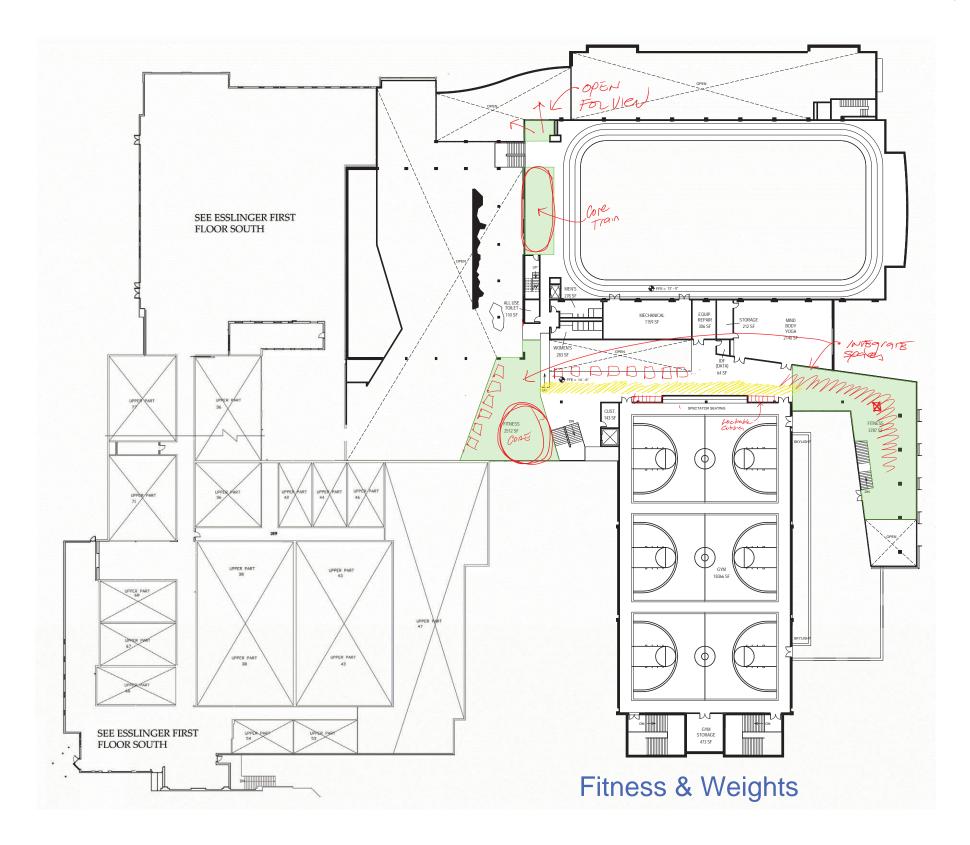
USER GROUP MTG. 8.14.12 ? MATAH CURPENT CARBIO TO NEW AESTATEC > ? I DESUTIFY OUTS BEFORE ESTIMATE + INCREASE FOOL/NAT+#500K + MAINSTREET + \$ 1.3 M - FIRE STRATEGY - # 2004GOK - BUDGET ADD \$700K ? NATATORUM INCREASE DO MUCH. # WATERFALL # WATER JETS LITE GUARD AREA - ASSEPTIVE STATE EQUIPMENT ISUE-LOCK & TOWEL CLOUER LEVEL LOWER HALL TOO BIG?



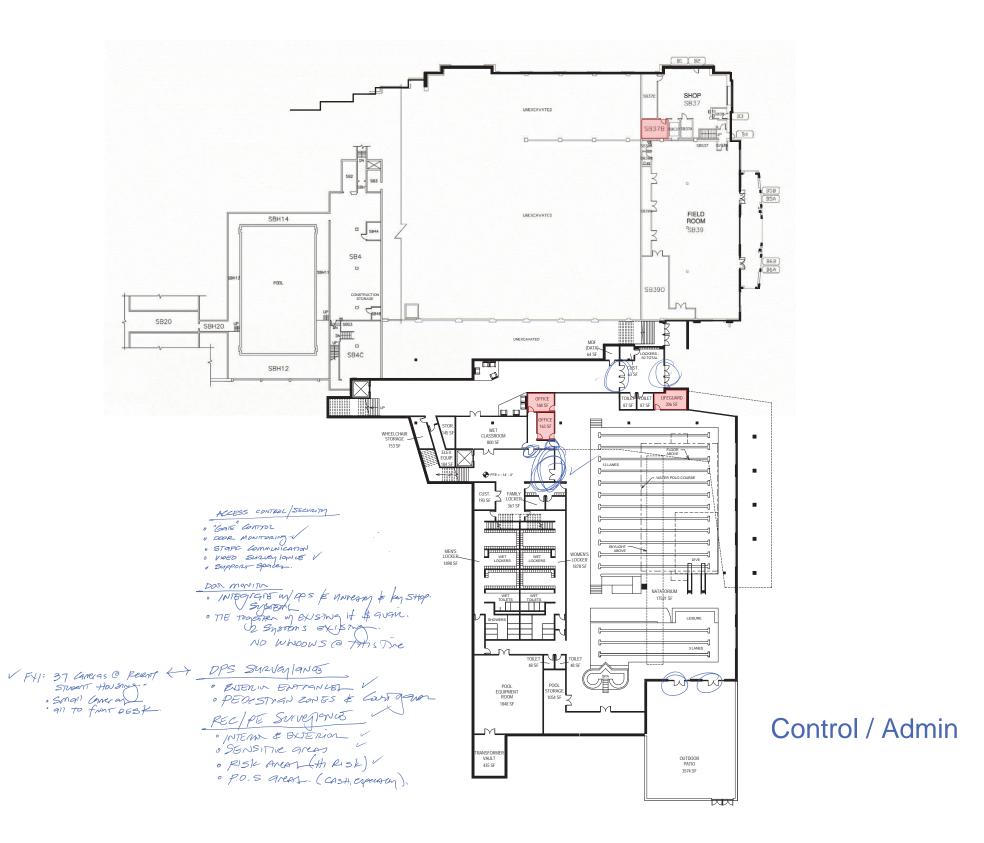
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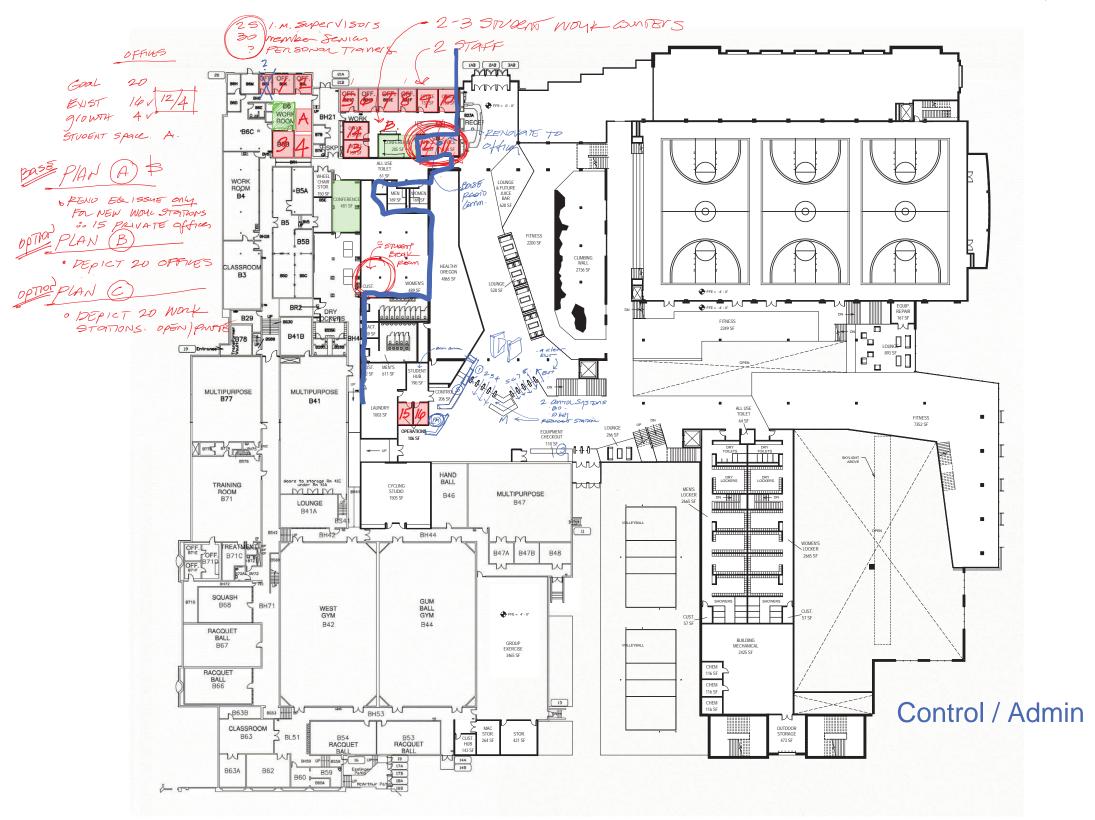




