Oregon State Capitol Master Plan

June 2009

SRG PARTNERSHIP INC

ARCHITECTURE PLANNING INTERIORS

Oregon State Capitol Master Plan

June 2009

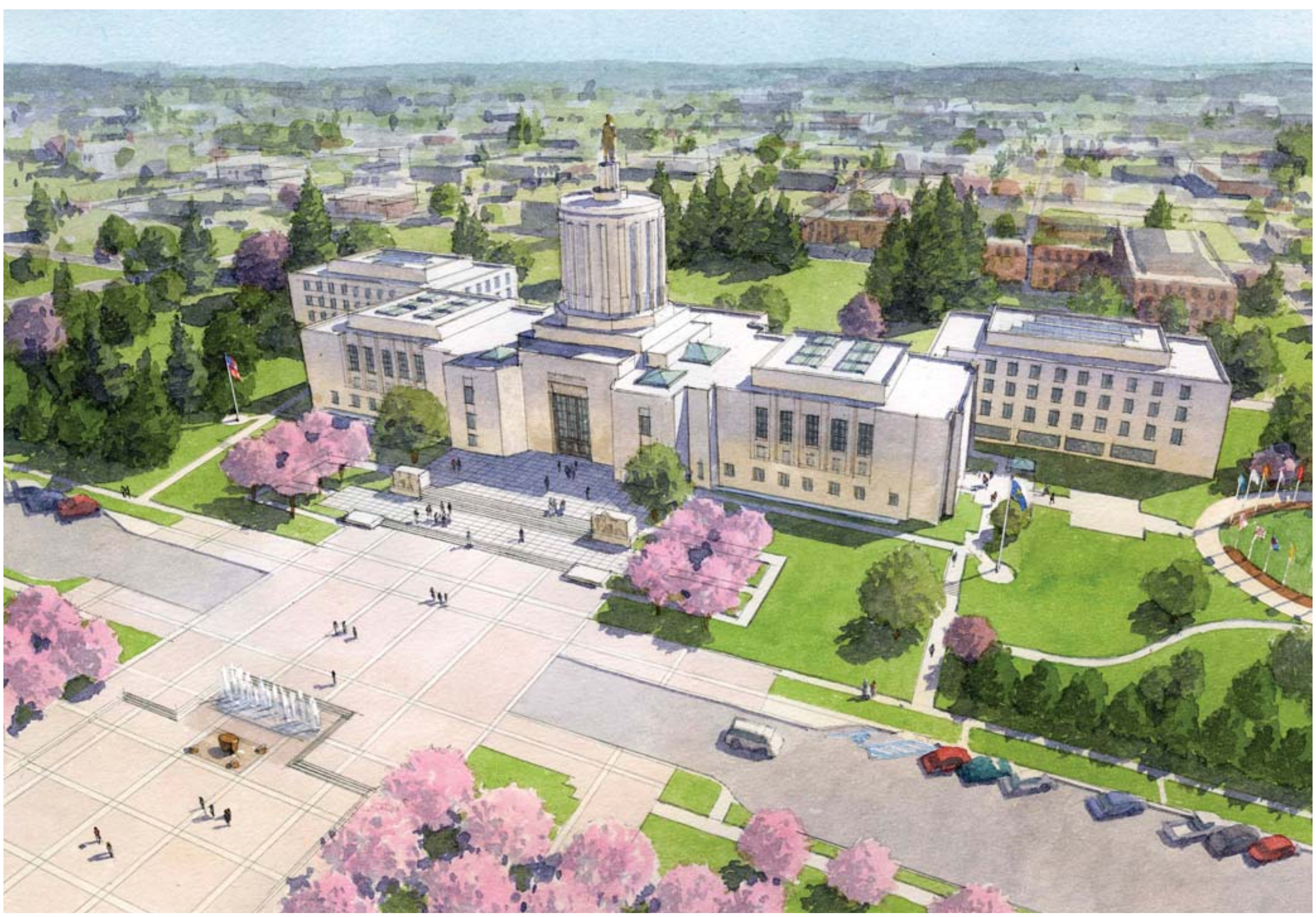


Table of Contents

Table of Contents Continued

Acknowledgements

We would like to thank the following individuals from the Oregon State Capitol for their time and participation in this study:

74th Legislative Assembly

Master Plan Governance Group

Senate President Peter Courtney
Senator Ted Ferrioli
Senator Betsy Johnson
Speaker of the House Dave Hunt
Representative Bob Jenson
Representative Arnie Roblan
U.S. Senator Jeff Merkley

Workshop Participants

Citizens of Oregon
Legislators
Legislative aides
Legislative departments
Capitol neighbors

Interested Organizations, including:

Capitol Foundation
Oregon Historical Society
Oregon Disabilities Commission

Legislative Administration Project Team

Scott Burgess
Vicki Brammeier
Herb Colomb
Daniel Russell

Space Needs Workgroup

Jeanne Atkins
Don Bishoff
Laura Campbell
Vicki Crider
Judy Hall
Robin Harpster
Dave Harrell
Dexter Johnson
Ramona Kenady
Robin Kirkpatrick
Matt Markee
Art Obendorf
Dmitri Palmateer
Kate Richardson
Ken Rocco
Connie Seeley
Jean Straight
Christy Sullivan
Jonathan Thompson
Abby Tibbs
Paul Warner
Angela Wilhelms
Peter Wong

Planning Team

SRG PARTNERSHIP, INC., Architects

Skip Stanaway, AIA

Jon Schleuning, FAIA

Greg Williams, AIA

Bonnie Bruce, IIDA

Jocelyn Bates, AIA

Kerry Phillips

Jennifer Gentry

CATENA CONSULTING ENGINEERS, Structural Engineering

Chris Thompson, P.E.

John McDonald, P.E.

SYSTEMS WEST ENGINEERS, Mechanical and Electrical Engineering

Greg Langdon, P.E.

Jeff Graper, P.E.

PETER MEIJER ARCHITECTS, Historic Resources

Peter Meijer

Katherine Fontaine

RIDER LEVETT BUCKNALL, Cost Estimators

Graham Roy

ENERGY STUDIES IN BUILDINGS LABORATORY, Energy Studies

GZ Charlie Brown

2.0 Master Plan Process

2.0 Master Plan Process

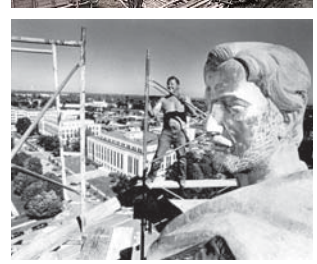
2.1 CAPITOL HISTORY

The Capitol history has played a major role in the development of the Capitol Master Plan. The heritage of the State's Capitol has evolved over the past 150 years and understanding the Capitol's history brings insight to the uniqueness of Oregon and its Capitol.

The present Oregon State Capitol is the third capitol building to house the Oregon state government. Two former capitol buildings were both destroyed by fire. The first Capitol burned in 1855 and the second Capitol was lost in 1935. As a result, many of the materials (marble, terracotta and terrazzo) on the exterior and interior are non-combustible on the 1938 building, however, it is not constructed for seismic resistance.

The Capitol, built during the height of art deco era, is the only Art Deco style state capitol in the country. New York architects Trowbridge & Livingston, in association with Francis Keally, conceived the current structure's art deco design. The Oregon State Capitol was placed on the National Register of Historic Places in 1988 because of its prominence and unique architecture.

The Public Works Administration, a branch of the U.S. government, partially financed construction of the Oregon State Capitol during the Great Depression in 1938. The building was erected at a cost of $2.5 million for the central portion of the building, which includes a 166 feet high (51 m) Rotunda. The Capitol Wings were added in 1977 at a cost of $12.5 million. The grounds surrounding the Capitol contain artwork, fountains, and flora native to the state. More specific historical detail can be found in the Historic Elements Section 3.2.



The Capitol is owned by and houses the State Legislature, and the offices of the Governor, Secretary of State, and Treasurer in the original 1938 portion of the building. The Capitol Wings house legislative offices, hearing rooms, support services, a first floor Galleria and underground parking. The Senate and House Chambers along with the hearing rooms provide Oregonians an opportunity to view state government at work and participate in legislative decision-making.

In the late 1990's, a series of energy and safety issues were identified in the Oregon State Capitol Wings. A project to address these issues was approved by the Legislative Assembly in 2001; however, a downturn in the economy prompted a decision to reduce the scope of the work, and as a result, renovations in 2002 were limited to Hearing Rooms and the Galleria areas.

The 2007 Legislature approved funding for the remainder of the Wing's restoration work. After an initial plan for replacing just the piping, wiring and ceiling in the Wings was developed, it was determined that it would be most cost effective to address additional areas of concern as part of the same project. Work on the Capitol Wings Restoration Project began in September 2007 and was completed prior to the 2009 legislative session. In addition to its recommendation for the Wings Restoration Project, the Legislature also recommended development of a comprehensive plan for future Capitol renovations. The Capitol Master Plan Development Project began in 2008. Although master plans are typically established prior to major renovation work, the Restoration Project was begun in advance of the master plan due to the urgent nature of the concerns it addressed in the 1977 addition.

The Oregon State Capitol is known throughout Oregon as the "peoples place," the symbolic center of state government. It also is a working office building serving as the center of legislative activity. The Capitol's design is unique from traditional state capitols with its modern lines, simplicity, dome design, and integration of daylight into the Senate and House Chambers. The Capitol is distinctive, different and stands apart from other state capitols, as Oregon stands apart from other states.

2.2 RESEARCH & ANALYSIS

The first step of the Capitol Master Plan development was to research and review all past drawings, reports, documentation, historic photographs, and writings about the Capitol over the past 70 years. This was crucial to fully understand the construction, building systems, infrastructure, materials and finishes of the original 1938 building, 1977 addition, and other improvements that have occurred to the building over the last 70 years. These documents were obtained from many sources including State Capitol Legislative Administration, State Archives, Oregon Historical Society, City of Salem, and the University of Oregon Library.

Following analysis of the documentation, field verification of the construction methods, materials, and conditions took place. This included review of the current condition of the stone, windows/doors, roofing, and site elements on the exterior. The interior architectural materials condition, ADA and universal access, fire and life safety, seismic strength, building mechanical, electrical, and energy performance was also verified and documented. The findings of the Capitol research and analysis are outlined in Section 5.0 – Building Assessment and have influenced the Master Plan direction, scope of work, and conceptual design recommendations.

2.3 WORKSHOPS & PUBLIC OUTREACH

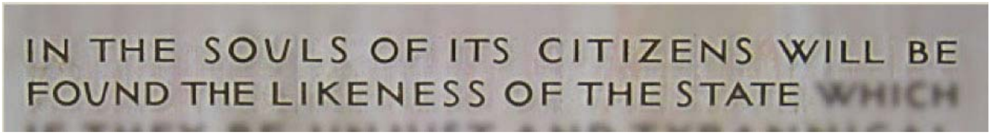
The Master Plan process and approach were based around a series of Master Planning workshops held at the Capitol that involved a wide range of participants. The workshops were key events in the development of the plan and provided the opportunity for many to contribute insight, input, and involvement in setting the future direction of the Capitol. Each workshop allowed involvement from legislators and their staff, legislative agencies, offices, and other Capitol residents. Those with particular interests including the Capitol Foundation, Oregon Disabilities Commission, State Historic Preservation Office, State Department of Administrative Services, City of Salem, Marion County, and local neighborhood associations also participated. Several workshops reached statewide audiences with public television access and allowed for input from all Oregonians over the Capitol Master Plan Web Site that was established at the beginning of the project.

Each workshop had a different focus and the workshops continued throughout the planning process. The first workshop set the long term vision and project goals for the Capitol. Following workshops included reviewing the existing condition findings, finalizing the space needs, reviewing the conceptual design options for the Capitol expansion, and review of the Master Plan refinement and completion. An Eco-Charette workshop was also held to discuss and identify opportunities on how sustainability could be enhanced in the renovation of the Capitol. Many sustainable strategies were discussed, including integrated design, use patterns, comfort criteria, and climate impact upon the building. The discussion from the Eco-Charette led to establishing sustainability as a major goal for the Capitol renovation and had a major influence on the Master Plan Concept and design recommendations of the building systems.

There were four main groups that were continuously involved in the plan development, each with a specific responsibility and focus. The Governance Group set policy, approved planning principles, and set the planning direction of the Capitol. Legislative Administration provided the project leadership, management, and facilities leadership for the Capitol Master Plan. The Space Needs Workgroup was focused on developing and reviewing the building program for the departments in the Capitol, and the workshop participants provided input at each step of the master planning process. The agenda of each Governance Group meeting is included in section 7.2 of the Appendix.

A total of over 50 workshops, public open houses, planning or stakeholder meetings were held for input and development of the Capitol Master Plan. There was great interest and passion exhibited for the Capitol as Oregon's historic symbol and the center of government. As stated in one workshop, "The Capitol is the people's place" for all Oregonians.

2.4 VISION STATEMENT & GOALS



This engraving appears upon entering the Capitol in the Rotunda. Its message became a symbol in development of the vision and goals for the Capitol Master Plan. The Capitol should represent the culture, heritage, and the uniqueness of Oregon and exhibit the values and spirit of all Oregonians.

At the first Capitol Master Plan workshop, participants were asked the following questions, and their response and the discussion helped develop the foundation of the Vision Statement. What makes Oregon unique? How would you describe Oregon to a visitor? What values are important to Oregonians? What do Oregonians think of the Capitol? What is unique about the Capitol? What is your favorite space/element of the Capitol and the grounds? What is sacred and what is not?

The following comments were offered in response:

» Oregonians are trail blazers. People come here to change their lives and build a new life.
» Managed growth is important to Oregon.
» Nature is a predominant part of what the State is.
» Oregonians have an independent streak. They love to be the first and only.
» Oregon is friendly, inviting, open and participatory.
» The shell of the Capitol will last for hundreds of years. The systems within it have their own life cycles.
» The Rotunda with the murals, the seal in the floor, and the Chambers are sacred.
» It's the building with the trophy on top.
» In ten years, people should say that the Capitol is:
    » The people's building
    » Welcoming to all
    » Permanent
    » Inspiring
    » Beautiful but not ostentatious
    » A model of sustainability

VISION STATEMENT FOR THE CAPITOL MASTER PLAN:

Following the Renovation:

"The Oregon State Capitol is a working symbol of State government that embodies the unique character, spirit, and heritage of Oregon. The Capitol is inviting, accessible, and safe, while being a symbol of environmental sustainability with long term flexibility for growth and change."

VISION STATEMENT THEMES

Working Symbol of State Government

- » Active and efficient office building
- » Adaptable for the future
- » Seat of state government

Unique Character, Spirit, and Heritage of Oregon

- » Pioneers – "trail blazers"
- » Respect for the environment
- » Diverse – people, culture, landscape, resources, and climate
- » Active citizen participation
- » Enhance and preserve historic elements

Inviting, accessible and safe

- » Open to Oregonians and visitors
- » ADA compliant for universal access
- » Upgrades to life safety and seismic elements

Symbol of Environmental Sustainability

- » Reflecting Oregon values
- » National and state example

CAPITOL MASTER PLAN GOALS

Following are specific goals to be accomplished in the Capitol Master Plan:

❶ Identify and prioritize immediate and long term needs and improvements for the Capitol building and grounds, and develop a phased implementation plan creating long term value.

❷ Strengthen the Capitol as an efficient working office building and efficient center of state government.

❸ Enhance the Capitol as an Oregon symbol – "The People's Place."

❹ Ensure the Capitol's longevity through seismic strengthening, code upgrades, and infrastructure improvements, while restoring and preserving the historic elements of the Capitol and grounds.

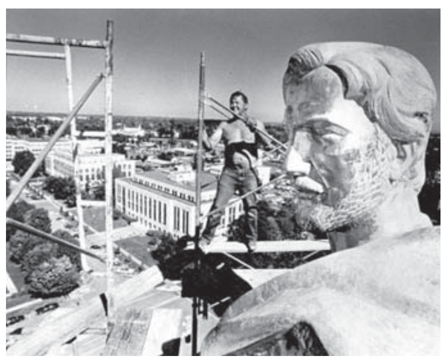
❺ Improve ADA accessibility, universal access and wayfinding within the Capitol and grounds for all patrons.

❻ Establish and implement a strategy to become the most environmentally sustainable Capitol in the United States.

An Eco-Charrette was held to discuss and identify how sustainability could be embraced in the renovation and upgrade strategies for the Master Plan. There was consensus that the Oregon State Capitol should set the example for the rest of the state, keeping Oregon in the forefront of environmentally responsible building design and solutions.

IMAGES

HISTORY



CONTEXT

WORKSHOPS

3.0 Building Program

3.0 Building Program

The Master Plan is planning for the next 20 to 30 years by providing program flexibility to accommodate change and growth. The Building Program component for the Concept Master Plan examined the existing capacity and utilization of the entire Capitol and identified current and projected space needs for the next 10 – 15 years. Programming beyond 15 years cannot be reasonably determined. Projections included both the actual space needs (assignable square footage) and the full time occupants (people requiring work stations). Of significant interest is the different intensity of use between the legislative session and the interim period between sessions. An historic perspective over the last five biennium sessions indicated that the average length of a legislative session is 6 - 7 months commencing in January on the odd calendar years, though the impacts of possible annual sessions were also discussed. Current conditions indicate that the building operates under maximum occupancy approximately 30% of the time and is in a considerably reduced operational mode 70% of the time. One objective of the programming phase was to quantify the differences between these conditions and the impact on building capacity, energy consumption, and similar items.

The Building Program was initiated with a series of on-site interviews with the 28 user groups currently occupying the Capitol. Each group's current spaces were inventoried and the existing square footage documented. A designated representative from each group forecasted the group's growth needs over the next 5-10 years. The information focused on existing and projected space and staffing requirements both during the legislative session and the interim period between sessions. Program data sheets were prepared for each group and were reviewed and edited by their representatives. Individual data sheets were summarized into a single spreadsheet indicating space and staff needs during and between legislative sessions for all user groups within the Capitol.

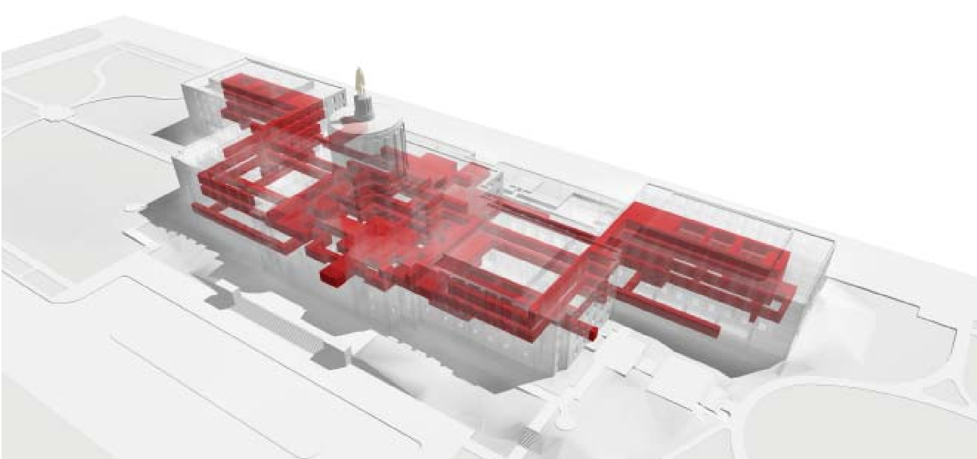


DIAGRAM INDICATING CURRENT CIRCULATION - 50% DEVOTED TO CIRCULATION AND PUBLIC SPACE

Based on maintaining a "working" Capitol, the program functions were prioritized into three categories:

- **'Dedicated Functions'** -- areas and groups in the building that are critical to the function of the Legislature. (Examples include Senate and House members office space, the Chambers, the Governor's ceremonial office, and similar functions.)
- **'Essential Functions'** -- areas and groups in the building which are required to support the 'Dedicated Functions'. (Examples include Legislative Counsel, Committee Services, Legislative Administration, and similar functions.)
- **'Other Functions'** -- areas and groups which could be re-located outside the Capitol building, if space limitations became an issue. (Examples include spaces for the Executive Branch, the Capitol Press, and similar functions.)

The initial program identified 174,250 net square feet within the existing 1938 Capitol and 1977 Capitol Wings addition. This square footage includes areas designated for specific functions and does not include unassigned spaces such as corridors, toilet facilities, mechanical spaces, wall thicknesses, and similar spaces. Since the building is fully occupied and the majority of corridors and their locations are historically designated, this net square footage number established the capacity, or baseline condition, for the Capitol.

For future legislative sessions, the Building Program projects growth needs of 19,200 square feet above the 174,250 square foot building capacity. To meet these needs three strategies were identified:

1. Relocating 'Other Functions' outside the existing building; thereby reducing additional or added space requirements to 10,300 square feet;
2. Constructing a one story infill of the existing courtyards to successfully accommodate the new hearing rooms with clear-span, column-free space; and
3. Constructing new space under the North Entry plaza to meet the remaining space requirements.

The comparison of building usage during the legislative session and during the interim period between sessions focused on both staffing needs and space requirements. Excluding visitors and individuals/groups providing testimony or lobbying functions, the total staff/occupancy is approximately 689 during the legislative session and 456 during the interim, (a 34% reduction). As expected, the increased staff required during the sessions focuses on legislative activities and includes legislators, their staff, Legislative Counsel, Committee Services, Capitol Club, Capitol Press, and others. In addition, many other assembly spaces are significantly under utilized, including the House and Senate Chambers during the interim, public hearing and caucus rooms, the café and similar support areas. This condition results in considerable inefficiencies in space utilization and in energy consumption since the unoccupied spaces continue to be heated, cooled and lighted year-round.

Based on the programming analysis and existing building deficiencies, the Governance Group established the following direction for Master Plan development:

» Provide additional hearing rooms and additional office/support space as identified in the Program Analysis.

» Concentrate public spaces, (including hearing rooms and major public spaces) on lower levels for easy access and public safety.

» Meet ADA access requirements with special focus on a universal accessible main North Entry.

» Provide new space as required by one-level infill of the existing courtyards and/or limited expansion under the North Entry reconstruction.

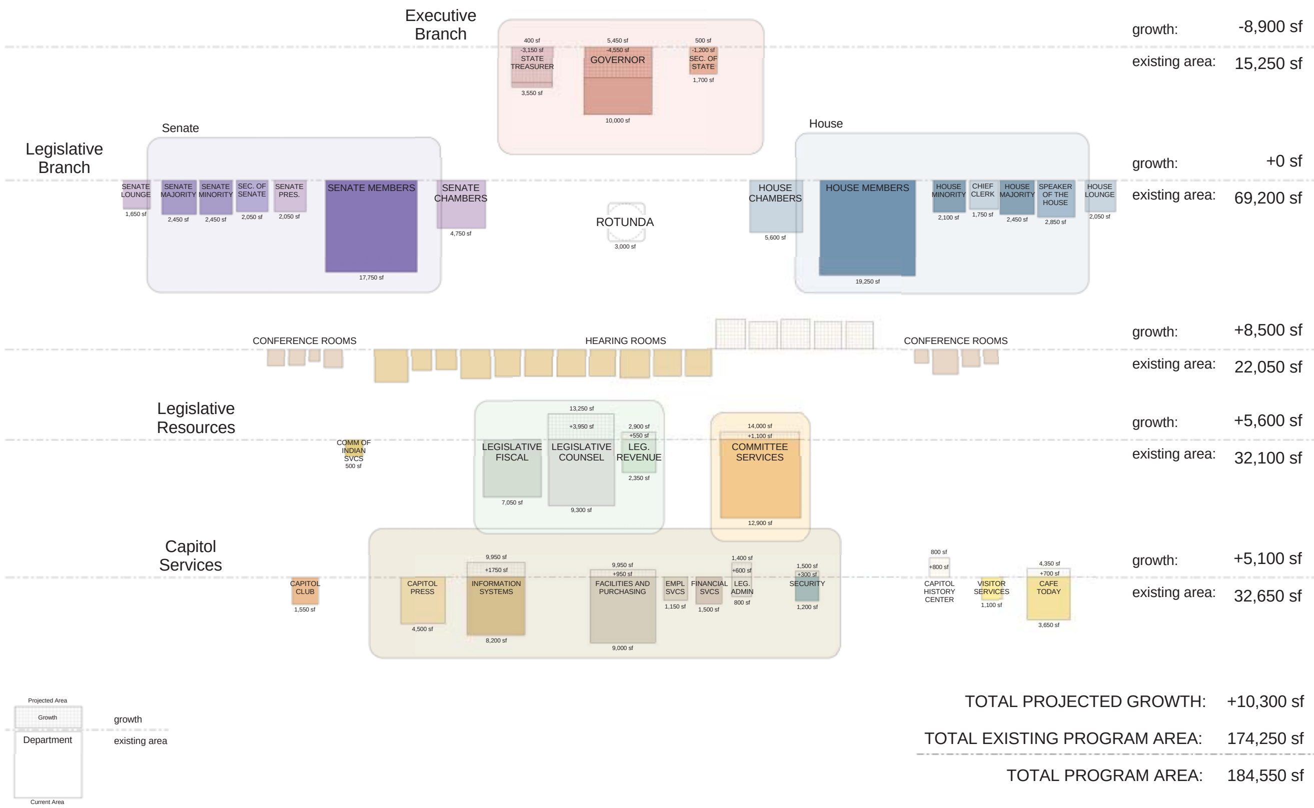
» Retain the historic Governor's office and immediate staff suite on Level 2 and relocate other remaining staff outside the Capitol.

» Provide shared ceremonial meeting space for the Secretary of State and State Treasurer within the Capitol and relocate their offices to locations outside the building.

» Consider opportunities to minimize building access and energy use in areas unused or under utilized during the interim periods between legislative sessions.

A Capitol History Center could be located in the vicinity of the historic Treasurer's vault. Co-locating the Legislative Library with the History Center could provide a monitored location for original artifacts on the first floor near the Rotunda. The entire Capitol could also be considered a history center. Interactive kiosks could be located throughout the building to provide information about Capitol history, Oregon history, and current legislative events. Accessibility for children is important in the History Center as well as through the kiosks.

BUILDING PROGRAM - SPACE

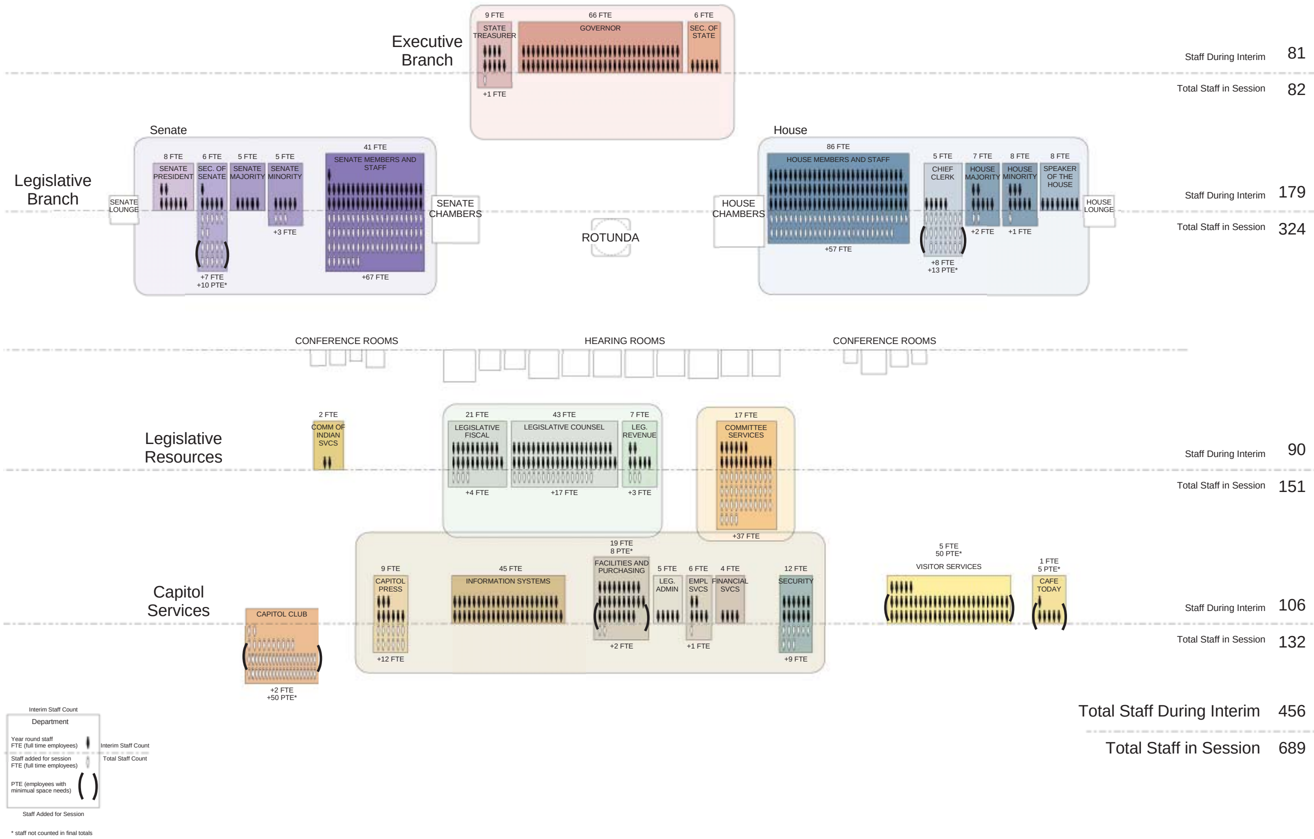


BUILDING PROGRAM - SPACE

	Existing Areas (Net Square Feet)	Projected Growth (Net Square Feet)		Total (Net Square Feet)	Comments
Dedicated Functions					
Governor - Ceremonial / Historic	5,450	-		**5,450**	historic suite on Level 2
Secretary of State - Ceremonial	500	-		**500**	incorporate w/shared conference
Treasurer - Ceremonial Use	400	-		**400**	
Senate Members	17,750	-		**17,750**	
Senate Chambers	4,750	-		**4,750**	
Senate President	2,050	-		**2,050**	
Secretary of Senate	2,050	-		**2,050**	
Senate Minority	2,450	-		**2,450**	
Senate Majority	2,450	-		**2,450**	
House Members	19,250	-		**19,250**	
House Chambers	5,600	-		**5,600**	
Speaker of the House	2,850	-		**2,850**	
Chief Clerk	1,750	-		**1,750**	
House Minority	2,100	-		**2,100**	
House Majority	2,450	-		**2,450**	
Rotunda	3,000	-		**3,000**	
SUB-TOTAL	74,850	-		**74,850**	
Essential Functions					
Legislative Counsel	9,300	3,950	Staff increase	**13,250**	
Legislative Fiscal	7,050	-		**7,050**	
Legislative Revenue	2,350	550	Staff increase	**2,900**	
Committee Services	12,900	1,100	Staff increase	**14,000**	incl. 13,500 (work area) & 500 (legislative library)
Commission on Indian Services	500	-		**500**	
Security	1,200	300	Reception, interview room, etc.	**1,500**	
Visitor Services	1,100	-		**1,100**	
Legislative Administration	800	600	Conference, work area, etc.	**1,400**	
Information Systems	8,200	1,750	Staff increase	**9,950**	incl. 6,600 (work area), 2,650 (media area) & 700 (computer room)
Facilities and Purchasing	9,000	950	Staff increase, storage	**9,950**	incl. 4,950 (Purchasing) & 5,000 (Facilities)
Employee Services	1,150	-		**1,150**	
Financial Services	1,500	-		**1,500**	
Capitol Club	1,550	-		**1,550**	
Hearing/Meeting/Caucus Rooms	22,050	8,500	new hearing rooms	**30,550**	
Café Today	3,650	700	expanded kitchen	**4,350**	
Capitol History Center	-	800		**800**	
SUB-TOTAL	82,300	19,200		**101,500**	
Other Functions					
Governor Non-Ceremonial	4,550	(4,550)	leaves Capitol building	-	
Secretary of State Non-Ceremonial	1,200	(1,200)	leaves Capitol building	-	
Treasurer Non-Ceremonial	3,150	(3,150)	leaves Capitol building	-	
Senate Lounge	1,650	-		**1,650**	
House Lounge	2,050	-		**2,050**	
Capitol Press	4,500	-		**4,500**	incl. 1,000 (press room) & 3,500 (offices)
SUB-TOTAL	17,100	(8,900)		**8,200**	

TOTAL EXISTING AREAS (NET SF)	**174,250**		
TOTAL PROJECTED GROWTH (NET SF)		**10,300**	
TOTAL (NET SF)			**184,550**

BUILDING PROGRAM - PEOPLE



BUILDING PROGRAM - PEOPLE

	Capitol Staffing	
	Session	Interim
Dedicated Functions		
Governor - Ceremonial Use	66	66
Secretary of State - Ceremonial Use	10	9
Treasurer - Ceremonial Use	6	6
Senate Members	108	41
Senate Chambers	-	-
Senate President	8	8
Secretary of Senate	13	6
	10-15 people in session that need space for breaks/lunches and space for their computer	
Senate Minority	8	5
Senate Majority	5	5
House Members	143	86
House Chambers	-	-
Speaker of the House	8	8
Chief Clerk	13	5
	13 people in session who need space but not a "workstation"	
House Minority	9	8
House Majority	9	7
Rotunda	-	-
SUB-TOTAL	406	260
Essential Functions		
Legislative Counsel	60	43
Legislative Fiscal	25	21
Legislative Revenue	10	7
Committee Services	54	17
Commission on Indian Services	2	2
Security	21	12
Visitor Services	5	5
	50 volunteers, need space but not office or cubicle	50 volunteers, need space but not office or cubicle
Legislative Administration	5	5
Information Systems	45	45
Facilities and Purchasing	21	19
	8 custodians, need space but not office or cubicle	8 custodians, need space but not office or cubicle
Employee Services	7	6
Financial Services	4	4
Capitol Club	2	-
	10 small workstations, +40 people in and out	
Hearing/Meeting/Caucus Rooms	-	-
Café Today	1	1
	4-5 people who work in Café but do not use a "workstation"	4-5 people who work in Café but do not use a "workstation"
Capitol History Center	-	-
SUB-TOTAL	262	187
Other Functions		
Governor Non-Ceremonial Use	-	-
Secretary of State Non-Ceremonial Use	-	-
Treasurer Non-Ceremonial Use	-	-
Senate Lounge	-	-
House Lounge	-	-
Capitol Press	21	9
SUB-TOTAL	21	9
TOTAL (does not include staff with minimal space needs)	**689**	**456**

4.0 Master Plan Concept

4.0 Master Plan Concept

4.1 CONTEXT

"In the souls of its citizens will be found the likeness of the State…"

These words, engraved in the Capitol Rotunda stone, provide inspiration for the Capitol Master Plan process and goals. The Vision Statement includes references to a Capitol "embodying the unique character, spirit, and heritage of Oregon," "creating long term flexibility for growth and change," being "inviting, accessible, and safe," a "symbol of environmental sustainability," and a "working symbol of State Government." These underlying principles are key design drivers in developing the overall master plan.

4.2 ISSUES, OPTIONS, & DIRECTION

The Master Plan Concept responds directly to the conditions and needs identified in the Building Program and Existing Building Assessment investigations.

The key issue identified in the Existing Building Assessment is the requirement for seismic upgrade for both the 1938 and 1977 structures. The magnitude, logistics, and cost of resolving this issue alone greatly influence the scope and direction of the planning process and severely limit the ability for small scale, incremental renovations. Additional issues include life safety deficiencies (especially the two public hearing rooms located on the third floor where dead-end corridors and confusing exit patterns hinder easy egress under emergency conditions) and the magnitude of the building infrastructure replacement. On the positive side, the resolution of these issues often provides further opportunities to upgrade the existing facility. For example, the recommendation to implement base isolation not only protects the historic building and its occupants but also provides enhanced capabilities for natural ventilation and reduced cooling loads; and the extensive reconstruction at the building foundations allow increased floor-to-floor heights, reduced interior columns, and the introduction of natural light at perimeter locations. In addition, the magnitude of infrastructure replacement provides opportunities for more flexible office arrangements, improved adjacencies, and increased building efficiencies; and compliance with ADA and universal access, especially at the North Entry, offer opportunities to increase building areas below grade.

The key issue identified in the Building Program assessment is the need for 19,200 additional square feet, including 5 -6 additional hearing rooms (8,500 square feet) during the legislative sessions and a modest expansion of additional office and support areas (10,300 square feet). Numerous design options were explored, including expansion of the Capitol Wings, adding new Wings, expanding areas below grade, adding a new building adjacent to the Capitol, and infilling the interior courtyards (see pages 4-11 & 4-12). Most of these options were deferred to a later date since the Governance Group determined that maintenance of the existing Capitol footprint was essential. The requirement for hearing rooms is major challenge and is exacerbated by the need to relocate the two hearing rooms on the third floor to more accessible locations. Providing these spaces within the existing building is unrealistic since they require a clear-span, column-free area; a condition not easily facilitated within the existing, column-dense structure. New space must be found, and a one-story infill of the existing courtyards provides an optimum, centrally-located solution. The pressure for additional office/support space is accommodated within the existing building envelope with the relocation of the Governor's support staff, the Secretary of State, the State Treasurer, and their support staffs, and building areas reclaimed from under-utilization and/or obsolete mechanical space freed up through a modest new construction under the North Entry. As a result, the Governance Group established the following Master Plan directions:

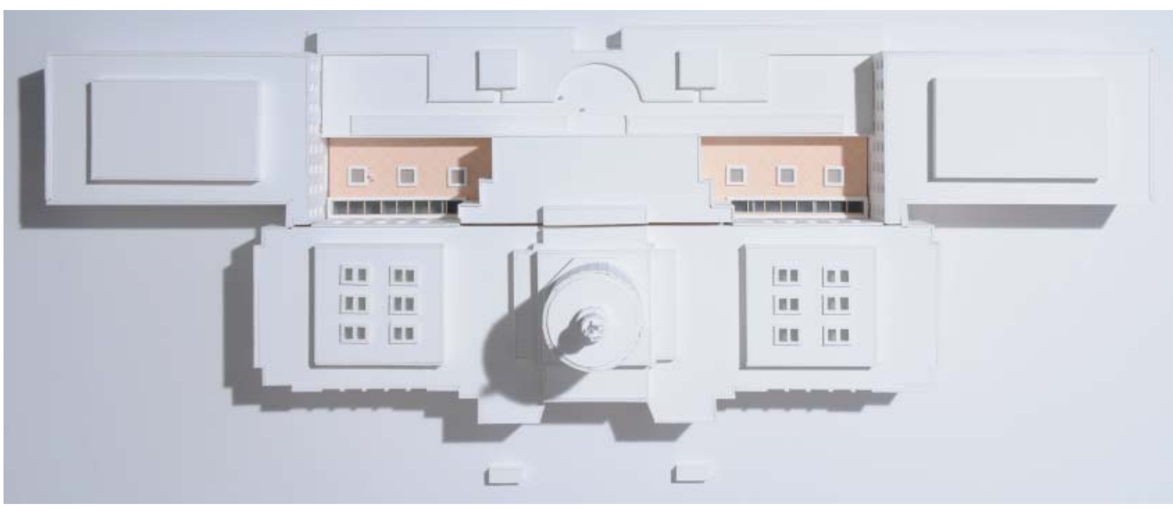
» Optimize the existing building and maintain its role as the "working center" for the State's legislative process.

» Develop the entire building as a single entity (1938 & 1977 portions) and retain its overall appearance, footprint, and historic character.

» Provide additional square footage (as required) with single-story infill at the existing courtyards (to accommodate new, clear-span space) and below-grade expansion under the existing north entry area (to consolidate new mechanical/support space).

» Limit high levels of public access (hearing rooms, public gathering areas, etc.) to the lower floors and improve overall public access and safety.

» Develop the building as a symbol of environmental sustainability and practice.



4.3 RECOMMENDED MASTER PLAN CONCEPT

The Capitol Master Plan preserves the historic presence of the existing facility while realigning building functions into a logical hierarchy of public and private spaces. The central Rotunda remains the Capitol's grand, defining space, and the original monumental staircases on each side lead to the formal second floor where the historic House and Senate Chambers flank the Governor's Suite, renovated in 2009. The greatest change occurs on the first floor and on the enhanced Concourse Level, where public-focused activities such as hearing rooms, galleria/display areas, the café, and other legislative/support functions are consolidated, while the upper floors remain designated for less public-focused office and support functions.

CONCOURSE LEVEL

The most distinctive feature of the Master Plan Concept is the expanded lower floor, renamed the Concourse Level. The Concourse Level provides enhanced public spaces and circulation, planned in concert with the existing hearing rooms and Galleria immediately above on the first floor. A pair of new open stairways and elevators within the Galleria encourages easy movement to the Concourse Level's six (6) new hearing rooms, centrally-located café, newly-aligned wide central corridor, and upgraded legislative offices and building support areas.

On the first floor, two courtyards flank the Galleria and provide new easily accessible, outdoor terraces adjacent to the existing hearing rooms. Previously on the lower level, these courtyards were dark and unused. Raised to the first floor, they provide newly found space underneath for the six hearing rooms at the Concourse Level. Skylights in the courtyards provide these hearing rooms with natural light.

The legislative support functions on the Concourse Level include Committee Services, Capitol Press Room, Information Services (Media), and Facility Services including Purchasing and Supply. Many of these functions, while heavily occupied during the legislative sessions, can convert to more dormant and less energy consumptive use during the interim periods. A by-product of the base isolation seismic upgrade allows increased floor-to-floor heights throughout, a reduced number of interior columns, and natural light into the office support areas along the north perimeter.

INTERIOR SECTION OF FIRST FLOOR GALLERIA

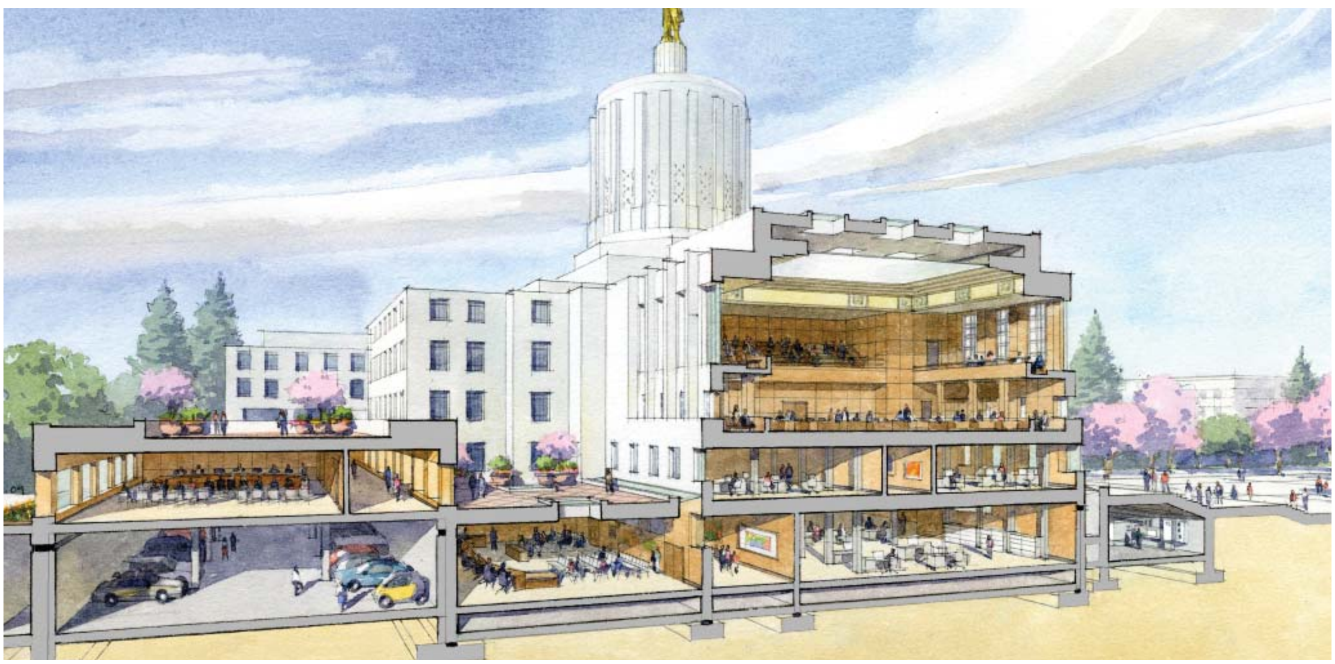
FIRST AND SECOND FLOORS

The first and second floors of the 1938 Capitol Building undergo substantial renovation and upgrading but retain their historic character and presence. On the first floor, office functions are relocated to provide more optimum adjacencies and layouts, and to offer greater public accessibility to significant historic features (the ceremonial offices now occupied by the Secretary of State and State Treasurer, and the historic Treasurer's vault).

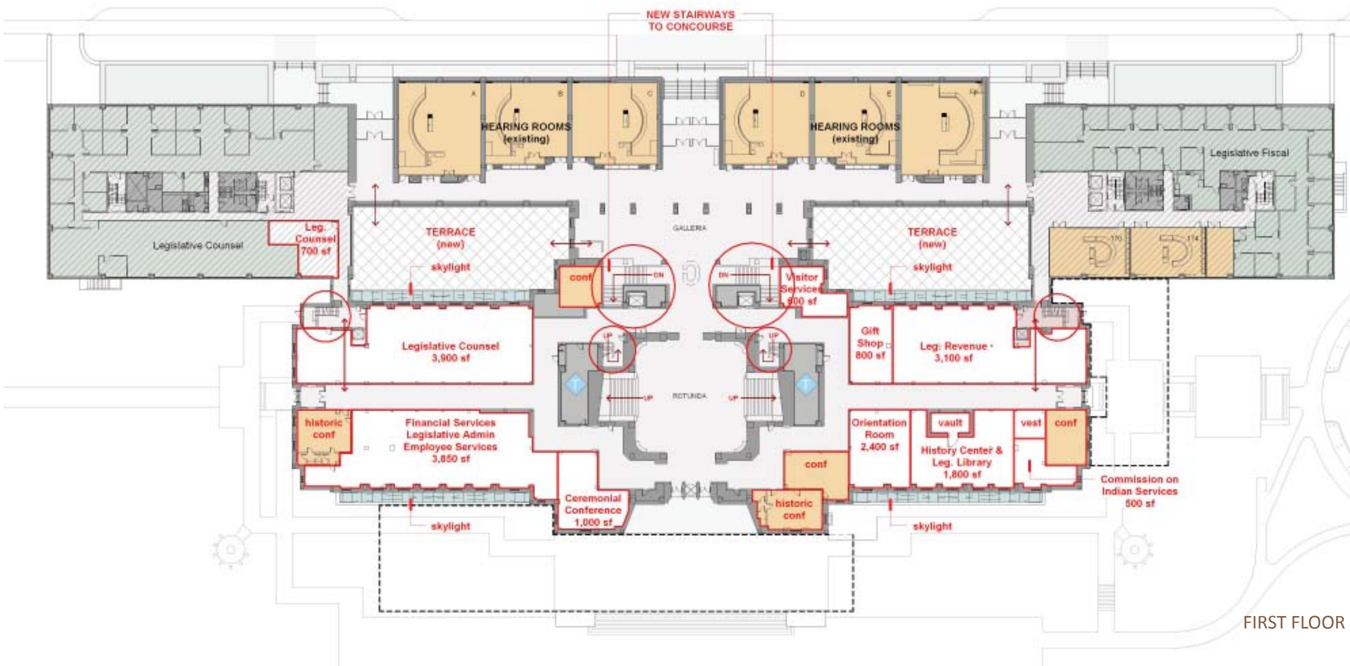
On the second level, the House and Senate Chambers and the Governor's Suite are renovated historically. The areas behind the Chambers on the upper floors are reserved for legislative functions. In all cases, more prominent integration of natural light and ventilation, predominant in the original design, will be incorporated.

THIRD AND FOURTH FLOORS

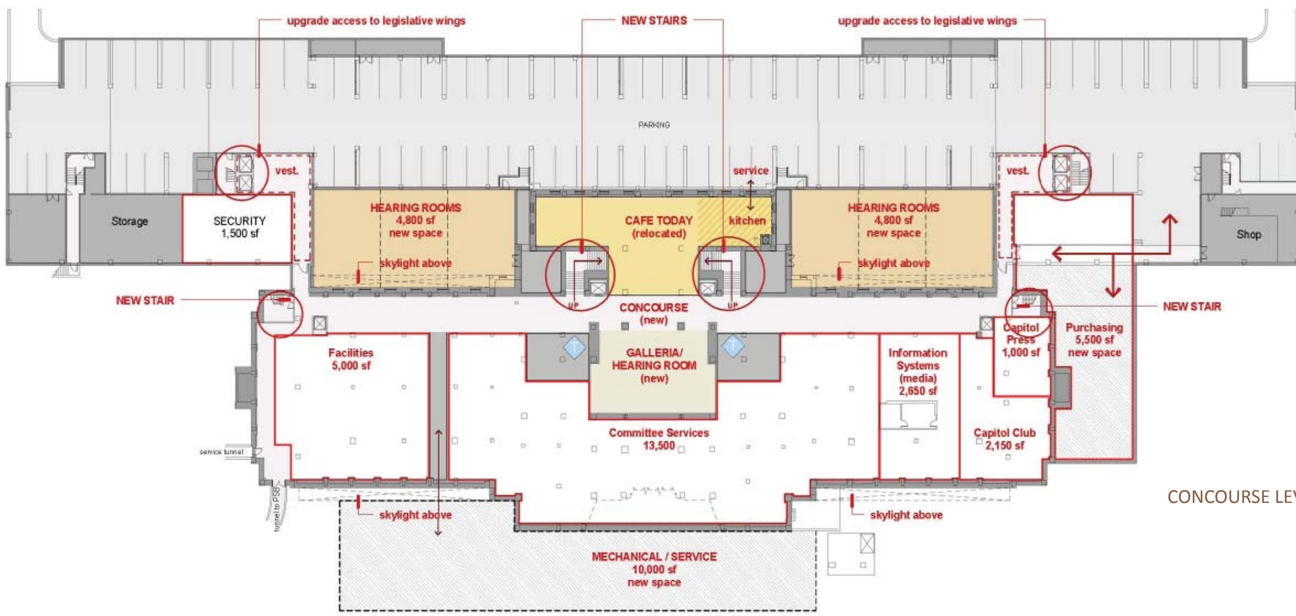
The third and fourth floors will be devoted to less publicly accessible administrative support spaces. This functional relocation will ensure natural light and views to most users who occupy the building twelve months of the year and reduce excess public traffic to areas that are more difficult to find and to egress in emergency conditions.



SECTION THROUGH CAPITOL SHOWING NEW CONCOURSE LEVEL AND ADDITIONAL HEARING ROOMS



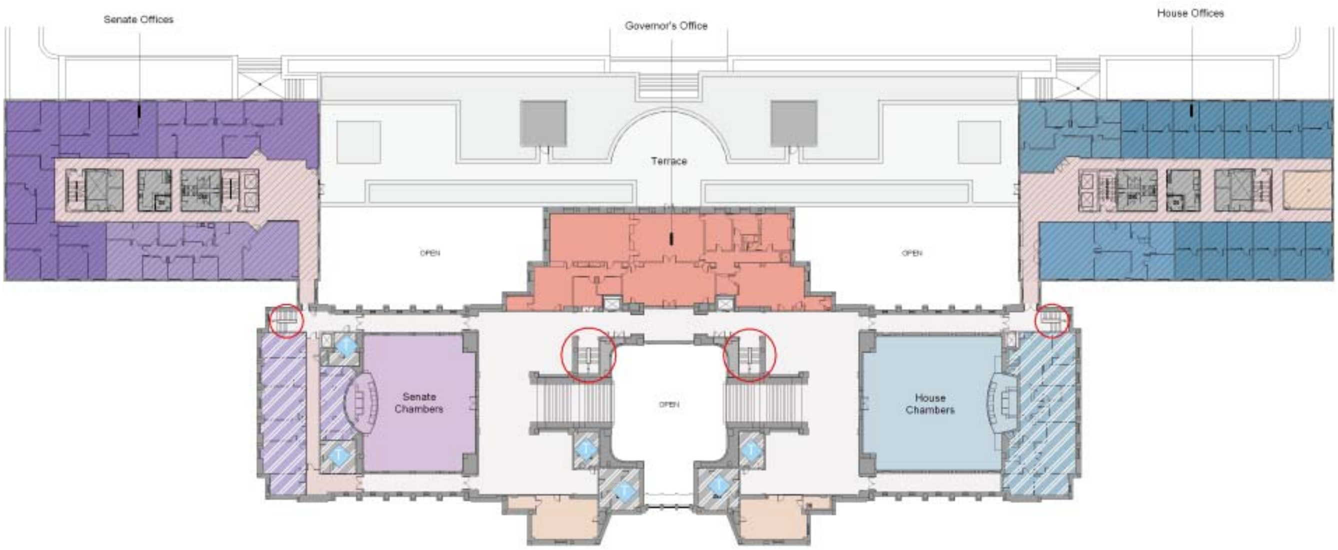
FIRST FLOOR



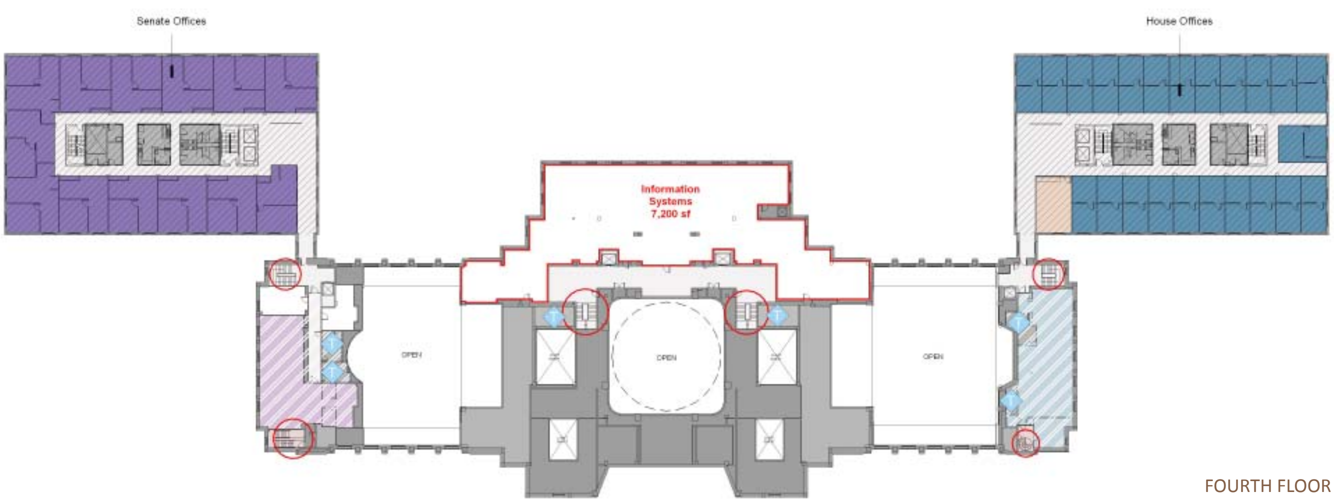
CONCOURSE LEVEL

MASTER PLAN CONCEPT FLOOR PLANS

THIRD FLOOR



SECOND FLOOR

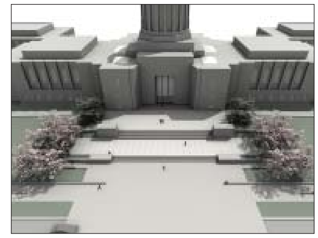


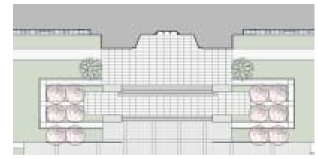
FOURTH FLOOR

MASTER PLAN CONCEPT FLOOR PLANS

EXTERIOR IMPROVEMENTS

Exterior improvements will incorporate the entire building perimeter (becaue of required excavation for the seismic upgrade) and re-design of the North Entry Plaza to comply with ADA and universal access requirements. The plaza immediately adjacent to the North Entry doors will be elevated to allow direct access into the building and two of the three revolving doors will be replaced with new, swinging, bronze doors.





NEW NORTH ENTRY STEPS AND SYMMETRICAL RAMPS

The newly re-designed North Entry Plaza will complement and reinforce the adjoining landscape of Capitol Mall blocks to the north. The front steps will accommodate the new grade changes and symmetrical ramps will be incorporated into the landscape. The parking/drop-off area immediately in front of the Capitol will be re-designed with an emphasized pedestrian connection across Court Street to the Mall blocks beyond.

Options to provide safe bus access for visitors must be explored. The current one-way street grid bordering the Capitol is not conducive to bus loading, unloading, and bus parking. For example, the doors on a bus open on the wrong side for safe unloading. Specific options still need to be studied, such as creating a bus loading/unloading area in the current landscape area on the south side of Court Street or turning Waverly Street NE into a restricted access street to accommodate bus loading/unloading and to improve security concerns to other adjacent State buildings.

Security methods to reduce the possibility of vehicle access to the front steps and main south entry are important to resolve. Options to be considered include the use of bollards, planters, or reinforcement of the entry area. Sensitivity to the Capitol's design, history and symmetry will have to be taken into consideration in designing for modern threats.

4.4 SUSTAINABILITY

One of the Master Plan Goals for the Oregon State Capitol is for it to become the most environmentally sustainable Capitol in the United States after the renovation. This goal can be accomplished through enhancement of the sustainable concepts from the original Capitol design.

"By bringing the Chambers to the outside walls we could use direct window lighting, letting in daylight and sunshine on the legislative deliberations and relieve the feeling, usual in such halls, of being shut in, as in a cellar."

Francis Keally, Capitol Architect 1938

The Capitol was designed in 1938 with sustainable features such as daylighting in the Senate and House Chambers, and natural ventilation through the corridor and Rotunda. The installation of the seismic base isolation system creates an opportunity to bring sustainable design concepts back to the Capitol as major design elements. Enhancing the natural ventilation concepts of the Senate and House Chambers, corridors, Rotunda, and all public areas can be achieved by creating "night flush," a natural air flow to cool the mass of the building at night, and a storage area for naturally cooled air to be used throughout the day when cooler air is needed. Findings from the planning team's daylighting studies, climatic data and the conceptual sustainable HVAC concept of each floor are included in the Appendix.

The Capitol Master Plan brings forth many sustainable design strategies. Within all areas of the Capitol, the integration of daylighting, natural ventilation, night flush tempering of the building mass, high efficiency mechanical systems, selection of sustainable building materials, and the use of low VOC materials will be incorporated into the design. Designing areas for recycling, the re-use and recycling of building materials, low flow fixtures, and the collection and use of rainwater for non-potable water in toilets and site irrigation will also be integrated into the design concept.

Other opportunities for sustainable elements include treatment of storm water on the site, addition of green roofs, and additional solar panels to demonstrate and educate the use of wind power as a viable energy source.

Utilizing the LEED scoring 2.2 NC developed by the US Green Building Council, with the renovation of the Capitol as recommended in this Master Plan study, the Capitol has the opportunity to achieve a LEED Platinum rating. A LEED scorecard demonstrating this opportunity is included following this section. When the renovation is complete a LEED Platinum rating could also be achieved for LEED EB.

When the Capitol is renovated, it will demonstrate environmental and energy efficient design and be a model of sustainable stewardship, representing the values of Oregonians.

Sustainable measures recommended for study and implementation follow. More detail can be found in the Appendix, section 7.5 Sustainability Diagrams and Reports.

Building Envelope Measures

- Add insulation to the currently uninsulated walls
- Improve the insulation value of the windows and doors
- Use a light color roof membrane when the building is reroofed

"Passive" Measures

- Natural ventilation during moderate weather
- "Night flush" mass cooling during hot weather by precooling building mass elements
- Additional photovoltaic arrays on the roof
- Solar hot water systems for preheating of domestic water or space heating
- Rainwater harvesting for use in toilets or landscape watering
- Natural daylighting through the reactivation of existing abandoned skylights and adding new skylights
- Ground source water wells for augmenting heating and cooling systems

Mechanical and Plumbing Measures

- Highly efficient mechanical systems, including new "chilled beams" technology
- Sophisticated controls
- Waterless urinals and automatic fixture controls
- Containment of pollutants like grease with effective traps

Electrical Measures

- Energy efficient lighting, both in fixtures and how spaces are lit
- Controls that include occupancy sensors, timers and daylight sensors where appropriate

Materials Measures

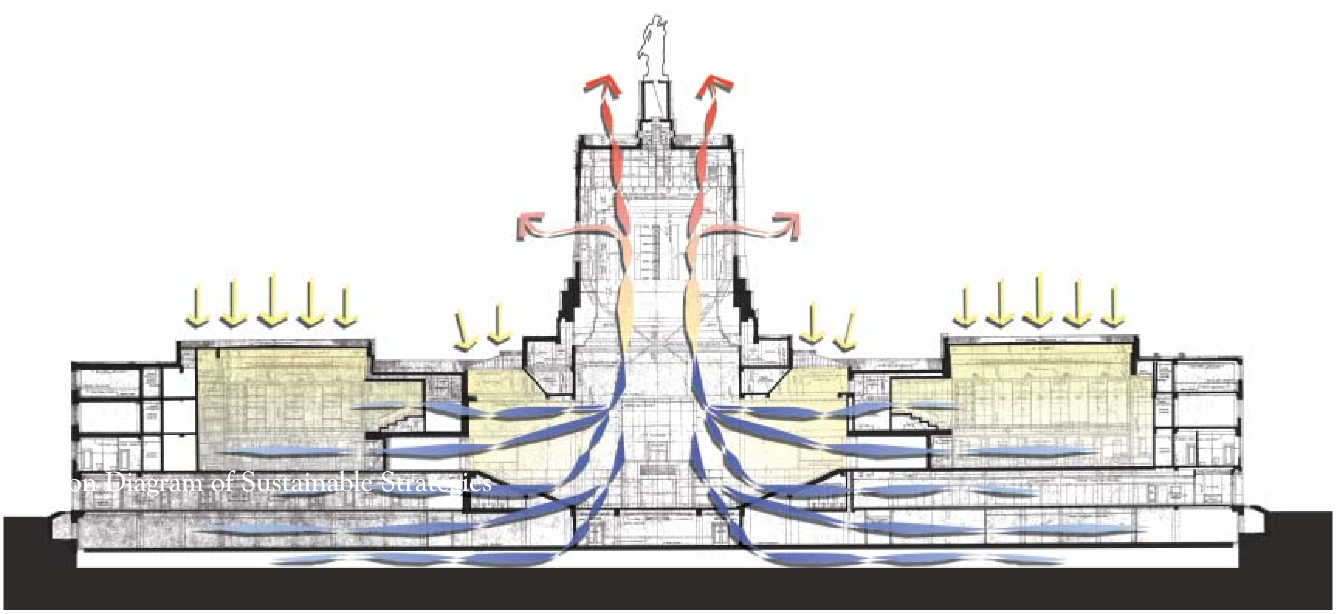
- Select low-emitting materials for improved indoor air quality
- Use locally-produced materials as much as possible
- Make recycling convenient and efficient for the building occupants

Natural Ventilation

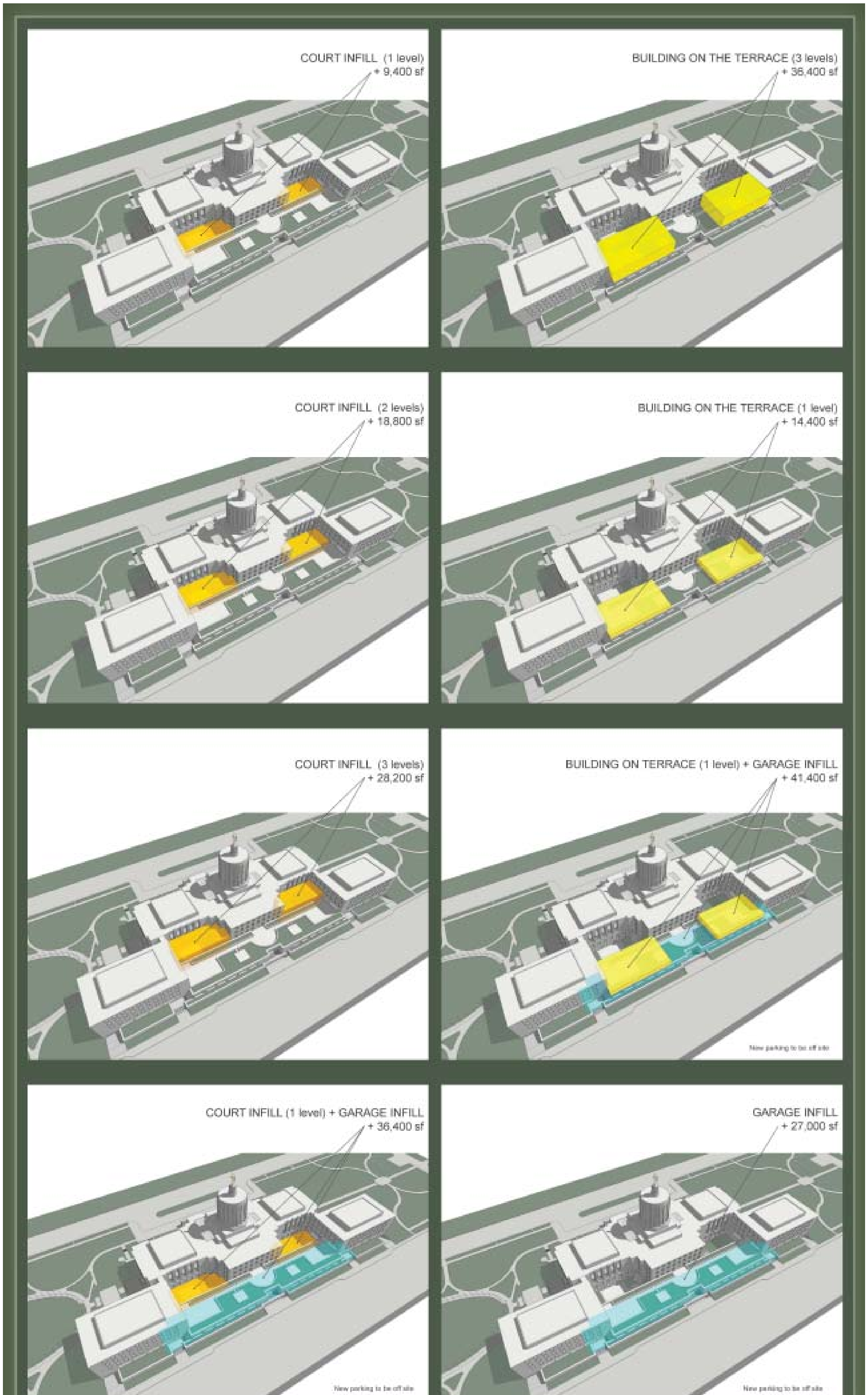
- Enhance stack effect in Rotunda
- Add natural ventilation in offices
- Improve natural ventilation in offices
- Cool building mass using night flush

Daylighting

- Enhance daylighting in Chambers
- Add daylighting in stairwells
- Add daylighting in offices

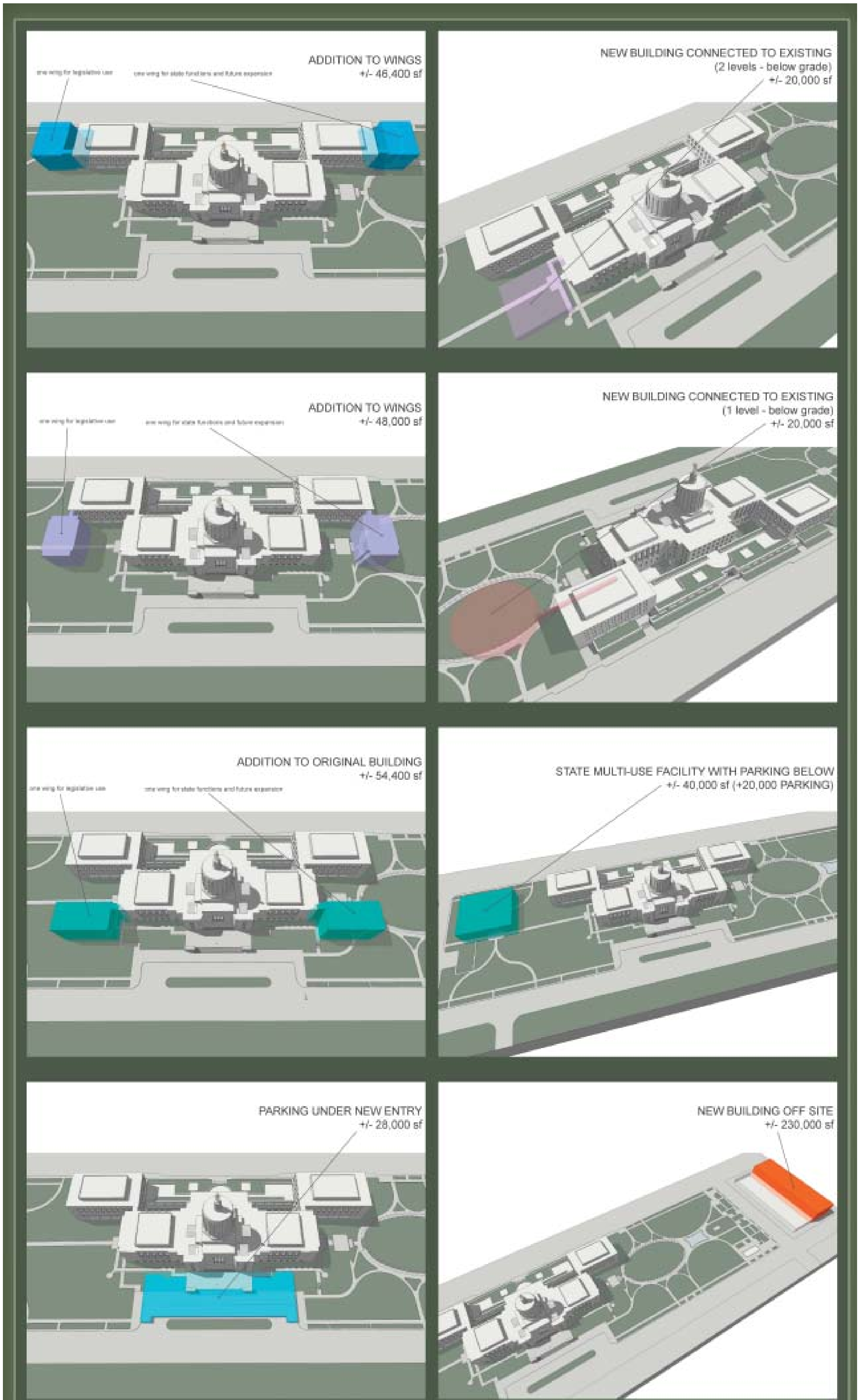


SECTION THROUGH CAPITOL INDICATING NATURAL VENTILATION AND DAYLIGHTING.

