UNIVERSITY OF ARKANSAS SCHOOL OF ARCHITECTURE

STEVEN L ANDERSON DESIGN CENTER & RENOVATION OF VOL WALKER HALL

PROJECT NARRATIVE

The 35,000 square foot addition and 60,000 square foot renovation to the Fay Jones School of Architecture in Vol Walker Hall at the University of Arkansas will respond to urgent needs while also supporting the vision for the future.

Once completed, the building will be a complex but resolute hybrid of a beautifully restored historical building, and a modern addition and insertion. Great care will be taken in preserving the historic aspects of Vol Walker Hall, while instilling new life. Needed for many years, the library stack spaces on the west side of the existing building will be removed to make room for new spaces and allow for a proper west entry and circulation through the building on the main campus axis. Removal of the stacks will eliminate a large amount of useless and troublesome space, though they currently support the floor of the main gallery. While beloved, the main gallery does not currently function well as a critique or gallery space due to poor light and acoustic quality. By reconsidering the main gallery, a central space will be created to unite old and new.

The main body of the proposed addition will be located on the west side of Vol Walker Hall, facing Mullins Library. The ground floor will provide a new entry and will feature secure gallery space, as well as a cafe and critique space. Spaces at the ground level are conceived as being more figural and transparent, creating an inviting entry for both students and faculty of other disciplines who regularly pass through on the main axis of the University. A 200 seat lecture hall occupies part of the second level, descending to become visible from the sidewalks nearby.

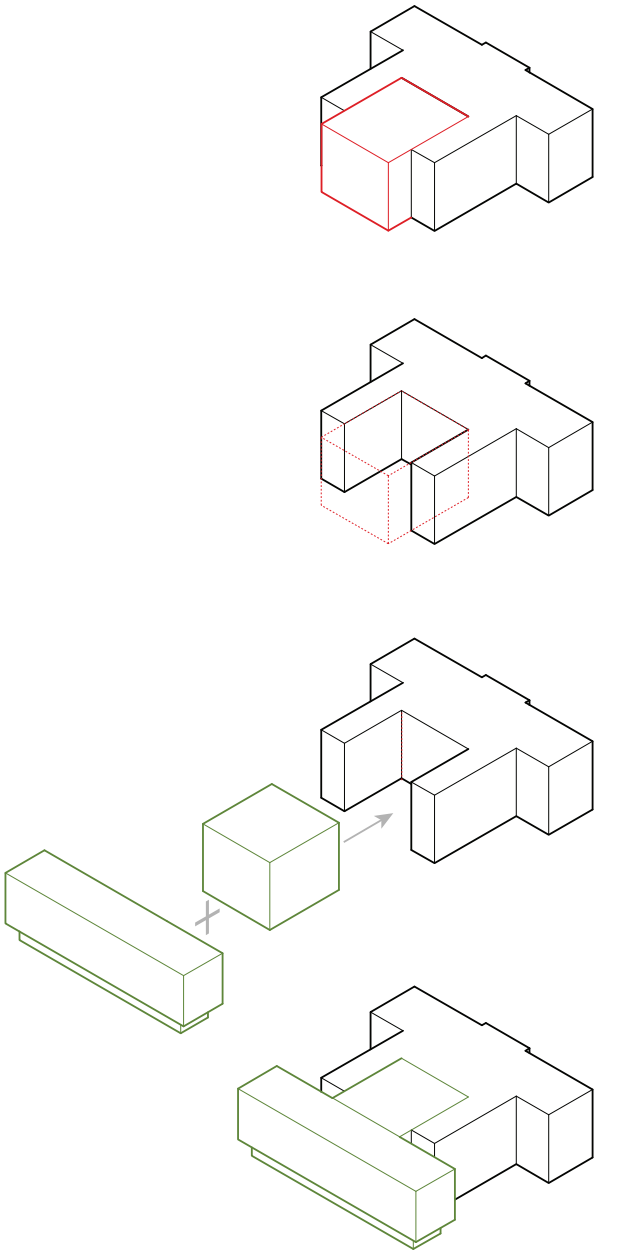
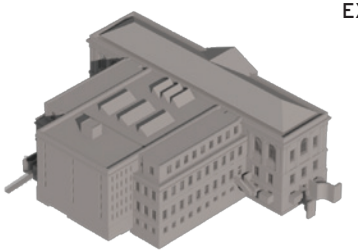
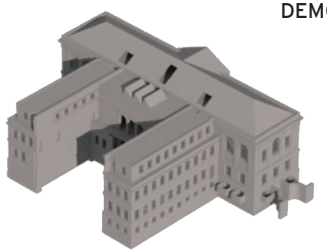


DIAGRAM OF DEMOLITION AND CONSTRUCTION ▲

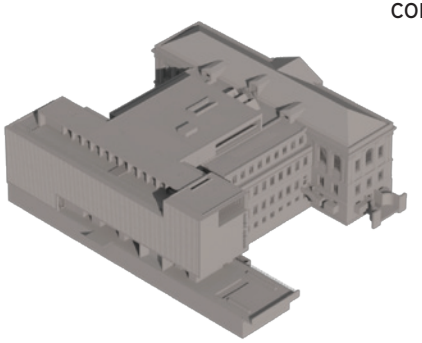
EXISTING



DEMOLITION



COMPLETE



PHASED CONSTRUCTION MODEL ▶

RENDERING OF THE SOUTH WEST CORNER OF THE ADDITION

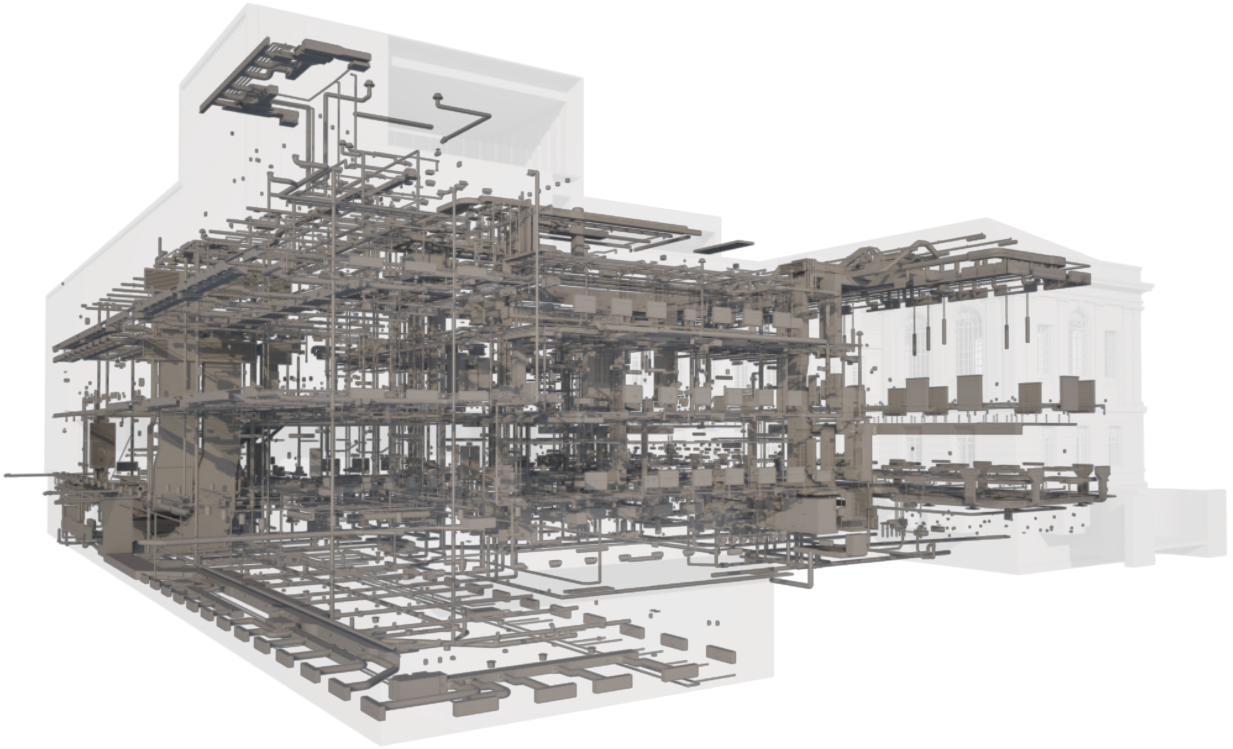
Additional studio space and critique spaces are urgent needs, even more so with the incorporation of the Landscape Architecture and Interior Design programs. The proposed addition will provide three floors with studios, two of which equal in size to the existing main studio space in Vol Walker Hall. These new studios will be limited in height by comparison, limiting the overall volume required. Access between each floor and between the new portion of the building and the old will be completely accessible, featuring centrally-located elevators. Two stairwells will flank each studio, helping to connect each studio and encourage collaboration while distributing natural light. Studio levels will be expressive of structure and systems in order to limit the overall height required, while also serving as a teaching tool. The broad western facade will incorporate a fritted glass brise soleil to screen the intense late-day sunlight and a custom curtain wall, used to illustrate construction methods, detailing, and environmental strategies.

The top floor above the studios will be set back from the perimeter of the studio spaces, respectful of the height of adjacent buildings but allowing views to the Boston Mountains to the south. A critique space and a conference room will be located here, opening to a roof terrace acting as a laboratory for the study of green roofs.