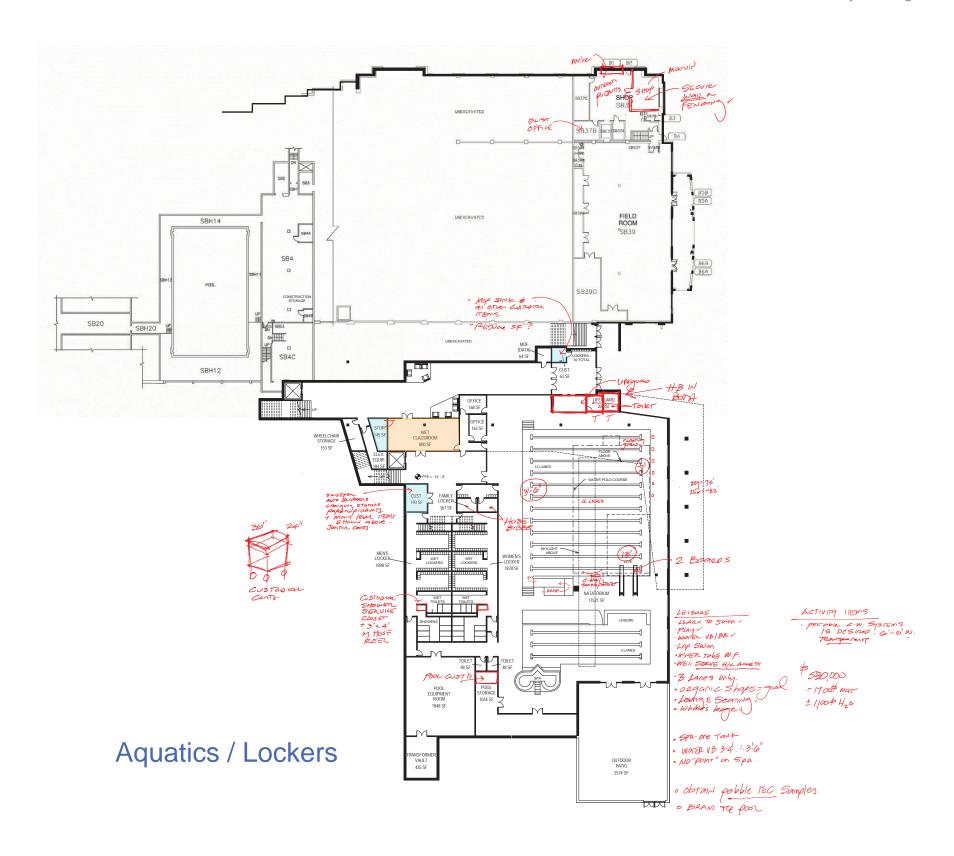


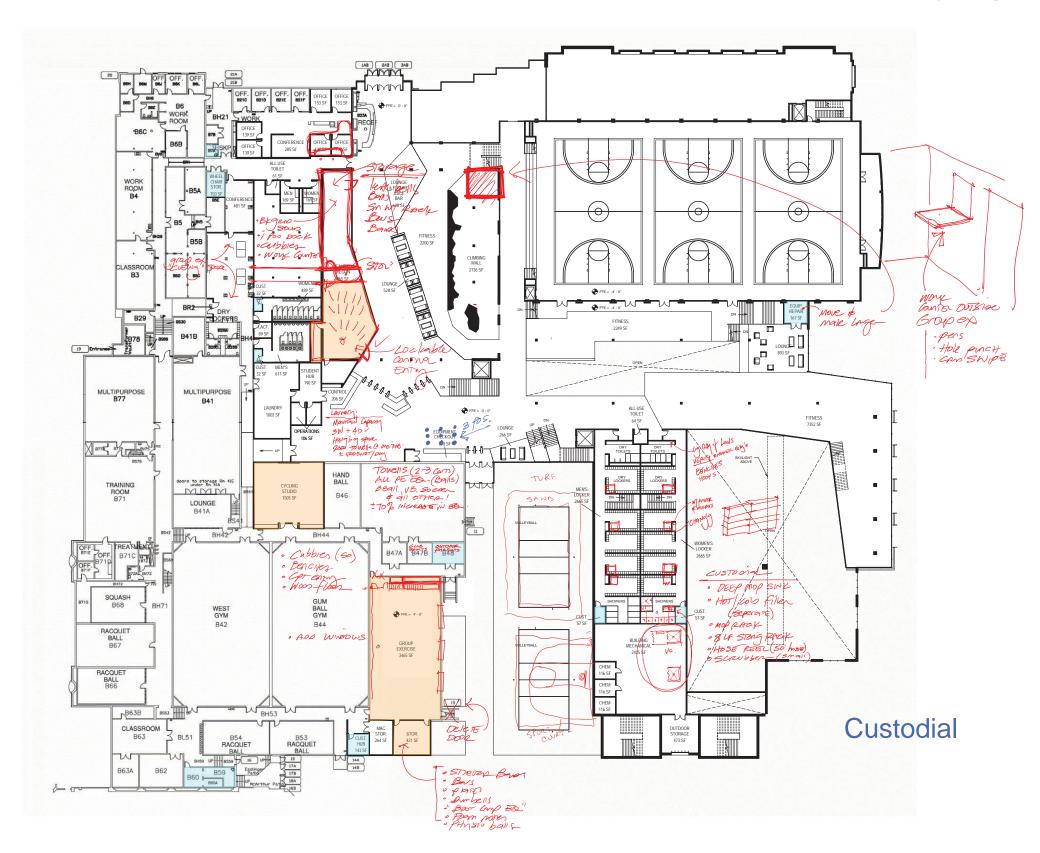


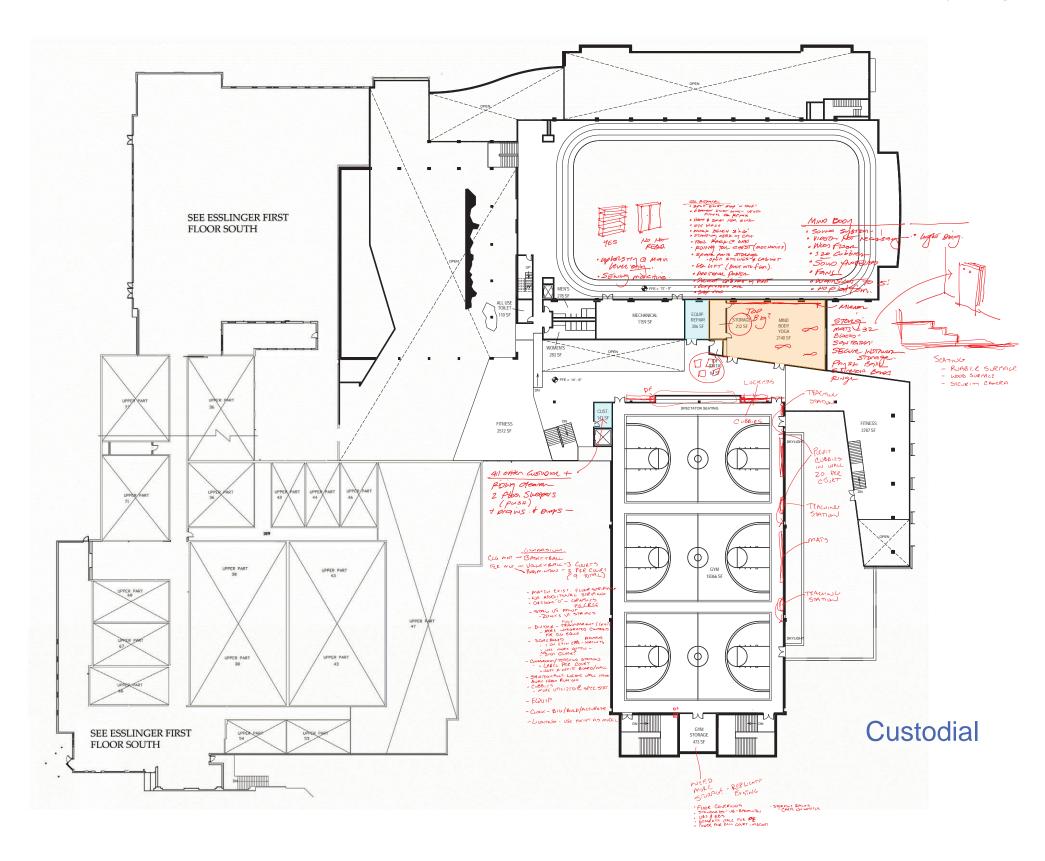


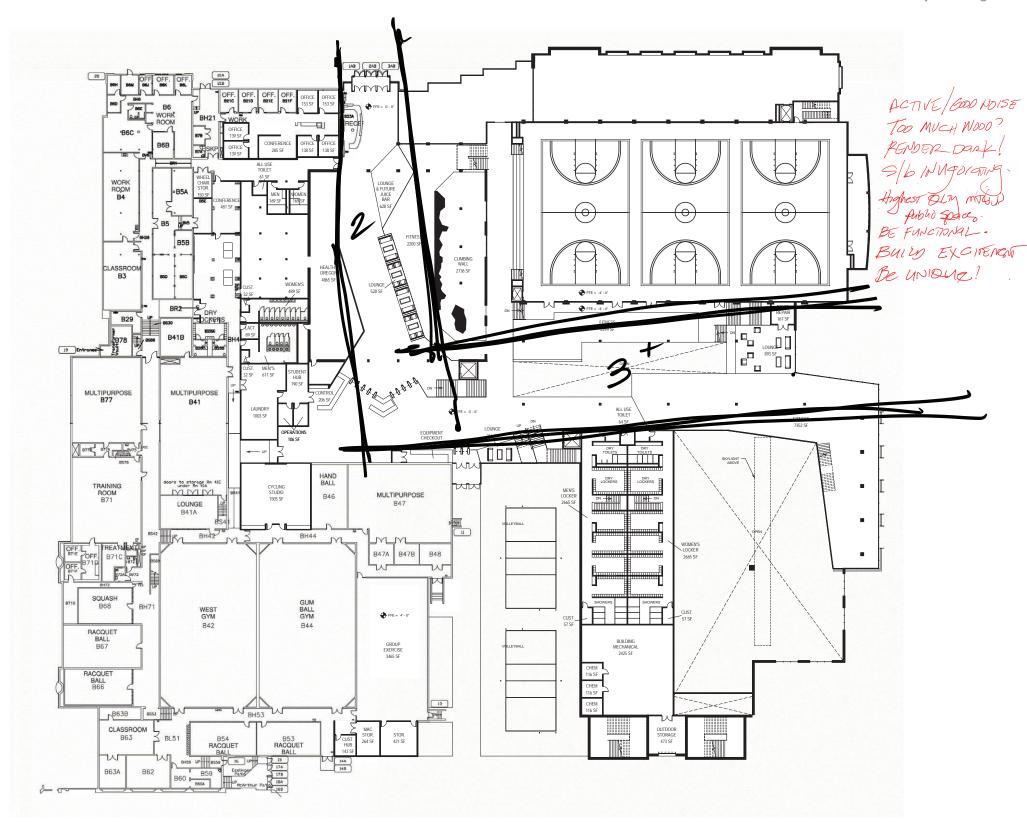




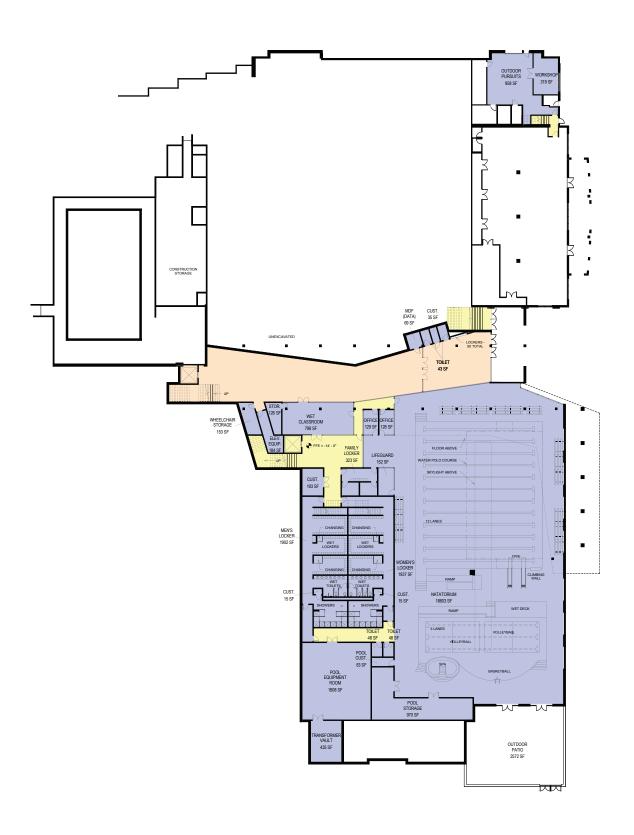








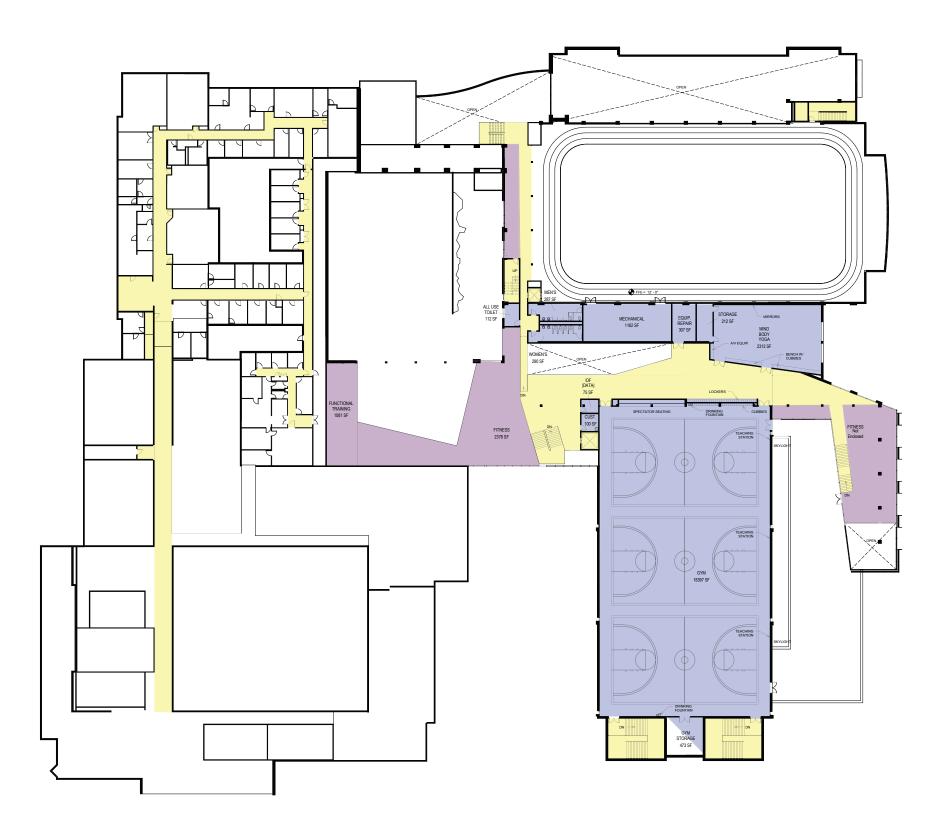
Public Spaces



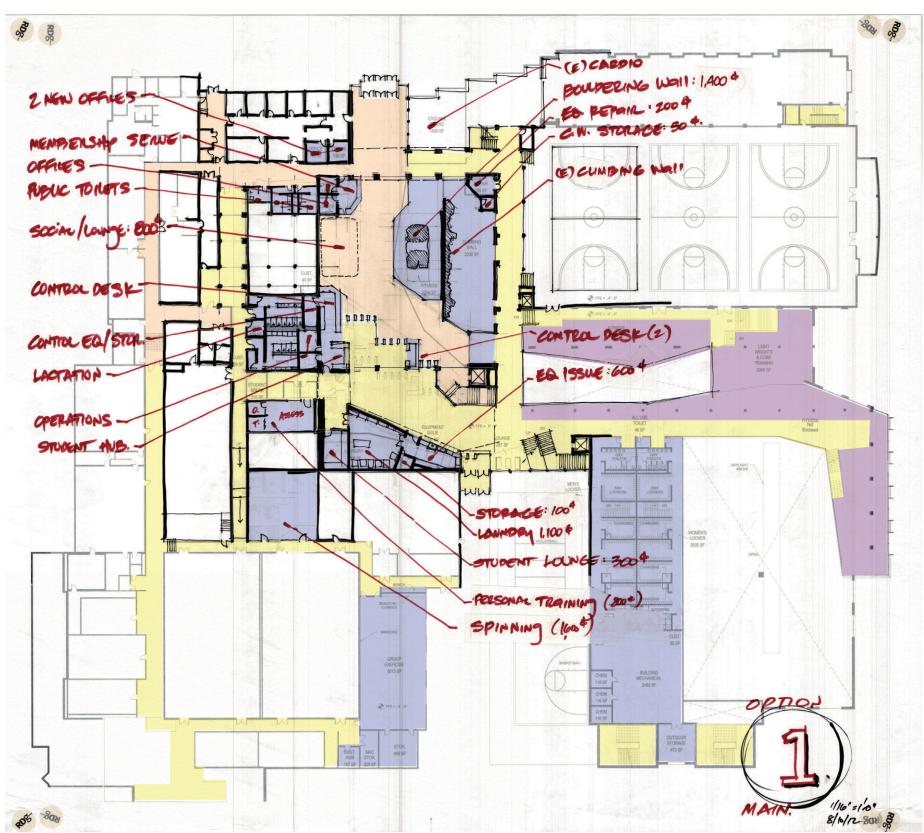


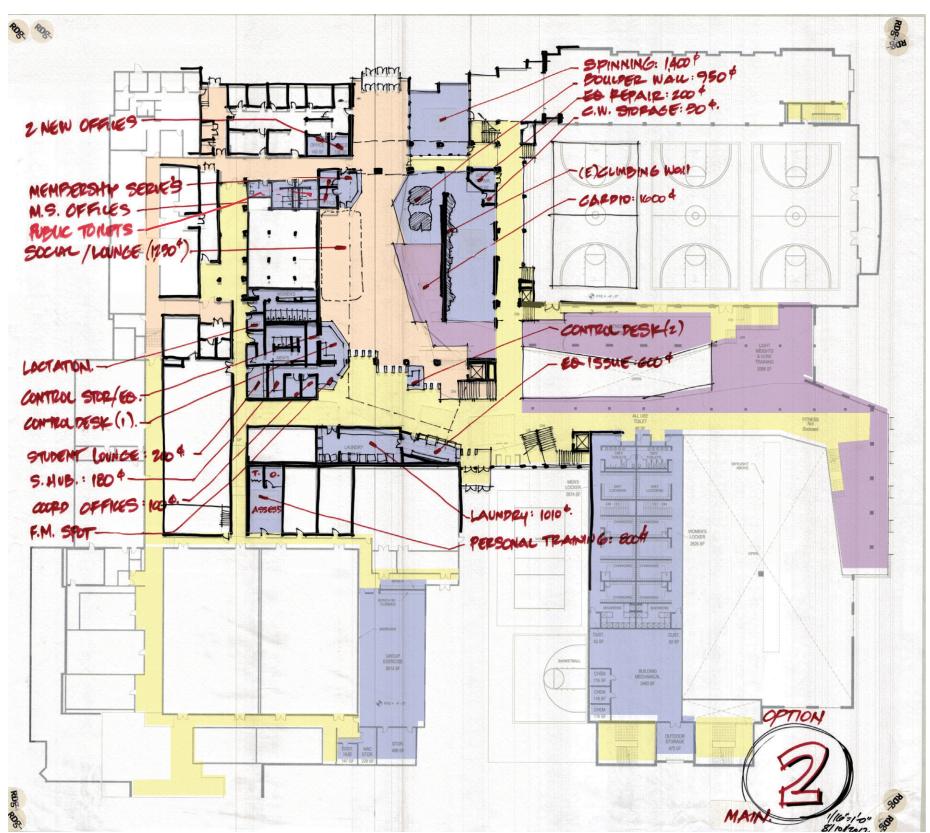


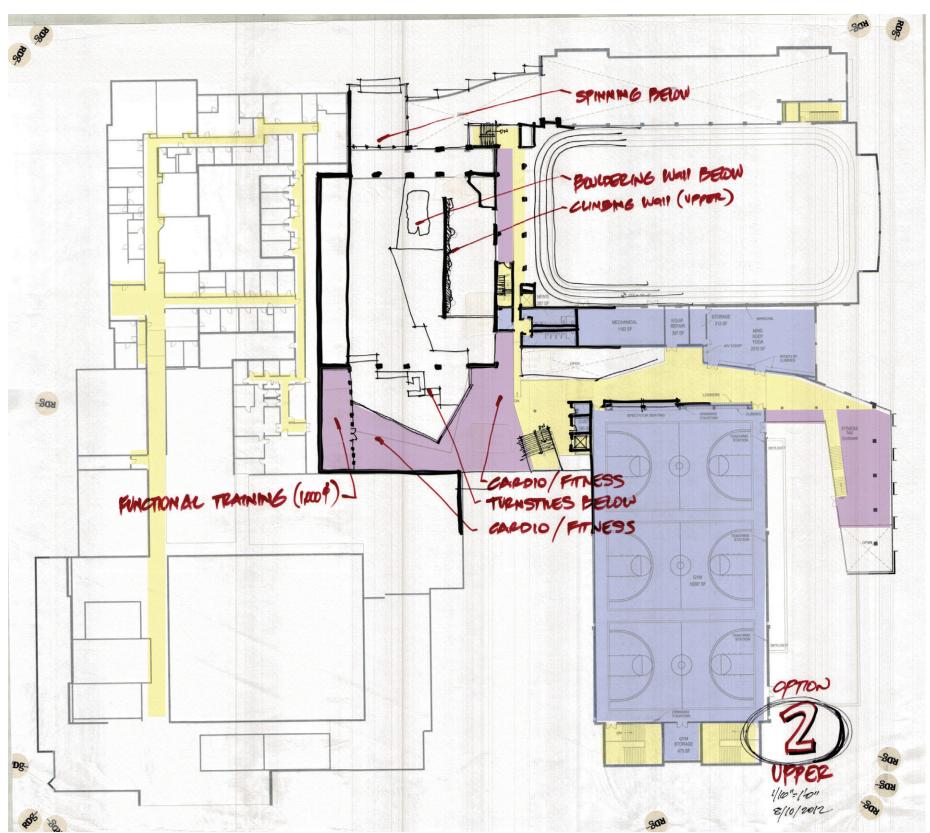