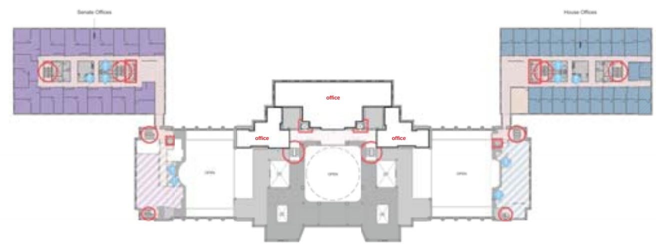


OPTIONS TO ACCOMMODATE GROWTH

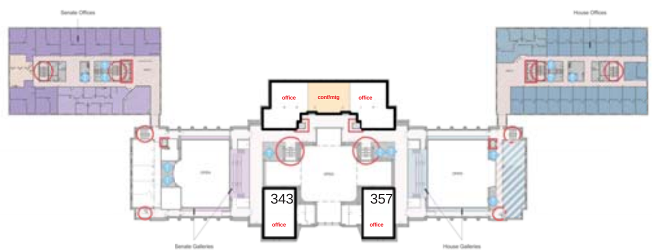
THE FOLLOWING PAGES SHOW SOME OF THE MULTIPLE DESIGN OPTIONS THAT WERE STUDIED TO SOLVE PROGRAM NEEDS, SPACE ORGANIZTION, LIFE SAFETY ISSUES AND ENERGY EFFICIENCY.



OPTIONS TO ACCOMMODATE GROWTH

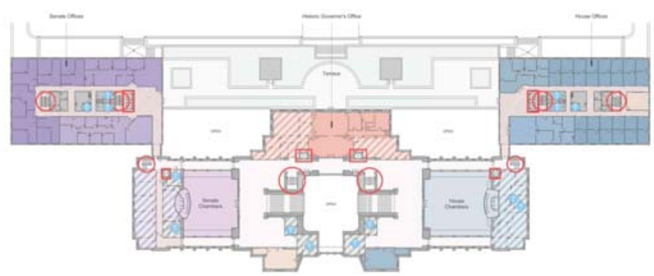


4

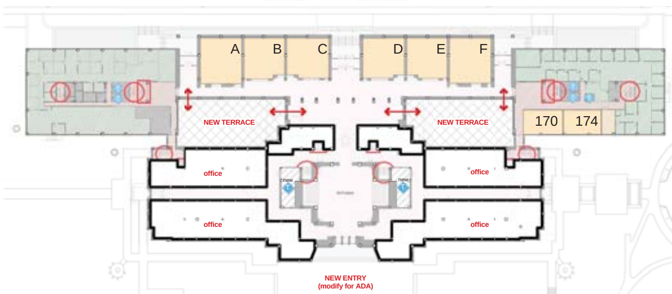


3

1 Meeting/Hearing Room
(existing hearing rooms 343 and 357 converted to offices)
Large conference room remains

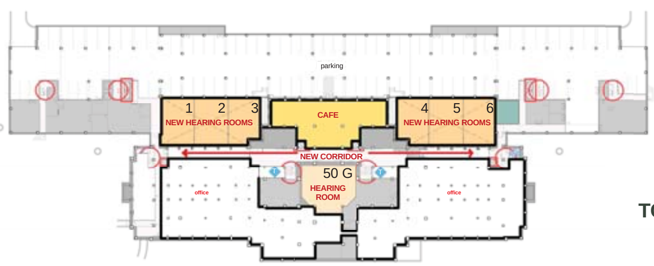


2



1

8 Hearing Rooms
(all existing)
2 new exterior terraces
(accessible to the public)



0

7 Hearing Rooms
(6 new, existing 50 G)
Relocated Cafe

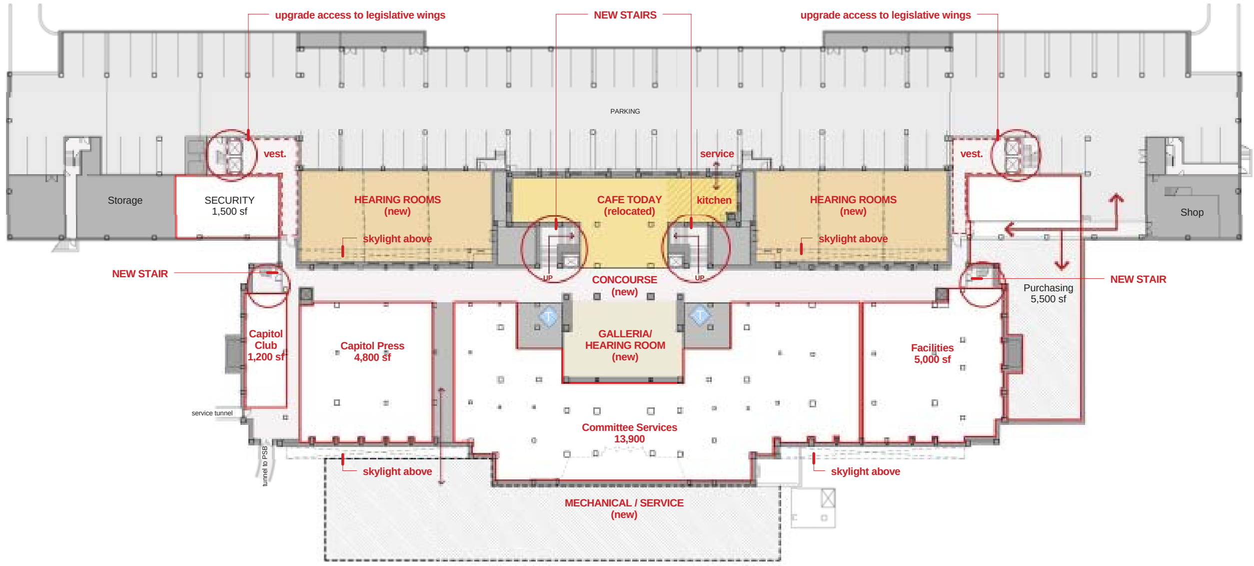
TOTAL: 16 Hearing Rooms
- 10-12,000 sf of office

COURTYARD INFILL

CONCEPT A1

Oregon State Capitol Master Plan

01.26.2009



	Actual SF	Program SF
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	13,900	13,500
Capitol Press	4,800	4,500
Security	1,500	1,500
Capitol Club	1,200	1,550
	31,900	30,550

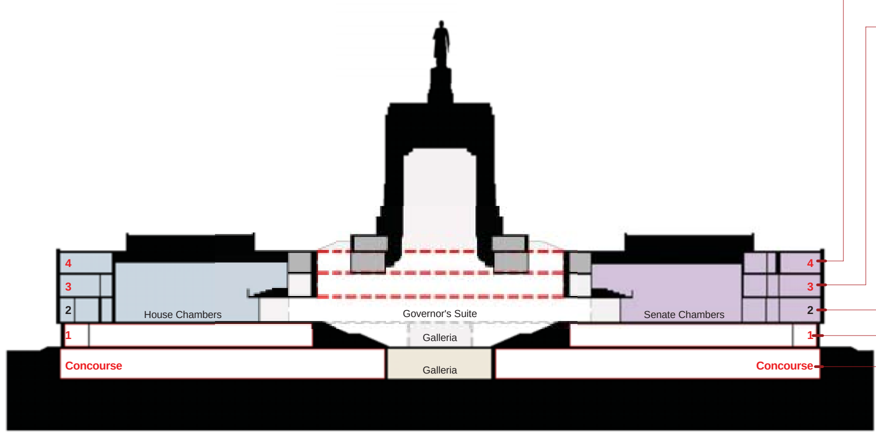
0 10 20 40 ft
N

Concourse level

option X
MASTER PLAN CONCEPT

Oregon State Capitol Master Plan

03.04.09



	Actual SF	Program SF
Information Systems	6,500	6,600
Computer Room	700	700
	7,200	7,300

	Actual SF	Program SF
Governor's Staff	4,800	4,450
Information Systems (Media)	3,800	2,650
	8,600	7,100

FULLY ASSIGNED

	Actual SF	Program SF
Legislative Counsel	4,600	4,550
Legislative Revenue	3,800	2,900
Secretary of State	1,700	1,750
State Treasurer	2,400	2,650
Legislative Administration	1,500	1,400
Employee Services	1,000	1,150
Financial Services	1,500	1,500
Commission on Indian Services	750	750
Visitor Services / Gift Shop / History Center	1,850	1,900
Committee Services Library	550	500
	19,650	19,050

	Actual SF	Program SF
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	13,900	13,500
Capitol Press	4,800	4,500
Capitol Club	1,200	1,550
	30,400	29,050
Total	65,850	62,500

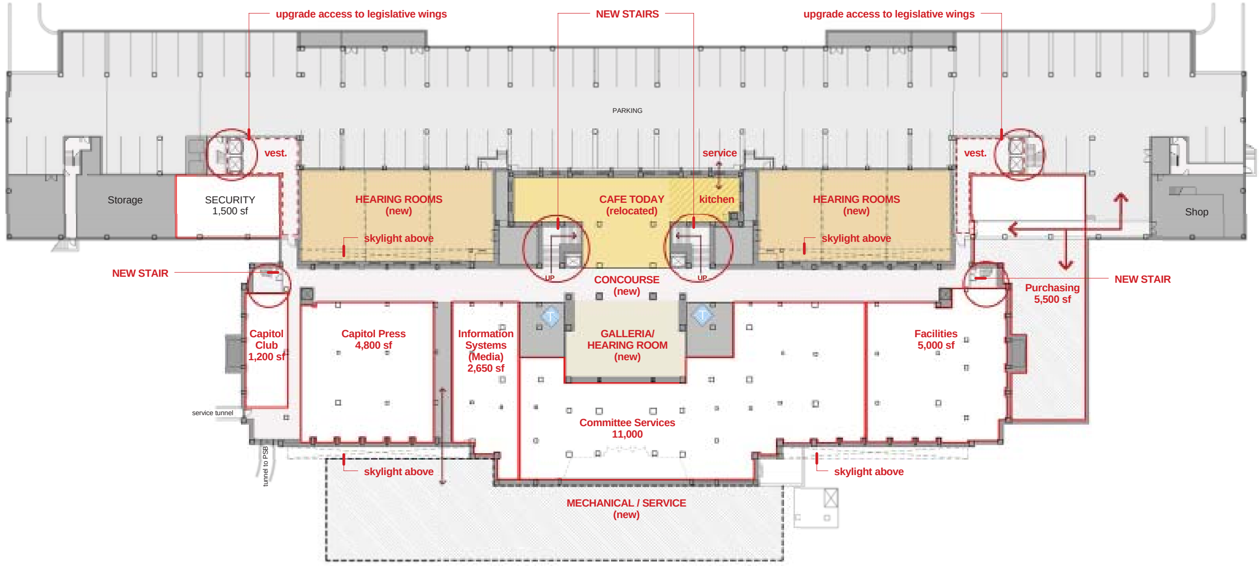
0 10 20 40 ft
N

SECTION DIAGRAM

option X
MASTER PLAN CONCEPT

Oregon State Capitol Master Plan

03.04.09



	Actual SF	Program SF
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	11,000	11,000
Information Sytems (Media)	2,650	2,650
Capitol Press	4,800	4,500
Security	1,500	1,500
Capitol Club	1,200	1,550
	31,650	30,700

0 10 20 40 ft
N

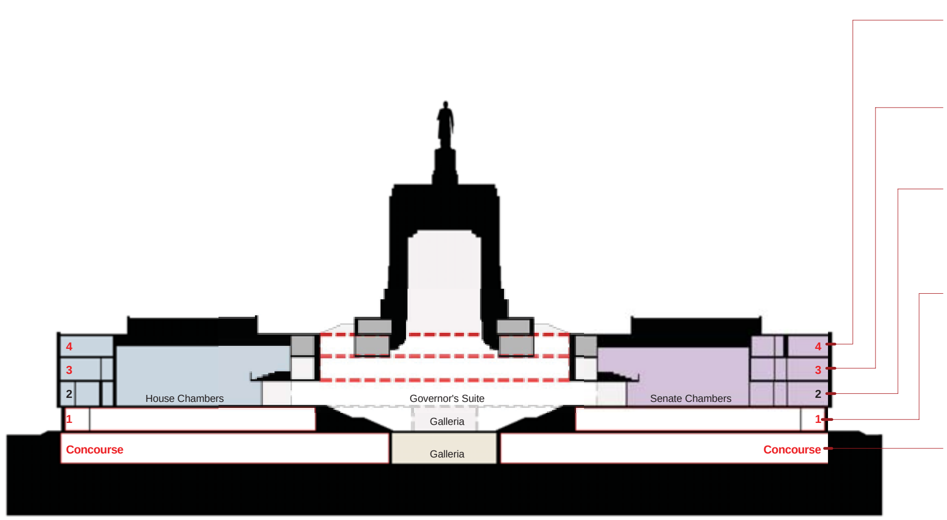
option Y

MASTER PLAN CONCEPT

Concourse level

Oregon State Capitol Master Plan

03.04.09



	Actual SF	Program SF
Information Systems	6,500	6,600
Computer Room	700	700
	7,200	7,300

	Actual SF	Program SF
Governor's Staff	3,400	4,450
Employee Services	1,500	1,150
Financial Services	1,500	1,500
	6,400	7,100

FULLY ASSIGNED

	Actual SF	Program SF
Legislative Counsel	4,600	4,550
Legislative Revenue	3,800	2,900
Secretary of State	1,700	1,750
State Treasurer	2,400	2,650
Legislative Administration	1,500	1,400
Committee Services	3,300	3,000
Commission on Indian Services	750	750
Visitor Services / Gift Shop / History Center	1,850	1,900
	19,900	18,900

	Actual SF	Program SF
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	11,000	11,000
Information Sytems (Media)	2,650	2,650
Capitol Press	4,800	4,500
Capitol Club	1,200	1,550
	30,150	29,200

Total	63,650	62,500

0 10 20 40 ft
N

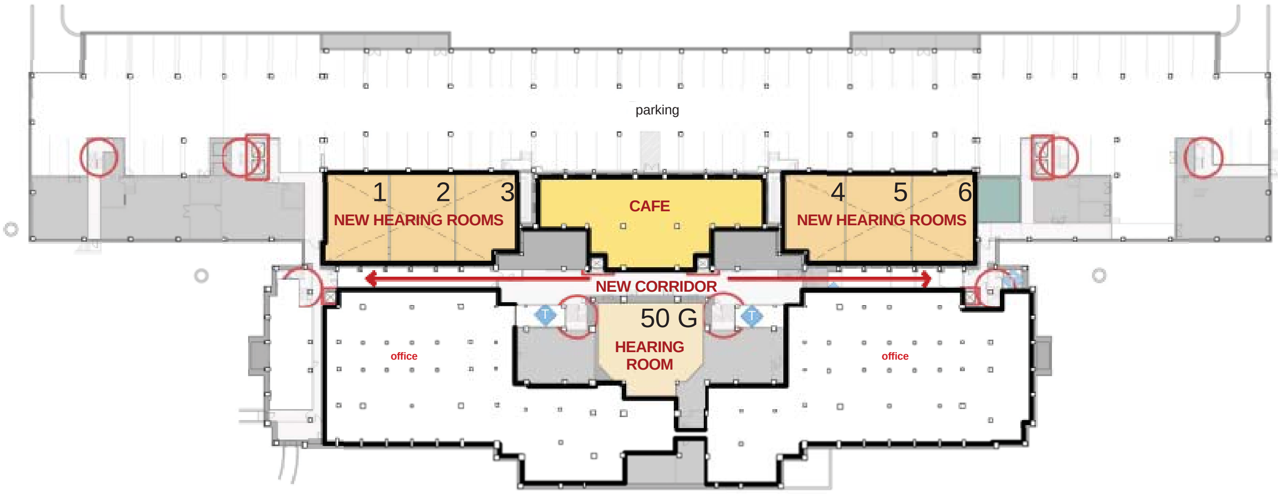
option Y

MASTER PLAN CONCEPT

SECTION DIAGRAM

Oregon State Capitol Master Plan

03.04.09

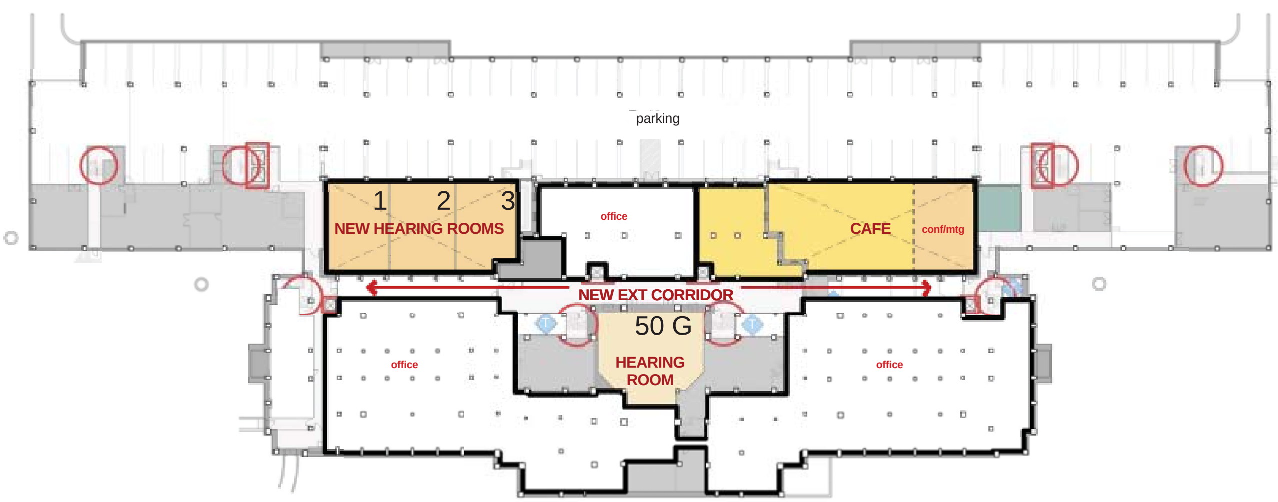


level 0

Courtyard Infill

CONCEPT A1

Oregon State Capitol Master Plan 01.26.09

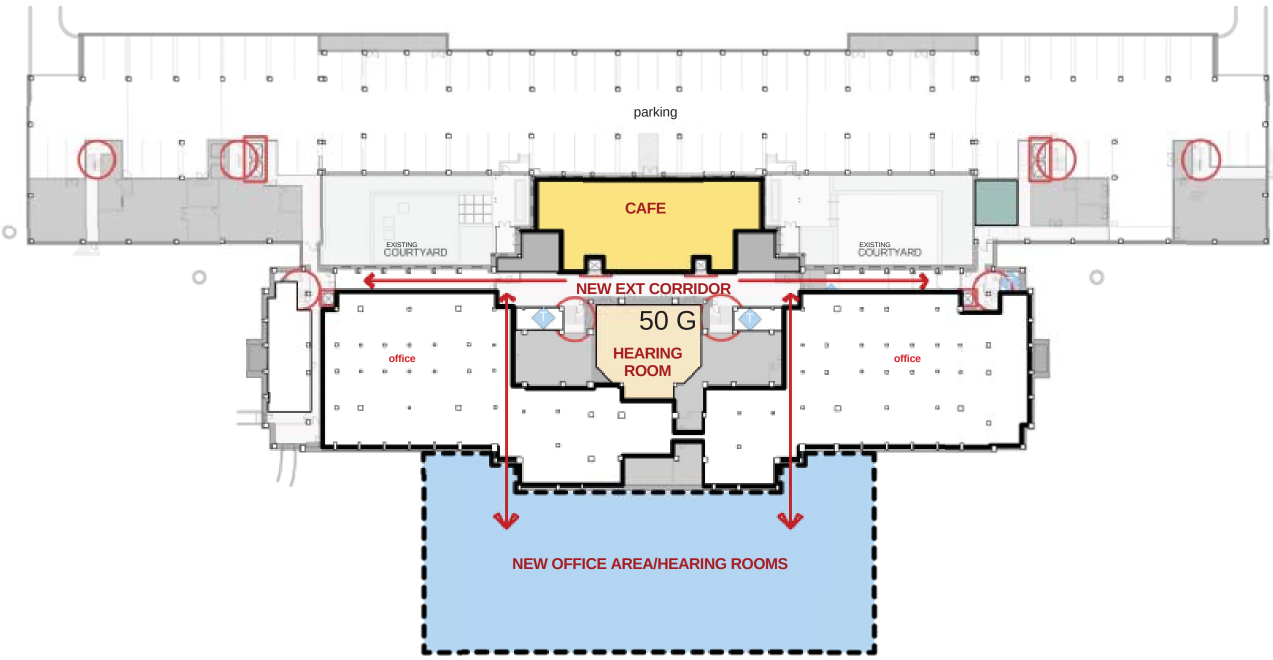


level 0

Courtyard Infill

CONCEPT A2

Oregon State Capitol Master Plan 01.26.09

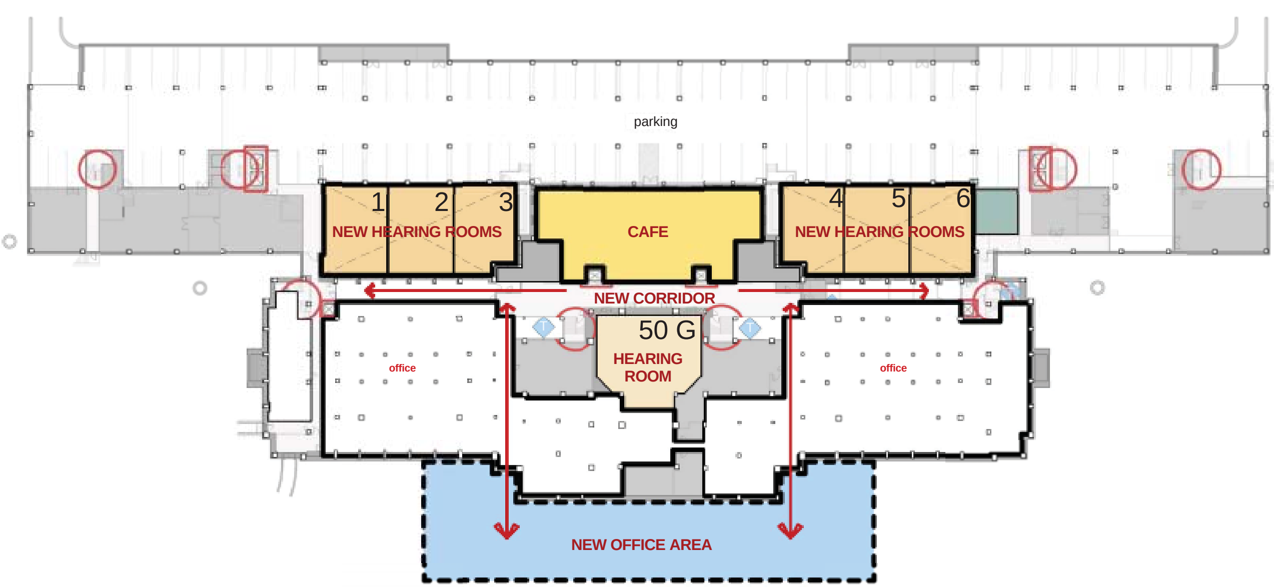


level 0

North Expansion (without infill)

CONCEPT B1

Oregon State Capitol Master Plan 01.26.09

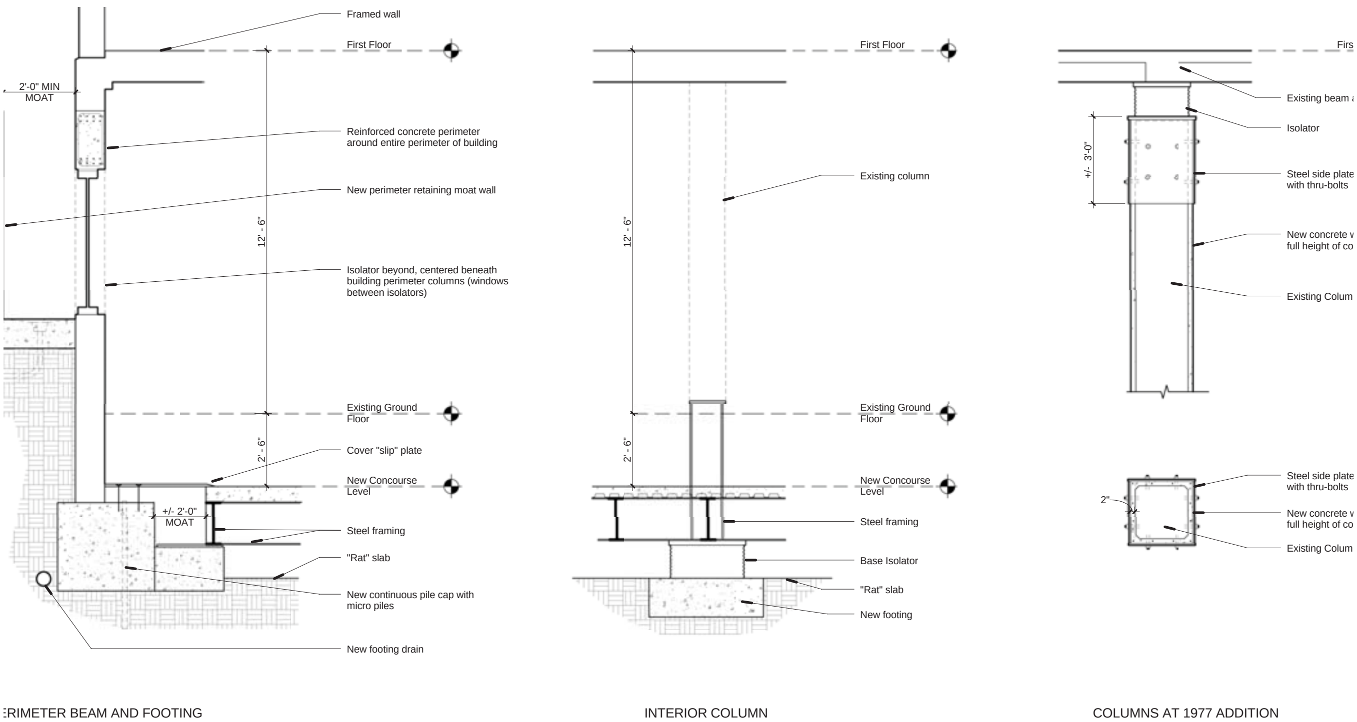


level 0

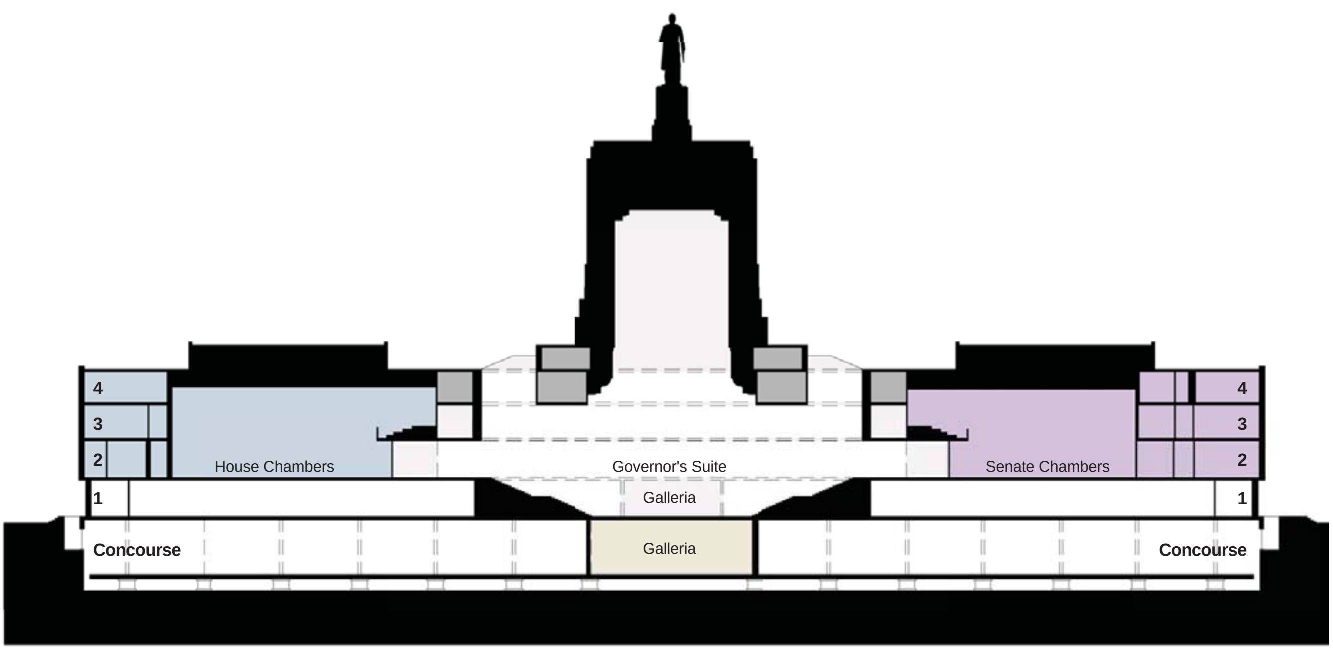
North Expansion (with infill)

CONCEPT B2

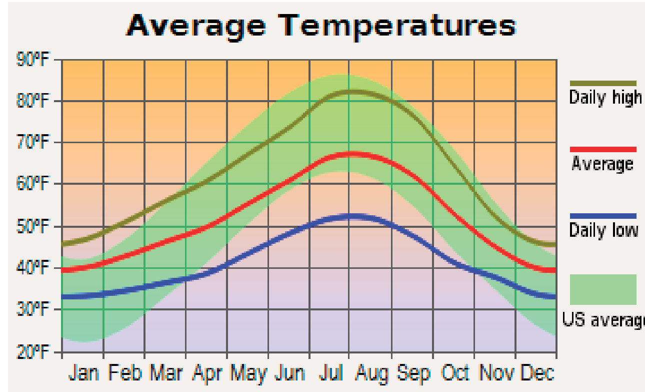
Oregon State Capitol Master Plan 01.26.09

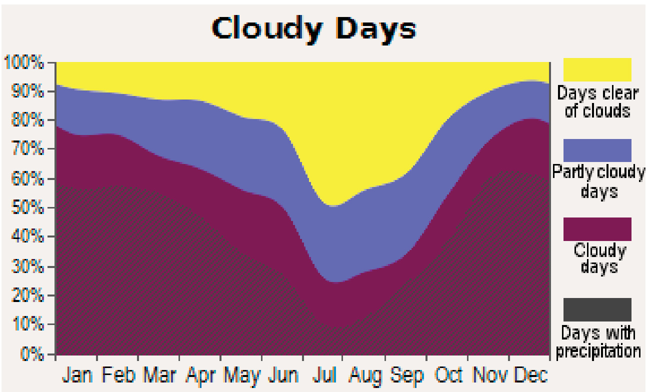


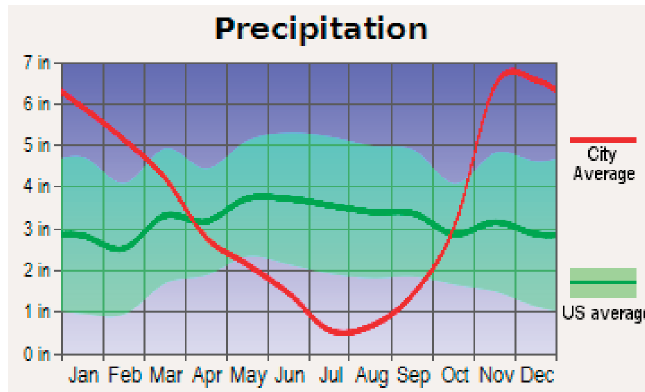
BASE ISOLATION DIAGRAMS

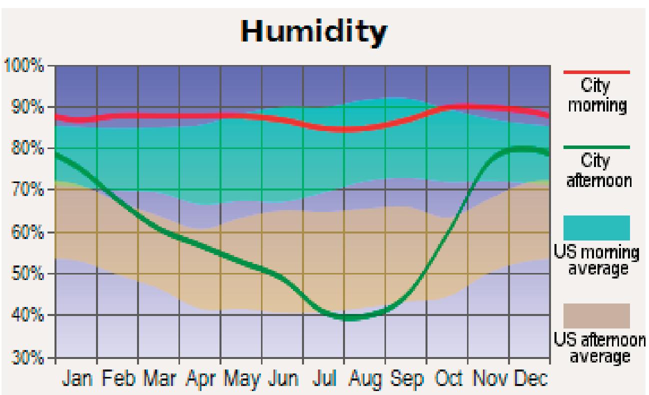


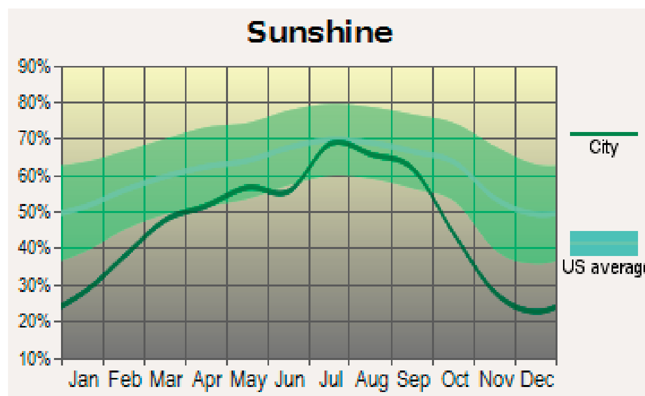
CAPITOL SECTION SHOWING BASE ISOLATION SYSTEM AT THE FOUNDATION.

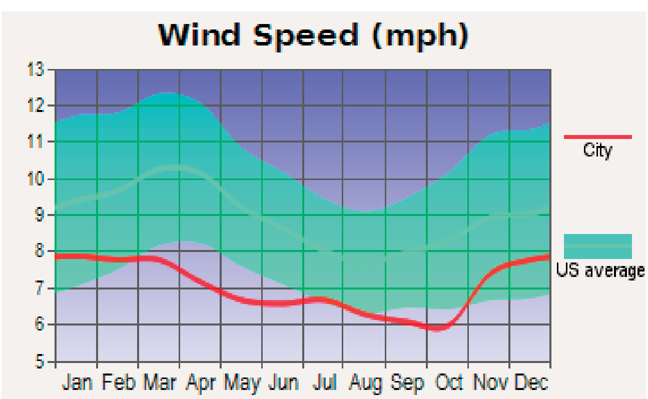












ENVIRONMENTAL CONDITIONS WERE STUDIED TO DEVELOP THE SUSTAINABLE DESIGN STRATEGIES.

5.0 Building Assessment

5.0 Building Assessment

The purpose of the Existing Building Assessment is to evaluate the condition of the building and its systems as a baseline for formulating strategies for its preservation and future evolution. The building has been well maintained and incrementally updated over its 70-year life, but not all advancements in codes, safety systems and technology have been integrated into the building infrastructure.

The Existing Building Assessment contains the following sections:

» 5.1 Architectural

» 5.2 Historical Elements

» 5.3 Structural/Seismic

» 5.4 Mechanical Systems

» 5.5 Electrical, Lighting & Data Systems

5.1 ARCHITECTURAL

BUILDING DATA

The building consists of two portions: the original historical building, completed in 1938, and the House and Senate Wings addition, completed in 1977. The gross square footage (gsf) area breakdown of each floor is shown below. The net square footage (nsf) of non-programmed space, such as circulation, which includes corridors, stairs, the Rotunda and Galleria; and support areas, such as mechanical, electrical and machine rooms, toilets, custodian closets and common storage, are also indicated.

Area Breakdown	Total (gsf)	Circulation* (nsf)	Support* (nsf)
Fifth Floor/Penthouse	**13,925**	**980**	**11,030**
’38 Building	5,310		3,715
’77 Building	8,615		7,315
Fourth Floor	**49,715**	**8,580**	**5,515**
’38 Building	23,995		4,715
’77 Building	25,720		800
Third Floor	**56,630**	**15,095**	**1,995**
’38 Building	30,910		1,195
’77 Building	25,720		800
Second Floor	**58,960**	**23,900**	**2,490**
’38 Building	32,270		1,690
’77 Building	26,690		1,650
First Floor	**84,125**	**27,495**	**2,660**
’38 Building	44,395		1,805
’77 Building	39,730		855
Ground	**100,020**	**10,560**	**53,915**
’38 Building	46,250		5,900
’77 Building	53,770		48,015
Exterior Courtyards - 2 @ 4,535			
Total	**363,375**	**86,610**	**78,255**

FIRE & LIFE SAFETY/BUILDING CODE

The first statewide building code was not adopted in Oregon until 1974. Even since then, fire and building codes have developed greatly, meaning elements of the building, especially the original 1938 portion, do not meet current code requirements. While upgrading a building to current codes is typically only mandated for areas that are substantially altered or renovated, it may be desirable to address safety issues regardless of mandates. The following code infractions were found in the Capitol that do impair occupant safety in an emergency situation:

General

- Four floors of the 1938 building are atmospherically interconnected, without smoke separation, through stairs and elevators.
- The building is not fully fire sprinklered; Assembly (Group A, per 2007 Oregon Structural Specialty Code) occupancies, including the House & Senate Chambers, lack sprinklers.

Basement/Ground Floor

- Café Today (occupant load over 100) only has one legal means of egress (two are required by code).
- The corridor leading to the Café exceeds permissible dead end length and is not fire sprinklered.
- The corridor west of the Café kitchen area is being used for storage.
- The exterior courtyards are technically A occupancies, but lack two legal means of egress. Doors swing the wrong way going back into building; the second means of egress is through the garage.

First Floor

- The primary egress stairs continue past the first floor to the lower level.

Second floor

- The main doors of the chambers swing in the wrong direction for exiting and lack panic hardware devices.
- The second means of egress doors from the Governor's Suite swing the wrong direction and lack panic hardware devices.

Third Floor

- The corridors outside the two chambers leading to the north are technically 110' dead ends (without exits), far in excess of the allowed 20 feet.
- The two north Hearing Rooms only have one means of egress from each; two are required by code.

Fourth Floor

» The second means of egress from the House lounge is a noncompliant spiral stair.

Penthouse/Roof

» The roofs lack guards or fall restraint anchors for personnel (OSHA regulations) who must access roof drains or other equipment items near roof edges.

ACCESSIBILITY (ADA ARCHITECTURAL GUIDELINES) AND UNIVERSAL ACCESS

The original 1938 building, and even the 1977 addition, predate the rise in awareness of issues related to building accessibility for people with disabilities. Codes for accessibility in the US started with the Architectural Barriers Act in 1968 which transitioned to the Americans with Disabilities Act (ADA) in 1990.

The federal ADA Architectural Guidelines are incorporated into the current Oregon Structural Specialty Code and must be complied with when buildings are remodeled or substantially altered (Section 1113.1.1). However, modifications of the compliance requirements are allowed for historic buildings (Section 1114.1).

The culmination of the ADA and the concept of human rights has resulted in universal access, which grants all people equal opportunity and access to services and products from which they can see benefits regardless of their social class, ethnicity, background or physical disabilities.

The 1977 wings have been largely, but not completely, brought up to current ADA standards. The extent to which overall ADA compliance is required will vary depending on the scope of proposed future alterations. The term "accessible" in the following means in complying with current ADA guidelines and Oregon code, and addressing universal access.

The following are shortcomings identified in this study:

Parking

» The covered parking is not van accessible.

Building Accessibility

» The North and South main entrances and the West staff entrance are not wheelchair accessible; only the East entrance complies. At the North main entrance the revolving doors are impediments in addition to the steps. At State Street to the south there is a considerable grade difference to the entries and no elevator or ramps.

Accessible Routes

» There are no handrails on: 1) exterior stairs, except at the south; 2) on monumental stairs off of the Rotunda; 3) on stairs from ground floor to the courtyards (note: handrails are also required for egress reasons).

- The door knobs in the 1938 building do not meet current accessibility standards.
- The two courtyards are not wheelchair accessible (there is a step at each upon leaving the old building; in addition, the west courtyard is depressed several steps).

Elevators

- All elevators (except the Governor's private elevator) have been upgraded to current accessibility standards.

Toilet & Bathing Facilities

- Most restrooms in the 1938 building are non-accessible or only partially accessible; issues include compartment size, accessible routes, clearances at fixtures, piping insulation and mirror and accessory heights. There are 17 public toilet rooms and 17 staff toilet rooms (including two with showers) in the 1938 building. Not all need to be fully compliant, but accessibility should be increased.

Assembly Areas

- Accessible chamber galleries are not fully wheelchair compliant. Wheelchair areas are fronted by large unprotected steps in the floor. Only one of three galleries in each chamber is accessible.
- Signage stating the availability of information for assistive listening systems in the chambers and hearing rooms is needed.

Other Elements

- Drinking fountains and telephone booths are not accessible throughout the public spaces of the 1938 building.
- The 1938 building signage does not all include tactile letters, and in some cases, braille; mounting height is variable and there are no tactile/braille floor plans.

BUILDING EXTERIOR CLOSURE

- The windows of the 1938 building are single-glazed, non-thermally broken bronze framed (thermally inefficient).
- The 1938 building exterior walls lack adequate insulation, though high thermal mass helps to moderate temperature swings.
- See Building Exterior Assessment for a detailed description of the condition of the exterior stone and bronze work.

MISCELLANEOUS

- Café Today dining has no natural light.
- Café Today kitchen capacity is limited by exhaust duct size restriction from the basement location.
- Corridors in the 1938 building are under lit, making them dreary.

- The ground floor central corridor in the 1938 building has extensive cracking and sagging of the plaster ceiling.
- The skylights over the two main interior stairs have been covered; daylight in these highly used circulation elements would be beneficial. It is recommended the skylights be restored.
- Daylighting over the monumental stairs of the Rotunda is out of balance with the lighting from the skylights of the main space, making the Rotunda appear dark. The building originally had variable louver systems (trade name "Ventilighter") for those skylights.
- The sound quality of the audio systems in the Chambers is poor.
- Hazardous materials (asbestos and lead paint) are present in many areas. These are not typically imminent dangers, but will require abatement or encapsulation during renovation work when encountered. PCBs may be present in some transformers.

SECURITY

- Allowing parking directly in front of the building is a potential risk. There is no deterrent to vehicles approaching the front of the building other than steps.
- The bronze doors at the east and west stair exits do not always close securely.
- The parking garage entrance/exit are minimally secured. Main doors from the garage into the courtyards and loading corridor are unsecured.
- The Governor's office is potentially vulnerable from the second floor terrace.
- Many staff areas have unrestricted access at all hours.
- There is no video camera coverage of many sensitive areas.

BUILDING EXTERIOR ASSESSMENT

Stone and Bronze

A limited visual exterior assessment of the Oregon State Capitol was conducted, including the forecourt marble Lewis and Clark commemorative sculptures. The purpose of the assessment was to provide a summary understanding of existing conditions, noted visual deficiencies, if any, and potential exterior material conditions that could affect the Master Plan or cost portions of the project.

The exterior assessment of the circa 1938 center volume, the Senate Wing, and House Wing elevations was conducted on May 15th and 16th, 2008 and included visual observation using binoculars from the street level and roof top levels. Weather conditions during the assessment were clear, sunny, and 94 degrees Fahrenheit. Selected marble panels accessible from the ground on the north and east elevations were scanned for metal panel anchors, using a Tucker Emhart Parabolt Metal Detector. The results of the scan indicated a potential for no metal anchors on the center dome volume and adequate panel anchors on the Senate and House Wings. The assessment was performed without any destruction or laboratory analysis.

The base drawings (located in the Appendix) were derived from construction drawings prepared by Trowbridge and Livingston Architects with Francis Keally, dated September 11, 1936 and by Wolff Zimmer Gunsul Frasca with Pietro Belluschi, dated September 11, 1975.

GENERAL HISTORY

(The following paragraphs are derived from the 1988 National Register of Historic Places Nomination prepared by Ms. Elisabeth Potter and Mr. James Hamrick of the Oregon State Historic Preservation Office.)

"The Oregon State Capitol was designed by the New York architectural firm of Trowbridge and Livingston in association with Francis Keally and completed in 1938. Erected in the Modernistic style, the Capitol was sensitively enlarged in 1977 by the Portland firm of Wolff Zimmer Gunsul Frasca in association with Pietro Belluschi."

"The [Capitol] is a landmark of Modernistic design based on Classical Architecture. Constructed with the assistance of the Federal Emergency Administration of Public Works (P.W.A.) at the height of the Depression, it was completed in 1938 as a replacement for the old Statehouse, which had been destroyed by fire in 1935. The Capitol was the central and original feature of the government building group which developed according to plan, around the mall which formed a lengthy formal approach from the north. Constructed of reinforced concrete, the building is distinguished by angular, unadorned exterior elevations and a massive, ribbed lantern – all sheathed in brilliant white Vermont marble. The new "Stripped Classical" Capitol was strikingly modern at the time of its dedication."

"Artists of national reputation [Ulric Ellerhusen, Leo Friedlander, Barry Faulkner, and Franck Schwarz] collaborated in the winning design and were employed at the recommendation of the architects to produce sculptural relief and paintings of a taut and finely wrought decorative program."

"Since its completion, the Capitol has been maintained, generally, with due appreciation of its character defining features by the Oregon Legislative Assembly through the Legislative Administration Committee (LAC). The most conspicuous indication of the Legislature's respect for the continuum of statehouse development at the head of Willson Park was the expansion project and hearing rooms to the Capitol's south elevation. Block-like wings of comparable scale, compatibly styled and sheathed in matching Vermont marble were designed to be fundamentally subordinate and distinguishable as additions by their set-back from the main volume."

GENERAL BUILDING INFORMATION

(The following paragraphs are derived from the 1988 National Register of Historic Places Nomination prepared by Ms. Elisabeth Potter and Mr. James Hamrick of the Oregon State Historic Preservation Office.)

"Exteriors [of the 1938 Oregon State Capitol] are clad in Vermont "Danby" white marble panels of varying width and height above a granite base. The original interior structural system is a combination of reinforced concrete, steel framing, and hollow clay tile. As originally constructed, the Capitol presented a truncated T-shaped plan, with the southern wing having the shortest dimension. The main façade is bilaterally symmetrical and organized into three volumes. The building's four-story main central volume is broken up by the use of setbacks and reveals complementing the verticality of the Rotunda".

"All windows [of the 1938 Oregon State Capitol] are organized vertically and centered in the bays emphasizing the massiveness of the individual volumes. Windows are bronze, multi-paned casement with operable hoppers below and awnings above the casement sections."

"Complementing the original building in terms of mass, scale, design, and materials, the new [1977] additions have a strong visual but minimal physical impact on the existing Capitol. To accommodate the connecting corridors, little significant fabric or interior spaces were altered. The major alterations of the Capitol were limited to the ground floor and first floor elevations of the south central volume…..Constructed of reinforced concrete and steel frame, the additions are faced on the exterior with the same white Vermont marble found on the original building…..All windows and door frames in the new additions are bronze anodized aluminum. Glass is insulated and tinted."

GRANITE BASE AND STAIRS

Main Capitol

CRACK AT TOP TREAD, STAIRS ON WEST ELEVATION

The National Register of Historic Properties nomination identifies the granite on the base course and the stairs as Sierra White Granite from the Cold Spring Granite Company, Raymond, California. However, this study did not confirm the material properties of the granite through petrographic analysis.

Investigation and Deficiencies

The granite base course and the stairs appear to be in excellent condition except for instances of biological growth on the horizontal surfaces, and cracks in the top tread of the stairs on the west elevation entrance.

Repair Recommendations

None required at the time of the report.

1977 Senate and House Wings

Both the Senate and the House Wings do not have a granite base like the original building, but granite is used at various locations including the three sets of stairs and landings at the south and at the two courtyards at the building base and stairs. Where the granite is from was not mentioned in the National Register of Historic Properties nomination, and this study did not confirm the material properties of the granite through petrographic analysis.

Investigation and Deficiencies

The granite appears to be in good condition except for some staining on the stairs and landings at the southern entrances and at the stair and landings at the two courtyards. The granite base at the western courtyard exhibits several deficiencies including staining from water back-splashing off of the pavers, and cracking of one base slab potentially attributable to corrosion of the granite anchors. There is also staining from efflorescence at the west facing elevation of this same courtyard, to the north of the entry doors (this area is enclosed by the later addition of the canopy).

CRACKING AT GRANITE BASE, WEST COURTYARD

Repair Recommendations

The water staining and the efflorescence are not compromising the integrity of the granite, and this study does not recommend intervention or cleaning at this time. The cause of the crack in the granite at the anchor location should be investigated via invasive techniques that were not part of this study.

MARBLE PANELS

"From the ground" assessments are limited in their observations to the most visible deficiencies. Whereas large scale patterns of stone panel system failure were not observed, the occurrence of further crack failure, particularly at higher elevations, and out-of-plane panel movement cannot be determined without up-close and/or destructive investigative techniques. It is therefore recommended that an additional detail assessment be conducted from high lift/snorkel equipment. The purpose of the detail assessment is to verify the current conditions noted from the ground and provide a more thorough evaluation of the marble panel veneer system at higher elevations on the central Capitol.

Main Capitol

According to the original design documents, marble panel thicknesses range between 6" and 12" with an average panel size approximately 52" wide and 79" high. Joints between panels are filled with sealant and typical sealant joint widths are ¼". The panels are generally laid in a stacked bond pattern in varying widths in courses of unequal heights. In many instances marble panels are used as signage, ornamentation, or as window covering. At the main north entrance, various inscriptions are incised into the panels above and at either side of the entry. At all entrances, panels above the doors are decorated with bas reliefs depicting various themes. On the east, west and south elevations spandrel panels at the windows at the 2nd and 3rd floors are separated by reeded marble spandrel panels. This same condition occurs in two locations on the north elevation, at the two pavilions that flank the main entrance. The windows of the cylindrical dome marble panels are pierced in a lace like pattern to provide a decorative grill in front of the windows.

All marble on the Oregon State Capitol is Danby Marble. Currently Danby Marble is quarried from a large underground deposit (Imperial Quarry) on Dorset Mountain in Vermont and has been commercially available since 1907. It is a calcite marble of medium to coarse grain texture with a light off-white color. Dark colored veining seen throughout is largely due to iron pyrites. Water absorption of the Danby Marble ranges from 0.03 to 0.24 (percent by weight after forty-eight hours).

Investigation and Deficiencies

The marble appears to be in good overall condition. There were no metal ties detected along the lower slabs where they were investigated with the metal scanner. The following deficiencies were noted: 1) "sugaring" of the marble; 2) delamination and spalling at the edges of the panels; 3) cracked panels; 4) general staining; 5) soiling at horizontal surfaces, and 6) biological growth. Sealant failures were also noted in several locations.


EXAMPLE OF SPALLING AT THE CORNER OF A MARBLE PANEL

In general, there does not appear to be a pattern to these deficiencies, except for soiling at the horizontal surfaces. "Sugaring", or granular decohesion of marble, is a condition that appears on all of the elevations but does not affect the integrity of the marble. On the north elevation, spalling at the edges of the panels occurs mostly between the second and third floors and at the parapet. Stone spalling appears consistently on the edges of the marble panels and the spalls are generally less then 2"x2". Cause of the spalling is unknown without further investigation. Some spalling also occurs at the first floor, just above the granite base and near or underneath the window heads.

There is also an instance of stone delamination on the east side of the north elevation near the base of the eastern most window on the second floor. Stone delamination occurs on the edges of the marble panels, and is in general less then 2"x2". Cause of the delamination is unknown without further investigation.

Stone soiling occurs on the horizontal surfaces at the windows on the third floor, and with some regularity at the base of the Rotunda. Such dark soiling is present on exterior marble in areas which are protected from direct contact with rainwater. This soiling pattern, typical for marbles and other calcareous stones, is prominent at the 1977 Senate and House Wings at the third and fourth floor window sills, and is most pervasive on the north side. The mechanism resulting in this condition is described as follows: acidic gases absorbed from the atmosphere by rainwater causes rainwater to be reactive with marbles and other calcareous stones. Sulfur dioxide, which (under typical atmospheric conditions) forms both sulfurous and sulfuric acid when dissolved in water, is perhaps the most destructive of these pollutant gases. In addition to the direct dissolution of calcium carbonate (calcite), the reaction of sulfur dioxide with marbles results in the formation of calcium sulfate dihydrate (gypsum) on the surface of the stone. As gypsum is more soluble in water than is calcium carbonate, the exposed surface becomes eroded when washed by the rain. Where a surface is protected from the flow of rainwater, the continued transformation of calcium carbonate into calcium sulfate dihydrate results in the formation of a crust of gypsum. Particulate matter becomes entrapped in the network of gypsum crystals, giving the surface of protected areas a blackened appearance.

On the south facing elevation, some staining occurs under the window heads at the first and second floors in the west courtyard, and above the flashing at the canopy. Incidences of spalling at the edges of the panels occur along the parapet at the central projecting portion of the building. There is also a location on the parapet on the west wing where there is sealant failure.

There are several locations of spalling on the west elevation. These occur mostly between the first and second floors, and on the southwest corner. There is also a crack under two of the window heads: one at the window immediately to the north of the entry doors, and one at the window head of the 6th window from the north on the 3rd floor. The cause of the cracking is unknown without further investigation. Some staining occurs on the west facing elevation of the courtyard above the flashing of the entry canopy.

EXAMPLE OF CRACKING AT THE UNDERSIDE OF THE WINDOW HEAD

The east elevation appears to be in good condition, with only one case of spalling noted.

1977 Senate and House Wings

According to the National Register Nomination, the 1977 addition is constructed of reinforced concrete and steel, and faced on the exterior with the same white Vermont marble found on the original building. The panels are arranged in a stacked bond pattern, similar to that of the original building.

The 1977 design documents indicated that the marble panels are slotted at the edges, and bolted to the concrete. There is an approximately 1-1/2” air space between the panel and the concrete. This study noted similar conditions on the south elevation of the east wing where one panel had been removed for repair work.

Investigation and Deficiencies

The Wings demonstrate a distinct pattern in the occurrences of staining, spalling, cracking, and sealant failure. Many of these conditions appear to be directly related to the panel anchor locations. This is caused by the silicone sealant interacting with the material of the anchor. The sealant has been replaced since the staining occurred, and stains that remain do not affect the integrity of the marble. Staining also occurs at the sealant joints.

Another distinct pattern is the occurrence of soiling at the window sills. This occurs predominantly on the north facing elevations, and mostly on the top three floors; the black soiling covers most of the horizontal surface of the sill, and streaks the vertical surface immediately below the sills. Most occurrences of soiling at the window sills occur at the north elevations of the House and Senate Wings of the 1977 addition. This occurs predominantly at the second through fourth floor windows. There is also soiling at the top of the coping stone on the parapets at the courtyard, and one panel at the east courtyard that exhibits staining that may be associated with its anchor locations.

INSTANCE OF SOILING AT THE WINDOW SILL

Biological growth occurs along the entire base of the north elevation. The growth of biological organisms on stone surfaces is favored in areas where there is high relative humidity. Minerals present in marble stonework and mortar provide a food source for micro-organisms as well as for several types of algae and fungi. There are several organisms known to preferentially grow on calcareous substrates in several locations (most notably at the top of the walls). It is generally agreed biological growth can adversely affect both the appearance and durability of stone. More importantly, all forms of biological growth are associated with the retention of water which can lead to accelerated deterioration of marble. The presence of algae, fungi and mosses impedes the shedding of rainwater. Most organisms secrete acidic products of metabolism; this lowers the pH of the moisture retained, resulting in the dissolution of carbonate minerals.

BIOLOGICAL GROWTH AT SLATE PAVERS AND BASE OF BUILDING

Although these organisms have not been specifically identified, it appears that algae, fungi and mosses are all present. As might be expected, growth is somewhat more pronounced on stone panels at the north elevation of the building.

The west elevation of the House Wing also exhibits the same staining pattern at the windows as the north elevation and staining at the coping stone on the one story portion of the building to the south. Biological growth occurs at the base of the building. Additionally, this elevation exhibits the staining of the panels at the anchor locations. There is also one location at the first floor window where there is a spall in the head of the window.

South facing elevations of the House and Senate Wings exhibit general staining at the anchor panel locations and staining at the sealant joints. Soiling occurs at the coping stone on the both the ground floor planters and at the roof above the hearing rooms. There are also several instances of cracking and spalling that occur predominantly along the ground floor, with some spalling occurring at the first and second floor window sills. Spalling and cracking occurs also at the main entry at the middle of the south elevation, presumably associated with the sculpture that has been hung above the entrance.

There is also some copper staining associated with these bronze sculptures. This occurs at the main entrance at the south and is associated with the bronze sculpture that is hung above the entry. Bronze is a copper based alloy, and the brown and green staining on the marble below the sculpture is a result of water washing the patina (caused by atmospheric conditions) of the sculpture down the sides of the marble. The east elevation of the Senate Wing exhibits general staining at the anchor panel locations and staining at the sealant joints, with some staining that occurs at the center of the elevation above the fourth floor windows.

COPPER STAINING

In general the remaining two elevations that face the courtyards, the Senate Wing west and House Wing east elevations are in good condition, with staining at the anchor panel locations and the sealant joints.

Repair Recommendations

In general marble panels and slabs on both the original Capitol and on the 1977 Senate and the House Wings, as well as on the marble statues on the main north side entry, are in good condition. For areas where cracks occurs at the window head or through the entire marble panel, further analysis is warranted to determine the cause of the cracking. At this time, the cracks should be monitored for additional elongation and movement. Once the cause of the crack is identified, a suitable solution can be recommended for repair.

At areas where sealant is missing, damaged or cracked, this study suggests installing new sealant to match color, type and profile of existing sealant. Where copper stains occur on the marble, the marble should be cleaned using a poultice method.

MARBLE STATUES

Main Entrance

On the north elevation, there are two massive marble sculptures that flank the stairs leading to the main entrance. The one to the east commemorates the Lewis and Clark Expedition of 1804-1806. The sculpture to the west commemorates the Oregon Trail Immigrants. Both were sculpted by artist Leo Friedlander.

MARBLE STATUE TO THE NORTH

Investigation and Deficiencies

The sculptures are in excellent condition without any cracking or spalling observed. Both the north and south sides exhibit black soiling on the horizontal surfaces, with some of the soiling streaking down the vertical surfaces.

Repair Recommendations:

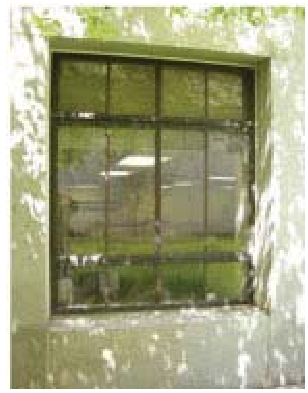
None required at the time of the report.

Gentle drip cleaning with warm water has been shown to be an effective method to remove gypsum crystal formations from marble and thereby remove the "dark" soiling stains.

BRONZE WINDOWS AND DOORS

Bronze windows typically do not fail at the frame or sash components but rather at the glazing, hinged parts, or original thin bronze weather stripping. Visual observation alone is not sufficient to determine a window's condition, air infiltration, or water intrusion characteristics. The physical properties of bronze windows require field testing for deficiencies of glazing seals, and degradation of joints. Therefore, this study recommends conducting additional ASTM air infiltration and water intrusion field tests to determine both the base line "soundness" as well as potential solutions for deficiencies.

Bronze Window Condition at 1938 Capitol



The windows of the Capitol are all made of bronze frames and single panes of glazing. The majority of the windows are multi-pane casement windows with an operable sash above consisting of four lites with an out swinging awning function and an operable sash below consisting of four lites with an in swinging hopper function. The windows are generally set into a ten-inch reveal. They are of a consistent width generally, but vary in height.

Windows at the main entry are fixed tripartite windows separated by engaged, reeded pilasters, twelve inch wide and bordered by a paneled jamb. The mullions, 2-3/4" in width, are organized into vertical and horizontal pairs.

House and Senate gallery windows (at third floor through fourth floors), on both the north and west facing elevations are 17 feet high and stylistically similar to those above the entrance, with the exception of an additional square panel created by the intersection of the horizontal and vertical paired mullions at the edges of the frames. Centered in each square is an eight point bronze star-like motif. These windows feature operable side casements which open into the interior. They also have eight operable panes that have a casement function.

Windows at the cylindrical dome are behind pierced marble screens that appear between each buttress of the dome. Their design mirrors that of the screens used in the east and west wings on the second floor. They are fitted on the interior as casements to allow for air circulation into the dome.

Investigation and Deficiencies

From the ground visual inspection showed that the bronze windows at the 1938 Capitol are in good condition. There were no instances of cracked glazing, metal corrosion or damaged window sections noted. This study recommends conducting both a detailed window survey and additional field testing. Specifically, the survey should include the presence and degree of any corrosion of the bronze; condition of patina; deterioration of the metal sections, including bowing, misalignment of the sash, or bent sections; condition of the glass and glazing compound; presence and condition of all hardware, screws, bolts, and hinges; and condition of the granite or marble surrounds, including need for caulking or resetting of improperly sloped sills.

Repair Recommendations

If any of windows are found to be damaged in any of the aforementioned ways, depending on their condition they can either be repaired in place or removed and repaired in an off-site facility. The original bronze windows are non-laquered, and it is recommended that all remain with their natural patina, which was the original design intent. Bronze windows are generally not energy efficient, and this has often led to their wholesale replacement. They can, however, be made more energy efficient in several ways, varying in complexity and cost. Caulking around the stone openings and adding weather-stripping are important first steps in reducing air infiltration around the windows. Other treatments include applying fixed layers of glazing over the historic windows, adding operable storm windows, or installing thermal glass in place of the existing glass. In combination with caulking and weather-stripping, these treatments can greatly enhance energy ratings.

Bronze Door Condition at 1938 Capitol

The 1938 Capitol retains all of its original bronze exterior doors. On the north elevation, there are three revolving doors at the main entrance. Each door has four leaves and a full lite. These doors are all in good condition and are functional. The only deficiency noted was severe surface wear of the bronze.

Investigation and Deficiencies

On the west elevation there is one pair of doors at the staff entrance, one door at the stair exit and one pair of doors into the west courtyard vestibule. The doors to the staff entrance have full lites, and are functional but are only in fair condition. It appears that the original hardware has been replaced and the bronze is showing signs of severe surface wear. The door to the stair exit is comprised of three recessed panels, and exhibits severe wear as well. The doors to the west courtyard vestibule each have full lites and are in excellent condition.

On the east elevation there is one pair of doors to the accessible public entrance, one door at the stair exit and one pair of doors into the west courtyard vestibule. The doors to the staff entrance have full lites, and are functional but are only in fair condition; it appears that the original hardware has been replaced and the bronze is showing signs of severe surface wear. The door to the stair exit is comprised of three recessed panels, and exhibits severe weathering as well. The doors to the east courtyard vestibule each have full lites and are in excellent condition.

The elevation to the south retains one pair of doors from the vestibule to the west courtyard and one pair of doors from the vestibule to the east courtyard. Both sets of these doors are in good condition, with only superficial wear to the bronze. There are also two single leaf doors on the main projecting portion of the Capitol at the 5th floor, both of which open out onto the roof of the 1977 addition. These doors are anodized aluminum doors that replaced the original windows in 1977 to provide roof access from the existing building to the new addition.

Repair Recommendations

Some operational improvement can be made to the east and west doors of the Capitol. It may be necessary to replace the existing worn hardware with new bronze hardware locksets. Replacement of the door assemblies are not required at the time of the study, but reconditioning of the bronze where there is severe surface wear is recommended.

Anodized Aluminum Window Condition at 1977 Senate and House Wings

Windows in the addition complement the original. Grouped in horizontal bands on the first floor between structural columns on the upper floors they follow the concept of the stacked vertical bay developed in the 1938 building. Normally 7’-1/2” high by 5’-4” wide, the single windows contain vertical, double light casements, framed by a recessed jamb motif similar to the one found in the 1938 building. The reveal is similar to the original. All windows and doors in the new additions are in bronze anodized aluminum. Glass is insulated and tinted.

Investigation and Deficiencies

From the ground visual inspection showed that the bronze anodized aluminum windows at the 1977 addition are in good condition. As with the bronze windows at the 1938 Capitol, it is recommended that a detailed window survey be conducted.

Repair Recommendations

None are required at the time of the report.

ROTUNDA

General

(The following paragraph is derived from the 1988 National Register of Historic Places Nomination prepared by Ms. Elisabeth Potter and Mr. James Hamrick of the Oregon State Historic Preservation Office.)

“The dominant feature of all Capitol elevations is the cylindrical dome. It rises above the roof on a series of four set-back marble-faced reinforced concrete and brick pedestals. The first, essentially a Greek cross shape, rises eight feet from the parapet to the second, which is a chamfered square nine feet high. There follows a six foot octagonal platform which is located beneath a four foot high round base. From these foundations, the main buttressed portion of the tower rises approximately 43 feet to the parapet, which is recessed and adds the additional six feet in height. The reeded marble pedestal for the Oregon Pioneer statue extends upward for another 18 feet.”

“The exterior of the steel-framed drum is approximately 5’-3” from the interior dome. The intervening interior space consists of steel platforms, stairs and catwalks which are designed to assist in the maintenance of the dome.”

Interior Investigation and Deficiencies

The primary interior historic materials of the Rotunda include a marble floor divided into a pattern with bronze strips, the bronze State of Oregon seal, marble wainscot wall panels, painted plaster walls and ceiling, and the grand stone staircases leading to the Senate and House Chambers. The conditions of materials only within the public accessible area of the Rotunda were observed.

In general, the Rotunda interior historic materials are in good overall condition. Some areas appear to have been repaired in the past. These repairs are of high quality and in sound condition. In sporadic areas the stone joints of the wainscot panels are missing mortar. A marble trim detail along the edge of the balcony across from the second level Governor’s Suite has spalled and symmetrical cracks thru the marble base occur on either side of the south portal. The current study did not include intensive research in order to determine if the current cracking and other deficiencies within the Rotunda are a result of existing stone panel movement or a result of past movement from seismic activity. The marble floor has one crack on axis with the entry doors running north south along the north edge. Within the Rotunda, the only surfaces with ongoing pattern deficiencies are the outside ends of the stair nosing. Evidence of past repairs at the nosing indicates spalling occurs at the nosing ends adjacent to the walls. One failure of an existing nosing repair and one new nosing failure was noted.

From the floor, observations of the interior plaster ceiling finishes of the dome did not reveal any deficiencies. Cursorily observed was the exterior face of the inner dome and surrounding steel angle structural system. As a result of the exterior outer window locations, the inner dome does not receive sufficient natural daylight leaving the top portion of the inner dome in shadow.

Repair Recommendations

Most of the deficiencies noted are small enough not to warrant repair.

INTERIOR HISTORIC FABRIC

General

The study focused on the interior historic fabric in the public corridors and public spaces of the Capitol. No private offices or individual chambers were reviewed. As in the Rotunda, the primary interior historic materials include marble wainscot wall panels, marble door surrounds, painted plaster walls and ceiling, and terrazzo flooring.

Investigation and Deficiencies

In general, the interior materials are in good overall condition. Some corridors adjacent to the Rotunda have been repaired in the past. Like the repairs in the Rotunda, they are high quality and in sound condition. Deficiencies noted include vertical, horizontal, and/or diagonal cracking in the marble panels, expansion cracks in the terrazzo floor that appear original and stable, and relatively few small spalled areas of some marble panels. Pattern deficiencies were noted in the lower level elevator corridor in which vertical cracks have occurred in pairs 6" apart at approximately 6" on either side of the marble panel joints.

The current study did not include intensive research in order to determine if the current cracking and other deficiencies within the Rotunda are a result of existing stone panel movement or a result of past movement from seismic activity.

Repair Recommendations

The observed deficiencies of the marble wainscot panels, the stone steps, and the terrazzo floor at the Oregon State Capitol Building may be the result of deteriorated joints between panels, damage sustained during earthquake movement, and/or settlement cracking. Previous repairs of horizontally cracked marble suggest that past deficiencies occurred as a result of the "Spring Break Quake" that occurred in 1993.

Though the overall deficiencies are minor, based on field observations, this study recommends repair options that consider: 1) repair of cracked and/or spalled marble panels and marble door surrounds; 2) repair of cracked terrazzo floor; 3) cosmetic replacement of missing panel mortar joints with new mortar.

Option 1: Marble Replacement: In general, marble panels and door surrounds in the Oregon Capitol maintain their structural integrity and do not require replacement. If aesthetic quality of cracked marble is of concern, then replacement is an option. Prior to replacement, it will be necessary to select marble with similar geological and aesthetic composition and match the original marble in structural strength.

It will be necessary to identify an existing working quarry source producing marble stone panels in quantity, quality, and finish matching the existing Oregon State Capitol stone. Schedules that consider block selection, preliminary slab approval, mock-up panel production and lead time for delivery should be developed. During the preliminary selection, independent testing must be performed on the marble blocks selected to confirm petrographic analysis that the proposed replacement marble matches the existing marble.

If marble replacement is to occur, extra marble should be purchased and set aside and pre-purchased for future replacement panels.

Option 2: Marble Repair: The decision to repair a crack or not repair a crack is dependent upon the cause, extent, and aesthetic result when the repair is completed. A number of the noted horizontal cracks are non-threatening to the structural integrity of the panels where they occur, as they do not traverse the entire panel. The noted cracks in the black base marble mirrored on either side of the southern Rotunda portal are diagonally cracked across the entire panel and should be either repaired or replaced. The spalling that occurs on the parapet of the balcony overlooking the Rotunda on the south side, as well as any other minor spalling, should have a Dutchman repair with marble to match existing.

On the northern edge of the Rotunda stairs, the cracked portion of the failed nosing should have a Dutchman repair. In the basement, a few of the previously repaired marble door surrounds have re-cracked and should be either repaired or replaced. The process of repairing any door surrounds that have cracked all the way through requires the removal and "gluing" back together of the two pieces, and then the reinstallation of the fixed piece. Epoxy injection into cracks is a common repair method. Such methods require the crack to be prepared by cleaning the crack with high pressure air and pre-drilling holes, or ports, for the entry and exit locations of the epoxy material. It is suggested that repair of interior marble panels with epoxy occur on the back side. Once the crack is prepared, products selected for their viscosity and compatibility with the marble are selected and installed along the crack. Pre-testing the procedure on flat panels off-site is highly recommended in order to evaluate aesthetic impact to the marble panel system.

