



Construction Top Challenges

- Occupied Construction
- Planning / Phasing / Schedule
- Budget Accuracy / Cost Control
- Logistics / access
- Occupied Construction
- Artisan craftsmanship





Capitol
Entrance



Pedestrian capitol
entrance located
on south side

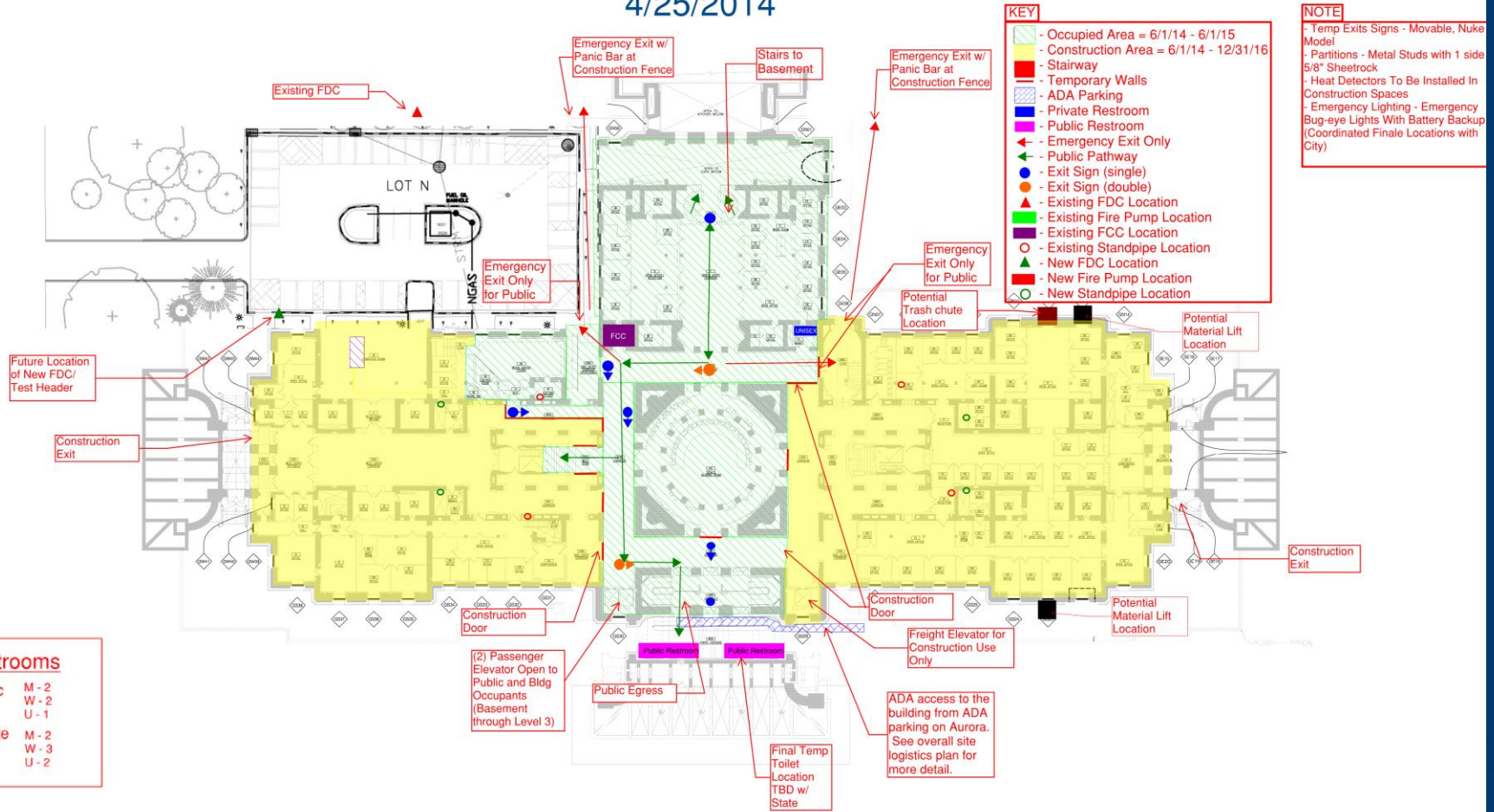
Public disability &
capitol entrance

Parking & entrance
located on south
side off Cedar
Street

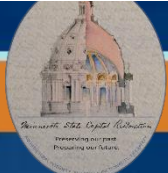


Logistics Planning

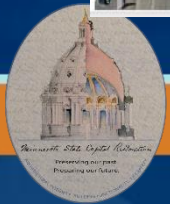
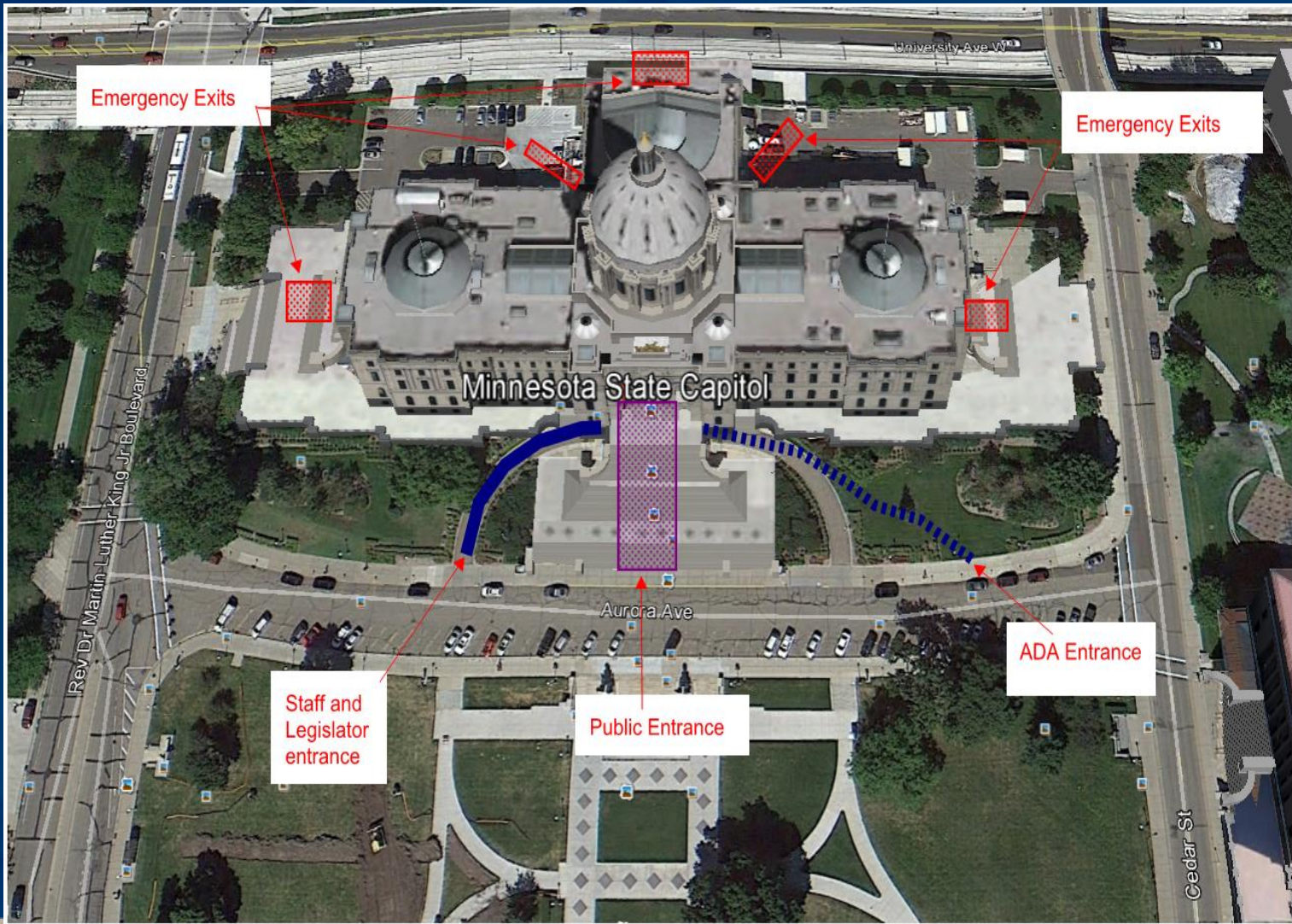
Phase 3 Logistics Plan Ground Floor 4/25/2014