BIM IMPLEMENTATION

This project will be the first Integrated Project Delivery for both the architects and the client, the University of Arkansas. It is also the first IPD project in the state of Arkansas. This innovation in delivery methods required the architects and consultants to work closely together to ensure that these new processes would successfully deliver the project. Clear understanding of the responsibilities for each of the stakeholders in the project was the initial step in the IPD method. The project had a lead and associate architect in charge of the final deliverables; supporting the deliverables on the project was a MEP, structural, and lighting consultant. All consultants were involved in the "construction" of their own building information model, which was then integrated into the architectural model.

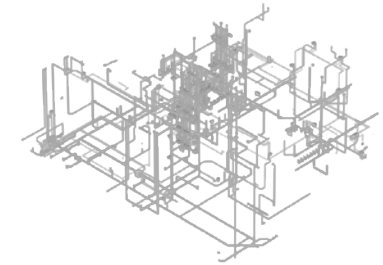
Throughout the design process the integrated model was used for many different purposes across the various design phases. In the schematic design phase the model was used for initial massing of the design, and as a underlay for the construction of physical models that were produced via manual and laser cut processes. In the design development phase the model facilitated solar studies of the addition's long west façade, mechanical simulation for sizing of mechanical units, visualization of the lighting scenarios, and animations and renderings of the design. Finally in the construction document phase the model was used for coordination of construction documents between consultants, collision detection, visual timeline of construction process, and material quantities. The model also continued to be useful moving forward into the construction administration phase serving as an underlay for shop drawings and coordination of design intent and field verification of the on site demolition.



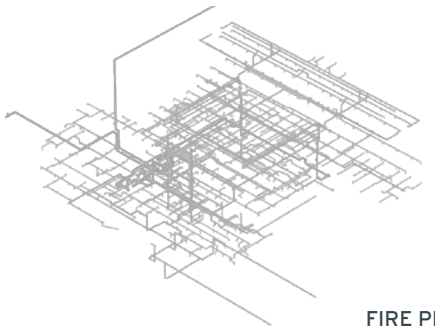
COMBINED MECHANICAL, ELECTRICAL, PLUMBING MODEL

All these various needs were filled through the detailed construction of a building information model that represented the design successfully at all scales. The design team was able to use this model to break down the project into all the subsystems making comprehension of the overall project much easier. The understanding among the design team is that integrated project delivery removes any surprises from the design and documentation process. The extreme clarity that the practice brought to the design process lowers uncertainty in the bidding and estimating phases. The process also ensures that the final product will reflect the true design intent as crafted by the design team.