Option 3: Install Mortar: As noted, some of the panel joints have lost their mortar due to building movement and/or seismic movement. The open joints between the panels need to be cleaned and refilled with mortar that matches the existing mortar.

Option 4: Do nothing. At their current state, none of the noted deficiencies are life-threatening to the occupants of the Capitol if left untreated. In other words, the structural attachment of all of the panels remains intact unless substantial seismic activity occurs. The undertaking of repairs would be done for the purposes of maintaining appearance, which may be reason enough considering the public importance of the building.

MISCELLANEOUS MATERIALS

Slate Pavers at Courtyards and at 1977 Senate and House Wing Rooftops

When the Senate and House Wings were added in 1977, two courtyards were created to the south of the existing Capitol, one to the east and one to the west. Both of these courtyards were paved in green slate, with two border rows and a half lap stacked bond pattern in the center.

Investigation and Deficiencies

The slate at the courtyards appears to be in good condition, with some biological growth near the walls of the new addition. Several slate pavers at the center of the west courtyard, which were not set in order to provide access to equipment below the pavers, are very loose and pose a tripping hazard.

Refer to Appendix for references and drawings.

5.2 HISTORIC ELEMENTS

"We decided, however, to try to design something that would be distinctive and different so that the Capitol would stand apart from all the other Capitols. From the beginning we also felt that this building should have all of the simplicity and fine proportion that is associated with the classic but that the detail should be related to contemporary life. This thought seemed especially appropriate when we consider the section of the country where the Capitol is to be placed, the progressive northwest where the newer ideas have more fertile soil to grow in."

Oregon State Capitol Architects
"Pencil Points, The Design That Won"

HISTORIC PRESERVATION

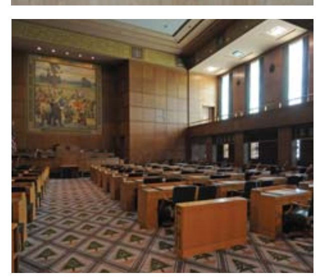
The historic elements of the Capitol include those on both the exterior and interior of the building. This master plan study does not specifically address the "Capitol grounds" or park area adjacent to the Capitol, but these areas should be addressed with the same care and preservation as the Capitol. Following is a summary of the Capitol historic elements or "historic fabric" that are to be preserved and restored as part of the master plan.

Exterior

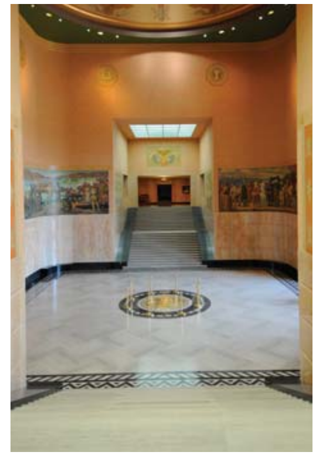
The Capitol exterior façade material is Vermont (Danby) marble, above a granite base, which slopes to reveal a full ground story on the south elevation on the 1938 portion. The windows are made of bronze and are operable although some have been sealed shut or require maintenance to regain full operation. The exterior building condition assessment and recommendations are included Architectural Section 5.1 of this report. The entire exterior façade of the building, including all marble elements such as site stairs, site walls, stone carvings, windows, and the bronze entry doors are to be preserved and restored.

Interior

The interior areas of the Capitol contain a number of unique and historic elements from spaces to artwork to finishes. The areas identified as historic and to be preserved and restored consist of the main circulation corridors and stairs, Rotunda and stair areas, Senate and House Chambers, Governor's ceremonial office and associated spaces, and the offices currently occupied by the Secretary of State and State Treasurer. There are other areas worthy of preservation and restoration also, yet more limited in their historic content. The following diagram classifies the areas within the Capitol to their historic significance. The three categories include:



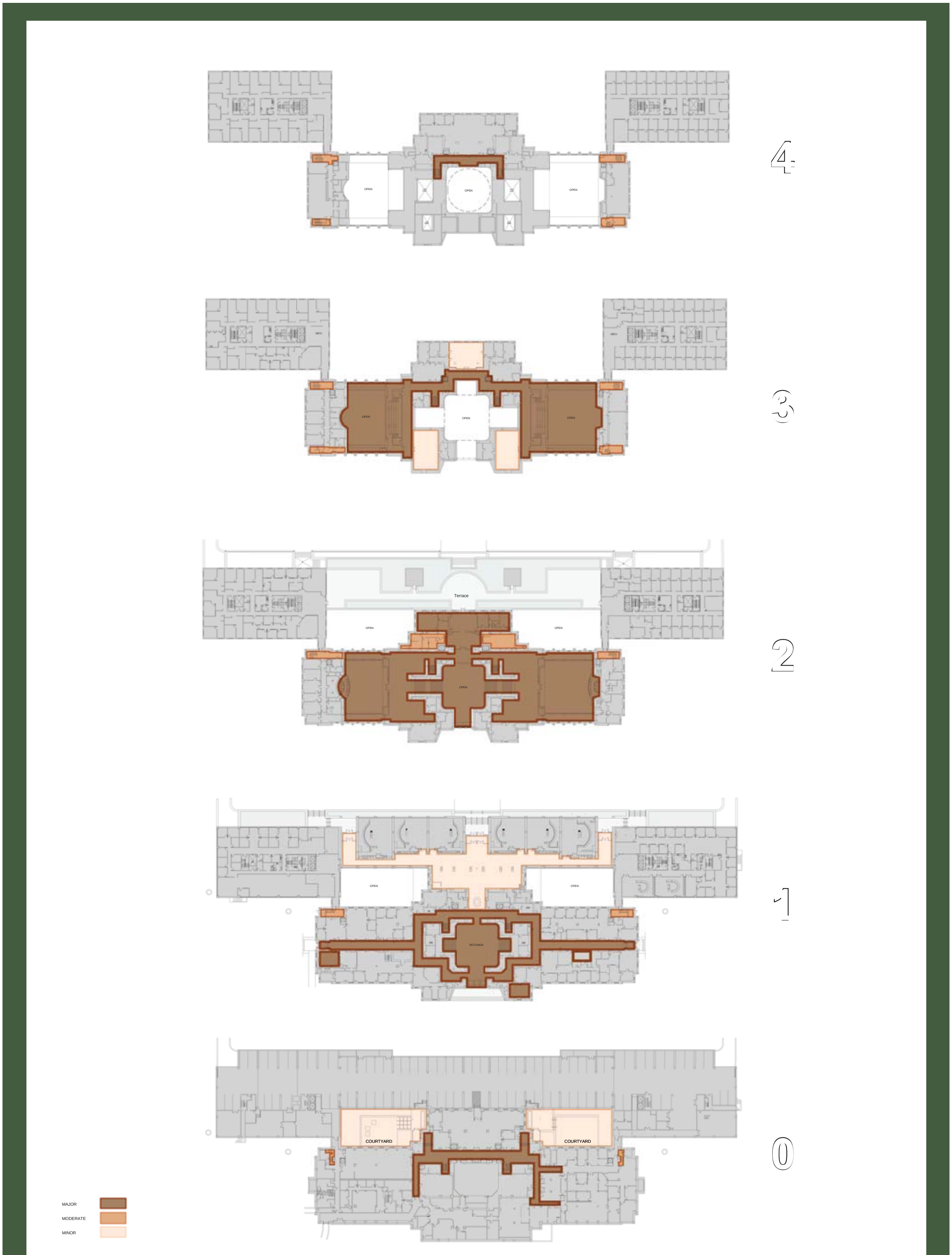
Major significance - These areas contain major elements of historical significance. It is recommended to preserve all spaces and all elements within including terrazzo flooring, Montana travertine walls, Vermont black marble base, cove ceilings, cast bronze lighting, artwork, bronze elevator doors and cabs, cast bronze railings, wood doors, door hardware, mail chutes, bronze dedicatory plaques, bronze radiator panels, skylights, wood desks/millwork and other elements of historic integrity.



Moderate Significance -These areas are historically significant but contain a moderate amount of historic elements. These areas should be preserved when possible, or renovated to be compatible in design, with the character of any existing historic elements. Renovation of the original skylights is recommended in these areas where skylights could bring natural light, but are currently covered.

Minor Significance - These areas are historically significant but contain only a minor amount of historic elements. These areas should be renovated to be compatible with the historic character of the Capitol or similar in nature to when they were originally constructed. This would also be appropriate for the main areas of the 1977 addition.

The remaining areas in the diagram are ones that were recently renovated, such as the 1977 Senate and House Wings, or other areas of general office or utilitarian use. These areas can be renovated to be compatible with the historic areas of the Capitol, but can have additional flexibility to integrate modern design elements and allow for adaptive re-use of these areas.


4
OPEN
OPEN
OPEN
3
OPEN
OPEN
OPEN
2
Terrace
OPEN
OPEN
OPEN
1
OPEN
OPEN
ROTUNDA
0
COURTYARD
COURTYARD
MAJOR
MODERATE
MINOR

HISTORIC

5.3 STRUCTURAL/SEISMIC

BUILDING DESCRIPTION

The Capitol is composed of the original building constructed in 1938 and an addition on the south side constructed in 1977. The addition consists of two, five-story legislative office wings to the southeast and southwest of the original Capitol, connected by a two-story section topped by an open plaza. The legislative office wings are separated from the central portion and from the original building by construction joints.

1938 Original Building

The original building is generally rectangular in plan with overall dimensions of 394 feet by 179 feet. The building has approximately 115,000 square feet of interior floor area. The center portion of the building houses a five-story Rotunda which effectively separates the building into three portions: the entry Rotunda and two wings. Each wing is approximately 95 feet wide and the center portion extends to approximately 179 feet in width. In addition to the Rotunda space, the center portion houses the offices of the Governor and various meeting rooms. The wings provide galleries and meeting chambers for the State Senate in the East Wing and the House of Representatives in the West Wing.

The Senate and House Wings of the Capitol are five stories tall, including the ground level which is located below grade on the north side and at grade on the south side. The total height of each wing is approximately 70 feet. The center Rotunda portion extends an additional 68 feet above the wings, and is topped by an 11 foot diameter turret which serves as a support for the Oregon Pioneer statue. A visitor's observation deck is located at the base of the turret.

The vertical load carrying system consists of a concrete beam, column, and slab system. Intermediate joists are used to support the concrete slabs at some locations. Steel beams are used at the roof level, in the Rotunda above the height of the Wings, and at various diaphragm openings. Columns are spaced irregularly throughout the building, allowing for large diaphragm openings in the Rotunda and in the House and Senate chambers. Although there are no distinct column lines for reference, the structure is generally symmetrical about a transverse line through the center of the Rotunda. Interior partitions and the interior of the Rotunda dome are made up of hollow terracotta tile. The exterior walls of the building are comprised of panels of unreinforced brick infilled between the concrete frame elements with a hollow terracotta tile interior finish and exterior cladding of marble or granite panels. Exterior grade is at the first floor level at the north side of the building and slopes down such that the first floor is approximately four feet above grade at the south side of the building. An underground tunnel has been constructed at the northeast corner of the building to provide access to other government facilities across Court Street.

The 1938 Capitol does not have an intended lateral system. At the time of its construction, no explicit consideration was given to the design for earthquake loads. The existing lightly reinforced concrete walls and the hollow clay tile partition walls have provided resistance to lateral forces. While the Capitol has performed relatively well since its construction, the walls and partitions currently in place lack the ductility and strength to resist the expected level of ground shaking. It is also noteworthy that the building has not experienced an earthquake that corresponds to the design level earthquake.

The building foundation is made up of spread footings under the columns and strip footings under the exterior walls. The column footings have pedestals between the ground floor slab and the top of the footings which creates a space of approximately 28 inches to 36 inches between the top of the ground floor slab-on-grade and the top of the footing. In its current configuration, the ground floor level consists of a double slab on grade with a total thickness of 11 inches in the public areas; the top slab consists of 2 inches of waterproofing material and a 1 inch thick marble finish. In the two mechanical equipment rooms, the double slab is made up solely of concrete.

The building experienced some damage as a result of the Scotts Mills earthquake on March 25, 1993. An investigation by Miller-Gardner Consulting Engineers revealed numerous plaster cracks, vertical joint separations, cracked brick, cracked and spalled concrete, loose and cracked marble, cracking of unreinforced clay tile brick, and other damage, particularly in the walls of the Rotunda. We understand that subsequent repairs to the building included the addition of a layer of reinforced shotcrete to the interior of the Rotunda walls to increase their lateral strength.

1977 Addition

The 1977 addition is located immediately to the south of the original Capitol. The addition is rectangular in plan with overall dimensions of approximately 70 feet by 330 feet. It has two levels that correspond to the ground and first floor levels of the original Capitol, and the top level of structure supports a landscaped plaza. At the east and west ends there are two five story wings. The wings are of concrete pan joist construction with overall plan dimensions of approximately 150 feet by 86 feet. Each wing has a 92 feet by 57 feet mechanical penthouse centered within the plan dimensions of the fifth floor. The roof to the mechanical penthouse is framed with steel beams.

The addition is separated from the original Capitol and from the legislative office wings by a 1-3/8 inch joint at the first floor and a 1-1/2 inch joint at the second floor.

The existing lateral system within the Legislative addition utilizes reinforced concrete shearwalls. Major changes to the Oregon Building Code with respect to the design and detailing of concrete shear walls occurred in 1976. The design criteria stated in the drawings from 1975 indicate that the newer code was not used. Since the mid-seventies, the seismic design forces have increased approximately 400%. The existing concrete walls lack sufficient strength and ductility to resist the increased expected forces.

The first floor and plaza level of the addition are constructed of reinforced concrete slabs and joists supported by concrete beams, columns, and walls. The walls and columns are supported by concrete spread footings. The ground floor level serves as a parking garage and is a concrete slab on grade. Lateral wind and seismic forces are resisted by reinforced concrete shear walls.

The Legislative Wings received a $30 million dollar nonstructural renovation in late 2008. This renovation did not include any structural or seismic work of which we are aware.

PREVIOUS EVALUATION EFFORTS

Since the early 1990s, the Legislative Administration Committee, through the State Capitol's Facility Services, has commissioned several studies of the building. We have reviewed a number of them to gain an understanding of what seismic deficiencies have been previously identified and to provide a background for developing the seismic rehabilitation portion of the master plan.


ROTUNDA STRENGTHENING

R.T. Miller Engineering, Inc. issued their report of a general structural assessment of the original Capitol in March 1990 that identified a few structural repairs that were needed, along with numerous repairs of the exterior and interior finishes, but did not include a review of seismic performance. This was followed in June 1990 by a seismic evaluation of the building by Miller that included in-situ material tests, soils tests, development of site-specific response spectra, dynamic computer analyses, and recommendations for strengthening the building. The evaluation was based on the 1988 Uniform Building Code, using a demand for zone 3 with an importance factor of 1.25. Although the performance criteria of the evaluation are not specifically described, it appears that the goal was to reduce the level of damage and minimize the risk to life safety. The recommendations placed the highest priority on strengthening the dome, turret, and statue attachment above the Rotunda, but also included shotcrete placement on walls throughout the building, removal and replacement of the hollow clay tile partition walls, and improvements to the exterior cladding attachments.

Miller concluded that this scope of strengthening would result in significant disruptions to the activities within the building as well as impacts to the historical fabric. In addition, the understanding of the potential for very large subduction zone earthquakes originating off the Oregon coast was being developed by seismologists. Therefore, Miller concluded that the proposed strengthening might not provide adequate protection for the building and its occupants during these ground motions. Miller retained Dynamic Isolation Systems to develop a scheme for base isolating the building, which was described in a report dated August 1990.

KPFF Consulting Engineers was retained to peer review Miller's 1990 evaluation and to perform a secondary evaluation of the Capitol. KPFF issued their report in April 1992 that confirmed Miller's assessment of the building's seismic vulnerabilities and concurred that base isolation would be a more reliable means of protecting both the building and its occupants and would reduce the scope of strengthening needed on the interior.

Miller-Gardner, Inc. (formerly R.T. Miller Engineering) issued another report in September 1992 summarizing the scope of the recommended seismic rehabilitation and their opinion of the associated costs. This report divided the work into five phases, each with an associated cost. The first phase consisted of base isolation, with later phases addressing strengthening of the various components of the building. Though the State could choose to implement only some of the phases, the report emphasized that unless the base isolation was included, the effectiveness of the remainder of the strengthening would be severely limited.

On March 25, 1993, the Scotts Mills earthquake caused significant damage to the Capitol, particularly in the Rotunda area where the most severe deficiencies had been identified. It should be noted that the severity and duration of the ground shaking during the Scotts Mills earthquake was significantly less than that of a potential subduction zone earthquake. The energy released during the Scotts Mills earthquake is approximately 1/900th of that which would be released by a Magnitude 8 – 9 subduction zone event. In May 1993, Miller-Gardner issued a seismic assessment of the 1975 portion of the Capitol that described the damage to the newer portions as generally cosmetic. In February 1994, Miller-Gardner completed a damage evaluation of the 1938 Capitol and made numerous recommendations for both structural and non-structural repairs. Subsequently, we understand that the State authorized funds for the Capitol Dome Project – Phase One, which implemented the dome strengthening recommendations of previous reports.

Miller-Gardner reconfigured the five-phase approach in a report issued in July 1994. The strengthening of the Rotunda area was already underway, so it was relabeled as Phase 1. The base isolation phase was moved to Phase 4.

In the evaluation reports by both Miller and KPFF, both conclude that in the Design Base Earthquake (DBE) [corresponding to a subduction zone earthquake near the coast of approximate Richter magnitude 8.0 or a crustal earthquake in the valley of approximate Richter magnitude 7.0], the existing, un-renovated Capitol is a collapse hazard. We concur with this assessment.

For a bibliography of the previous studies we reviewed, please refer to Appendix.

SEISMIC EVALUATION METHODOLOGY

For the evaluation of the Oregon State Capitol, we have used ASCE 31-03, Seismic Evaluation of Existing Buildings. This Standard is published by the American Society of Civil Engineers and the goal of ASCE 31 is to identify the "weak links" in a building's lateral force resisting system that can lead to significant failure and/or collapse.

ASCE 31 improves on previous evaluation methodologies in many ways. The previous evaluations utilized the current building code at the time. Building codes are written for the design of new buildings, and are not intended to be tools for evaluating existing buildings. Historically, criteria for evaluation have been set lower than those for new design to minimize the need to strengthen buildings that would otherwise have only modest deficiencies. Additionally, ASCE 31 incorporates the latest displacement demand concepts, addresses both the Life Safety and Immediate Occupancy performance objectives and incorporates the latest seismic hazard maps.

The ASCE 31 methodology utilizes a three-tiered approach to the evaluation of any structure. Each tier provides the engineer with more detailed and concise information regarding the potential deficiencies of the structure to better develop a focused rehabilitation scheme. The level of analysis increases with each tier, and the conservatism of the evaluation decreases correspondingly.

Tier 1, the Screening Phase, uses a series of checklists that allow the engineer to identify potential structural, non-structural, and geotechnical hazardous elements of the building and site. The evaluating engineer addresses each checklist statement and determines whether it is compliant or non-compliant. Compliant statements identify conditions that are acceptable. Non-compliant statements identify conditions in need of further investigation. In some cases, the handbook specifies additional calculations that may be performed to address a non-compliant statement. In other cases, a detailed analysis of the building must be performed using the procedures of Tier 2.

Tier 2, the Evaluation Phase, is a full building analysis focusing upon the areas identified by Tier 1 as deficient. As in Tier 1, a Tier 2 evaluation is intended to identify elements and systems requiring rehabilitation. If deficiencies are identified using the procedures of Tier 2, the engineer may choose to develop rehabilitation schemes for those deficiencies or conduct a detailed seismic evaluation using the Tier 3 procedures.

Tier 3 typically consists of a full building non-linear analysis and is performed to further evaluate the structural deficiencies identified in Tier 1 and Tier 2.

We have completed a Tier 1 analysis to identify the structural deficiencies and have evaluated those deficiencies using Tier 2 procedures. This analysis has updated the previous efforts and analysis approaches using the current evaluation tools available.

In order to more clearly identify and quantify the rehabilitation measures, a Tier 3 analysis could be completed. This Tier 3 level of analysis will more accurately define the level of each deficiency and indicate a level of additional strength required. This increased level of evaluation will provide more detail in identifying the deficiencies and quantifying the amount of rehabilitation required.

EVALUATION CRITERIA

The procedures in ASCE 31 were developed to evaluate the seismic performance of a building at two performance levels: Life Safety or Immediate Occupancy. These performance levels are established for a single level of seismic demand. We understand the preservation of the existing interior and exterior historic fabric of the Capitol building is a high priority. As such the evaluation criteria to which we have evaluated the building is the Life Safety and then the Immediate Occupancy levels.

Seismic Demand

The seismic demand (Design Basis Earthquake) used by ASCE 31 is 2/3 of the Maximum Considered Earthquake (MCE), which is the same demand level used by the 2006 International Building Code for design of new buildings. The MCE corresponds to an earthquake with a 2% probability of exceedance in a 50-year period, or an earthquake with a return period of approximately 2500 years. In Oregon, the MCE corresponds to the subduction zone earthquake in many cases.

Performance Level

We have evaluated the State Capitol with regard to the Life Safety and then to the Immediate Occupancy performance levels as defined in ASCE 31. A building that performs at the Life Safety level are so designed that their primary aim is to save lives; the building will sustain structural damage, but the damage will not be life threatening. After the earthquake, the kind and level of damage that the structure suffers will determine if the building is repairable or will have to be demolished and rebuilt.

A building that performs at the Immediate Occupancy level will experience some damage to both structural and nonstructural components during an earthquake, although the damage will not be life-threatening. Buildings designed to this level are safe for occupation and for use immediately after a major earthquake, so that the building may remain occupied immediately after the earthquake and during repairs.

The damage that the State Capitol experienced during the March 25, Scotts Mills earthquake is consistent with the upper end of the Life Safety performance. However, as stated above, the Scotts Mills earthquake released approximately 1/900th of the energy contained in the design basis earthquake.

POTENTIAL BUILDING SEISMIC DEFICIENCIES

Using the Tier 1 procedure of ASCE 31, we have identified a number of potential seismic deficiencies in the original 1938 Capitol:

- The unreinforced brick masonry infill and hollow clay tile walls have insufficient shear strength to resist the earthquake demands. The demand-to-capacity ratios are approximately 6 in the longitudinal direction and 13 in the transverse direction. This means the existing shearwalls are 600% and 1300% overstressed in the two orthogonal directions.
- The perimeter infill walls are too slender to maintain stability during strong seismic shaking and are likely to fail out-of-plane.
- Many of the concrete columns were constructed with transverse reinforcement (ties) spaced too far apart relative to the column plan dimensions. As the building experiences relative lateral movement between stories, the columns may experience a brittle shear failure before more ductile moment yielding can occur.
- The exterior stone cladding is anchored or adhered to unreinforced brick infill panels that are not likely to remain stable under out-of-plane forces. In addition, the joints between the panels are not capable of accommodating the expected horizontal displacements between stories, so seismic-induced story drifts will result in heavy damage to the panels and their attachments. Falling stone panels constitute a hazard on the exterior, particularly near exits.

We have identified the following potential deficiencies in the 1977 Capitol addition:

- The lateral force-resisting system on the upper story is limited to two bays of shear wall on the south side. These two walls lack the strength and ductility to resist the expected forces. The demand/capacity ratio for these walls is approximately 9.
- The joints between the exterior stone cladding panels are not capable of accommodating the expected horizontal displacements between stories.
- Shear walls in the wings are limited in number, and have a demand to capacity ratio approaching 12 in the transverse direction and 8 in the longitudinal direction.

We have also identified the following potential nonstructural component deficiencies:

- The interior partitions in the Capitol, many of which have historically or artistically significant finishes, are constructed of hollow clay tile masonry. This is a heavy, brittle, and relatively weak material. Seismic accelerations from a large earthquake are likely to result in numerous out-of-plane wall failures. The addition contains concrete block partition walls in limited areas of the ground floor which are also likely to result in out-of-plane failures

- The plaster ceilings in many areas of the Capitol, including the Rotunda, are not capable of accommodating the expected building movements. The material is brittle and relatively weak, and there are few, if any, joints that would allow the expected interstory drifts to occur without significant damage to the finishes.

- Stairwells and elevator shafts in the Capitol are surrounded by a combination of lightly reinforced concrete and hollow clay tile walls. The failure of these walls could render the exit ways impassable.

- We have assumed that ceilings, fire sprinklers, ducts, etc. that were replaced during the recent renovation have been adequately braced.

We understand that a seismic upgrade of the building would include improvements to the mechanical and electrical systems. We have assumed that these improvements would include bracing and attachments in accordance with current seismic standards, therefore, we have not included them in the scope of this evaluation.

EXPECTED BUILDING PERFORMANCE

Although it is impossible to predict and quantify the exact nature of the ground motion at any particular site, the State Capitol could potentially experience partial collapse during the Maximum Considered Earthquake. This expectation is based on the results of our ASCE 31 evaluation as well as on our experience and judgment. We expect portions of the reinforced concrete frame to exhibit reasonable ductile behavior, although some columns may experience brittle shear failures causing partial collapse. Although the risk of complete floor collapse is relatively low, most of the beam-column joints will experience large deformations and will likely be damaged beyond repair. The unreinforced brick infill panels will behave in a much more brittle manner and will become extensively cracked after relatively few cycles of shaking. As the brick loses integrity, it may become unable to provide out-of-plane stability to the exterior cladding, which may fall from the building. The heavy, brittle interior partitions may lose lateral support and collapse throughout the building, potentially blocking stairways and corridors and preventing access to the exits. Other brittle interior finishes such as plaster will also be heavily cracked and will break and fall, creating unsafe conditions.

We anticipate a smaller amount of damage to the 1977 addition during the design basis earthquake, since it relies on much stronger concrete walls to resist lateral forces. Most of the structural damage is expected to be concentrated at the seismic joints adjacent to the original Capitol and between the two-story portion of the addition and the office wings. The joints at these locations do not appear to be large enough to accommodate the expected building movements, and there is a potential for pounding to occur between the buildings. During strong ground motions, damage to the second floor shear walls on the south side of the building on either side of the entry should be expected in the form of diagonal cracks in the shear walls. The exterior stone panels will have cracks as a result of the inter-story drifts.

To protect the inhabitants of the building and the general public, and because of the importance of the building to the identity of the State of Oregon and to the proper functioning of our State government, we recommend seismic rehabilitation of the building as outlined in the next section.

SEISMIC REHABILITATION SCHEMES

Past seismic studies of the building have focused on two general means of addressing the State Capitol's seismic deficiencies: first, a traditional strengthening scheme that augments the strength of the existing structure with added shear walls and second, a base isolation scheme that decouples the building from the ground motions and requires less strengthening within the structure above the base. Each approach has advantages and disadvantages with regard to construction cost, construction duration, effects on the occupants, and influence to the building's layout and aesthetics.

There are several options to consider in approaching the seismic renovation of the State Capitol. The renovation options range from a minimalist approach, which assumes a large risk of consequences, to a fairly robust seismic damage mitigation approach which minimizes as much as possible the post earthquake damage.

Option 1 - Minimal Renovation Approach

If a minimalist approach is implemented, the structural upgrade work might vary from doing nothing to strategically identifying, prioritizing, and mitigating those elements most detrimental to the Life Safety performance.

To minimize the disruption to the occupants and to the functioning of the State Capitol, the columns could be wrapped with carbon fiber-reinforced polymer material, which would reduce the loss of load carrying ability of those elements during an earthquake. Additionally, a beam seat could be added to the face of the columns immediately beneath the beam so there is redundant support should the beam joints degrade to such an extent that they lose their ability to carry load.

This minimal amount of work would reduce the partial collapse concern at the beam-column joints.

Option 2 – Life Safety

Referred to as the "traditional" method of strengthening, this method employs the addition of new structural elements, in this case concrete shear walls, to resist and augment the existing structure. Where new structural elements are introduced, architectural finishes and building services must be moved and replaced.

TYPICAL SHEAR WALL

Structural

- Reinforce the walls of the turret with masonry anchors and reinforced shotcrete.
- Strengthen the beams of the Rotunda roof with steel plates to increase resistance to overturning loads from the turret.
- Reinforce the parapets around the Rotunda roof with masonry anchors and reinforced shotcrete.
- Brace the suspended plaster finishes of the Rotunda interior with steel trusses.
- Remove the interior wall finishes from all exterior walls and apply a layer of reinforced shotcrete to the inside face of all exterior walls between the foundation and the roof level.
- Construct concrete shear walls on either side of the Rotunda, extending from the foundation up to the roof level. The shear walls will be anchored to the existing columns and to the floor diaphragms at each level with adhesive rebar dowels. Construct a continuous concrete wall footing beneath each wall that envelops the existing column footings. Some of this work has already been designed and partially constructed.
- Remove the cladding at each floor line around the entire perimeter of the building. Re-support the cladding on ledger angles at each floor line and roof. Re-attach the marble cladding, accommodating the newly installed ledger angle.
- Wrap the columns that have low shear strength with fiber-reinforced polymer material. Where columns occur at the building perimeter, the stone panels immediately adjacent to these perimeter columns will need to be removed and reinstalled.

Nonstructural

- Brace the hollow clay tile interior partition walls with metal studs or carbon fiber anchored to the floor structures, or remove and replace them with modern materials.
- Brace the plaster ceilings.
- Brace or remove and replace the lightly reinforced concrete and hollow clay tile walls which surround the stairwells and elevator shafts.
- Secure the Oregon Pioneer statue to the turret roof with stainless steel anchors.

» Brace tall, narrow building contents against overturning in locations where they could block exit passages.

With the Life Safety Performance Objective approach, the concrete shear walls can be strategically located to resist the seismic forces and to minimize the disruption to the program of the building. The extent of the number, location and thickness of the new shear walls will vary based on the balance between the efficiency of structural rehabilitation and the program needs of the occupant.

The shear wall approach is a fairly conventional method to strengthen existing historic buildings similar in construction to the Capitol. However, due to the introduction of new shear walls, existing finishes and services (such as duct work, electrical lines, plumbing lines, etc.) can be significantly impacted. While the structural cost of the renovation is minimized, the non-structural mitigation costs tend to increase.

Base isolating the structure to achieve a Life Safety Performance Objective is a costly option. Implementing a base isolation approach comes with a high root cost that, should this approach be taken, it may be more prudent to set the performance objective at Immediate Occupancy. The difference in cost is minimal between Life Safety and Immediate Occupancy with the base isolation option. Base isolating the structure is not a cost effective approach with the Performance Objective at Life Safety.


BASE ISOLATION

Option 3 – Immediate Occupancy

This option includes the base isolation of the building. Base isolation of the building is a method of seismic rehabilitation that involves decoupling the building structure from the ground. The isolation is achieved through placing isolation bearings at a predetermined level – the plane of isolation. Typically, isolation bearings are placed between the ground and the building columns at the interface of the columns and foundations. The ground accelerations that occur in an earthquake are not transferred to the building structure. In a fixed base or "traditional" approach, the building structure actually amplifies the ground acceleration in a "whiplash" effect. In base isolated buildings, ground accelerations are not transferred to the building, hence the resulting forces and damage are greatly reduced.

Structural

» Remove the interior partition walls and the slab on grade at the ground floor level and excavate to expose all footings. Provide temporary shoring at each column and along the perimeter walls, remove each footing, and replace it with a footing at a lower bearing elevation. Install base isolation bearings under the columns and exterior walls.

» Construct new structural basement slab. Tie new footings together with grade beams. Construct new moat (ranging from 18" to 24") wall around perimeter and tie into the original structure.

- Install flexible couplings at all utility service connections that could accommodate 24 inches of movement.

- We expect that there may be some structural strengthening that would be required above the plane of isolation; however, we expect that it would be of considerably less scope than that required for the traditional scheme since the accelerations experienced in the building would be approximately 25% of those in the traditional scheme. Therefore, shear walls and other structural elements would be less extensive. However, the main difference between the two schemes would be the level of damage to the building. The base isolated scheme would result in little or no structural damage and little or no damage to the building contents. In the traditional scheme, while damage to the structure would be minor, the accelerations in the building could cause some damage to the contents of the building that are not anchored.

Nonstructural

We envision that the base isolated scheme could greatly reduce or perhaps eliminate the need for nonstructural mitigation due to the reduction in accelerations transmitted to the building. The design criteria could be set to limit the accelerations in the building to a level that would not significantly damage the nonstructural components – thus eliminating the need for wholesale mitigation. However, minor nonstructural mitigation in limited areas may be needed, including the following:

- Brace the hollow clay tile interior partition walls with metal studs anchored to the floor structures, or remove and replace them with modern materials.

- Secure the Oregon Pioneer statue to the turret roof with stainless steel anchors.

- Brace tall, narrow building contents against overturning in locations where they could block exit passages.

Seismic isolation is a common method to rehabilitate historically significant buildings and has been employed in numerous cases in regions of high seismicity. Examples of implementation of seismic isolation include the San Francisco City Hall, the Utah State Capitol, the Salt Lake City/County building, Pasadena City Hall, and locally, the Pioneer Federal Courthouse in Portland.

ADVANTAGES AND DISADVANTAGES OF THE OPTIONS

Option 1 – Minimal

- This option is the lowest cost solution.

- There is no statute or code requirement to seismically rehabilitate the building.

- The range of damage could be partial collapse (do nothing) to extensive damage and loss of use for a period of up to 2 years, or damage beyond repair.

- The risk to the occupants is greatest in this option.

Option 2 – Life Safety

- The central core of the Capitol (consisting of the Rotunda/dome area from the ground floor up to the Oregon Pioneer statue) has had a structural design implemented which relies on force levels that presumed the future use of base isolation. Omitting the base isolation would mean these new walls would be structurally inadequate to resist the expected seismic forces.

- Construction of the traditional shear wall rehabilitation option is more economical from a pure structural point of view. However, the magnitude and extent of the new walls will affect the program and historic fabric of the building significantly. As the cost of the structural rehabilitation work decreases, the cost associated with the non-structural elements increases. Depending on the desired level of preservation of the nonstructural fabric, this shifting of cost can be considerable.

- Preserving the interior and portions of the exterior finishes and historic fabric will be complex and costly.

- Rehabilitation construction may be accomplished in phases, without having to vacate the entire building. This assumes a phasing that is within a relatively short period of time, i.e. the entire building would be rehabilitated in a three to four year period.

Option 3 – Immediate Occupancy- Base Isolation Scheme

- Base isolated buildings can achieve a high level of performance with reduced amount of interior alterations. By isolating the structure from the ground motions, the forces that the existing Capitol will need to resist are reduced. Generally, the isolation can achieve up to a 75% reduction of the forces and accelerations. This directly relates to the amount of internal shear walls and other structural elements.

- Construction of Phase 1 would take approximately 3+ years with a 6 month pause for a Legislative session to take place. Areas above the new Concourse Level could be occupied during the construction but parking in the Capitol would require relocation. Construction of Phase 2 would take approximately 2 years and with proper segments, could occur during the Legislative session.

- The reduced amount of new structural elements will result in preservation of the interior finishes and historic fabric.

NEXT STEPS

It is clear that the Legislative Administration Committee has had a successful program over the score of years of seismic evaluation and mitigation. Developing the rehabilitation measures after the Scotts Mills earthquake and completing several studies are logical extensions of this work. Throughout the course of this current evaluation, several issues were explored that are recommended to be addressed to continue the Legislative Administration Committee's progress toward a seismically resistant Capitol. The following section outlines their next steps.

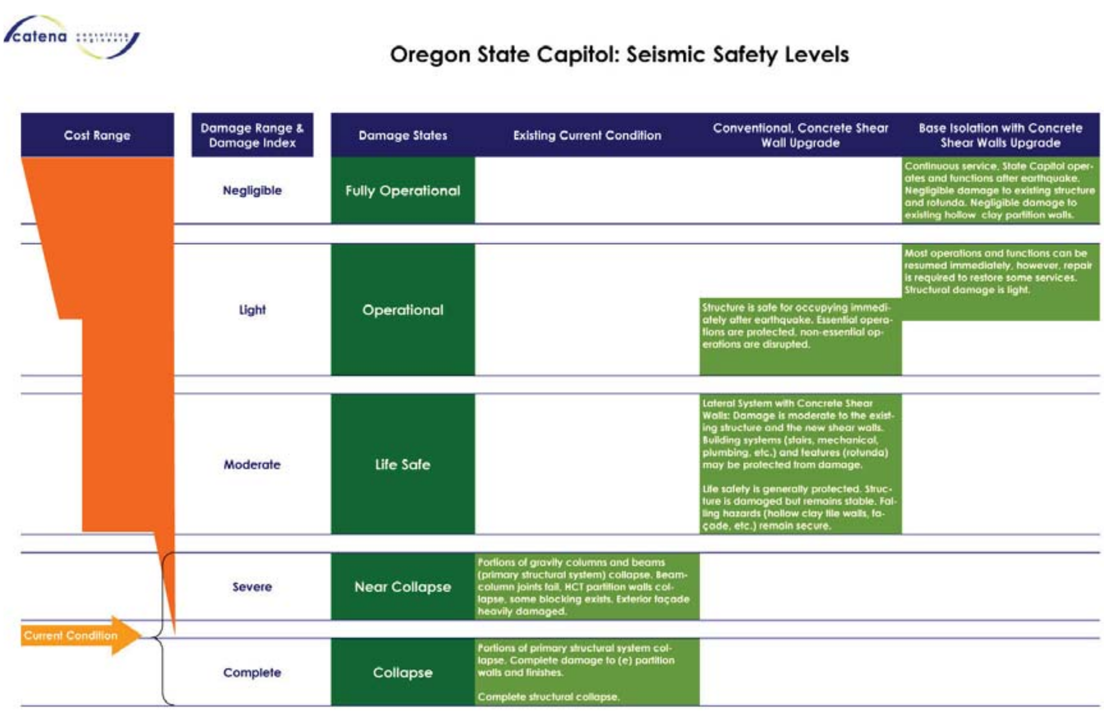
1. The performance objective for the Capitol are to provide for Continued Operation or Immediate Occupancy for the more frequent earthquake (BSE -1 as per ASCE -41) and Life Safety for the rare earthquake (BSE-2 as per ASCE-41) as a minimum, given the historic nature and value of the facility and critical nature of its function.
2. The analysis and rehabilitation using the base isolation scheme.
3. Continue to monitor estimated costs including all components of the work – architectural, structural, mechanical, electrical, plumbing, etc. using current market conditions and projected escalation.
4. In future phases of work, selective destructive testing of existing structural elements is recommended to fully understand their strength and deformation characteristics, so that may be incorporated into the rehabilitation design.

The continued analysis of the Capitol will allow developing seismic rehabilitation schemes that may be carried forward to implementation. Subject to this future analysis, we are using a base isolation scheme as the recommended approach for this report because:

» A higher seismic performance level may be achieved compared to a shear wall strengthening scheme.

» It is less invasive to the fabric of the building and less disruptive to upper levels.

» It appears to be highly competitive on a cost basis with a shear wall approach.



5.4 MECHANICAL SYSTEMS

HEATING SYSTEMS

Space heating is provided by a combination of steam and hot water heating systems. A steam boiler plant produces high pressure steam which is used to heat the facility. The 1977 addition also has a hot water boiler plant which is used to heat the addition when the steam plant is not in operation.

Steam Heating System

A high pressure steam boiler plant is located in the Garden Pride building east of the Capitol. The plant consists of two high pressure water tube steam boilers, deaerator feed water heater, three feed water pumps, and associated equipment.


HIGH PRESSURE STEAM BOILERS

The boiler plant produces 40 psi steam, which is distributed throughout the Capitol for space heating. Steam and condensate distribution piping are routed through a below grade utility tunnel, which connects the Garden Pride building to the Capitol. The plant is operated from 5:30 a.m. to 4:45 p.m. from October through May, and is shutoff if the outside air temperature is higher that 60°F.

A pressure reducing station located in the basement of the 1938 building reduces steam pressure to 5 psi for distribution to air handler heating coils and to 3 psi for distribution to steam radiators.

Age & Condition

- Boiler Plant: The boiler plant and a portion of the steam and condensate piping in the utility tunnel were installed in 1996 and are in generally good condition.
- 1938 Building: Steam system piping and equipment were installed in 1938 and have exceeded their useful life.
- 1977 Addition: Steam system piping and equipment were installed in 1977 and appear to be in good condition.

Observations

- Manned Boiler Plant Operation: State regulations stipulate that high pressure steam boiler plants must be manned when in operation. Therefore, facility staff must be assigned to manually start, stop, and periodically inspect boiler operation daily to insure safety. This results in a substantial labor cost. Additionally, steam boilers can only be operated when facility staff is on site. Consequently, the 1938 building can not be heated during off hours unless facility staff is scheduled to work extended hours. This condition can be eliminated by converting heating systems in the 1938 building to use hot water as a heating source. A hot water boiler plant would have fully automatic controls and would not require continuous manned operation.

» Boiler Efficiency: High pressure steam boilers have a low efficiency when compared with newer condensing type hot water boilers. Boiler plant efficiency can be improved by approximately 20% by converting to modern hot water boilers.

» Condensate Pumping Station: A condensate pumping station is located in the utility tunnel, which returns condensate to the boiler plant. The pumping system appears to be under-sized. The receiver tank often overflows during periods of peak steam demand. The receiver tank is not equipped with a water level gauge and receiver tank high water alarms do not exist.

» Deaerator Tank Pitting: Excessive pitting was identified in the deaerator tank. A sacrificial anode was installed and chemical treatment practices were modified. Tank wall thickness was tested using ultrasound and found to be acceptable.

» Noisy Pressure Reducing Stations: Two steam pressure reducing stations control steam pressure to building heating equipment. Facility staff report that the pressure reducing stations are noisy during some operating conditions and disturb occupants in nearby spaces.

» Asbestos Piping Insulation: Sections of steam and condensate piping and fittings in the original building have asbestos insulation.

» Seismic Restraints: Steam system piping and equipment are not seismically restrained in accordance with current code.

» Steam and Condensate Shutoff Valves: Shutoff valves throughout the original building do not shutoff properly.


CONDENSING HOT WATER BOILERS


CONDENSATE PUMPING STATION

1977 Addition Hot Water Heating System

A hot water heating system provides space heating for the 1977 addition. Heating can be provided by either of two sources. A steam-to-water heat exchanger is used to heat hot water when the steam boiler plant is in operation. Three hot water condensing boilers are used to heat the addition when the steam boiler plant is off.

The hot water heating system consists of a steam-to-water converter, steam pressure reducing station, condensate return unit, three condensing hot water boilers each equipped with boiler circulation pumps, and two main hot water distribution pumps.

Age & Condition

» Hot Water Heating System: The system was originally installed in 1977, although large portions of the system have been upgraded or replaced. Remaining portions of the original system appear to be in good condition and include the steam-to-water heat exchanger, steam pressure reducing station, condensate return unit, and portions of the heating water piping system.

- » Hot Water Boilers: Three hot water boilers and boiler circulation pumps were installed in 1996. The equipment is in good condition.
- » House and Senate Wings Renovation: A large portion of the heating water system was replaced in 2008 as part of the Capitol Wings Renovation Project. The work includes replacement of two distribution pumps, heating water piping in the Wings, and the heating water system automatic controls.

Observations

- » Boiler Efficiency: Facility staff reported that the hot water boilers are difficult to tune and, therefore, do not operate at optimum efficiency.
- » Asbestos Piping Insulation: Piping and fittings installed in 1977 were insulated with asbestos insulation.
- » Seismic Restraints: Steam system piping and equipment installed in 1977 are not seismically restrained in accordance with current code.

COOLING SYSTEMS

Chilled water is provided to air handling units throughout the facility for air conditioning. The central chiller plant is located in a basement level mechanical room in the 1977 addition. A second process chiller provides cooling for critical air conditioning loads in the facility including data processing centers, communications equipment rooms, and electrical rooms, and operates whenever the central chiller plant is not operating.

Air Distribution Systems

- » 1938 Building: Seven air distribution systems were installed as part of the original building and serve all of the basement and first floors, and portions of the second, third, and fourth floors including the Governor's offices, House and Senate Chambers, caucus rooms, and hearing rooms. Air distribution systems provide heating, cooling, and ventilation during occupied hours.
- » Seven air distribution systems were installed in 1968 and serve offices and lounges on the west and east end of the 1938 building and offices on the south portion of the third and fourth floors. Air distribution systems provide heating, cooling, and ventilation during occupied hours.
- » It is noteworthy that the Rotunda is unconditioned. No heating, cooling, or ventilation is provided in that space.
- » House and Senate Wings: Two air distribution systems serve the House and Senate office wings. Air handling equipment is located in penthouse mechanical rooms above each wing. Supply and return ductwork systems are routed in vertical shafts to each floor. Terminal units control the amount of heating, cooling and ventilation provided to each space.

» Hearing Rooms: Six air handling units serve 1st floor hearing rooms and the adjacent corridor located in the 1977 addition. The units are located in two mechanical rooms in the parking garage level and two mechanical rooms on the 2nd floor terrace. Each air handler provides heating, cooling and ventilation to one hearing room.

Central Chiller Plant

The chiller plant includes two, water-cooled chillers and associated chilled water and condenser water pumps. Two cooling towers are located on the roof of the Senate Wing, which rejects heat produced as a byproduct of the cooling process.

Chiller CH-1 is a 370-ton centrifugal-type, water chiller and chiller CH-2 is a 185-ton, screw-type chiller. Both have 134A refrigerant which is CFC free. The plant is operated from 7:00 a.m. to 4:45 p.m. from May through October, and is shutoff if the outside air temperature is below 65°F.

WATER CHILLER CH-1

Age & Condition

» Chiller Plant: Chillers and pumps were installed in 1996 and are in generally good condition.

» Cooling Tower: Cooling tower CT-1 was replaced in 1996 and is in good condition. Cooling tower CT-2 was installed in 1977 and is in fair condition.

COOLING TOWER CT-2

» Chilled Water & Condenser Water Piping: A majority of piping was installed in 1977. Some sections of chilled water risers in the wings are being replaced in 2008 as part of the Capitol Wings Renovation Project, as well as 16 of 23 chilled water control valves.

Observations

» Chiller Staging Controls: Operating the chiller plant with two chillers on-line is problematic. Existing control systems are unable to start the second chiller reliably without producing low-flow, safety shutdowns.

Process Chiller

A 30-ton, air-cooled chiller is located in the basement parking area and provides cooling for critical air conditioning loads in the facility that operates continuously. The process chiller provides chilled water for critical loads including data processing centers, communications equipment rooms, and electrical rooms. The chiller operates whenever the central chiller plant is not in operation.

PROCESS WATER CHILLER

Age & Condition

» Process Chiller: The process chiller was installed in 2006 and is in good condition.

AIR DISTRIBUTION SYSTEM

For the purpose of this report, air distribution systems have been separated into two categories: systems serving the 1938 building and systems serving the 1977 addition.

1938 Building Air Distribution Systems

Following is a summary of air distribution systems serving the 1938 Capitol.

1938 Systems: Air distribution systems SF-1 through SF-7 were installed as part of the original building. Built-up air handling units are located in two basement mechanical rooms and two 4th floor mechanical rooms. The systems originally provided heating and outside air ventilation. However, chilled water cooling coils were added to the systems in 1968 to provide air conditioning. Perimeter spaces and the 1st, 2nd, 3rd, and 4th floors also have steam convectors or fan coil units below windows to provide supplemental heating and cooling. These devices are described further in "Unitary Heating and Cooling Systems" below.

1938 FAN SYSTEM SF-1

1968 Systems: Air distribution systems SF-8 through SF-14 were installed to serve offices and lounges on the east and west ends of the 1938 building and the 3rd and 4th floors above the Governor's offices. Air handling units are located in several small mechanical rooms on the 4th floor and in one penthouse mechanical room. These systems provide heating, cooling, and outside air ventilation, and operate in conjunction with perimeter steam convectors and fan coil units as described above.

Age & Condition

- 1938 Systems: SF-1 through SF-7 were installed in 1938 and have exceeded their expected useful life.
- 1968 Systems: SF-8 through SF-14 were installed about 1968. The equipment generally appears to be in fair condition but is approaching the end of its useful life.

Observations

- SF-2: Several leaking steam coil tubes have been capped reducing coil capacity. The unit often trips on freeze protection during periods of cold weather.
- SF-6 & SF-7: Each system serves the associated legislative Chamber and adjacent caucus rooms and hearing rooms. The systems are generally controlled to maintain space temperature in the Chamber. Consequently, space temperatures in the caucus rooms and hearing rooms become uncomfortable.
- SF-12 & SF-13: Air distribution systems serve interior and exterior spaces resulting in poor space temperature control. SF-12 draws 100% outside air into the supply fan. It does not appear that 100% outside air is required for ventilation, which results in excessive energy consumption for heating and cooling.
- Maintenance Access: SF-8 through 14 are installed in very small mechanical rooms with insufficient clearance to properly maintain equipment. In several instances, code-required service clearance is not maintained in front of electrical equipment.

TABLE 1			AIR DISTRIBUTION SYSTEM SUMMARY
System Designation	System Type	Area Served	Installation Date
SF-1	Variable Volume Reheat	North Basement	1938
SF-2	Kitchen Make-up Air	Café Today	1938
SF-3	Variable Volume Reheat	Basement SE, 1st Floor East	1938
SF-4	Constant Volume Heating & Cooling	Basement SW, 1st Floor West	1938
SF-5	Dual Zone Heating & Cooling	Basement Room 50, 2nd Flr Governor Office	1938
SF-6	Single Zone Heating & Cooling	Senate Chamber, Senate Caucus	1938
SF-7	Single Zone Heating & Cooling	House Chamber, House Caucus	1938
SF-8	Single Zone Heating & Cooling	3rd & 4th Floors South	1968
SF-9	Single Zone Heating & Cooling	3rd & 4th Floors South	1968
SF-10	Multizone Heating & Cooling	3rd & 4th Floors South	1968
SF-11	Multizone Heating & Cooling	3rd & 4th Floors South	1968
SF-12	Single Zone Heating & Cooling	2nd, 3rd, 4th Floors East	1968
SF-13	Single Zone Heating & Cooling	2nd, 3rd, 4th Floors West	1968
SF-14	Multizone Heating & Cooling	2nd, 3rd, 4th Floors East	1968

SENATE WING AIR HANDLING UNIT ASU-1

1977 Addition Air Distribution Systems

Following is a summary of air distribution systems serving the 1977 addition.

ASU-1 and ASU-2: Two built-up variable volume air distribution systems serve the House and Senate Wings. Air handling equipment is located in penthouse mechanical rooms. Each air handler consists of a supply fan, chilled water cooling coil, pre-filters and final filter, and mixed air dampers for controlling the amount of outside air provided to the space for cooling and ventilation, and a return air fan. Supply and return ductwork systems are routed in vertical shafts to each floor. A combination of variable volume reheat and parallel fan powered reheat terminal units control heating, cooling, and ventilation in each space.

ASU-3 through ASU-8: Single zone heating and cooling units serve 1st floor hearing rooms and the adjacent corridor. The units are located in two mechanical rooms in the parking garage level and two mechanical rooms on the 2nd floor terrace. Each air handler consists of a supply fan, hot water heating coil, chilled water cooling coil, pre-filters and final filter, and mixed air dampers for controlling the amount of outside air provide to the space for cooling and ventilation. Each system also has an independent return air fan and duct mounted reheat coil to heat air delivered to the corridor area.

Age & Condition

» ASU-1 and ASU-2: These systems were installed in 1977, and renovated in 2008 as part of the Capitol Wings Renovation Project. Built-up air handling units were reused and major components such as fans, dampers, and controls were replaced. All ductwork, terminal units, and controls on the floors were replaced.

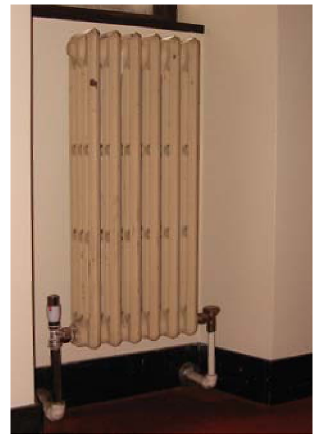
- ASU-3 through ASU-8: These systems were installed in 1977 and are in fair to good condition.

Observations

- Air Filters: Air handlers ASU-3 through ASU-8 have slots for a one-inch pre-filter and 12-inch bag type filters. Pre-filters were found to be missing.

Unitary Heating and Cooling Equipment

The following additional heating and cooling equipment serves various spaces throughout the facility.



STEAM CONVECTORS

FAN COIL UNIT

Steam Radiators: Cast iron radiators and finned convectors were originally installed below windows throughout the 1938 building for space heating. Heating units are controlled by manual control valves and thermostatic control valves.

Electric Unit Heaters: Heaters are installed in stairwells in the 1977 addition. Heaters are also provided above the suspended ceiling in the basement parking to prevent fire sprinkler piping from freezing. Heaters are controlled by integral thermostats.

Fan Coil Units: Fan coil units were installed below windows in offices located on the west, south, and east exposures of the 1938 building to replace original steam radiators. Fan coils have steam heating coils and chilled water cooling coils. Fan coil units also provide cooling for the basement electrical room and the basement conference room/test lab.

Computer Room Air Conditioning Unit: A computer room cooling unit is located in the basement that serves a data processing center located on the first floor Senate wing. The system consists of a supply fan direct expansion cooling coil and a chilled water cooling coil.

Process Cooling Systems: Self-contained split system cooling units provide cooling for the following spaces:

- Media services located in the basement of the 1938 building.

- Elevator equipment room located in the penthouse of the 1938 and 1977 buildings.

Age & Condition

- Steam Convectors: Installed in 1938 and have exceeded their expected useful life.

- Fan Coil Units: Installed in 1968 and have exceeded their expected useful life, other than those in specific areas that have been replaced, principally the areas affected by the 2008 fire.

» Electric Unit Heaters: Installed in 2008 as part of the Capitol Wings Renovation Project.

» Computer Room Cooling Unit: Installed in 1993 and is nearing the end of its expected useful life.

TABLE 2			AIR DISTRIBUTION SYSTEM SUMMARY
System Designation	System Type	Area Served	Installation Date
ASU-1	Variable Volume Reheat	Senate Wing	1976
ASU-2	Variable Volume Reheat	House Wing	1976
ASU-3	Single Zone Heating & Cooling	Hearing Room A	1976
ASU-4	Single Zone Heating & Cooling	Hearing Room B	1976
ASU-5	Single Zone Heating & Cooling	Hearing Room C	1976
ASU-6	Single Zone Heating & Cooling	Hearing Room D	1976
ASU-7	Single Zone Heating & Cooling	Hearing Room E	1976
ASU-8	Single Zone Heating & Cooling	Hearing Room F	1976

PLUMBING SYSTEMS

Potable Cold and Hot Water

Cold water is provided to the building from the City utility system and distributed throughout the building to plumbing fixtures and process equipment.

1938 Building: A four-inch water service enters the building from the north. Buried water piping is ductile iron and cast iron from the meter to the building penetration. The service is protected by a reducer pressure type backflow preventer. Original potable water piping is a mixture of galvanized steel and brass. Subsequent additions used a combination of brass, galvanized steel, and copper. Piping is insulated with a variety of materials. Original piping has cork insulation. More recent installations have fiberglass insulation, and some sections are uninsulated.

1977 Addition: A four-inch service enters the building from the southeast. Buried water piping is ductile iron from the meter to the building penetration. The water service is protected by a reduced pressure type backflow preventer. Piping inside the building is copper with victaulic or soldered joints, and has fiberglass insulation.

Age & Condition

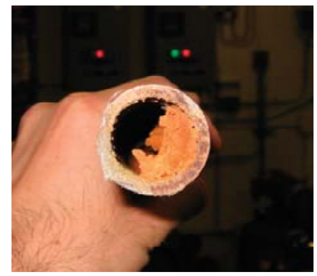
» 1938 Building Water Service: Buried water service piping was replaced with cast iron from the utility water main to within 15 feet of the building in 1999. The remaining 15 feet of buried piping is hub type cast iron piping with lead sealed joints. The section with lead sealed joints needs to be replaced.

- 1938 Building Potable Water Piping: The original cold water piping was installed in 1938, and is in generally good condition. Subsequent additions and modifications used a combination of brass, galvanized steel, and copper. The age and condition of these sections vary. Some sections of galvanized steel piping are in poor condition.

- 1977 Addition Water Service and Potable Water Piping: The buried water service and building distribution piping was replaced in 2008 as part of the Capitol Wings Renovation.

Observations

- Backflow Preventer: Facility staff report that the backflow preventer serving the 1938 building is obsolete and replacement parts are no longer available.



PIPING CORROSION

- Lead Contamination: Facility staff report measurable amounts of lead have been identified in the potable water system in the 1938 building. The source of the contamination is unknown, although it is believed that both brass piping and soldered joint material contain lead. No test data could be obtained to confirm this condition. It is recommended that additional testing be conducted.

- Brass Piping: Facility staff report that brass piping in the 1938 building is becoming brittle and is difficult to work with.

- Lead Piping Joints: Maintenance staff stated that OSHA rules prohibit using devices to melt lead to repack existing lead sealed pipe joints or use lead to seal new pipe joints. A portion of the water service to the 1938 building that contains lead sealed joints needs to be replaced.

- Seismic Restraints: Piping in the 1938 building is not seismically restrained in accordance with current code.

- Shutoff Valves: Many valves in the 1938 building which are infrequently used have frozen in position. Some valves are difficult to access and often do not have sufficient clearance to open or close. Staff report that in some locations cold water piping for multiple floors must be shut off to perform maintenance because local shutoff valves are inoperable.

Domestic Water Heating

Potable hot water is heated by three natural gas hot water heaters located in the Senate Wing penthouse mechanical room. The water heating system includes three high efficiency condensing water heaters, thermostatic mixing valves, and recirculation pumps.

WATER HEATING SYSTEM

The water heaters maintain a storage tank temperature of 140°F. Thermostatic mixing valve reduces the hot water supply temperature to 120°F for distribution to plumbing fixtures throughout the facility. Two recirculation pumps circulate a small amount of water in the piping to maintain a constant supply water temperature at each fixture.

Age & Condition

- The domestic water heating system was replaced in 2008 as part of the Capitol Wings Renovation.

Sanitary Waste & Vent Piping

A system of gravity waste and vent piping collects and discharges sanitary waste from plumbing fixtures located thoughout the building to the City waste water system.

Age & Condition

- 1938 Building: Two sewer mains discharge sanitary waste from the building. A 12-inch main exits to the north. A second 9-inch main also exits to the north. Original waste and vent piping are cast iron with hubs and lead sealed joints and has exceeded its expected useful life.
- 1977 Addition: Waste and vent piping is a mixture of cast iron no-hub and galvanized. Piping was originally installed in 1977, but a large portion of the piping in the Wings was replaced in 2008 as part of the Capitol Wings Renovation. Fixtures in the basement level drain to two sewage ejectors that pump waste into the gravity drainage system in the 1938 building.
- Sewage Ejectors: The two ejectors, installed in 1977, are in generally good condition.

Observations

- Grease Interceptor: Waste piping serving fixtures in the Café Today kitchen does not have a grease interceptor as required by Code.
- Waste Piping Inspection: Remote camera inspection of the waste pipe was performed within the last five years, and showed that the waste pipe is worn and has grown thin in fittings, such as wyes and elbows.
- Waste Piping Vaults: Two below grade piping vaults are located where the sewer mains exit the building. The vault associated with the 12-inch sewer main collects ground water and leakage from the cold water system reduced pressure backflow preventer drain. Waste piping in the vault is often submerged. High water level in the vault has a high water alarm, but the alarm is not continuously monitored.

FLOODED WASTE PIPING VAULT

- Lead Piping Joints: Maintenance staff stated that OSHA rules prohibit using devices to melt lead to repack existing lead sealed pipe joints or use lead to seal new pipe joints. It is possible to manually reseal the leaded joints with cold working tools; however, few plumbing firms have staff with the requisite skills, experience, and specialized tools to perform this work.
- Seismic Restraints: Piping in the original building and the 1977 addition are not seismically restrained in accordance with current Code.

Storm Drain Piping

A system of drain fixtures and piping collect rain water from roofs throughout the facility. No records have been found that indicate that storm water is discharged to the municipal storm water system. Facility staff believes that storm drain piping may be connected to the sanitary sewer piping.

Age & Condition

1938 Building: Piping is cast iron with hubs and lead sealed joints and has exceeded its expected useful life.

1977 Addition: Piping is cast iron no-hub with clamped joints and is generally in good condition.

Observations

» Lead Piping Joints: Maintenance staff stated that OSHA rules prohibit using devices to melt lead to repack existing lead sealed pipe joints or use lead to seal new pipe joints. A portion of the water service to the 1938 building that contains lead sealed joints needs to be replaced.

» Seismic Restraints: Piping in the 1938 building are not seismically restrained in accordance with current Code.

PLUMBING FIXTURES

General

Plumbing fixtures are located throughout the building and vary in terms of age, condition, maintainability, and water consumption.

Age & Condition

1938 Building: A majority of fixtures are original and were installed in 1938. The original fixtures are in fair to poor condition and hardware is obsolete. Following is a description of some of the most common historical fixtures in the 1938 building:

» Pedestal Sinks: American Standard, 12" center faucet handles. Faucets have no flow restrictions or metering devices. Approximately 20% of the faucets have been replaced with newer models. The original faucets do not have replacement parts for isolation valves. Sinks are in fair condition, however do not meet accessibility guidelines. Many have chips or cracking of the porcelain glaze coating.

PEDESTAL SINKS

» Urinals: American Standard "Madstone" floor mounted model with floor level foot operated flush valves. Direct replacements for this type of urinal are not available. These units are not designed to be retrofit with modern low-flush urinal valves. Most of the flush valves appear to have been replaced with new valves. Urinals are in fair condition. Approximately 20% have chips or cracking of the porcelain glaze coating.

» Water Closets: American Standard "Purimo" floor mounted model. These units are not designed to be retrofit with modern low-flush urinal valves. Most of the original flush valves have been replaced with newer valves. Water closets are in fair condition. Approximately 20% of the original water closets have chips or cracking of the porcelain glaze coating. Approximately 10-15% of the original units have been replaced.

» Drinking Fountains: Original to the building. Maintenance staff reports that many of the drinking fountains are out of order due to clogged drain piping or broken valves. Facility staff report that drain traps are often plugged with potting soil resulting from watering plants at the drinking fountain. Fixture condition is fair to good; however, approximately 50% are out of order. Drinking fountains do not meet accessibility guidelines.

» Janitor's Closet Service Sinks: Most are original wall mounted porcelain models. Some have been replaced with plastic "Utilitub" type service sinks due to damage from use. The existing service sinks have outdated faucets that do not have replacement parts.


WATER CLOSET


DRINKING FOUNTAIN

1977 Addition: Fixtures in the basement and portions of the first floor are original and in generally good condition. Fixtures in the Wings were replaced in 2008 as part of the Capitol Wings Renovation.

FIRE & LIFE SAFETY SYSTEMS

Fire Sprinklers

The 1938 Capitol is partly sprinklered and the 1977 addition is fully sprinklered.

Age and Condition

The majority of the basement is protected by wet and dry systems, first floor is three quarters protected by a wet system, second and portions of the third floors are not protected, fourth floor is about a quarter protected and the mechanical penthouse is not protected. House and Senate Wings have been recently remodeled and are fully sprinklered with floor controls on each floor.

The fire sprinkler system for the 1938 Capital is supplied from Court Street entering the northeast corner of the basement into the northeast corner water closet near the tunnel access. The system is equipped with a 6" backflow preventer, a 6" single riser with an isolation valve, and the fire department connection for the system is located on State Street. The entire 1938 Capitol is served by one wet sprinkler system. The sprinkler crossmain is routed west down the tunnel access corridor with numerous take offs to sprinkler systems that have been added over the years. With each new take off from the crossmain, a control flow switch and tampered control valves switch have been installed and located above ceiling panels or any place convenient. The first floor is supplied by the crossmain in the basement via four different risers. Two valves are located in room 43-K, one serving northeast first floor and one serving the southeast first floor. One valve located in room 60-G1 serves the northwest first floor. One valve located in mechanical room 45-A serves the 1977 addition rooms and fourth floor rooms 453, 454-A, and 456-A.

The fire sprinkler system for the 1977 addition is supplied from State Street entering the southeast corner of the parking garage and routed overhead to mechanical room S15. The system is equipped with a 6" backflow preventer, 6" dry valve, wet riser. The fire department connection for the system is located on State Street. The entire 1977 addition basement is protected by a dry system divided into two zones east and west cold parking garage areas and the headed central area is protected by a wet system. The 1977 addition first floor is protected by the wet system via the basement system.

Class II hose cabinets are located at the stairwell entries on each floor.

Observations and Recommendations

The 1938 Capitol's existing sprinkler backflow preventer is to remain and the sprinkler feed main is to be routed over and into 30-C stairwell. Route a new riser up a stairwell with floor controls, flow switch, and test and drain per floor. When the 1938 Capitol is remodeled, the corridors ceiling can be removed, the new sprinkler crossmain can be installed in the corridor with branch lines into each area to be protected. The existing systems are to be tied back into its respective floor control and all floors not sprinklered are to be retrofitted with new sprinklers.

Due to the Rotunda architectural features, sprinkler protection is not recommended; it is totally a noncombustible area. We recommend, with City Fire Marshal approval, the use of a ("VESDA") early warning smoke detection system.

The House and Senate Chambers are to be sprinklered throughout utilizing concealer type heads with special factory painted covers to blend in with the wall and ceiling decor. The galleries and ceiling sprinkler heads piping are to be taken off the third floor system and routed over and up to fourth floor.

Penthouse and mechanical areas sprinkler system feed main is to come off the main riser on the fourth floor and be routed up and over to central dome/mechanical space.

The Class II hose valves can be removed once the building is fully sprinklered. We recommend keeping the one Class II hose station near the south entry into the Rotunda if is not sprinklered and has detection only.

The 1977 Addition: Class I Standpipes and garage area sprinkler system are to remain as-is.

Halon System

Age and Condition

There are two halon systems. A system tank (235 lb) and controls are located in basement electrical room 21-S and protect first floor Computer Room 124. The other system tank (27 lb) and controls are located first floor in Closet 160-I and protects Computer Room 160-N.

Observations and Recommendations

The Halon system could be updated with an environmentally safe clean agent. ECARO-25 is recommended as a direct replacement for the existing halon. This requires a new flow calculation, removal of halon containers and discharge nozzles, and drop in of the new ECARO-25 contains and discharge nozzles.

Fire Alarm

Age and Condition

The existing MXL Fire Alarm panel serves the 1938 Capitol, and remodeled House and Senate Wings. The 1938 Capitol and the 1977 addition have a mixture of bells and strobe notification devices and manual pull station on each floor. The fire sprinkler flow switches, pressure alarm switch, and sprinkler control valve switches are monitored by the fire alarm panel. There are smoke detectors, heat detectors, and duct smoke detectors located throughout the building and supervised by the main fire alarm panel. The remodeled wings fire alarm notification system utilizes horn/strobes and manual pull station located at each exit per floor. They are connected into the existing fire alarm panel.

Observations and Recommendations

The existing bells and strobes should be removed and new horn/strobe devices added throughout the building. New device/circuits are to be connected to the existing MXL fire alarm panel and remote annunciator.

Manual fire alarm boxes are not required where the building is equipped with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler flow. One manual fire alarm box is required for test purpose only and is to be located near the panel or at a location designated by the owner.

5.5 ELECTRICAL, LIGHTING & DATA SYSTEMS

ELECTRICAL

Power and Power Distribution

The electrical service and panels in portions of the basement area have been recently replaced. Most electrical distribution equipment in the remainder of the building is either out of manufacture or other service and maintenance issues exist.

ELECTRICAL DISTRIBUTION EQUIPMENT

Age & Condition

» 1938 Building: The existing switchboard was replaced and a new electrical room was created. The existing room currently is used for storage, some electrical panels, and the telephone entrance to the building.

» 1977 Addition: There have been concerns in one area of the Senate wing that excess magnetic fields are present. The area was tested and levels were found to be in the range of 8 to 12 milligauss. Ideally, levels should be maintained at or below 10 milligauss.

Observations

» Several panels that have been replaced were done with retrofit kits that do not provide the currently required wire bending space within the cabinet. A retrofit kit generally consists of the internal parts of the panelboard that is installed in the existing backbox. The requirements for wire bending space, or the clearance between the internal parts and the surrounding backbox, have been increased since the manufacture of the existing panels.

POOR PANEL ACCESS

» Several panels have been replaced with new surface cans over the existing flush cans. This type of installation does not provide the Code required access to wiring for maintenance.

» Several panels are located such that there is inadequate working clearance or the location violates the restrictions in the current National Electric Code.

» There are a number of feeders that require replacement and/or reconfiguring. These feeders generally contain multiple splices or are not appropriately sized for the equipment they serve.

» Many areas with floor duct, in floor wireways, are carpeted over and no longer accessible, although the original wiring remains in the wireway.

» Most floor mounted receptacles are fed from the floor below and not properly identified, making maintenance difficult. Maintenance staff currently must locate the panel in the floor below and turn off the breakers to isolate any problems in the floor mounted receptacles above.

» There are abandoned cables throughout the facility. The current National Electrical Code requires that all abandoned cables be removed.

» Panel directories and other types of circuit identification are not up to date.

LIGHTING

General

Age & Condition

» In the 1977 addition, all lighting was replaced in the Capitol Wings Renovation Project. It is energy-efficient and currently complies with codes.

» In the 1938 building, much of the lighting is incandescent or older fluorescent lamps with magnetic ballasts. This technology is outdated and uses approximately 15% more energy than fluorescent lamps and ballasts of current technology.

» Several areas utilize fixtures with lenses that do not provide any glare reduction and are less energy efficient than current types of shielding media, such as parabolic louvers or indirect reflectors.


TYPICAL OFFICE LIGHTING


SENATE LOUNGE LIGHTING

Observations

» In the 1938 building: Existing ballasts have not been tested for PCB's and must be assumed to contain PCB's due to the type and age. Ballasts containing PCB's must be treated as hazardous materials.

» Many incandescent fixtures have not been retrofitted to conserve energy.

» Lighting/power density likely doesn't comply with current energy code.

» The building does not contain any means for automatic lighting control or occupancy sensing. The current scheme is to have the State Police turn circulation lights on and off by the use of breakers in the panels. The approach leaves the panels unlocked and potentially capable of being tampered.

» The emergency lighting system does not comply with current codes.

» It has been noted that the outdoor lighting system is in disrepair.