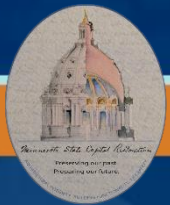
FLOOR PLAN - GROUND FLOOR



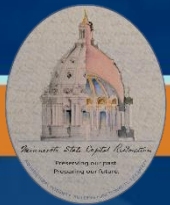
Logistic Planning



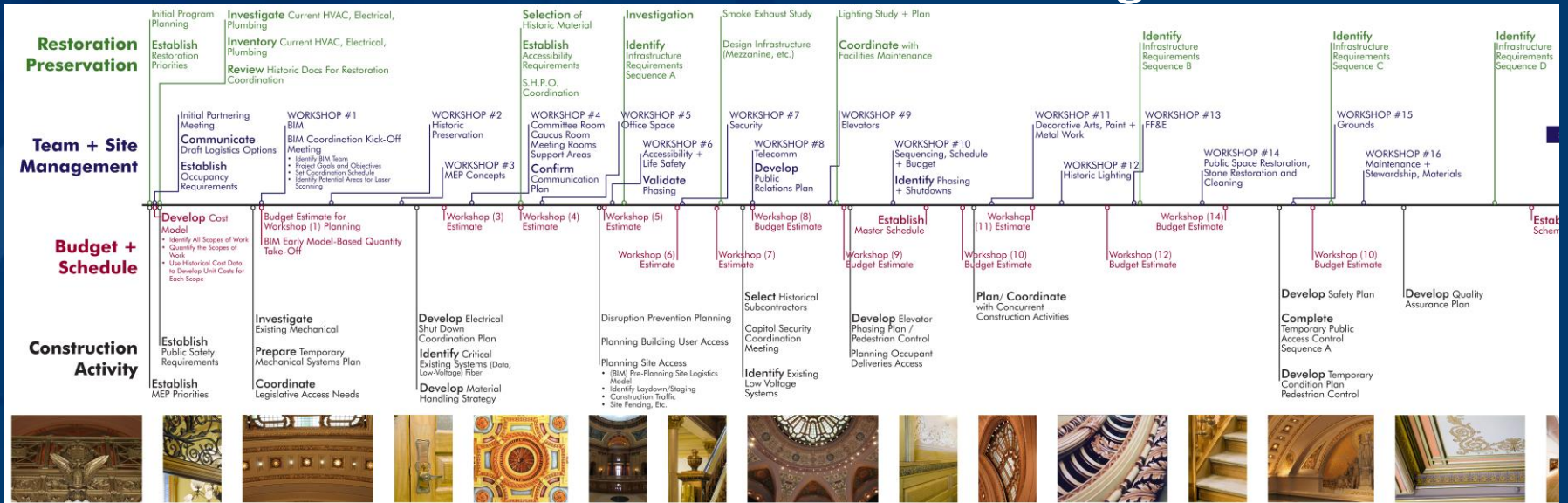
Project Phasing – Where Do You Start?



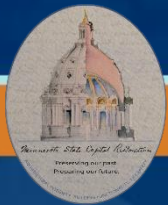
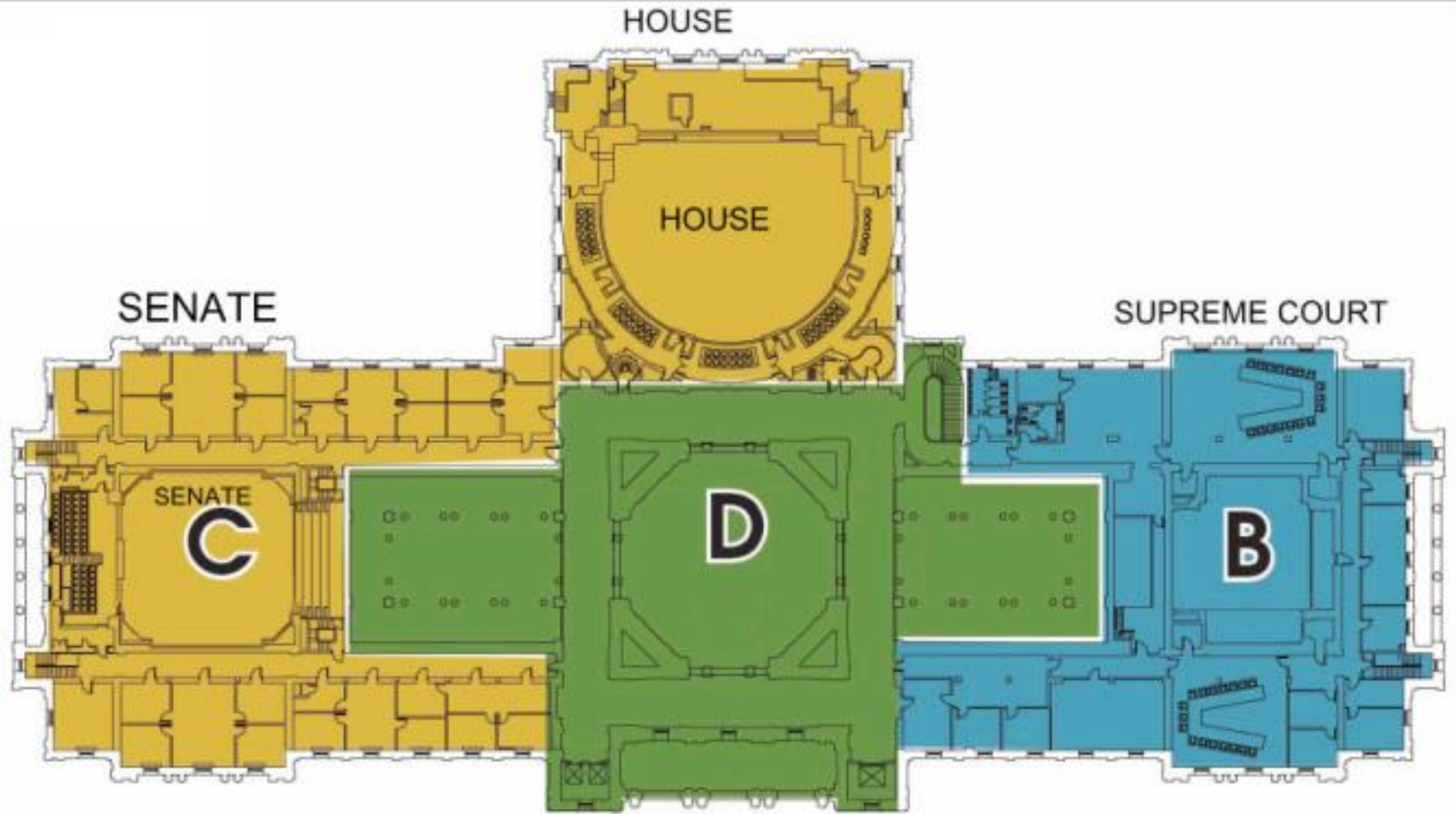
Project Phasing – Where Do You Start?