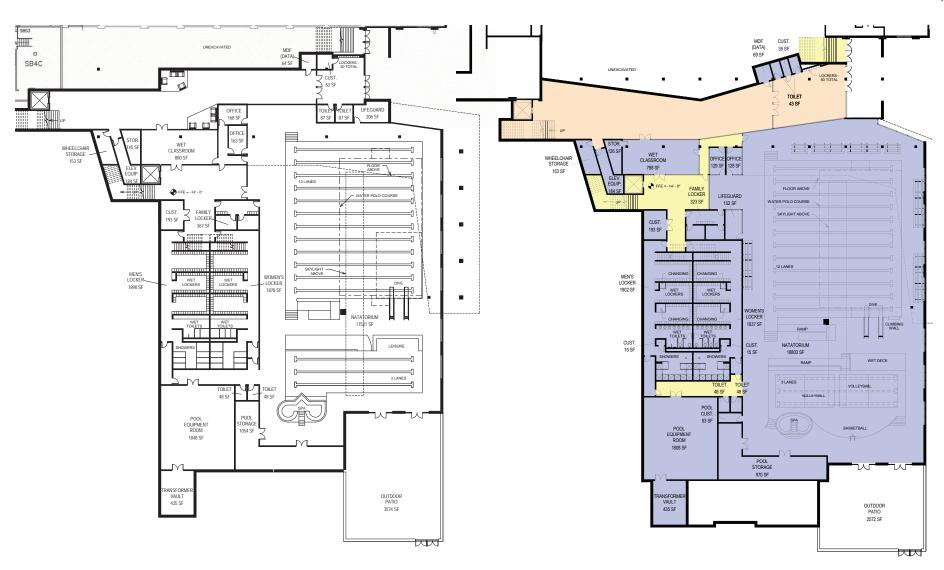








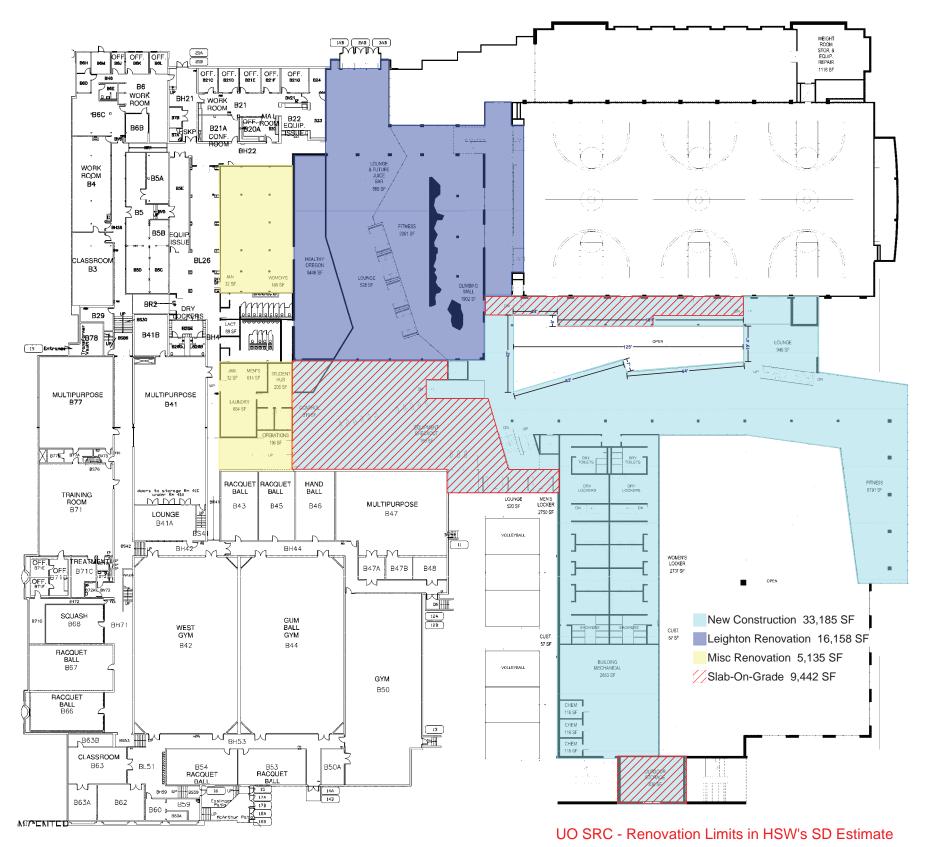


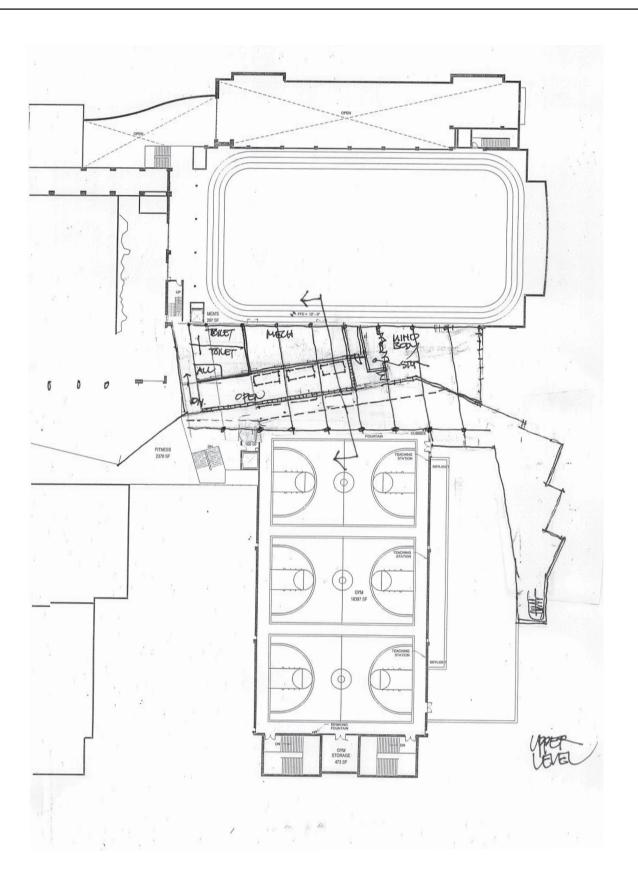


Previous Pool Plans

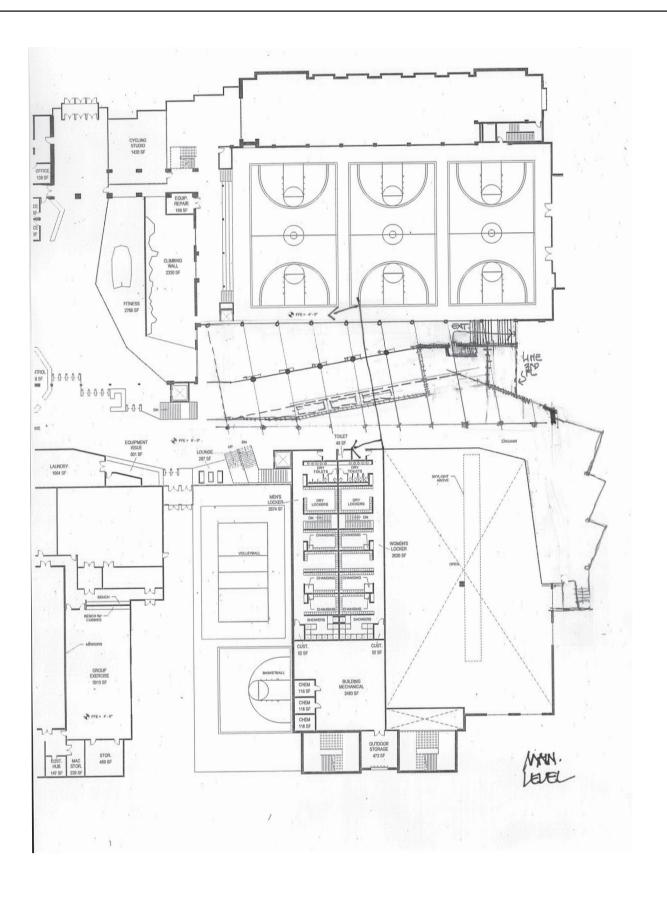
Current Pool Plans



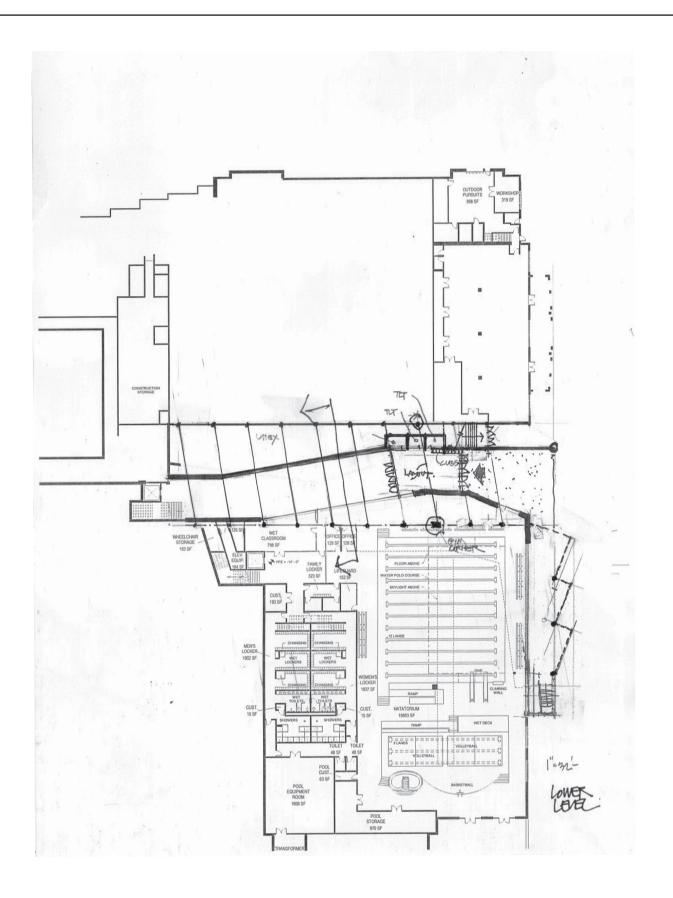




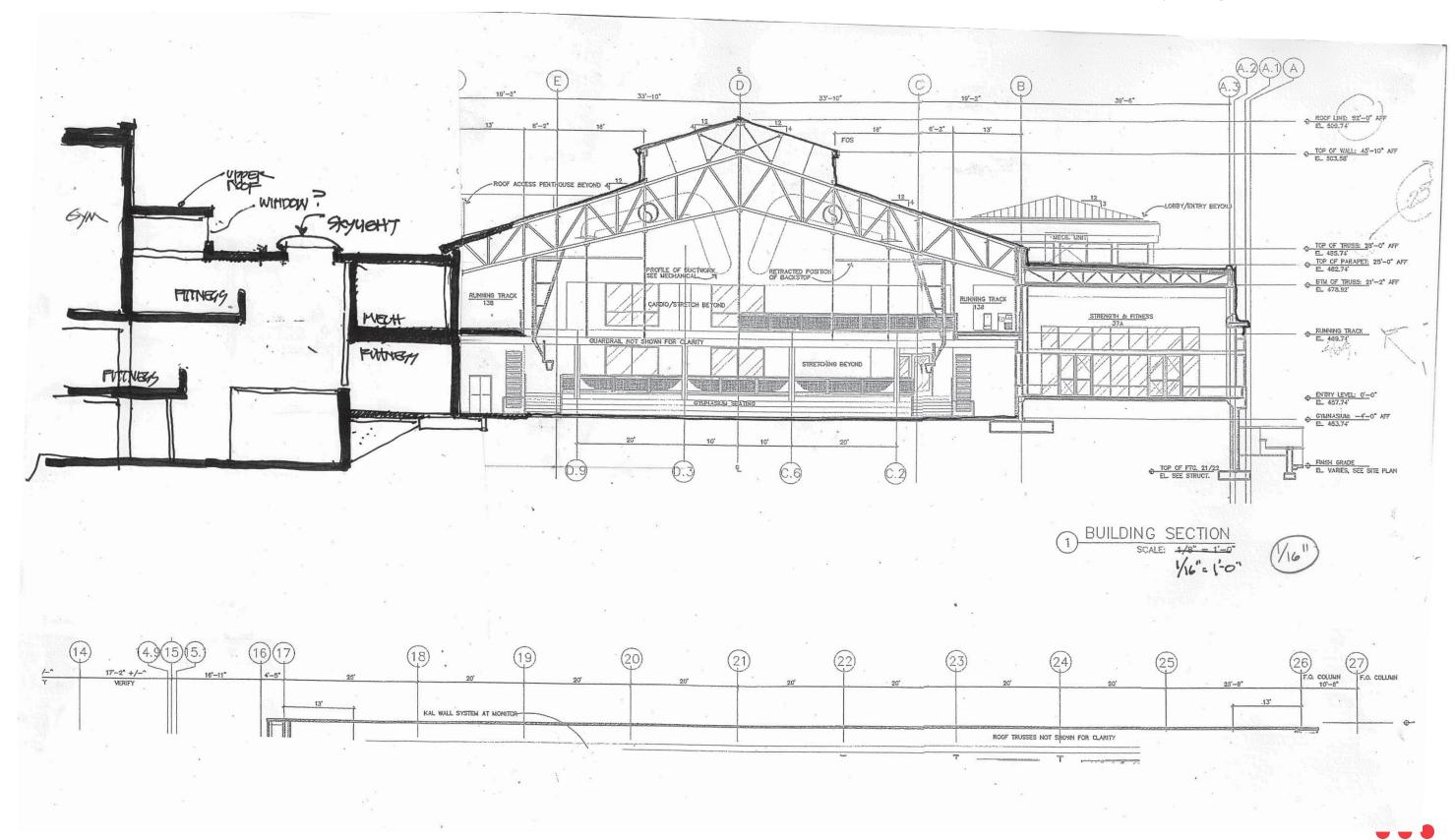














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UO Student Recreation Center Integrated Design Meeting – 8/15/12