DATA SYSTEMS

Signal and Alarm Systems

Age & Condition

The current remodel to the Wings has caused a change to the basic systems that should also be addressed in the 1938 building.

Observations

- The Wings fire alarm system utilizes horn/strobes while the 1938 building utilizes bells. Notification sound is not required to be consistent throughout the building, but safety would be enhanced if the system was integrated throughout the facility.
- There are an inadequate number of fire alarm strobes and smoke detectors in the 1938 building.
- Many of the telephone cabinets have illegal barriers containing 120 volt wiring.
- The Wings panic/duress system is a stand-alone system; the 1938 building system is tied to the phones.
- Data wiring in the 1938 building is not adequate for a future upgrade to IP phones.


BASEMENT TELEPHONE ROOM

6.0 Master Plan Implementation

6.0 Master Plan Implementation

6.1 PHASING AND IMPLEMENTATION

Ideally, from a funding standpoint, the proposed improvements could be broken into a number of discrete packages and be spread over several fiscal periods. However, the seismic renovation work places limitations on this approach because it has such a large impact, driving the majority of the improvements.

It is recommended that an advisory committee be established by the Legislative Administration Committee (LAC) as stewards of the Master Plan to review and monitor progress on an ongoing basis to ensure the protection of the historic fabric and that supplemental work or repairs do not inhibit the phasing of the Master Plan, as per the recommendations of the Public Commission on the Oregon Legislature, 2006 Report.

PHASE 1 – BASE ISOLATION

The base isolation seismic upgrade work requires the demolition of the entire ground "Concourse" Level of the 1938 building, including mechanical and electrical systems that serve upper floors. In the proposed approach, this work would be preceded by the construction of new central service facilities in the area under the front (north) plaza and stairs to provide new, energy efficient services to the upper floors which could subsequently remain occupied during the seismic upgrade work. Construction of the new central service facilities (north addition) would include a new plaza, front stairs, and ramps to make the main entrance universally accessible to the physically challenged. The west underground addition could be done at the same time, or with the subsequent base isolation work.

The base isolation work itself could be phased in several ways, working on the two 1938 building wings concurrently, or sequentially, or starting with the central area and working outward. The 1977 building work, as foreseen, would not require complete demolition of the ground floor, but would take place mostly under the first floor structure. This work could be undertaken concurrently with the 1938 building work given enough resources.

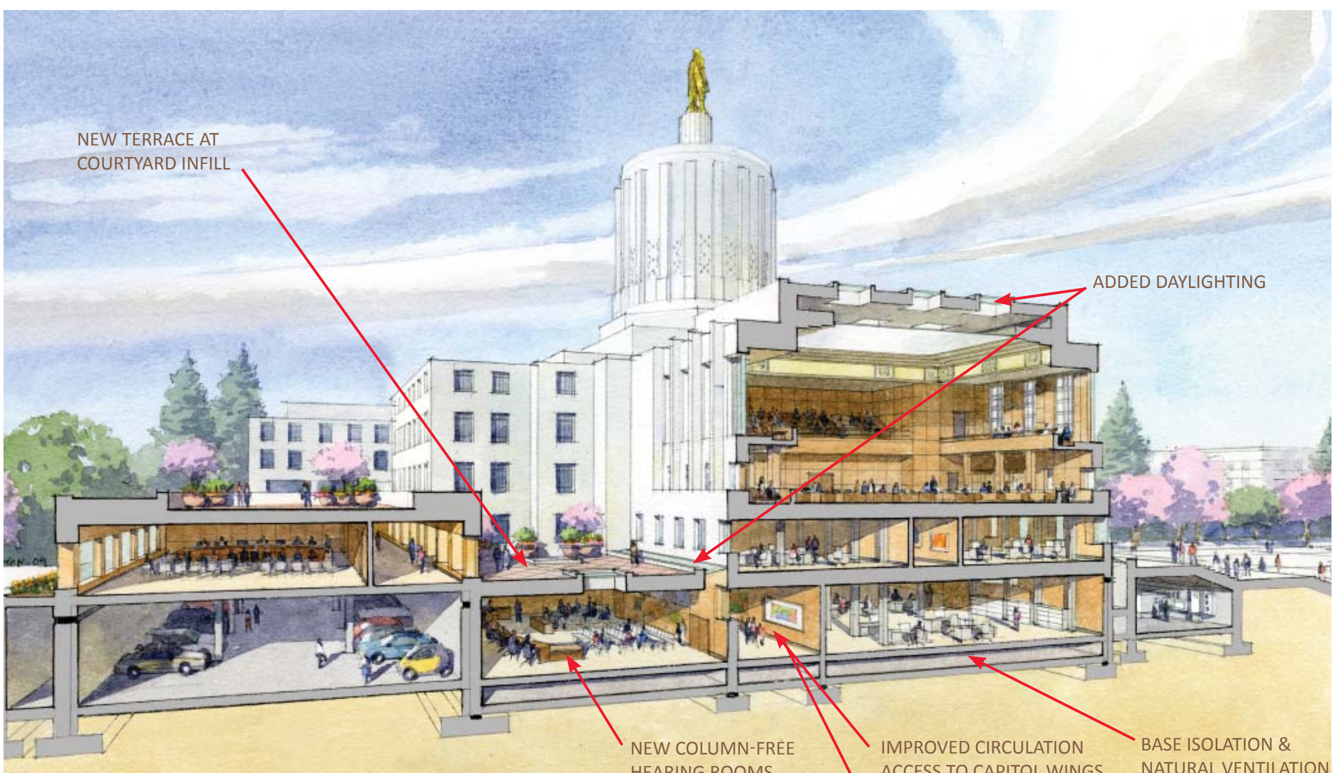
The project will require installing a seismic movement joint ("moat") about two feet wide around the perimeter of the entire building. This joint will be covered by plates, slabs or grilles that will slide in the event of an earthquake. Inside, after demolition of the basement interior and slab, columns will be cut and extended to new footings with isolators. To improve space utilization, the number of columns at the ground level will be reduced by installing new beams and columns at the central area of the east and west wings. This has the benefit of reducing the number of isolators, as well. The new floor to be installed above the isolators will be built two to three feet lower than the current slab on grade, allowing for further flexibility due to the increased height in the space.

At the exterior walls, isolators will be installed into the walls below a new perimeter beam, with the wall footings lowered. There is the opportunity to install windows, particularly at the north wall, which would allow daylight to the perimeter of the space through ground level skylights.

Restricted access, requirements for keeping the building stable, and logistics would mean the base isolation project would likely span two 18-month interim periods between sessions. Further design and planning work is needed to refine a construction schedule and determine what, if any work, could continue while the Legislature is in session. No seismic safety benefit will be seen until the entire building is completed, so the work should be done on the quickest schedule possible.

Completion of the structural base isolation work would be followed by the interior build-out of the Concourse Level, including the construction of the new hearing rooms in the courtyard 'infills' and the relocated cafe. Mechanical, plumbing and electrical/data systems to serve this floor and the balance of the building would be completed.

Cleaning and repair of the exterior stone could be accomplished during this phase, or deferred to a later time.



PHASE 2

After the base isolation and Concourse Level work is complete, there will be considerably more flexibility to phase the upper floor renovations in smaller packages. The bulk of the work will be in the 1938 building, as the legislative office wings have largely been updated in the recent remodel. Work packages can be approached on a systems basis, or by floor or by area. It would make sense to address multiple items at once in each area that is disrupted. The systems to be addressed include:

- Heating, Ventilating & Air Conditioning – Old equipment replacement, updated controls.
- Plumbing – Old piping replaced, fixtures updated.
- Electrical – Power, data, improved and more efficient lighting, computer room relocation, chamber sound systems.
- Fire and Life Safety – Fire sprinklers and alarms, emergency communications, emergency lighting.
- Universal Access/ADA – Toilet rooms, handrails, door hardware, signage, assistive listening systems.
- Sustainability – Exterior insulation, daylighting, gray water recovery, rain water harvesting, ground source heat recovery, solar systems, passive ventilation, efficient plumbing fixtures, efficient mechanical systems.
- Security – Access control, closed circuit video.

Systems work would be tied to functional renovation of office areas where possible, including layout changes and finishes replacement where required. One possible sequence by area would be: 1) first floor; 2) second, third and fourth floor areas behind the Chambers; 3) House and Senate Chambers; 4) third and fourth floor south; 5) Rotunda natural ventilation, mechanical penthouse, skylights and rooftop work. A more detailed description of the systems recommendations follows the cost summary.

Phasing Strategy
Oregon State Capitol Master Plan

	Phase Description	Master Plan Principles	Notes
1	**Phase 1**		
	Structural Seismic Upgrade		
1.1	Base Isolators - Entire lower level to be removed and rebuilt to new layout. Has potential to lower the floor level to increase ceiling heights. Limited impact on existing historic fabric. Upper floors have potential to remain occupied. Able to retain existing corridor walls. Limited non-structural upgrades.	Upgrades the seismic capacity of the 1930's and 1970's building for immediate occupancy with minor damage following an major seismic event. Dramatically improves the **seismic safety**.	**Priority 1**
	Program and Space Needs		
1.2	Building Addition - Expansion of Capitol	Expand the Capitol to provide **additional space needs on the lower level:** infill the light courts to accommodate the addition of 5-6 new Hearing Rooms; Expand below the north Stairs to accommodate new mechanical and electrical rooms; and expand west to accommodate a new purchasing area adjacent to the loading area.	Implemented on lower level with installation of base isolation for seismic upgrade.
	Existing Conditions Improvements		
1.3	New HVAC plant for 1938 building and new system in lower level	Replace lower floor 1938 HVAC system equipment and controls throughout the 1938 building. Includes replacement of existing air handlers, ductwork, and controls. Establishes new system for future phase(s) of HVAC replacement in upper floors. **User comfort, safety, energy efficiency and sustainability.**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases.
1.4	New Plumbing Piping in lower level	Replace lower floor 1938 piping system and equipment and throughout the 1938 building. Requires removal of existing waste, storm, and steam/hotwater piping. **User comfort, safety, energy efficiency and sustainability.**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases.
1.5	Lighting in lower level	Relamp and re-use historic fixtures, replace new lighting with new energy efficient fixtures and occupancy controls throughout the lower level. **User comfort, safety, energy efficiency and sustainability.**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases.
1.6	Electrical and Data in lower level	New electrical distribution, data distribution and electrical and data outlets throughout the lower level of the 1938 building. **User comfort, safety, energy efficiency and sustainability.**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases.
1.7	Restoration of Exterior Stone	Restoration of exterior marble and granite stone including resealing joints, cleaning, and repair. **Restore and preserve historic elements.**	
	Fire/Life Safety		
1.8	New Fire/Smoke Alarm System infrastructure and new system throughout lower level	New fire and smoke alarm in 1938 building including early warning detection system in historic areas and conventional addressable system in all other areas of the 1930's and 1970's buildings. **Fire/Life Safety**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases. **Priority 1**
1.9	Fire Sprinkler System infrastructure and new system throughout lower level	New fire sprinkler system in 1938 building in areas where currently not served. **Fire/Life Safety**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases. **Priority 1**
1.10	Corridor and Exit Lighting throughout the lower level	New lighting in corridor areas to improve exiting light levels and means of egress levels. **User comfort, safety, energy efficiency and sustainability.**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases. **Priority 1**
	ADA Accessibility		
1.11	ADA Access for north and east Capitol entries	ADA accessible exterior entries for the north and east entires. Requires modification of at least 1 north entry revolving door, entry stair modifications for access to exterior doors, and some site/landscape modifications with reconstruction of north steps. **ADA Accessibility**	
1.12	New ADA Restroom Facilites throughout lower level	New and expanded restroom facilities to provide **ADA accessibility** throughout the lower level. **ADA Accessibility**.	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases. **Priority 1**
	Sustainability		
1.13	Natural Ventilation infrastructure in the corridors, public areas, new hearing rooms in the lower level	Utilize natural ventilation to enhance energy efficiency and user comfort in all lower level areas with new underfloor air displacement system, new natural ventilation infrastructure, night flushing for mass heat/cool transfer. **Sustainability, user comfort, and energy efficiency**	Implemented on lower level with installation of base isolation for seismic upgrade. Upper level improvements in future phases. **Priority 1**
1.14	Natural daylighting	Add new skylights in new lower level hearing rooms and office areas and capture daylighting with existing windows. **Sustainability, user comfort, and energy efficiency**	
1.15	Sustainable Implementation	Additional elements of sustainability including storm water treatment, additional rooftop photovoltaics, possible wind turbines, interior recycle centers, battery charging stations, low voc materials, sustainable materials, occupancy sensor plug strips. **Sustainability**	
2	**Phase 2 - Future Phase(s)**		
2.1	Interior Restoration and Renovation	Future Phases to continue interior renovation of historic elements, building systems including mechanical, electrical, data, and lighting.	Phasing to occur on a floor by floor basis working up from the First Floor.
2.2	Sustainable Implementation - remaining areas	New skylights added to the existing Hearing Rooms, replacement of existing skylights, new skylights where removed, and new skylights to each House and Senate Chambers. Complete natural ventilation throughout building.	

6.2 COST SUMMARY

The Capitol renovation project costs include all elements of the project including the cost of construction, contingency for unknown or unforeseen conditions, and ancillary costs for non-construction project related expenses. The project costs for the Master Plan Capitol Renovation as identified are broken down as follows:

Capitol Renovation Project Costs – 2009 Dollars

Phase 1

Construction – Phase 1		$ 94,600,000
Construction	$ 86,000,000	
Construction Contingency (10%)	$ 8,600,000	
Construction Sub-Total	$ 94,600,000	
Ancillary Costs (33%)		$ 31,200,000
Includes costs for: Geotechnical, Site Survey, Hazardous Material Survey, Design Services, Testing, Furnishings, Equipment, Permits, Fees, Building Commissioning, Art, Solar.		
Owner Contingency (10%)		$ 12,600,000
PHASE 1 TOTAL PROJECT COSTS IN 2009 DOLLARS		**$ 138,400,000**

Phase 2

Construction – Phase 1		$ 60,900,000
Construction	$ 55,400,000	
Construction Contingency (10%)	$ 5,500,000	
Construction Sub-Total	$ 60,900,000	
Ancillary Costs (33%)		$ 20,100,000
Includes costs for: Geotechnical, Site Survey, Hazardous Material Survey, Design Services, Testing, Furnishings, Equipment, Permits, Fees, Building Commissioning, Art, Solar.		
Owner Contingency (10%)		$ 8,100,000
PHASE 2 TOTAL PROJECT COSTS IN 2009 DOLLARS		**$ 89,100,000**

TOTAL PROJECT COST FOR CAPITOL RENOVATION IN 2009 DOLLARS $ 227,500,000

The Total Project Cost for the Capitol Renovation, represented in 2009 dollars, requires escalation to be added to the time that construction of the two phases would actually occur. As an example, following are the costs for the two phases of the Capitol Renovation when escalated to a 2013 start of construction for Phase 1 and a 2019 start of construction for Phase 2.

Project Costs – Phased Construction with Escalation

Phase 1 – 2013 Start of Construction	$ 169,400,000
Phase 2 – 2019 Start of Construction	$ 128,600,000

TOTAL PROJECT COSTS FOR CAPITOL RENOVATION WITH ESCALATION $ 298,000,000

During the Master Plan development, discussion took place with two respected Northwest general construction companies with major renovation expertise, JE Dunn Construction and Howard S. Wright Constructors, with regard to the time line and logistical challenges of maintaining Capitol operations during the construction of Phase 1 and Phase 2. With a construction plan, the work can be achieved in the following way:

» Construction of Phase 1 would take approximately 3+ years with a 6 month pause for a Legislative session to take place. Phase 2 would take approximately 2 years to build and with proper sequencing, could occur during Legislative session.

» Areas above the new Concourse Level could be occupied during the construction.

» Parking in the Capitol would require relocation during construction of Phase 1.

Another phasing option is to proceed with some select small Pre-Phase 1 projects, prior to the implementation of the full Phase 1 scope of work. These projects would be considered complete and would not be impacted or redone with the implementation of the full Phase 1 scope of work. Pre-Phase 1 projects could include:

❶ New Mechanical Room below North Entry Steps and ADA Entry Upgrade $ 13,400,000*

Create new mechanical room and energy efficient systems to serve the existing and expanded Capitol below new ADA accessible north entry steps. This is required for the seismic upgrade work to take place.

❷ Skylight renovation and restoration $ 1,340,000*

Replacement of 70 year old skylights, and reinstallation of new skylights where previously removed for improved natural daylighting and energy efficiency. Includes skylights in stairways, Rotunda, and fourth floor meeting rooms.

❸ Addition of new skylights, lighting, and ceiling in House and Senate Chambers $ 700,000*

The roof skylights will be added to bring natural daylight into the Chambers, and the electrical lighting will be upgraded for energy efficiency.

❹ Restoration and renovation of exterior stone and bronze windows/doors $ 7,200,000*

The exterior stone cladding will be cleaned, joints repointed and damaged stone repaired or replaced. The bronze windows and doors will be reconditioned for full operation, with weatherstripping, insulated glazing, and hardware where needed.

❺ Interior historic and public area lighting retrofit and upgrade $ 5,600,000*

Public area lighting will be upgraded for historic restoration, safety, and energy efficiency, and includes all lighting in Rotunda, corridors stairs and other significant historic locations.

❺ Installation of bronze handrails at the Rotunda stairs leading to the Senate and House Chambers. $ 230,000*

Install bronze handrails for safety and ADA and universal accessibility to the Chambers.

*Note: Costs are total project cost with escalation to 2011.
For cost estimate detail, see Appendix Section 7.4.

6.3 DETAILED SYSTEMS RECOMMENDATION

Based on the existing Capitol infrastructure assessments and the goals established for the Master Plan, the recommendations for all system improvements are defined below. They are also included in the cost estimates.

FIRE AND LIFE SAFETY

The highest priority for fire and life safety is to improve the fire sprinkler coverage within the building. Sprinklers are the most effective means of life and property protection in the event of fire. The fire on the terrace outside the Governor's Suite in August 2008 would likely have had far fewer consequences if sprinklers or detection had been in place in that area.

For areas where sprinklers are not feasible because of construction, historic elements or configuration (e.g., the Rotunda or Governor's Suite), it is recommended that an advanced aspirating type ("VESDA") early detection system be installed. Fire detection and alarms are present in much of the building, but need work to bring them into full code compliance with uniform annunciation devices.

To improve all exiting in an emergency, the master plan concept proposes terminating the existing central egress stairs at the first floor, and providing new separate stairs to connect to, and exit from, the lower level. Coupled with this, changing the existing third floor committee rooms to office space will move more of the public functions close to grade level for improved exiting.

ACCESSIBILITY / ADA

Improving accessibility to the building is foremost. In the renovation of the north plaza, described in other sections, access would be provided by ramping to the existing main entrance, east and west. Two of the revolving doors should be replaced with architecturally-compatible, power assisted, outward swinging doors. At the State Street side, a ramp could be constructed behind the existing planter wall to make the transition from the sidewalk. These revisions would mean that all four sides of the building would be universally accessible.

Inside the building, the toilet rooms need the most attention. Renovations to most toilet rooms should be made to be fully compliant with current standards. At the first floor of the Rotunda four existing toilet rooms would be merged into two, allowing more flexibility for these improvements.

Miscellaneous improvements to be addressed include modifying door knobs to lever style, adding or converting drinking fountains to accessible style, installing permanent assistive listening systems in the hearing rooms and Chambers, and improving signage. Handrails need to be installed on all stairs where none exist, and specifically in the Rotunda stairs, bronze handrails should be installed to provide safety and accesibility to the Senate and House Chambers.

SECURITY

Security and maintaining open public access to this building are not mutually exclusive goals, but one does tend to compromise the other. An in-depth security analysis was not undertaken as part of this study. Recommendations from the Oregon State Police, originally drafted in July 2005, and updated May 21, 2008, were reviewed.

These recommendations were: 1) additional key card access control at several locations; 2) remedial work to doors and hardware at some exterior entrances; and 3) 56 additional closed circuit video cameras and upgrades to many of the 20 existing cameras. This increase in video surveillance scope would drive changes in equipment and staffing at the monitoring end of the system, as well.

In addition to these interior items, there are opportunities to improve site security for protection of the entries from vehicle penetration. The front plaza renovation that is part of the north addition could easily incorporate such improvements.

A detailed security study should be included in Phase 1 design.

STRUCTURAL / SEISMIC SAFETY

It is clear that the Legislature has had a successful program over the score of years of seismic evaluation and mitigation. Developing the rehabilitation measures after the Scotts Mills earthquake and completing several studies are logical extensions of this work. Throughout the course of this evaluation, several issues were explored and are recommended to be addressed to continue the Legislature's progress toward a seismically-resistant Capitol. The following are these recommendations:

1. The performance objective for the Capitol are to provide for Continued Operation or Immediate Occupancy for the more frequent earthquake (BSE -1 as per ASCE -41) and Life Safety for the rare earthquake (BSE-2 as per ASCE-41) as a minimum, given the historic nature and value of the facility and critical nature of its function.

2. The analysis and rehabilitation using the base isolation scheme.

3. Continue to monitor estimated costs including all components of the work – architectural, structural, mechanical, electrical, plumbing, etc. using current market conditions and projected escalation.

4. In future phases of work, selective destructive testing of existing structural elements is recommended to fully understand their strength and deformation characteristics, so that may be incorporated into the rehabilitation design.

The continued analysis of the Capitol will allow developing seismic rehabilitation schemes that may be carried forward to implementation. Subject to this future analysis, we are using a base isolation scheme as the recommended approach for this report because:

» A higher seismic performance level may be achieved compared to a shear wall strengthening scheme.

» It is less invasive to the fabric of the building and less disruptive to upper levels.

» It appears to be highly competitive on a cost basis with a shear wall approach for the Capitol.

HEATING SYSTEMS

Steam is provided to the Capitol from the Garden Pride boiler plant to the east as the primary source of heating for the facility. Natural gas condensing boilers are also used to heat the 1977 addition when the steam boiler plant is not in use. The existing steam boiler plant and condensing boilers are generally in good condition. However, steam and condensate piping and associated condensate pumping units within the 1938 building have exceeded the expected useful life and need to be replaced. Many system options were considered including:

» Reuse the existing Garden Pride boiler plant and replace steam and condensate systems within the Capitol.

» Electric resistance heating equipment.

- Hot water heating system with high efficiency hot water boilers.
- Hot water heating system with a ground source heat recovery chiller plant.

Hot Water Boiler Plant

A hot water boiler plant including condensing type high efficiency boilers is recommended to serve the 1977 addition. Existing heating equipment in the 1977 addition is designed to have a supply water temperature of 180°F. Other more efficient heat plant options are not capable of producing water at this high of a water temperature. The boiler plant should have the following characteristics:

- Hot water boilers do not require continuous staffing that high pressure steam boiler plants require.
- Condensing boilers are more efficient than steam boilers. The overall plant efficiency would be improved by approximately 15% to 20% reducing energy consumption and carbon emissions.
- Distribution piping will be maintained at a lower temperature reducing heat loss.

Heat Recovery Chiller Plant

A heat recovery chiller plant is recommended to serve heating equipment in the 1938 building. Water chillers are generally used to provide cooled water for air-conditioning. Thermal energy is produced as a by-product of the cooling process. A condenser water system removes heat from the chiller, which is typically discharged to the atmosphere by cooling towers. Heat recovery chillers are designed to operate with leaving condenser water temperatures up to 130°F. Hot water produced by the chillers can be circulated to heating equipment located throughout the 1938 building for space heating. This process is essentially the same as what is commonly referred to as a "Heat Pump." Heat recovery chillers are described further in the section titled "Cooling Systems." The plant should have the following characteristics:

- Heat recovery chillers use substantially less energy than combustion type heating equipment. Overall energy consumption will be reduced by approximately 60% - 70% compared to the current steam boiler plant.
- Heat recovery chillers are operated by electric motors. Electricity is a much cleaner fuel source than natural gas, and has lower carbon emissions.
- Heat recovery chillers will provide heating and cooling simultaneously. Only one system will operate to provide both functions.
- Distribution piping will be maintained at a much lower temperature reducing piping heat loss.
- All asbestos insulation needs to be removed.

COOLING SYSTEMS

Cooling is provided by a chilled water system. Three electric water chillers produce chilled water which is circulated throughout the facility to cooling equipment. Chilled water piping in the 1938 building is in poor condition and must be replaced. Distribution piping in the 1977 addition is in good condition and should remain.

Several cooling plant options were considered including a reuse of the existing chiller plant, a high efficiency cooling only chiller plant, a heat recovery chiller plant, and a ground source heat recovery chiller plant. The ground source heat recovery chiller plant was selected because this system type was judged to be the most sustainable alternative. This option will provide the largest reduction in energy use and carbon emissions.

Ground Source Heat Recovery Chiller Plant

A ground source chiller plant uses special purpose water chillers to produce heating water and chilled water for space heating and cooling. The heating portion of the plant is described above in the section titled "Heat Recovery Chiller Plant." A ground source type system also uses well water provided by on-site vertical wells to add or remove energy from the process as required to balance the heating and cooling loads in the chiller plant. Generally, the plant will consist of the following equipment and systems:

- Chillers: The chiller plant will include three water chillers. One chiller will be a high efficiency centrifugal unit used for cooling only. Two rotary screw heat recovery chillers will produce heating water and chilled water. Heat recovery chillers will operate to meet building heating loads, and will also provide chilled water to process cooling equipment that operates continuously. During the cooling season when the building cooling demand exceeds the output of the heat recovery chillers, the centrifugal chiller will operate.
- Well Water System: Well water can be pumped from vertical on-site wells to a well water storage tank. Two wells would be provided: one supply well and one recharge well. The recharge well is used to return the well water back into the ground water aquifer after it is used. Water from the storage tank will be used for three purposes:
    - Direct well water cooling: Some equipment operates with higher chilled water supply temperatures and well water can be used directly as a cooling source. Using well water directly for cooling is the most efficient method of cooling. This equipment includes perimeter induction units and active chilled beams.
    - Chiller cooling load: When heating is required, the chiller must be provided with a cooling load so that hot water can be produced. Process cooling loads will provide some of this load. When additional cooling load is required, well water will be provided to the chiller to be cooled.

   - » Chiller heat rejection: When building cooling loads produce more heat than is required to heat the facility, excess energy must be removed from the heating system and/or condenser water system. Well water will be used to remove excess energy from the system.

- » Cooling Towers: Cooling towers should be installed as a back-up system to provide chiller heat rejection if the well water system is not functional or does not have adequate capacity.

The plant will have the following characteristics:

- » A majority of the energy required to heat and cool the facility can be obtained from on-site sources.
- » Chiller refrigerants have non-CFC/HCFC environmentally-friendly refrigerants.

AIR DISTRIBUTION SYSTEMS

Numerous air distribution systems provide heating, cooling, and ventilation for individual spaces throughout the facility. Generally, air distribution systems in the 1938 building have exceeded the expected useful life and need replacing. Air distribution systems serving the 1977 addition are in good condition and can remain.

Several air distribution system configurations were considered to serve spaces in the 1938 building including:

- » Fan coil units.
- » Under floor air distribution.
- » Single zone heating and cooling.
- » Variable volume reheat.
- » Constant volume induction.

The configuration of the building, historical features, and proposed seismic renovations impose significant limitation and many opportunities which greatly affect the selection of the most suitable system alternatives. Consequently, a combination of these system options is proposed for renovation of the 1938 building. Following is a description of recommended air distribution systems. Schematic diagrams showing the areas of the 1938 building served by each system type are included in the Appendix.

Perimeter Constant Volume Induction System

An induction type air distribution system will serve spaces on the first, second, third, and fourth floors having exterior walls and interior office spaces on the second, third, and fourth floors behind the House and Senate Chambers. This system is well suited for spaces that have high thermal loads and relatively low occupancy levels such as office spaces along exterior walls. The system will consist of a central air handler that provides 100% outside air to induction type terminal units located in each space. Terminal units may be either wall-mounted induction units or ceiling-mounted active chilled beams. Terminal units will provide a constant amount of outside air for ventilation and have coils that provide space heating and cooling. One notable feature of an induction type terminal unit is that room air is drawn into the unit using high velocity nozzles, and a mixture of supply air from the air handler and return air is delivered to the space. By inducing return air into the induction unit, the amount of air delivered from the central air handler can be reduced by approximately 65%. This reduces construction costs and fan energy consumption.

This system will have the following characteristics:

» Lower supply airflow requirements will result in a smaller air handling unit and distribution ductwork systems and reduced fan motor energy consumption.

» A constant amount of outside air will be provided continuously to all spaces, which will result in improved ventilation effectiveness.

» Each room will have independent space temperature control.

» Inductions units and active chilled beams require chilled water to have a temperature of 55°F to 58°F. Higher supply temperatures allow the use of direct well water cooling.

Central Variable Volume Reheat System

A variable air volume air distribution system will serve spaces in the basement and interior offices on the first floor. This system is well suited for spaces that have low thermal loads, open office configurations, or variable occupancy levels such as a conference room. The system will consist of a central air handler that provides a mixture of outside air and return air to terminal units located in the ceiling space above each room. Terminal units will provide a variable amount of supply air to each space as required to maintain space temperature setpoints, and will have heating coils to provide space heating when required.

This system should have the following characteristics:

» Outside air will be pre-cooled during the cooling season using sub-basement mass thermal storage. Refer to the following Mass Thermal Storage section.

» Occupancy sensors and demand base ventilation controls will be provided to reduce airflow rates when spaces are unoccupied or occupancy is less than design levels.

House and Senate Chamber Variable Volume Reheat System

The House and Senate Chambers are served by two single zone air distribution systems, one for each chamber. These air handlers also serve adjacent caucus rooms. Existing air handling units have exceeded the expected useful life and need replaced. Additionally, the Chambers and adjacent caucus rooms need to have independent temperature control. The House and Senate Chambers are historical sensitive areas. System modifications in these spaces will be limited so that the appearance of the rooms will not be altered. Therefore, it is recommended that a majority of existing ductwork systems be reused.

It is recommended that the system be converted to a variable volume reheat system. Existing air handler units will be replaced and new systems will be connected to existing ductwork. A mixture of outside air and return air will be provided to terminal units located in the ceiling space above the Chambers. Terminal units will be installed in supply air ductwork to provide a variable amount of supply air to the Chambers and to the caucus rooms as required to maintain space temperature setpoints. Terminal units would have heating coils to provide space heating when required.

This system should have occupancy sensors and demand base ventilation controls to reduce airflow rates when spaces are unoccupied or occupancy is less than design levels.

NATURAL VENTILATION / MASS THERMAL STORAGE

Natural Ventilation System

Natural ventilation is a method of cooling a facility when the outdoor air temperature is lower than the temperature of the building structure. This is accomplished by providing openings in the building that will naturally induce airflow. Warm air will naturally rise and exit the building from openings located higher in the structure. Intake openings located lower in the structure will allow cool outdoor air to enter the building to replace the air that is exhausted. This natural ventilation process will result in the circulation of cool air through the building and will lower the temperature of the structure. This process will occur without operating mechanical cooling systems and will not consume energy.

The 1938 building has two unique features that make natural ventilation particularly feasible. The Capitol dome, located high above the remainder of the building, can be used as an exhaust structure. The second feature is that the building is constructed of heavy materials that have an excellent potential for storing thermal energy.

The following spaces where natural ventilation is recommended are listed with a description of the proposed airflow pathways:

- » House and Senate Chambers: Air will enter the space through intake louvers constructed in skylight curbs. With doors open air will exit the building through the Capitol dome exhaust louvers.

» Concourse Level hearing rooms: Air will enter the space from the sub-basement, and will exit the space through exhaust louvers constructed in skylight curbs.

» 1938 basement Concourse and Galleria: Air will enter the space from the sub-basement, and will exit the building through Capitol dome exhaust louvers.

» 1977 addition hearing rooms: Air will enter the space from an outside air intake structure located on grade south of the hearing rooms, and will exit the space through exhaust louvers constructed in skylight curbs.

Mass Thermal Storage

Seismic upgrade of the facility includes the construction of a sub-basement to install seismic base-isolators which offers a significant opportunity to enhance the performance of natural ventilation systems. The sub-basement will have a large volume, and will be constructed with a concrete floor, walls, and ceiling. The massive elements of this space are particularly well suited for storing thermal energy. The mass storage concept includes two operating modes. The first includes cooling the concrete sub-basement structure when the outside temperature is cool and conditions are suitable for natural ventilation. The second includes using the cooled structure to pre-cool outside air supplied to air distribution systems during occupied hours. The two operating modes are further described below:

» Sub-basement cooling: This will occur when natural ventilation is active. Outside air intakes will be constructed around the perimeter of the 1938 building to allow outside air to enter the sub-basement. Air pathways will be provided from the sub-basement to the Concourse, Galleria, and 1938 hearing rooms to facilitate natural ventilation of these spaces. Additionally, air will flow up through two existing vertical ductwork shafts from the sub-basement to the roof of the 1938 building to produce increased airflow for cooling the sub-basement.

» Outside air pre-cooling: During occupied hours, when the outdoor air temperature is higher than the temperature of the building structure, natural ventilation systems will be disabled and air distribution systems will cool the building. During these conditions, outside air being provided to the Central Variable Volume Reheat System will be circulated through the sub-basement space. The cool surfaces of the sub-basement will cool the air prior to entering the air handling unit, reducing chilled water system cooling loads.

Diagrams showing proposed air circulation paths through the sub-basement in both the Natural Ventilation and Outside Air Pre-cooling modes of operating are included in the Appendix.

PLUMBING SYSTEMS

Plumbing systems in the 1938 building have exceeded the expected useful life and need to be replaced. Plumbing systems in the 1977 addition were substantially renovated in 2008 as part of the Capitol Wings Renovation and will be reused. Where systems are being replaced, consideration was given to the use of energy efficiency and sustainable technologies. A description of these features follows.

Potable Cold and Hot Water

1938 Building Water Service: The existing 4-inch cold water service to the 1938 building can be reused up to the connection with original water distribution piping. A new pressure reducing station and backflow preventer needs to be provided.

1938 Building Cold & Hot Water Piping: All potable water piping should be replaced.

Potable Water Heating

1977 Addition Water Heating System: The existing water heating system can be reused and supplemented by a solar water heating system.

Solar Water Heating System: A solar water heating system will be installed to heat domestic water, and will reduce natural gas consumption and carbon emissions. The system will provide hot water for the entire facility. An automatic drain down feature is proposed to prevent freezing during periods of cold weather. The system will have the following components:

» Roof mounted solar collectors.

» Indoor drain down storage tank.

» Solar heating water piping loop and circulation pumps.

» Flat plate double walled heat exchanger.

Rain Water Harvesting / Reclaimed Water System

Rain Water Harvesting: Rain water should be collected on-site as a sustainability feature to reduce consumption of city water. Rain water can be provided to toilets and urinals that do not require potable water. The rain water system will have the following components:

» Underground rain water collection tank and transfer pump.

» Day-tank with a chemical treatment system.

» Reclaimed water booster pumping station.

Reclaimed Water Piping: Distribution piping will be provided from the booster pumping station throughout the 1938 building to toilet and urinal fixtures.

Sanitary Waste & Vent Piping

1938 Building Sanitary Waste & Vent Piping: All waste and vent piping needs to be replaced.

1938 Building Sewage Lift Station: Provide new lift station as required to accommodate basement modifications associated with seismic base isolation.

Grease Interceptors: Provide grease interceptors for waste piping service kitchen fixtures.

Storm Drain Piping

1938 Building Fixtures: All storm drain piping needs be replaced. Drain piping will discharge into the rain water collection tank for use as reclaimed water. Refer to Rain Water Harvesting / Reclaimed Water System above.

Plumbing Fixtures

1938 Building: Fixtures should be replaced throughout the original building. Newer fixtures that are in good condition will be reused. New fixtures will be the water conserving type and will be ADA compliant where required. Automatic controls will be provided to reduce water consumption. The following features will be provided:

- Water closets will have dual flush with automatic flush valves and will use reclaimed water.
- Urinals will be most efficient for sustainability.
- Lavatories will have low flow aerators and automatic faucet controls.
- Any showers will be provided with low flow heads.

POWER AND POWER DISTRIBUTION

Portions of the electrical system in the 1938 building have exceeded the expected useful life and need to be replaced. Electrical systems in the 1977 addition were renovated in 2008 as part of the Capitol Wings Renovation. There is adequate capacity in the existing panels to accommodate planned building modifications.

1938 Building Electrical Switchgear

Due to the required seismic upgrades and program enhancements, it appears that the existing switchgear will be relocated. When the switchgear is relocated, most of the existing electrical feeders will need to be replaced and rerouted to facilitate construction work in the basement ceiling space in the 1938 building.

1938 Building Panelboards

The majority of existing panels are either out of manufacture or not in conformance with current codes. All panelboards in the 1938 portion should be replaced; in 2006 the Capitol main switch gear was replaced.

1938 Building Wiring

New branch circuit wiring will need to be provided where panels are not replaced in their original location and in remodeled areas.

Emergency Power

A new emergency power system should be provided for the Capitol. Currently there is no emergency power system in the 1938 building, and the 1977 addition is served by central battery inverters and a separate electrical service. A building of this size and complexity requires emergency power to serve emergency lighting, elevators and critical services. Automatic transfer switches would be provided for emergency systems in the 1938 building, the 1977 addition, and for non-emergency systems. The automatic transfer switch for the 1977 addition is optional, but recommended. The existing power inverters could be left in place to provide instantaneous emergency lighting. An independent transfer switch is required to separate required emergency wiring from optional emergency wiring to serve non-emergency electrical loads such as computer rooms, voice data systems, and critical HVAC equipment.

Photo-voltaic Equipment

The existing photo-voltaic solar power system should be expanded to reduce electrical energy consumption, carbon emissions, and comply with State "1.5% for Solar" regulations. System equipment will match the equipment that is currently installed in the 1977 addition.

LIGHTING AND LIGHTING CONTROLS

Lighting in the 1938 building needs to be upgraded to current standards. Lighting in 1977 addition appears to be in accordance with current standards and requires no upgrades except in areas that will be remodeled. The proposed upgrades are intended to bring the facility to an energy consumption level well below that required by current Energy Code.

Fluorescent Lighting

Fluorescent fixtures will be replaced with more current designs, such as direct/indirect fixtures with electronic high-lumen output ballasts and T8 lamps. Lamp color will be coordinated throughout the facility.

Incandescent Lighting

Existing incandescent light fixtures having historic significance will be retrofit with more energy efficient lamps. The remaining fixtures will be replaced with a more current design and more energy efficient lamps. In general, there should be no incandescent lighting remaining in the facility other than that required for artistic accent.

Emergency Lighting

Emergency lighting in the 1938 building uses battery packs. The 1977 addition is served by central battery inverters. Emergency lighting will be connected to the generator noted previously. This will require rewiring fixtures within the exit path throughout the building.

Lighting Controls

Lighting controls should be added to minimize the operating of light fixtures. Controls will include occupancy sensors in all normally occupied areas and a centralized time control system to control circulation and common spaces, as well as daylight sensors in spaces with substantial natural light.

Daylighting

Photo-sensor controlled daylighting will be provided in areas where sufficient ambient light is available. These areas include, at a minimum, perimeter rooms, hearing rooms, and House and Senate Chambers.

SIGNAL AND ALARM SYSTEMS

Fire Alarm

The existing fire alarm system in the 1938 building should be replaced. The overall system, including systems currently installed in the 1977 addition wings, will be upgraded to a Voice Evacuation system. This will include the addition of speakers, amplifiers, and monitored power supplies. Areas with historic significance may utilize an aspirating type ("VESDA") early detection system to minimize disturbance to building finishes. Other areas will utilize a system that matches the equipment currently serving the 1977 addition.

Communication Systems

There is currently no emergency communication system in the facility. A system will be added to allow for emergency announcements. The system will include speakers, a central control station, amplifiers, and required wiring.

1938 Building Voice/Data

The existing telephone entrance and central equipment is located in the basement and will require relocation. Also, many of the existing voice/data closets are not in conformance with current codes or conflict with the proposed remodel plan. A new telephone switchgear room will be required with complete voice and data rewiring from the basement to each of the floors. It is currently assumed that some of the wiring within the floor will be reused; however, all wiring within the areas proposed for remodel will be completely replaced.

Wireless Internet

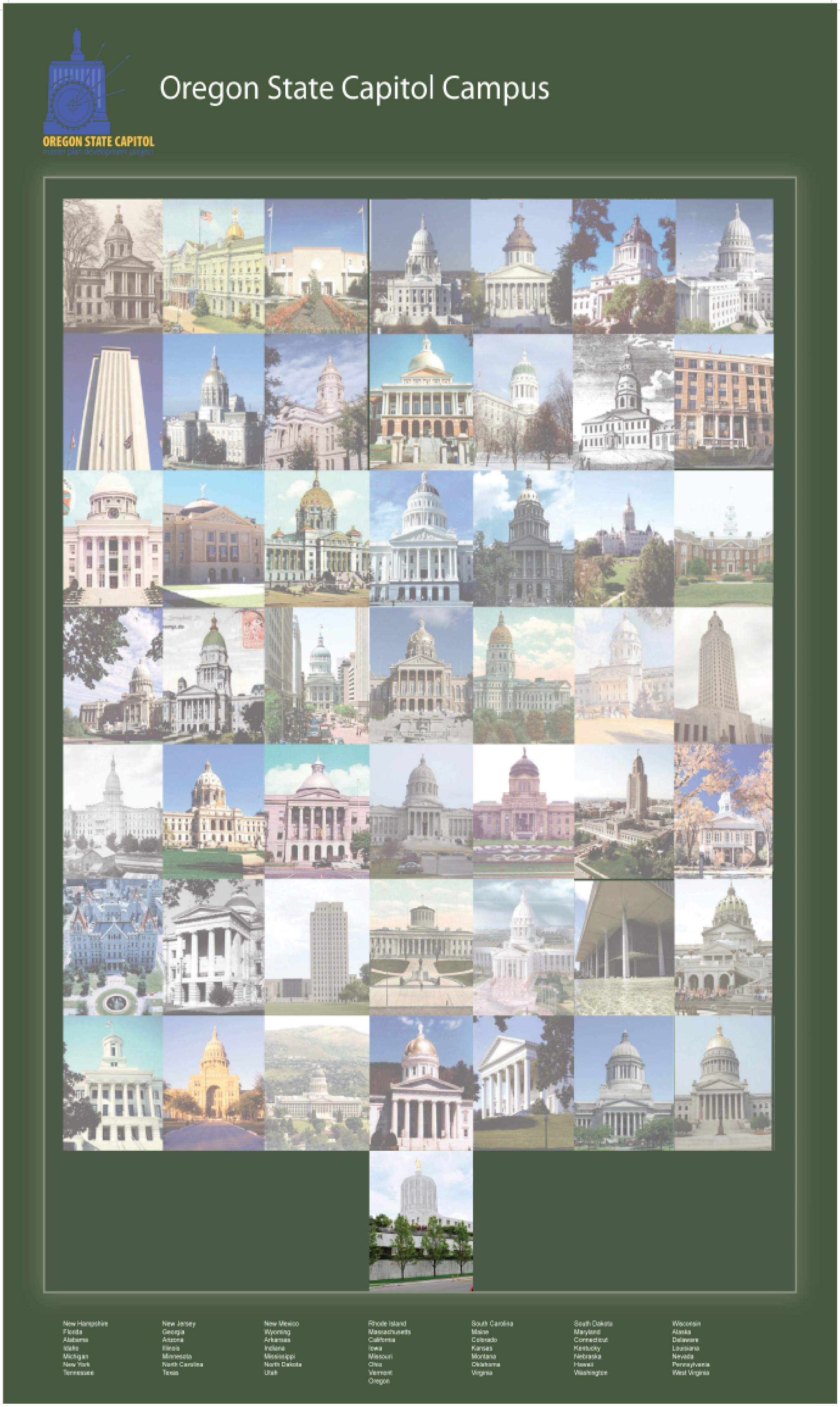
The existing system of wireless repeaters will be expanded to serve all areas of the facility. The existing system was installed by the telephone service provider and will require upgrades during the remodel phase of the project.

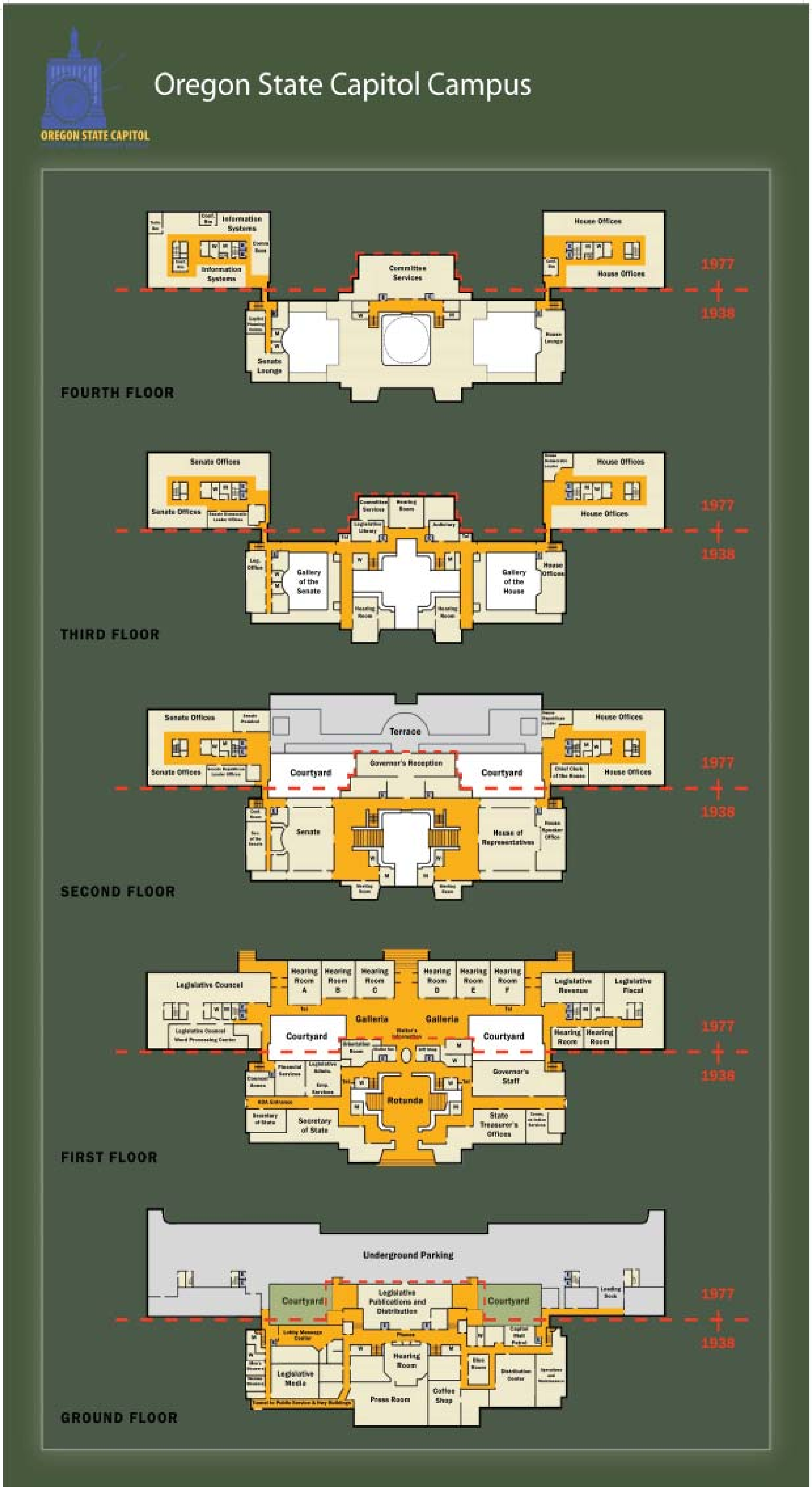
IMAGES

7.0 Appendix

7.0 Appendix

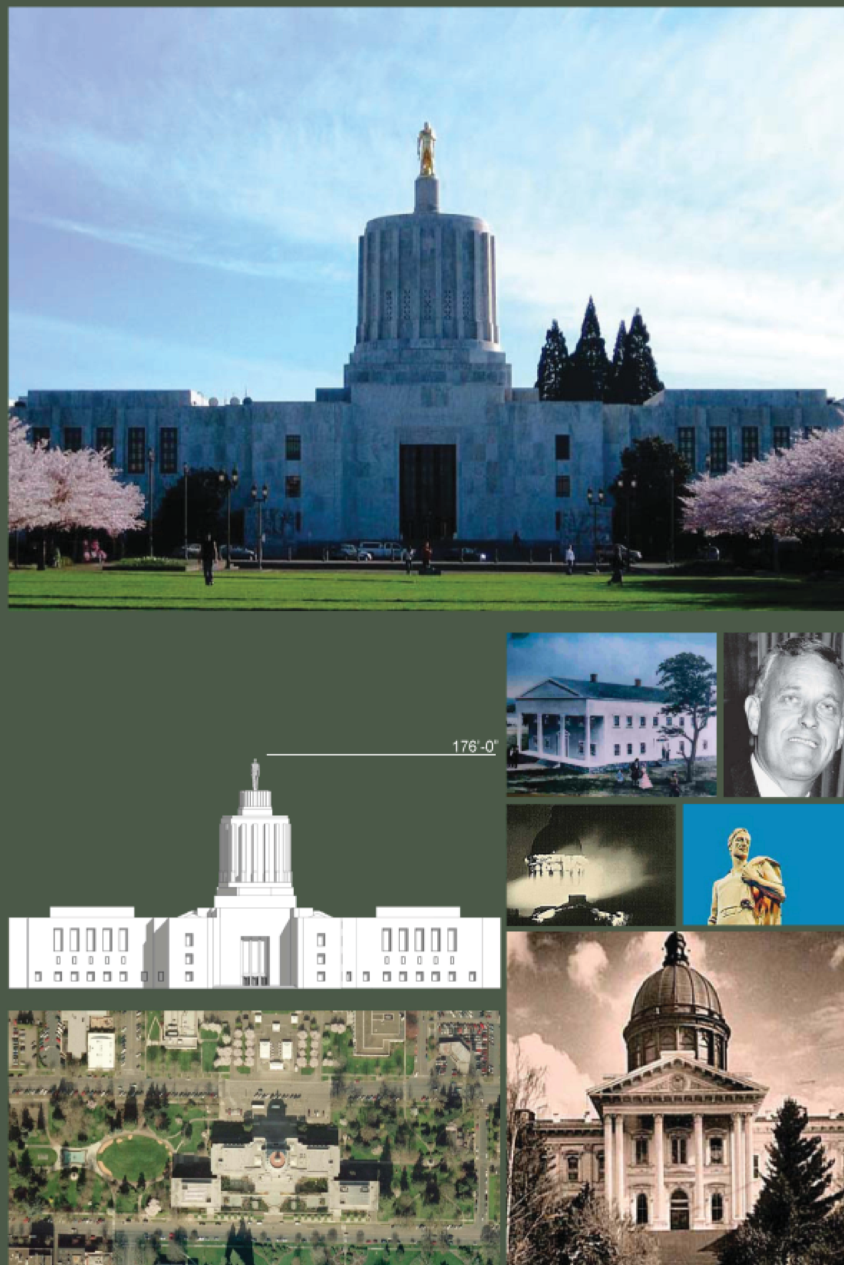
7.1 WORKSHOP PRESENTATION DRAWINGS

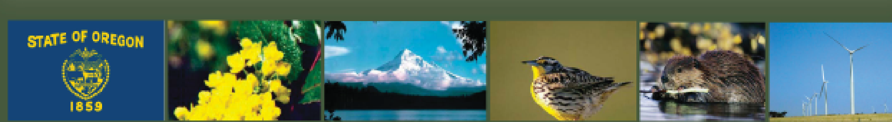



Oregon State Capitol Campus
OREGON STATE CAPITOL
FOURTH FLOOR
Information Systems
Committee Services
House Offices
Senate Lounge
House Lounge
1977
1938
THIRD FLOOR
Senate Offices
House Offices
Gallery of the Senate
Gallery of the House
Hearing Room
SECOND FLOOR
Senate Offices
House Offices
Terrace
Courtyard
Governor's Reception
Senate
House of Representatives
FIRST FLOOR
Legislative Counsel
Hearing Room A
Hearing Room B
Hearing Room C
Hearing Room D
Hearing Room E
Hearing Room F
Legislative Revenue
Legislative Fiscal
Galleria
Courtyard
Rotunda
Governor's Staff
Secretary of State
State Treasurer's Offices
GROUND FLOOR
Underground Parking
Courtyard
Legislative Publications and Distribution
Hearing Room
Legislative Media
Press Room
Coffee Shop
Distribution Center

OREGON STATE CAPITOL

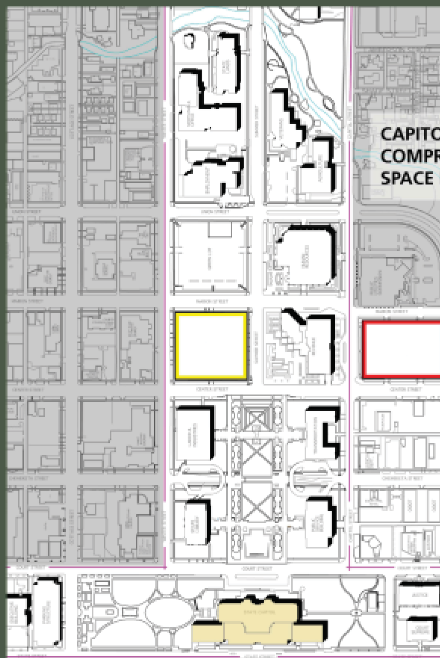
Oregon State Capitol Campus

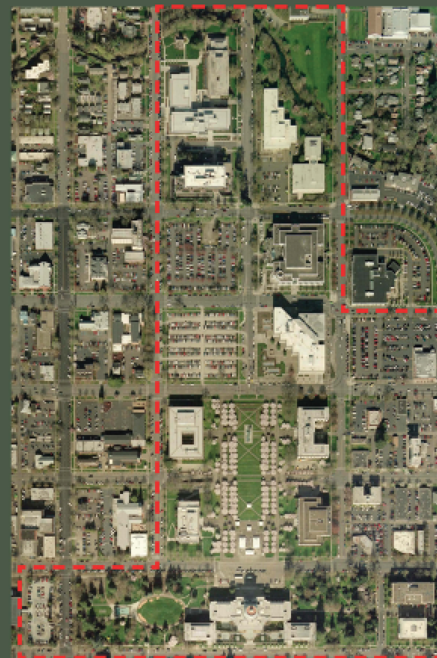


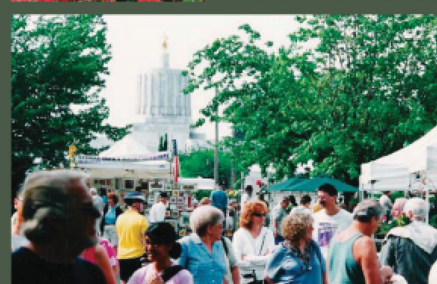


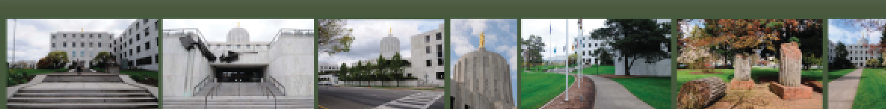
OREGON STATE CAPITOL

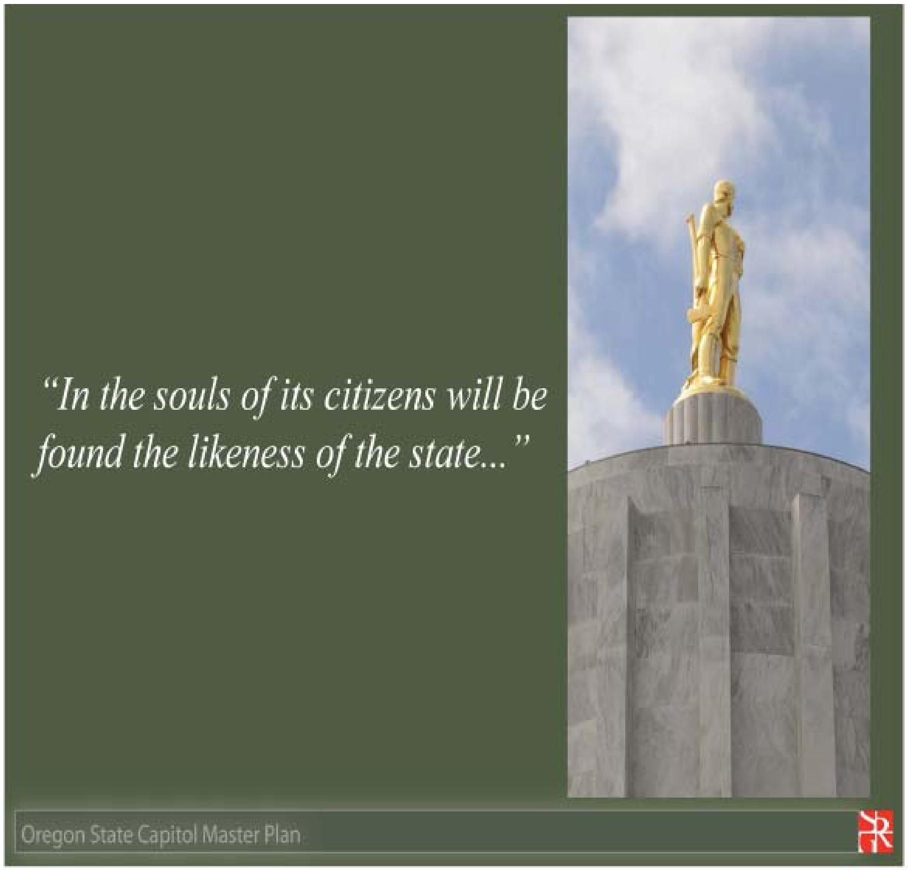
Oregon State Capitol Campus





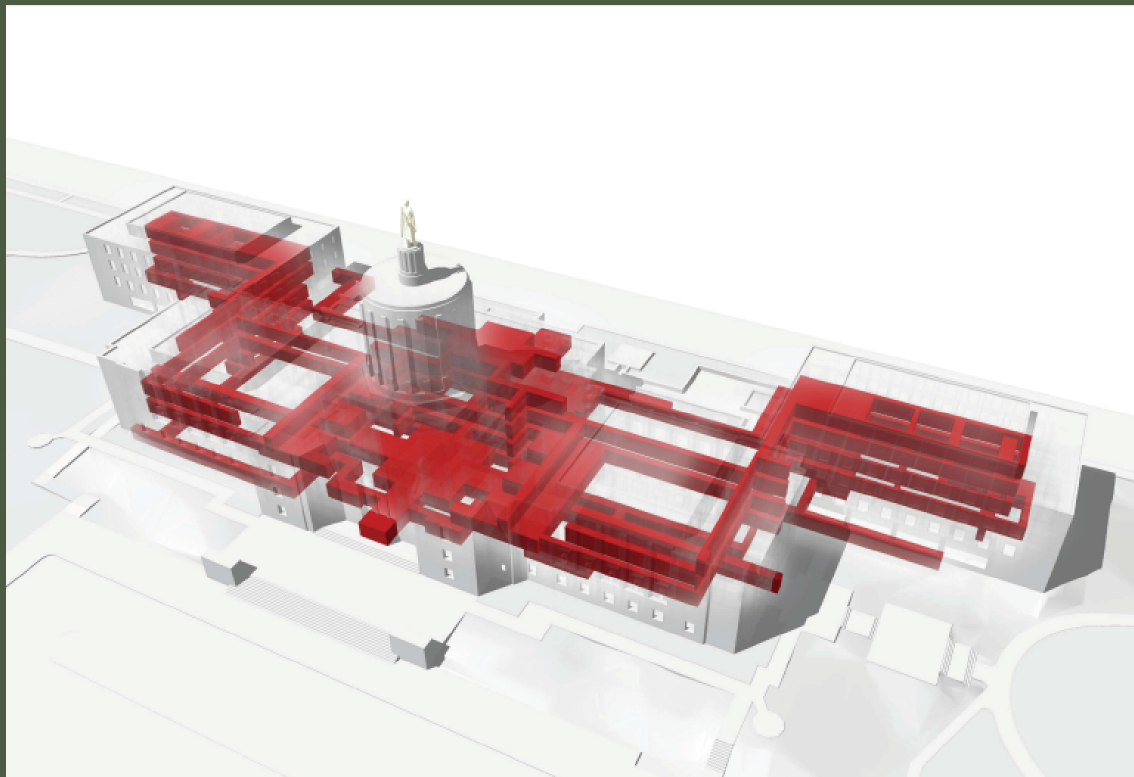




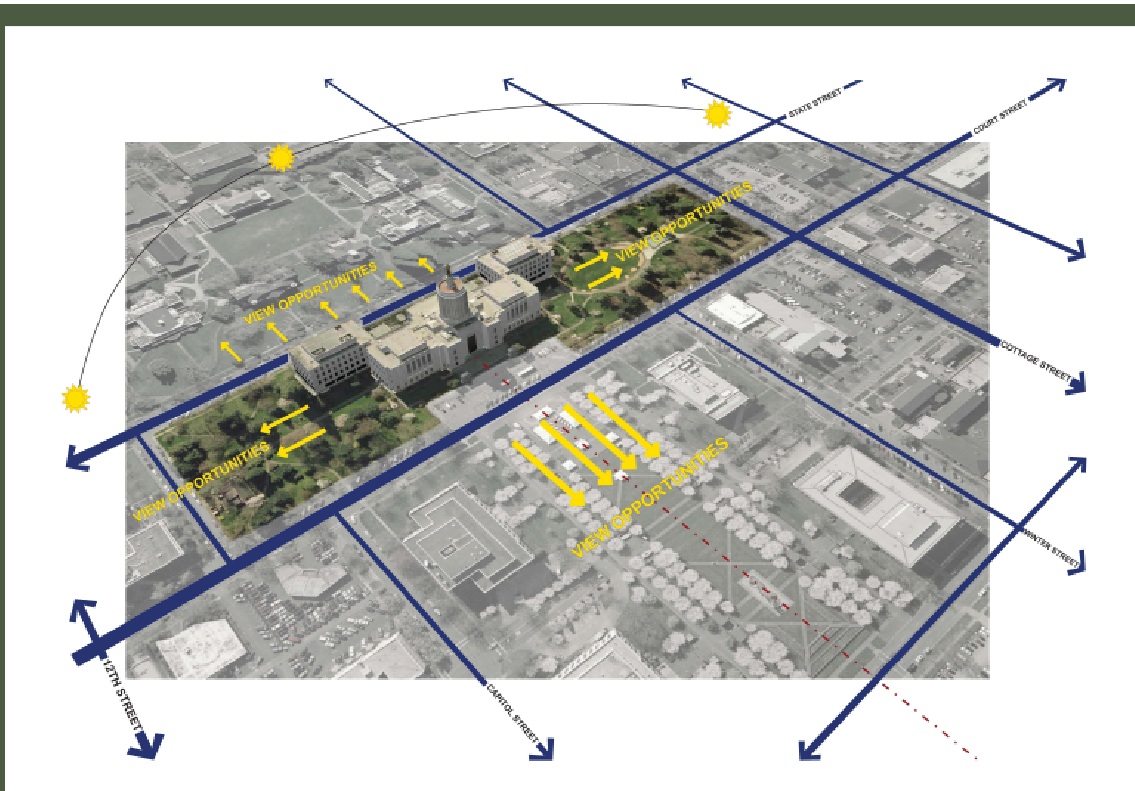

"In the souls of its citizens will be found the likeness of the state..."
Oregon State Capitol Master Plan