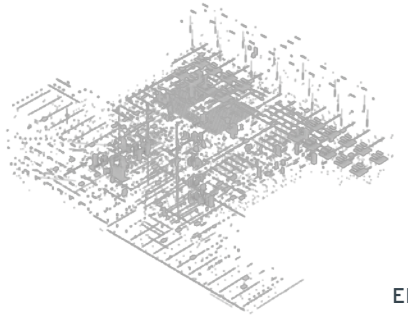
BIM WORKFLOW



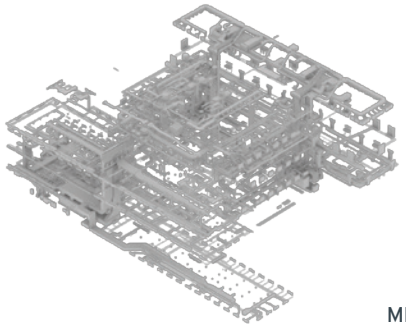
PLUMBING



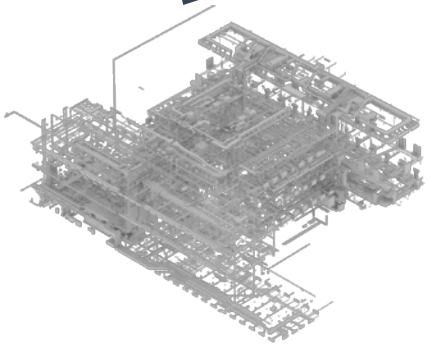
FIRE PROTECTION



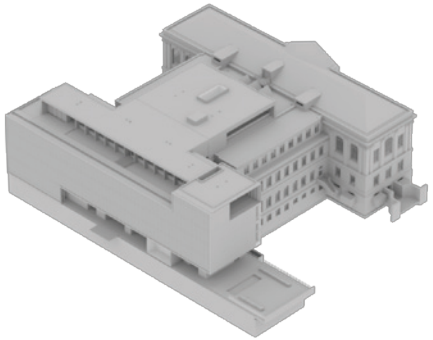
ELECTRICAL



MECHANICAL

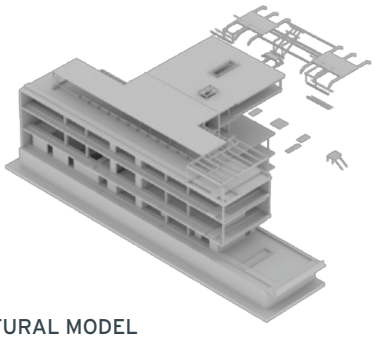


MEP MODEL



ARCHITECTURAL MODEL

WORKSHARING BETWEEN FIRMS BY LINKING SYSTEM SPECIFIC MODELS TOGETHER FOR COORDINATION OF DESIGN

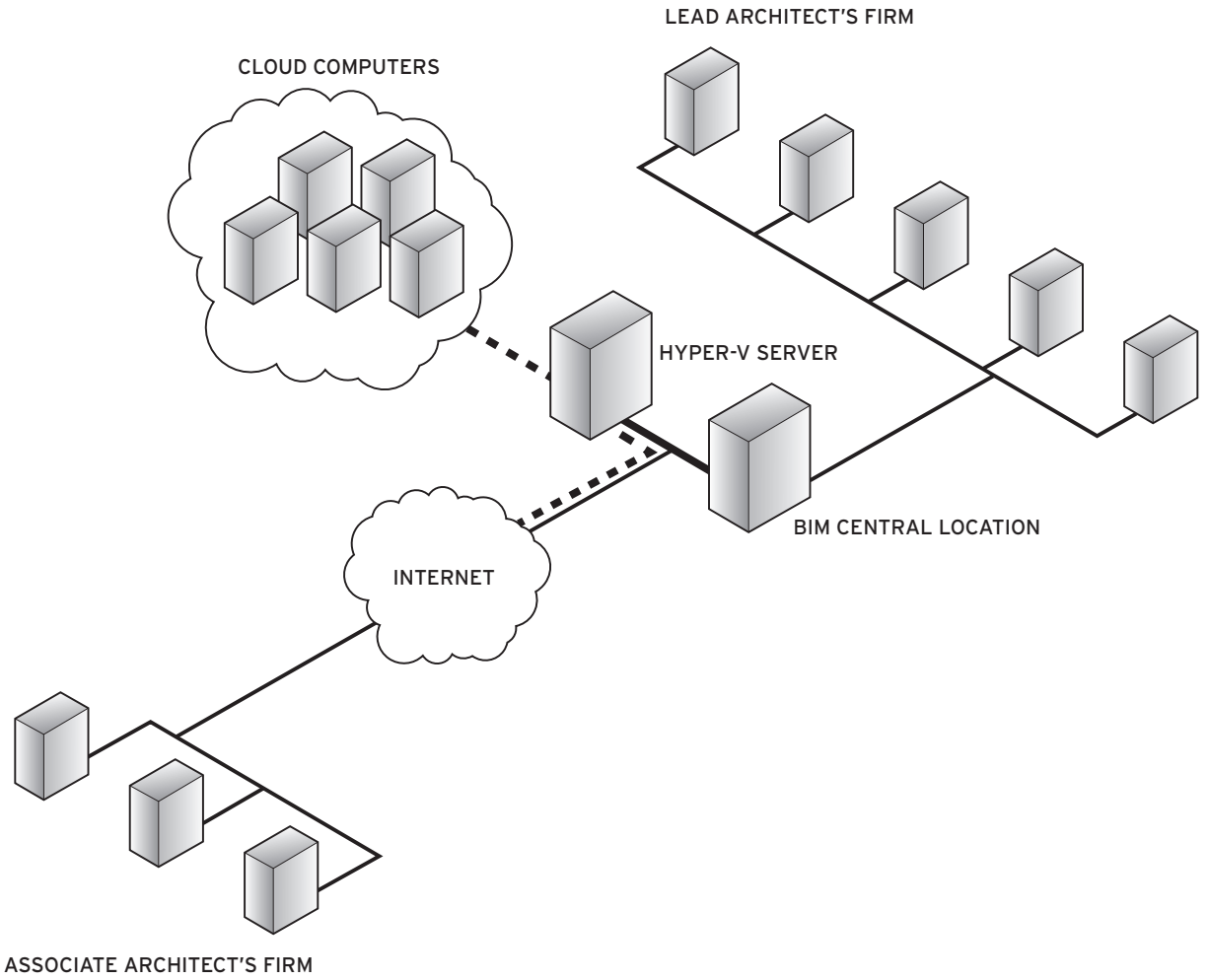


STRUCTURAL MODEL

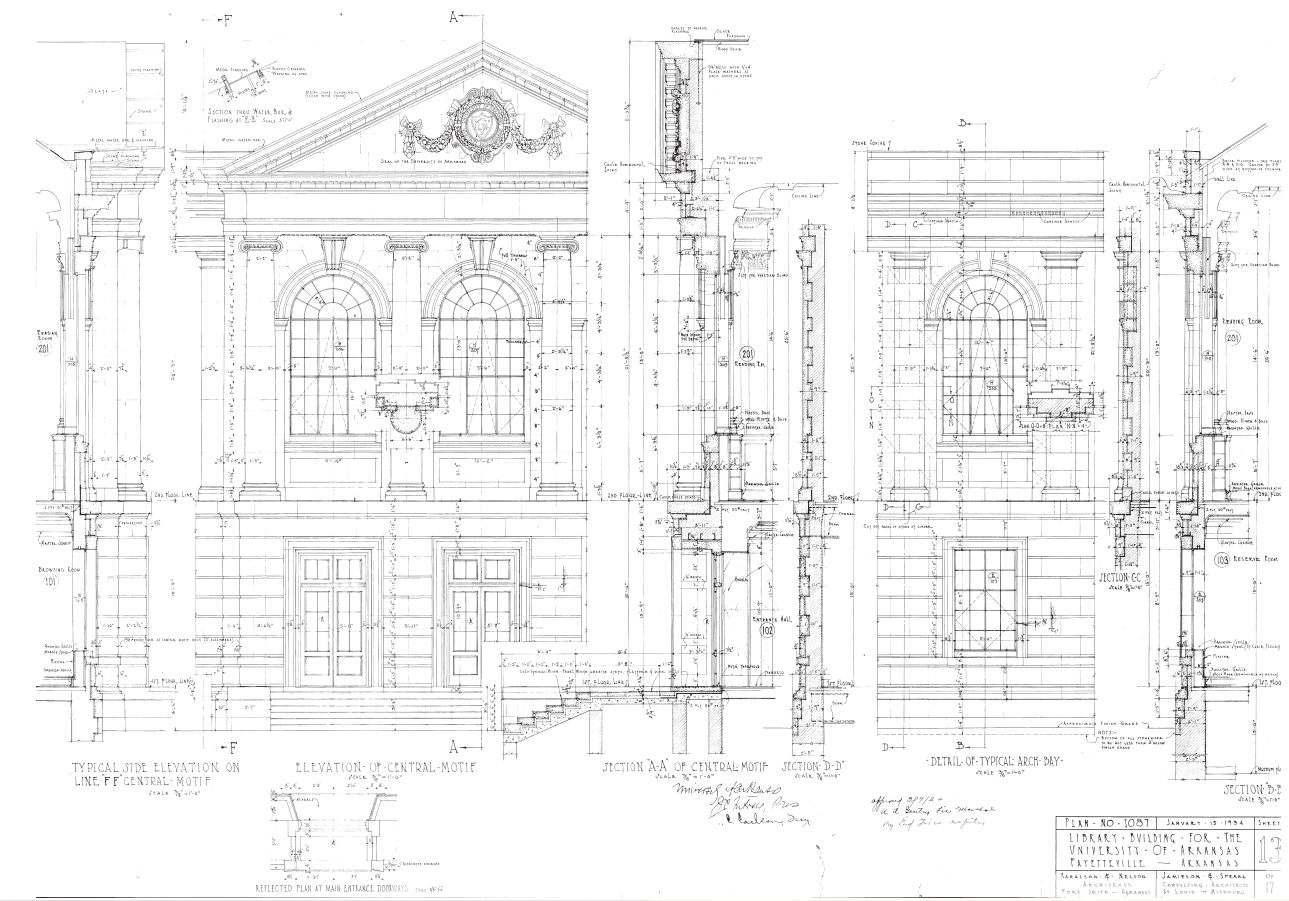
INNOVATIONS IN PROCESS

Several different processes of communication between architects and consultants had to be established to facilitate the completion of the design and documentation process. The architect of record was selected for its design expertise and history with adaptive reuse projects, but had a staff of 8 employees limiting its ability to complete the documentation of a 90,000 square foot project in a timely manner. An associate architectural firm was brought into the project to aid in the delivery of the construction documents and construction administration. A method for collaboration between the different architectural firms so that they could work cooperatively on the same BIM model had not been developed in an affordable format at the time of the design phase. Out of necessity the lead architect built a cloud computing solution using Windows Hyper V server so that the associate architect could work remotely from their office. This solution essentially allowed designers at the satellite offices for the associate architect work on the project as if they were sitting in the lead architect's office. This cloud computing solution is currently being used in the construction administration phase. It allows for the flexibility of viewing the model in multiple contexts across multiple platforms live on site.

This method allowed seamless collaboration between the architects on the project. The lead architect took charge of modeling standards, file linking, model review, content creation, and model maintenance while the associate architect took on a majority of the detail documentation, LEED documentation, construction administration, and specification writing.



FIDELITY TO ORIGINAL DETAIL



The Integrated Model was constructed largely from the original construction drawings, done by hand in the early 1930's. In an effort to restore its original glory, great care was taken to construct a building information model with as much detail as possible, including complex column capitals, fluting, cornices and entablature. These details became the basis for the renovation and restoration effort.

FIDELITY TO ORIGINAL DETAIL

THE INTEGRATED MODEL ▲

THE EXISTING BUILDING ▶

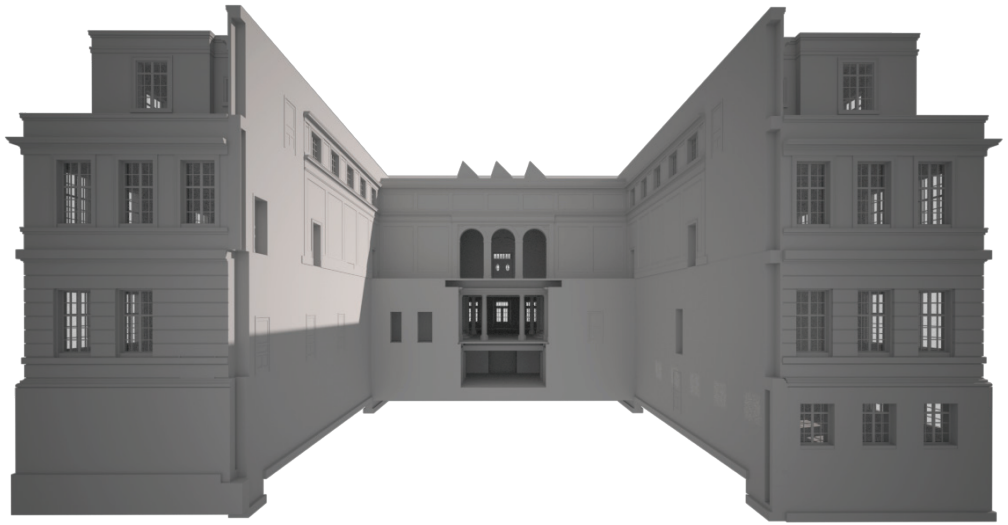
◀ THE INTEGRATED MODEL

◀ THE EXISTING BUILDING

BIM IN ACTION: CONSTRUCTION PHASING

Construction phasing was one of the more powerful tools used throughout the development of the project. The design team was able to develop the model with all the geometry tied to a schedulable project timeline. This allowed the design team to visually see how the project would look as it moved through its construction phases. In order to accomplish this task the architectural firms had to take the original 1935 construction drawings of Vol Walker and convert them into a building information model. Once that was accomplished the design team was able to virtually demolish pieces of the building. As a result the architects were able to precisely design the interface between the existing building and the addition.

From this demolition model the architectural firms were able to add and renovate the existing spaces in the model. The architects were essentially building the project in the computer before the contractor even stepped foot on the site. This phased model filled other needs than visualizing the effect demolition would have on the project. It also allowed the architect to have close estimates on demolition quantities and accurate drawings for instructing the demolition of the existing building.