Preconstruction Planning



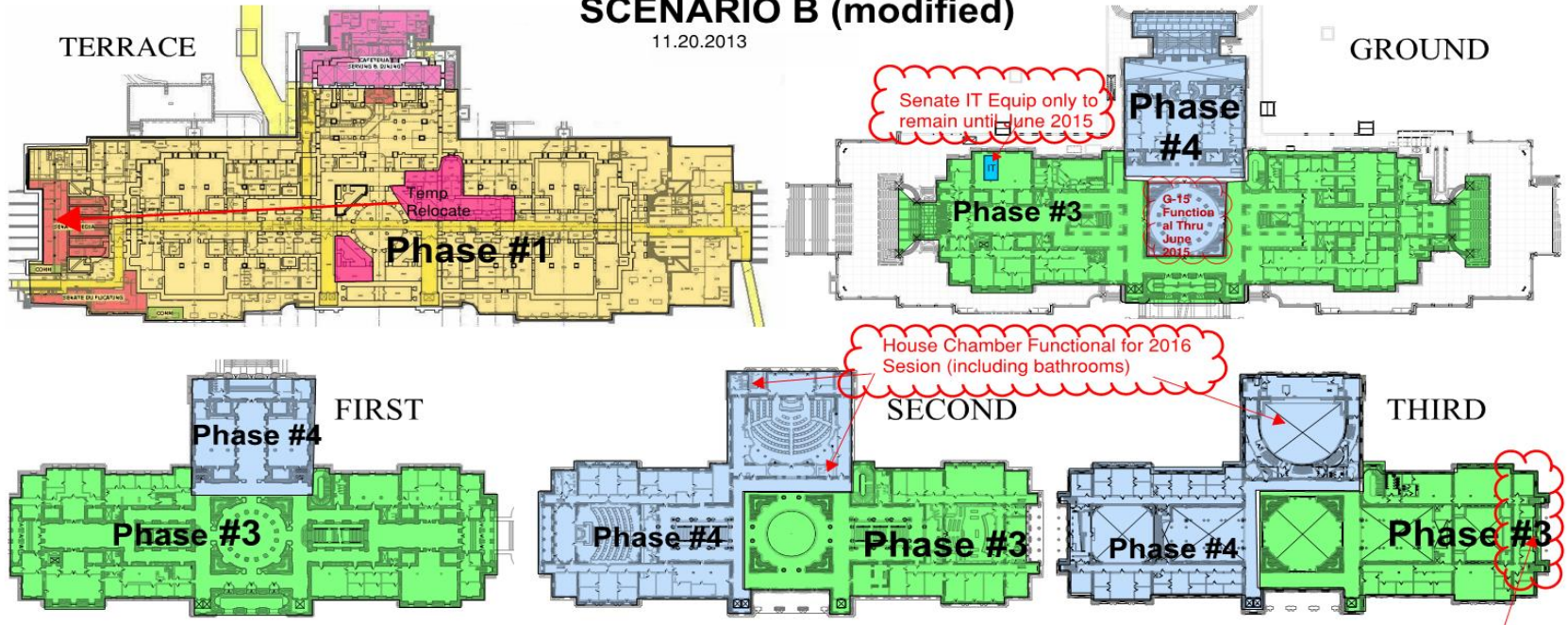
Original Phasing Plan



Actual Phasing Plan

SCENARIO B (modified)

11.20.2013



Scenario B (Modified)

	Construction			Legislative Session												Legis Session												House Chamber in Use											
	Start	Complete	Days	Aprox SF	% of SF	O-13	N-13	D-13	O-14	N-14	M-14	M-14	P-14	A-14	S-14	O-14	N-14	D-14	J-15	M-15	M-15	J-15	A-15	S-15	O-15	N-15	D-15	J-16	M-16	M-16	J-16	A-16	S-16	O-16	N-16	D-16			
WP #1 Terrace Level Demo	9/3/2013	8/26/2015	722	90,000	n/a																																		
WP #2 Roof + Underpinning + Select MEP	1/20/2014	10/1/2015	619	n/a	n/a																																		
WP #3 East (all floors) + West (Grnd & 1st floors) + Rotunda (except G15)	6/1/2014	12/31/2016	944	117,023	59%																																		
WP #4 North (all floors) + West (2nd & 3rd floors)	6/1/2015	12/31/2016	579	82,977	41%																																		

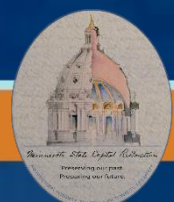
*7/15/15 Complete Relocation of Capitol Tenants to New Legislative Office Bldg

Dec. 1st, 2016 Capitol Tenants Start Moving Back Into Capitol

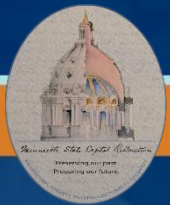
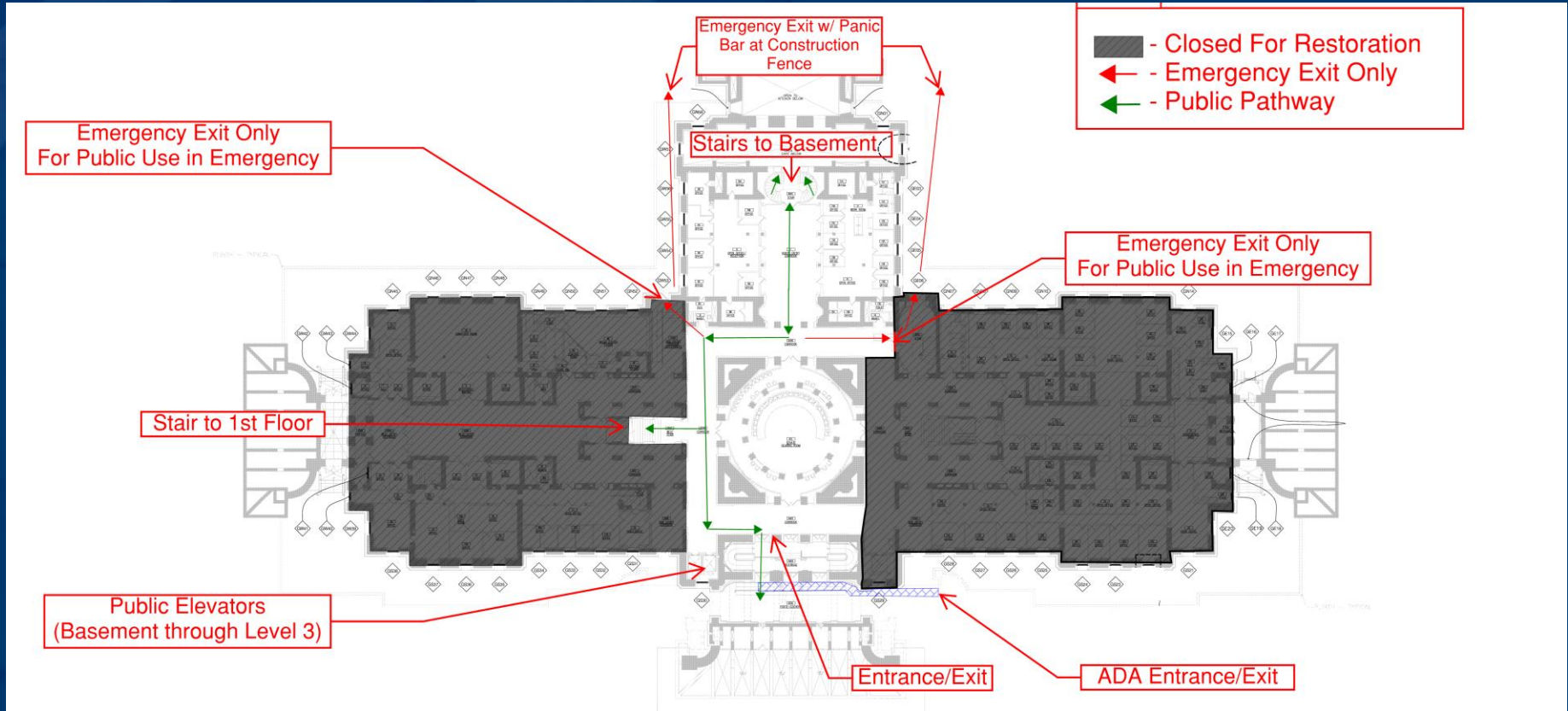
House Media Relocation??

Minnesota State Capitol Restoration
Preserving our past. Preparing our future.

ARCHITECTURAL INTEGRITY. BUILDING FUNCTIONALITY. LIFE SAFETY.