Oregon State Capitol Master Plan

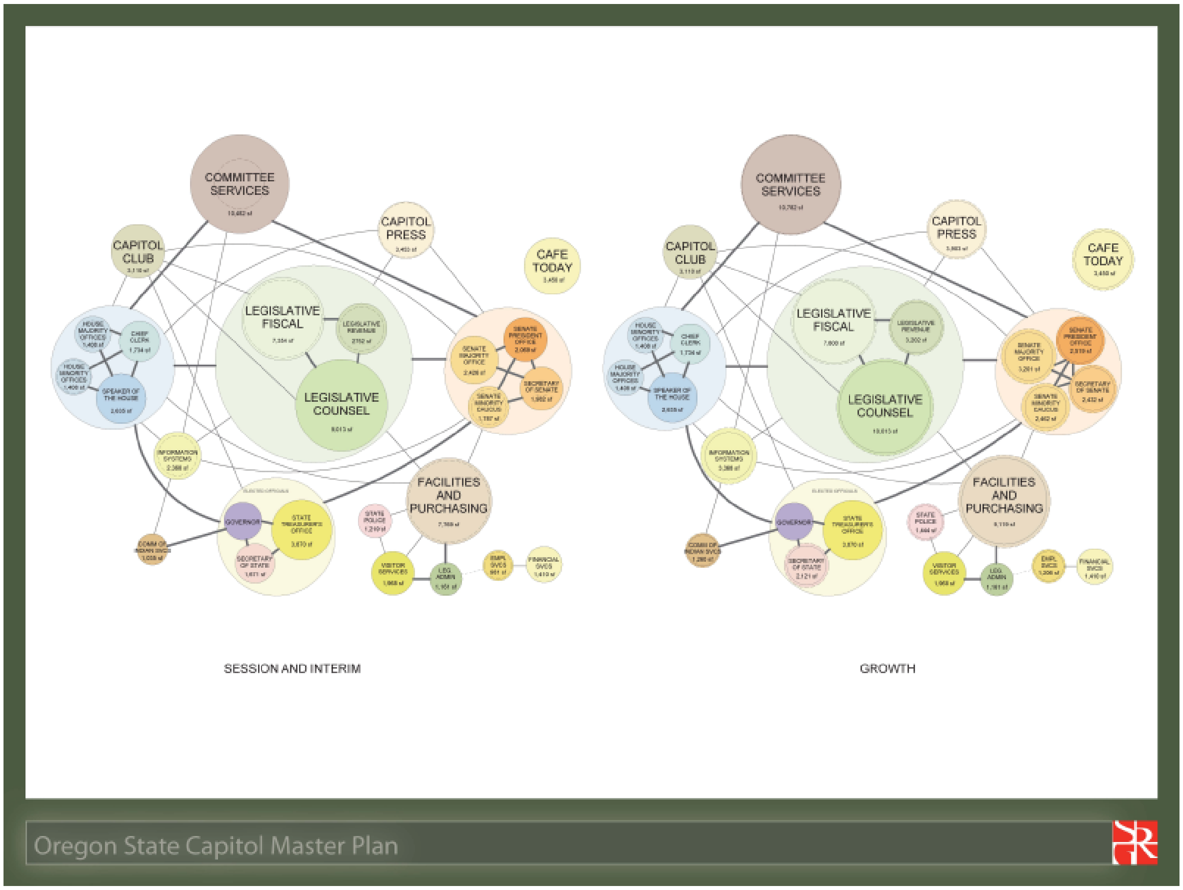

Oregon State Capitol Master Plan

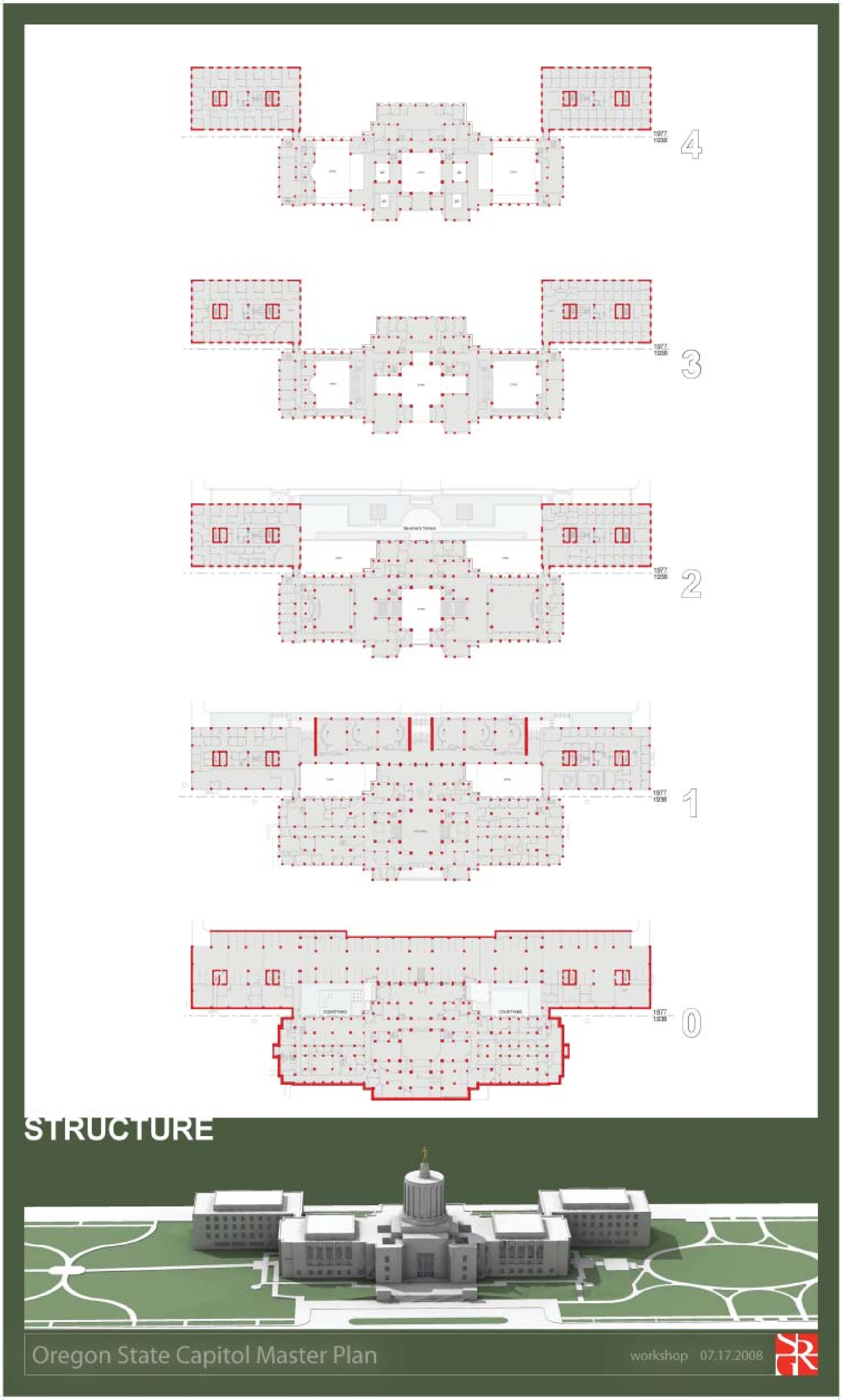


Oregon State Capitol Master Plan

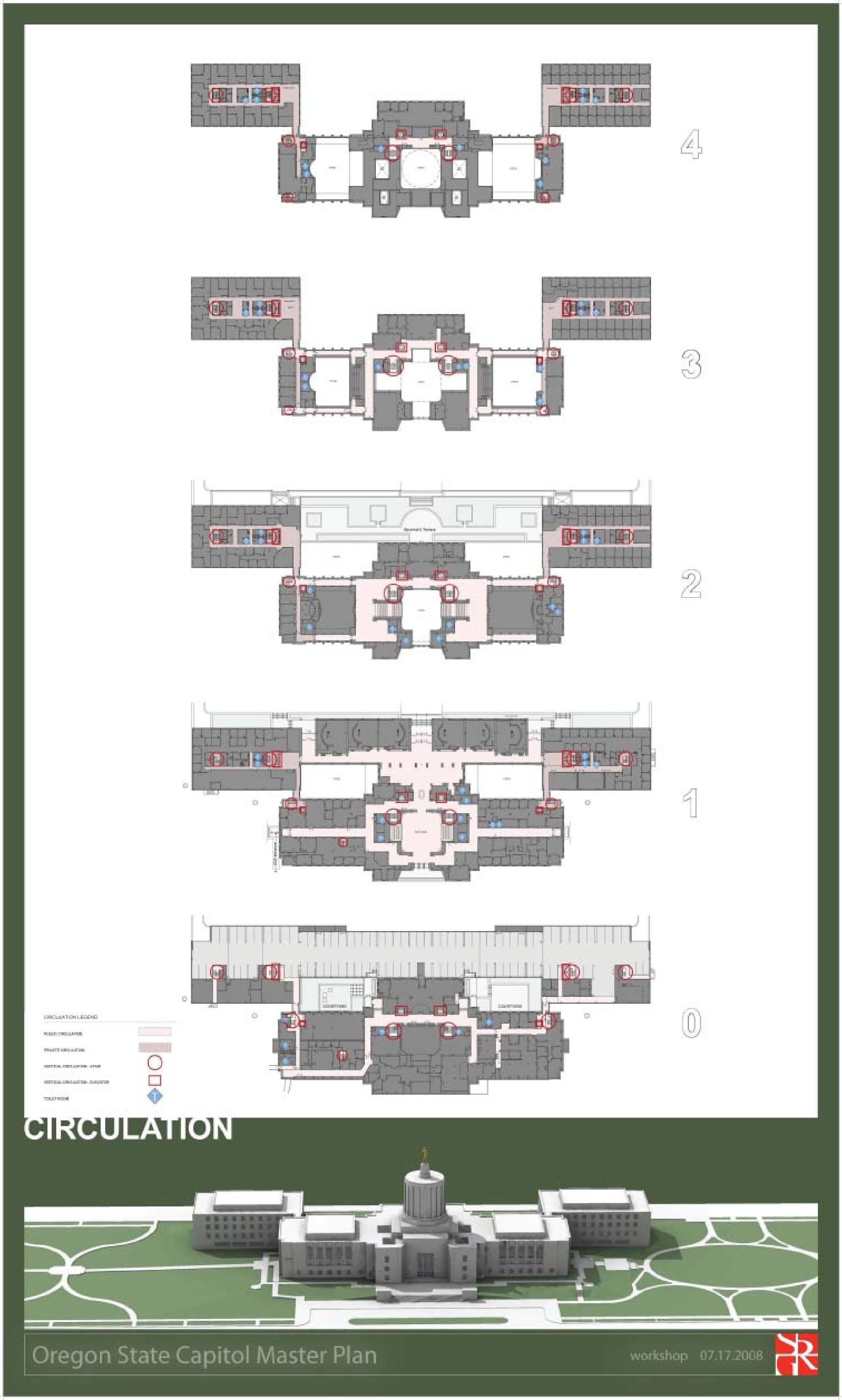


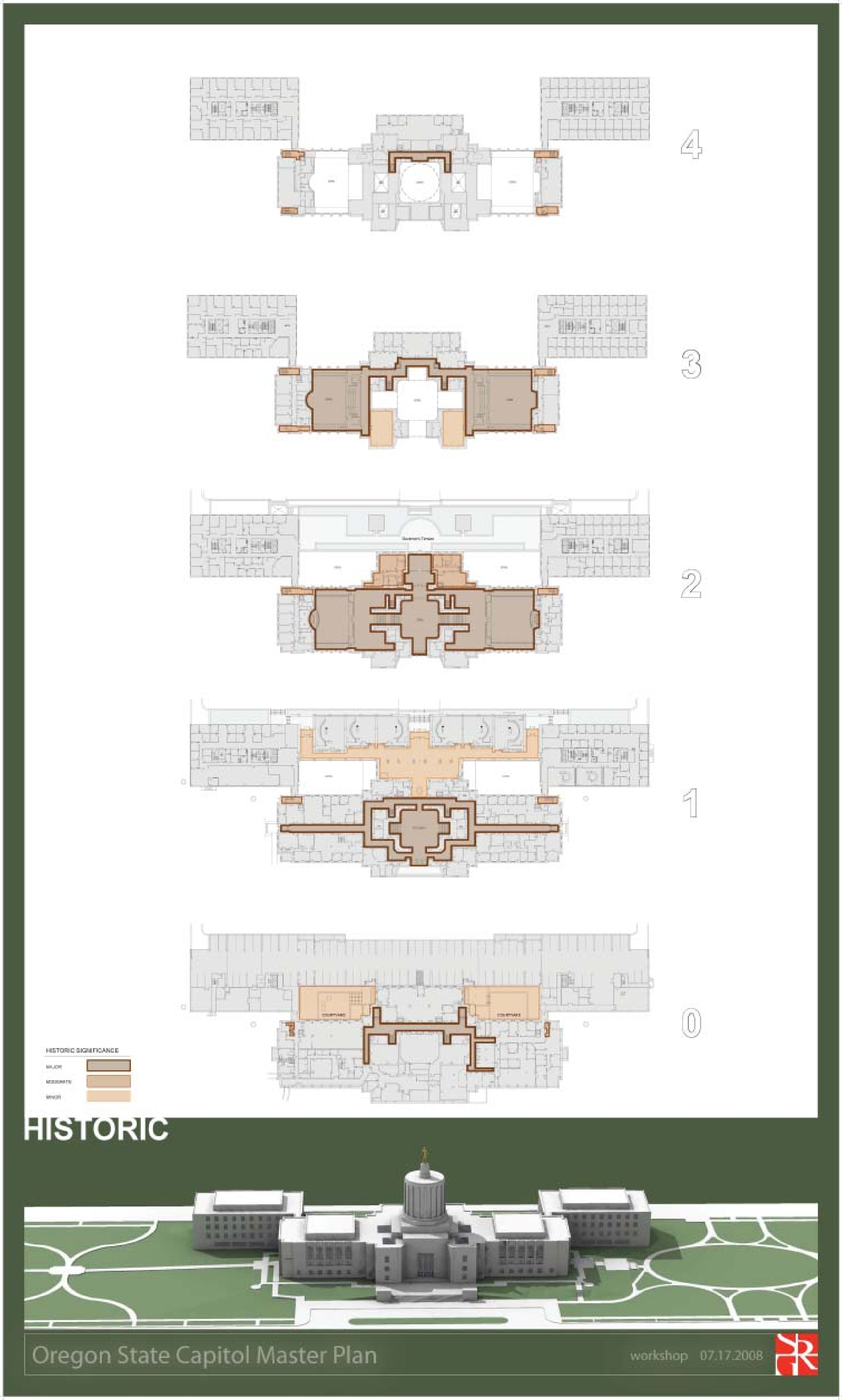
Oregon State Capitol Master Plan

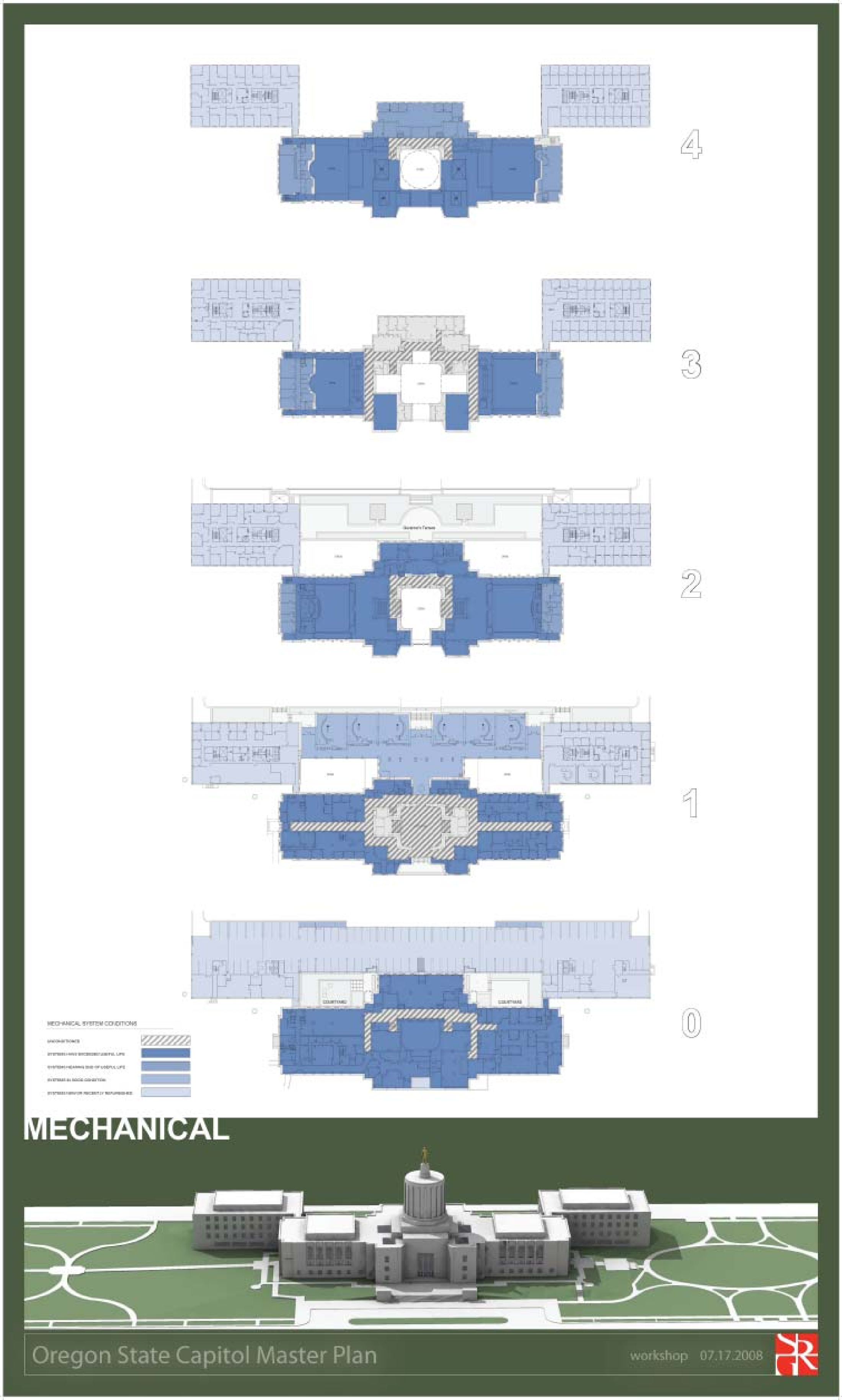

COMMITTEE SERVICES
CAPITOL CLUB
CAPITOL PRESS
CAFE TODAY
LEGISLATIVE FISCAL
LEGISLATIVE COUNSEL
FACILITIES AND PURCHASING
SESSION AND INTERIM
COMMITTEE SERVICES
CAPITOL CLUB
CAPITOL PRESS
CAFE TODAY
LEGISLATIVE FISCAL
LEGISLATIVE COUNSEL
FACILITIES AND PURCHASING
GROWTH
Oregon State Capitol Master Plan

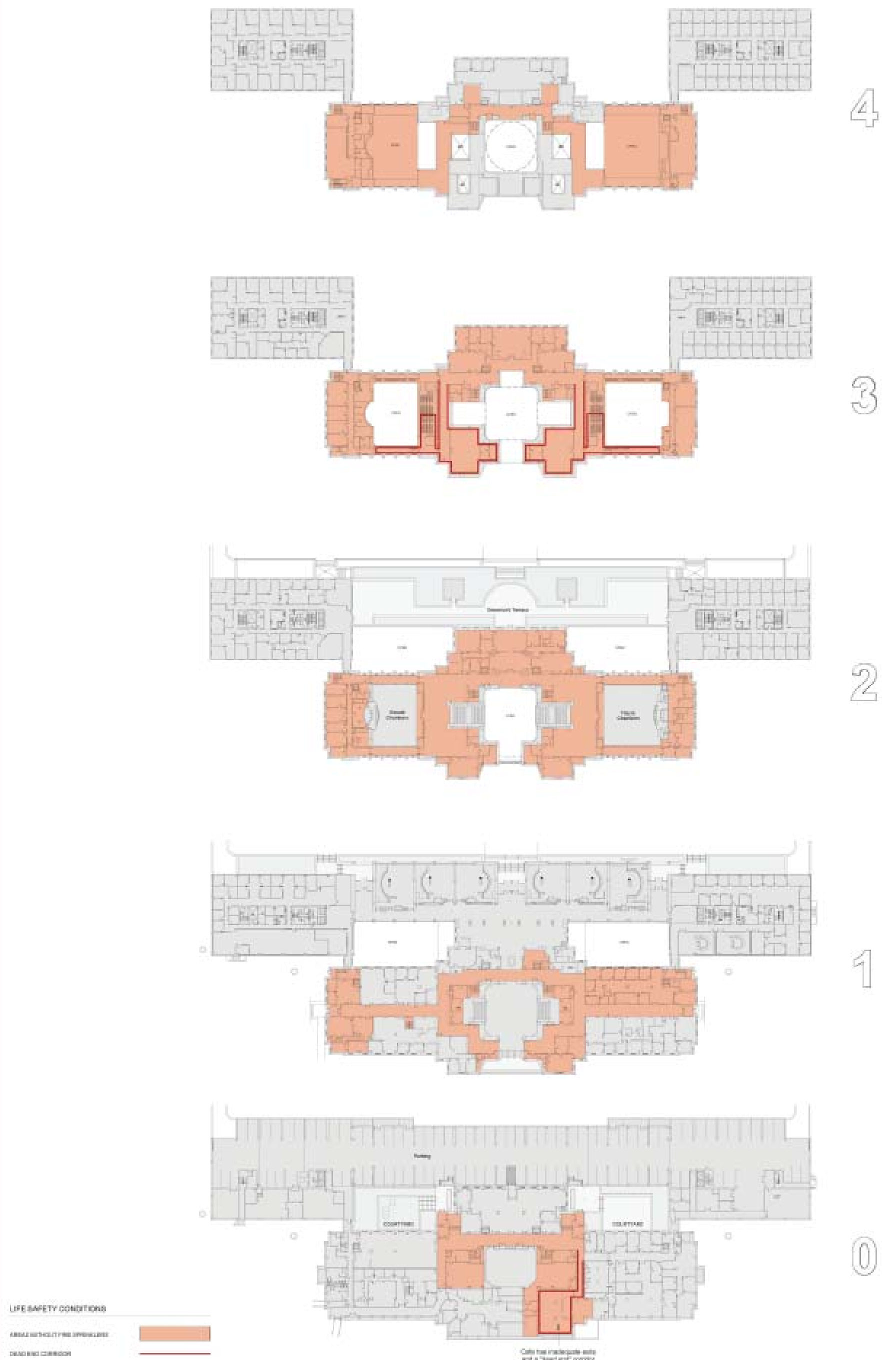


1977
1938
4
1977
1938
3
1977
1938
2
1977
1938
1
COURTYARD
COURTYARD
1977
1938
0
STRUCTURE
Oregon State Capitol Master Plan
workshop 07.17.2008


4
3
2
1
0
CIRCULATION LEGEND
PUBLIC CIRCULATION
PRIVATE CIRCULATION
VERTICAL CIRCULATION - STAIR
VERTICAL CIRCULATION - ELEVATOR
TOILET ROOM
CIRCULATION
Oregon State Capitol Master Plan
workshop 07.17.2008


4
3
2
1
0
HISTORIC SIGNIFICANCE
HISTORIC
Oregon State Capitol Master Plan
workshop 07.17.2008


4
3
2
1
0
MECHANICAL SYSTEM CONDITIONS
MECHANICAL
Oregon State Capitol Master Plan
workshop 07.17.2008



FIRE & LIFE SAFETY

Oregon State Capitol Master Plan

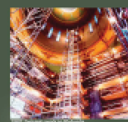
workshop 07.17.2008

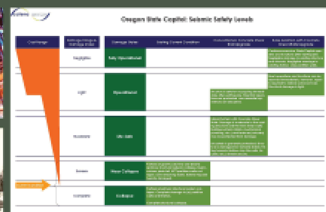
Oregon State Capitol Campus

Structural: Existing Conditions

Building Deficiencies:

- During a major seismic event, existing Capitol could be near collapse with severe damage
- Insufficient shear strength of 1938 and 1977 structure
- Perimeter clay tile infill walls are too slender with no shear strength
- Exterior stone cladding is unstable during a seismic event
- Capitol to be upgraded to seismic life safety level for safe exiting of occupants
- Options for seismic upgrade
  1. Install new concrete shear walls
  2. Base isolate 1938 building and install shear walls in 1977 addition



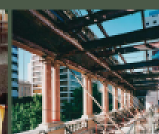


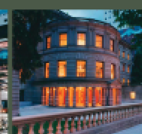
Seismic Option 1: Shear Wall Construction

Strategy: Strengthen building with the addition of concrete shear walls

- Reinforce turret walls with anchors and shotcrete
- Strengthen the beams of the rotunda roof
- Reinforce the parapets around the Rotunda roof
- Brace the plaster finishes of the Rotunda interior
- Remove interior finish and apply shotcrete to the interior face of 1938 exterior walls
- Construct interior shear walls in 1938 and 1977 buildings
- Construct shear walls on either side of Rotunda
- Increase joint sizes of exterior marble cladding
- Reinforce low shear strength columns


Shotcrete being applied


Portland City Hall - Preparing for Shear Walls


Portland City Hall

Examples:
Portland City Hall
Montana State Capitol
Washington State Capitol
Idaho State Capitol
Salt Lake City Hall

Seismic Option 2: Base Isolation

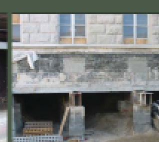
Strategy: Limit seismic event movement and force on the existing building

- 1938 building:

Remove existing ground floor slab and excavate to expose all footings. With temporary structure in place, remove all footings and replace with new footings. Install base isolation bearings under the columns and exterior walls.

- Construct new basement slab
- Install flexible couplings at all utility service connections
- Construct small amount of interior shear walls in isolated locations


Base isolation bearing installed


Utah State Capitol Excavation preparing for base isolation


Pioneer Courthouse

Examples:
Pioneer Courthouse
Utah State Capitol
San Francisco City Hall
Pasadena City Hall

Seismic Options - Comparison

Seismic Option 1 - Shear Wall Construction

Advantages
- Traditional Construction Method
- Ability to construct in sequences

Disadvantages
- Requires major demolition and reconstruction of existing elements and systems
- Impacts existing historic elements and has the potential to damage the existing building
- Major impact on occupancy of areas under construction

Seismic Option 2 - Base Isolation

Advantages
- Construction impact mainly limited to the ground floor
- Retains existing historic elements
- Very little risk to damage of existing building
- Capitol can remain in use on 1st - 4th floors through construction

Disadvantages
- Isolators traditionally slightly more costly that shear walls

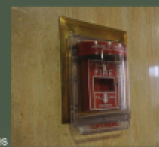
EXISTING CONDITIONS (STRUCTURAL)

Oregon State Capitol Campus

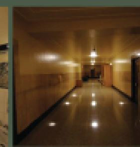
Life Safety and Accessibility: Priorities

Most important areas of focus:

- Install fire sprinkler system to all areas in the 1938 and 977 buildings. Main entry Rotunda to remain non-sprinklered.
- Update gas suppression Halon system with an environmental safe clean agent
- Install new smoke detection system throughout 1938 and 1977 buildings
- Remove existing fire alarm bells/strobes and replace with new horn/strobe devices
- Improve ADA Accessibility of entire building
- Safe exiting from all areas


Fire Alarm Pull


Accessibility

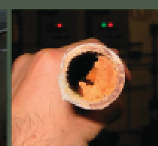

Dead-end Corridor on 3rd Floor

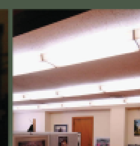
Infrastructure: Existing Conditions

Building Deficiencies:

- 1938 Infrastructure are all in poor condition and beyond life expectancy (including heating plant, cooling plant, air distribution, and plumbing)
- Steam, boiler plant and hot water system are not operating at optimum efficiency due to age
- Code requirements are not being met in the following areas:
  - Air distribution service clearances
  - Seismic restraining of various piping
  - Electrical panel wiring access
  - Emergency lighting
- Existing florescent lighting is outdated and operating at low efficiency
- Insufficient alarms and smoke detectors


1938 Mechanical Equipment


Existing Plumbing


Existing Inefficient Lighting

Infrastructure: Priorities

Most important areas of focus:

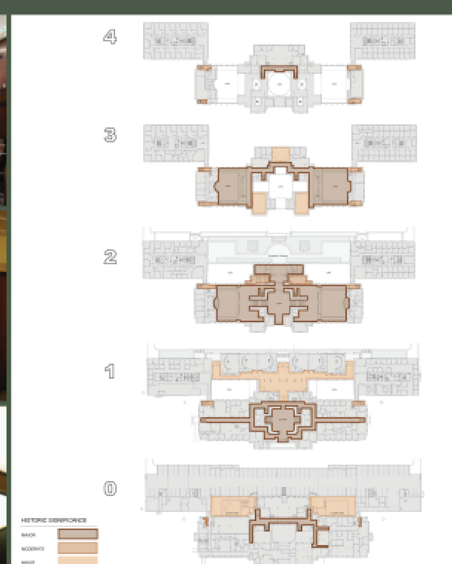
- Convert steam and condensate piping systems to a more efficient hot water heating system
- Replace HVAC system serving the 1938 building
- Replace plumbing fixtures and piping systems in the 1938 building (cold water, hot water, sanitary waste, and storm drain piping)
- Replace electrical distribution systems including electrical panel boards in 1938 building
- Replace fire alarm system and integrate with the system installed in the wings


Existing Electrical Distribution Equipment


1938 Fan System SF-1


Existing Water Heating System

Historic Elements



EXISTING CONDITIONS (INFRASTRUCTURE AND HISTORIC)

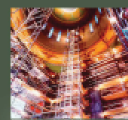
OREGON STATE CAPITOL
master plan development project

Oregon State Capitol Campus

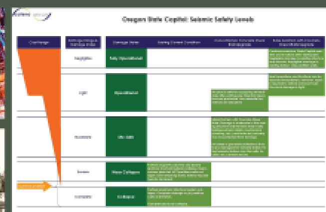
Structural: Existing Conditions

Building Deficiencies:

- During a major seismic event, existing Capitol could be near collapse with severe damage
- Insufficient shear strength of 1938 and 1977 structure
- Perimeter clay tile infill walls are too slender with no shear strength
- Exterior stone cladding is unstable during a seismic event
- Capitol to be upgraded to seismic life safety level for safe exiting of occupants
- Options for seismic upgrade
    1. Install new concrete shear walls
    2. Base isolate 1938 building and install shear walls in 1977 addition


Seismic work in Rotunda


Exterior construction



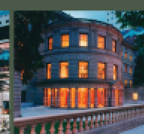
Seismic Option 1: Shear Wall Construction

Strategy: Strengthen building with the addition of concrete shear walls

- Reinforce turret walls with anchors and shotcrete
- Strengthen the beams of the rotunda roof
- Reinforce the parapets around the Rotunda roof
- Brace the plaster finishes of the Rotunda interior
- Remove interior finish and apply shotcrete to the interior face of 1938 exterior walls
- Construct interior shear walls in 1938 and 1977 buildings
- Construct shear walls on either side of Rotunda
- Increase joint sizes of exterior marble cladding
- Reinforce low shear strength columns


Shotcrete being applied


Portland City Hall - Preparing for Shear Walls


Portland City Hall

Examples:
Portland City Hall
Montana State Capitol
Washington State Capitol
Idaho State Capitol
Salt Lake City Hall

Seismic Option 2: Base Isolation

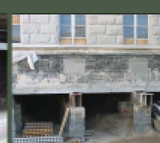
Strategy: Limit seismic event movement and force on the existing building

- 1938 building:

Remove existing ground floor slab and excavate to expose all footings. With temporary structure in place, remove all footings and replace with new footings. Install base isolation bearings under the columns and exterior walls.

- Construct new basement slab
- Install flexible couplings at all utility service connections
- Construct small amount of interior shear walls in isolated locations

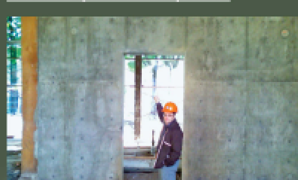

Base Isolation Bearing Installed


Utah State Capitol Excavation preparing for base isolation


Pioneer Courthouse

Examples:
Pioneer Courthouse
Utah State Capitol
San Francisco City Hall
Pasadena City Hall

Seismic Options - Comparison


Shear Wall

Seismic Option 1 - Shear Wall Construction

Advantages
- Traditional Construction Method
- Ability to construct in sequences

Disadvantages
- Requires major demolition and reconstruction of existing elements and systems
- Impacts existing historic elements and has the potential to damage the existing building
- Major impact on occupancy of areas under construction


Base Isolator

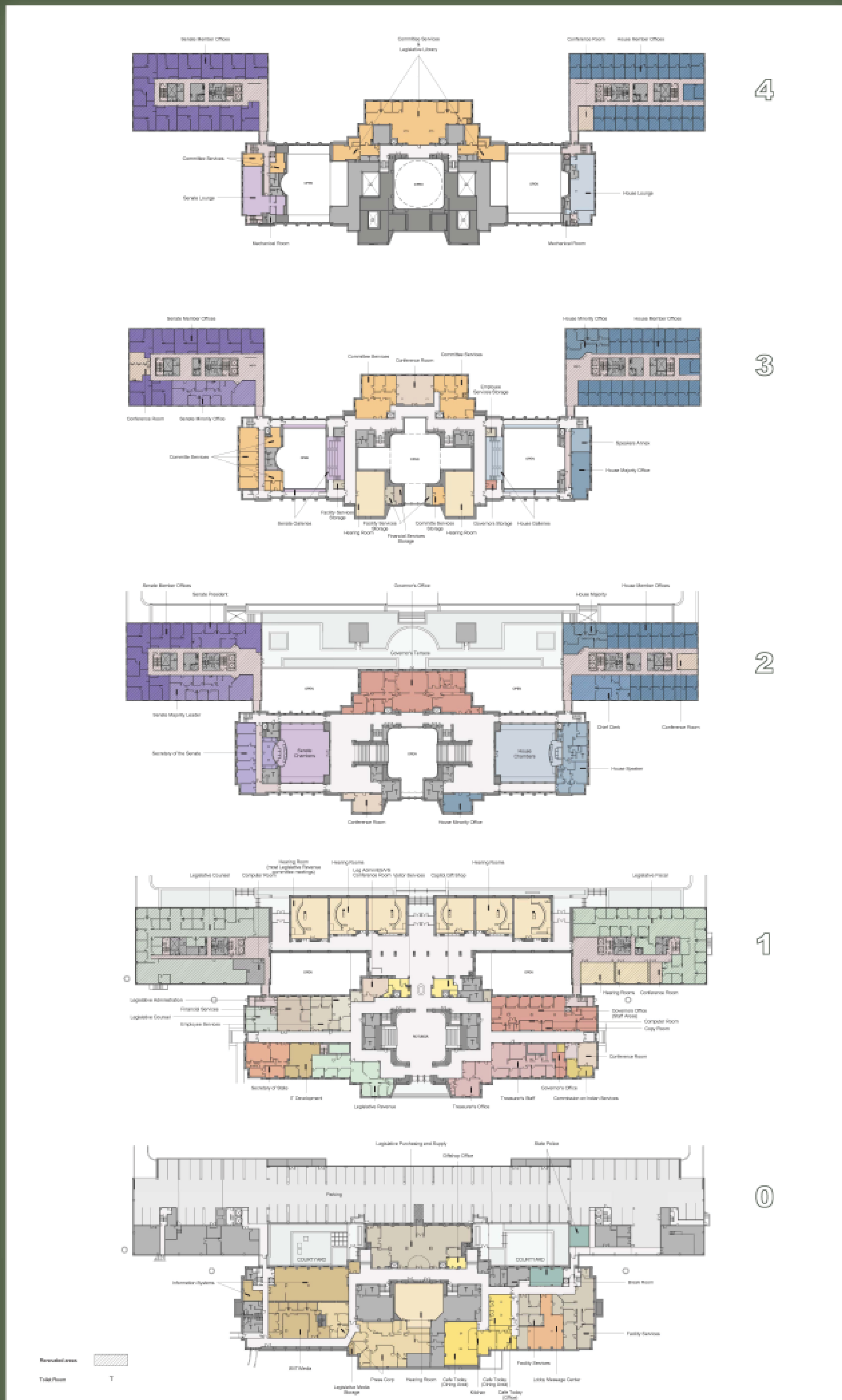
Seismic Option 2 - Base Isolation

Advantages
- Construction impact mainly limited to the ground floor
- Retains existing historic elements
- Very little risk to damage of existing building
- Capitol can remain in use on 1st - 4th floors through construction

Disadvantages
- Isolators traditionally slightly more costly that shear walls

EXISTING CONDITIONS (STRUCTURAL)

Oregon State Capitol Campus



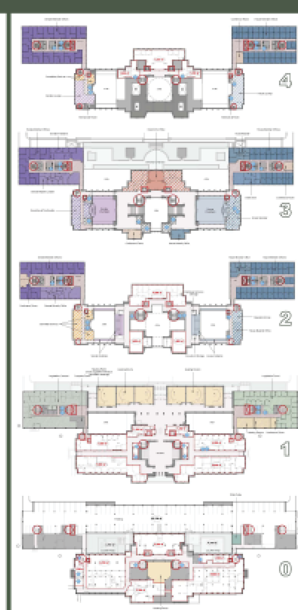
SPACE (IN SESSION)

OREGON STATE CAPITOL

Oregon State Capitol Campus

PROGRAM SPACE	DEDICATED AREAS (CURRENT AREAS + GROWTH)	ESSENTIAL FUNCTIONS (CURRENT AREAS + GROWTH)
EXECUTIVE BRANCH	**3,560**	**11,627**
Governor	3,560	6,357
Treasurer		3,027
Secretary of State		2,243
LEGISLATIVE BRANCH	**72,969**	**-**
Senate Members	17,720	
Senate Chambers	4,749	
Senate Lounge	1,626	
Senate President	2,070	
Secretary of Senate	3,446	
Senate Minority	2,438	
Senate Majority	3,558	
House Members	19,235	
House Chambers	5,608	
House Lounge	2,028	
Speaker of the House	2,825	
Chief Clerk	3,134	
House Minority	2,108	
House Majority	2,424	
LEGISLATIVE RESOURCES	**15,483**	**24,127**
Legislative Fiscal	7,025	
Legislative Counsel	8,458	4,770
Legislative Revenue		2,914
Committee Services		15,714
Commission on Indian Services		729
SUPPORT SERVICES	**2,996**	**66,739**
Capitol Club		1,523
Information Systems		9,228
Security		1,519
Facilities and Purchasing		9,959
Visitor Services		1,067
Legislative Administration		1,403
Employee Services		1,147
Financial Services		1,500
Cafe Today		4,359
Capitol Press		4,508
Hearing/Meeting/Caucus Rooms		30,526
Rotunda	2,996	
Capitol History Center		800
TOTAL AREA (CURRENT): **173,481**	DEDICATED AREA: 95,008	ESSENTIAL FUNCTIONS: 103,696

CURRENT PROGRAM AREA:	173,481
- DEDICATED AREA:	95,008
- ESSENTIAL FUNCTIONS:	103,696
SPACE DEFICIT:	-24,820



SPACE NEEDS

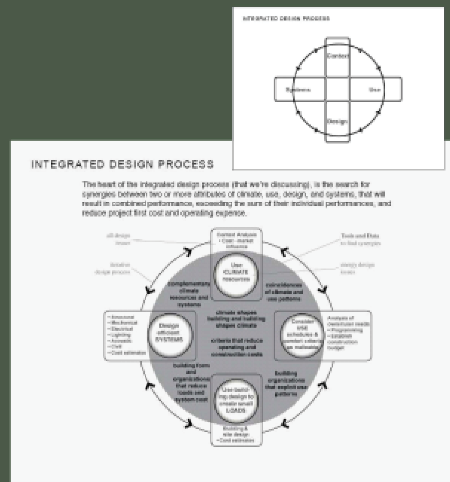
Oregon State Capitol Campus

OREGON STATE CAPITOL
master plan development project

Definition of Sustainability

Sustainability is an economic state where the demands placed upon the environment by people and commerce can be met with-out reducing the capacity of the environment to provide for future generations. It can also be expressed in the simple terms of an economic golden rule for the restorative economy: **leave the world better than you found it, take no more than you need, try not to harm life of the environment, make amends if you do**.

PAUL HAWKEN



Green Facts

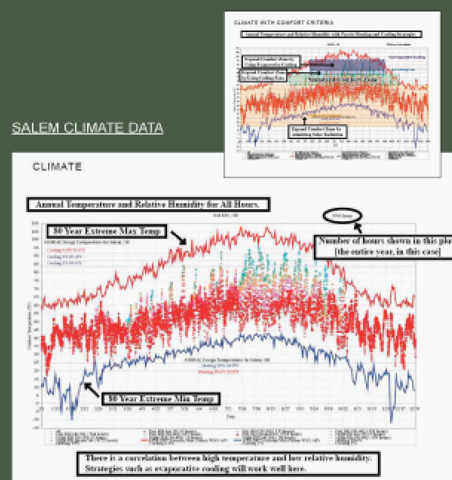
Buildings we work in account for:

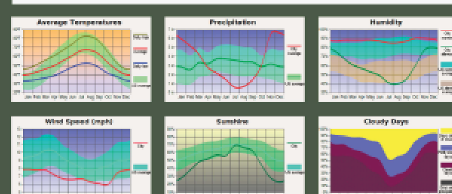
- 30-40% of total energy use and emissions
- 30-40% of solid waste
- 25-30% of wood and raw material waste
- 25% of potable water
- 90% of our time indoors

" Slowing the growth rate of greenhouse gas emissions and then reversing it over the next 10 years is critical to keep global warming one degree above today's level. Buildings are a major source of demand for energy and materials."

The 2030 Challenge is asking the global architecture and building community to adopt the following: New building and renovations designed to use energy consumption performance standards of 50% less of the regional average for that building type.

SALEM CLIMATE DATA





"The Opportunity" – Strategies for Sustainable Success

Site Design

- Existing site clean-up
- Storm water management and treatment
- Protect and respect the local environment
  - Biofiltration swales
  - Storm water planters
  - Biofiltration strips
  - Testing & demonstration facilities
- Transportation efficiency
- Maximize previous paving
- Light pollution reduction
- Minimize new building site

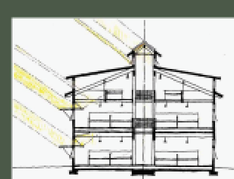
Building

Materials and Resources

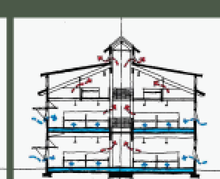
- Storage and collection of recyclables
- Construction waste management
- Materials with recycled content
- Local and regional materials
- Renewable materials
- Certified wood products

Indoor Environmental Quality

- Commissioning
- Two-week flush prior to occupancy
- Low-emitting materials
- Operable windows
- Task lighting
- HVAC at user location



Day lighting



Ventilation and Passive Cooling

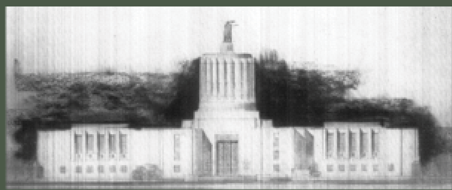
SUSTAINABILITY STRATEGIES

ORANGE STATE CAPITOL

Oregon State Capitol Campus

ORIGINAL THOUGHTS ABOUT A SUSTAINABLE CAPITOL:

NOTES BY THE ARCHITECTS
1936



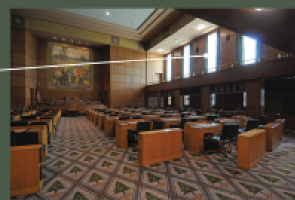
"From the beginning we also felt that this building should have all of the simplicity and fine proportion that is associated with the classic but that the detail should be related to contemporary life. **This thought seemed especially appropriate when we considered the section of the country where the Capitol is to be placed, the progressive northwest where the newer ideas have more fertile soil to grow in"**

"**By bringing the chambers to the outside walls we could use direct window lighting, letting in daylight and sunshine on the legislative deliberations** and relieving the feeling, usual in such halls, of being shut in, as in a cellar"

EXISTING SUSTAINABLE ELEMENTS:

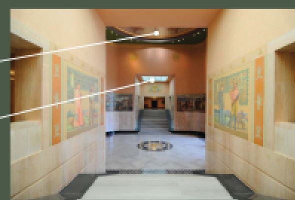
PVs on a portion of the roof

Day lighting opportunities in Senate and House chambers



Day lighting and natural ventilation in rotunda

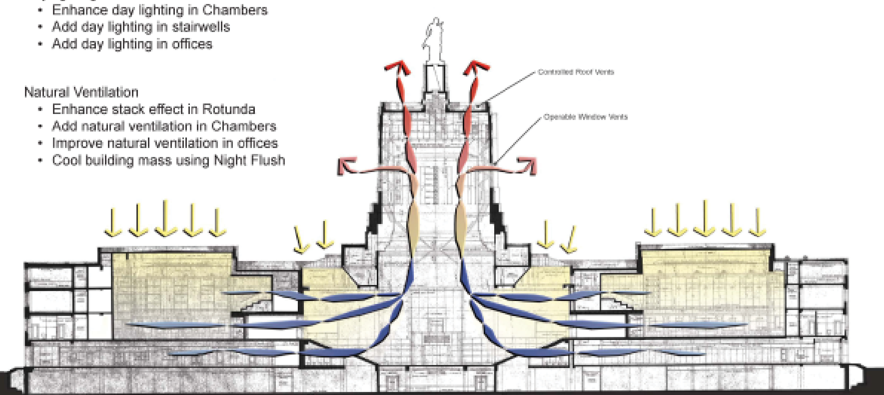
day lighting in rotunda stair



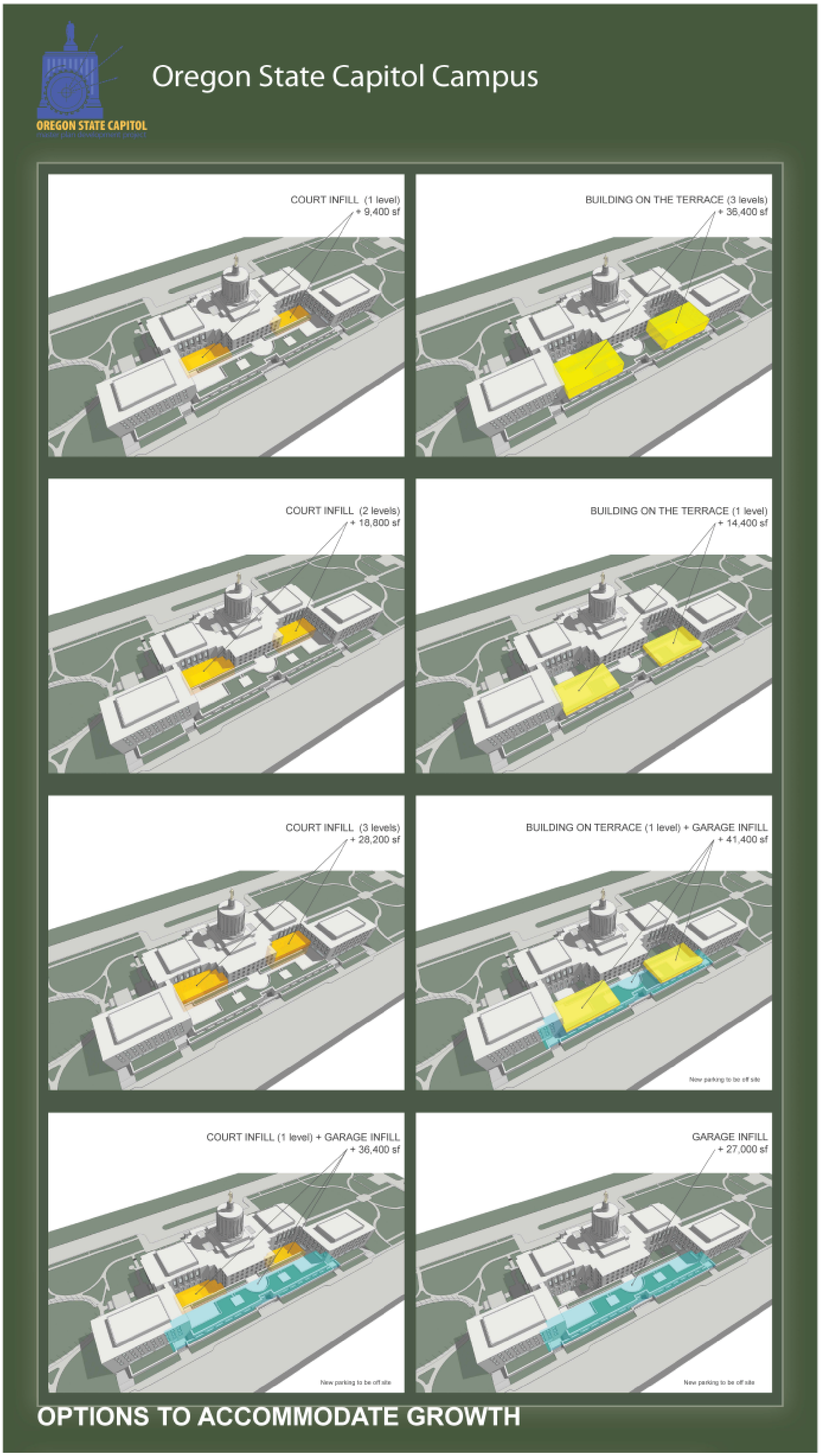
day lighting in offices

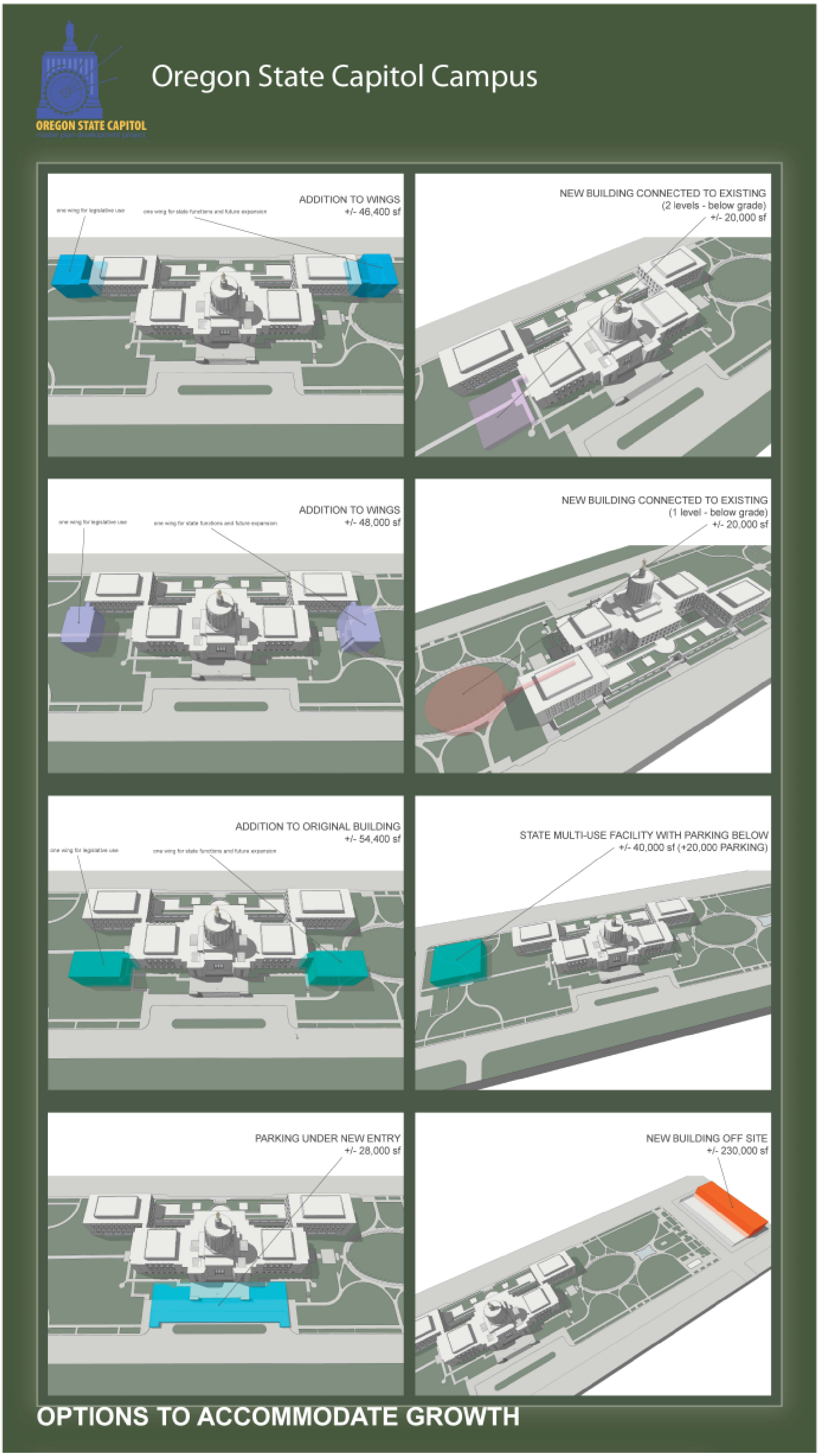
Day lighting
- Enhance day lighting in Chambers
- Add day lighting in stairwells
- Add day lighting in offices

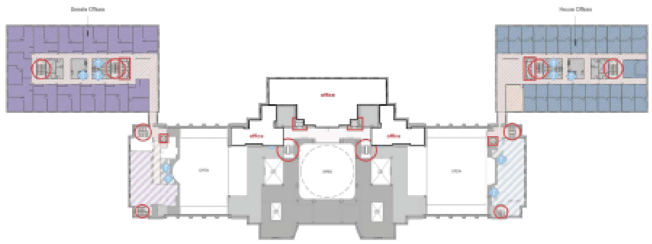
Natural Ventilation
- Enhance stack effect in Rotunda
- Add natural ventilation in Chambers
- Improve natural ventilation in offices
- Cool building mass using Night Flush



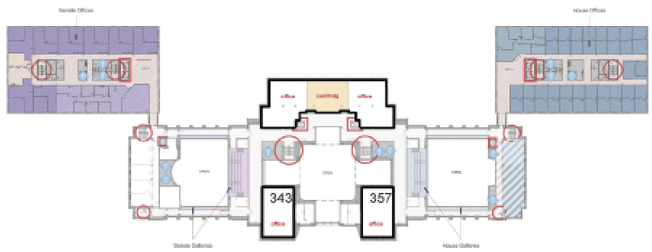
SUSTAINABILITY STRATEGIES


OREGON STATE CAPITOL
Oregon State Capitol Campus
COURT INFILL (1 level)
+ 9,400 sf
BUILDING ON THE TERRACE (3 levels)
+ 36,400 sf
COURT INFILL (2 levels)
+ 18,800 sf
BUILDING ON THE TERRACE (1 level)
+ 14,400 sf
COURT INFILL (3 levels)
+ 28,200 sf
BUILDING ON TERRACE (1 level) + GARAGE INFILL
+ 41,400 sf
New parking to be off site
COURT INFILL (1 level) + GARAGE INFILL
+ 36,400 sf
New parking to be off site
GARAGE INFILL
+ 27,000 sf
New parking to be off site
OPTIONS TO ACCOMMODATE GROWTH


Oregon State Capitol Campus
OREGON STATE CAPITOL
ADDITION TO WINGS
+/- 46,400 sf
one wing for legislative use
one wing for state functions and future expansion
NEW BUILDING CONNECTED TO EXISTING
(2 levels - below grade)
+/- 20,000 sf
ADDITION TO WINGS
+/- 48,000 sf
one wing for legislative use
one wing for state functions and future expansion
NEW BUILDING CONNECTED TO EXISTING
(1 level - below grade)
+/- 20,000 sf
ADDITION TO ORIGINAL BUILDING
+/- 54,400 sf
one wing for legislative use
one wing for state functions and future expansion
STATE MULTI-USE FACILITY WITH PARKING BELOW
+/- 40,000 sf (+20,000 PARKING)
PARKING UNDER NEW ENTRY
+/- 28,000 sf
NEW BUILDING OFF SITE
+/- 230,000 sf
OPTIONS TO ACCOMMODATE GROWTH

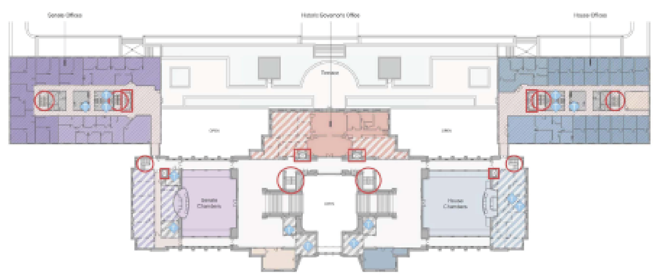


4

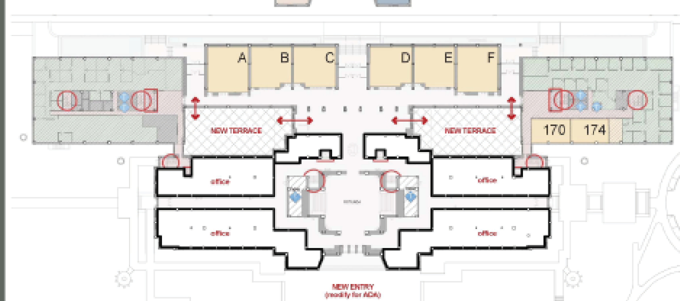


3

1 Meeting/Hearing Room
(existing hearing rooms 343 and 357 converted to offices)
Large conference room remains



2



1

8 Hearing Rooms
(all existing)
2 new exterior terraces
(accessible to the public)

0

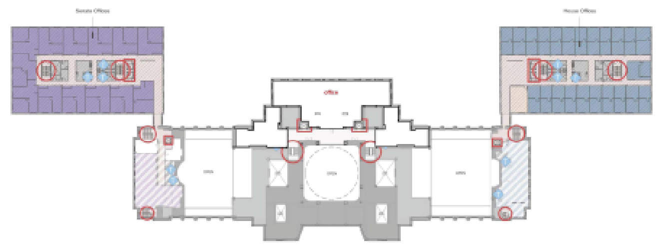
7 Hearing Rooms
(6 new, existing 50 G)
Relocated Cafe

TOTAL: **16 Hearing Rooms**
- 10-12,000 sf of office

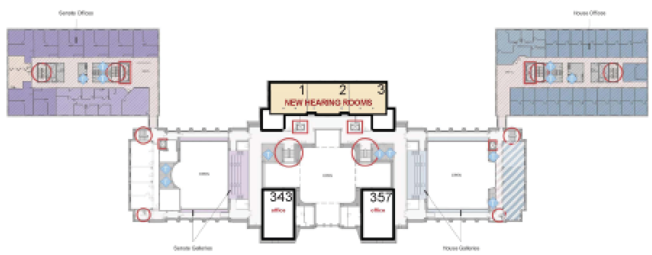
COURTYARD INFILL

CONCEPT A1

Oregon State Capitol Master Plan 01.26.2009

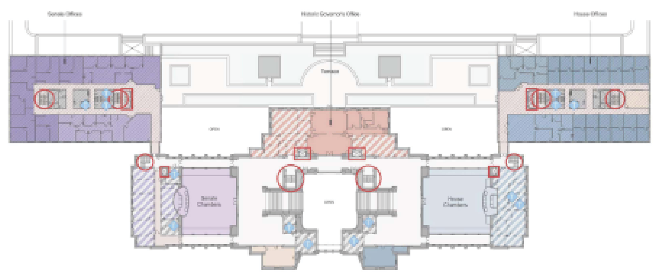


4

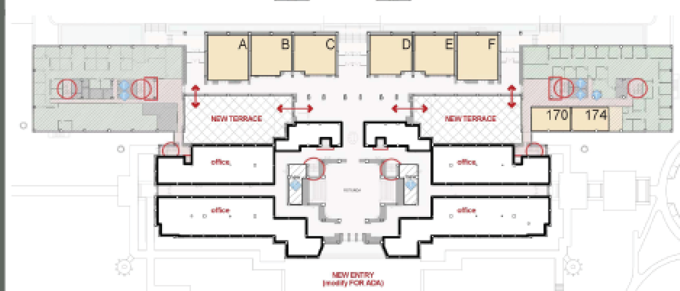


3

3 Hearing Rooms
(2 new hearing rooms, plus existing large conference room)
Existing hearing rooms 343 and 357 converted to offices

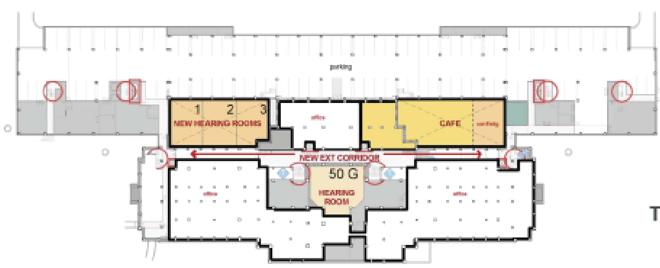


2



1

8 Hearing Rooms
(all existing)
2 new exterior terraces
(accessible to the public)



0

5 Hearing Rooms
(4 new, existing 50 G)
Relocated Cafe with attached conference room

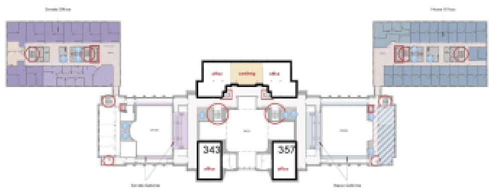
TOTAL: 16 Hearing Rooms
- 10-12,000 sf of office

COURTYARD INFILL

CONCEPT A2

Oregon State Capitol Master Plan

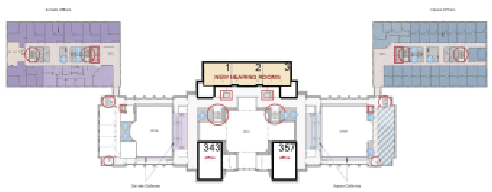
01.26.2009



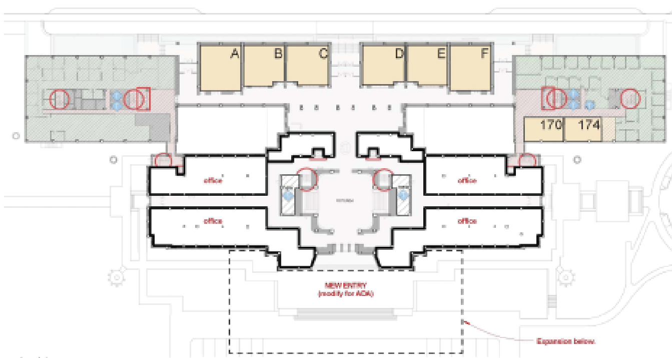
A1

3

1-3 Hearing Rooms
(based on A1 and A2)

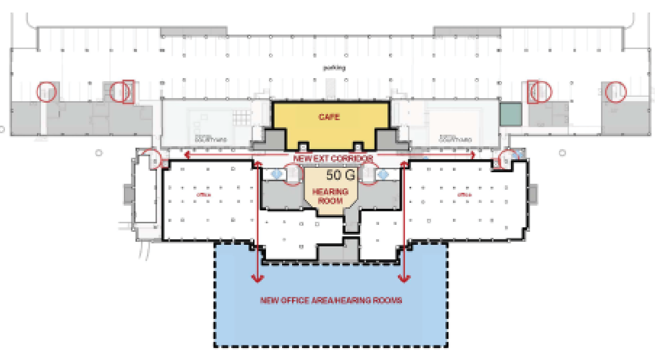


A2



1

8 Hearing Rooms
(all existing)
Major upgrades and ADA improvements at exterior of north entry



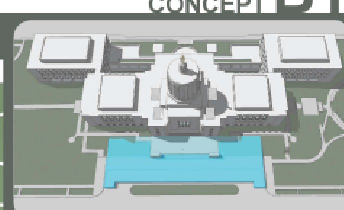
0

5-7 Hearing Rooms
(1 existing hearing room and 4-6 new hearing rooms depending on 3rd floor)
New office expansion
Relocated Cafe

TOTAL: 16 Hearing Rooms
office sf meets program

NORTH EXPANSION (WITHOUT INFILL)

CONCEPT B1

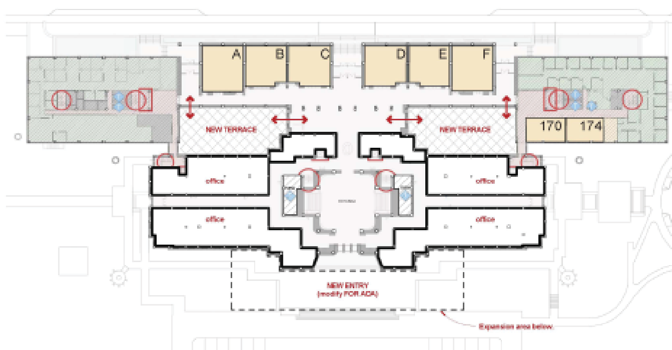


Oregon State Capitol Master Plan 01.26.2009

A1

3

1 Meeting/Hearing Room
(existing hearing rooms 343 and 357 converted to offices)
Large conference room remains



1

8 Hearing Rooms
(all existing)
Major upgrades and ADA improvements at exterior of north entry
2 new exterior terraces
(accessible to public)

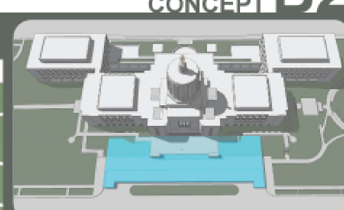
0

8 Hearing Rooms
(6 new hearing rooms at courtyard infills)
New office expansion to meet program
Relocated Cafe

TOTAL: 16 Hearing Rooms
office sf meets program

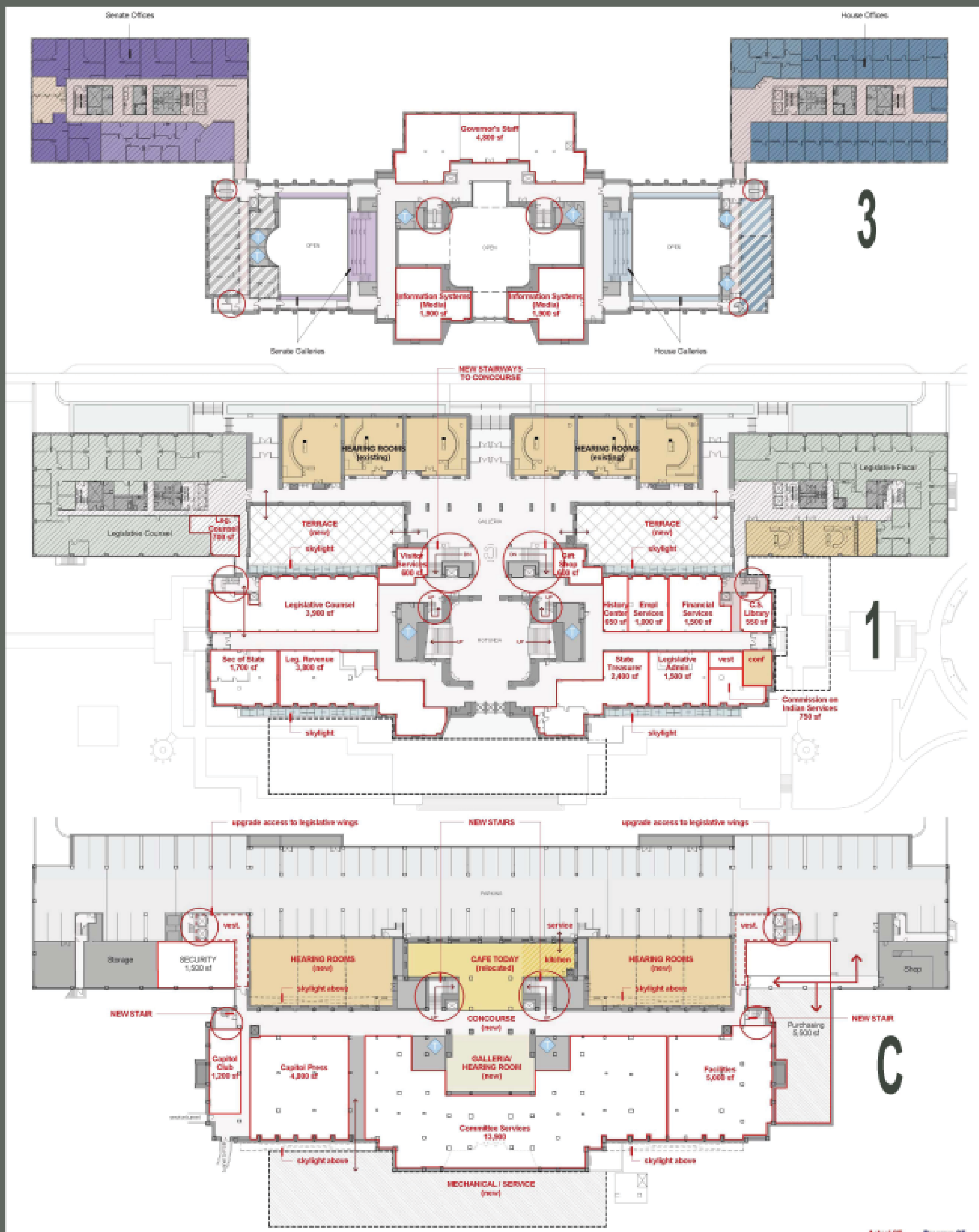
NORTH EXPANSION (WITH INFILL)

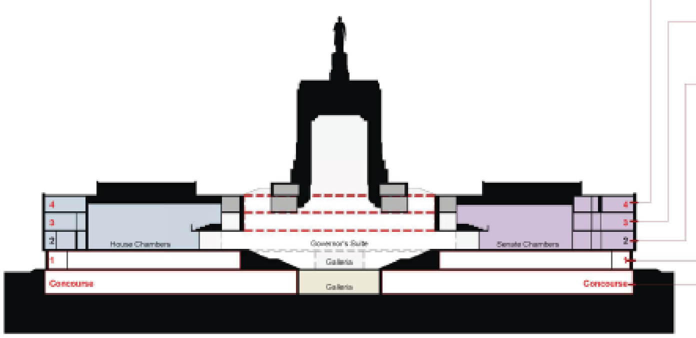
CONCEPT B2



Oregon State Capitol Master Plan

01.26.2009





Information Systems	Actual SF	Program SF
Information Systems	6,500	6,600
Computer Room	700	700
	7,200	7,300

	Actual SF	Program SF
Governor's Staff	4,800	4,450
Information Systems (Media)	3,800	2,650
	8,600	7,100

FULLY ASSIGNED

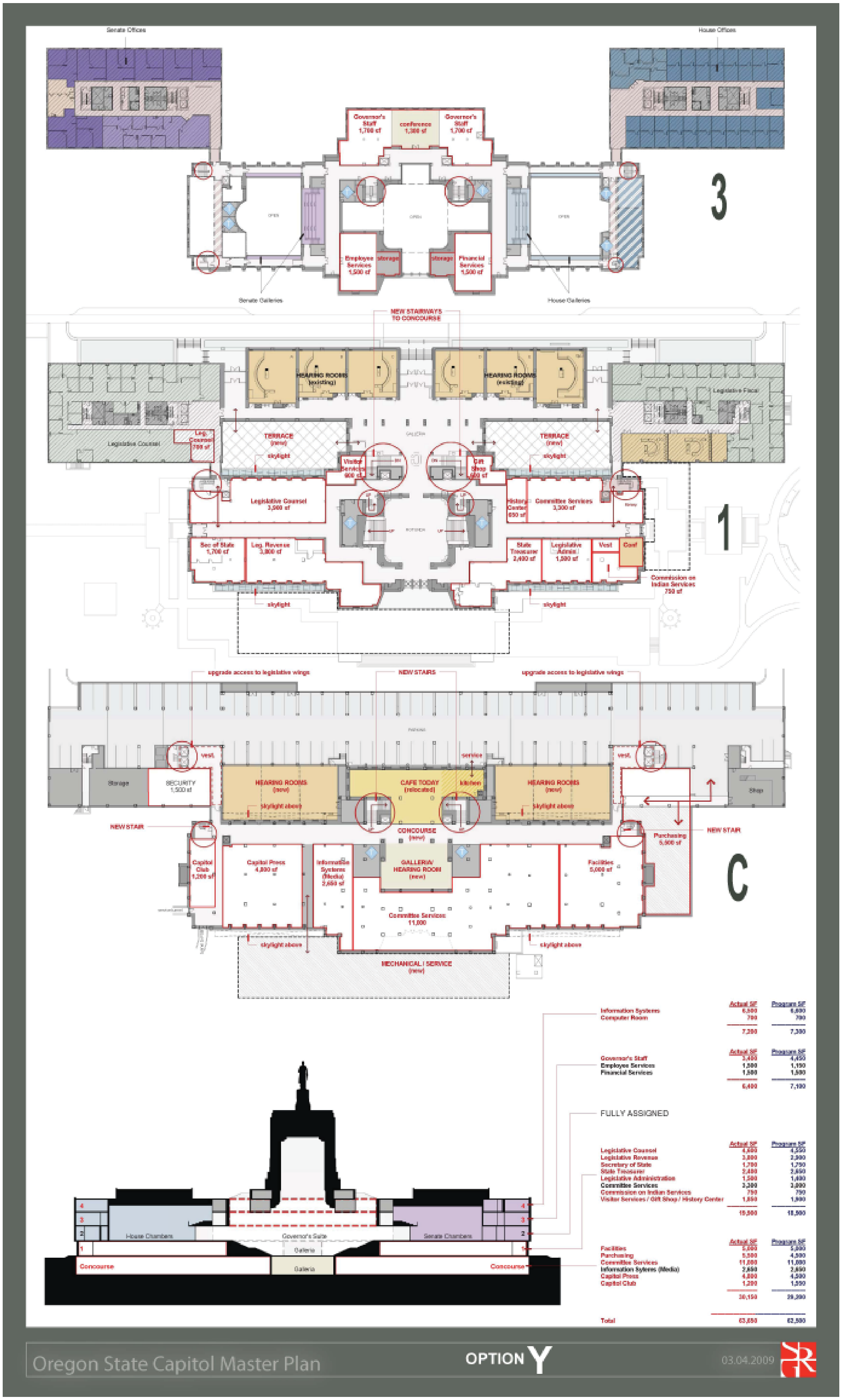
	Actual SF	Program SF
Legislative Counsel	4,600	4,550
Legislative Revenue	3,800	2,900
Secretary of State	1,700	1,750
State Treasurer	2,400	2,050
Legislative Administration	1,500	1,400
Employee Services	1,000	1,150
Financial Services	1,500	1,500
Commission on Indian Services	750	750
Visitor Services / Gift Shop / History Center	1,850	1,900
Committee Services Library	550	500
	19,650	19,050

	Actual SF	Program SF
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	13,900	13,500
Capitol Press	4,800	4,500
Capitol Club	1,200	1,550
	30,400	29,050
Total	65,850	62,500

Oregon State Capitol Master Plan

OPTION X

03.04.2009



	Actual SF	Program SF
Information Systems	6,500	6,600
Computer Room	700	700
	7,200	7,300
Governor's Staff	3,400	4,450
Employee Services	1,500	1,150
Financial Services	1,500	1,500
	6,400	7,100
Legislative Counsel	4,600	4,550
Legislative Revenue	3,800	2,900
Secretary of State	1,700	1,750
State Treasurer	2,400	2,650
Legislative Administration	1,500	1,400
Committee Services	3,300	3,000
Commission on Indian Services	750	750
Visitor Services / Gift Shop / History Center	1,850	1,900
	19,900	18,900
Facilities	5,000	5,000
Purchasing	5,500	4,500
Committee Services	11,000	11,000
Information Sytems (Media)	2,650	2,650
Capitol Press	4,800	4,500
Capitol Club	1,200	1,250
	30,150	28,900
Total	63,650	62,200

OREGON STATE CAPITOL
master plan development project

Legislative Administration

Legislative Administrator

Oregon State Capitol Master Plan

Governance Group - Work Shop #1

May 22, 2008 9:00 – 11:30 Hearing Room C

Welcome to the Kick-off Work Shop for the Capitol Master Plan. Your participation, insight, guidance, and decision making will be critical as we work with you to establish a Master Plan for Oregon's State Capitol.

The purpose of this first Kick-off Work Shop is to:

- Review what is to be accomplished by the Capitol Master Plan.
- Review the proposed Master Plan approach, process, and schedule.
- Discuss strategy and set expectations of the process and outcome.
- Set the vision and goals for the Capitol that reflect the values of all Oregonians.