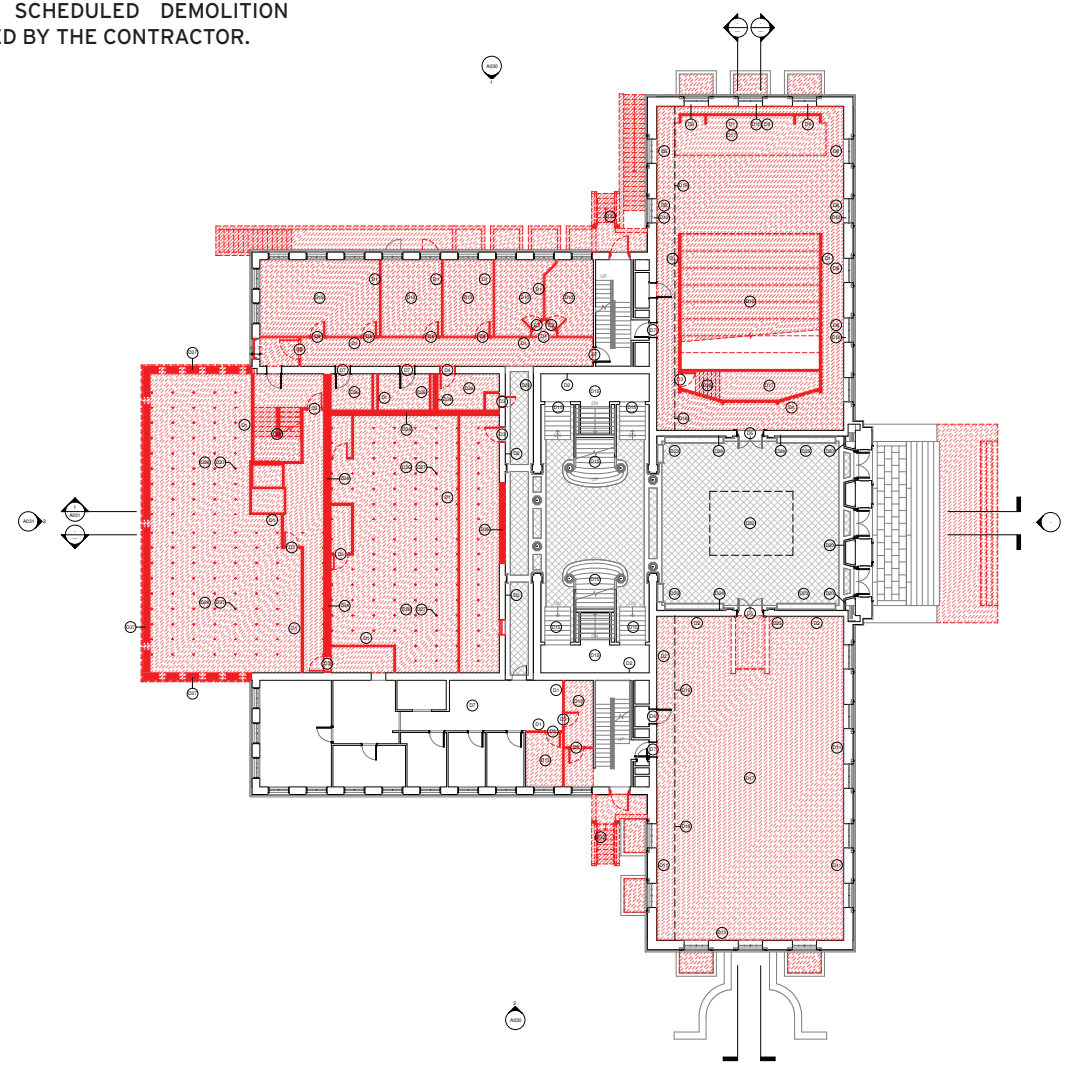


THE INTEGRATED MODEL PHASED FOR DEMOLITION ▲

COMPLETED DEMOLITION ▶

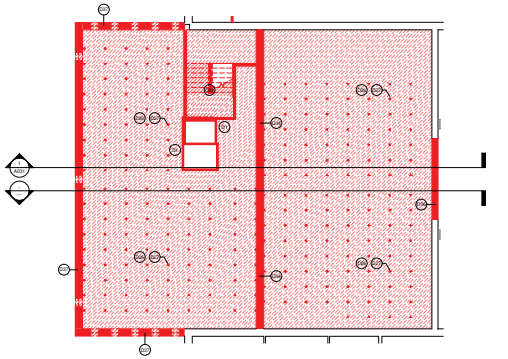
BIM IN ACTION: CONSTRUCTION PHASING

EXAMPLE OF THE PROVIDED TWO DIMENSIONAL FLOOR PLANS WITH SCHEDULED DEMOLITION NOTES THAT WERE USED BY THE CONTRACTOR.



1 LEVEL 1 DEMO
1/8" = 1'-0"

DEMOLITION KEYNOTES	
D1	REMOVE PARTITION WALL IN ENTIRETY
D2	REMOVE TACKBOARD AND WOOD FRAME ENTIRE LENGTH OF WALL. REPAIR DAMAGE TO WALL AS NEEDED PER SECTION (00 00 00)
D3	REMOVE DOOR AND/OR FRAME IN ENTIRETY
D4	REMOVE DOOR AND ALL COMPONENTS SUCH AS TRANSOM, FRAME, TRIM, AND/OR STONE PLINTH. SALVAGE FOR REUSE PER SECTION (00 00 00)
D5	REMOVE DOORS. PROTECT FRAME, TRANSOM, MARBLE SURROUND PER SECTION (00 00 00)
D6	REMOVE DOOR. PROTECT FRAME AND TRIM PER SECTION (00 00 00)
D7	PROTECT EXISTING DOOR, FRAME, AND TRIM PER SECTION (00 00 00)
D8	REMOVE BLACKOUT CURTAINS AND FRAMES AT WINDOW OPENINGS AND REPAIR PER SECTION (00 00 00)
D9	REMOVE BLINDS FROM WINDOWS
D10	REMOVE METAL PLATE COVERING OPENING IN WINDOW SILL
D11	REMOVE MILLWORK
D13	REMOVE FLOOR FINISH
D15	PROTECT MARBLE STAIR TREADS AND LANDINGS PER SECTION (00 00 00)
D17	REMOVE RAISED FLOOR CONSTRUCTION
D19	REMOVE EXISTING MECHANICAL CHASE AND RESTORE WALL PER SECTION (00 00 00)
D20	REFER TO MEPFP DEMOLITION DRAWINGS. REPAIR WALL AS NEEDED PER SECTION (00 00 00)
D22	REMOVE 'CRT CUBE'. BEFORE REMOVAL, VERIFY ATTACHMENT TO FLOOR AND REFER TO ARCHITECT FOR FURTHER INSTRUCTION.
D23	PROTECT BENCHES PER SECTION (00 00 00)
D24	PROTECT WALL PLAQUES PER SECTION (00 00 00)
D25	SALVAGE CLOCK PER SECTION (00 00 00)
D26	REMOVE FLOOR SLAB
D27	REMOVE STEEL STANCHIONS
D28	REMOVE INTERIOR STAIR
D32	REMOVE EXTERIOR STAIR
D34	REMOVE INTERIOR LOAD-BEARING MASONRY WALL
D36	REMOVE PORTION OF EXISTING LOAD-BEARING MASONRY WALL. SALVAGE MARBLE VENEER AND/OR BASE PER SECTION (00 00 00)
D37	REMOVE EXTERIOR LOAD-BEARING MASONRY WALL. SALVAGE SUFFICIENT LIMESTONE VENEER FOR FUTURE USE PER SECTION (00 00 00)



2 LEVEL 1.5 DEMO
1/8" = 1'-0"

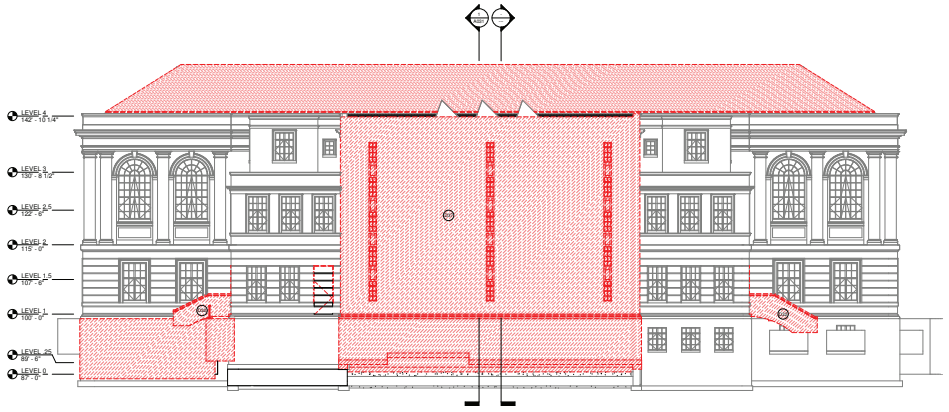
VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: DEMO PLANS - LEVEL 1

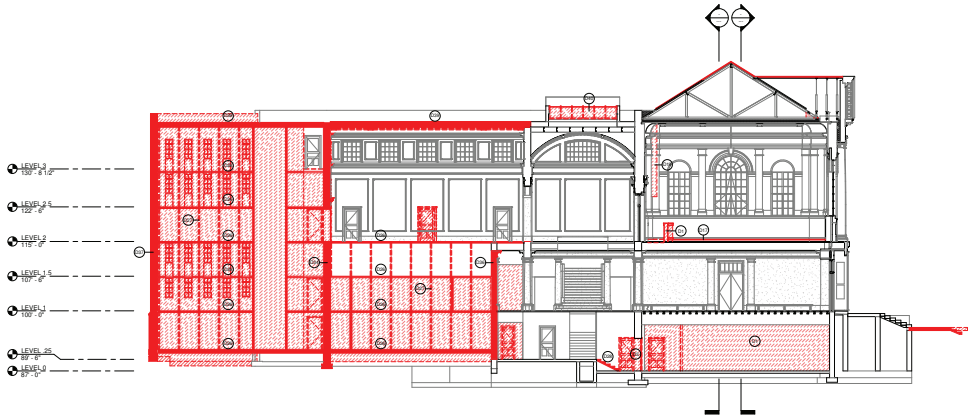
A021

BIM IN ACTION: CONSTRUCTION PHASING

DEMOLITION KEYNOTES	
D1	REMOVE PARTITION WALL IN ENTIRETY
D3	REMOVE DOOR AND/OR FRAME IN ENTIRETY
D17	REMOVE RAISED FLOOR CONSTRUCTION
D19	REMOVE EXISTING MECHANICAL CHASE AND RESTORE WALL PER SECTION (00 00 00)
D26	REMOVE FLOOR SLAB
D27	REMOVE STEEL STANCHIONS
D28	REMOVE INTERIOR STAIR
D32	REMOVE EXTERIOR STAIR
D34	REMOVE INTERIOR LOAD-BEARING MASONRY WALL
D36	REMOVE PORTION OF EXISTING LOAD-BEARING MASONRY WALL. SALVAGE MARBLE VENEER AND/OR BASE PER SECTION (00 00 00)
D37	REMOVE EXTERIOR LOAD-BEARING MASONRY WALL. SALVAGE SUFFICIENT LIMESTONE VENEER FOR FUTURE USE PER SECTION (00 00 00)
D39	REMOVE ROOF CONSTRUCTION
D40	REMOVE SKYLIGHT GLAZING