Public Communication - Floor Maps

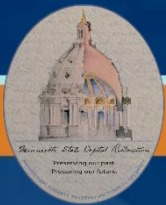


- \$285 million divided between 12 separate pots of state funding.
- Over 100 subcontractors and suppliers from all over the country and world.
- 9 million a month / or \$450,000 per day
- Monthly billing was over 1,000 pages
- 435 workers on site during peak construction

Majority of work was behind or under layers of previous decades of work or behind historic elements. (unquantifiable)

Budget Accuracy

- Early involvement during Schematic Design
- Integration of Construction Team into Design Workshops
- Early involvement of design-assist subcontractors
- Budget reconciliation after each Design Workshop
- 3 Independent Estimates at SD & DD – JE Dunn, MOCA & HGA
- Intensive Investigation
- Laser Scanning
- Similar Experience
- Responsible allowances



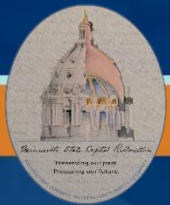




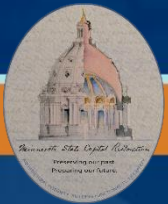




Layers and Layers of Mechanical / Electrical



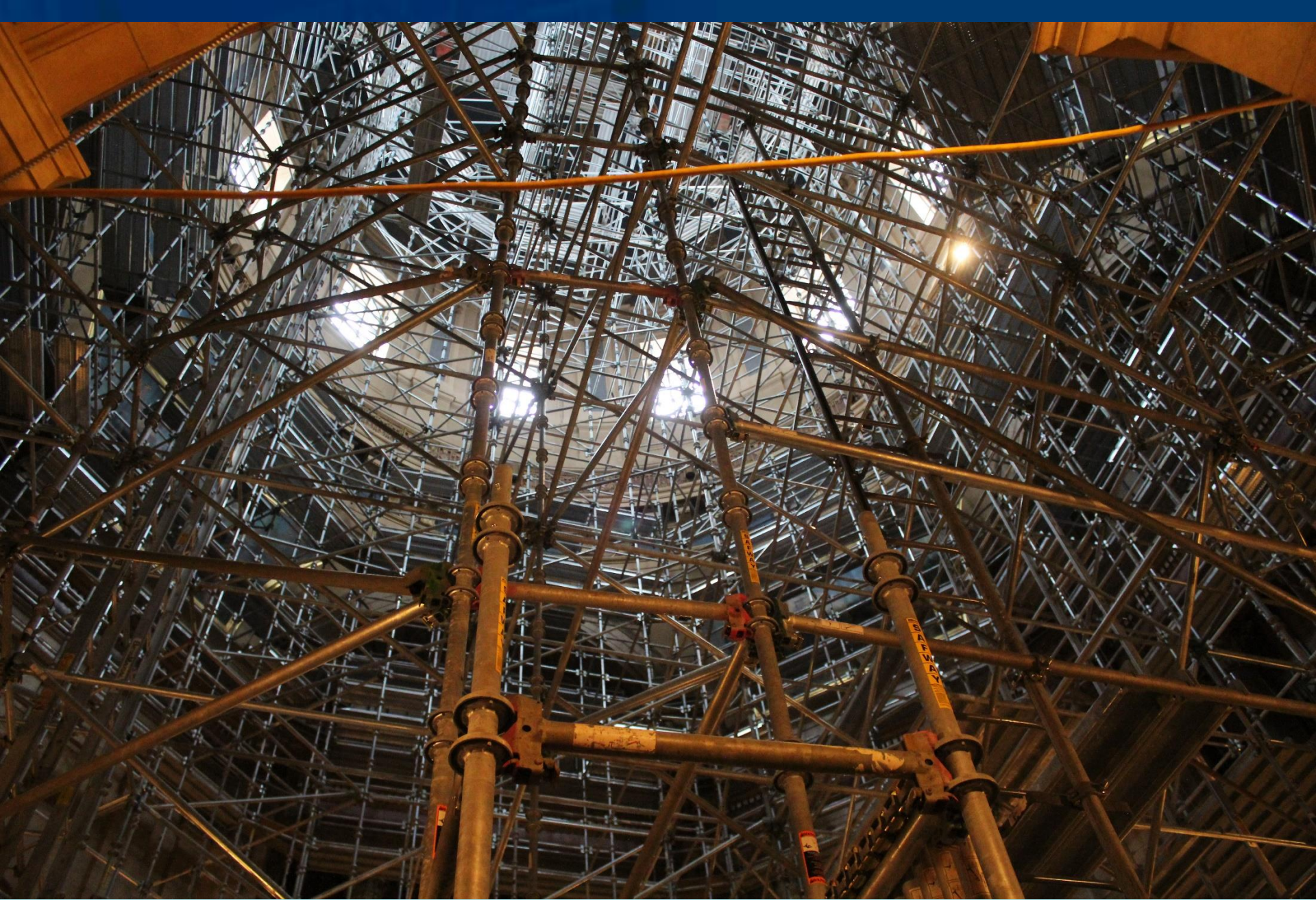
Years of Retrofits and Temp Fixes



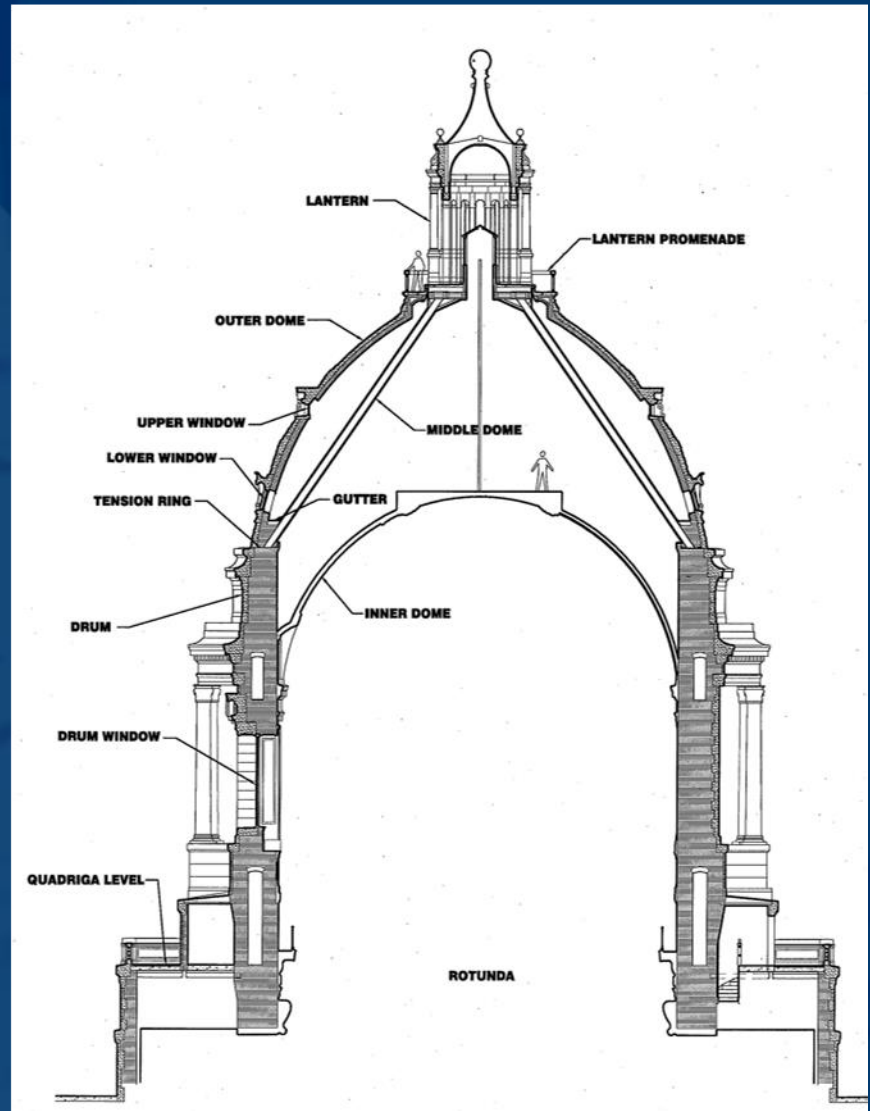




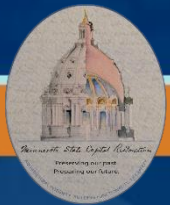
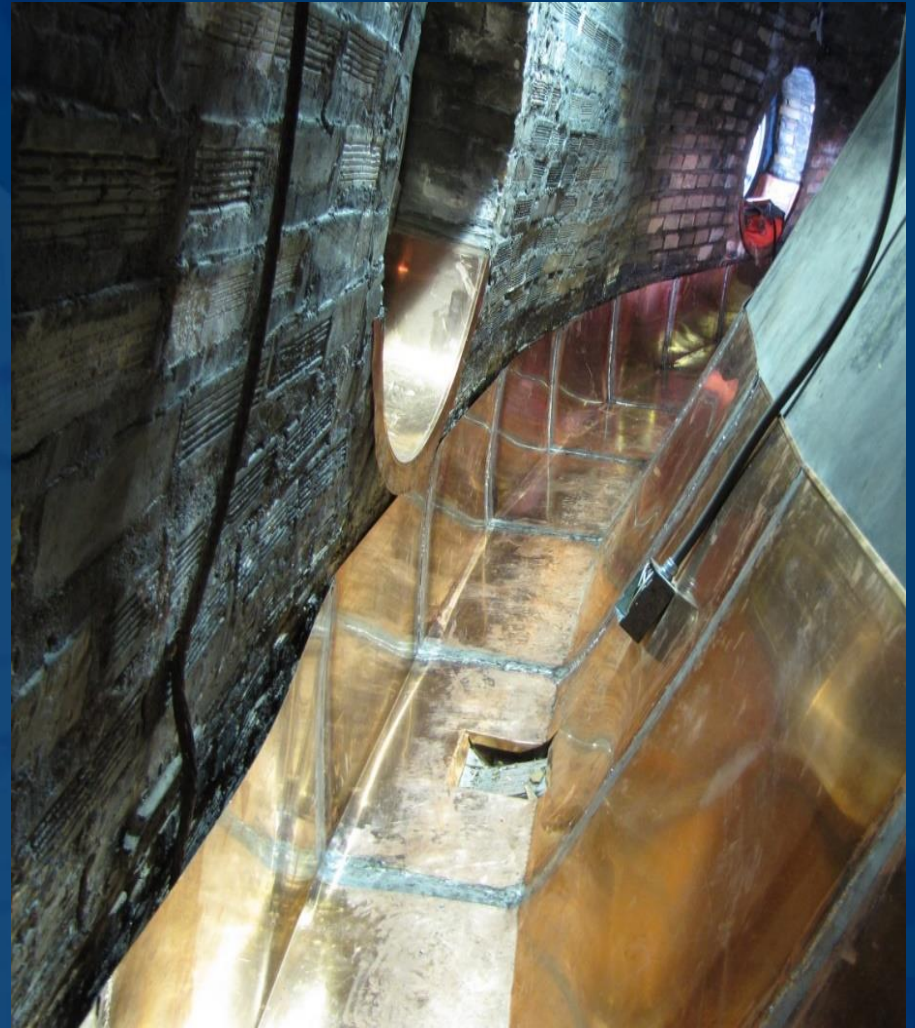


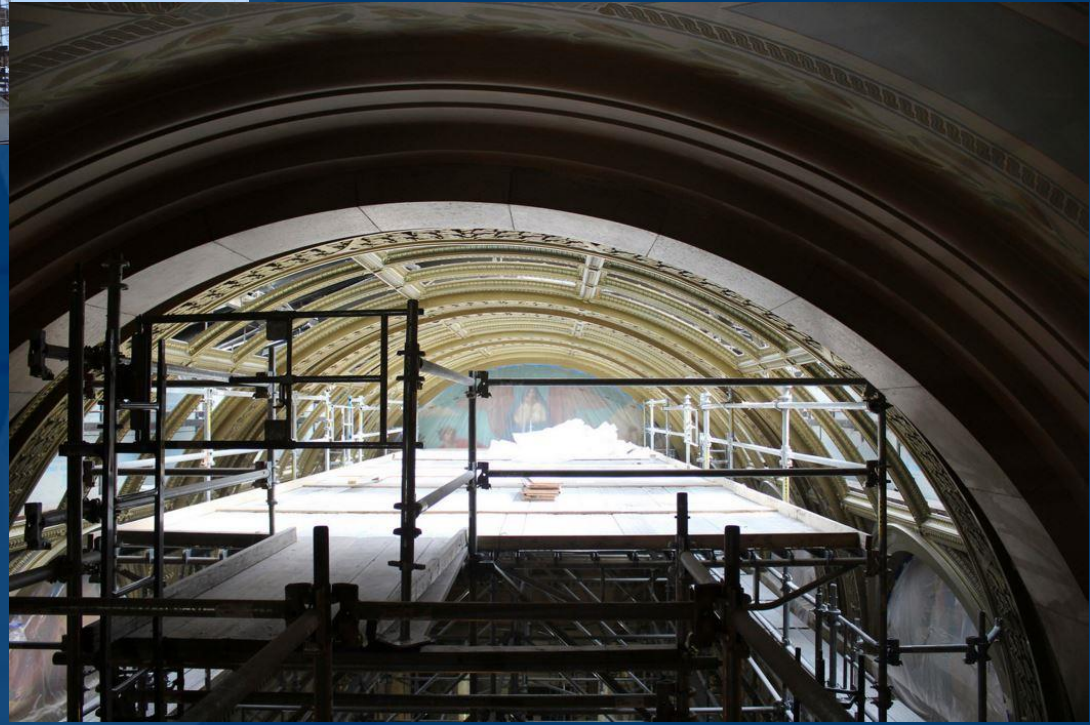


Inner Dome Access

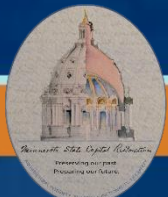
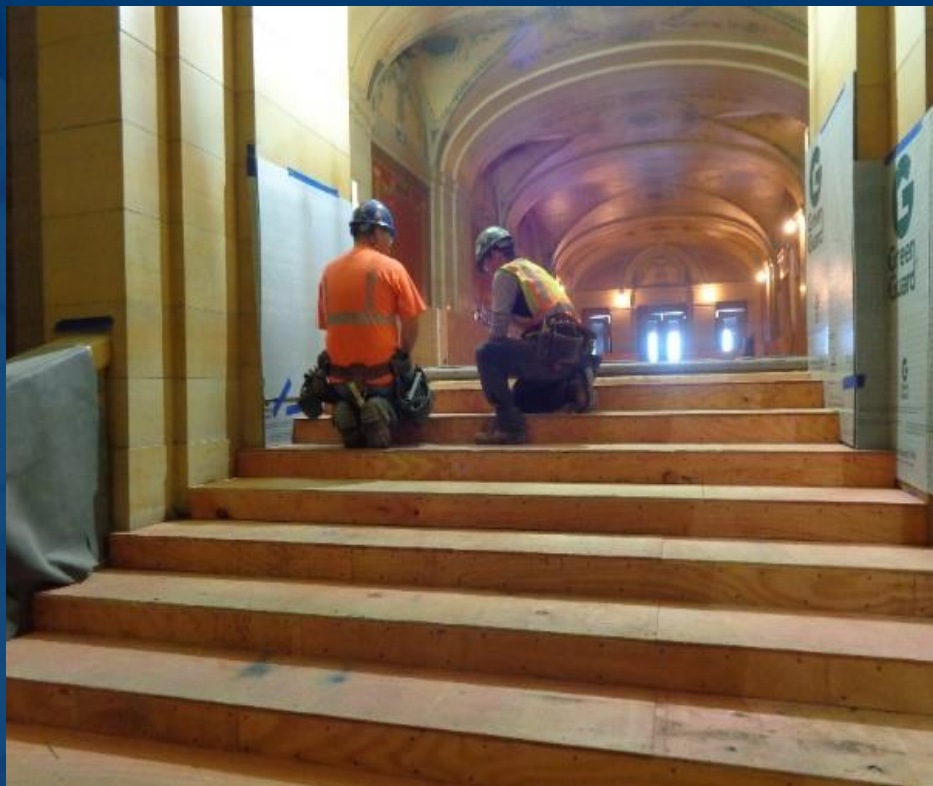