Our Agenda will be as follows with appropriate breaks:

Agenda

Welcome and Introductions

Capitol Master Plan purpose

Master Plan Process/Approach and Schedule

Master Plan Strategy and Expectations

- Governance Group Involvement/Communication
- Outcome of the Master Plan

Vision and Goal Setting

Summary and Next Steps

- June 19th – Work Shop #2 and Governance Group Meeting

Legislative Administration

O r e g o n   S t a t e   C a p i t o l   M a s t e r   P l a n

G o v e r n a n c e   G r o u p

J u n e   1 9 ,   2 0 0 8   1 : 3 0 - 3 : 0 0   H e a r i n g   R o o m   C

The purpose of this meeting is to review, discuss, and provide input from the Master Plan Participant Group Work Shop held in the morning session which includes the following:

- Review the draft vision and goals for the Capitol based upon Work Shop #1
- Review the findings of:
  - Existing Conditions Study
  - Programming and Space Needs
- Study Challenges and Opportunities based upon the findings
- Explore the concept of a Sustainable Capitol

Agenda

Work Shop #1 Review

Vision and Goal Setting

Existing Conditions

Programming/Space Needs

Challenges and Opportunities

Eco-Charrette

Draft Concepts for Community Meetings

Next Governance Meeting

July 17th – following Concepts Work Shop #3

S R G   P A R T N E R S H I P   I N C

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Restoration, Master Plan and Terrace Repair Projects

Agenda for July 17, 2008
1:30 – 4:30
Room 257

Binder Tab #	POLICY DECISION	Staff Presentation
Capitol Master Plan Development Project		
1	**Information:** Briefing on July 17 workshop	**Skip Stanaway**, SRG Partnership
2	**Decision/Input:** 2a. Sustainability and energy conservation 2b. Accessibility of front steps and revolving doors 2c. Handrails on the Rotunda stairs 2d. Consolidation, relocation, reconfiguration, and expansion – limitations, parameters, or sacred issues	**Skip Stanaway**, SRG Partnership
Capitol Restoration Project		
3	**Information:** Quality Assurance update	**Lou Tarnay**, Heery International
4	**Decision:** Review draft of Furniture and Art policy and forward to Legislative Administration Committee with recommendation for approval	**Scott Burgess**, Interim Legislative Administrator
5	**Information:** Monthly status report	**Scott Burgess**, Interim Legislative Administrator
Capitol Terrace Repair Project		
6	**Information:** Status	**Tim Sissel,** Fortis Construction

Binder Tab #	POLICY DECISION	Staff Presentation
1	**Information:** Briefing on July 17 workshop	**Skip Stanaway**, SRG Partnership

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Restoration, Master Plan and Terrace Repair Projects

Agenda for August 14, 2008
1:30 – 4:30
Room 257

Binder Tab #	POLICY DECISION	Staff Presentation
Capitol Master Plan Development Project		
1	**Information:** Status	**Scott Burgess**, Interim Legislative Administrator
2	**Decision/Input:** Recommend approval of the Master Plan vision statement Recommend approval of the Master Plan goals	**Skip Stanaway**, SRG Partnership
Capitol Restoration Project		
3	**Information:** Quality Assurance update	**Lou Tarnay**, Heery International
4	**Decision:** Recommend approval of design option one for signs outside member offices. Option one includes the member name on the glass and a frame next to the glass of a photo of the member and the district highlighted in a map of Oregon.	**Scott Burgess,** Interim Legislative Administrator
5	**Information:** Monthly status report	**Scott Burgess**, Interim Legislative Administrator
Capitol Terrace Repair Project		
6	**Information:** Status	**Tim Sissel,** Fortis Construction

Next meeting Thursday, September 11, 1:30 – 4:30

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Restoration, Master Plan and Terrace Repair Projects

Agenda for October 30, 2008
9:00 – 11:00
Room 167A

Binder Tab #	POLICY DECISION	Staff Presentation
Capitol Master Plan Development Project		
1	**Information:** Status	**Scott Burgess**, Interim Legislative Administrator
2	**Approval to proceed:** Master plan concepts for space, infrastructure, seismic and sustainability	**Skip Stanaway**, SRG Partnership
Capitol Restoration Project		
3	**Information:** Quality Assurance update	**Lou Tarnay**, Heery International
4	**Decision:** Approve conference room chair and table recommendation	**Scott Burgess,** Interim Legislative Administrator
5	**Decision:** Approve recommendation to purchase one television per member staff area	**Scott Burgess,** Interim Legislative Administrator
6	**Review/Input:** Proposal to hold Capitol Restoration Ribbon Cutting on session opening day	**Scott Burgess,** Interim Legislative Administrator
Capitol Terrace Repair Project		
7	**Information:** Status	**Scott Burgess,** Interim Legislative Administrator
Capitol Fire Recovery Project		
8	**Information:** Status	**Scott Burgess,** Interim Legislative Administrator

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Master Plan Development Project

Agenda for December 17, 2008
3:00 – 5:00
Room 167A

Time	POLICY DECISION
Recommendations re: Space Programming* **Decisions are needed immediately on these recommendations to avoid delay of the master plan.*	
3:00 – 3:05	**Introduction**
3:05 – 3:25	**1. Recommendation:** Current occupants of the Capitol project the need for an additional 16,320 square feet of office space over the next 10-15 years. **2. Recommendation:** Dedicated and essential functions will have the highest priority for space within the Capitol *See Attachment 1and Attachment 2*
3:20 – 3:40	**3a. Recommendation:** Additional hearing rooms are needed. The workgroup recommends an additional five hearing rooms for a total of 8,500 square feet. **3b. Recommendation:** If additional hearing rooms are needed, they will be located 3.b.1 in the Capitol or 3.b.2 within one block of the Capitol or 3.b.3 within one block of the Capitol with weather-protected access.
3:40 – 3:55	**4a. Recommendation:** Parking for legislators will be provided within the Capitol, or **4.b** Parking for legislators will be provided within one block of the Capitol, and it will 4.b.1 have weather-protected access or 4.b.2 have secure access or 4.b.3 have secure and weather-protected access.

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

3:55- 4:15	**5. Recommendation:** 5.a The Governor will have a ceremonial and business office presence in the Capitol or 5.b The Governor will have a ceremonial presence only in the Capitol. **6. Recommendation:** 6.a The State Treasurer and Secretary of State will have a ceremonial and business office presence in the Capitol, or 6.b The State Treasurer and Secretary of State will have a ceremonial presence only in the Capitol.
4:15 – 4:30	**7. Recommendation:** The Capitol Café will be relocated to a more accessible and prominent location within the Capitol.
Recommendation re: Historic Preservation* **A decision is needed immediately on this recommendation to avoid delay of the master plan and fire recovery work on the second floor.*	
4:30 – 4:45	**8. Recommendation:** The historic areas of the Governor's ceremonial office, including reception, conference and adjoining office area on the second floor will be renovated/restored to the 1938 design. *See Attachment 3*
Recommendation re: Meeting Schedule	
4:45 – 5:00	**9. Recommendation:** It is recommended that, starting in January, the Governance Group meet for one hour every other week on a regular schedule to make decisions about the direction of the master plan, so that the plan can be completed prior to the end of the 2009 legislative session. *See attached memo.*
Other Discussion/Decision Items as Needed	

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Master Plan Development Project

Agenda for January 21, 2009
5:00 – 6:00 pm, Room 167A

Recommendations for Approval	
5:00 – 5:10	**1. Recommendation re: Historic Preservation** The historic elements/areas of the 1938 Capitol will be restored and preserved. These include the entire exterior and adjacent grounds, the entry, rotunda, corridors, stairs, chambers, Governor's ceremonial and historic space, and historic spaces in the Treasurer's and Secretary of State's offices (regardless of use/tenants).
5:10 – 5:20	**2. Recommendation re: Structural Upgrade** The entire Capitol building (1938 and 1977) will be seismically upgraded to a minimum "Life/Safety" condition to allow for safe exiting of the facility following a major seismic event, even though the Capitol building may be severely damaged. *(see attachment)*
5:20 – 5:30	**Recommendations re: Existing Conditions – Fire/Life Safety and Handicapped Access** 3. Install a fire sprinkler system in all areas in the 1938 building with the possible exception of significant historic areas such as the Main Entry, Rotunda, and Governor's Ceremonial areas where access for pipes is very limited. Other alternatives would be explored for these specific historic areas. 4. Install a new smoke detection system and new fire alarm system throughout the Capitol. 5. Improve ADA accessibility into the Capitol and within the Capitol. 6. Improve exiting and reduce public access on the 3rd floor to address safety and existing dead end corridor conditions in the 1938 building.
5:30 – 5:35	**Recommendation re: Existing Conditions – HVAC, Mechanical, Electrical and Data** 7. Replace the 1938 building systems including heating/ventilation/air conditioning, all piping (water, sanitary, storm), convert steam heating system to hot water, replace electrical distribution system, upgrade electrical and data distribution, and upgrade the existing electrical lighting throughout the Capitol.
5:35 – 5:40	**8. Recommendation re: Sustainability** The day lighting and natural ventilation potential will be enhanced throughout the Capitol including the Chambers, Rotunda, stairwells and office areas.
Master Plan Contents	
5:40 – 5:50	Discussion of master plan contents, due date, and decisions needed from the Governance Group *(see attached memo)*
Status Reports	
5:50 – 6:00	1. Information gathering re: governors' use of space 2. Workgroup and workshop participant communication 3. Regular meeting schedule *(see attached memo)*
Other Discussion/Decision Items as Needed	

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol RESTORATION PROJECT

Governance Group
Oregon State Capitol Master Plan Development Project

Agenda for February 4, 2009
5:00 – 6:00, Room 167A

Approval of Recommendations re: Space for Governor, Secretary of State, Treasurer and Shared Ceremonial Space	
5:00 – 5:20	**1. Recommendation:** a. The Governor's suite on the second floor will be restored following the fire in a way that maximizes historic preservation and flexible use of the space, and supports a ceremonial and office presence for the Governor. b. Legislative Administration and SRG Partnership will work with the Governor to develop a floor plan for the second floor suite that balances the goals above and meets the needs of the Governor. c. A shared ceremonial office and a Capitol History Center will be established in the Capitol in a location to be determined (probably not within Governor's Suite). **2. Recommendation:** a. The Treasurer and Secretary of State will have access to a ceremonial office shared with other officials, but will not have their own ceremonial or business offices in the Capitol. b. The historic aspects of the areas currently occupied by the Treasurer and Secretary of State will be restored and maintained regardless of use.
Approval of Recommendation re: Master Plan Scope for Fire Restoration of Second Floor	
5:20 – 5:40	**2. Recommendation:** In addition to the fire recovery of the second floor, work detailed in Attachment 1 will be funded to continue the momentum of the Restoration Project and further the goals of the master plan. The estimated cost range is $758,000 to $940,000, which can be funded within CPO authority from the Capitol Restoration Project. *Please see Attachment 1*
Approval of Concepts for Further Development	
5:40 – 6:00	**1. Recommendation:** Options to infill one story of the courtyards and/or build under the north entrance will be the focus of development and refinement as the basis of the master plan. *Please see Attachment 2*
Status Reports 1. Upcoming workshop 2/10/09 2. Next Governance Group meeting 2/18/09	
Other Discussion/Decision Items as Needed	

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Master Plan Development Project

Agenda for February 18, 2009
5:00 – 6:00, Room 167A

Approval of Recommendation re: Seismic Upgrade Using Base Isolation	
5:00 – 5:20	**1. Recommendation:** The entire Capitol (1938 and 1977 buildings) will be seismically upgraded using base isolators. *Please see Attachment 1*
Approval of Recommendation re: Priority of Structural Seismic and Fire/Life Safety Work	
5:20 – 5:30	**2. Recommendation:** In developing the phasing of master plan work, structural seismic and fire/life safety work will be the first priority. *Please see Attachment 2*
Information on Concept Direction	
5:30 – 5:40	**3. Information:** One concept will be further developed to meet space needs in the most effective and efficient manner in light of the adopted policies. The concept being refined combines infilling one story of the courtyards and building under the north entrance.
Approval of Recommendation re: Floor Plan for Governor's Suite	
5:40 – 6:00	**4. Recommendation:** The Governor's Suite will be restored per the floor plan in Attachment 3a, which considers historic preservation, input from the current and several former governors and their staffs, and flexibility for future governors. *Please see Attachments 3a and 3b*
Status Reports 1. Upcoming workshop to be rescheduled 2. Next Governance Group meeting 3/4/09	
Other Discussion/Decision Items as Needed	

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

Oregon State Capitol
RESTORATION PROJECT

Governance Group
Oregon State Capitol Master Plan Development Project

Agenda for March 4, 2009
5:00 – 6:00, Room 167A

Information	
5:00 – 5:05	**1. Report on Open House:** Feedback from Open House held 2/25/09
Approval of Recommendation re: Concept Design	
5:05 – 5:45	**2. Recommendation:** The concept for the future of the Capitol to fulfill the master planning principles established by the Governance Group includes: 2a. Hearing Room expansion within the infill of the lower level courtyards. 2b. Turning the basement into the “Concourse Level,” creating new interior stairs from the first floor Galleria, new corridor location, new café location, multi-use galleria/meeting room, and moving the mechanical areas into the addition under the north stair creating additional and more useable office area. 2c. In addition to being located in a specific area, the History Center becomes integrated into all public spaces of the Capitol with a focus within the Upper and Lower Galleria areas. 2d. Program needs and allocations are met.
Information	
5:45 – 5:55	**3. Information on Phasing, Seismic and Sustainability**
Status Reports	
5:55 – 6:00	**4. Upcoming Meetings:** Meeting scheduled for 3/18/09 is cancelled Next regularly scheduled Governance Group meeting will be 4/1/09
Other Discussion/Decision Items as Needed	

Oregon State Capitol RESTORATION PROJECT
900 Court Street NE, Room 140A, Salem Oregon 97301 Phone: 503-986-1848

OREGON STATE CAPITOL
master plan development project

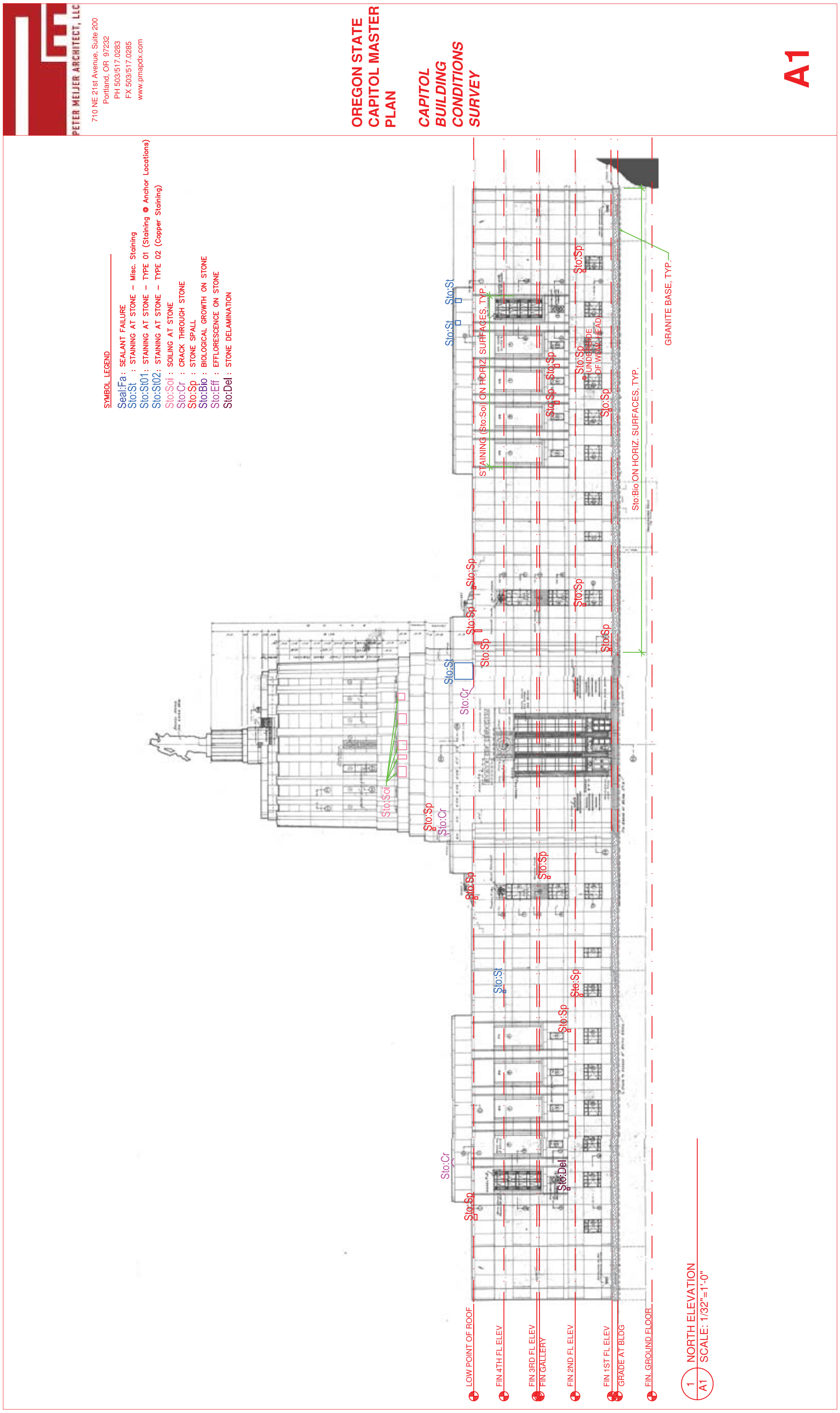
Legislative Administration

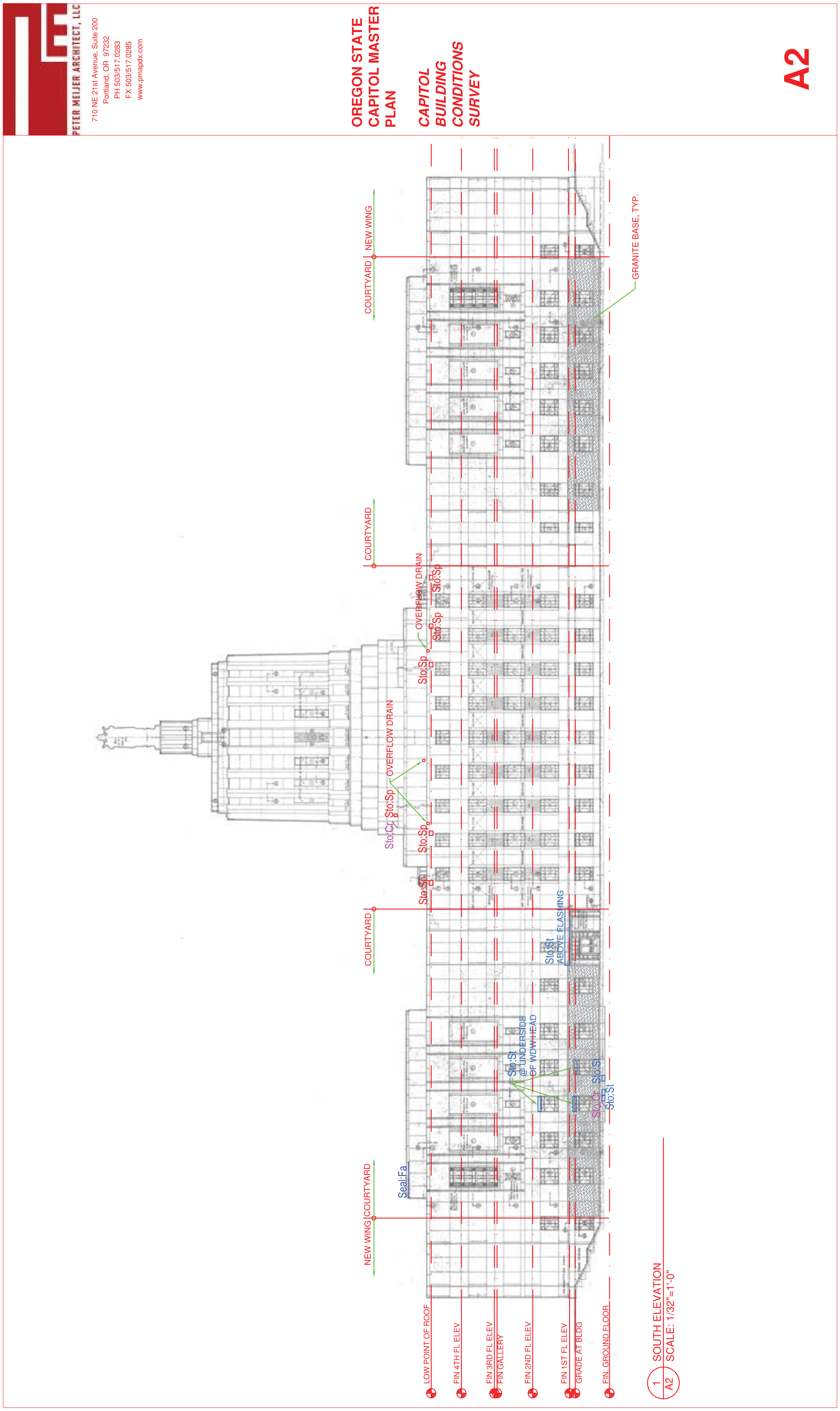
Governance Group
Oregon State Capitol Master Plan Development Project

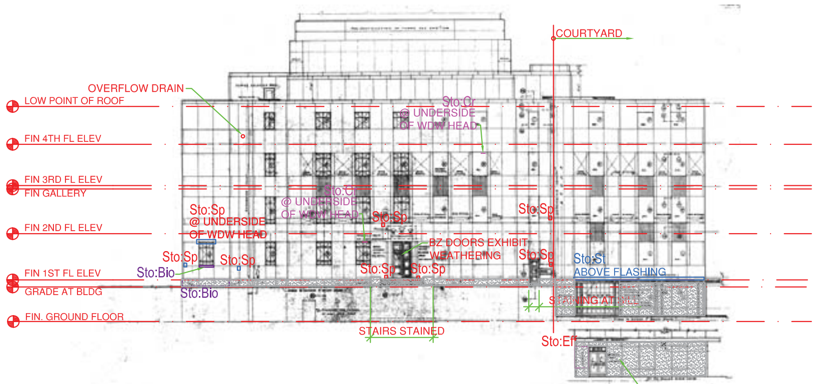
Agenda for April 9, 2009
5:00 – 6:00, Room 167A

Information re: draft Master Plan	
5:00 – 5:20	**1. Presentation of draft Master Plan** a. Contents/organization b. Recommendations in the Plan i. Further development of the expansion concept ii. North entry ADA access iii. Phasing/costs
Input re: draft Master Plan	
5:20 – 5:35	**2. Governance Group asks questions, provides input on draft Master Plan**
Approval of Review Process for draft Master Plan	
5:35 - 5:45	**3. Recommendation:** It is recommended that: o the draft Master Plan be widely circulated for review and comment, o the Governance Group receive a report on the comments, including how they were incorporated into the final plan, and o the final version of the Master Plan be submitted to the Governance Group at a meeting in early May with a recommendation that it be approved for presentation to the 75th Legislative Assembly. *See Attachment 1*
Approval of Open House Contents	
5:45 -5:50	**3. Recommendation:** It is recommended that the April 7 Master Plan Open House include displays about: o creation of new space o reassignment of space for specific offices o seismic upgrade o preservation of historic elements o accessibility o sustainability o phasing of master plan projects o planning makes sense especially in tight economic times
Approval of Small Ergonomic Executive Chair Purchase	
5:50 – 5:55	**4. Recommendation:** It is recommended that up to 15 executive chairs be purchased that are a better ergonomic fit for smaller members, for an expenditure of up to $15,000.
Status Reports	
5:55 – 6:00	**5. Upcoming Meetings:** o Next two regularly scheduled Governance Group meetings are cancelled. (These meetings were 4/15/09 and 4/29/09.) o A meeting will be scheduled in early May.
Other Discussion/Decision Items as Needed	

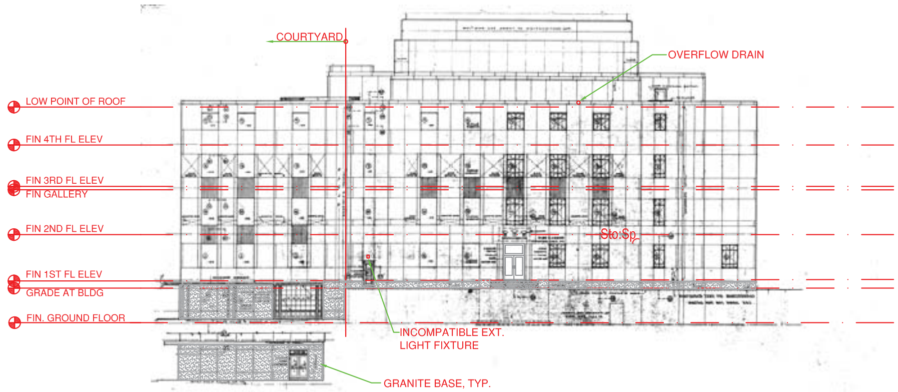
7.3 EXISTING CONDITION SURVEY




PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com
OREGON STATE CAPITOL MASTER PLAN
CAPITOL BUILDING CONDITIONS SURVEY
A2
NEW WING
COURTYARD
OVERFLOW DRAIN
Sto:Sp
Sto:Cr
Sto:St
ABOVE FLASHING
Sto:St @ UNDERSIDE OF WDW HEAD
Seal:Fa
GRANITE BASE, TYP.
LOW POINT OF ROOF
FIN 4TH FL ELEV
FIN 3RD FL ELEV
FIN GALLERY
FIN 2ND FL ELEV
FIN 1ST FL ELEV
GRADE AT BLDG
FIN. GROUND FLOOR
1
A2
SOUTH ELEVATION
SCALE: 1/32"=1'-0"



1 A3 WEST ELEVATION
SCALE: 1/32"=1'-0"



2 A3 EAST ELEVATION
SCALE: 1/32"=1'-0"

PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com

OREGON STATE CAPITOL MASTER PLAN

CAPITOL BUILDING CONDITIONS SURVEY

A3

1 A4 HOUSE WING SOUTH ELEVATION
SCALE: 1/32"=1'-0"

2 A4 HOUSE WING WEST ELEVATION
SCALE: 1/32"=1'-0"

SYMBOL LEGEND

- Seal:Fa : SEALANT FAILURE
- Sto:St : STAINING AT STONE – Misc. Staining
- Sto:St01 : STAINING AT STONE – TYPE 01 (Staining @ Anchor Locations)
- Sto:St02 : STAINING AT STONE – TYPE 02 (Copper Staining)
- Sto:Soi : SOILING AT STONE
- Sto:Cr : CRACK THROUGH STONE
- Sto:Sp : STONE SPALL
- Sto:Bio : BIOLOGICAL GROWTH ON STONE
- Sto:Eff : EFFLORESCENCE ON STONE
- Sto:Del : STONE DELAMINATION

GENERAL NOTES

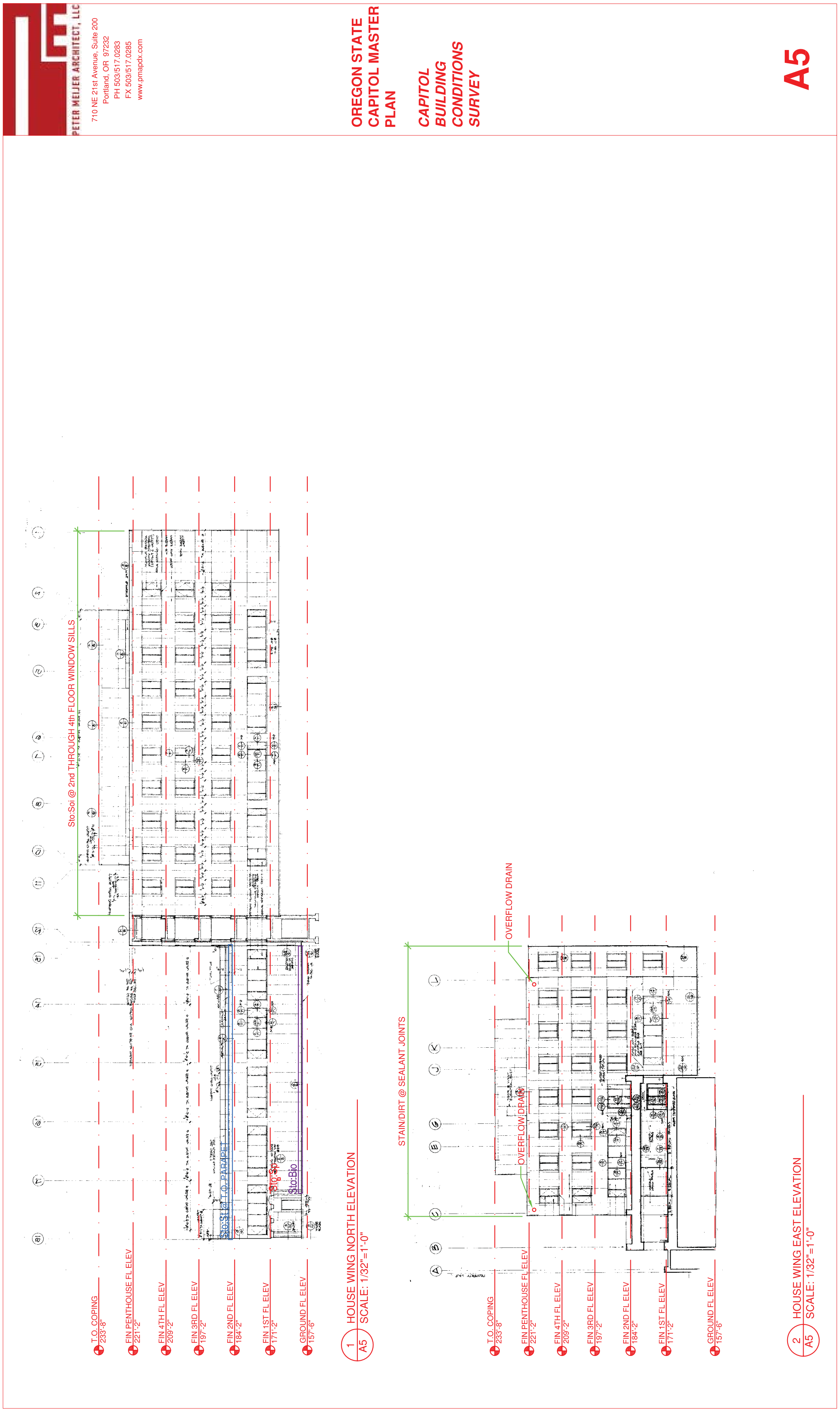
1. MARBLE HAS "GENERAL" STAINING CONCENTRATED @ SEALANT JOINTS.
2. STAINING EXHIBITED @ PANEL ANCHORS
3. SPALLED EDGES CORRESPOND TO PANEL ANCHOR LOCATIONS
4. TYP. STAINING OCCURS @ PANEL ANCHORS, ALL ELEVATIONS

PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com

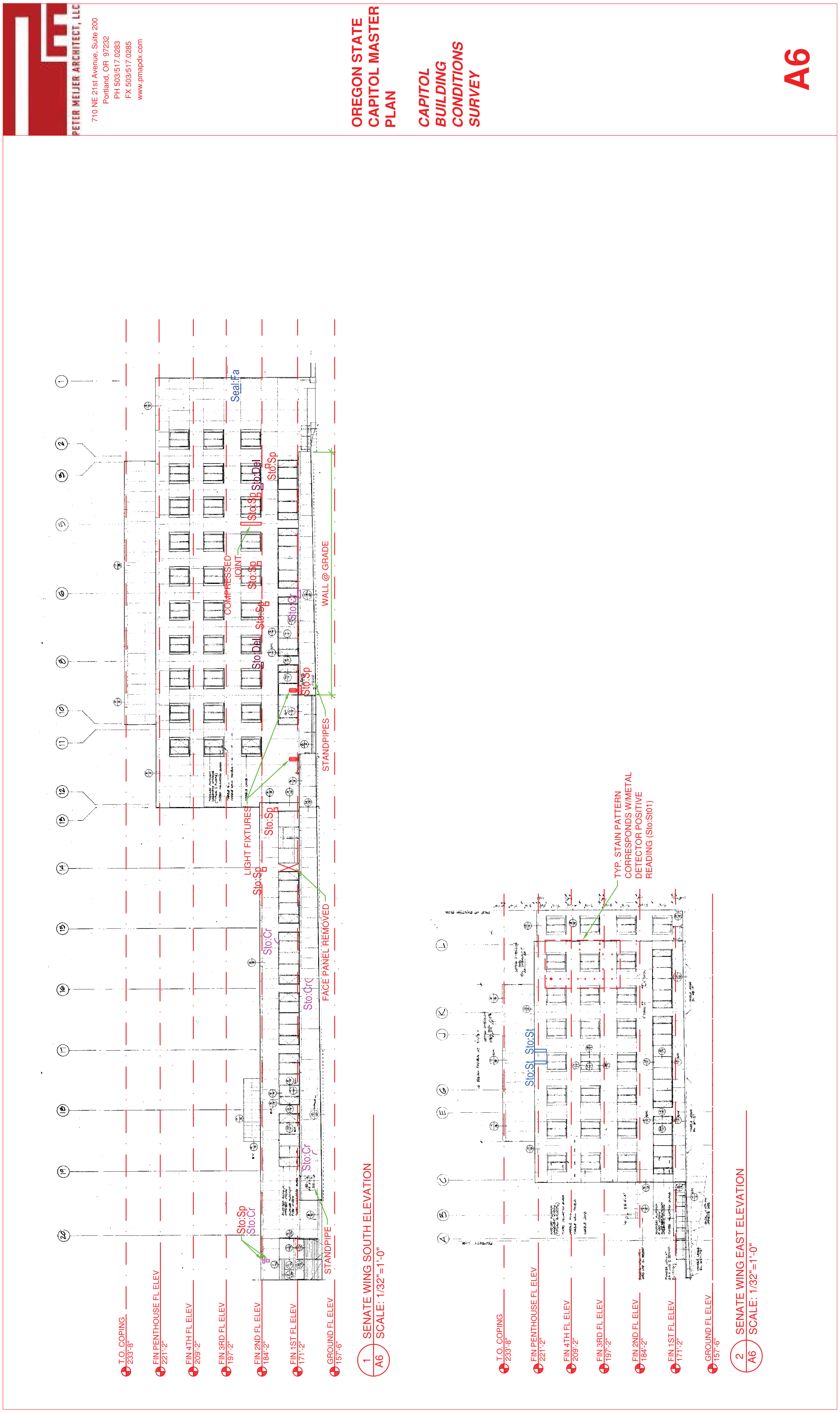
OREGON STATE CAPITOL MASTER PLAN

CAPITOL BUILDING CONDITIONS SURVEY

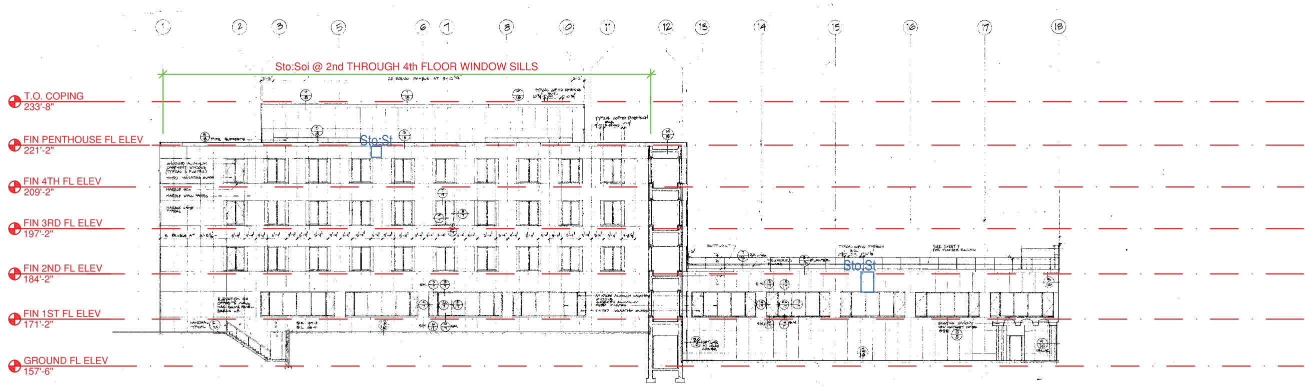
A4



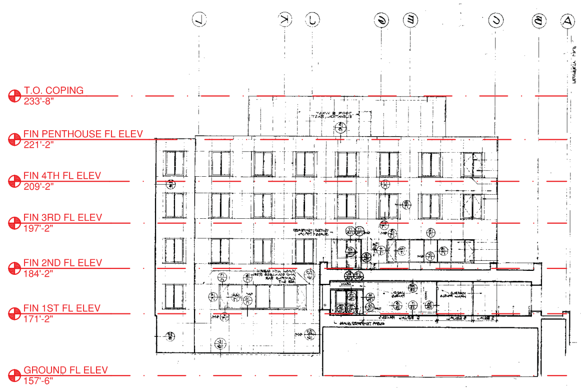
PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com
OREGON STATE CAPITOL MASTER PLAN
CAPITOL BUILDING CONDITIONS SURVEY
A5
Sto:Soi @ 2nd THROUGH 4th FLOOR WINDOW SILLS
Sto:St @ T.O. PARAPET
Sto:Bio
T.O. COPING 233'-8"
FIN PENTHOUSE FL ELEV 221'-2"
FIN 4TH FL ELEV 209'-2"
FIN 3RD FL ELEV 197'-2"
FIN 2ND FL ELEV 184'-2"
FIN 1ST FL ELEV 171'-2"
GROUND FL ELEV 157'-6"
1 A5 HOUSE WING NORTH ELEVATION
SCALE: 1/32"=1'-0"
STAIN/DIRT @ SEALANT JOINTS
OVERFLOW DRAIN
OVERFLOW DRAIN
T.O. COPING 233'-8"
FIN PENTHOUSE FL ELEV 221'-2"
FIN 4TH FL ELEV 209'-2"
FIN 3RD FL ELEV 197'-2"
FIN 2ND FL ELEV 184'-2"
FIN 1ST FL ELEV 171'-2"
GROUND FL ELEV 157'-6"
2 A5 HOUSE WING EAST ELEVATION
SCALE: 1/32"=1'-0"


PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com
OREGON STATE CAPITOL MASTER PLAN
CAPITOL BUILDING CONDITIONS SURVEY
A6
T.O. COPING 233'-8"
FIN PENTHOUSE FL ELEV 221'-2"
FIN 4TH FL ELEV 209'-2"
FIN 3RD FL ELEV 197'-2"
FIN 2ND FL ELEV 184'-2"
FIN 1ST FL ELEV 171'-2"
GROUND FL ELEV 157'-6"
Seal:Fa
Sto:Del
Sto:Sp
COMPRESSED JOINT
Sto:Cr
WALL @ GRADE
STANDPIPES
LIGHT FIXTURES
FACE PANEL REMOVED
Sto:Grc
STANDPIPE
1 A6 SENATE WING SOUTH ELEVATION
SCALE: 1/32"=1'-0"
TYP. STAIN PATTERN CORRESPONDS W/METAL DETECTOR POSITIVE READING (Sto:St01)
Sto:St
2 A6 SENATE WING EAST ELEVATION
SCALE: 1/32"=1'-0"

PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503/517.0283
FX 503/517.0285
www.pmapdx.com



1
A7
SENATE WING NORTH ELEVATION
SCALE: 1/32"=1'-0"



2
A7
SENATE WING WEST ELEVATION
SCALE: 1/32"=1'-0"

OREGON STATE CAPITOL MASTER PLAN

CAPITOL BUILDING CONDITIONS SURVEY

A7

Appendix C – Plan Drawings

1. Sheet A8 – Basement Floor Plan
2. Sheet A9 – First Floor Plan
3. Sheet A10 – Second Floor Plan
4. Sheet A11 – Fourth Floor Plan: West Wing
5. Sheet A12 – Fourth Floor Plan: East Wing

Annotation Key

StoI:A/[h,v,d]/[w, lj, rj, h] ========= Stone Interior Wall : crack / horizontal, vertical, diagonal / wall, left jamb, header

StoI:B/[w,lj,rj,h] =============== Stone Interior Wall : patch / wall, left jamb, right jamb, header

StoI:C/[h,v] ================== Stone Interior Wall : open joint / horizontal, vertical

StoStp:[A,D]/[r,t,n] ============= Stone Step : crack, chip / riser, tread, nose

[Ter,Sto] Fl:A ================= Terrazzo, Stone Floor : crack

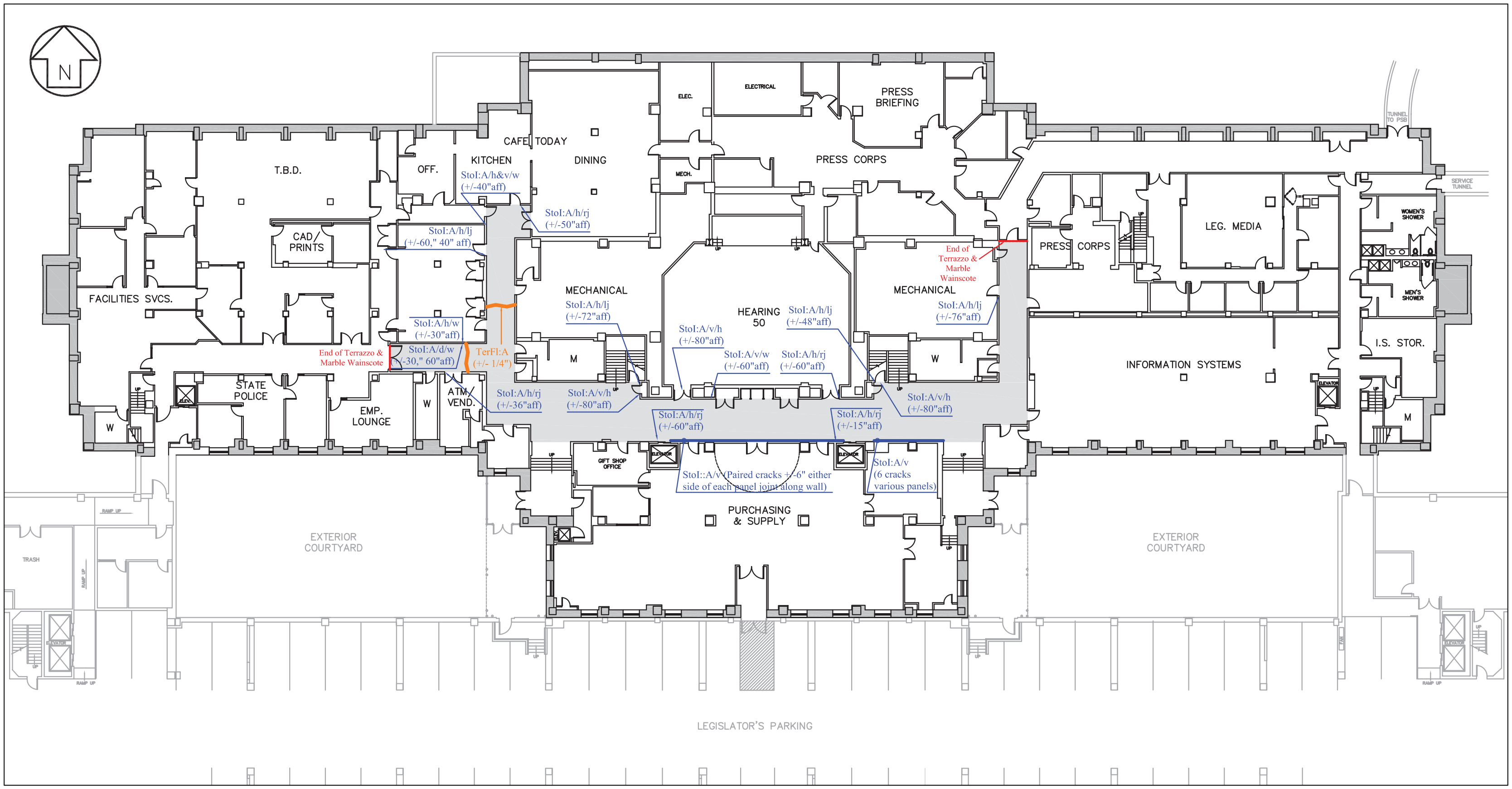
Deficiency Types:
A - Crack
B - Patch
C - Open Joint
D - Spall

Vertical Distances: (+/- dist." aff), aff = above finish floor

Historic Assessment Zone (Public Corridor):

PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503.517.0283
FX 503.517.0285
www.pmapdx.com

OREGON STATE CAPITOL
SALEM, OREGON



Date: 07.17.08
Project Num:
Scale: Not to scale
Drawn By: SBP
Checked By: PRM

BASEMENT FLOOR PLAN

A.8

Annotation Key

StoI:A/[h,v,d]/[w, lj, rj, h] ========= Stone Interior Wall : crack / horizontal, vertical, diagonal / wall, left jamb, header

StoI:B/[w,lj,rj,h] =============== Stone Interior Wall : patch / wall, left jamb, right jamb, header

StoI:C/[h,v] ================== Stone Interior Wall : open joint / horizontal, vertical

StoStp:[A,D]/[r,t,n] ============= Stone Step : crack, chip / riser, tread, nose

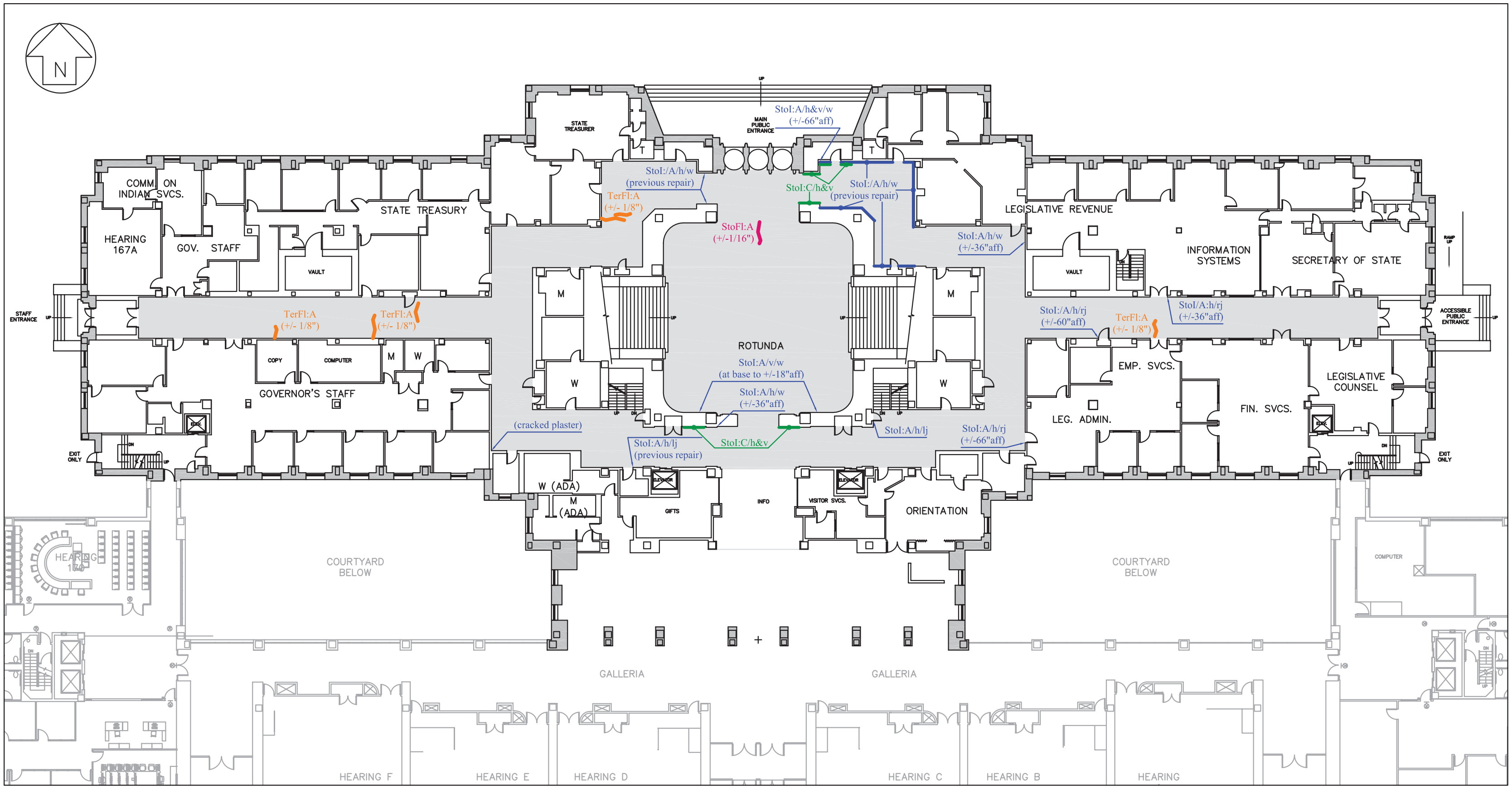
[Ter,Sto] Fl:A ================= Terrazzo, Stone Floor : crack

Deficiency Type:
A - Crack
B - Patch
C - Open Joint
D - Spall

Vertical Distances: (+/- dist." aff), aff = above finish floor

Historic Assessment Zone (Public Corridor):

PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503.517.0283
FX 503.517.0285
www.pmapdx.com



OREGON STATE CAPITOL
SALEM, OREGON

Date: 07.17.08
Project Num:
Scale: Not to scale
Drawn By: SBP
Checked By: PRM

FIRST FLOOR PLAN

A.9

Annotation Key

StoI:A/[h,v,d]/[w, lj, rj, h] ========= Stone Interior Wall : crack / horizontal, vertical, diagonal / wall, left jamb, header

StoI:B/[w,lj,rj,h] =============== Stone Interior Wall : patch / wall, left jamb, right jamb, header

StoI:C/[h,v] ================== Stone Interior Wall : open joint / horizontal, vertical

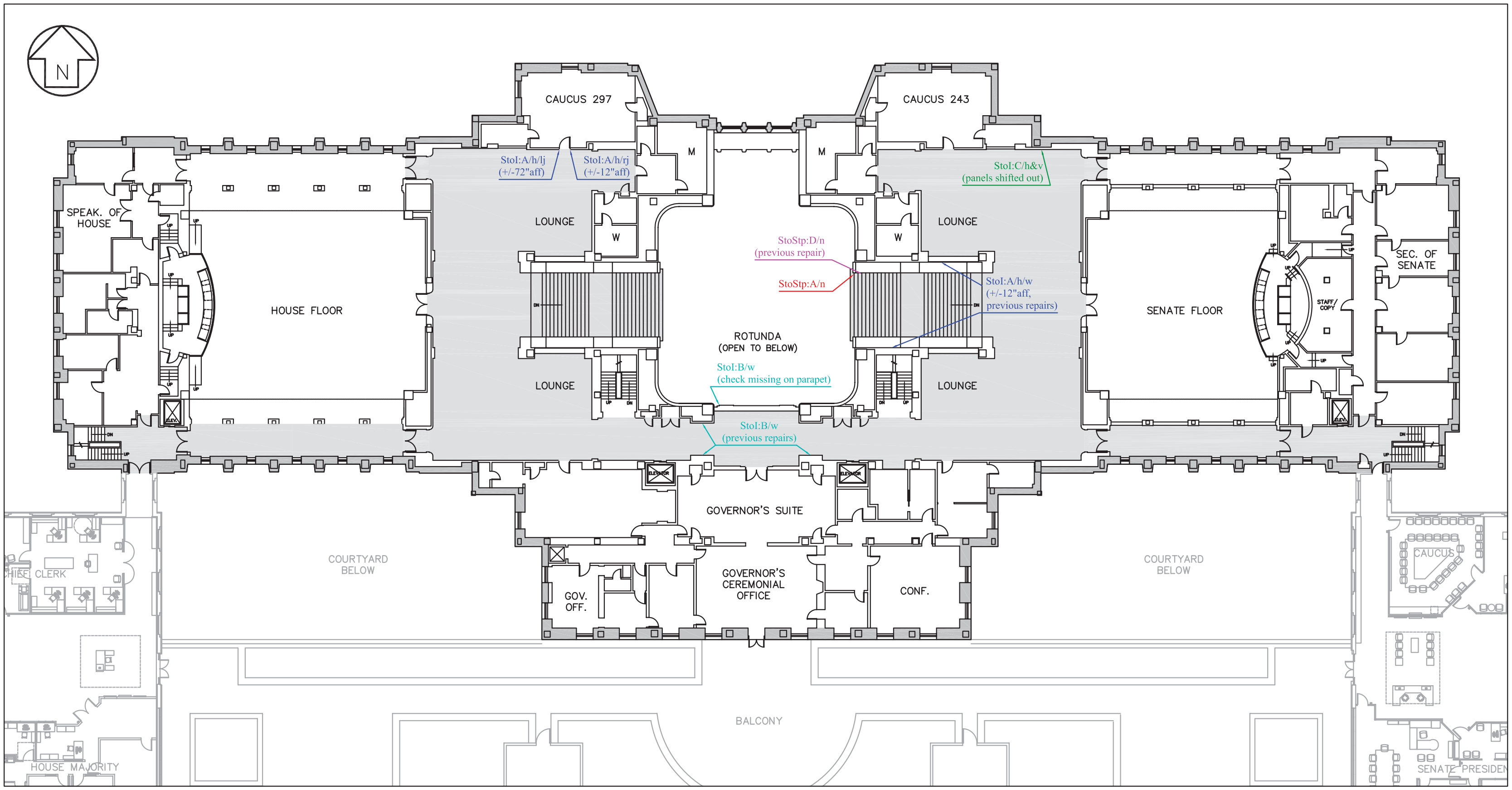
StoStp:[A,D]/[r,t,n] ============= Stone Step : crack, chip / riser, tread, nose

[Ter,Sto] Fl:A ================= Terrazzo, Stone Floor : crack

Deficiency Types:
A - Crack
B - Patch
C - Open Joint
D - Spall

Vertical Distances: (+/- dist." aff), aff = above finish floor

Historic Assessment Zone (Public Corridor):



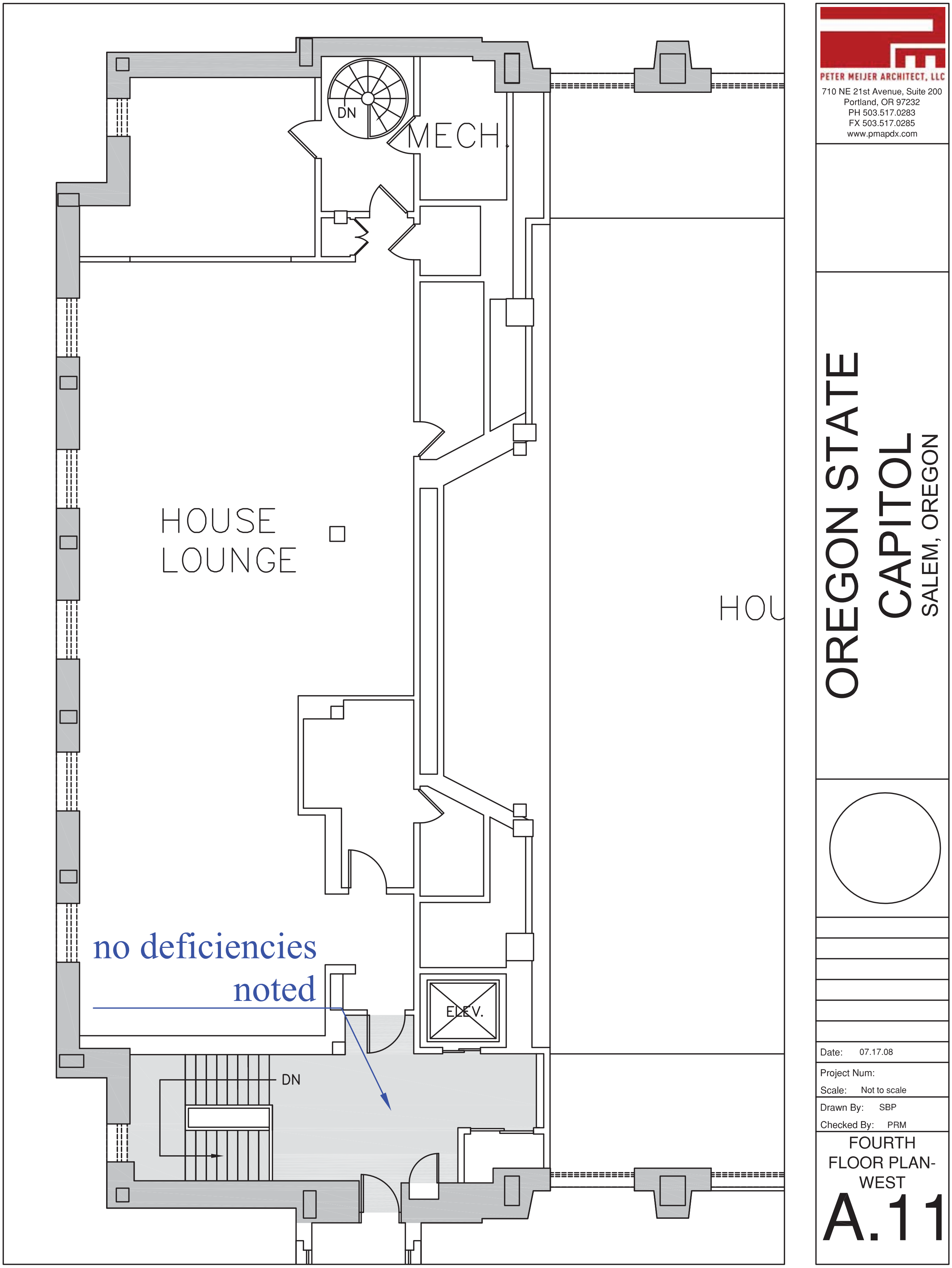
PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503.517.0283
FX 503.517.0285
www.pmapdx.com

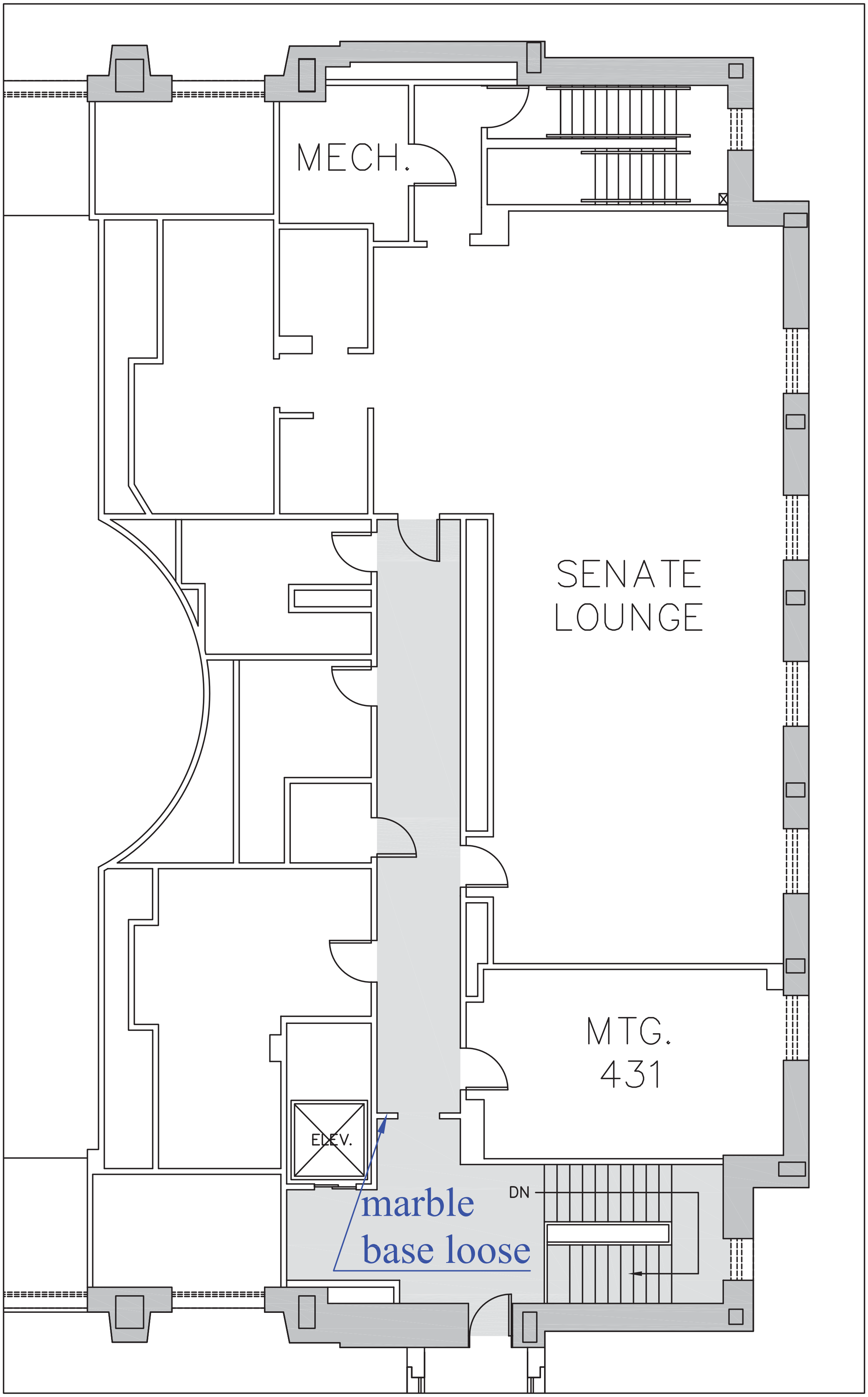
OREGON STATE CAPITOL
SALEM, OREGON

Date: 07.17.08
Project Num:
Scale: Not to scale
Drawn By: SBP
Checked By: PRM

SECOND FLOOR PLAN

A.10


MECH.
DN
HOUSE LOUNGE
HOU
no deficiencies noted
ELEV.
DN
PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503.517.0283
FX 503.517.0285
www.pmapdx.com
OREGON STATE CAPITOL
SALEM, OREGON
Date: 07.17.08
Project Num:
Scale: Not to scale
Drawn By: SBP
Checked By: PRM
FOURTH FLOOR PLAN-WEST
A.11



PETER MEIJER ARCHITECT, LLC
710 NE 21st Avenue, Suite 200
Portland, OR 97232
PH 503.517.0283
FX 503.517.0285
www.pmapdx.com

OREGON STATE CAPITOL
SALEM, OREGON

Date: 07.17.08
Project Num:
Scale: Not to scale
Drawn By: SBP
Checked By: PRM

FOURTH FLOOR PLAN-EAST

A.12

Appendix D – Terminology and Glossary

A number of terms used in this report have a specific meaning in the context of this report and are therefore defined below. All of the terms and abbreviations used are standard in the industry. This glossary may be of some aid for those not familiar with constructions terms.

Air Leakage: refers to airflow into or out of a space through the wall assembly. The outward leakage of air is known as exfiltration and the inward leakage is known as infiltration.

Andesite: a volcanic rock.

Arch: a mechanical arrangement of blocks of any hard material disposed in the line of same curve, and supporting one another by their mutual pressure; the arch itself is formed of arch stones.

Architectural Stone: non-load bearing cut panels (3/4" – 5" thick) used as a *curtain wall* or veneer in building construction; commonly referred to as cladding in the industry.

Architrave: the lowest of the three main parts of an *entablature.*

Artificial Stone: stone chips and matrix formed to look like stone.

Ashlar: wrought stone of uniform shape and height, as opposed to rubble work.

Atrium: a tall internal courtyard with a glazed roof that lets in daylight.

Awning: an external blind of fabric, such as canvas, that can be put up for protection against sun or rain.

Bay: one of several uniform divisions of a building.

Beds: the lower surface upon which a block of stone rests, and the upper surface which supports the stone above.

Building Paper: refers to a breather-type asphalt sheathing paper which is rated in minutes (15, 30 or 60), based on preventing water flow through it for number of minutes in accordance with a standard test. Usually used as a moisture barrier.

Capital: the head or crowning feature of a *column.*

Column: an upright member, circular or rectangular in plan; in classical architecture consists of a *pedestal, shaft* and *capital*. It is designed to carry the *entablature* or other load, but is also use ornamentally in isolation.

Coping: a capping or covering to a wall, either flat or sloping to throw off water.

Corbel: a projecting block, usually stone or brick, supporting a beam or other horizontal member. A series, each one projecting beyond the one below can be used in constructing a vault or *arch.*

Cornice: typically the projecting molded course which crowns the part of the wall to which it is affixed.

Course: a horizontal layer of stone or brick.

Curtain Wall: a non-load-bearing wall which can be applied in front of a framed structure to keep out the weather. There are many types, manufactured from a variety of materials such as aluminum, steel, and glass.

Dentils: are small square block features used in series as part of particularly styled *cornices.*

Dormer: a small window with a *gable* or *arched* top, projecting from a sloping roof.

Drip Edge: a projecting member of a *cornice* etc., from which rainwater drips and is thus prevented from running down the face of the wall.

Dutchman: a stone repair where the broken stone is cut uniform to receive the fitting of a newly matched stone which has been cut to fit; usually fastened with a epoxy and/or pin.

Efflorescence: occurs when salts from the *masonry* and mortar are dissolved by water and carried by solution to the surface. Once the water is evaporated, the salts are deposited on the surface of the *masonry*.

Entablature: the upper part of an order consisting of *architrave, frieze* and *cornice*.

EPDM: (Ethylene Propylene Diene Monomer) refers to a waterproofing sheet membrane made of vulcanized rubber. These membranes, usually single-ply applications, may be installed fully bonded to the substrate with an adhesive, or may be “loose-laid” with only the laps and terminations of the membranes adhered.

Exfoliation: the process where the surface of brick or stone *masonry* comes off in layers.

Flashing: refers to sheet metal or other material used in roof or wall construction and designed to shed water (typically sloped outwards, with a drip edge to shed water). Used in conjunction with:

- *Cap* or *Parapet flashing:* top of wall, pier, column or chimney**.**
- *Saddle flashing:* an upturn, sloping transition piece between a horizontal and vertical plane, e.g., balcony cap and wall intersection.
- *Head/sill flashing:* at head or sill of window opening or other penetration.
- *Base flashing:* at bottom edge of wall surface.
- *Cross-cavity* or *Through-wall flashing:* a flashing which sheds water from the moisture barrier plane to the exterior, through the cladding.

Frieze: the middle division of an *entablature*, between the *architrave* and the *cornice*, usually decorated but may be plain.

Gable: triangular section of wall beneath the ridge of the roof.

Granite: refers to rocks of various origins, range including felsic igneous and metamorphic rocks that vary considerably in mineral composition. These rocks are usually dense and have a wide range of grain sizes.

Gum Lip: refers to a method of sealing *flashing* to a wall surface whereby the top edge of the *flashing* is bent outwards to form a caulk-filled cavity (typically at the termination of a waterproofing membrane).

Juliet Balcony: a narrow balcony in front of a door.

Keystone: the central stone of an *arch* or a window head.

Limy Mortar: refers to a lime based mortar composition as opposed to cement. This type of mortar is much softer compared to cementitious types and is better suited for soft masonry such as brick.

Lintel: a horizontal beam or stone bridging an opening.

Mansard Roof: a roof with a lower section that steeply slopes to form a wall.

Masonry: an assemblage of masonry units properly bonded together with mortar.

Mullion: the vertical post or other upright dividing a window or other opening into two or more lights, usually structural.

Muntin: secondary strips (not structural) used to divide a window into multiple lights.

Order: in classical architecture, a *column* with *pedestal, shaft, capital* and *entablature*.

Oxide Jacking: the process where the expansion of a corroded structural or supporting steel members causing displacement or *spalling* of the *masonry* by internal pressure.

Pedestal: makes up the base of a *column*, supporting the *shaft*.

Pillar: a vertical structure of stone, slender in proportion to height used as support or ornament.

Plastic Repairs: repairs where damaged stone or masonry is replaced by mortar.

Quoins: the dressed stones at the corners of buildings, usually laid so that their faces are alternately large and small.

Sandstone: comprised of individual grains supported by a natural cementitious materials; often shows bedding planes.

SBS Membrane: a manufactured sheet membrane applied by heating the substrate and membrane. Typically installed in two plies.

Scaling: the removal of loose, delaminated or *spalled* masonry.

Shaft: the trunk of a *column*, between the *pedestal* and the *capital*.

Sill-Block: the segment(s) of masonry that make up the sill portion of a window.

Spall: refers to a fragment of material, such as concrete or *masonry*, detached from a larger mass by a physical blow, weather action, internal pressure or efflorescence within the mass (sub-fluorescence).

Split Face: the resulting surface texture, which arises from splitting a stone.

Sugaring: a process where the crystal bonds of *granite* are eroded by salt crystallization.

Superstructure: a structure above or on something else, anything erected on a foundation.

Tide Lines: are formed when dissolved salts in water are wicked up the porous *masonry* then are deposited on the surface when the water evaporates.

Tieback Brick: bricks used in such a fashion as to support one *wythe* to another.

Weepholes: refers to an opening placed in a wall or window assembly to permit the escape of liquid water from within the assembly. Weepholes can also act as vents.

Wythe: a continuous vertical section of a masonry wall having a thickness of one masonry unit.