2 WEST ELEVATION DEMO
1/8" = 1'-0"



1 BUILDING SECTION NORTH DEMO
1/8" = 1'-0"

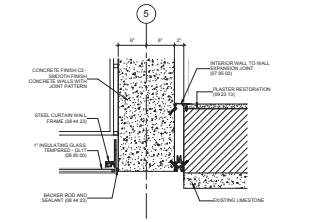
VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: DEMO ELEVATION AND SECTION

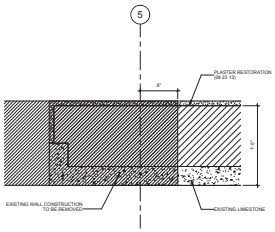
A031

BIM IN ACTION: CONSTRUCTION PHASING

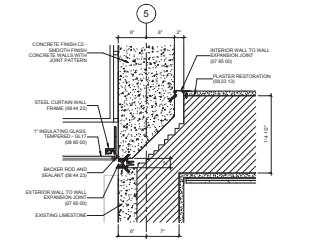
CONSTRUCTION DRAWINGS ILLUSTRATING THE DEMOLITION DETAIL AND DESIGNED EXPANSION JOINT WHERE THE ADDITION AND EXISTING BUILDING CONNECT.



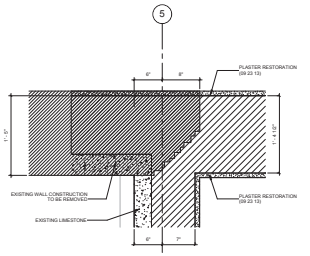
8 PLAN DETAIL AT 3ST6 AND 3ST7 (O.H.)
1 1/2" = 1'-0"



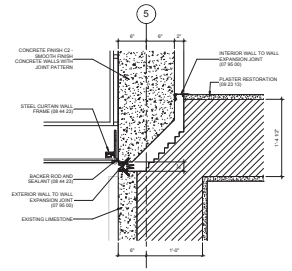
4 DEMOLITION DETAIL AT 3ST6 AND 3ST7 (O.H.)
1 1/2" = 1'-0"



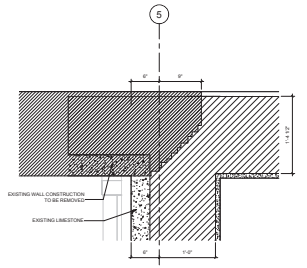
7 PLAN DETAIL AT 2ST6 AND 2ST7 (O.H.)
1 1/2" = 1'-0"



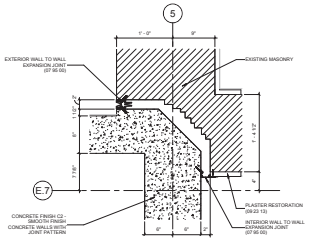
3 DEMOLITION DETAIL AT 2ST6 AND 2ST7 (O.H.)
1 1/2" = 1'-0"



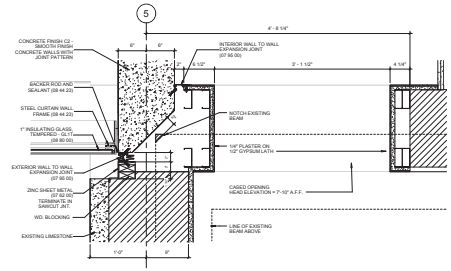
6 PLAN DETAIL AT 1ST6 AND 1ST7 (O.H.)
1 1/2" = 1'-0"



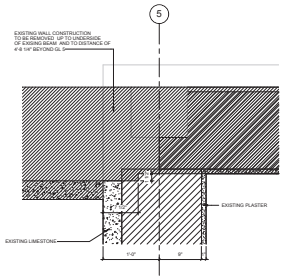
2 DEMOLITION DETAIL AT 1ST6 AND 1ST7 (O.H.)
1 1/2" = 1'-0"



9 PLAN DETAIL AT BST7
1 1/2" = 1'-0"



5 PLAN DETAIL AT BST6
1 1/2" = 1'-0"



1 DEMOLITION DETAIL AT BST6 AND BST7 (O.H.)
1 1/2" = 1'-0"

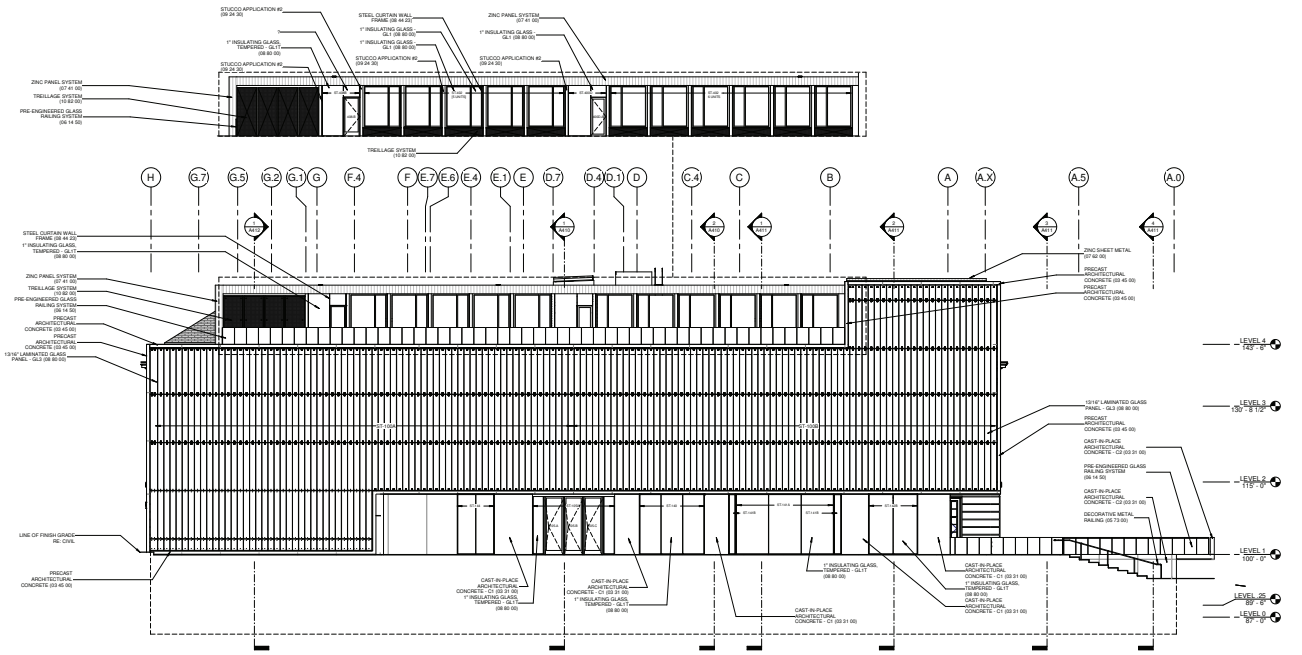
VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: DEMO DETAILS

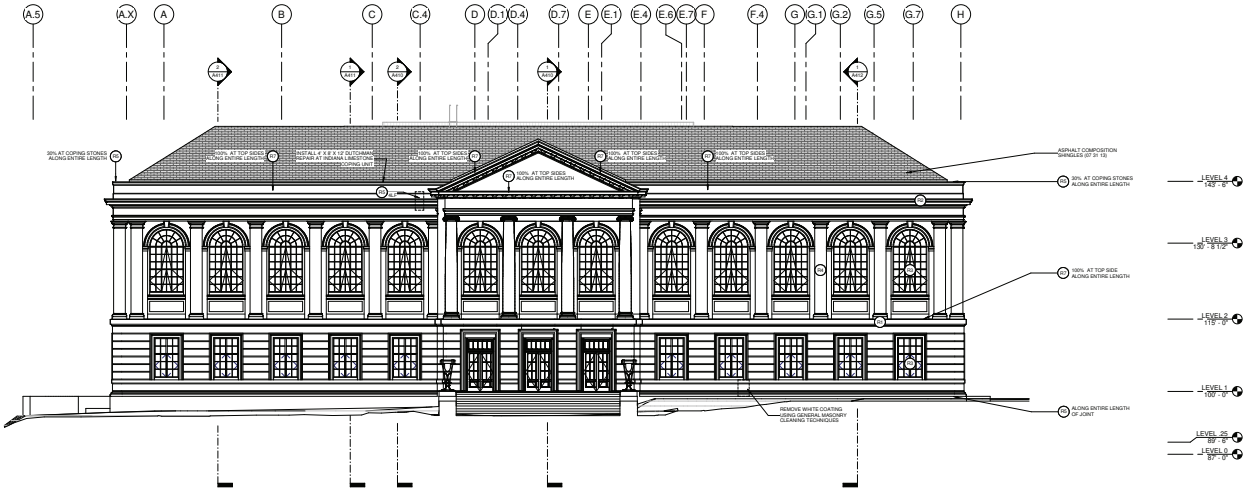
A615

BIM IN ACTION: CONSTRUCTION DRAWINGS

ALL THE DRAWINGS CREATED THROUGHOUT THE PROJECT DEVELOPMENT WERE CREATED FROM THE INTEGRATED BUILDING MODEL.