Design Development

User Group:	Dennis Munroe Kevin Marbury Mike Eyster Bryan Haunert Brent Harrison Sue Wieseke Geoff Hale Michelle Vander Heyden Derick Olsen Kristen Gleason Jen Phillips Julie Haack Rob Thallon	UO UO UO UO UO Student Student Student UO UO UO	PE & Rec PE & Rec Student Affairs PE & Rec PE & Rec PE & Rec SRC Advisory Bd ASUO SRC Student Emp Club Sports Neuroscience Chemistry Architecture	present present present present present present present
Support	Gene Mowery Emily Eng Charlene Lindsay* Daren Dehle Jeff Madsen Art Corliss*	UO UO UO UO UO	Planning Planning FS Cap Con FS Cap Con FS Cap Con FS Cap Con	present present present present
Design Team	Jack Patton Jeff Schaub Michael Andresen Emlyn Altman* Otto Poticha Carl Sherwood Dave Guadagni* Charlie Brown* Kate Lane* Andy Frichtl* Steve Dacus* Chris Larson*	RDG RDG RDG RDG PA RSA RSA ESBA ESBA IE IE	Architect Architect Energy/LEED Lighting Designer Architect Architect Architect Daylight Daylight Mech Eng Mech Eng Elect Eng	present
Energy Analyst	Mitch Dec*	G	Energy Analyst	present
CMGC	Dan Pelissier*	HSW	Contractor	present
Guests	Peg Rees	UO	PE & Rec	present (second half)

^{*} Also attended the break-out session



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MEETING MINUTES – Note that there was an initial large meeting followed by a break-out session The participants in the initial meeting are listed above. Those who also attended the break-out session are noted with an asterix

Diagrams and other visual information presented at this workshop and noted below are available at the UO project web site: http://pages.uoregon.edu/eeng/src.html

Target Goals and Modeling

1. LEED gold and 35% better then Oregon Energy Code are our targets.

Energy Efficiency Measures

- The Energy Efficiency Measures (EEM) Energy Metric spread sheet developed by Mitch at Glumac has rough order of magnitude cost information that is preliminary and only intended to illustrate relative costs. During the break-out session the items on this matrix were priority ranked with one being the lowest priority and five the highest. An updated matrix is attached.
- Basis of Design / Design Intent is at 34.8% energy use savings before evaluating steam tunnel or pool heat recovery system options. The tunnel/pool heat recovery options put us well above 35% goal for energy use savings with SEED program
- 4. Basis of Design / Design Intent achieves more than 40% energy cost savings relative to the Oregon Energy Code. Reverting back to the ASHRAE 90.1-2007 requirements should put the project on track to achieve more than 50% energy cost savings for LEED before the tunnel heat recovery. This will be updated after the VE exercise is completed to see where the revised results sit.
- 5. Factoring in the basis of design with all items that have a priority number of "3" or higher, the potential exists to achieve and 80% energy use reduction and 67% energy cost reduction relative to the 2010 Oregon energy code.
- Additional EEMs louvered skylights, "earth tube" concept, automated pool cover, optimized pool
 cover r-value will be added when the model is updated per the 50% DD set being issued next
 week.
- 7. Steam tunnel heat source helps with both providing energy to building but also reduces loses in the chilled water system in tunnel as tunnel is cooled. A heat exchanger will draw waste heat, generated by heat loss from steam lines in the tunnel, for use in the building. Jeff has diagram that shows where heat draws and ventilation will occur in the tunnel in the future. Note: Later it was determined that the tunnel under the very hot administration area office might not be significantly cooled since this area is remote from where the heat exchangers will be located.
- 8. Project will be using central plant system and its efficiency is already determined. This will limit some of our possible energy credits since it is an existing building.
- 9. Baseline design is 16% better than the 2010 OESC (Oregon Energy Efficiency Code). Measures can take us to 40% or 50% depending on what measures are adopted.
- 10. The pool HVAC system is key energy system due to its size and the need for relatively high heat in area. Heat recovery option gives free pre-heat for this area.
- 11. A dehumidification system is not recommended for natatorium because it is not necessary in our climate and creates issues with air quality.
- 12. Pool covers are required by code. We can not take credit and is not included in the analysis.
- 13. 100% outside air (OSA) versus optimized OSA. Air quality is dependent on the pool chemistry. HVAC system needs to respond to dynamic nature of pool chemistry.
- 14. Chilled beams will be used in only a few enclosed areas such as the upper level Mind/Body room. Active or passive are possible. This should be included in the base rather than as an option.



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- 15. Radiant floor and radiant wall panels are in base EEM assumption and will be used in most locations where possible.
- 16. Night flush and thermal mass is in base but savings are not that significant. Need to review electric and gas consumption. Need to get to 130 lb to cubic foot density for the mass elements. Generally we need to have 2x the floor area in exposed mass. It does not matter whether it is in the floor, walls or ceiling so long as it is visible to the space (not hidden behind other construction)
- 17. Solar Thermal UO prefers drain back systems with heat exchanger. Heat will be used for domestic and pool heat use. Might have cascading heat exchangers. About a 5,000 gallon storage tank will be required. There is an existing tank in the existing pool mechanical room that might be adequate.
- 18. Cogenera systems are an option for solar panel system that uses water for cooling the Photovoltaic panel.

LEED

- 19. Project is registered
- 20. There is a matrix developed and already distributed by Michael Andresen indicating assignments for each LEED point
- 21. Preliminary review will be at 100 DD and final at 95% CD
- 22. LEED project target is 30% energy cost savings.
- 23. Consider planning simple infrastructure for future net-zero design. Basically photovoltaic systems will be required in future to meet net-zero. Budget for program space is more important than spending current funding for infrastructure or planning to meet net-zero
- Commissioning agent should be on board in a couple of weeks. They will need a packet of info on project.

Mechanical Systems

- 25. Heating with radiant heated slabs / wall panels, chilled beam locations and ventilation system locations were reviewed as noted below.
- 26. Ceiling fans will be located in fitness areas to improve comfort levels.
- 27. Radiant cooling will be located at east entry floor and possibly other areas yet to be determined.
- 28. Ventilation air will have a small heating and cooling capacity.
- Very little mechanical heating at Great Hall is anticipated due to the limited exposure to exterior envelope.
- Natatorium will be a closed environment and will not have operable windows. It will be served by a dedicated heat recovery unit.
- Natural ventilation at Main Street and Great Hall is anticipated but we need to complete CFD modeling.
- 32. Open workout spaces will be designed without mechanical cooling but with ceiling fans. We have a target of 78 degrees as determined in earlier Integrated Design sessions with group. Art Corliss has a concern that 78 degree will generate too many user complaints. Art gets calls in fitness areas when temperature reaches over 74 degrees. Those existing areas do not have ceiling fans so the fans might solve the user comfort issue in the new building. Dennis says we can not design cooling systems for the three hottest weeks of the year when student use is at a minimum.
- 33. Spot cooling will be used in identified areas, if necessary as determined through further analysis.
- 34. We will have cooling coils in units that do provide spot cooling with ventilation and this will be enhanced by ceiling fans.
- 35. Mind/body yoga room will have active chilled beams.
- 36. Currently gym will have radiant heated floor system and east wall openings and roof top turbines. Large ceiling fans are possible.



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- 37. Heat recovery system uses existing Leighton Pool for non-potable water storage (for flushing of urinals and water closets) of about 140,000 gallons. Tank will also be used for heat extraction from the rain water. The design team plans to provide 140 degree heating water supply with 100 degree heating water return using the campus steam system. Air to water heat pumps in tunnel with circulation pumps will be used in order to raise the return water in the heating water and domestic hot water loop from 100 to 130 degrees. Solar thermal will be a heat source for domestic hot water, heating water, and for the pool heating system. Winter gained rain water in pool at 50 degrees will be source for a water to water heat pump. There will be a back up heat exchanger from UO steam system for domestic hot water.
- 38. Architects have looked at pool tank and have confirmed it will be usable for a cistern. Pool is built very stoutly. We would divide tank with east/west wall at 5' elevation and fill in shallow end of pool or make it into earth tube. Add another north/south diving wall to form two possible tanks. Also add liners and the total will add will be about \$100,000 to \$150,000 to project but has good payback and side benefits. Need to verify and look closely at the total cost

Lighting

- 39. New lighting standards have been adopted in the last year and light levels are based on age of occupants (less than 25, 25 to 60, and 60 years and older). We would like to design to lowest age group (25 years and younger) which has the lowest light level requirements. Group agrees on this standard the users and staff are generally very young (with a few exceptions).
- 40. Existing building light levels are generally at the new lower level recommendations and the building occupants have found these levels acceptable.
- 41. LED lighting technology, efficacy and cost suggest that they be used where appropriate.
- 42. Building will have a lighting control system.
- 43. Areas like the Gym will have skylights with operable louvers that can be coordinated with electrical lighting with multi-level control capability to accommodate flexible light level requirements
- 44. Surface color and obstructions will impact lighting design. Light colored reflective surfaces will help minimize lighting requirement
- 45. Jeff Madsen asks that the design team try and drive down light energy levels even lower than the EEMs suggest, if possible.

End of Report





integrated design session exhibits

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- BOTTOM LIKE 160% -
- OPPORTUNITIES ARE MUCH GREATER
- CAN'T CLAIM CREDIT FOR CENTRAL PLANT EFFICIENCIES - YET

POOL HVAC (6,220)
1009. OSA VS. OPHMITZER OSA 26B (26B)
POOL COUERS NOT IN ANALYSIS (ODE REGID)
AIR QUALITY... NEED RESPONSIVE
SYSTEM
ACTIVE CHILLED BEAMS
PRESIVE CHILLED BEAMS
RADIANT PRIVELS

integrated design session exhibits

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MASS CONST./ NIGHT CODLING

EEM (2) - GET TO 19019/CF EXPOSED MASS,

STEEL/CONC QUANTITIES (NEED FOR ANALYSIS)

EEM (25) EDPT. MIXED MODE

SOLKE THERMAL II 29 A, 29B, 29C

DECIDE WHICH SYSTEMS

CO-CENERA SYSTEM? 30. KW ARRAY

(CONCERN ARRAY

(CONCERN ARROY COMPETITION (LACK))

BREAT-OUT SESSION

· IDENTIFY GIVENS

· WORK TO IDENTIFY HARD CHOKES

LEED STATUS
REGISTERED, ASSIGNED, 100% DO CHECK IN
SO REPORT
LEED TARGET 30% / SEED TARGET 35%
STEAM TIMEL
SOLAR HOT ALLIMPOPTANT FOR LEEL
P.V.

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NET "ZERO- MILLE IT READY ? 19 150 H LEED - CFD/DAYLIGHT ANALYSIS M&V - PISCUSSION/DECISIONS
MERGE M/E/P COMPONENTS COMMISSIONING - NEED OFR TOCOMENTS (SELECT FIRST FRIDAY - CONTRACT ASAP) DAYLIGHT MODELING - CONTRIBUTE TO (ESBL) LEEP > WHAT KBOUT LOXO REPUCTION > MEGH SYSTEMS D MODELING - NEED TO USE TO DETORMINE NATURAL VENTILATION FOR COURAL VOLUMES REUSIT TEMP RANGES-- CURRENTLY SEEM HIGH HEAT RECOVERY-MULTIPLE

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NON-POTABLE WATER USES
TOILETS, IPPLEATION?
(VERIFY)



POOL/TAXK- MXFE SURE ALL
COSTS CONSITERED

LEXELDETATION.