APPENDIX A

Bibliography of available reports

Reports:

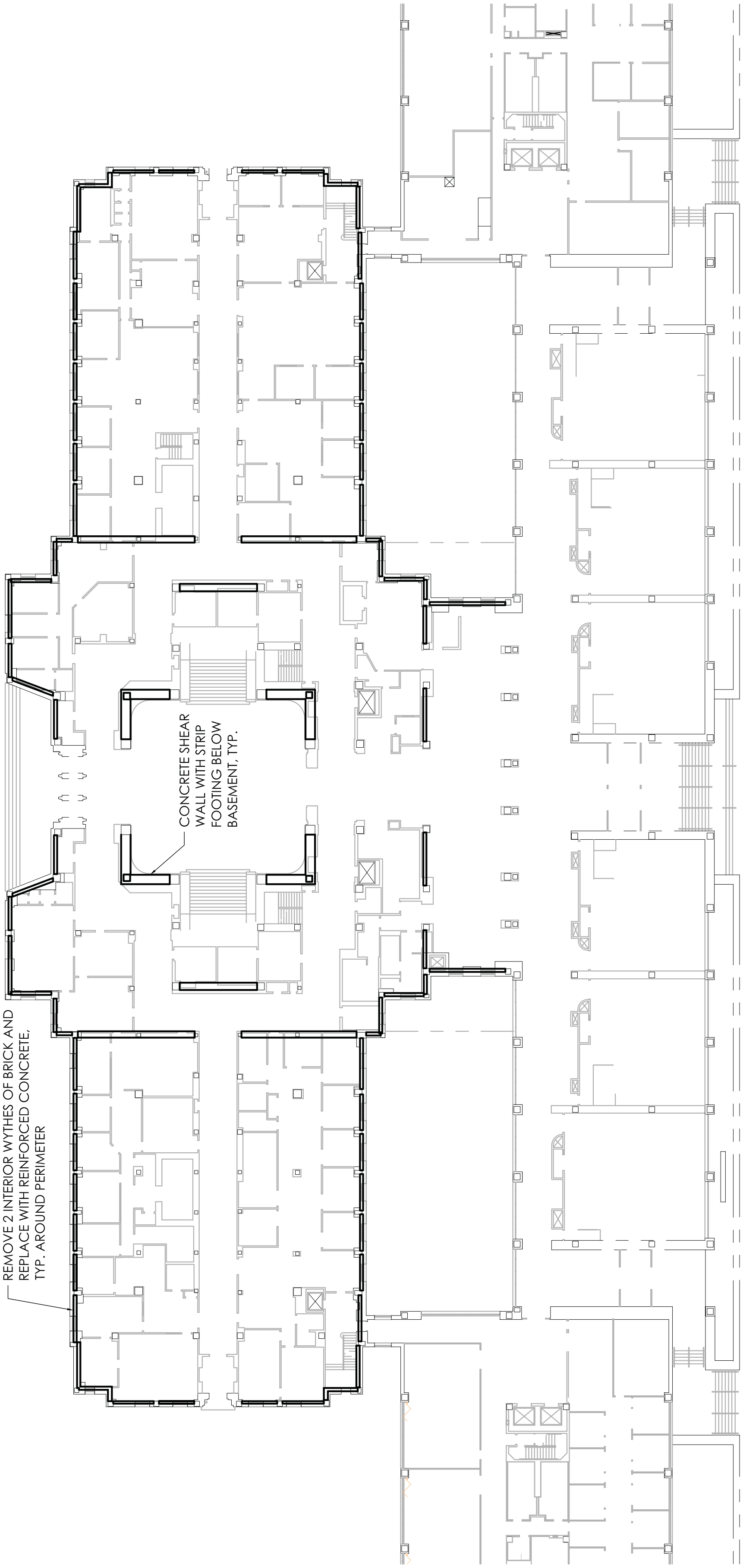
1. R.T. Miller Engineering, Inc. *Structural Survey of the 1937 Portion of the Oregon State Capitol Building, Salem, Oregon*, March 8, 1990.
2. R.T. Miller Engineering, Inc. *Seismic Evaluation of the 1937 Portion of the Oregon State Capitol Building, Salem, Oregon*, June 19, 1990, with subsequent recommendations for base isolation dated November 25, 1991.
3. KPFF Consulting Engineers. *Seismic Evaluation of the Oregon State Capitol Building, Salem, Oregon*, March 10, 1992.
4. Miller-Gardner, Inc. *Defined Scope of Work and Method of Repair for Seismic Upgrade of the 1937 Portion of the Oregon State Capitol Building, Salem, Oregon*, September 4, 1992.
5. Miller-Gardner, Inc. *Earthquake Evaluation of the 1975 Portion of the Oregon State Capitol Building House and Senate Wings*, May 14, 1993.
6. Miller-Gardner, Inc. *Complete Seismic Upgrade of the 1937 Portion of the Oregon State Capitol Building*, Salem, Oregon, June 15, 1994.
7. Miller-Gardner, Inc. *Earthquake Damage Evaluation of the Oregon State Capitol Building*, February 8, 1994.
8. Miller-Gardner, Inc. *Seismic Upgrade of the 1937 Oregon State Capitol, Phase 2, Salem, Oregon*, July 21, 1994.

a connected series of related elements
1111 ne flanders street • suite 206 • portland oregon 97232 • v 503. 467. 4980 • f 503. 467. 4797

APPENDIX B

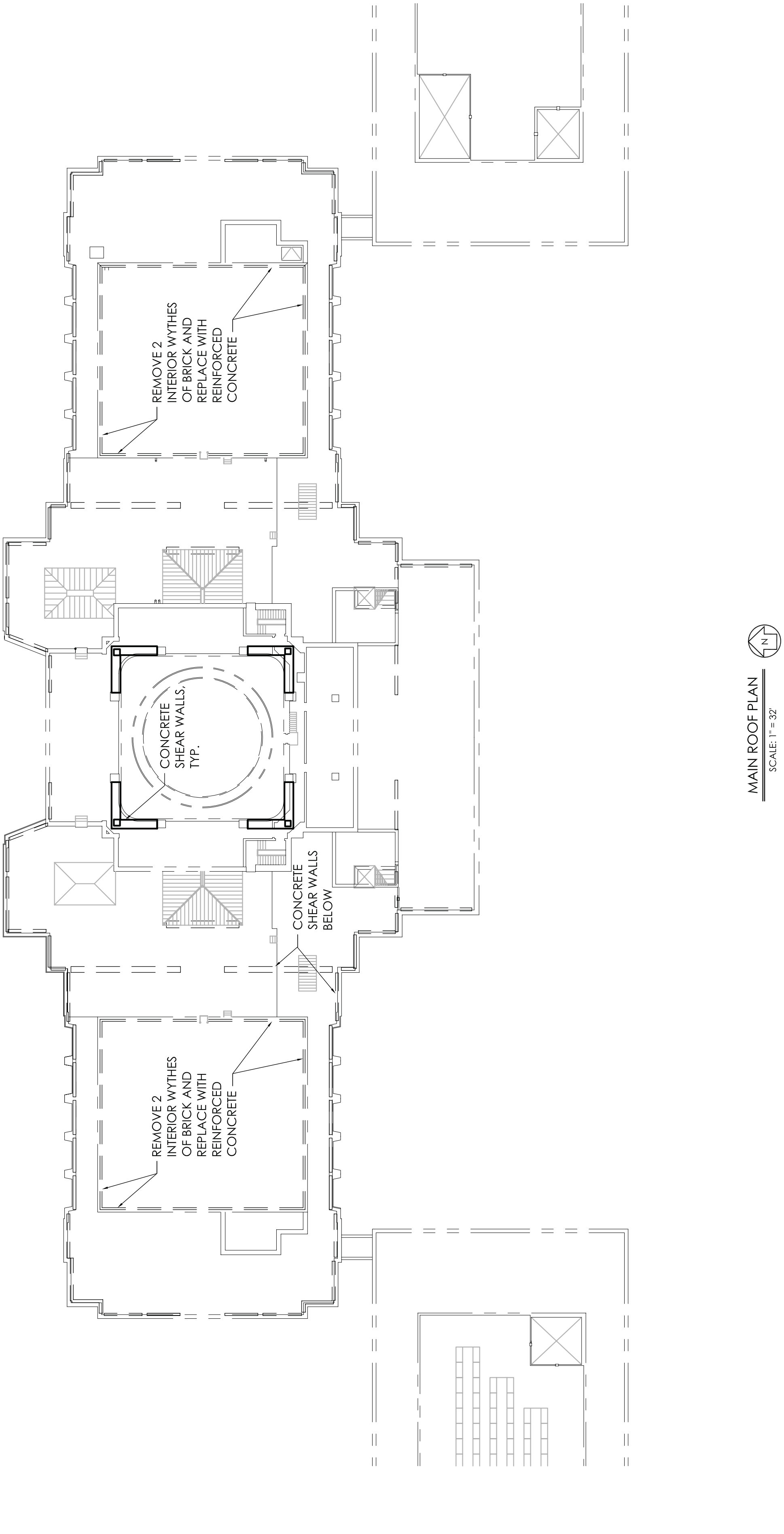
Option 1 and Option 2 Figures

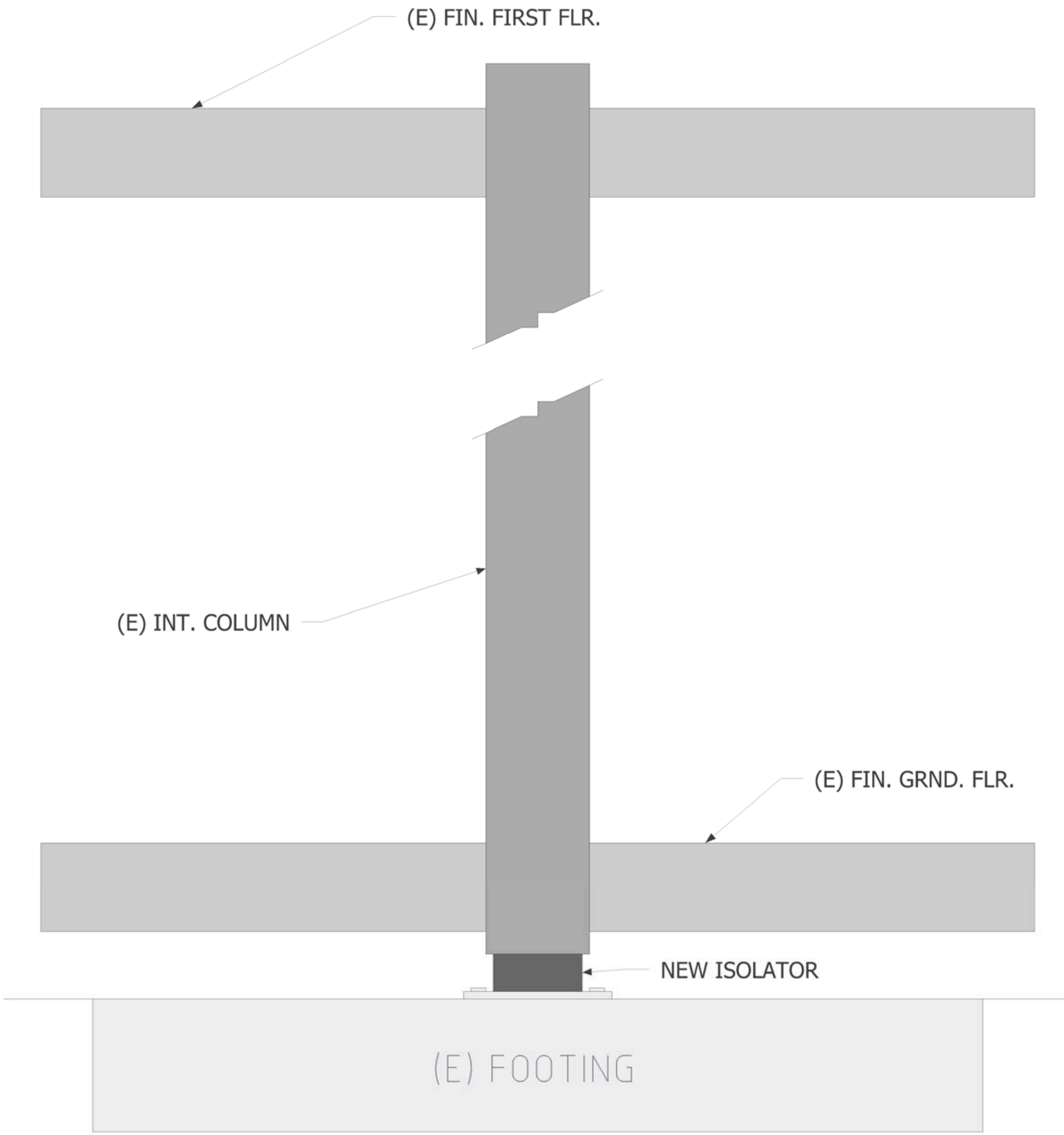
a connected series of related elements
1111 ne flanders street • suite 206 • portland oregon 97232 • v 503. 467. 4980 • f 503. 467. 4797



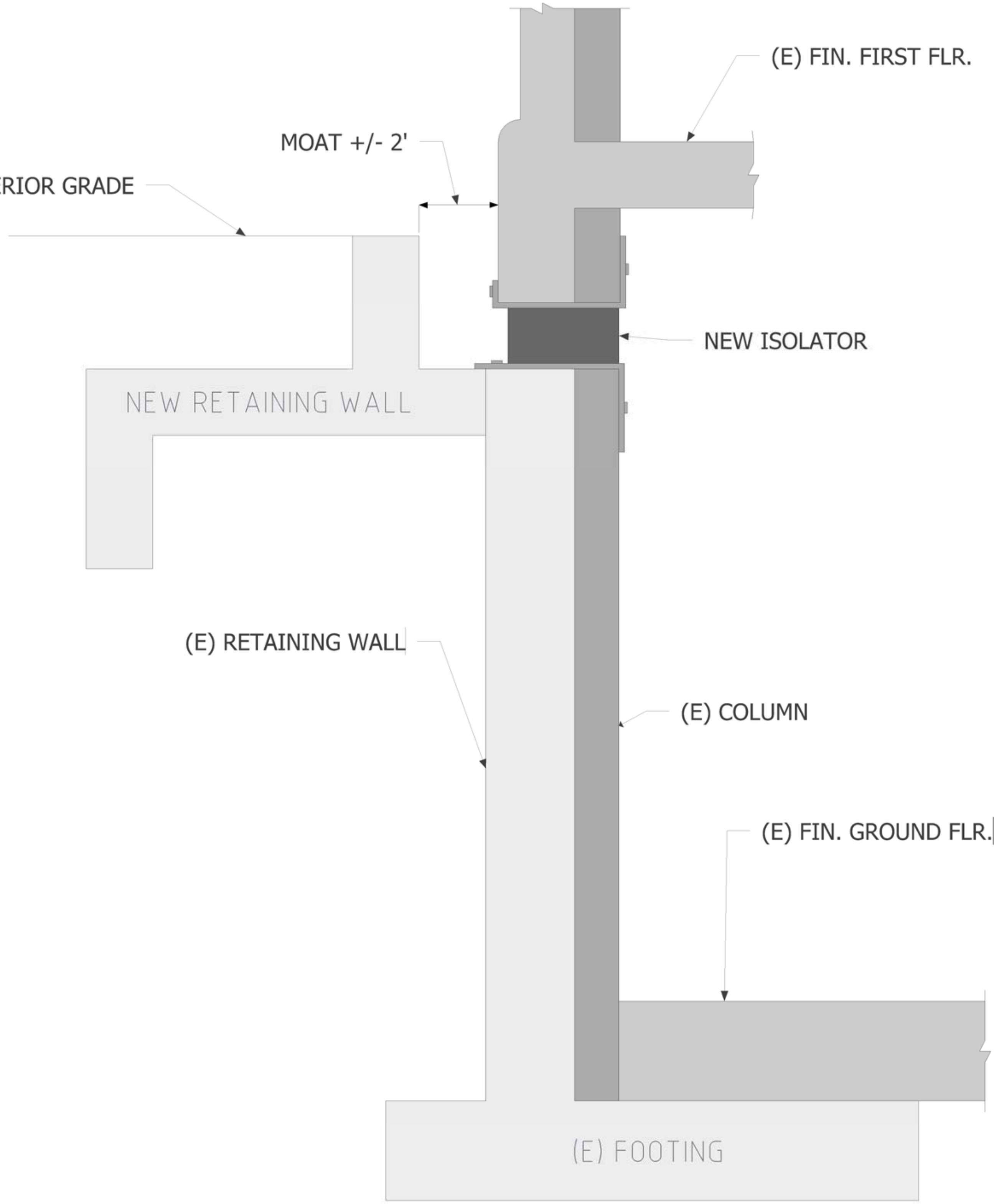
FIRST FLOOR PLAN

SCALE: 1" = 32'


REMOVE 2 INTERIOR WYTHES OF BRICK AND REPLACE WITH REINFORCED CONCRETE
CONCRETE SHEAR WALLS, TYP.
CONCRETE SHEAR WALLS BELOW
REMOVE 2 INTERIOR WYTHES OF BRICK AND REPLACE WITH REINFORCED CONCRETE
N
MAIN ROOF PLAN
SCALE: 1" = 32'



OPTION 2: FIGURE 1



OPTION 2: FIGURE 2

APPENDIX C

ASCE 31 Check sheets

catena consulting engineers

Building Name: **Oregon State Capitol** Date: **07.25.2008**

Building Address: **900 Court Street NE, Salem, Oregon** Page: **1** of **1**

Job Number: **2007186.00** Job Name: **Oregon State Capitol Master Planning** By: **NJS**

ASCE 31 SUMMARY DATA SHEET

BUILDING DATA

Latitude:	44.9383926	Longitude:	-123.0302582		
Year Built:	1938	Year(s) Remodeled:		Original Design Code:	
Area (sf):	192,000	Length (ft):	400	Width (ft):	150
No. Stories:	6	Story Height:	12 ft + 76 ft rotunda	Total Height:	137

USE ☐ Industrial ☒ Office ☐ Warehouse ☐ Hospital ☐ Residential ☐ Educational ☐ Other:_

CONSTRUCTION DATA

Gravity Load Structural System: Nonductile reinforced concrete frame

Exterior Transverse Walls: URM infill brick panels clad with marble Openings?: Limited windows

Exterior Longitudinal Walls: URM infill brick panels clad with marble Openings?: Some multistory openings

Roof Materials/Framing: One-way concrete pan joist slabs supported by concrete beams

Intermediate Floors/Framing: One-way concrete pan joist slabs supported by concrete beams

Ground Floor: Concrete slab on grade

Columns: Reinforced tied or spiral concrete columns Foundation: Concrete spread footings

General Condition of Structure: Good, limited settlement, a few cracks in concrete fireproofing

Levels Below Grade?: The ground floor is approximately 4' below grade on the north side.

Special Features and Comments: The center rotunda extends high above the rest of the building.

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal Direction	Transverse Direction
System:	Concrete frame with brick infill walls	Concrete frame with brick infill walls
Vertical Elements:	URM infill brick walls	URM infill brick walls
Diaphragms:	Reinforced concrete slabs	Reinforced concrete slabs
Connections:	Slabs cast monolithically with frame members	Slabs cast monolithically with frame members

EVALUATION DATA

Spectral Response Accelerations: S_s = 0.93331 S_1 = 0.38845

Soil Factors: Class = D F_a = 1.13 F_v = 1.62

Design Spectral Response Accelerations: S_{DS} = 0.70 S_{D1} = 0.42

Level of Seismicity: High Performance Level: Immediate Occupancy

Building Period: T = 0.801 s Spectral Acceleration: S_a = 0.52

Modification Factor: C = 1.00 Building Weight: W = 45,127 kips

Pseudo Lateral Force: $V=CS_aW$= 23,684 kips

BUILDING CLASSIFICATION: C3, Concrete frames with infill masonry shear walls

CHECKLISTS ATTACHED

Basic structural checklist	☒	Basic nonstructural checklist	☒
Supplemental structural checklist	☒	Intermediate nonstructural checklist	☒
Geologic Site Hazards and Foundations checklist	☒	Supplemental nonstructural checklist	☒

FURTHER EVALUATION REQUIREMENTS: Tier 2 and Tier 3 evaluations required

catena consulting engineers

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 1 of 2

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC CHECKLIST C3: CONCRETE FRAMES WITH INFILL MASONRY SHEAR WALLS AND RIGID OR STIFF DIAPHRAGMS

BUILDING SYSTEM

C	NC	N/A			Comments
☒	☐	☐	4.3.1.1	LOAD PATH: The structure shall contain a minimum of one complete load path for Life Safety and Immediate Occupancy for seismic force effects from any horizontal direction that serves to transfer the inertial forces from the mass to the foundation.	
☒	☐	☐	4.3.1.3	MEZZANINES: Interior mezzanine levels shall be braced independently from the main structure, or shall be anchored to the lateral-force-resisting elements of the main structure.	
☒	☐	☐	4.3.2.1	WEAK STORY: The strength of the lateral-force-resisting system in any story shall not be less than 80% of the strength in an adjacent story above or below for Life-Safety and Immediate Occupancy.	Tower excluded
☒	☐	☐	4.3.2.2	SOFT STORY: The stiffness of the lateral-force-resisting-system in any story shall not be less than 70% of the lateral-force-resisting system stiffness in an adjacent story above or below, or less than 80% of the average lateral-force-resisting system stiffness of the three stories above or below for Life Safety and Immediate Occupancy.	Tower excluded
☒	☐	☐	4.3.2.3	GEOMETRY: There shall be no changes in horizontal dimension of the lateral-force-resisting system of more than 30% in a story relative to adjacent stories for Life Safety and Immediate Occupancy, excluding one-story penthouses and mezzanines.	Tower excluded
☐	☒	☐	4.3.2.4	VERTICAL DISCONTINUITIES: All vertical elements in the lateral-force-resisting system shall be continuous to the foundation.	Tower walls are discontinuous
☒	☐	☐	4.3.2.5	MASS: There shall be no change in effective mass of more than 50% from one story to the next for Life Safety and Immediate Occupancy. Light roofs, penthouses and mezzanines need not be considered.	Tower excluded
☒	☐	☐	4.3.2.6	TORSION: The estimated distance between the story center of mass and the story center of rigidity shall be less than 20% of the building width in either plan dimension for Life Safety and Immediate Occupancy.	
☒	☐	☐	4.3.3.4	DETERIORATION OF CONCRETE: There shall be no visible deterioration of concrete or reinforcing steel in any of the vertical- or lateral-force-resisting elements.	Assumed
☒	☐	☐	4.3.3.7	MASONRY UNITS: There shall be no visible deterioration of masonry units.	Assumied
☒	☐	☐	4.3.3.8	MASONRY JOINTS: The mortar shall not be easily scraped away from the joints by hand with a metal tool, and there shall be no areas of eroded mortar.	Assumed

catena consulting engineers

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 2 of 2

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC CHECKLIST C3: CONCRETE FRAMES WITH INFILL MASONRY SHEAR WALLS AND RIGID OR STIFF DIAPHRAGMS

C	NC	N/A			Comments
			BUILDING SYSTEM		
☐	☒	☐	4.3.3.12	CRACKS IN INFILL WALLS: There shall be no existing diagonal cracks in the infilled walls that extend throughout a panel, greater than 1/8" for Life Safety and 1/16" for Immediate Occupancy, or out-of-plane offsets in the bed joint greater than 1/8" for Life Safety and 1/16" for Immediate Occupancy.	**Based on 1994 post-earthquake assessment**
☒	☐	☐	4.3.3.13	CRACKS IN BOUNDARY COLUMNS: There shall be no existing diagonal cracks wider than 1/8" for Life Safety and 1/16" for Immediate Occupancy in concrete columns that encase masonry infills.	**Assumed**
			LATERAL-FORCE-RESISTING SYSTEM		
☒	☐	☐	4.4.2.1.1	REDUNDANCY: The number of lines of shear walls in each principal direction shall be greater than or equal to 2 for Life Safety and Immediate Occupancy.	
☐	☐	☒	4.4.2.4.1	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check Procedure of Section 3.5.3.3, shall be less than 70 psi for Life Safety and Immediate Occupancy.	
☐	☒	☐	4.4.2.5.1	SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 3.5.3.3, shall be less than 30 psi for clay units and 70 psi for concrete units for Life Safety and Immediate Occupancy.	
☒	☐	☐	4.4.2.6.1	WALL CONNECTIONS: Masonry shall be in full contact with frame for Life Safety and Immediate Occupancy.	**Assumed**
			CONNECTIONS		
☒	☐	☐	4.6.2.1	TRANSFER TO SHEAR WALLS: Diaphragms shall be connected for transfer of loads to the shear walls for Life Safety and the connections shall be able to develop the lesser of the shear strength of the walls or diaphragms for Immediate Occupancy.	**Slabs are cast monolithically with frame beams**
☒	☐	☐	4.6.3.2	CONCRETE COLUMNS: All concrete columns shall be doweled into the foundation for Life Safety and the dowels shall be able to develop the tensile capacity of reinforcement in columns of lateral-force-resisting system for Immediate Occupancy.	

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 1 of 2

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 SUPPLEMENTAL CHECKLIST C3: CONCRETE FRAMES WITH INFILL MASONRY SHEAR WALLS AND RIGID OR STIFF DIAPHRAGMS

LATERAL-FORCE-RESISTING SYSTEM

C	NC	N/A	Item	Statement	Comments
☐	☒	☐	4.4.1.6.2	DEFLECTION COMPATIBILITY: Secondary components shall have the shear capacity to develop the flexural strength of the components for Life Safety and shall meet the requirements of 4.4.1.4.9, 4.4.1.4.10, 4.4.1.4.11, 4.4.1.4.12 and 4.4.1.4.15 for Immediate Occupancy.	**Typ. column tie spacing is 8", greater than d/2 for some columns.**
☐	☐	☒	4.4.1.6.3	FLAT SLABS: Flat slabs/plates not part of lateral-force-resisting system shall have continuous bottom steel through the column joints for Life Safety.	**No flat slabs**
☐	☐	☒	4.4.2.4.3	REINFORCING AT OPENINGS: All wall openings that interrupt rebar shall have trim reinforcing on all sides. This statement shall apply to the Immediate Occupancy Performance Level only.	**Walls are unreinforced**
☐	☒	☐	4.4.2.6.2	PROPORTIONS: The height-to-thickness ratio of the infill walls at each story shall be less than 9 for Life Safety in levels of high seismicity, 13 for Immediate Occupancy in levels of moderate seismicity, and 8 for Immediate Occupancy in levels of high seismicity.	**Walls are taller than 10' and brick thickness is 12" or less, so h/t = 10 > 8**
☒	☐	☐	4.4.2.6.3	SOLID WALLS: The infill walls shall not be of cavity construction.	**Assumed**
☒	☐	☐	4.4.2.6.4	INFILL WALLS: The infill walls shall be continuous to the soffits of the frame beams and to the columns to either side.	**Assumed**

DIAPHRAGMS

C	NC	N/A	Item	Statement	Comments
☒	☐	☐	4.5.1.1	DIAPHRAGM CONTINUITY: The diaphragms shall not be composed of split-level floors and shall not have expansion joints.	
☒	☐	☐	4.5.1.4	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls shall be less than 25% of the wall length for Life Safety and 15% of the wall length for Immediate Occupancy.	
☐	☐	☒	4.5.1.6	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls shall not be greater than 8 ft long for Life Safety and 4 ft long for Immediate Occupancy.	**Concrete frame beams occur in exterior walls adjacent to all openings**
☒	☐	☐	4.5.1.7	PLAN IRREGULARITIES: There shall be tensile capacity to develop the strength of the diaphragm at re-entrant corners or other locations of plan irregularities. This statement shall apply to the Immediate Occupancy Performance Level only.	

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 2 of 2

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 SUPPLEMENTAL CHECKLIST C3: CONCRETE FRAMES WITH INFILL MASONRY SHEAR WALLS AND RIGID OR STIFF DIAPHRAGMS

C	NC	N/A			Comments
			DIAPHRAGMS		
☒	☐	☐	4.5.1.8	DIAPHRAGM REINFORCEMENT AT OPENINGS: There shall be reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. This statement shall apply to the Immediate Occupancy Performance Level only.	**Reinforced concrete beams surround all openings**
			CONNECTIONS		
☐	☐	☒	4.6.3.10	UPLIFT AT PILE CAPS: Pile caps shall have top reinforcement and piles shall be anchored to the pile caps for Life Safety, and the pile cap reinforcement and pile anchorage shall be able to develop the tensile capacity of the piles for Immediate Occupancy.	

catena consulting engineers

Building Name: Oregon State Capitol Date: 07.24.2008

Building Address: Salem, Oregon Page: 1 of 2

Job Number: 2007186.00 Job Name: Oregon State Capitol Master Planning By: NJS

ASCE 31 GEOLOGIC SITE HAZARDS AND FOUNDATIONS CHECKLIST

C NC N/A — Comments

GEOLOGIC SITE HAZARDS

The following statements shall be completed for buildings in levels of high or moderate seismicity.

☒ ☐ ☐ 4.7.1.1 LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 feet under the building for Life Safety and Immediate Occupancy.

☒ ☐ ☐ 4.7.1.2 SLOPE FAILURE: The building site shall be sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or shall be capable of accommodating any predicted movements without failure.

☒ ☐ ☐ 4.7.1.3 SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site is not anticipated.

CONDITIONS OF FOUNDATIONS

The following statement shall be completed for all Tier 1 building evaluations.

☒ ☐ ☐ 4.7.2.1 FOUNDATION PERFORMANCE: There shall be no evidence of excessive foundation movement such as settlement or heave that would affect the integrity or strength of the structure.

The following statement shall be completed for buildings in levels of high or moderate seismicity being evaluated to the Immediate Occupancy Performance Level.

☒ ☐ ☐ 4.7.2.2 DETERIORATION: There shall not be evidence that foundation elements have deteriorated due to corrosion, sulfate attack, material breakdown, or other reasons in a manner that would affect the integrity or strength of the structure.

CAPACITY OF FOUNDATIONS

The following statement shall be completed for all Tier 1 building evaluations.

☐ ☐ ☒ 4.7.3.1 POLE FOUNDATIONS: Pole foundations shall have a minimum embedment depth of 4 ft for Life Safety and Immediate Occupancy.

The following statements shall be completed for buildings in levels of moderate seismicity being evaluated to the Immediate Occupancy Performance Level and for buildings in levels of high seismicity.

☒ ☐ ☐ 4.7.3.2 OVERTURNING: The ratio of the horizontal dimension of the lateral-force-resisting system at the foundation level to the building height (base/height) shall be greater than $0.6S_a$.

Comments: **163 ft / 137ft = 1.2 > 0.6*0.52 = 0.31**

☒ ☐ ☐ 4.7.3.3 TIES BETWEEN FOUNDATION ELEMENTS: The foundation shall have ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Class A, B, or C. (Section 3.5.2.3.1)

catena consulting engineers

Building Name: Oregon State Capitol Date: 07.24.2008

Building Address: Salem, Oregon Page: 2 of 2

Job Number: 2007186.00 Job Name: Oregon State Capitol Master Planning By: NJS

ASCE 31 GEOLOGIC SITE HAZARDS AND FOUNDATIONS CHECKLIST

C	NC	N/A			Comments
			CAPACITY OF FOUNDATIONS		
☐	☐	☒	4.7.3.4	DEEP FOUNDATIONS: Piles and piers shall be capable of transferring the lateral forces between the structure and the soil. This statement shall apply to the Immediate Occupancy Performance Level only.	
☒	☐	☐	4.7.3.5	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story in height. This statement shall apply to the Immediate Occupancy Performance Level only.	

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 1 of 4

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC NONSTRUCTURAL COMPONENT CHECKLIST

C	NC	N/A			Comments
				PARTITIONS	
☐	☒	☐	4.8.1.1	UNREINFORCED MASONRY: Unreinforced masonry or hollow clay tile partitions shall be braced at a spacing of equal to or less than 10 feet in levels of low and moderate seismicity and 6 feet in levels of high seismicity.	
				CEILING SYSTEMS	
☐	☐	☐	4.8.2.1	SUPPORT: The integrated suspended ceiling system shall not be used to laterally support the tops of gypsum board, masonry, or hollow clay tile partitions. Gypsum board partitions need not be evaluated where only the Basic Nonstructural Checklist is required by Table 3-2.	
				LIGHT FIXTURES	
☐	☐	☐	4.8.3.1	EMERGENCY LIGHTING: Emergency lighting shall be anchored or braced to prevent falling during an earthquake.	
				CLADDING AND GLAZING	
☐	☐	☐	4.8.4.1	CLADDING ANCHORS: Cladding components weighing more than 10 psf shall be mechanically anchored to the exterior wall framing at a spacing equal to or less than 4 ft. A spacing of up to 6 ft is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
☒	☐	☐	4.8.4.2	DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements.	
☐	☐	☒	4.8.4.3	CLADDING ISOLATION: For moment frame buildings of steel or concrete, panel connections shall be detailed to accommodate an interstory drift ratio of 0.02. Panel connection detailing for an interstory drift ratio of 0.01 is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
☐	☐	☐	4.8.4.4	MULTISTORY PANELS: For multistory panels attached at each floor level, panel connections shall be detailed to accommodate an interstory drift ratio of 0.02. Panel connection detailing for an interstory drift ratio of 0.01 is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
☐	☐	☐	4.8.4.5	BEARING CONNECTIONS: Where bearing connections are required, there shall be a minimum of two bearing connections for each wall panel.	

catena consulting engineers

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 2 of 4

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC NONSTRUCTURAL COMPONENT CHECKLIST

C	NC	N/A			Comments
				CLADDING AND GLAZING	
☐	☐	☐	4.8.4.6	INSERTS: Where inserts are used in concrete connections, the inserts shall be anchored to reinforcing steel or other positive anchorage.	
☐	☐	☐	4.8.4.7	PANEL CONNECTIONS: Exterior cladding panels shall be anchored out-of-plane with a minimum of 4 connections for each wall panel. Two connections per wall panel are permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
				MASONRY VENEER	
☐	☐	☒	4.8.5.1	SHELF ANGLES: Masonry veneer shall be supported by shelf angles or other elements at each floor 30 feet above ground for Life Safety and above the first floor for Immediate Occupancy.	
☐	☐	☒	4.8.5.2	TIES: Masonry veneer shall be connected to the back-up with corrosion-resistant ties. The ties shall have a spacing of equal to or less than 24" with a minimum of one tie for every 2-2/3 square feet. A spacing of up to 36" is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
☐	☐	☒	4.8.5.3	WEAKENED PLANES: Masonry veneer shall be anchored to the back-up adjacent to weakened planes such as at the locations of flashing.	
☐	☐	☒	4.8.5.4	DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the connection elements.	
				PARAPETS, CORNICES, ORNAMENTATION, AND APPENDAGES	
☐	☐	☐	4.8.8.1	URM PARAPETS: There shall be no laterally unsupported unreinforced masonry parapets or cornices with height-to-thickness ratios greater than 1.5. A height-to-thickness ratio of up to 2.5 is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	
☐	☐	☒	4.8.8.2	CANOPIES: Canopies located at building exits shall be anchored at a spacing of 6 feet. An anchorage spacing of up to 10 feet is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.	

catena consulting engineers

Building Name: Oregon State Capitol | Date: 07.25.2008

Building Address: Salem, Oregon | Page: 3 of 4

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC NONSTRUCTURAL COMPONENT CHECKLIST

C NC N/A **Comments**

MASONRY CHIMNEYS

☐ ☐ ☐ 4.8.9.1 URM CHIMNEYS: No unreinforced masonry chimney shall extend above the roof surface more than twice the least dimension of the chimney. A height above the roof surface of up to three times the least dimension of the chimney is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.

STAIRS

☐ ☐ ☐ 4.8.10.1 URM WALLS: Walls around stair enclosures shall not consist of unbraced hollow clay tile or unreinforced masonry with a height-to-thickness ratio greater than 12-to-1. A height-to-thickness ratio of up to 15-to-1 is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.

☐ ☐ ☒ 4.8.10.2 STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure shall not rely on shallow anchors in concrete. Alternatively, the stair details shall be capable of accommodating the drift calculated using the Quick Check Procedure of Section 3.5.3.1 without inducing tension in the anchors.

BUILDING CONTENTS AND FURNISHING

☐ ☒ ☐ 4.8.11.1 TALL NARROW CONTENTS: Contents over four feet in height with a height-to-depth ratio greater than 3-to-1 shall be anchored to the floor slab or adjacent structural walls. A height-to-depth ratio of up to 4-to-1 is permitted where only the Basic Nonstructural Checklist is required by Table 3-2.

MECHANICAL AND ELECTRICAL EQUIPMENT

☐ ☐ ☐ 4.8.12.1 EMERGENCY POWER: Equipment used as part of an emergency power system shall be mounted to maintain continued operation after an earthquake.

☐ ☐ ☒ 4.8.12.2 HAZARDOUS MATERIAL EQUIPMENT: HVAC or other equipment containing hazardous material shall not have failed or weak supply lines or unstable isolation supports.

☒ ☐ ☐ 4.8.12.3 DETERIORATION: There shall be no evidence of deterioration, damage or corrosion in any of the anchorage or supports of mechanical or electrical equipment.

catena consulting engineers

Building Name: Oregon State Capitol | Date: 07.25.2008

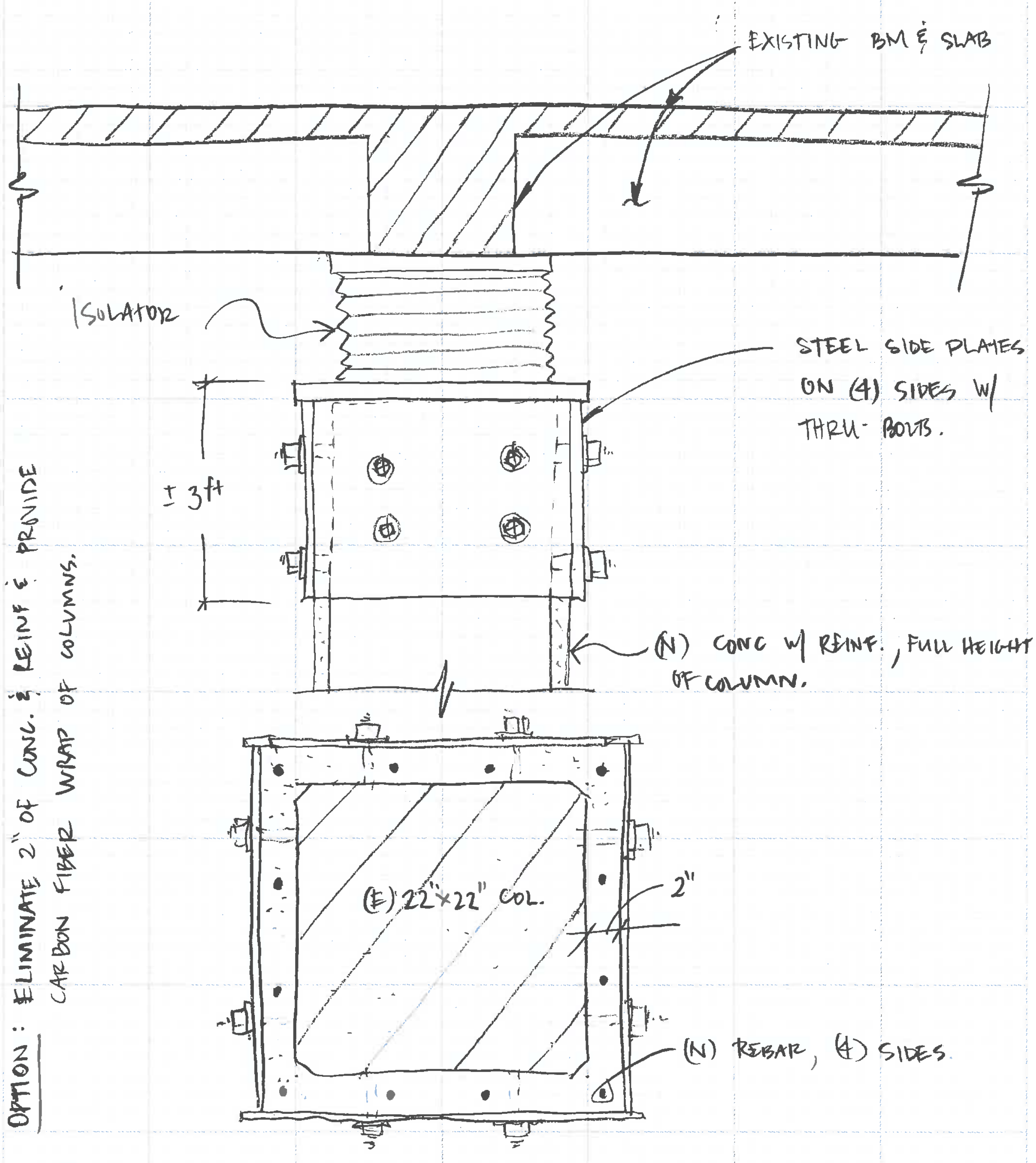
Building Address: Salem, Oregon | Page: 4 of 4

Job Number: 2007186.00 | Job Name: Oregon State Capitol Master Planning | By: NJS

ASCE 31 BASIC NONSTRUCTURAL COMPONENT CHECKLIST

C	NC	N/A			Comments
				MECHANICAL AND ELECTRICAL EQUIPMENT	
☐	☐	☐	4.8.12.4	ATTACHED EQUIPMENT: Equipment weighing over 20 lb that is attached to ceilings, walls, or other supports 4 ft above the floor level shall be braced.	
				PIPING	
☐	☐	☐	4.8.13.1	FIRE SUPPRESSION PIPING: Fire suppression piping shall be anchored and braced in accordance with *NFPA-13* (NFPA, 1996).	
☐	☐	☐	4.8.13.2	FLEXIBLE COUPLINGS: Fluid, gas and fire suppression piping shall have flexible couplings.	
				HAZARDOUS MATERIALS STORAGE AND DISTRIBUTION	
☐	☐	☒	4.8.15.1	TOXIC SUBSTANCES: Toxic and hazardous substances stored in breakable containers shall be restrained from falling by latched doors, shelf lips, wires, or other methods.	

Project: Base Iso @ 1977 Add.	No: 2007186.00	Page:
Subject: State Capitol	By:	Date: 2009.03.24



COLUMNS @ 1977 Addition

7.4 COST ESTIMATE DETAIL

OREGON STATE CAPITOL MASTER PLAN - PHASES 1 & 2

Total Cost Summary

GFA: Gross floor area
Rates current at April 2009

Level	Zone		GFA SF	Cost/SF	Total Cost
A	**PHASE 1**				86,064,096
	Escalation				
	Mid Point of Construction 2Q2015	23%			19,794,742
	Total Construction Phase 1				**105,858,838**
	PHASE 2				55,413,827
	Escalation				
	Mid Point of Construction 2Q2020	45%			24,936,222
	Total Construction Phase 2				**80,350,049**
	Smaller Phased Projects (in current dollars)				
1	Mechanical room below North Steps (North addidtion)				$8.65M
2	Work to existing skylights				$950k
3	New skylights in senate and House				$400k
4	Exterior renovation				$4.5M
5	Interior Lighting at Historic Public spaces and corridors ; (PH 1 & PH 2)				
	Phase 1				$1.75M
	Phase 2				$1.75M

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Total Cost Summary

GFA: Gross floor area
Rates current at March 2009

Level		Zone	GFA SF	Cost/SF	Total Cost
A	**EXTERIOR RENOVATION**				
	A1	Stone Renovation (38')			810,891
	A2	Stone renovation (77')			598,950
	A3	Window Renovation (38')			1,412,700
					$2,822,541
B	**INTERIOR ARCHITECT. RENOVATION**				
	B1	Historic repair/renovation			3,181,050
	B2	Area usage re-orientation			2,914,600
	B3	Sustainability work			Incl.
	B4	ADA work to restrooms			187,500
					$6,283,150
C	**STRUCTURAL SEISMIC IMPROVEMENTS**				
	C1	Base Isolation alternative			25,700,442
					$25,700,442
D	**MECHANICAL**				
	D1	Plumbing / piping			900,180
	D2	HVAC			2,500,500
	D3	Fire protection			200,040
	D4	Ground Source Well System			300,000
	D5	Rainwater Harvesting System			155,000
					$4,055,720
E	**ELECTRICAL**				
	E1	Electrical			1,100,220
	E2	Lighting			1,200,240
	E3	Data / systems			650,130
					$2,950,590
F	**BUILDING EXPANSION OPTIONS**				
	F1	North Expansion			5,472,960
	F2	West Expansion			2,350,000
	F3	South Entrance ADA work			300,000
	F4	Courtyard Infills			3,121,840
	F5	Renovation for Infills			1,274,150
					$12,518,950
		Net Cost			**$54,331,393**
Margin & Adjustments					
Solar Allowance			1.5%		814,971
		Carried forward			**$55,146,364**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Total Cost Summary

GFA: Gross floor area
Rates current at March 2009

Level	Zone		GFA SF	Cost/SF	Total Cost
		Brought forward			$55,146,364
General Conditions			14.0%		7,720,491
Phasing & Temporary Work			5.0%		3,143,343
Overhead and Profit			6.0%		3,960,612
Bonds and Insurances			2.5%		1,749,270
Design Contingency			20.0%		14,344,016
Escalation 2Q2014					Excl.
		Total Cost			**$86,064,096**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
A		**EXTERIOR RENOVATION**				
A1		**Stone Renovation (38')**				
EW		**EXTERIOR WALLS**				
	1	Scaffolding for stone repairs	SF	97045.00	2.25	218,351
	2	Sealant replacement	SF	75.00	15.00	1,125
	3	Stone cleaning	SF	97045.00	2.50	242,613
	4	Additional cleaning at stained areas (allow 20%)	SF	19409.00	2.00	38,818
	5	Repairs at soiled stone	SF	97045.00		Incl.
	6	Crack repairs	SF	300.00	20.00	6,000
	7	Spalling repairs (allow 15% of area)	SF	14557.00	12.00	174,684
	8	Removal of biological growth on stone	SF	750.00	5.00	3,750
	9	Removal of efflorescence (allowance)	Item			50,000
	10	Repairs at stone delamination (allowance)	Item			50,000
		Element EW total				**785,341**
LA		**LANDSCAPING**				
	1	General repairs on conclusion of stone cleaning around perimeter	SF	5110.00	5.00	25,550
		Element LA total				**25,550**
		A1 Stone Renovation (38') Total				**810,891**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
A	**EXTERIOR RENOVATION**				
A2	**Stone renovation (77')**				
EW	**EXTERIOR WALLS**				
1	Scaffolding for stone repairs	SF	81000.00	2.25	182,250
2	Sealant replacement	Item			50,000
3	Stone cleaning	SF	81000.00	2.50	202,500
4	Additional cleaning at stained areas (allow 5%)	SF	4050.00	2.00	8,100
5	Repairs at soiled stone	SF	81000.00		Incl.
6	Crack repairs (allowance)	Item			25,000
7	Spalling repairs (allow 5% of area)	SF	4050.00	12.00	48,600
8	Removal of biological growth on stone	Item			10,000
9	Removal of efflorescence (allowance)	Item			25,000
10	Repairs at stone delamination (allowance)	Item			25,000
	Element EW total				**576,450**
LA	**LANDSCAPING**				
1	General repairs on conclusion of stone cleaning around perimeter	SF	4500.00	5.00	22,500
	Element LA total				**22,500**
	A2 Stone renovation (77') Total				**598,950**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
A	**EXTERIOR RENOVATION**				
A3	**Window Renovation (38')**				
WW	**EXTERIOR WINDOWS**				
1	Re-glazing of existing historic windows with double glazed panels (38')	SF	8310.00	120.00	997,200
2	Repair / recondition existing windows	SF	8310.00	50.00	415,500
	Element WW total				**1,412,700**
	A3 Window Renovation (38') Total				**1,412,700**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
B	**INTERIOR ARCHITECT. RENOVATION**				
B1	**Historic repair/renovation**				
FN	**INTEGRATED CONSTRUCTION**				
1	Major renovation at concourse to 38'	SF	11725.00	170.00	1,993,250
2	Moderate renovation to 38'	SF	300.00	85.00	25,500
3	Moderate renovation to 77'	SF	8380.00	85.00	712,300
4	Minor renovation to 38'	SF	9000.00	50.00	450,000
5	NOTE: Remaining renovation covered under area usage re-orientation	Item			Excl.
	Element FN total				**3,181,050**
	B1 Historic repair/renovation Total				**3,181,050**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
B	**INTERIOR ARCHITECT. RENOVATION**				
B2	**Area usage re-orientation**				
FN	**INTEGRATED CONSTRUCTION**				
1	Renovation of parking areas at 77'	SF	53770.00	20.00	1,075,400
2	Renovation of 77'wings at L1 (minor work resulting from structural work)	SF	39730.00	40.00	1,589,200
3	Allowance for security enhamncements per memo dated May 21st, 2009	Item			250,000
	Element FN total				**2,914,600**
	B2 Area usage re-orientation Total				**2,914,600**

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
B	**INTERIOR ARCHITECT. RENOVATION**				
B4	**ADA work to restrooms**				
FN	**INTEGRATED CONSTRUCTION**				
1	ADA upgrade of restrooms	SF	1250.00	150.00	187,500
	Element FN total				**187,500**
	B4 ADA work to restrooms Total				**187,500**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
C		**STRUCTURAL SEISMIC IMPROVEMENTS**				
C1		**Base Isolation alternative**				
	DE	**BUILDING ELEMENTS DEMOLITION**				
	1	Shoring of existing	SF	363375.00	2.50	908,438
	2	Demolition of basement interior 38'	SF	46250.00	10.00	462,500
	3	Demolition at level 1 77'	SF	53770.00	10.00	537,700
	4	Sawcutting etc for column inserts at level 1 77'	SF	53770.00	25.00	1,344,250
	5	Site demolition around 77' building for new moat	Item			500,000
	6	Demolition and removal of existing columns	SF	46250.00	5.00	231,250
	7	Removal of slab on grade	SF	46250.00	3.00	138,750
	8	Excavation to expose footings	CY	10278.00	35.00	359,730
	9	Demolish existing footings	SF	46250.00	7.00	323,750
		Element DE total				**4,806,368**
	FD	**STANDARD FOUNDATIONS**				
	1	New footings under existing isolated interior columns (38')	CY	687.00	575.00	395,025
	2	New perimeter footings at perimeter 38'	CY	347.00	575.00	199,525
	3	New columns and connections at level 1 77'	SF	53770.00	35.00	1,881,950
	4	New steel plates and anchors at columns 77'	SF	53770.00	10.00	537,700
	5	Steel cover plate at perimeter 38'	LF	1170.00	95.00	111,150
	6	New perimeter beam at perimeter moat	CY	347.00	650.00	225,550
	7	Moat wall tied in to existing structure	SF	14400.00	95.00	1,368,000
		Element FD total				**4,718,900**
	SP	**SPECIAL FOUNDATIONS**				
	1	Continous pile cap at perimeter 38'	CY	694.00	650.00	451,100
	2	Minipiles (assumed 5' c/c at 30' deep)	LF	7020.00	85.00	596,700
	3	Base isolators 38'	SF	151.00	30000.00	4,530,000
	4	Base isolators 77'	SF	140.00	30000.00	4,200,000
		Element SP total				**9,777,800**
	SG	**SLAB ON GRADE**				
	1	Rat slab 38'	SF	46250.00	3.00	138,750
	2	New concrete slab on metal deck 38'	SF	46250.00	5.00	231,250
	3	Steel structure supporting suspended lowest level slab 38' (say 15lbs/sf)	T	346.88	3900.00	1,352,832
	4	New steel column stubs under existing columns	T	37.11	3900.00	144,729
	5	Additional steel at underside of level 1, 38'	T	90.00	3900.00	351,000
		Element SG total				**2,218,561**
		Page total				**21,521,629**

11

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
C	**STRUCTURAL SEISMIC IMPROVEMENTS** Cont'd				
C1	**Base Isolation alternative** Cont'd				
FN	**INTEGRATED CONSTRUCTION**				
1	Flexible couplings at utility connections	SF	363375.00	1.50	545,063
2	Minor structural strengthening 38' and 77'	SF	363375.00	10.00	3,633,750
3	Non structural repairs at basement (covered elsewhere)	SF	46250.00		Incl.
4	Non structural repairs to remainder of building (covered elsewhere)	SF	317125.00		Incl.
	Element FN total				**4,178,813**
	C1 Base Isolation alternative Total				**25,700,442**

12

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**MECHANICAL**				
D1	**Plumbing / piping**				
PF	**PLUMBING FIXTURES**	**SF**	**100020.00**	**9.00**	**900,180**
	Element PF total				**900,180**
	D1 Plumbing / piping Total				**900,180**

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**MECHANICAL**				
D2	**HVAC**				
HV	**SPECIAL HVAC SYSTEMS & EQUIPMENT**	**SF**	**100020.00**	**25.00**	**2,500,500**
	Element HV total				**2,500,500**
	D2 HVAC Total				**2,500,500**

14

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**MECHANICAL**				
D3	**Fire protection**				
FP	**FIRE PROTECTION & SPRINKLER SYSTEMS**	**SF**	**100020.00**	**2.00**	**200,040**
	Element FP total				**200,040**
	D3 Fire protection Total				**200,040**

15

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**MECHANICAL**				
D4	**Ground Source Well System**				
HT	**HEAT TRANSFER**				
1	Ground source well system (see attached detail)	Item			300,000
	Element HT total				**300,000**
	D4 Ground Source Well System Total				**300,000**

16

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**MECHANICAL**				
D5	**Rainwater Harvesting System**				
RW	**RAIN WATER DRAINAGE**				
1	Rainwater harvesting system (see attached for detail)	Item			155,000
	Element RW total				**155,000**
	D5 Rainwater Harvesting System Total				**155,000**

17

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
E	**ELECTRICAL**				
E1	**Electrical**				
SD	**ELECTRICAL SERVICE & DISTRIBUTION**	**SF**	**100020.00**	**11.00**	**1,100,220**
	Element SD total				**1,100,220**
	E1 Electrical Total				**1,100,220**

18

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
E	**ELECTRICAL**				
E2	**Lighting**				
LP	**LIGHTING & BRANCH WIRING**	**SF**	**100020.00**	**12.00**	**1,200,240**
	Element LP total				**1,200,240**
	E2 Lighting Total				**1,200,240**

19

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
E	**ELECTRICAL**				
E3	**Data / systems**				
CM	**COMMUNICATIONS & SECURITY SYSTEMS**	**SF**	**100020.00**	**6.50**	**650,130**
	Element CM total				**650,130**
	E3 Data / systems Total				**650,130**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

		Item	Description	Unit	Qty	Rate	$
F	**BUILDING EXPANSION OPTIONS**						
F1	**North Expansion**						
	DE		**BUILDING ELEMENTS DEMOLITION**				
		1	General demolition	SF	10000.00	20.00	200,000
		2	Remove and replace auto bronze door	EA	2.00	30000.00	60,000
		3	Remove and reinstall monuments	EA	2.00	250000.00	500,000
			Element DE total				**760,000**
	DV		**SITE DEVELOPMENT**				
		1	New egress stairs at East/ West side of addition	EA	2.00	65000.00	130,000
		2	New monumental stair plaza over basement addition	SF	10000.00	130.00	1,300,000
		3	New skylights complete	EA	2.00	150000.00	300,000
			Element DV total				**1,730,000**
	FD		**STANDARD FOUNDATIONS**				
		1	Foundations for basement addition	SF	10000.00	25.00	250,000
			Element FD total				**250,000**
	BE		**BASEMENT EXCAVATION**	**CY**	**5556.00**	**35.00**	**194,460**
			Element BE total				**194,460**
	BW		**BASEMENT WALLS**	**SF**	**9300.00**	**45.00**	**418,500**
			Element BW total				**418,500**
	RF		**ROOF CONSTRUCTION**	**SF**	**10000.00**	**45.00**	**450,000**
			Element RF total				**450,000**
	FN		**INTEGRATED CONSTRUCTION**				
		1	Interior TI	SF	10000.00	75.00	750,000
			Element FN total				**750,000**
	PF		**PLUMBING FIXTURES**	**SF**	**10000.00**	**12.00**	**120,000**
			Element PF total				**120,000**
	FP		**FIRE PROTECTION & SPRINKLER SYSTEMS**	**SF**	**10000.00**	**3.00**	**30,000**
			Element FP total				**30,000**
			Page total				**4,702,960**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
F	**BUILDING EXPANSION OPTIONS** Cont'd				
F1	**North Expansion** Cont'd				
HV	**SPECIAL HVAC SYSTEMS & EQUIPMENT**	**SF**	**10000.00**	**45.00**	**450,000**
	Element HV total				**450,000**
SD	**ELECTRICAL SERVICE & DISTRIBUTION**	**SF**	**10000.00**	**12.00**	**120,000**
	Element SD total				**120,000**
LP	**LIGHTING & BRANCH WIRING**	**SF**	**10000.00**	**15.00**	**150,000**
	Element LP total				**150,000**
CM	**COMMUNICATIONS & SECURITY SYSTEMS**	**SF**	**10000.00**	**5.00**	**50,000**
	Element CM total				**50,000**
	F1 North Expansion Total				**5,472,960**

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
F	**BUILDING EXPANSION OPTIONS**				
F2	**West Expansion**				
FN	**INTEGRATED CONSTRUCTION**				
1	New basement addition complete	SF	5000.00	400.00	2,000,000
	Element FN total				**2,000,000**
DV	**SITE DEVELOPMENT**				
1	New stair / hardscape reconfiguration	Item			350,000
	Element DV total				**350,000**
	F2 West Expansion Total				**2,350,000**

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
F	**BUILDING EXPANSION OPTIONS**				
F3	**South Entrance ADA work**				
FN	**INTEGRATED CONSTRUCTION**				
1	Allowance for work to South entrance	Item			300,000
	Element FN total				**300,000**
	F3 South Entrance ADA work Total				**300,000**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

		Item	Description	Unit	Qty	Rate	$
F	**BUILDING EXPANSION OPTIONS**						
F4	**Courtyard Infills**						
	DE		**BUILDING ELEMENTS DEMOLITION**				
		1	Demolition at existing courtyards	SF	9130.00	20.00	182,600
		2	Remodel work around permieter envelope of courtyard for new work	SF	9000.00	20.00	180,000
			Element DE total				**362,600**
	FD		**STANDARD FOUNDATIONS**				
		1	New foundations for infill	SF	9130.00	20.00	182,600
			Element FD total				**182,600**
	SG		**SLAB ON GRADE**				
		1	New slab on grade	SF	9130.00	6.50	59,345
			Element SG total				**59,345**
	RF		**ROOF CONSTRUCTION**				
		1	New roof structure	SF	9000.00	30.00	270,000
			Element RF total				**270,000**
	EW		**EXTERIOR WALLS**				
		1	Perimeter walls	SF	9000.00	25.00	225,000
			Element EW total				**225,000**
	RC		**ROOF COVERINGS**				
		1	New roof terrace	SF	9130.00	25.00	228,250
			Element RC total				**228,250**
	RO		**ROOF OPENINGS**				
		1	New skylights (allow 30% of roof area)	SF	2739.00	95.00	260,205
			Element RO total				**260,205**
	FN		**INTEGRATED CONSTRUCTION**				
		1	Interior TI	SF	9130.00	75.00	684,750
			Element FN total				**684,750**
	PF		**PLUMBING FIXTURES**	**SF**	**9130.00**	**12.00**	**109,560**
			Element PF total				**109,560**
	FP		**FIRE PROTECTION & SPRINKLER SYSTEMS**	**SF**	**9130.00**	**3.00**	**27,390**
			Element FP total				**27,390**
			Page total				**2,409,700**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
F		**BUILDING EXPANSION OPTIONS** Cont'd				
F4		**Courtyard Infills** Cont'd				
	HV	**SPECIAL HVAC SYSTEMS & EQUIPMENT**	**SF**	**9130.00**	**45.00**	**410,850**
		Element HV total				**410,850**
	SD	**ELECTRICAL SERVICE & DISTRIBUTION**	**SF**	**9130.00**	**12.00**	**109,560**
		Element SD total				**109,560**
	LP	**LIGHTING & BRANCH WIRING**	**SF**	**9130.00**	**15.00**	**136,950**
		Element LP total				**136,950**
	CM	**COMMUNICATIONS & SECURITY SYSTEMS**	**SF**	**9130.00**	**6.00**	**54,780**
		Element CM total				**54,780**
		F4 Courtyard Infills Total				**3,121,840**

OREGON STATE CAPITOL MASTER PLAN - PHASE 1 MASTERPLAN

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
F		**BUILDING EXPANSION OPTIONS**				
F5		**Renovation for Infills**				
	FN	**INTEGRATED CONSTRUCTION**				
	1	New cafe	SF	3970.00	195.00	774,150
	2	Kitchen equipment	Item			200,000
	3	Major remodel for new corridor concourse (see historic renovation)	SF	11900.00		Incl.
	4	Major remodel for galleria/hearing room (see historic renovation)	SF	2400.00		Incl.
	5	New stairs at cafe	EA	2.00	150000.00	300,000
		Element FN total				**1,274,150**
		F5 Renovation for Infills Total				**1,274,150**

GFA: Gross floor area
Rates current at March 2009

Level	Zone	GFA SF	Cost/SF	Total Cost
A	**EXTERIOR RENOVATION**			
A1	Other exterior repairs			1,875,000
				$1,875,000
B	**INTERIOR ARCHITECT. RENOVATION**			
B1	Historic repair/renovation			8,050,650
B2	Area usage re-orientation			6,896,850
B3	Sustainability work			Incl.
B4	ADA work			1,700,000
				$16,647,500
C	**MECHANICAL**			
C1	Plumbing / piping			2,370,195
C2	HVAC			6,583,875
C3	Fire protection			526,710
				$9,480,780
D	**ELECTRICAL**			
D1	Electrical			2,633,550
D2	Lighting			3,160,260
D3	Data / systems			1,185,098
				$6,978,908
	Net Cost			**$34,982,188**
Margin & Adjustments				
Solar allowance		1.5%		524,733
General Conditions		14.0%		4,970,969
Phasing & Temporary Work		5.0%		2,023,895
Overhead and Profit		6.0%		2,550,107
Bonds and Insurances		2.5%		1,126,297
Design Contingency		20.0%		9,235,638
Escalation				Excl.
	Total Cost			**$55,413,827**

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
A	**EXTERIOR RENOVATION**				
A1	**Other exterior repairs**				
RF	**ROOF CONSTRUCTION**				
1	New diagphragm work to 38'	SF	45000.00	5.00	225,000
2	New diagragm work to 77'	SF	40000.00	5.00	200,000
	Element RF total				**425,000**
RC	**ROOF COVERINGS**				
1	New roof coverings with insulation	SF	85000.00	10.00	850,000
	Element RC total				**850,000**
RO	**ROOF OPENINGS**				
1	Replace all skylights (allowance)	Item			600,000
	Element RO total				**600,000**
	A1 Other exterior repairs Total				**1,875,000**

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
B	**INTERIOR ARCHITECT. RENOVATION**				
B1	**Historic repair/renovation**				
FN	**INTEGRATED CONSTRUCTION**				
1	Major renovation to 38'	SF	46575.00	150.00	6,986,250
2	Moderate renovation to 38'	SF	3240.00	85.00	275,400
3	Minor renovation to 38'	SF	7400.00	50.00	370,000
4	Minor renovation to 77'	SF	8380.00	50.00	419,000
5	NOTE: Remaining renovation covered under area usage re-orientation	Item			Excl.
	Element FN total				**8,050,650**
	B1 Historic repair/renovation Total				**8,050,650**

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
B	**INTERIOR ARCHITECT. RENOVATION**				
B2	**Area usage re-orientation**				
FN	**INTEGRATED CONSTRUCTION**				
1	Renovation of non historic areas at 77'	SF	19495.00	30.00	584,850
2	Renovation of 77'wings (no work required)	SF	98600.00		Excl.
3	Renovation of non historic areas at 38'	SF	126240.00	50.00	6,312,000
	Element FN total				**6,896,850**
	B2 Area usage re-orientation Total				**6,896,850**

31

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
B		**INTERIOR ARCHITECT. RENOVATION**				
B4		**ADA work**				
	FN	**INTEGRATED CONSTRUCTION**				
	1	ADA upgrade of restrooms	SF	20000.00	85.00	1,700,000
		Element FN total				**1,700,000**
		B4 ADA work Total				**1,700,000**

32

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
C		**MECHANICAL**				
C1		**Plumbing / piping**				
	PF	**PLUMBING FIXTURES**	**SF**	**263355.00**	**9.00**	**2,370,195**
		Element PF total				**2,370,195**
		C1 Plumbing / piping Total				**2,370,195**

33

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
C		**MECHANICAL**				
C2		**HVAC**				
	HV	**SPECIAL HVAC SYSTEMS & EQUIPMENT**	**SF**	**263355.00**	**25.00**	**6,583,875**
		Element HV total				**6,583,875**
		C2 HVAC Total				**6,583,875**

34

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
C	**MECHANICAL**				
C3	**Fire protection**				
FP	**FIRE PROTECTION & SPRINKLER SYSTEMS**	**SF**	**263355.00**	**2.00**	**526,710**
	Element FP total				**526,710**
	C3 Fire protection Total				**526,710**

35

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**ELECTRICAL**				
D1	**Electrical**				
SD	**ELECTRICAL SERVICE & DISTRIBUTION**	**SF**	**263355.00**	**10.00**	**2,633,550**
	Element SD total				**2,633,550**
	D1 Electrical Total				**2,633,550**

36

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

Item Details

Rates current at March 2009

Item	Description	Unit	Qty	Rate	$
D	**ELECTRICAL**				
D2	**Lighting**				
LP	**LIGHTING & BRANCH WIRING**	**SF**	**263355.00**	**12.00**	**3,160,260**
	Element LP total				**3,160,260**
	D2 Lighting Total				**3,160,260**

OREGON STATE CAPITOL MASTER PLAN - PHASE 2

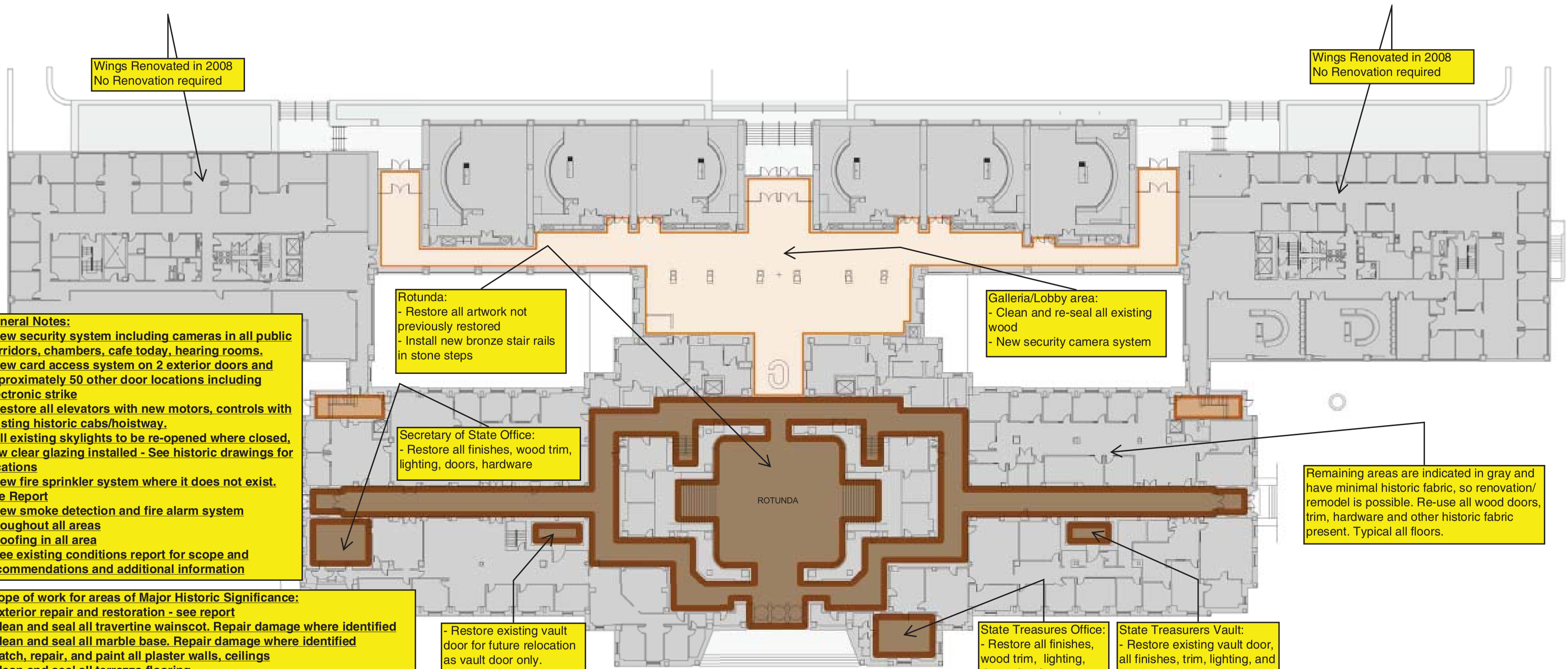
Item Details

Rates current at March 2009

	Item	Description	Unit	Qty	Rate	$
D		**ELECTRICAL**				
D3		**Data / systems**				
	CM	**COMMUNICATIONS & SECURITY SYSTEMS**	**SF**	**263355.00**	**4.50**	**1,185,098**
		Element CM total				**1,185,098**
		D3 Data / systems Total				**1,185,098**

HISTORIC RENOVATION

level 1



General Notes:
- New security system including cameras in all public corridors, chambers, cafe today, hearing rooms.
- New card access system on 2 exterior doors and approximately 50 other door locations including electronic strike
- Restore all elevators with new motors, controls with existing historic cabs/hoistway.
- All existing skylights to be re-opened where closed, new clear glazing installed - See historic drawings for locations
- New fire sprinkler system where it does not exist. See Report
- New smoke detection and fire alarm system throughout all areas
- Roofing in all area
- See existing conditions report for scope and recommendations and additional information

Scope of work for areas of Major Historic Significance:
- Exterior repair and restoration - see report
- Clean and seal all travertine wainscot. Repair damage where identified
- Clean and seal all marble base. Repair damage where identified
- Patch, repair, and paint all plaster walls, ceilings
- Clean and seal all terrazzo flooring
- Restore artwork on walls in Rotunda area on floors 1 and 2 not previously restored
- Restore all bronze stair railing - clean
- Clean and re-seal all wood doors, frames, and trim
- Historic Door hardware on all doors to be re-built with custom levers added to all public doors
- Restore and exterior bronze doors - clean. Add ADA per report
- Restore and relamp/rewire historic lighting in all areas
- New mechanical and electrical per existing condition report
- Structural improvement per report
- New signage/wayfinding throughout

Scope of work for areas of Moderate and Minor Historic Significance:
- Clean and re-seal all wood doors, frames and trim
- Historic Door hardware on all doors to be re-built with custom levers added to all public doors. Non-historic door hardware to be replaced with new
- Restore all bronze stair railing - clean
- Clean and seal all travertine wainscot at stair and corridors. Repair damage where identified
- Clean and seal all marble base at stair and corridors. Repair damage where identified
- Patch, repair, and paint all plaster walls, ceilings
- Clean and seal all terrazzo flooring at stairs
- Restore and relamp/rewire historic lighting in all areas where historic still remain
- New recessed lighting
- New mechanical and electrical per existing condition report
- Structural improvement per report
- New signage/wayfinding throughout
- New flooring - upgraded to coordinate with historic character

Remaining Areas - Minimal Historic
- Clean and re-seal all wood doors, frames, and trim
- Historic Door hardware on all doors to be re-built with custom levers added to all public doors. Non-historic door hardware to be replaced with new
- Restore and relamp/rewire historic lighting in all areas
- New recessed lighting
- New mechanical and electrical per existing condition report
- Structural improvement per report
- New signage/wayfinding throughout
- New flooring - upgraded to coordinate with historic character
- ADA Restroom upgrades using existing fixtures with one new ADA