1 WEST ELEVATION



2 EAST ELEVATION

RENOVATION KEYNOTES

NUMBER	TEXT
A1	CLEAN ALL MASONRY SURFACES USING A BIOLOGICAL CLEANER AND LOW-PRESSURE WATER SPRAY
A2	REMOVE INSECT NESTS FOUND AT UNDERSIDE OF PROJECTING BELT COURSES
A3	REMOVE EXISTING SEALANT AND INSTALL NEW SEALANT SYSTEM AT PERIMETER OF ALL WINDOWS
A4	FOR BASE BEL REPOINT 10% OF MORTAR JOINTS OVERALL IN ADDITION TO AREAS INDICATED FOR REPOINTING
A5	REPOINT FAILED OR OPEN MORTAR JOINT. EXTENT OF REPOINTING INDICATED AT EACH LOCATION
A6	INSTALL CRACK REPAIR AT STONE. EXTENT OF CRACK INDICATED BY AT EACH LOCATION
A7	REMOVE EXISTING SEALANT AND INSTALL NEW SEALANT SYSTEM. EXTENT OF NEW SEALANT INDICATED AT EACH LOCATION
A8	INSTALL CRACK REPAIR AT STUCCO EXTENT OF CRACK INDICATED AT EACH LOCATION

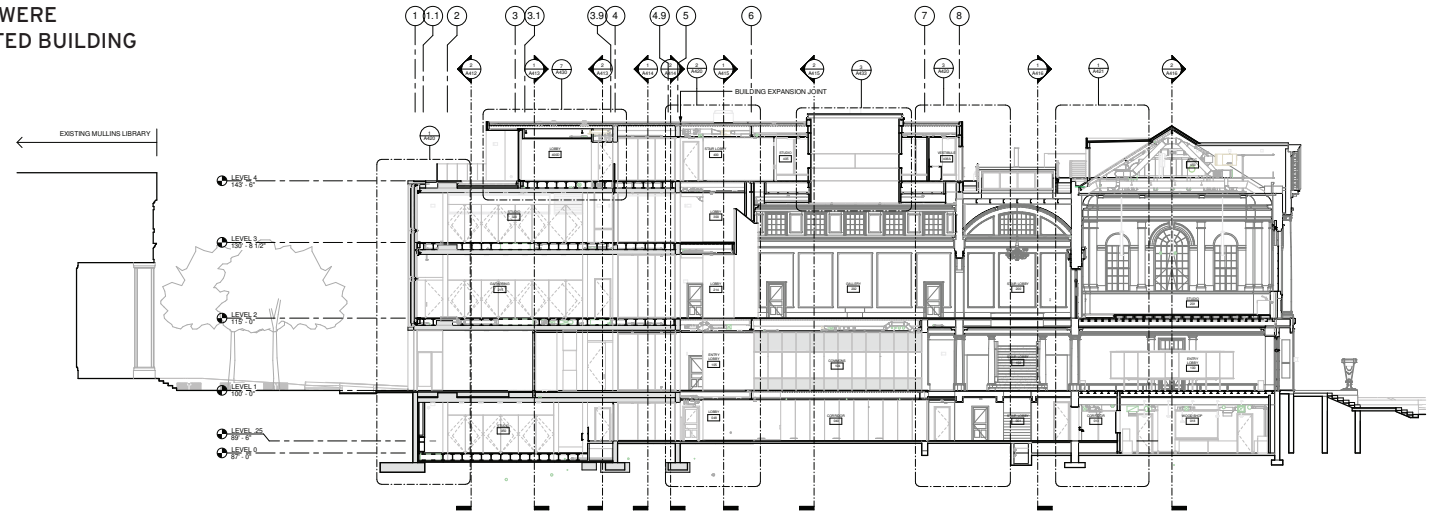
VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: BUILDING ELEVATIONS

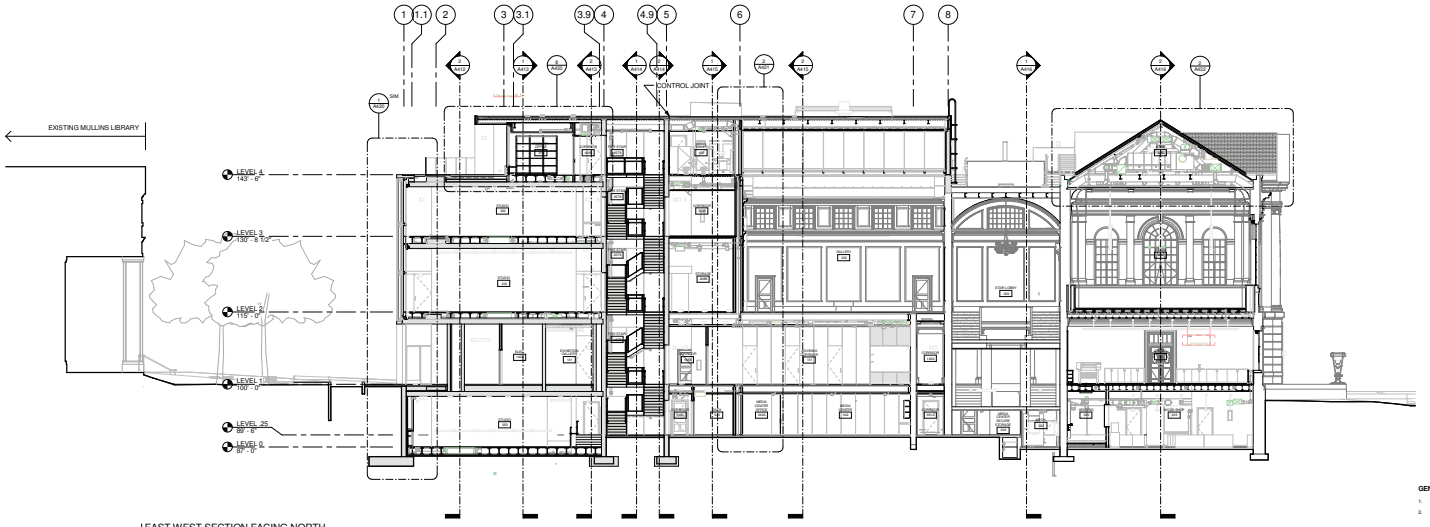
A310

BIM IN ACTION: CONSTRUCTION DRAWINGS

ALL THE DRAWINGS CREATED THROUGHOUT THE PROJECT DEVELOPMENT WERE CREATED FROM THE INTEGRATED BUILDING MODEL.



1 GALLERY SECTION LOOKING NORTH
1/8" = 1'-0"



2 EAST WEST SECTION FACING NORTH
1/8" = 1'-0"

GENERAL NOTES:

1. DIMENSIONS SHOWN ARE TO FACE OF STUD, FACE OF MASONRY, OR GRIDLINE UNLESS NOTED OTHERWISE.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS PRIOR TO INSTALLATION AND VERIFY ANY DISCREPANCIES WITH THE ARCHITECT PRIOR TO INSTALLATION.
3. REFER TO STRUCTURAL, MECHANICAL, ELECTRICAL AND CIVIL DRAWINGS FOR ITEMS BELOW GRADE.
4. GENERAL CONTRACTOR SHALL PROVIDE ALL BLOCKING NECESSARY FOR ALL WALL MOUNTED ITEMS INCLUDING MILLWORK, TOILET ACCESSORIES, DOOR STOPS, AND MECH/ELEC DEVICES.