CONSIDER SHALLOW PORTION OF POOL AS

CHARLE HEAT EXCHANGER ON

AIR SIDE

LICHTING SYSTEMS

- -185 STANDARDS HAVE BEEN LADATED
- CUPPENT SPC LIGHT LEVELS MEET OR EXCRED CUPPENT LEVELS
- -DIMMABUE LED. TO BE USED WHERE EZON, PATRONAL
- DIMMING SYSTEM/CONTROLS
 THE TO DAY LIGHTING

- LOHTING SELECTION
- FINISHES / COLOR SELECTIONS WILL BE & FACTUR IN PLACEMENT & SELECTION OF FIXTURES
 - * SKME IS TRUE FOR DAYLIGHTING
- LOOK FOR OPPORTUNITIES TO DRIVE LOWER THAN STANDARDS
- PERCEPTION LOWER CENELS IN CORPHODES
 - HIGHER IN LATIVITY SPACES
- FIELD LIGHTING MOVE/RELOCATE AS ECONOMICALLY AS POSSIBLE

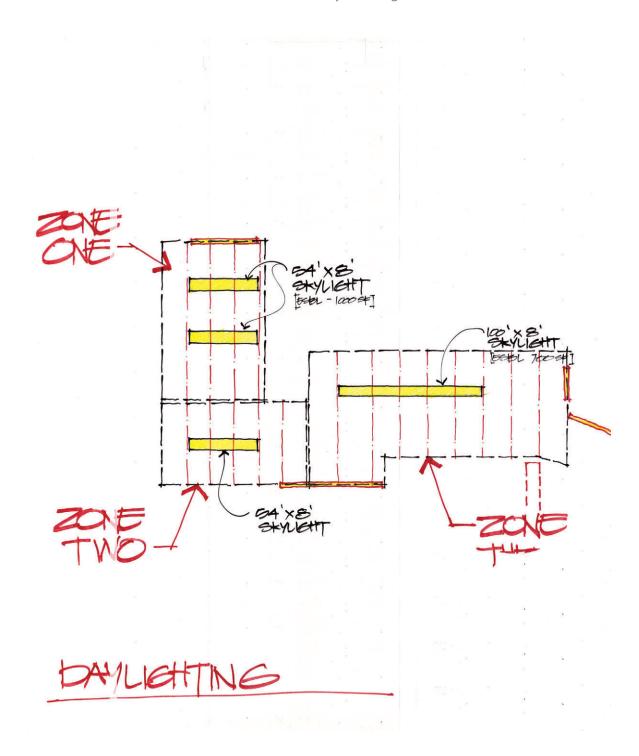


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ENERGY CONSULT PECA REVIEWED CLIENDAR - 27th START 50% SD ESTIMATE REVIEWED 507. SP REQUIREMENTS * LEED FLOOR COVERING -ANDY WILL SEND R-VALUE CHART TO TEAM * EXPOSE AS MUCH THERMAL MASS + POSPIBLE · CONCRETE, CHU, TILE, STONE · CABYRYNTH * LEED BOUNDARY - B-COURTCHM. . SUBMIT C.I.R. TO USGBC * LIFE CYCLE COST ANALYSIS · GLUMAC... APPROX BY SEPT 13th * AUTOMATIC POOL BUXNET

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WINDOW/CURTAIN WALL SILLS
30"-36" RECOMMENDED
INSUL, WALL/SPANDREL
VS., GLASS.









U of O	SRC	M: \$26/SF P: \$8/SF Energy Metric - Revision #1	S:Au	tom	ated	Pool	Building - Preliminary	× -	-	2009 NC	P	DD:	Louve	red Si	by
Code Building		Annual Energy Cost		See Note #	Annual Electricity Usage (kWh)	Annual Natural Gas Usage (therms)	Annual Base EUI kBtu per s.f.	Amual CO ₂ Emissions Ibs	12% - 1 14% - 2 16% - 3	Thresholds ³ 30% - 10 32% - 11 34% - 12	- 1	DD:E	arth	red SI Tube :	5
Basis of		\$1 51,616		Carableto	1,244,639 Annual	74,593 Annual Natural	125.1 Annual Base EUI	1,238,670 Annual CO ₂	18% - 4 20% - 5 22% - 6	36% - 13 38% - 14 40% - 15					
Design (TBD)		Annual Energy Cost (see note)	Percent Savings	See Note	Electricity Usage (kWh)	Gas Usage (therms)	kBtu per s.f.	Emissions Ibs	24% - 7 26% - 8 28% - 9	42% - 16 44% - 17 46% - 18		Rate (\$/kWh) ⁴	Gas Rate (\$/therm) ⁴	Electricity CO ₂ (lbs/kWh) ⁵	Ga (lbs/
EEM#		\$151,616 Individual Energy Efficiency Measure	Туре	See Note	1,244,639 Additional Electricity	74,593 Additional Natural Gas	125.1 Additional Energy Cost	1,238,670 Additional Energy Cost	Incremental First	Incentives	Simple Payback	\$0.065 Addition	\$0.948 onal EUI Additional	0.30 Additional A	
				#	Savings (kWh/yr) ^{6,7}	Savings (therms/yr) ^{6,7}	Savings ^{6,7}	Percent Savings ^{6,7}	Cost ⁸	meentives	(yrs)	kBtu/sf-yr	%	lbs	Add
Energy Effi	ciency I	Measures oulined in Pre-SD Documents Glazing Tuned by orientation for optimum performance	Envelope		14,507	200	C4.447	0.8%	\$23,154	\$3,917			2 22		
Y	2 7.8				-11,840	1,167	\$1,147 \$398	0.8%	\$23,154	\$3,917	17	0.7	0.6%	6,707	
Y	3 9	High Efficiency Lighting (0.75 LPD)	Lighting		29,395	-540	\$1,372	0.9%	\$23,250	\$7,937	11	0.5	0.7%	9,985 2,554	
Y	4 15		HVAC		-20,808	5.635	\$4,283	2.8%	\$12,000	ψ1,001		5.3	4.2%	59,124	
Y	5 17.18		HVAC		222,733	-7,136	\$7,343	4.8%	\$125,000	\$60,138		0.5	0.4%	-15,958	
Y	•	Natatorium HRU with 100% OA and 60% ERV controlled with OSA bypass damper to													
4	21	maintain a mixed air reset discharge temperature for humidity control.	HVAC		90,295	135	\$6,005	4.0%	\$15,000	\$7,500	1	3.4	2.7%	28,654	
1	7 24	Natural Ventilation of Fitness Spaces (Cool SP = 78 F, (not in pool area)	HVAC		80,594	182	\$5,422	3.6%	\$75,000	\$21,760	10	3.1	2.5%	26,289	
Wineat-	8 25	Displacement Ventilation with DOAS to zones (not in pool area) Steam Tunnel Heat Recovery /3 * 1/2 * Potential*	HVAC		29,307	3	\$1,909	1.3%	\$25,000	\$7,913	9	1.1	0.9%	8,827	
Y	9 26 0 27	HeatSink for TES in old Pool - WILL NEED TO EVALUATE WHEN CAPACITY			-364,579 TBD	55,983 TBD	\$32,286 #VALUE!	21.3% #VALUE!	\$105,000	107	3	#VALUE!	37.2% #VALUE!	540,029 #VALUE!	
Y 1	1 30	SHW for Pool Water Heating	Solar		0	2,322	\$2,323	1.5%	\$70,000		30	2.5		26,935	
Y 1:	2 34	Low Flow Fixtures for DHW Savings	DWH		0	2,116	\$2,117	1.4%	\$5,000		2	2.3		24,546	,
11	Energy												200		
13/			Envelope		2,403	1,036	\$1,193	0.8%	\$170,828	\$649	143		1.0%	12,739	
7 13	B 1b	Continuous Insulation: Extruded Polyilso board @ R-20 High Performance Curtainwall System (Elco. 5500 x)	Envelope Envelope		1,407	676	\$768		\$28,471	\$380	37		0.6%	8,264	
7	5 4	R-40 or better continuous roof insulation above deck	Envelope		5,246 7,297	1,201	\$1,543		\$27,785	\$1,416	17		1.2%	15,505	
7	_	R-10 Continuous Slab insulation, 24" deep to top of slab	Envelope		-498	1,298 183	\$1,773 \$152	1.2% 0.1%	\$42,703	\$1,970	23		0.1%	17,246 1,973	
7		Thermal break of high temp. (pool) space from other spaces (Delta T >=10"F)	Envelope		-293	1,241	\$1,223	0.8%	\$15,000		12		1.1%	14,308	
18/			Lighting		29,395	-540	\$1,372	0.9%	\$23,250	\$7,937	11		0.4%	2,554	
188			Lighting		44,092	-810	\$2,057	1.4%	\$46,500	\$11,905	17		0.6%	3,832	
? 1	9 10		Lighting		15,972	1,300	\$2,339	1.5%	-\$159,439	HVAC	Savango	2.0	1.6%	19,872	
Y 2	0 11	Vacancy Sensors (not in pool)	Lighting		35,930	-610	\$1,726	1.1%	\$16,000	\$9,701	4	0.7	0.5%	3,703	
2	1 12	Energy Producing Gym Equipment	Equipment		4,049	0	\$264	0.2%			0	0.1	0.1%	1,215	
2:	2 13	Watt-Stoppers in offices and classrooms for PCs	Equipment		6,748	-14	\$426	0.3%	\$7,663	\$1,822	14	0.2	0.2%	1,862	
23/	15		HVAC	19 19 19	-15,269	524	-\$468	-0.3%	A Comment		0	0.0	0.0%	1,498	
238	B 16	ERV Savings: Heat Recovery in winter AND Pre-cooling in summer (pool is separate measure)	HVAC		-17,145	523	-\$590	-0.4%			0	-0.1	-0.1%	923	
		ERV Savings: Heat Recovery in winter AND Pre-cooling in summer with evaporative													
Y 2	35 4 19	cooling on exhaust air stream (pool is separate measure) Active Chilled Beams in select spaces	HVAC		-10,932 185,396	-3,096	-\$195 \$8,956	-0.1% 5,9%	\$100,000	\$50.057	0	0.2	0.1%	2,695	
Y 2	5: 20	Optimized Cooling Control Sequence: Mixed Mode Cooling/Ventilation	HVAC		74,586		\$5,238	3.5%	\$60,000	100000000000000000000000000000000000000	6	3.5	100	19,705	
N 26/	1	Poel Heating 2: Dehumidification with Latent Heat Recovery	HVAC		142.608	1000	20.623	-	\$300,000	\$20,138 \$38,504	13	3.1 17.3	2. <u>5%</u> 13.9%	26,888 174,477	
V	V	Pool Heating 3: Optimized Outside Air with OSA ERV and Return Air Mixed Downstrea	m								13	17.5	13.970		
14	1		HVAC		-8,881	8,363	7,786	5.1%	\$45,000		6	8.6	6.9%	94,344	
2	7 28	Pump savings from increased delta T on HW & CHW loops + High Eff. Pumps	Fans/Pumps		15,972	1,300	2,339	1.5%	£1e - CC	THE PERSON NAMED IN	0	2.0	1.6%	19,872	
20	29	Pool Makeup Water Savings due to Regenerative Media Filters Solar Hot Water 2: DHW only.	DHW		0	2,427	2,428 \$2,500	1.6% 1.7%	\$10,066		6	2.6	2.1%	28,153	
Y 291	ĺ				0	2,589	\$2,590		\$80,000		31	2.8	2.2%	30,032	
7 290			Solar Solar		28,778	4,911 4,911	\$4,912 \$6,783	3.2% 4.5%	\$120,000 \$165,000	\$37,500	19	5.2	4.2%	56,968	
		g Interactive combinations in the design (from LEED Baseline)	Join		20,770	4,811	φο,783	4:376	\$100,000	Ψ57,500	19	6.3	5.0%	65,601	
TOTAL SAVIII															
A A		Basis of Design without Steam Tunnel Heat Recovery (EEMs 1-8, 10-12)	Combo		434,183	4,087	\$32,310	21.3%	\$373,404	\$109,165	8	20.2	16.1%	177,664	

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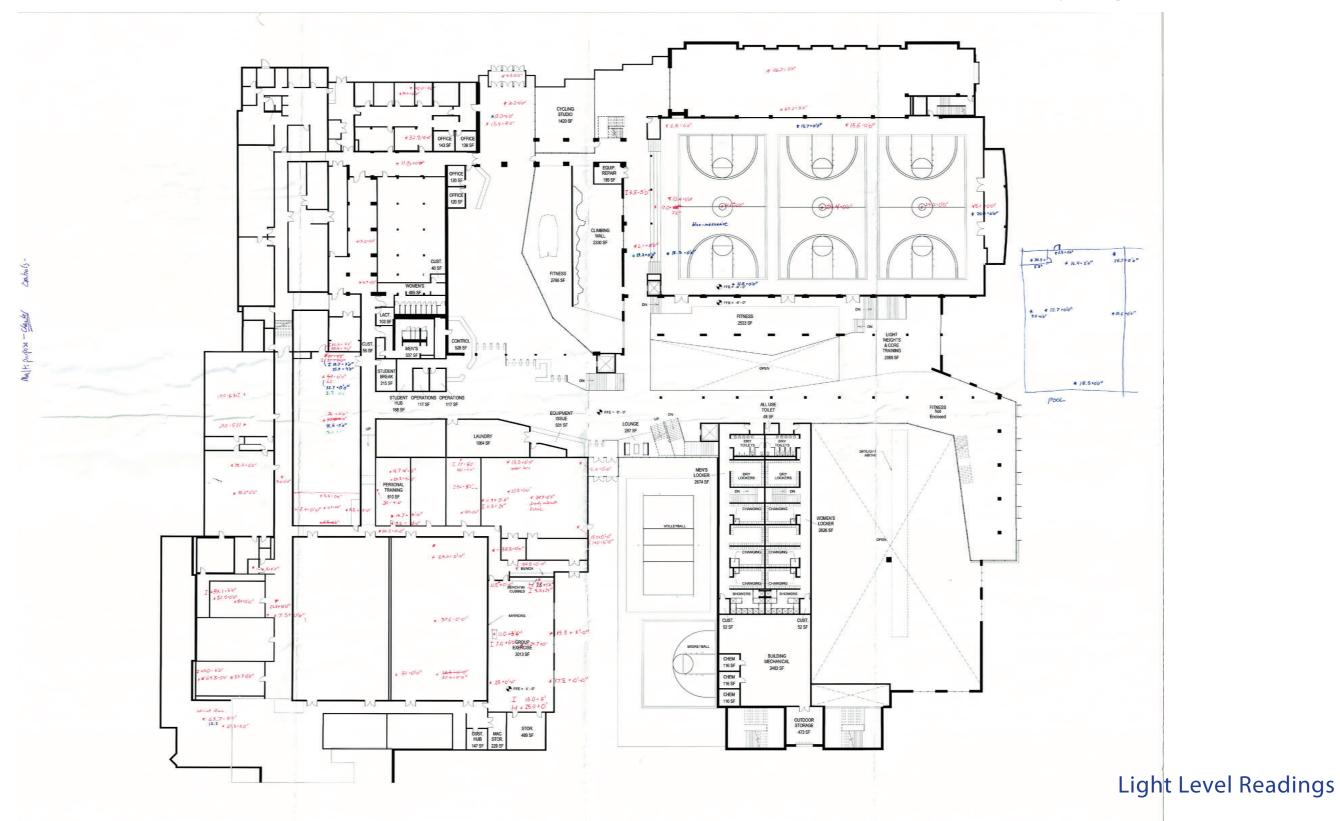
8/22/2012