Middle Dome Access

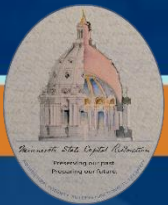




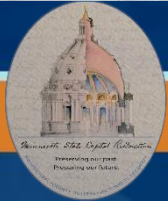
Temp Protection



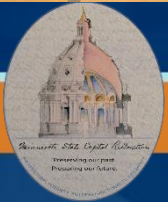
Temp Protection





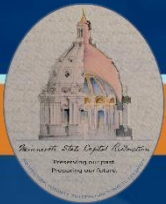


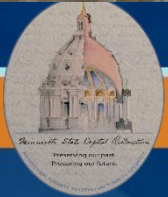
Historic Salvage Inventory

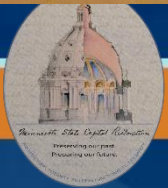
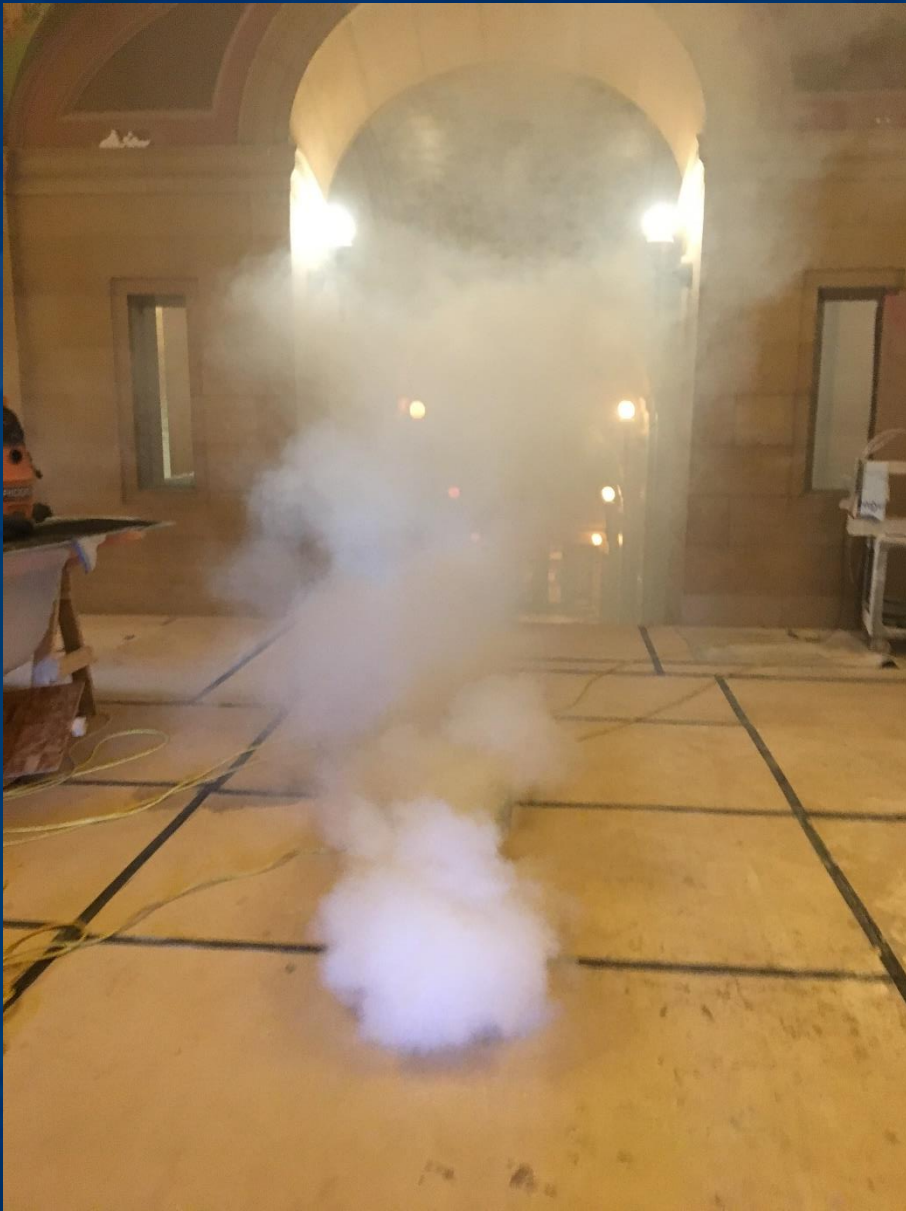




Historic Salvage Inventory

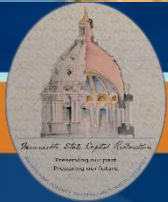




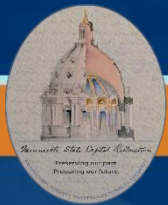




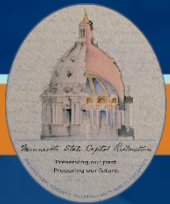






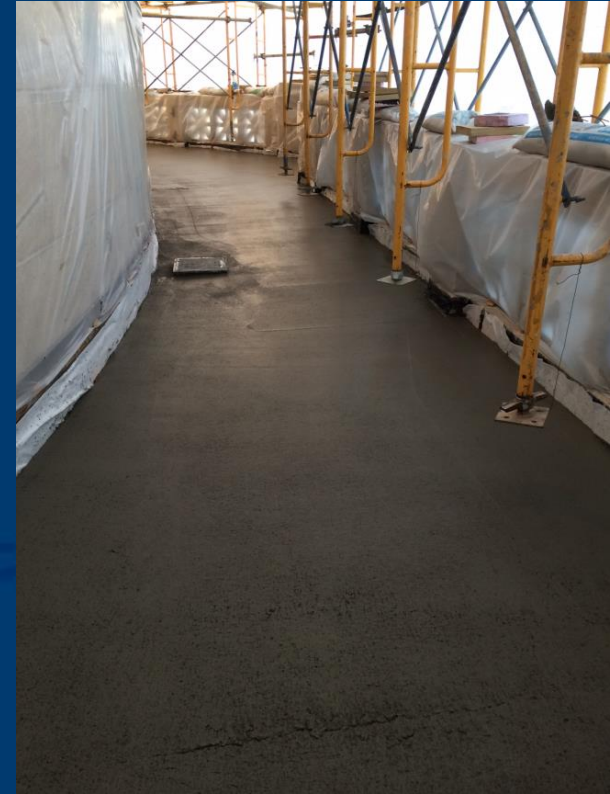


New Material Inventory



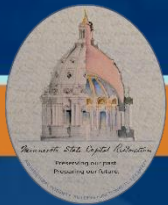




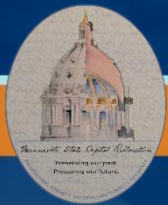




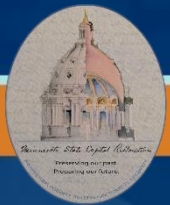
Jobsite Access – Haz Mat Containment Areas