NEW CONSTRUCTION

EXISTING CONSTRUCTION

BUILDING SECTION LEGEND

VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: BUILDING SECTIONS

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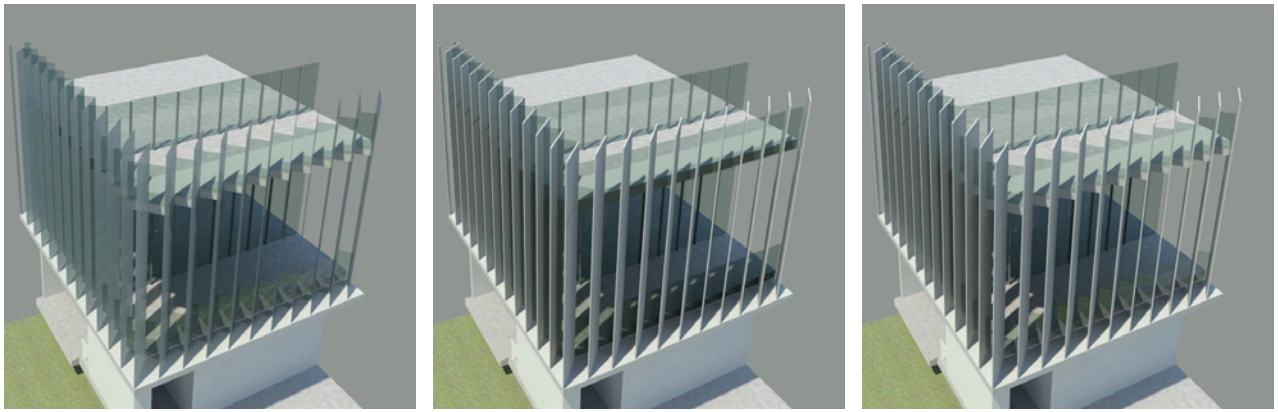
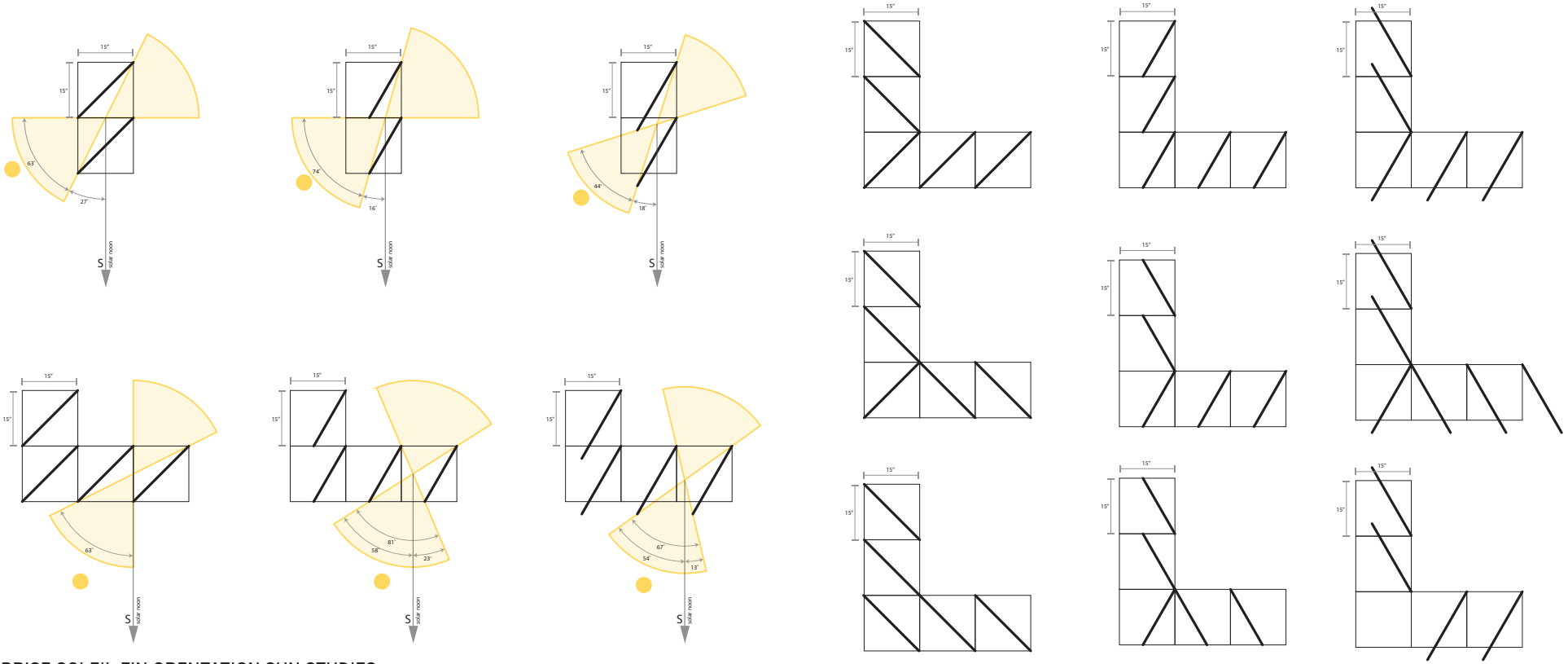
BIM IN ACTION: DETAIL DEVELOPMENT

One of the key design features of the project is the long west façade and its custom steel curtain wall. There was a concern regarding the system and how well the fritted glass fins would perform in bringing down the suns intensity in the afternoon. The model was used to test and verify the solar angels relative to the direction of the fins. This tool gave the design team the ability to find and use the ideal angle for mitigating the solar impact along the west façade.

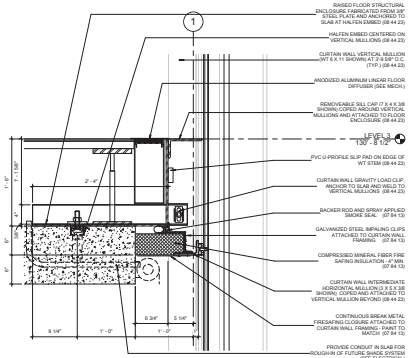


SUN STUDIES OF THE SOUTHEAST CORNER

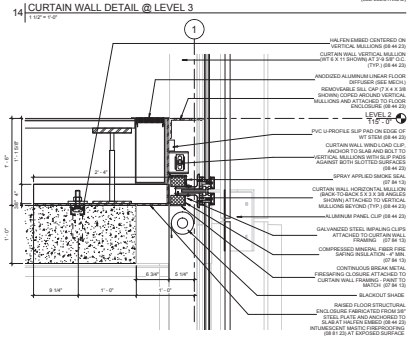


BRISE SOLEIL FIN ORENTATION SUN STUDIES

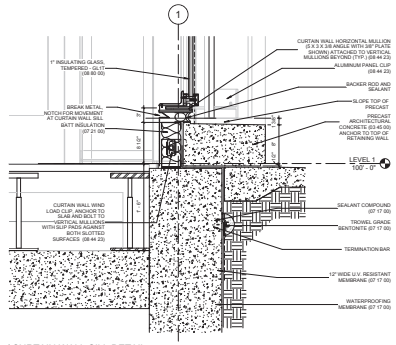
BIM IN ACTION: DETAIL DEVELOPMENT



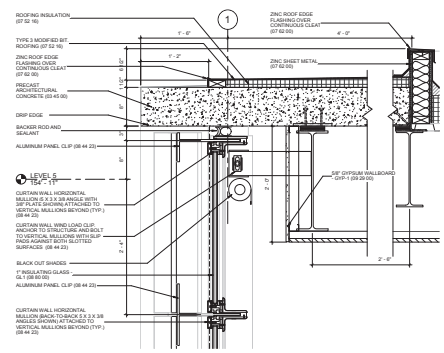
14 CURTAIN WALL DETAIL @ LEVEL 3
1 1/2" = 1'-0"



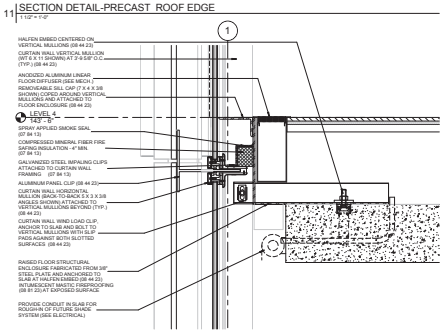
13 CURTAIN WALL DETAIL @ LEVEL 2
1 1/2" = 1'-0"



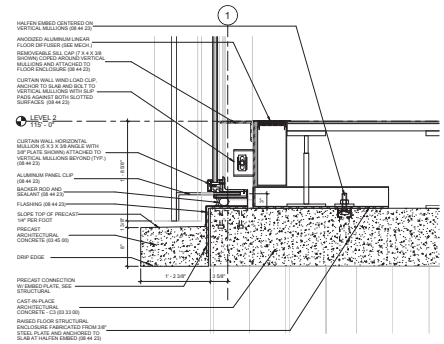
12 CURTAIN WALL SILL DETAIL
1 1/2" = 1'-0"



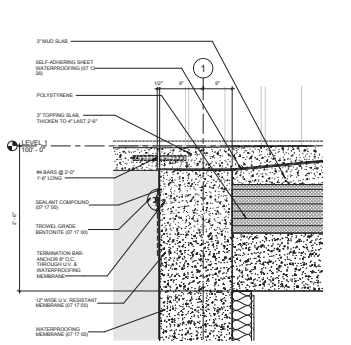
11 SECTION DETAIL-PRECAST ROOF EDGE
1 1/2" = 1'-0"



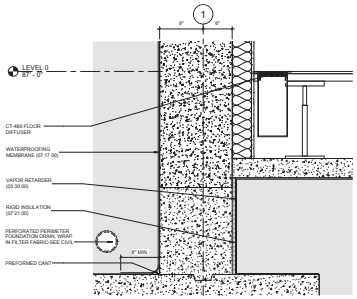
10 CURTAIN WALL DETAIL @ LEVEL 4
1 1/2" = 1'-0"



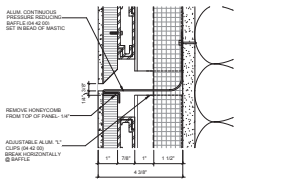
9 CURTAIN WALL SILL DETAIL @ PRECAST
1 1/2" = 1'-0"



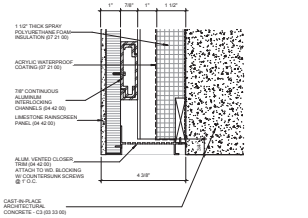
8 SECTION DETAIL- SUB GRADE
1 1/2" = 1'-0"



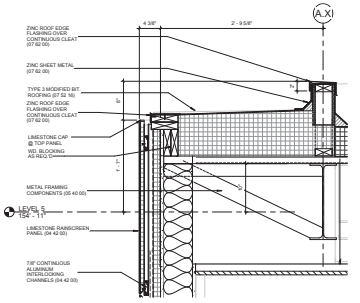
7 SECTION DETAIL- SUB GRADE
1 1/2" = 1'-0"