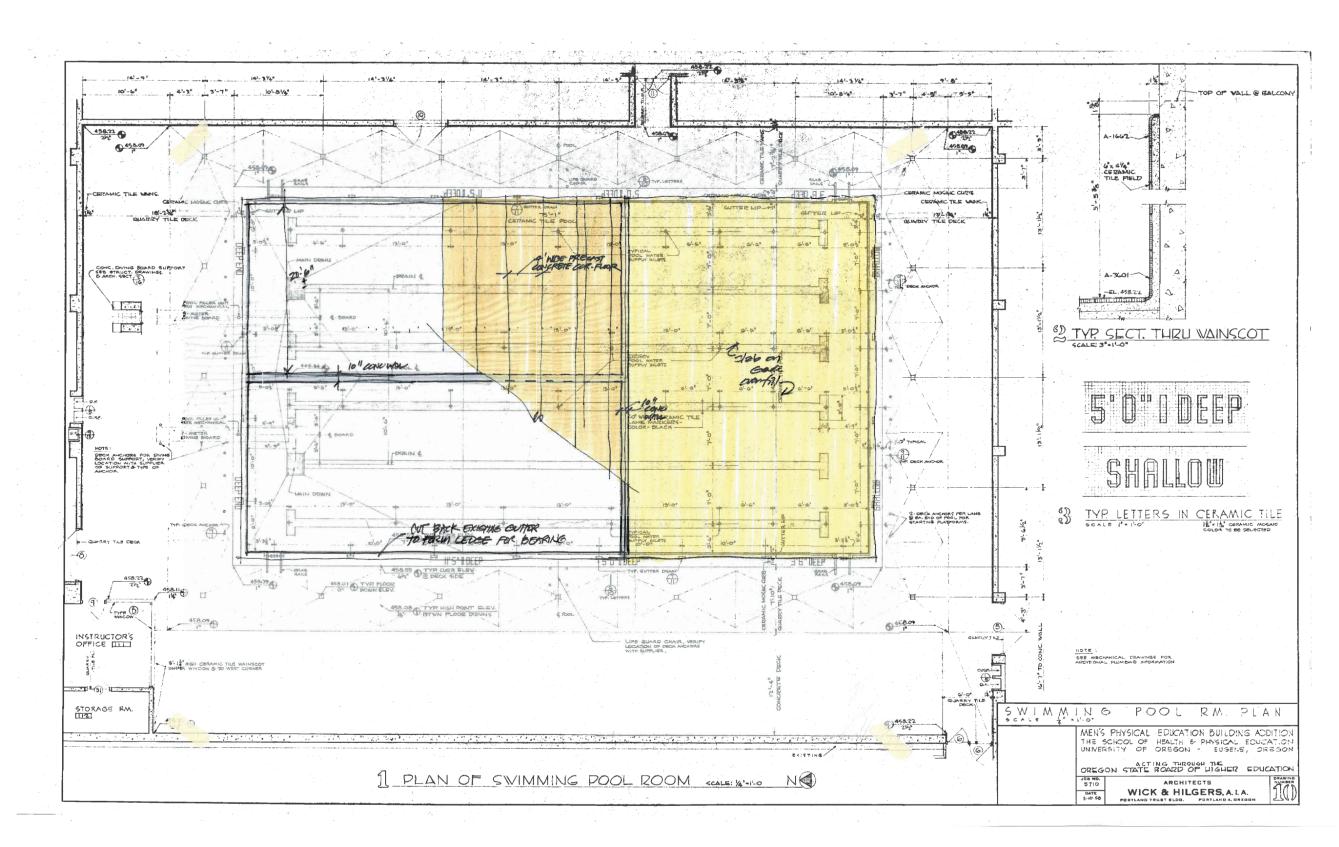
U of O SRC - Energy Efficiency Measures Savings from OR Code Building - Preliminary

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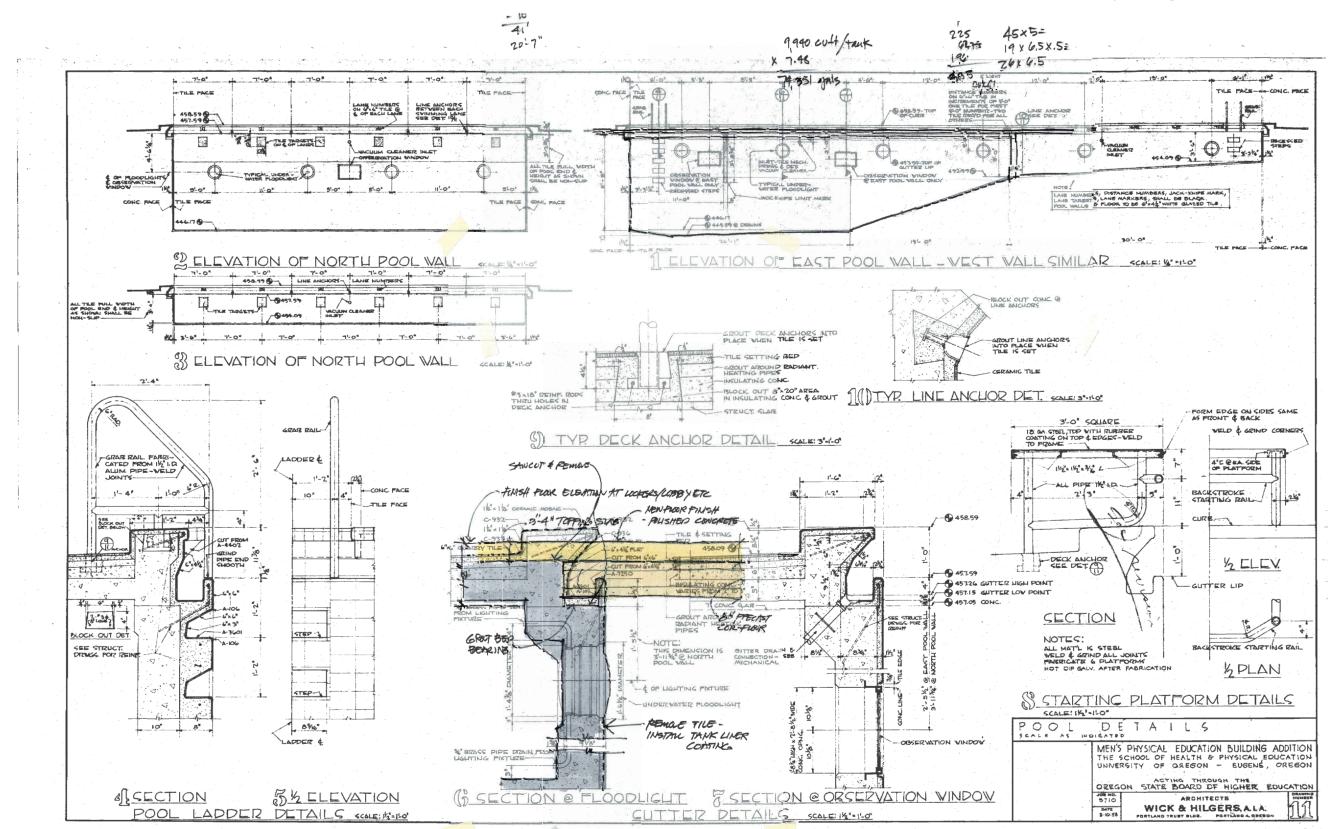
U of O	of O SRC Energy Metric - Revision #1										2009 NC					
					See Note	Annual	Annual Natural	Annual Base EUI	Annual CO ₂ Emissions	12% - 1	Thresholds ³ 30% - 10					
Code Building			Annual Energy Cost		#	Electricity Usage (kWh)	Gas Usage (therms)	kBtu per s.f.	Ibs	14% - 2 16% - 3	32% - 11 34% - 12					
			\$151,616			1,244,639	74,593	125.1	1,238,670	18% - 4	36% - 13					
Basis of				Davaget	Can Nata	Annual	Annual Natural	Annual Base EUI	Annual CO ₂ Emissions	20% - 5 22% - 6	38% - 14 40% - 15		Electricity			
Design (TBD)			Annual Energy Cost (see note)	Percent Savings	See Note #	Electricity Usage (kWh)	Gas Usage (therms)	kBtu per s.f.	lbs	24% - 7 26% - 8 28% - 9	42% - 16 44% - 17 46% - 18		Rate (\$/kWh) ⁴	Gas Rate (\$/therm) ⁴	Electricity CO ₂ (lbs/kWh) ⁵	Gas CO ₂
(100)			\$151,616			1,244,639	74,593	125.1	1,238,670	20/6 - 9	48% - 19		\$0.065	\$0.948	0.30	11.6
		Priority				Additional	Additional	Additional	Additional			Simple	Additio	onal EUI	Additional A	nnual CO ₂
EEM#	In Design? (Y/N)	Number (1-5)	Individual Energy Efficiency Measure	Туре	See Note #	Electricity Savings (kWh/yr) ^{6,7}	Natural Gas Savings (therms/yr) ^{6,7}	Energy Cost Savings ^{6,7}	Energy Cost Percent Savings ^{6,7}	Incremental First Cost ⁸	Incentives ⁸	Payback (yrs)	kBtu/sf-yr	Additional %	lbs	Additional %
Energy Effic		res oulined	in Pre-SD Documents		ı				0.004	000 454	00.047	Ι				
1	Y	3	Glazing Tuned by orientation for optimum performance	Envelope		14,507	203		0.8%	\$23,154	\$3,917	17	0.7	0.6%	6,707	
2	Y	5	Mass Construction and Night Cooling (130lb/ft^3 density mass)	HVAC		-11,840	1,167		0.3%	\$00.050	¢7.007		0.8		9,985	
3	Y	3	High Efficiency Lighting (0.75 LPD)	Lighting HVAC		29,395	-540		0.9%	\$23,250	\$7,937	11			2,554	0.29
4	Y	5	DCV (not in pool)			-20,808	5,635	\$4,283	2.8%	\$12,000	000 100	3	5.3	4.2%	59,124	4.89
5	Y	4	Passive Cooling/Heating to Fitness Spaces Natatorium HRU with 100% OA and 60% ERV controlled with OSA bypass damper to	HVAC		222,733	-7,136	\$7,343	4.8%	\$125,000	\$60,138	9	0.5	0.4%	-15,958	-1.3%
6	Υ	5	maintain a mixed air reset discharge temperature for humidity control.	HVAC		90,295	135	\$6,005	4.0%	\$15,000	\$7,500	1	3.4	2.7%	28,654	2.39
7	Y	3	Natural Ventilation of Fitness Spaces (Cool SP = 78 F, (not in pool area)	HVAC		80,594	182	\$5,422	3.6%	\$75,000	\$21,760	10	3.1	2.5%	26,289	2.19
8	Υ	5	Displacement Ventilation with DOAS to zones (not in pool area)	HVAC		29,307	3	\$1,909	1.3%	\$25,000	\$7,913	9	1.1	0.9%	8,827	0.7%
9	Y (partial)	3	Steam Tunnel Heat Recovery	HVAC		-364,579	55,983	\$32,286	21.3%	\$105,000		3	46.5	37.2%	540,029	43.6%
10	Υ	2	HeatSink for TES in old Pool - WILL NEED TO EVALUATE WHEN CAPACITY INFORMATION CAN BE CLARIFIED WITH DESIGN CONCEPT	HVAC		TBD	TBD	#VALUE!	#VALUE!				#VALUE!	#VALUE!	#VALUE!	#VALUE
11	Y	1	SHW for Pool Water Heating	Solar		0	2,322	\$2,323	1.5%	\$70,000		30	2.5	2.0%	26,935	2.29
12	Y	5	Low Flow Fixtures for DHW Savings	DWH		0	2,116	\$2,117	1.4%	\$5,000		2	2.3	1.8%	24,546	2.09
20	Υ	5	Vacancy Sensors (not in pool)	Lighting		35,930	-610	\$1,726	1.1%	\$16,000	\$9,701	4	0.7		3,703	
24	Y	5	Active Chilled Beams in select spaces	HVAC		185,396	-3,096	\$8,956	5.9%	\$100,000	\$50,057	6	3.5		19,705	1.69
25		5	Optimized Cooling Control Sequence: Mixed Mode Cooling/Ventilation	HVAC		74,586	389		3.5%	\$60,000	\$20,138	8	3.1	2.5%	26,888	2.2%
			Pool Heating 3: Optimized Outside Air with OSA ERV and Return Air Mixed													
26B		5	Downstream of ERV	HVAC		-8,881	8,363	7,786	5.1%	\$45,000		6	8.6		94,344	7.6%
27		5	Pump savings from increased delta T on HW & CHW loops + High Eff. Pumps	Fans/Pumps		15,972	1,300	2,339	1.5% 3.2%	£400.000		0	2.0		19,872	1.6%
29B Additional E	Y nergy Efficie	ncy Measui	Solar Hot Water 3: Cascading HX, DHW and then Pool Water res For Consideration	Solar		0	4,911	\$4,912	3.2%	\$120,000		24	5.2	4.2%	56,968	4.6%
13A	N	1	Continuous Insulation: R-24 assembly - Glass Reinforced Concrete Panel	Envelope		2,403	1,036	\$1,193	0.8%	\$170,828	\$649	143	1.2	1.0%	12,739	1.0%
13B	?	1	Continuous Insulation: Extruded Polyilso board @ R-20	Envelope		1,407	676	\$768	0.5%	\$28,471	\$380	37	0.8	0.6%	8,264	0.7%
14	?	4	High Performance Curtainwall System (Efco 5500 x)	Envelope		5,246	1,201	\$1,543	1.0%	\$27,785	\$1,416	17	1.5	1.2%	15,505	1.3%
15	?	2	R-40 or better continuous roof insulation above deck	Envelope		7,297	1,298	\$1,773	1.2%	\$42,703	\$1,970	23	1.7	1.3%	17,246	1.49
16	?	1	R-10 Continuous Slab insulation, 24" deep to top of slab	Envelope		-498	183	\$152	0.1%	\$17,500		115	0.2	0.1%	1,973	0.2%
17	?	4	Thermal break of high temp. (pool) space from other spaces (Delta T >=10°F)	Envelope		-293	1,241	\$1,223	0.8%	\$15,000		12	1.3	1.1%	14,308	1.29
18A	?	3	Lighting reductions to .65 LPD	Lighting		29,395	-540	\$1,372	0.9%	\$23,250	\$7,937	11	0.5	0.4%	2,554	0.29
18B	?	3	Lighting reductions to .55 LPD	Lighting		44,092	-810	\$2,057	1.4%	\$46,500	\$11,905	17	0.7	0.6%	3,832	0.39
19	?	5	Daylighting Savings with 30" window placement	Lighting		15,972	1,300	\$2,339	1.5%	-\$159,439		-68	2.0	1.6%	19,872	1.69
21	?	1	Energy Producing Gym Equipment	Equipment		4,049	0	\$264	0.2%			С	0.1	0.1%	1,215	0.1%
22	?	1	Watt-Stoppers in offices and classrooms for PCs	Equipment		6,748	-14	\$426	0.3%	\$7,663	\$1,822	14	0.2	0.2%	1,862	0.2%
23A	N	n/a	ERV Savings: Heat Recovery in winter (pool is separate measure)	HVAC		-15,269	524	-\$468	-0.3%			е	0.0	0.0%	1,498	
23B	N	2/2	ERV Savings: Heat Recovery in winter AND Pre-cooling in summer (pool is separate-measure)	HVAC		17 1 15	523	-\$590	-0.4%				0.1	0.49/	923	0.10
200	H	n/a	ERV Savings: Heat Recovery in winter AND Pre-cooling in summer with evaporative	HVAC		-17,145	920	- 0090	-0.4%			-	-0.1	-0.1%	923	0.1%
230		n/a	cooling on exhaust air stream (pool is separate measure)	HVAC		-10,932	515					6	0.2		2,695	
26A	N N	n/a	Pool Heating 2: Dehumidification with Latent Heat Recovery	HVAC		142,608	11,353		13.6%	\$300,000	\$38,504	43	17.3	13.9%	174,477	
28	N	1	Pool Makeup Water Savings due to Regenerative Media Filters	DHW		0	2,427	2,428	1.6%	\$15,000		6	2.6	2.1%	28,153	2.3%
	N (29B															
29A	current SHW option)	1	Solar Hot Water 2: DHW only.	Solar		0	2,589	\$2,590	1.7%	\$80,000		31	2.8	2.2%	30,032	2.49
29C	N	1	PV + Solar HW: Co-genera	Solar		28,778	4,911		4.5%	\$165,000	\$37,500	19			65,601	
		active com	binations in the design (from LEED Baseline)			20,770	7,311	ψυ, του	70	,	, , 500	, 18	0.3	3.0 /8	33,001	5.57
	Y		Basis of Design without Tunnel/Pool Heat Recovery (EEMs 1-8, 11-12, 20, 24-25, 26B,	Combo		707.407	45.044	600.000	44.70/	\$270.404	£100.405		40.0	04.004	200.444	00.00
A	Y	5	27, 29B)	Combo		737,187	15,344		41.7%	\$373,404	\$109,165	4	43.3		399,144	32.29
В	T Y	4	Basis of Design with Tunnel/Pool Heat Recovery (Combo A + EEMs 9-10) Combination B including Optional Priority Items Ranked "3" or Higher (Combo B +			372,608	71,327		63.0%	\$471,250	\$114,949	4	89.8	71.8%	939,173	75.8%
С	?	3	EEMs 14, 17, 18B, 19)	Combo		437,625	74,259	\$102,705	67.7%	\$478,404	\$109,165	4	95.3	76.2%	992,690	80.1%