Jobsite Access – Attic Areas



Jobsite Access - Basement

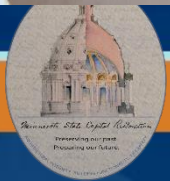




Basement Access

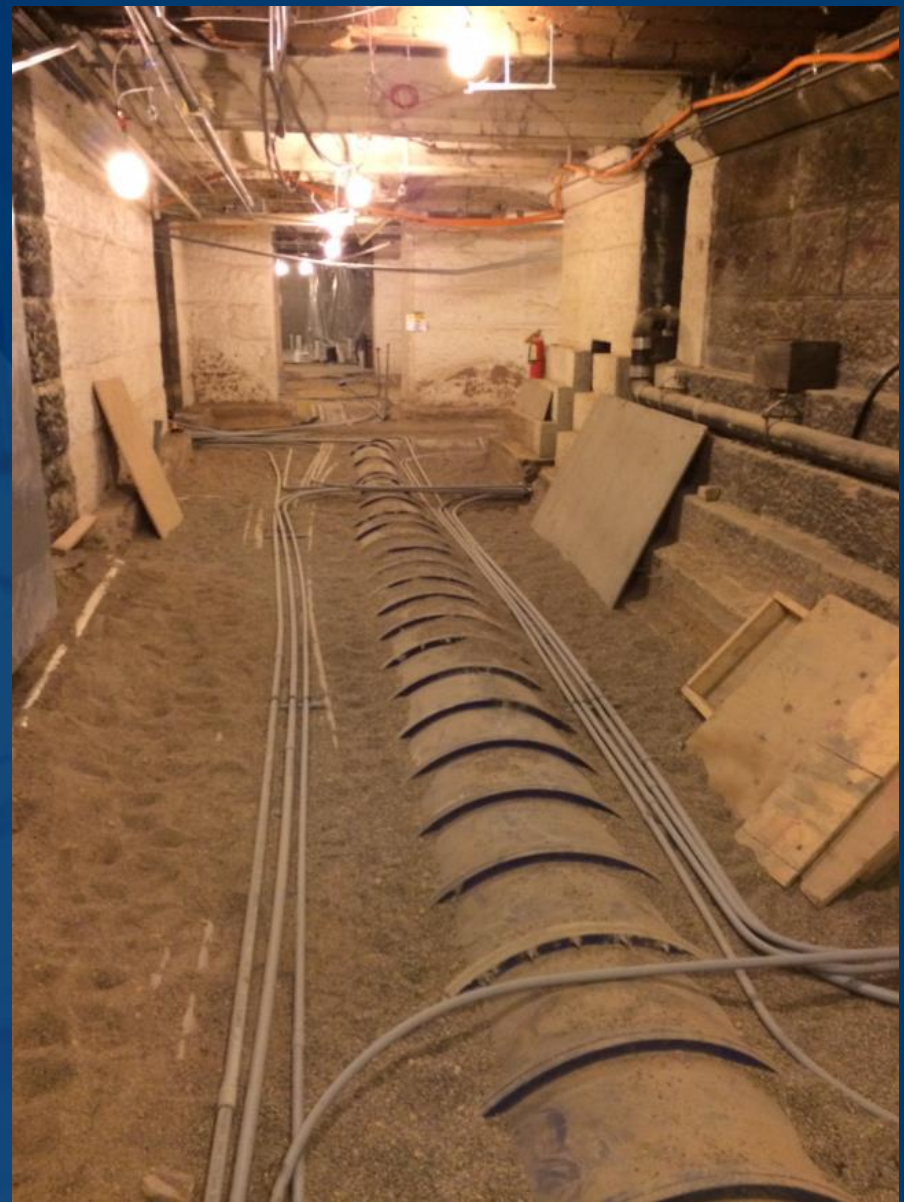


Electric Equipment

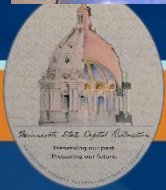
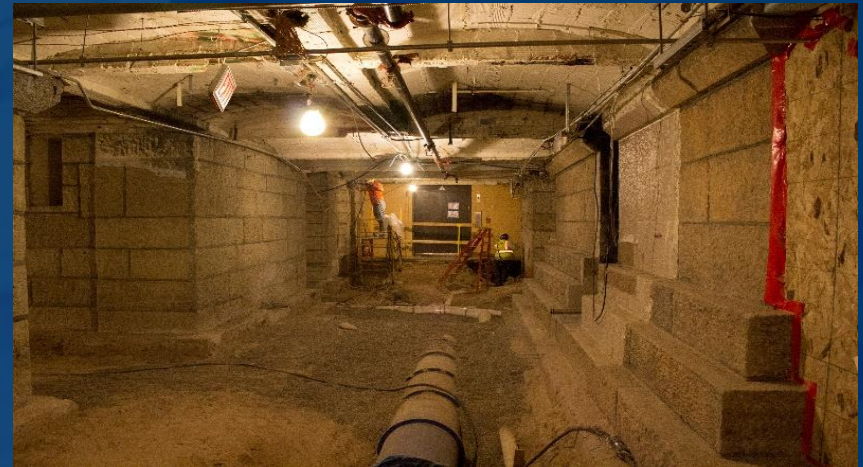
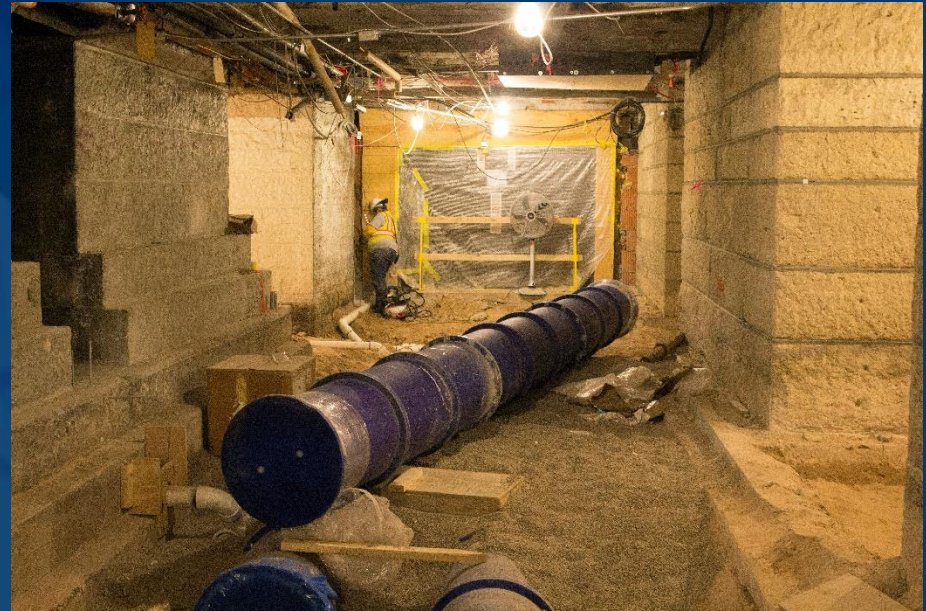




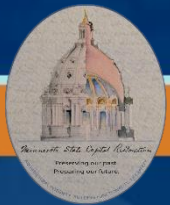


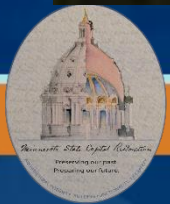


Basement Access



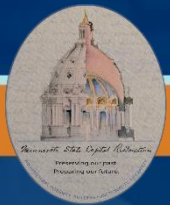




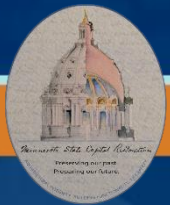
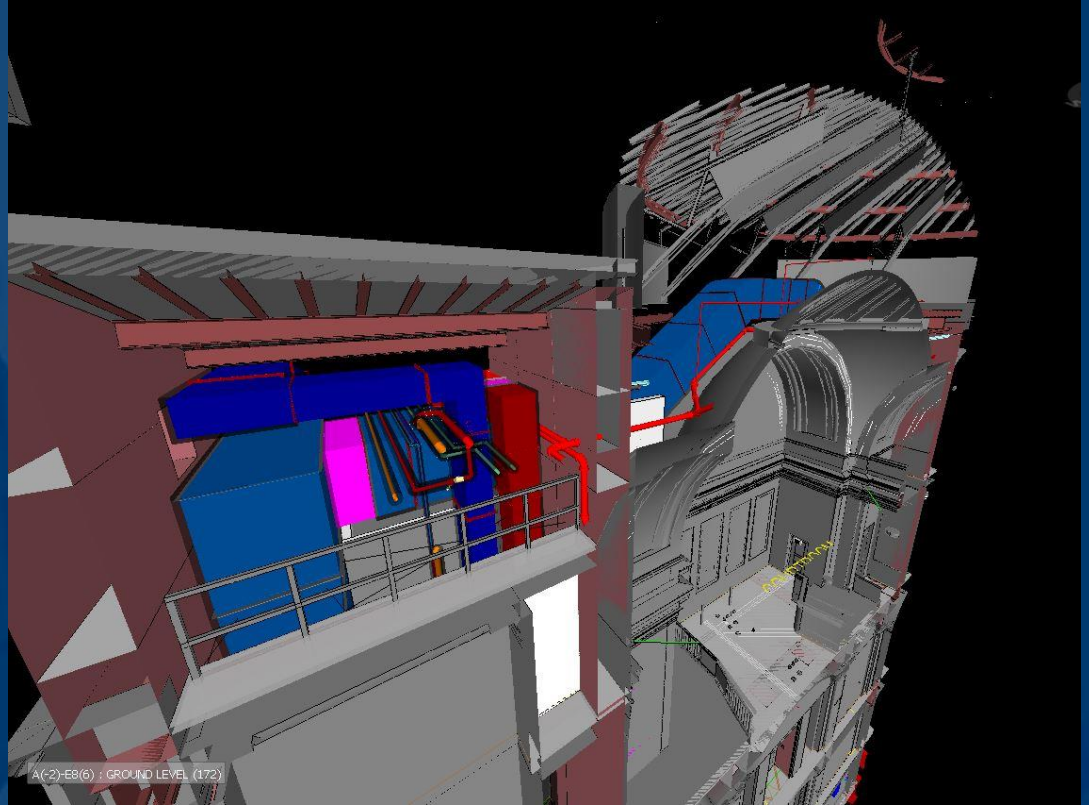
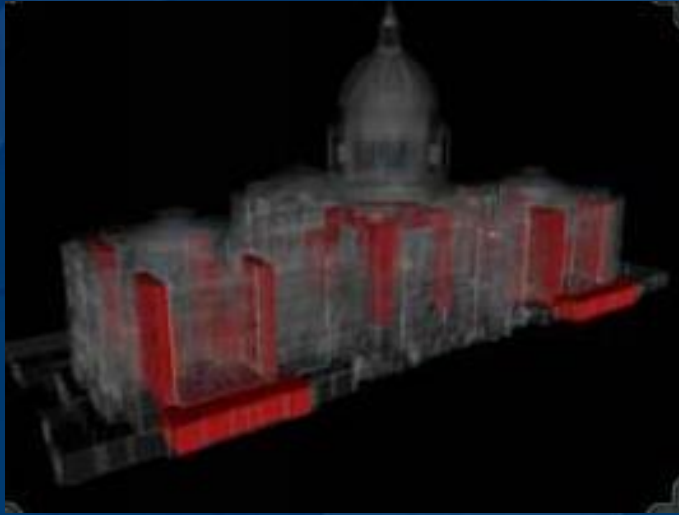