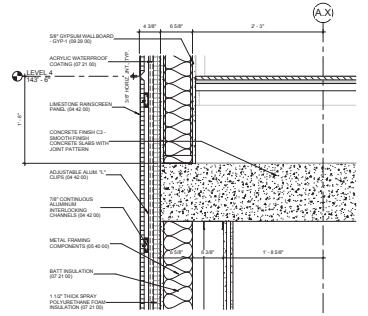
6 CONTINUOUS BAFFLE
6" = 1'-0"



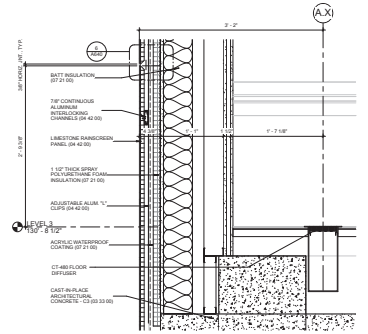
5 LIMESTONE TERMINATION
6" = 1'-0"



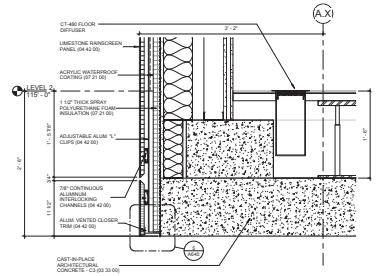
4 SECTION DETAIL @ LIMESTONE ROOF EDGE
1 1/2" = 1'-0"



3 SECTION DETAIL @ LIMESTONE
1 1/2" = 1'-0"



2 SECTION DETAIL @ LIMESTONE
1 1/2" = 1'-0"



1 SECTION DETAIL @ LIMESTONE
1 1/2" = 1'-0"

THE FINAL CURTAIN WALL DETAILS DEVELOPED FROM THE INTEGRATED MODEL REPRESENTED HERE IN THE CONSTRUCTION DOCUMENT SET

VOL WALKER HALL RENOVATION + ADDITION

CONTENTS: SECTION DETAILS

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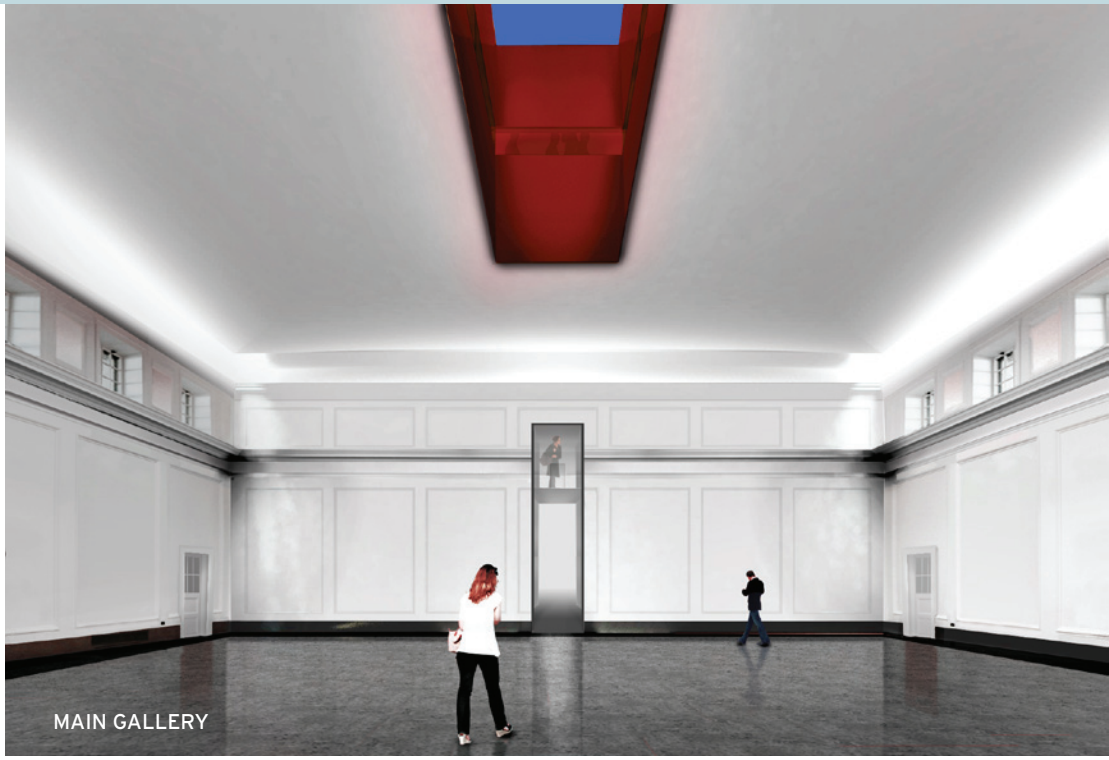
VISUALIZATION

The BIM processes allowed the architects to represent all aspects of the model from the holistic highly refined renderings to very specific three dimensional details.



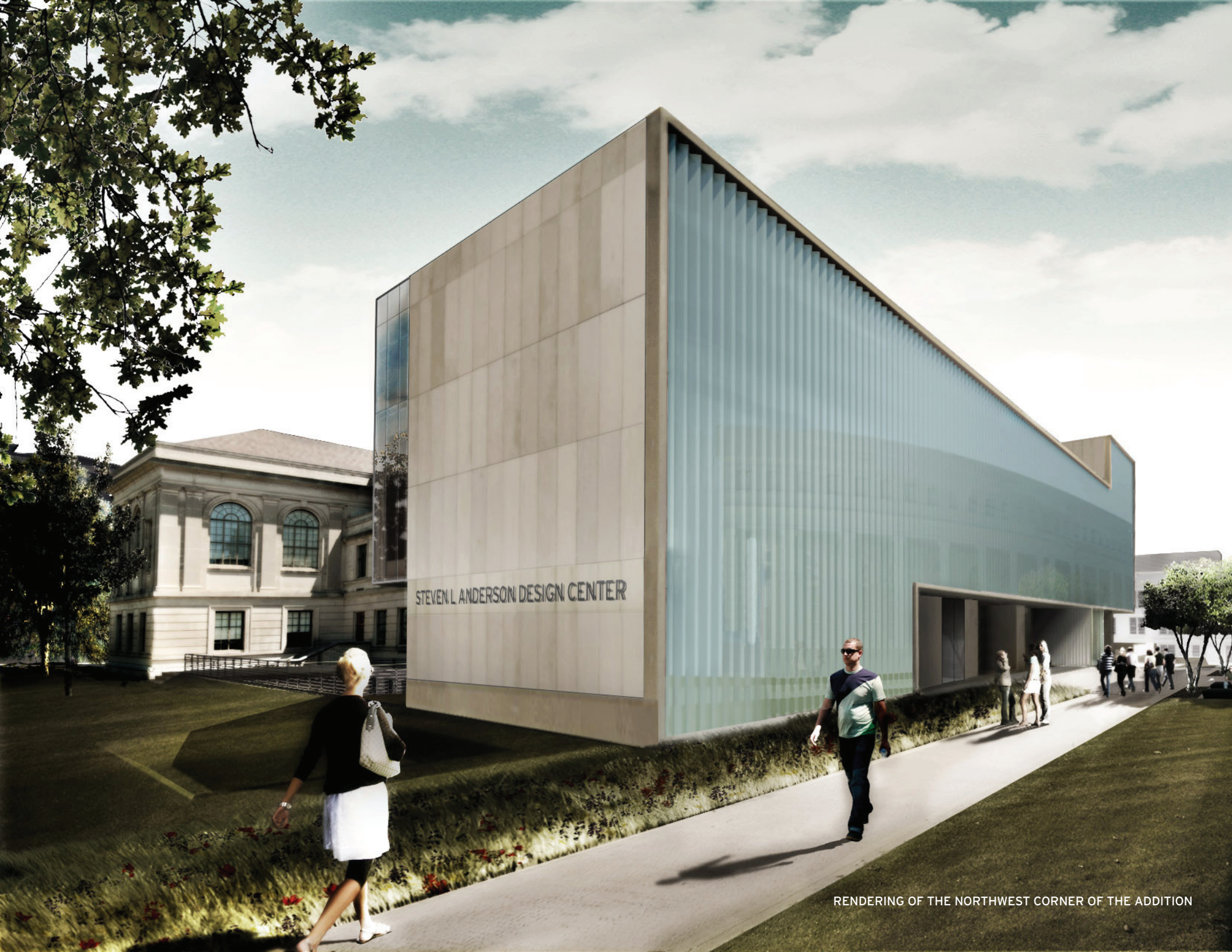
MAIN GALLERY

SOUTHWEST CORNER OF THE ADDITION

ROOF TERRACE WITH VIEW OF BOSTON MOUNTAINS

RENDERING OF THE RENOVATED READING ROOM IN THE EXISTING BUILDING

RENDERING OF THE AUDITORIUM IN THE ADDITION



RENDERING OF THE NORTHWEST CORNER OF THE ADDITION

It seems only fitting to use a school of architecture to demonstrate the remarkable evolution project delivery technology that BIM provides. Given the complexity and detail of the original Beaux Arts structure and the complementary modern addition, BIM allowed an unprecedented ability to explore the relationship between the two structures in order to create an ordered and unified whole. In this way, the Integrated Model itself becomes representative of the values of the school itself, committed to architecture that is of its time and place, but respectful of history.