S.A.G. GROUP PRESENT DAD

PECAPPED INPUT

VIEWED INTERIOR MACES

REVIEWED NEW PLAN

- WHY MANE PROVIDER? CHW/
SAF.

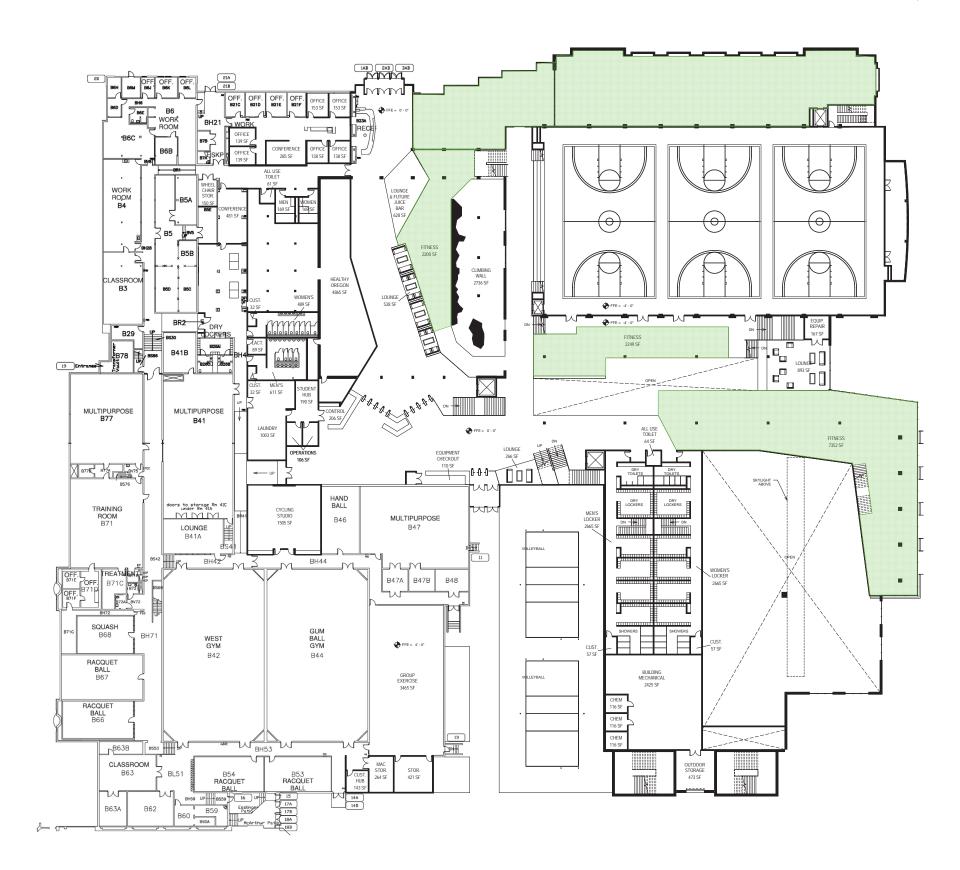
-4. ACTIVITY SPACESONN

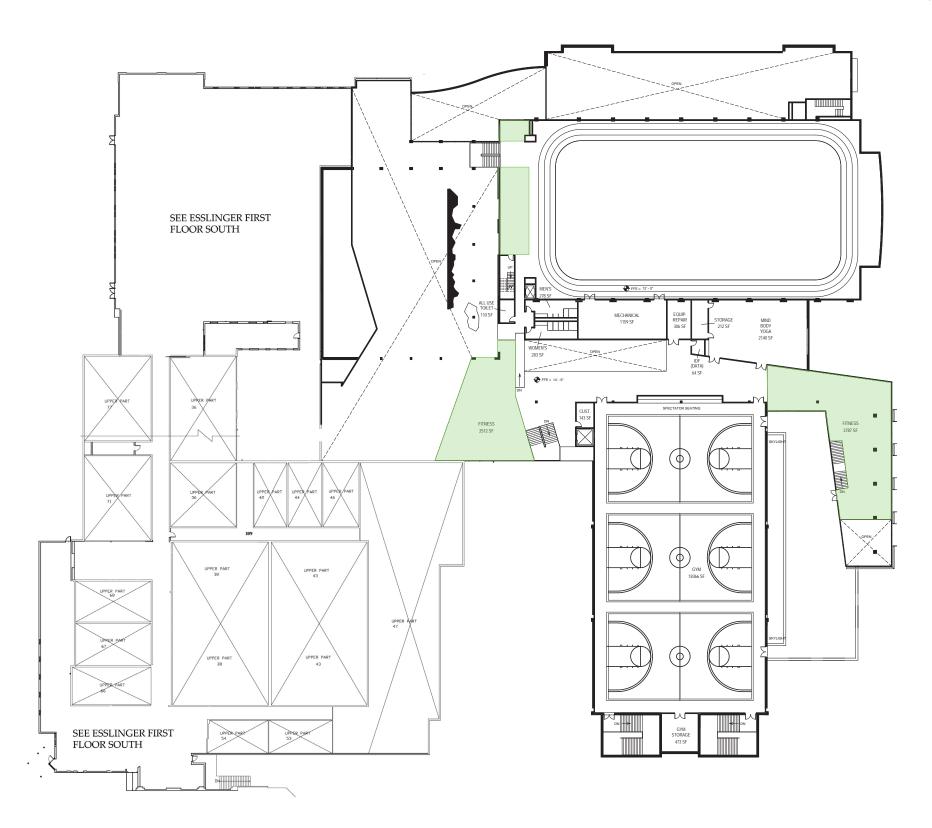
BUTRY REQUENCE

- CLASSROOM - WHY TRANSP!