Technology



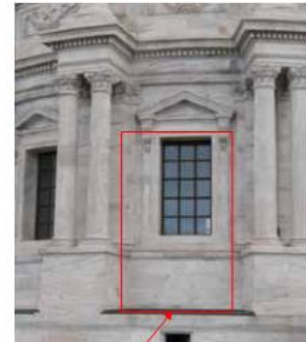
Use of Technology - BIM



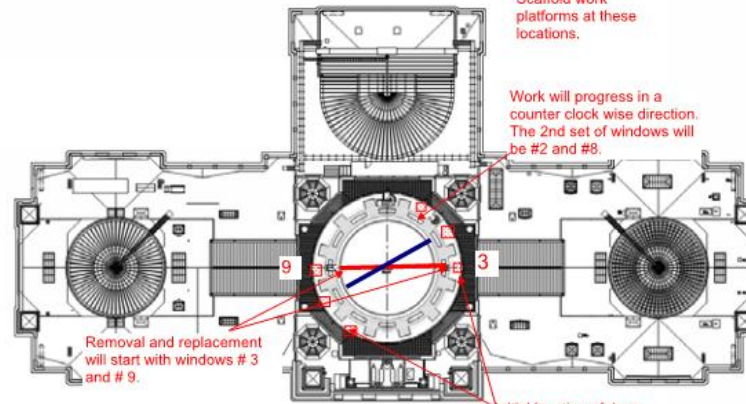
Project Communication – Work Plans



During the day the windows being worked on will be open, at the end of each work day the window openings being worked on will be covered with plywood and reinforced plastic for weather protection.



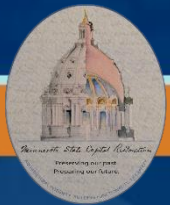
Scaffold work platforms at these locations.



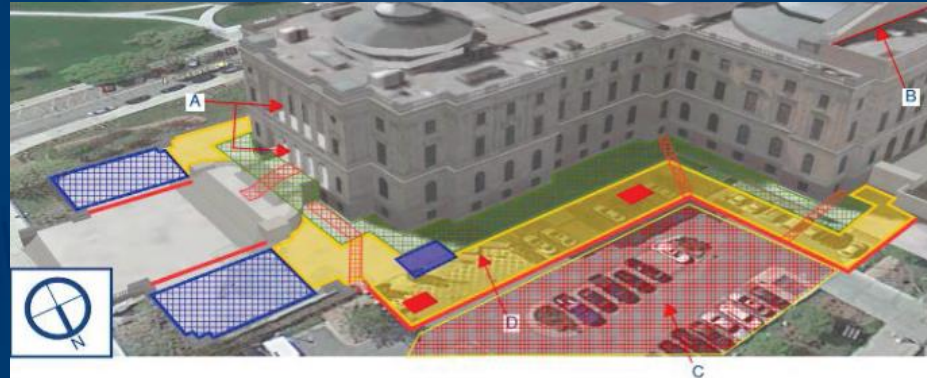
Removal and replacement will start with windows # 3 and # 9.

Work will progress in a counter clock wise direction. The 2nd set of windows will be #2 and #8.

Initial location of drum window work platforms. (6) These will be rotated around the dome as the work progresses.



Public Communication – Visual Aids



Notes:

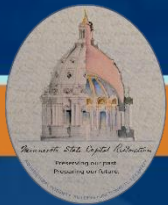
- Area between scaffolding and chain link fence serves as a:
 - Safety zone to separate work and pedestrians.
 - Necessary space to provide the trades access to the work area for moving tools, equipment, and materials.
 - Staging area for materials being installed.
 - Set up area for compressors required for stone carvers' pneumatic tools.
 - Tool storage area as work is completed during the day. Tools will be stored in containers at Ca Gilbert park at night.

Logistics Key:

- Chain Link Fence
- Scaffolding
- Temporary Access Overhead Protection
- Stone storage
- Stair Access Tower to Scaffolding
- Pneumatic Tool Compressor
- Safety Buffer Zone

Scaffold Notes:

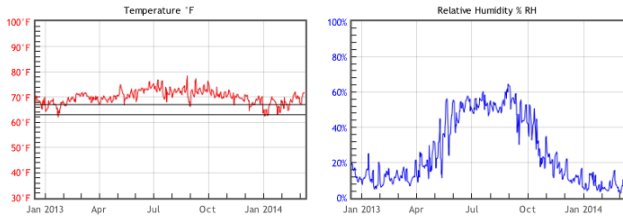
- A - Balcony Scaffolding
- B - Area A Scaffolding
- C - Parking Area is not available for use during normal business hours
- D - Build Scaffold around existing loading dock



Preservation Environment Evaluation

Type of Decay	Risks & Metrics	Evaluation & General Comments
Natural Aging Chemical decay of organic materials	OK TWP1 = 60	Generally OK, but fast decaying organic materials such as acidic paper, color photographs and cellulose plastics will be at elevated risk due to the cumulative effects of temperature and humidity
Mechanical Damage Physical damage to hygroscopic materials	RISK % DC = 2.42 % EMC min = 1.6 % EMC max = 10.2	Heightened risk of physical damage to any hygroscopic material, such as paintings, rare books, furniture, paper, leather, film, or color photos, due to extremely low or high levels of humidity, and / or excessive humidity fluctuation.
Mold Risk Mold growth in area or on collection objects	GOOD MRF = 0	Minimal risk of mold growth.
Metal Corrosion Corrosion of metal components or objects	OK % EMC max = 10.2	Generally OK, but archeological or salt-encrusted metals may corrode due to extended periods of moderately high levels of humidity.

Graphs



Statistics

Temperature		Relative Humidity		Dew Point		T Limits	
T°F Mean	70	%RH Mean	26	DP°F Mean	27.6	T°F < 63	1.3%
T°F Median	70.3	%RH Median	5	DP°F Median	18	T°F [63,67]	10.6%
T°F Stdev	2.8	%RH Stdev	19	DP°F Stdev	21	T°F > 67	88.1%
T°F Min	60.8	%RH Min	2	DP°F Min	-24.9		
T°F Max	79.9	%RH Max	66	DP°F Max	64		

Public Communication – Environmental Conditions

- Maintain Temps
- Humidity
- Dust
- Vibration
- Noise Levels

Smart Box