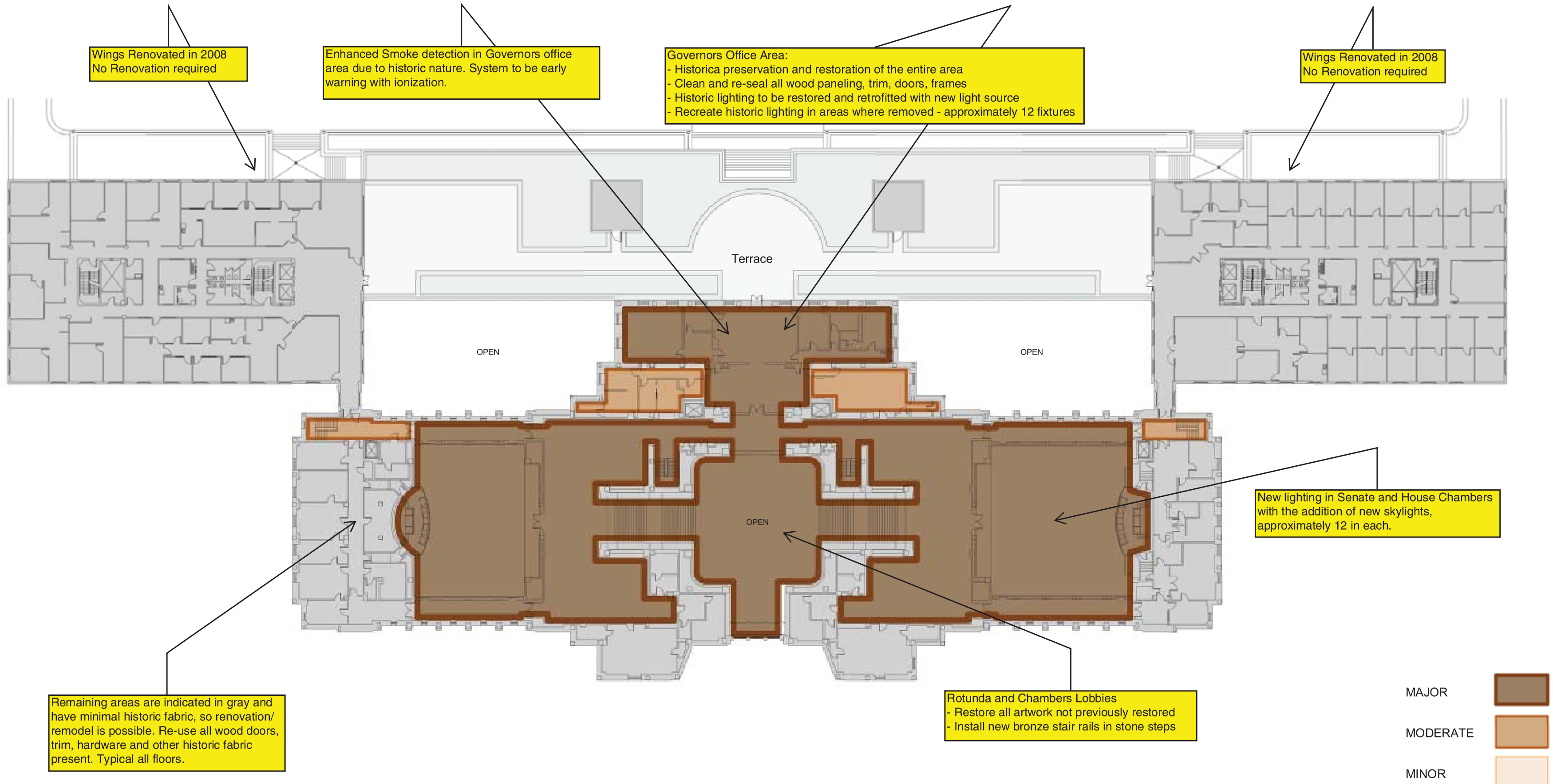
MAJOR

MODERATE

MINOR

Scope of Work Summary
SRG Partnership
12.10.08

Oregon State Capitol Master Plan

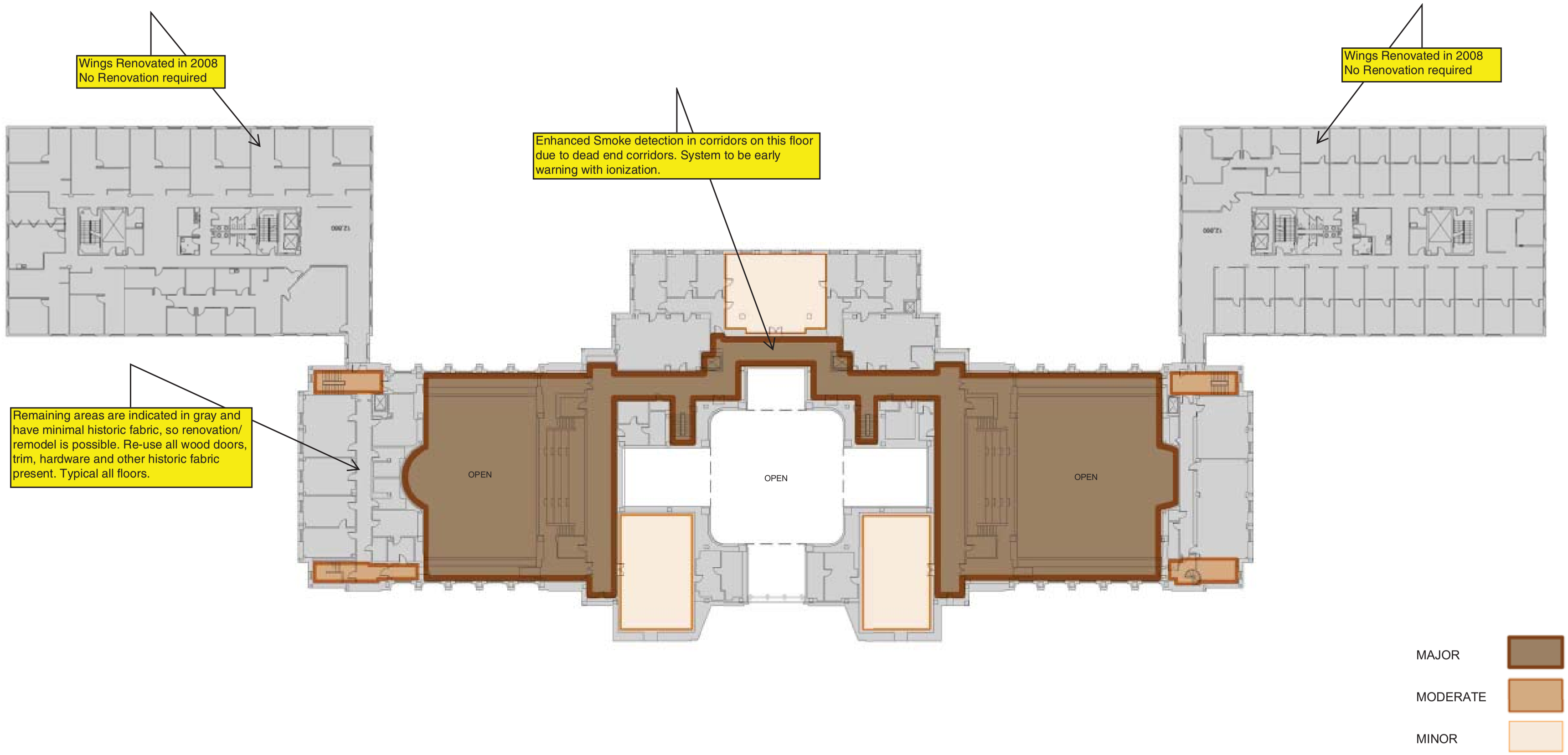


HISTORIC RENOVATION

level 2

Oregon State Capitol Master Plan

Scope of Work Summary
SRG Partnership
12.10.08

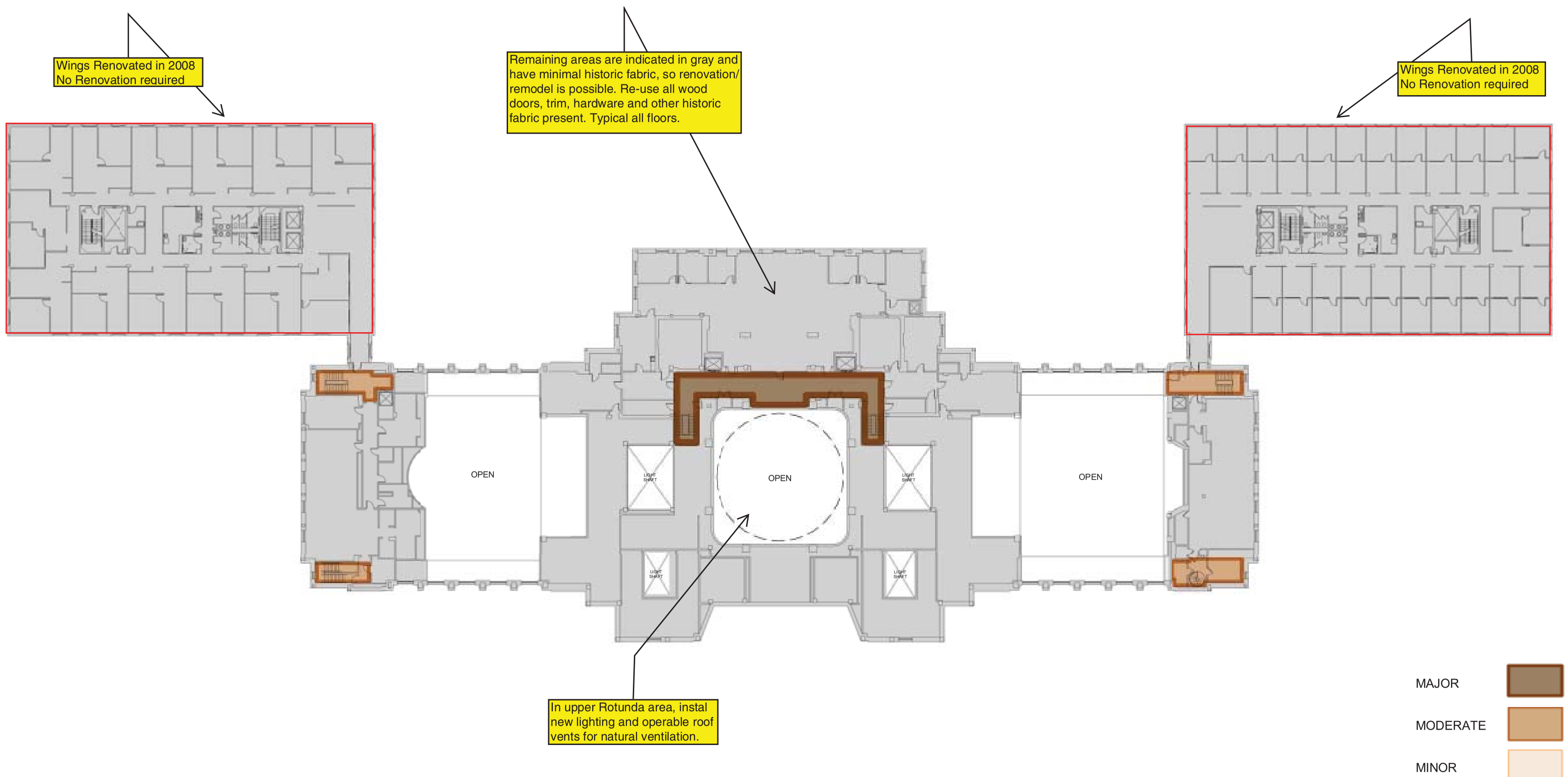


HISTORIC RENOVATION

level 3

Oregon State Capitol Master Plan

Scope of Work Summary
SRG Partnership
12.10.08



HISTORIC RENOVATION

level 4

Oregon State Capitol Master Plan

Scope of Work Summary
SRG Partnership
12.10.08

7.5 SUSTAINABILITY DIAGRAMS AND REPORTS

LEED SCORECARD

LEED-NC

LEED-NC Version 2.2 Project Scorecard
Oregon State Capitol Master Plan
Salem, OR

30-Mar-09

Certain	Possible	Unlikely			
9	3	1	**Sustainable Sites**		**14** Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density & Community Connectivity**	1
		1	Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation**, Public Transportation Access	1
1			Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms	1
1			Credit 4.3	**Alternative Transportation**, Low-Emitting and Fuel-Efficient Vehicles	1
1			Credit 4.4	**Alternative Transportation**, Parking Capacity	1
			Credit 5.1	**Site Development,** Protect of Restore Habitat	1
	1		Credit 5.2	**Site Development,** Maximize Open Space	1
1			Credit 6.1	**Stormwater Design,** Quantity Control	1
	1		Credit 6.2	**Stormwater Design,** Quality Control	1
1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
1			Credit 7.2	**Heat Island Effect,** Roof	1
	1		Credit 8	**Light Pollution Reduction**	1

Certain	Possible	Unlikely			
4	1	0	**Water Efficiency**		**5** Points
1			Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%	1
1			Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation	1
1			Credit 2	**Innovative Wastewater Technologies**	1
1			Credit 3.1	**Water Use Reduction**, 20% Reduction	1
	1		Credit 3.2	**Water Use Reduction**, 30% Reduction	1

Certain	Possible	Unlikely			
11	3	3	**Energy & Atmosphere**		**17** Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**Fundamental Refrigerant Management**	Required
6	2	2	Credit 1	**Optimize Energy Performance**	1 to 10
1	1	1	Credit 2.1	**On-Site Renewable Energy**	1 to 3
1			Credit 3	**Enhanced Commissioning**	1
1			Credit 4	**Enhanced Refrigerant Management**	1
1			Credit 5	**Measurement & Verification**	1
1			Credit 6	**Green Power**	1

continued…

SUSTAINABILITY AND ENERGY EFFICIENCY

SYSTEM RECOMMENDATIONS

HEATING PLANT

A. Condensing Natural Gas Boilers

B. Variable flow heating water pumping system.

C. Heat recovery chillers. Heat produced as a byproduct of cooling process equipment such as computer rooms and voice data equipment can be used to heat the 1938 building. The 1977 Addition has a high temperature heating water system, which is not compatible with low temperature chiller heat recovery. Additional chiller heat recovery could be provided by limiting the amount of outside air economizer cooling during winter months or by using well water as a heat source.

COOLING PLANT

A. High efficiency cooling chiller

B. Variable flow chilled water pumping system

C. Low power cooling tower motors with VFD

D. Variable flow condenser water pumping system

NATURAL VENTILATION

A. Night purge cooling: This concept has been developed by SRG and includes the following spaces:

- ❶ House and Senate Chambers
- ❷ Rotunda
- ❸ 1977 hearing rooms
- ❹ 1938 hearing rooms
- ❺ Basement concourse and Galleria

B. Mass thermal storage/outside air pre-cooling: We are preparing a schematic to describe our concept.

PERIMETER INDUCTION SYSTEM

A. Exhaust air heat recovery, heat wheel

B. Low primary airflow. An induction type system provides lower airflow to terminal equipment. Primary airflow from the air handler will be 25% to 35% of a conventional air distribution system reducing fan operating costs and construction costs.

C. Induction units/active chilled beams can be controlled individually increasing the number of temperature control zones and space comfort.

D. 100% outside air ventilation to each space ensuring proper ventilation.

BASEMENT VARIABLE AIR VOLUME SYSTEM

A. Low temperature supply air/reduce supply airflow: Reduce supply air temperature during winter months when outside air temperature is low. This will lower fan motor energy consumption.

B. Induction supply diffusers: Required to operate with low supply air temperatures.

C. Outside air pre-cooling/preheat using sub-basement mass storage

D. Demand based ventilation

E. Occupancy sensors to reduce airflow in offices/conference rooms when spaces are unoccupied.

HOUSE/SENATE VARIABLE AIR VOLUME SYSTEM

A. Add variable air volume controls

B. Demand based ventilation

PLUMBING

A. Rain water harvesting

B. Solar Water Domestic Water Heating

LIGHTING / LIGHTING CONTROLS

A. High efficiency lighting fixtures

B. Occupancy sensors

C. Automatic day lighting controls

OTHER OPTIONS BEING CONSIDERED.

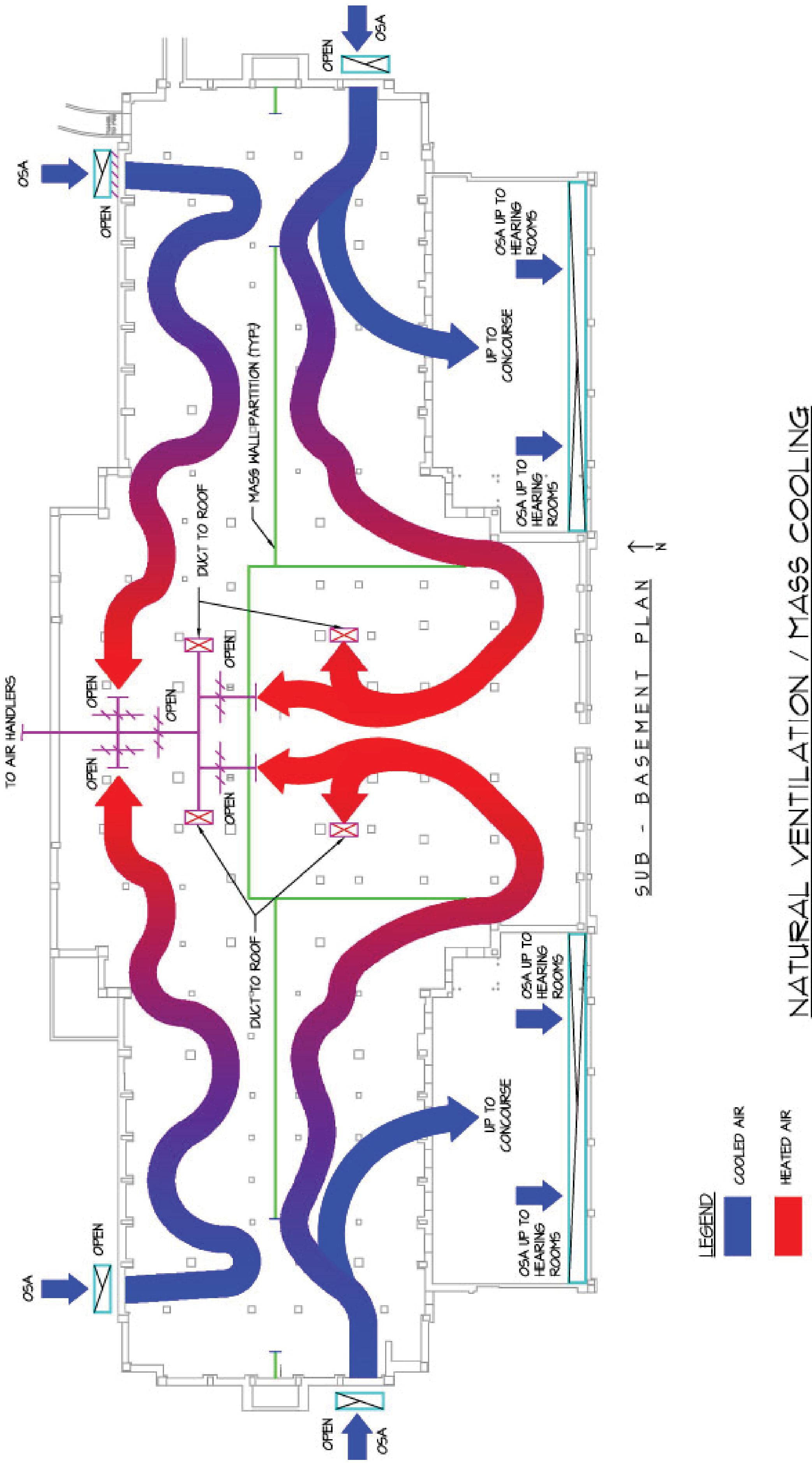
A. Well water energy source: Constructing a well water system on site would provide several options for reducing energy consumption and for reducing carbon emissions.

   1. Well water can be used as an energy source for chiller heat recovery.

❷ Well water can be used directly for cooling at induction units and chilled beams, and could provide a portion of the cooling required at air handler cooling coils. Induction units and chilled beams can be provided with 55oF to 58oF supply water. Well water temperature in this area is typically around 55oF. Air handler cooling coils can be sized for entering and leaving temperatures of 45oF to 65oF. Although well water temperatures are not typically low enough to be supplied to these coils directly, well water can be used to cool return water and reduce cooling loads.

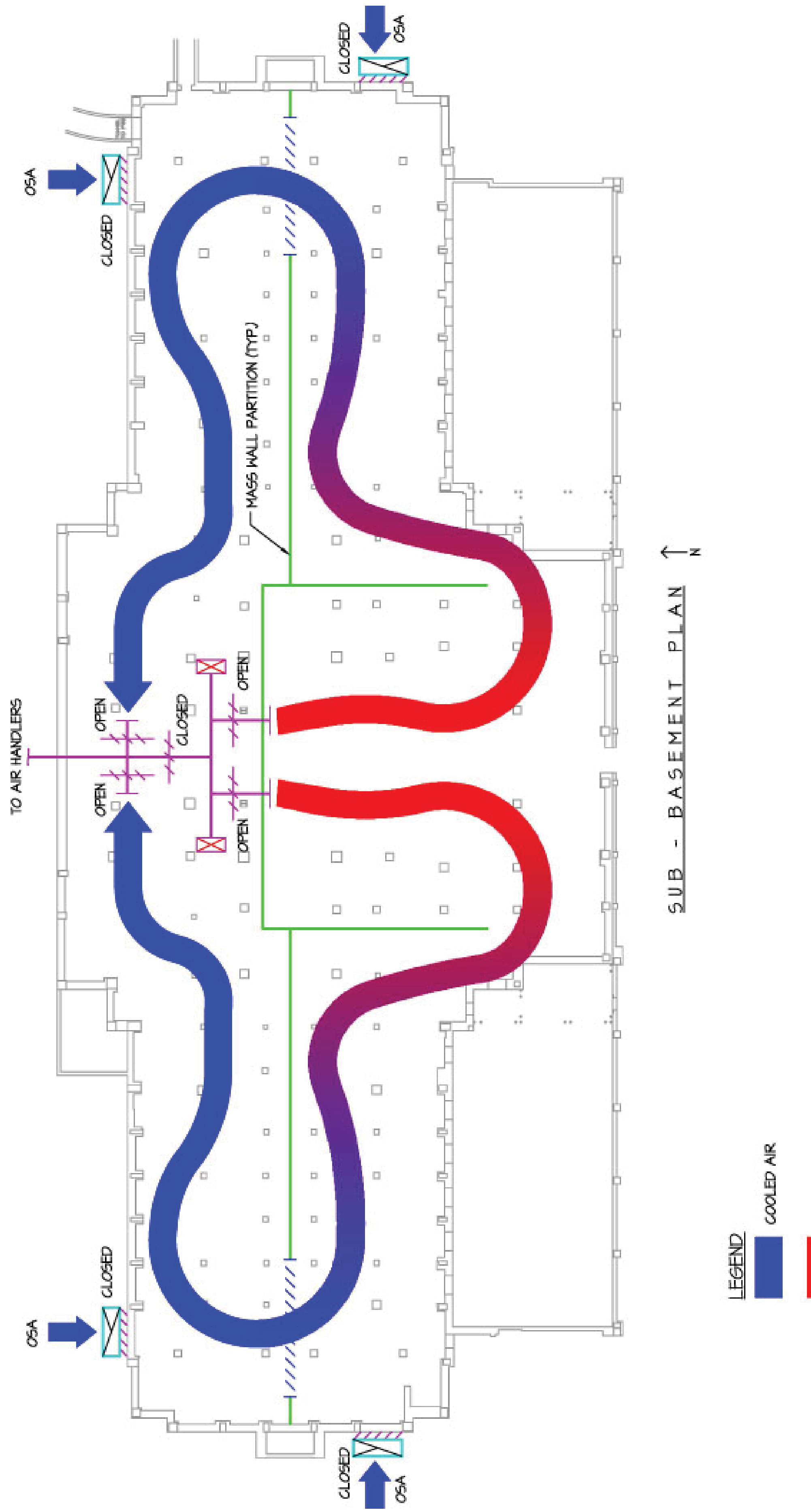
❸ Well water can be used as a source of chiller condenser water cooling. This could eliminate or greatly reduce the need for a cooling tower and associated electrical consumption and chemical treatment costs.

B. Photovoltaic Panels on roof.



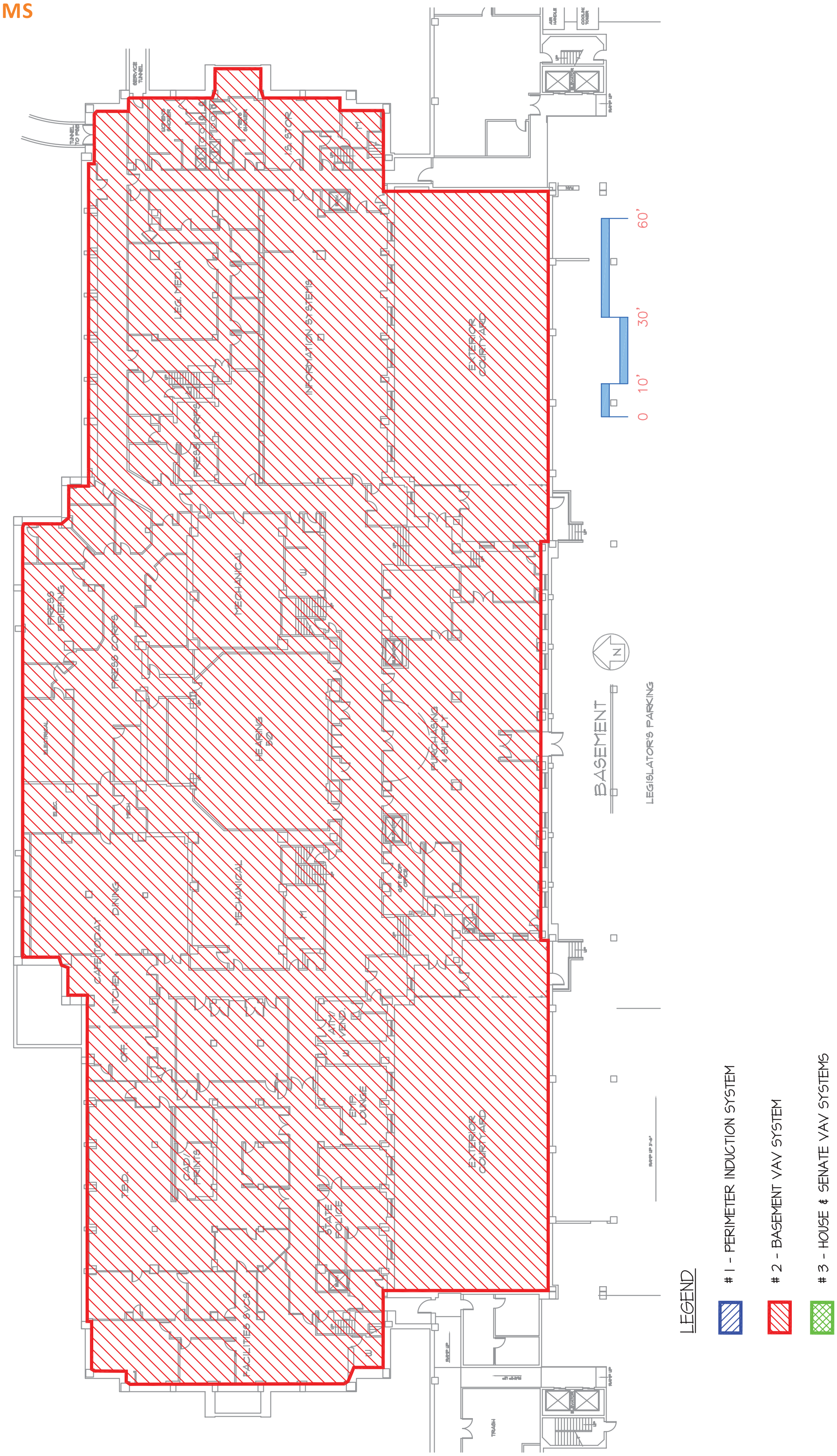
NATURAL VENTILATION / MASS COOLING

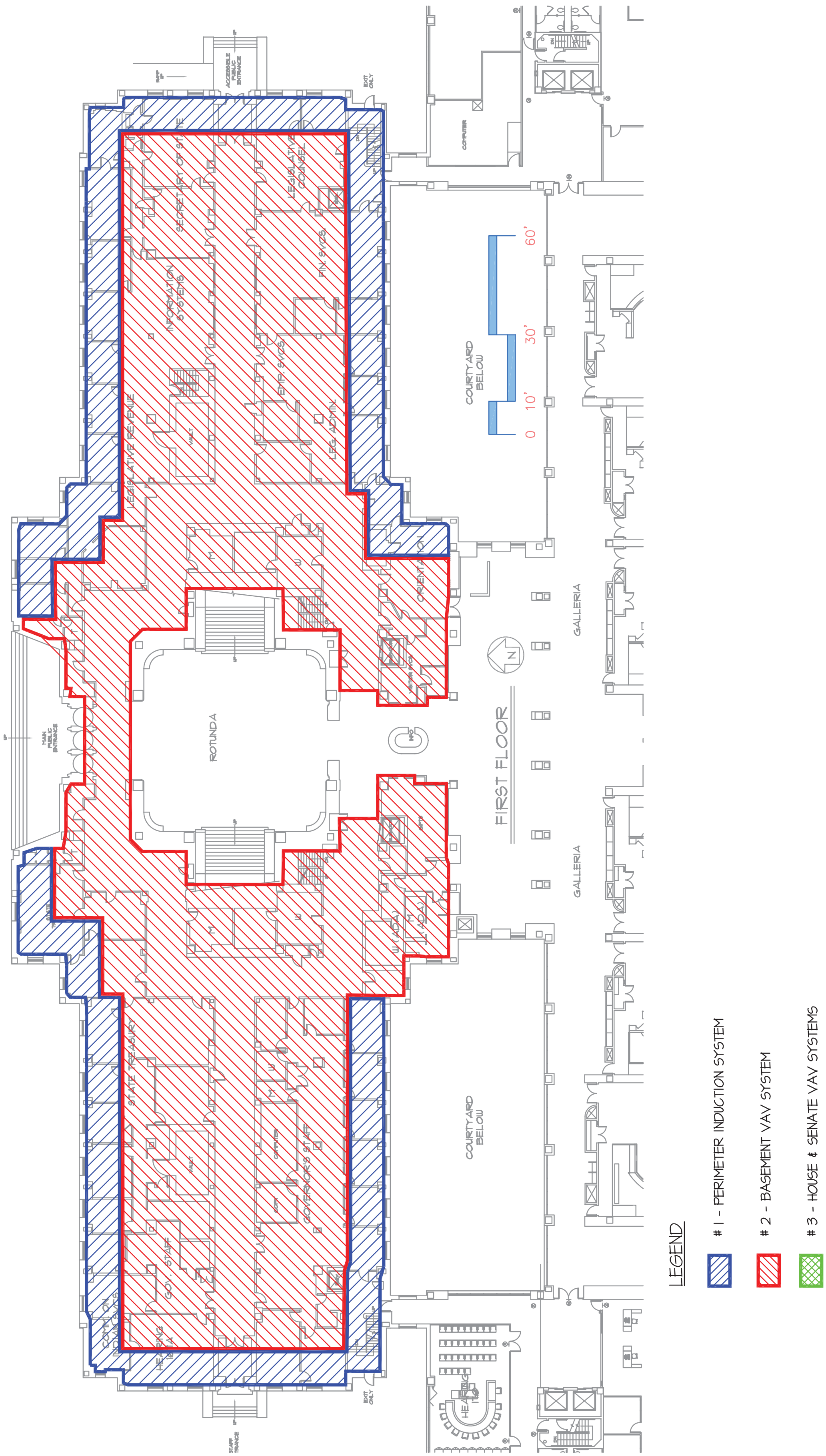
NOT TO SCALE

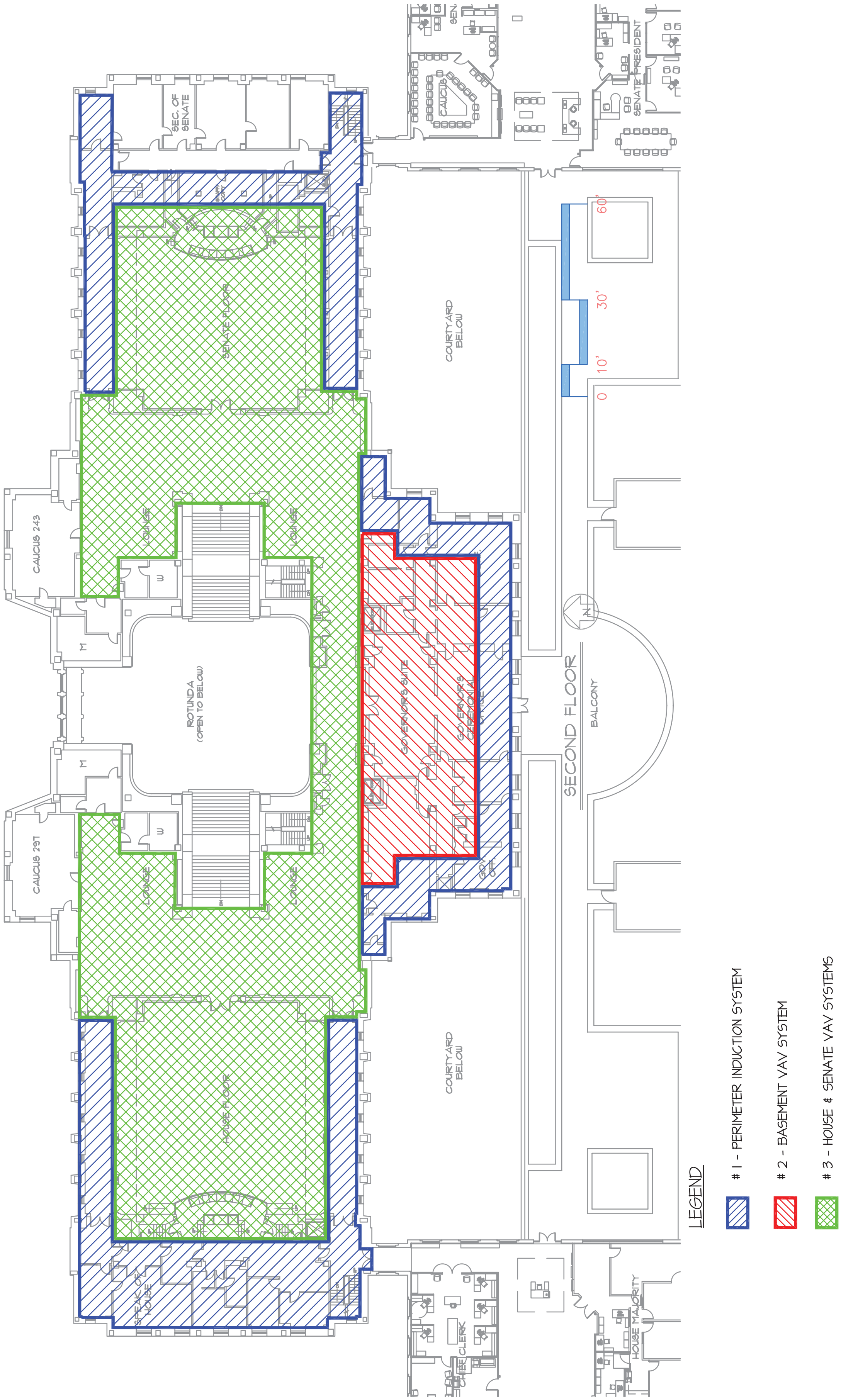


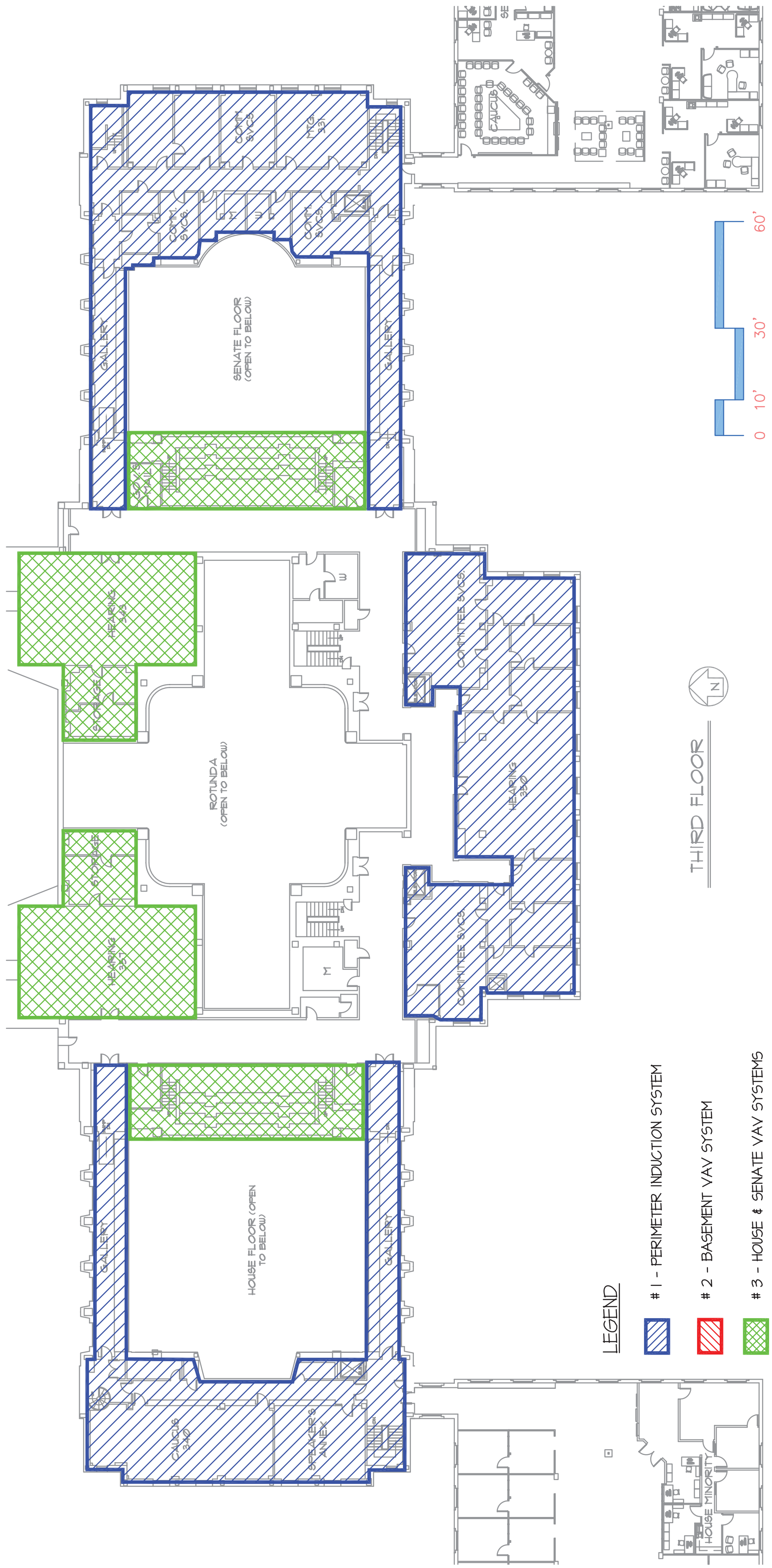
OUTSIDE AIR (ØSA) PRE-COOL

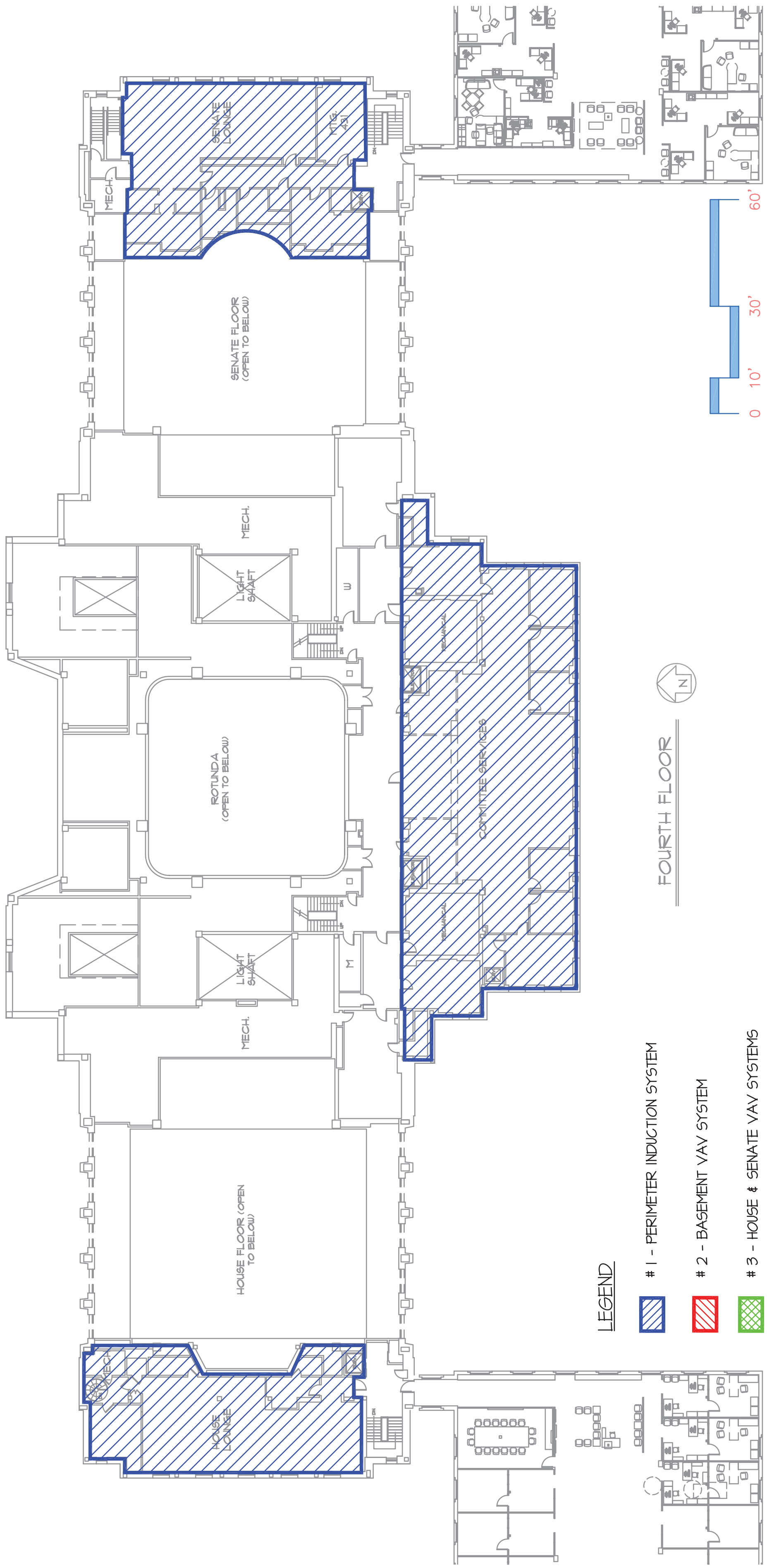
NOT TO SCALE

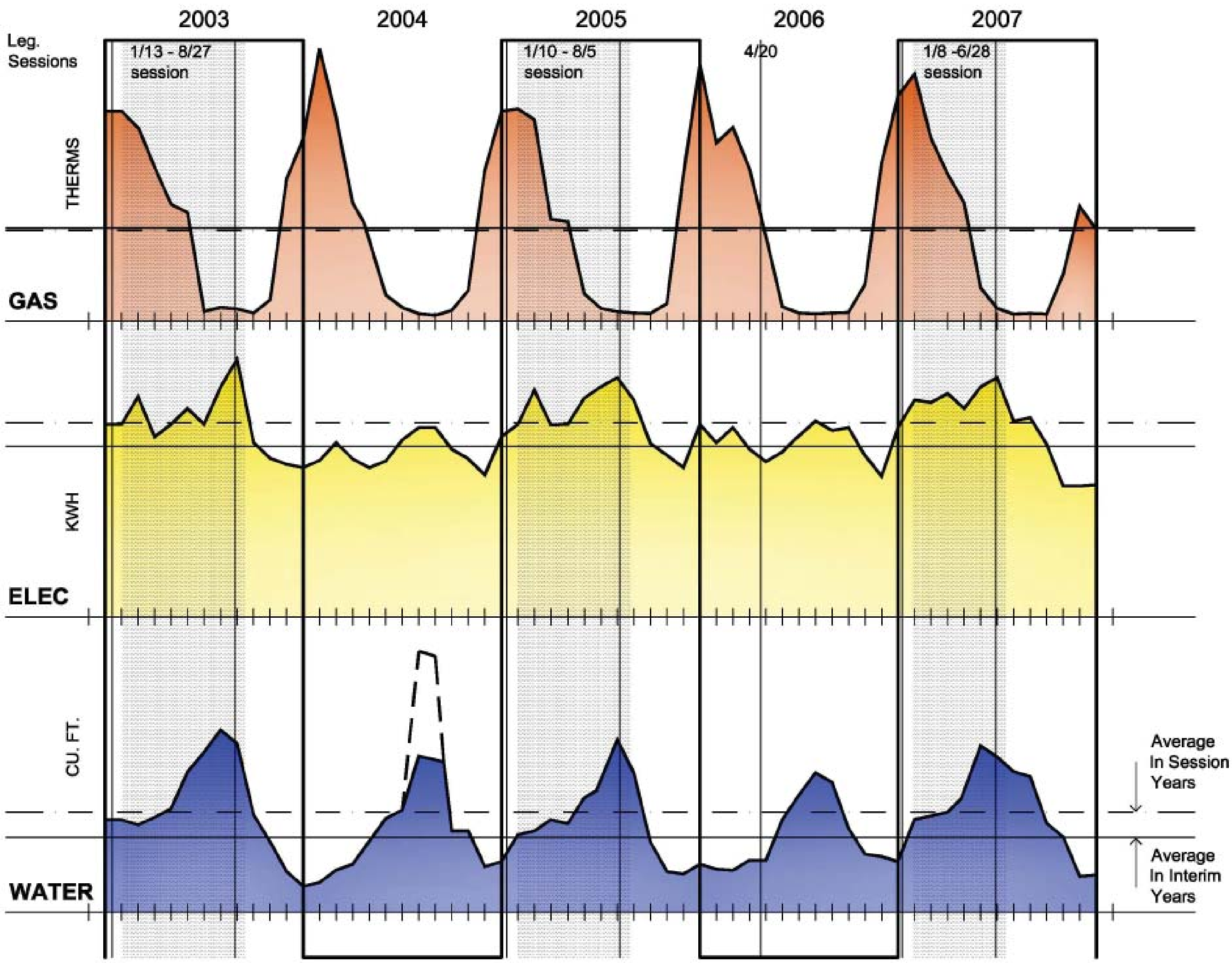

LEG. MEDIA
INFORMATION SYSTEMS
EXTERIOR COURTYARD
PRESS CORPS
MECHANICAL
PRESS BRIEFING
HEARING 50
PURCHASING & SUPPLY
BASEMENT
LEGISLATOR'S PARKING
DINING
CAFETODAY
KITCHEN
MECHANICAL
EMP. LOUNGE
CAD/PRINTS
TBD
STATE POLICE
FACILITIES SVCS.
EXTERIOR COURTYARD
0 10' 30' 60'
LEGEND
1 - PERIMETER INDUCTION SYSTEM
2 - BASEMENT VAV SYSTEM
3 - HOUSE & SENATE VAV SYSTEMS


FIRST FLOOR
ROTUNDA
GALLERIA
GALLERIA
COURTYARD BELOW
COURTYARD BELOW
LEGISLATIVE REVENUE
SECRETARY OF STATE
INFORMATION SYSTEMS
LEGISLATIVE COUNSEL
FIN SVCS
EMP SVCS
LEG. ADMIN.
ORIENTATION
STATE TREASURY
GOVERNOR'S STAFF
GOV. STAFF
HEARING
MAIN PUBLIC ENTRANCE
0 10' 30' 60'
LEGEND
1 - PERIMETER INDUCTION SYSTEM
2 - BASEMENT VAV SYSTEM
3 - HOUSE & SENATE VAV SYSTEMS


SEC. OF SENATE
SENATE PRESIDENT
SENATE FLOOR
COURTYARD BELOW
0
10'
30'
60'
CAUCUS 243
LOUNGE
LOUNGE
ROTUNDA (OPEN TO BELOW)
GOVERNOR'S SUITE
SECOND FLOOR
BALCONY
CAUCUS 297
LOUNGE
LOUNGE
HOUSE FLOOR
COURTYARD BELOW
SPEAKER OF HOUSE
CHIEF CLERK
HOUSE MAJORITY
LEGEND
1 - PERIMETER INDUCTION SYSTEM
2 - BASEMENT VAV SYSTEM
3 - HOUSE & SENATE VAV SYSTEMS


THIRD FLOOR
LEGEND
1 - PERIMETER INDUCTION SYSTEM
2 - BASEMENT VAV SYSTEM
3 - HOUSE & SENATE VAV SYSTEMS
SENATE FLOOR (OPEN TO BELOW)
HOUSE FLOOR (OPEN TO BELOW)
ROTUNDA (OPEN TO BELOW)
GALLERY
GALLERY
GALLERY
GALLERY
HEARING 343
HEARING 357
HEARING 350
STORAGE
STORAGE
COMMITTEE SVCS
COMMITTEE SVCS
CAUCUS 340
SPEAKER'S ANNEX
CAUCUS
HOUSE MINORITY
0 10' 30' 60'


SENATE LOUNGE
MECH.
SENATE FLOOR (OPEN TO BELOW)
MECH.
LIGHT SHAFT
W
ROTUNDA (OPEN TO BELOW)
COMMITTEE SERVICES
LIGHT SHAFT
M
MECH.
HOUSE FLOOR (OPEN TO BELOW)
HOUSE LOUNGE
0 10' 30' 60'
N
FOURTH FLOOR
LEGEND
1 - PERIMETER INDUCTION SYSTEM
2 - BASEMENT VAV SYSTEM
3 - HOUSE & SENATE VAV SYSTEMS



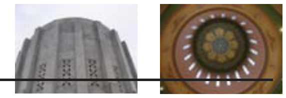
RESOURCE USE HISTORY

OREGON STATE CAPITOL UPGRADES 1993 - 2008

Year	Project	
2008	3rd & 4th floor south offices	Complete interior renovation after the August 2008 fire on the Terrace
2008	1st floor Hearing Rooms & Galleria	Replaced many finishes after the August 2008 fire on the Terrace
2008	Information Services office space/ conference room/ test lab	Remodeled room 40 for I.S. staff, room 35 divided into 2 rooms, 35A is conf.. room, 35B is a test lab for servers, etc
2008	Info Services Development/Leg Revenue offices	Remodeled rooms 141 &143(old bldg) added offices for departments relocated from Wings
2007/2008	Elevator upgrade old bldg and Wings	Replace controls/motors & restored cabs in old Senate and House elevators New controls/motors and modernize cabs in House and Senate Wings Add air conditioning for 4 machine rooms
2007/08	House & Senate Wing Renovation	Complete renovation
2006	Elevator upgrade Old Bldg	Replaced controls/motors , restored cab interiors on 2 center elevators & add air conditioning for 2 machine rooms
2006	Switchgear replacement	Relocated main electric room, replaced switchgear, remodeled portion of Capitol press rooms 43 , 42,& 41 & across hall. Added 30 ton chiller serving switchgear, computer and telephone rooms. Will also serve new IT hub rooms
2004	Speakers office room269	Added office
2002	Gift Shop & Visitor Services	Remodel areas
2000	Room 35 Legislative Media	Relocate control room and offices to Room 35
2000	Electrical panel replacement	Replace 1938 electrical panels
1998	Remodel Financial Services Room 137	Convert Hearing Room to office
1998	Café Today room 57	Remodel service area
1998	3rd floor Old House Wing room 360	Demo 6 Legislative offices & replace w/ Majority Caucus room and staff office
1996	Roof	Roof replacement
1996	HVAC Upgrade	Replace chillers,add cooling tower, 2 steam boilers & 3 heating hotwater boilers
1995	4th floor Center room 446,453, &454	Remodel of Committee Service office
1994	Seismic Upgrade	Add shear walls, reinforce rotunda

VENTILATION

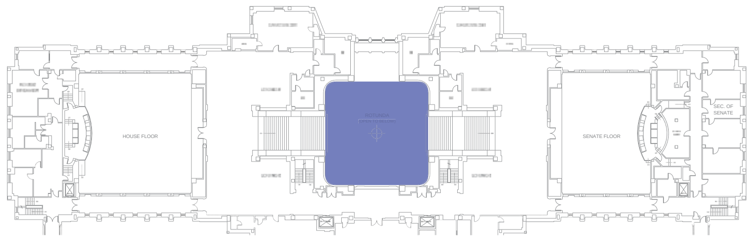
Green Governing:
Oregon State Capitol, Rotunda and Chambers



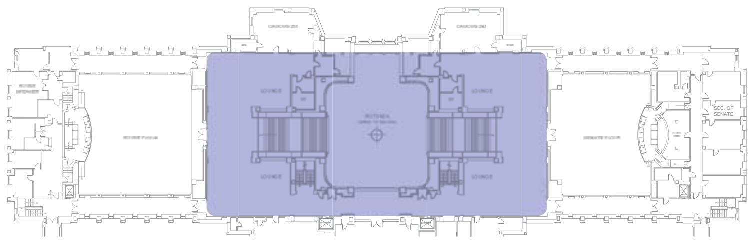
Opportunities for natural ventilation were analyzed for the Oregon State Capitol. The areas studied include the main rotunda and House and Senate Chambers. Existing operable openings were measured to identify feasibility of stack ventilation to meet the requirements for fresh air, heat removal, and night ventilation of thermal mass. Operational schemes and architectural options for increasing the ventilation performance were identified.

Ventilation Options:

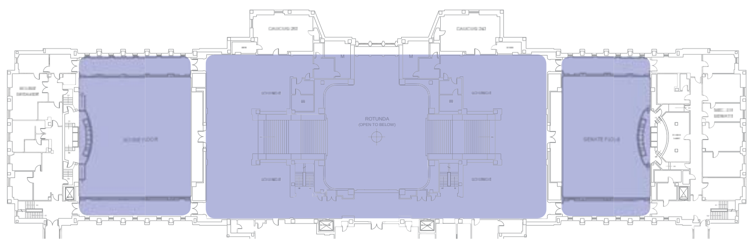
A. **Night Ventilation of Mass: Rotunda**
Ventilation flow rates are limited by exterior rotunda aperture size.



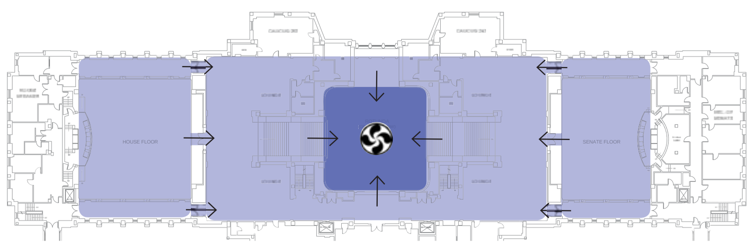
B. **Daytime Ventilation: Rotunda and adjacent areas**
During daytime hours, the stack height of the rotunda may be used for ventilating the area shown.

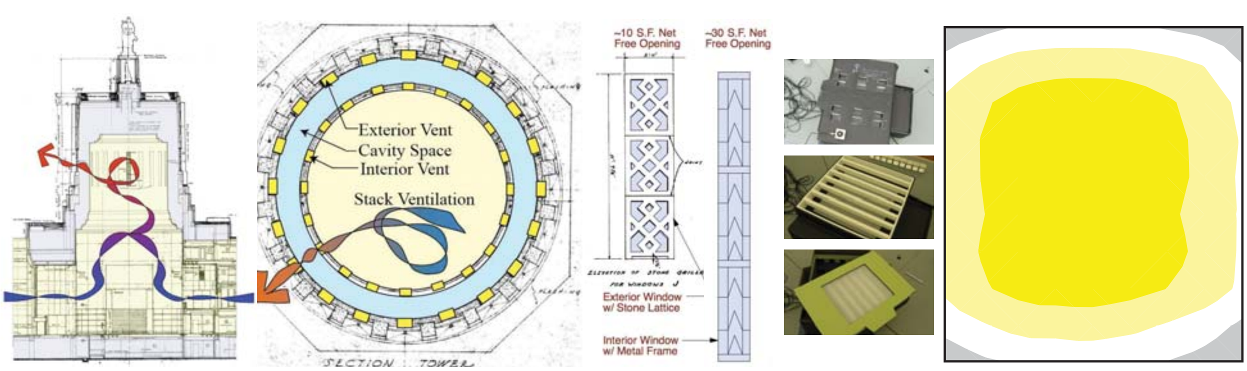


C. **Independent Day and Night Ventilation of Legislative Chambers:**
If recommended skylight area is implemented in chambers for even daylight distribution, then ventilation outlets can be incorporated into the skylight design.



D. **Fan Assisted Day and Night Vent Through Rotunda:**
Due to stone lattice on exterior rotunda glazing, aperture size is limited. Fan assisted ventilation would increase tributary area able to be ventilated.





©2009 Energy Studies in Buildings Laboratory, University of Oregon *14805/09:js*

7.6 CITY OF SALEM CORRESPONDENCE

CITY OF Salem
AT YOUR SERVICE

Commission on Fire Accreditation International
2006 - 2011

RECEIVED
OCT 10 2008
Legislative Administration

October 9, 2008

Scott Burgess
Interim Legislative Administrator
900 Court St. NE, Room 140A
Salem Or 97301

Dear Mr. Burgess:

The purpose of this letter is to request a meeting with you and your Facilities Manager to discuss the fire that struck the Capitol building on August 30, 2008. I believe, and hope you will agree that the first Salem firefighters on the scene made excellent tactical decisions quickly controlling the fire. However, flame, smoke, and water damage was extensive, and I would appreciate your perspective of how the Salem Fire Department's response to this event can be improved.

In addition, I would like to discuss fire prevention generally for the Capitol. Specifically, I would like to discuss the installation of sprinklers and smoke detectors. As you are aware, although newer sections of the capitol building are equipped with fire sprinklers, substantial portions of the facility are not. The House and Senate wings are fully protected with fire sprinklers, along with the fourth floor and the occupied spaces of the basement of the original building. However, the remainder of the capitol building, including areas with the greatest occupant loads, remains unprotected as shown in the attached.

As Salem's Fire Chief I would like to be a resource to the State of Oregon on this matter and explore how I can help encourage the installation of fire sprinklers in the remaining areas. I appreciate the expense associated with this undertaking but firmly believe this would be a wise investment, and would like to assist in helping to identify resources.

I hope you agree that a meeting on these matters would be mutually beneficial. Please call me at your convenience at 503-588-6245 so that we can set a time and place to meet.

Sincerely,

Gregory H Keller

Gregory H. Keller
Fire Chief

Cc: Nancy Orr, Oregon State Fire Marshal

Attachment: Oregon State Capitol Master Plan, Life Safety: Existing Conditions

Salem Fire Department
370 Trade Street SE ● Salem OR 97301 ● (503) 588-6245 ● FAX (503) 588-6371

CITY OF Salem AT YOUR SERVICE

June 22, 2009

Vicki Brammeier
900 Court St. NE, Room 140-A
Salem, OR 97301

RE: Oregon State Capitol Master Plan

Dear Ms. Brammier;

I enjoyed meeting you and Herb Columb as well as Skip Stanaway on April 15, 2009 for an overview of the Oregon State Capitol Master Plan, and specifically to discuss immediate and long term improvements to the Capitol Building.

Since the Oregon State Capitol Building is listed individually on the National Register, any changes to the exterior of the building are subject to review by City of Salem's Historic Landmarks Commission. Routine maintenance and repair are exempt from review, as are any interior alterations. Based upon our discussions at this meeting and the preliminary review of plans presented, the proposed reconstruction of the stairs in order to move the mechanical below the entry, the construction of two ADA ramps and any replacement of the doors at this entry, would require a Type III review and public hearing before the Historic Landmarks Commission (HLC).

At that time city staff would evaluate the proposal more thoroughly to determine its compliance with the appropriate Design Guidelines that would be applicable to this project. As we discussed at the meeting, applicable guidelines generally encourage the retention of as much original historic material as possible. In the event an alteration or replacement is necessary, any new additions should not destroy or alter any significant architectural features or create a false sense of history. As we discussed, the most critical part of the design will be ensuring that the new ADA ramps are clearly new, although well integrated, and that the original integrity of the entry steps is maintained, as these stairs create a strong connection from the Mall to the Capitol Building.

I have appreciated the opportunity to discuss your plans early on in the process and look forward to working with you in the future as you work to make necessary improvements to the Oregon State Capitol Building.

Sincerely,

Kimberli Fitzgerald

Kimberli Fitzgerald, MCH/CHP
Senior Historic Planner
City of Salem

COMMUNITY DEVELOPMENT
Planning Division • 555 Liberty St. SE / Room 305 • Salem, OR 97301-3513 • (503) 588-6173 FAX (503) 588-6005

ARCHITECTURE PLANNING INTERIORS
621 SW Morrison Street, Suite 200 Portland, Oregon 97205
T : 503.222.1917 **F** : 503.294.0272

S R G P A R T N E R S H I P I N C

M E E T I N G M I N U T E S

PROJECT NAME:	DATE:	REVISED DATE:	SRG PROJECT NO.:
OREGON STATE CAPITOL MASTER PLAN	**03.19.09**		**2743**

MEETING DATE/TIME:	LOCATION:
03.19.09 10:30 am	**Salem Building & Safety**
SUBJECT:	PREPARED BY:
Master Plan Scope Review (Pre-App)	**Greg Williams**

PRESENT:		DISTRIBUTION:	
Client:	**Herb Colomb, Dave Hartsfield**	Client:	**Scott Burgess, Herb, Dave**
SRG Partnership:	**Greg Williams**	SRG Partnership:	**Skip Stanaway, Jon Schleuning**
Consultant:		Consultant:	**Greg Langdon/SWE**
Others:	**Claude Kennedy, Plans Examiner II, Mitch Routh, Plans Examiner, John Stroebel, Deputy Fire Marshal, James Gengler, Envir. Compliance Off., ____, Planner (came in late)**	Others:	

*Denotes part-time attendance

**Minute recipients shall distribute to others within their organizations as appropriate or required.

ATTACHMENTS:

Greg explained the reason for and scope of the Master Plan. He summarized the findings of the Existing Building Assessment, and presented the proposed renovation option and all of its components. Large colored plan boards were used for graphics. The Governor's Suite expanded scope option was presented last.

Comments:

Building

- Given the number of life safety improvements proposed, the new open stairs between the ground level and first floor should be acceptable.
- Pre-existing, non-conforming items will be evaluated in the context of the historic nature of the building.
- Mitch Routh was introduced as the plans examiner that would work on at least the Governor's Suite package.

Planning

- Kimberley Fitzgerald is the Senior Planner specializing in historic preservation. It was suggested that she be briefed on the project.
- Planning's main concern would be with the historic elements.

Environmental

- John would be concerned with the following: grease containment at the trash area, improved recycling facilities, sorting out of old non-compliant piping that might be discovered when the basement is demolished,

Fire

- A voice evacuation announcement system per NEC/NFPA standards is needed.
- Sprinklers in the Chambers would be high on the list.
- Verify if the two FDCs on State Street are an interconnected system (preferable) or serve separate parts of the building (Dave H. Will ask Dave C.).
- The Vesda detection system in the Rotunda and Governor's Suite would be desirable.
- If a generator is added, there are 2-hour enclosure requirements for fuel storage.
- Adding area to the building may increase fire flow rates, which might mean additional hydrants. The calculation does now, however, give credit for things like sprinklers, which could be offsetting.

There were no negative comments on the Governor's Suite.

END OF MEETING MINUTES

7.7 SHPO CORRESPONDENCE

Oregon

Theodore R. Kulongoski, Governor

Parks and Recreation Department
State Historic Preservation Office
725 Summer St NE, Ste C
Salem, OR 97301-1266
(503) 986-0671
Fax (503) 986-0793
www.oregonheritage.org

June 23, 2009

Skip D.F. Stanaway
SRG Partnership, Inc.
c/o Vicki Brammeier
900 Court St. NE, Room 140-A
Salem, OR 97301

Dear Skip:

Thank you for your good work on the Capitol Master Plan. It has been a pleasure to be part of the discussion and we thank you for the opportunity to comment. Listed in the National Register of Historic Places, the Oregon State Capitol is among the state's most significant historic buildings. For this reason, we are pleased to see that the Master Plan is based on fundamentally sound preservation strategies, including identifying the character-defining features and spaces of the building based on original plans and detailed information in the National Register nomination; and basing the scope-of-work recommendations on the Secretary of the Interior's Standards for the Treatment of Historic Properties.

Having said that, we expect there to be further discussion on the following issues:

- We support the use of base isolation as the preferred option for seismic strengthening. Expanding the building's square footage into the resulting excavated areas will prevent new additions visible from the public right-of-way from being constructed, preserving the historic integrity of the capitol's exterior. Further discussion should address the removal and possible preservation, reuse, or interpretation of intact historic features, fixtures, and finishes on the lower floor (basement) before it is demolished.

- The accessibility solutions presented for the front steps and plaza remain a concern. Solutions should focus on retaining as much historic fabric as possible. Any redesign of the plaza area should take a restoration approach if documented evidence of what it looked like historically can be located. All work here should be coordinated closely with Oregon Parks and Recreation Department and the city of Salem, as it will likely affect the park grounds and the adjacent street.

- It is probably worth noting in the Master Plan that when any recommended work becomes a live project, there are regulatory obligations to the city of Salem under its preservation ordinance and to the State of Oregon under Oregon Revised Statute 358.653. Consultation with city planning staff, the Salem Landmarks Commission, and the State Historic Preservation Office will help guide project details to avoid any unintended damage to the building's historic integrity.

Again, thank you for the opportunity to comment. We applaud the visionary approach and the worthy goals of the Capitol Master Plan and we look forward to future discussions about the good work planned for the building's future.

Sincerely,

Chrissy Curran
Associate Deputy State Historic Preservation Officer

7.8 CAPITOL FOUNDATION AGENDA/CORRESPONDENCE

O R E G O N S T A T E

CAPITOL FOUNDATION

May 13, 2009

Scott Burgess, Legislative Administrator
Oregon State Legislature
900 Court Street NE, Room 140A
Salem, OR 97301

Dear Mr. Burgess:

Thank you for briefing the Oregon State Capitol Foundation on the draft master plan for the Capitol, and for including a Foundation representative in the development of the plan.

As you know, the Foundation is charged in statue with preserving and enhancing the Capitol by making recommendations to the Legislative Administration Committee on renovations and repairs. As such, the Foundation has a vested interest in the master plan's outline for the development of the historic building over the next 20 to 30 years.

The Foundation is pleased with the draft master plan's emphasis on historic preservation, as well as its commitment to improving accessibility and safety. The Foundation supports the recommendation to improve the Capitol's seismic performance through base isolation. Not only will this investment protect lives, it will also preserve the building in the event of a major earthquake and facilitate other necessary improvements. The direction proposed in the plan supports the Foundation's vision to create a living history, enhance the dignity and beauty of the Capitol, and foster cultural and educational opportunities.

The Capitol Foundation looks forward to continuing to work with you and the Legislative Administration Committee as opportunities arise to implement the master plan for the benefit of the Capitol and all Oregonians.

Sincerely,

Frank Brawner
Chair

The Fund for the Oregon State Capitol Foundation is a 501(c)(3) tax-exempt organization dedicated to preserving and enhancing the historical integrity of the Oregon State Capitol.

1938-Present 1876-1935 1854-1855

Telephone:
503.986.1654
Fax:
503.986.1684

900 Court St. NE
Room 140-A
Salem Oregon 97301

Oregon
Theodore R. Kulongoski, Governor

Oregon Disabilities Commission
500 Summer St NE E-02
Salem, OR 97301
503-947-1136 V/TTY
1-800-282-8096 V/TTY
503-373-7823 Fax

May 11, 2009

Scott Burgess
Legislative Administrator
900 Court St. NE, Room 140-A
Salem, OR 97301

Dear Scott,

I want to thank you, Vicki Brammeier, Herb Colomb and Skip Stanaway for meeting with Judy Cunio and me as representatives of the Oregon Disabilities Commission to brief us on the accessibility features in the Capitol Master Plan.

As I stated at your stakeholder advisory meetings, in a letter to Dave Henderson and again at the March 2008 Commission meeting attended by Mr. Henderson, the Commission's primary concern was that the front entrance to the Capitol be accessible to everyone. We were pleased to see the creative thinking that went into addressing this issue. We believe that option one, which you stated was the option that will be included in the plan, does a nice job of integrating two ramps into the historic design of the Capitol and making two of the three adjacent front doors accessible. We were glad to learn this work is included in Phase One of the plan, along with seismic upgrades.

We strongly support that the plan calls for all four entry points into the Capitol to be accessible.

We also reviewed with you some suggestions made to Mr. Henderson at the March 2008 Commission meeting. You indicated that tactical site maps for "way finding" will be included in the plan and that raised lettering for signage (in addition to Braille) was already incorporated into recent renovation work and will be included in the plan. Regarding the issue of helping elevator users identify the floors at each stop, you indicated that verbal announcements on elevators was considered cost-prohibitive, but will be reconsidered, and color coding to represent the different floors is not feasible since there is no universally recognized color designation for various floors of a building. You did point out that the elevators currently provide chimes that correspond to the number of each floor.

We appreciate your agreeing to remove from the plan all use of the term “handicapped.” We suggest you instead use language such as “universal design” or, if you are referring to individuals, use the legislatively approved respectful language: “individual with disabilities”.

After our meeting, Herb Colomb gave us a brief tour of the House wing of the building. We noticed that all the office signs (with raised letters and Braille) were placed at a height that could be difficult to reach for many people who use wheelchairs. Even though, as Herb stated, the placement of the signs met ADA specifications, we encourage you to explore whether you can lower them and still be within ADA guidelines.

When I debriefed with Commissioners after our meeting, they had one additional suggestion for the master plan: that there be at least one centralized reader board describing accessible features in the Capitol. They also had a concern I want to pass along even if it is not something within the scope of the master plan. Concern was expressed that buttons for the automatic doors connecting the parking garage to the Capitol are turned off at 4:30 p.m. If these buttons could function later in the evening, the Capitol would remain accessible to people using chairs. On more than one occasion, a Commissioner had to request that a state trooper come down to open the door.

Finally, I want to reiterate that when funds become available to implement the master plan, the Commission would like to continue to advise you on these and other accessibility features.

Sincerely,

Bill Lynch, Chair