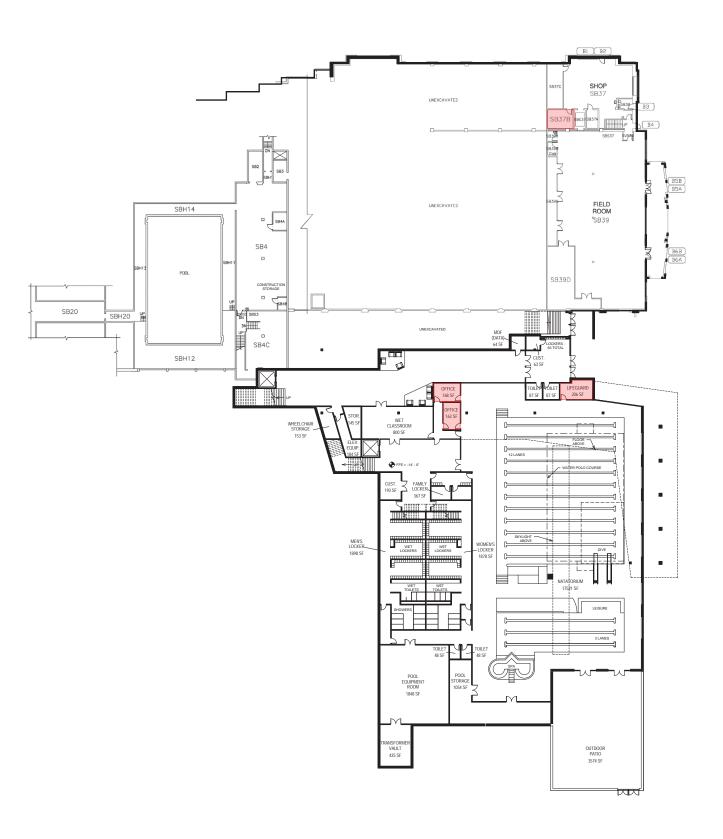
- NEED PRIVACY CONTROLS



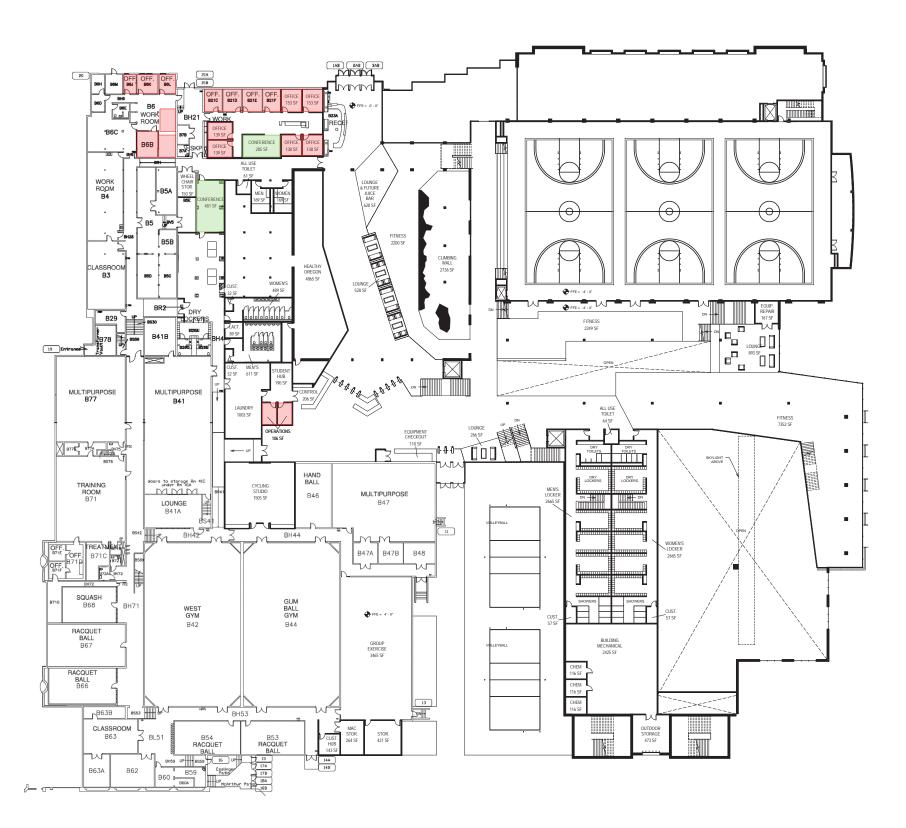




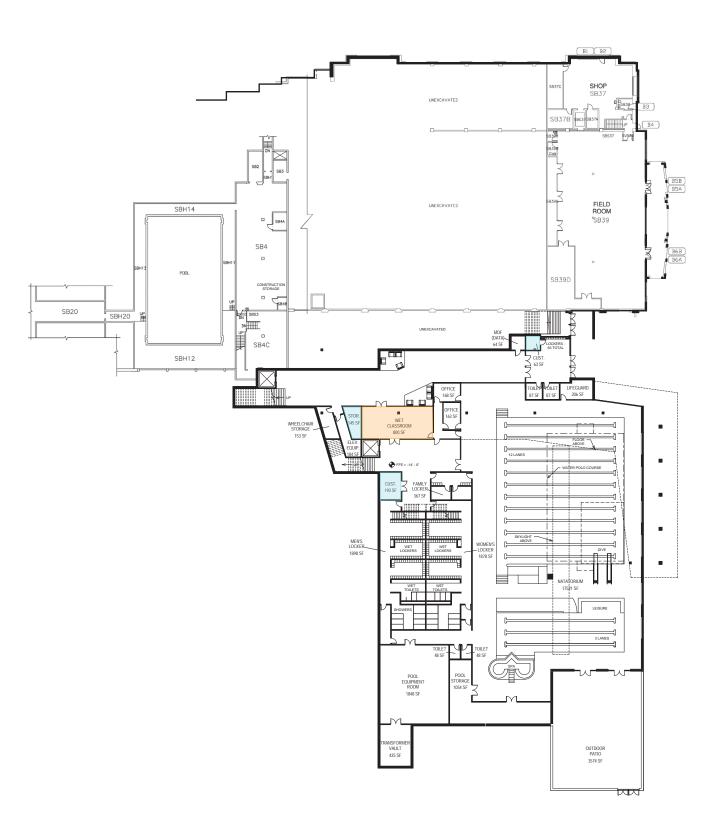








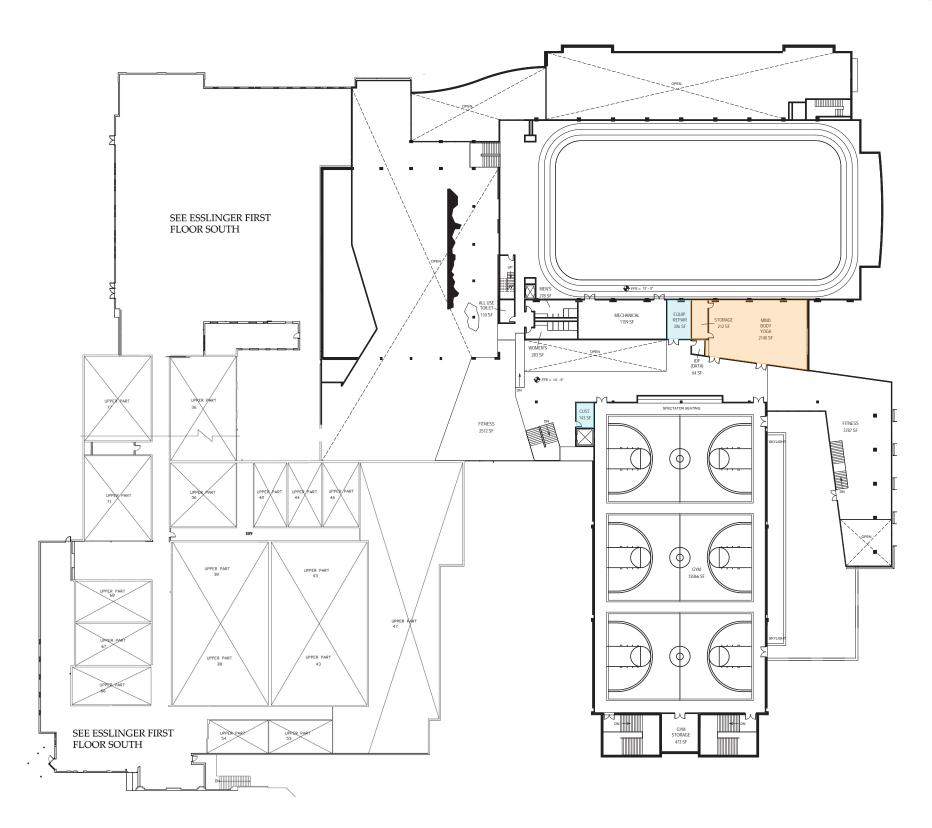




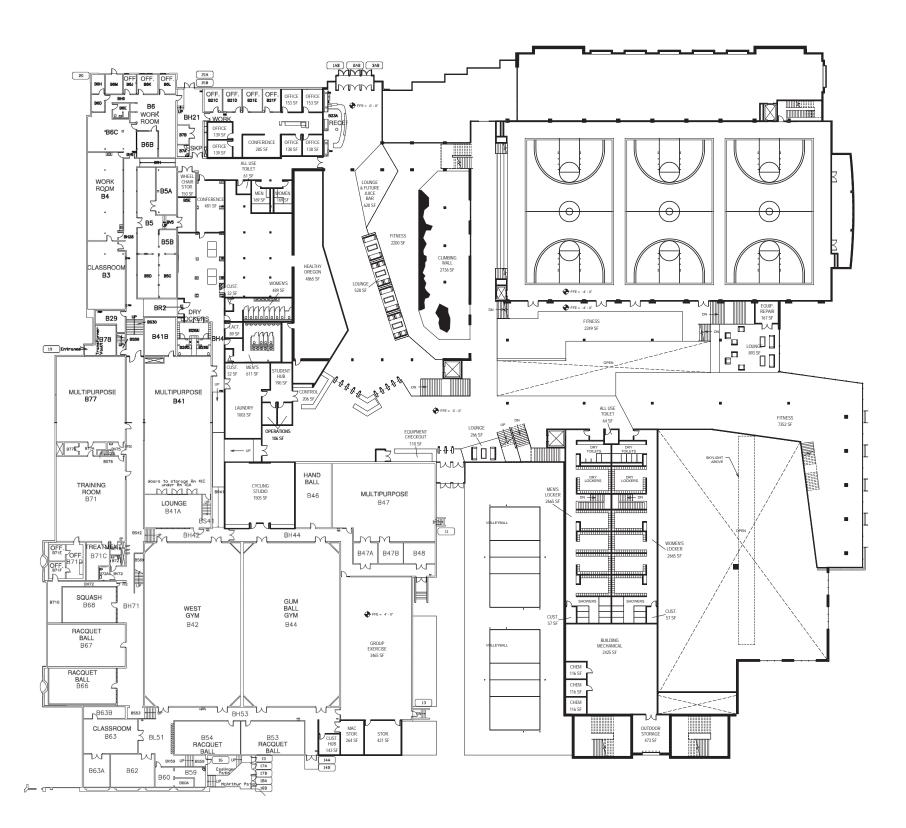






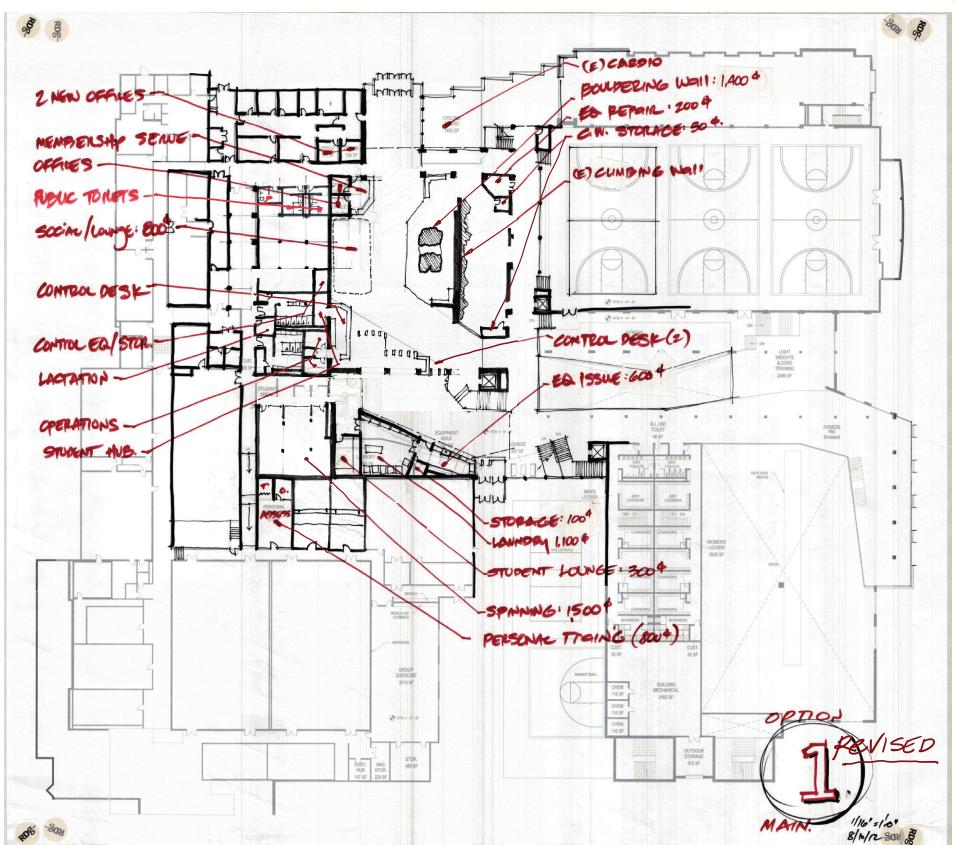




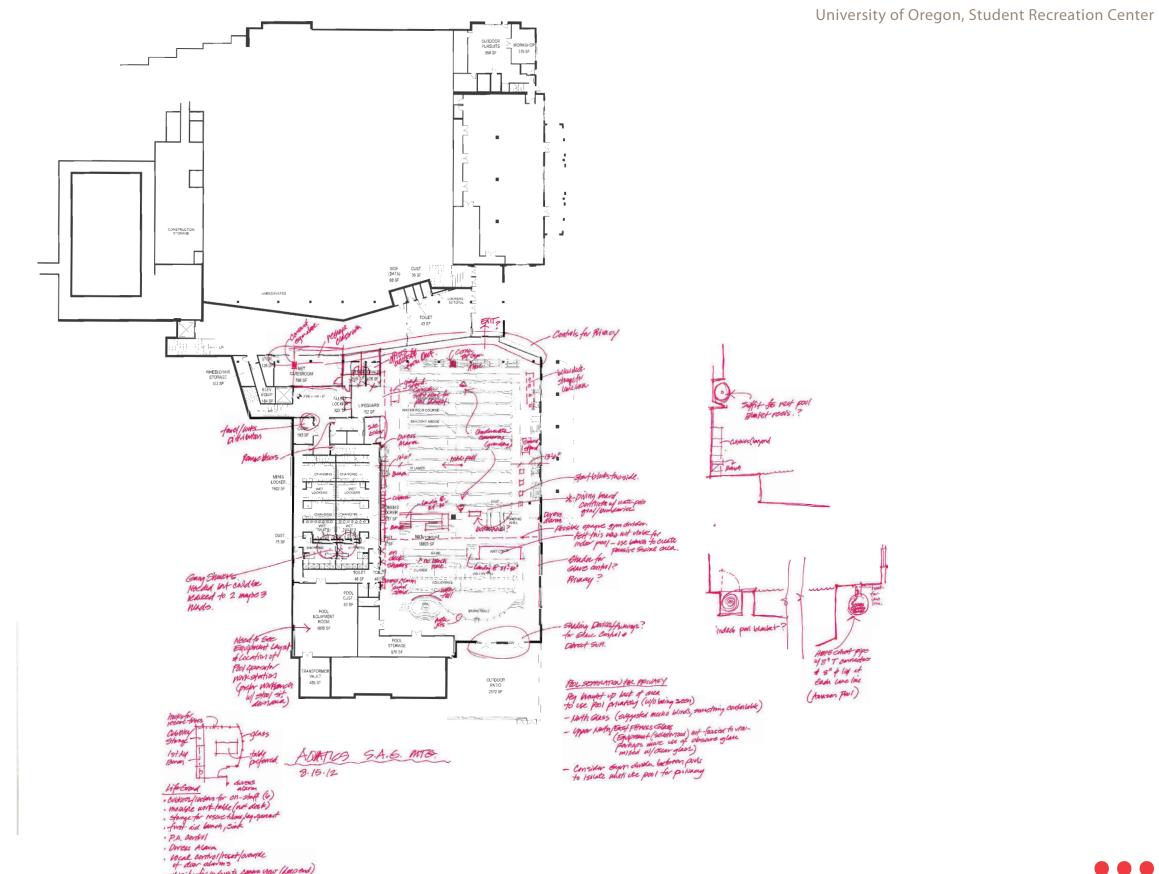


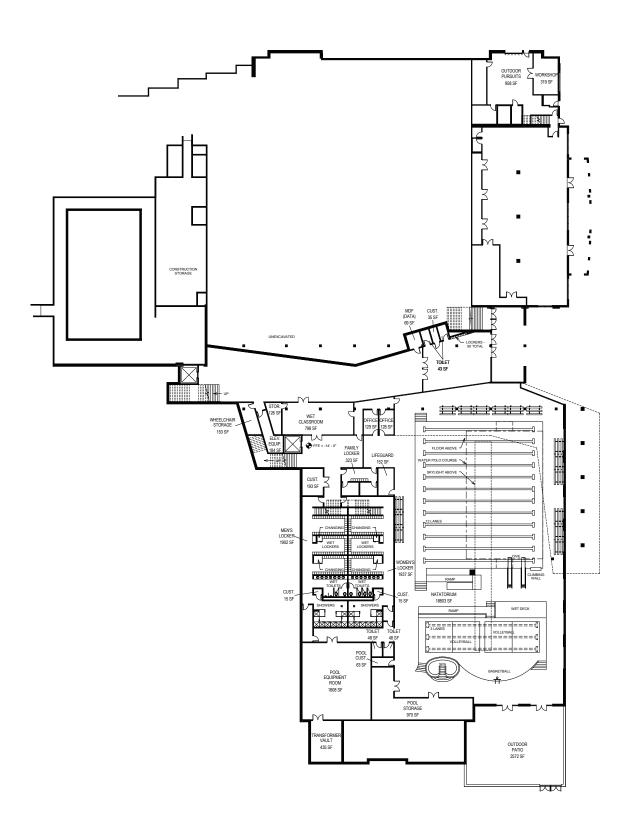


SAG meeting exhibits

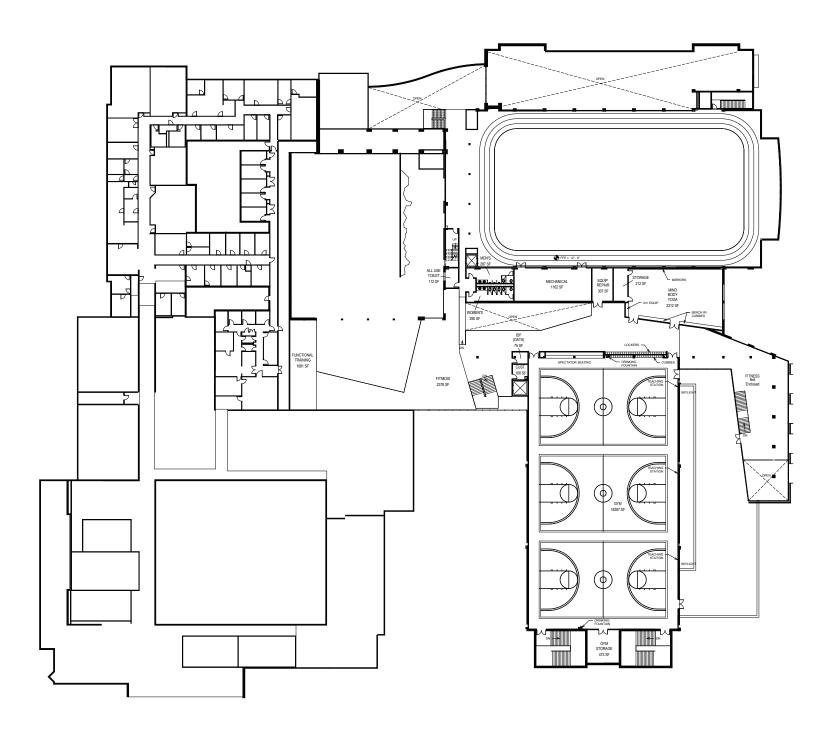


SAG meeting exhibits











SAG meeting exhibits

