AUTODESK UNIVERSITY

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From a Thought to Reality: How Collaboration for Revit Changes a Workflow

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Learning Objectives

- Discover how Collaboration for Revit can be implemented
- Discover tips and tricks for Collaboration for Revit
- Discover the stepping stones it takes to change your own workflow

Description

The demanding pace in the design industry for faster collaboration with outside consultants, and the need to provide multiple resources from different office locations, is making it necessary to find quicker and more-efficient solutions to resolve those demands. Hear how a 200-person architectural firm took A360 Collaboration for Revit cloud service and implemented it into its daily workflow, proving that a small pilot project to a multimillion-dollar hotel resort can save a lot of time, money, and effort in its new workflow. This session features Collaboration for Revit, A360.

Your AU Expert(s)

Glen A. Hines
BIM & Technical Operations Manager, McMillan Pazdan Smith

With 20 years in the design/teaching industry, Glen has been able to understand and build proper workflows while using the latest industry trends. At McMillan Pazdan Smith, Glen has taken the idea of using A360 Collaboration for Revit (C4R), and has built it into a workflow that now encompasses $300 million in projects costs.

Shannon Calloway Associate AIA
Sports Designer, McMillan Pazdan Smith

As a Sports Designer with McMillan Pazdan Smith, Shannon's career has focused on sports venues and athletic support facilities working for clients that range from Division II athletics to professional organizations. Shannon has been able to turn his experiences and lessons learned working on various projects with multiple design partners on different file sharing platforms into a practical expertise of BIM team collaboration.

McMillan Pazdan Smith

mcmillan | pazdan | smith
ARCHITECTURE

http://www.mcmillanpazdansmith.com/

McMillan Pazdan Smith is a regional, studio-based architecture, planning and interior design firm whose mission is to help clients create environments that embody their personalities, enrich their lives and enhance the quality of their community.

At McMillan Pazdan Smith, good design is integral to all of our services, creating functional, beautiful, cost-effective, and well-designed buildings that are long lasting and contribute to the success of our clients and the quality of life for our community. Good design is client focused, service oriented, value driven, and award winning.

Through our collaborative culture, creativity and innovative design solutions, McMillan Pazdan Smith enjoys a premier clientele and diverse portfolio of complex, sophisticated projects that have received local, regional and national recognition.

Practicing since 1955, McMillan Pazdan Smith currently has offices throughout the Southeast in Charleston, Greenville and Spartanburg, SC; Asheville and Charlotte, NC; and Atlanta, GA.

McMillan Pazdan Smith
Greenville, SC

McMillan Pazdan Smith: Building Information Modeling

With 230 employees, approx. 190 users are involved in the production phase by using BIM technology.

Revit:

- Building Design Suite - 190 users

Navisworks:

Simulate

- Installed on every user's machine - 190
- Encouraged to be used on all projects for visual clash detection during design.

Manage

- VDC clash detection reports by the BIM Coordinator on each project.

4 Ways BIM Collaboration Tools are Changing Design at McMillan Pazdan Smith

Technological innovations continue to drive better outcomes for our clients, especially in relation to BIM. Recently, architects at MPS worked with Autodesk 360 to pilot a new platform at our firm: Collaboration for Revit (C4R). Simultaneously, we introduce Navisworks into our standard workflow. Here are 4 quick ways our clients are already seeing the benefits of these great design tools.

Better Communications with the Design Team, Sub-Consultants and Clients

In our pilot projects, our design teams are now linked to the same cloud-based central file as our sub-consultants, in real-time. This allows the entire design team to work from one virtual location, eliminating much of the back and forth of swapping Revit model files with the various disciplines. It has significantly opened up lines of communication and the ease with which teams can collaborate.

Instantaneous Feedback

Due to the shared virtual file location, teams are also able to provide live feedback. This shortens the time needed for changes and approval processes, keeping the projects on schedule. Drawings, plans and models can be shared online with anyone, regardless of whether they have an A360 license, providing clients, and even local officials, a robust and interactive tool for critiquing and analyzing the design.

Cloud-based and Mobile-Friendly

Because C4R is cloud-based, it's accessible from anywhere that the project team has internet access. The well-developed mobile app allows the team to make notes, annotations and markups in the field – they can even upload photos to the model itself, drawing sharper connections between the digital model and the real-life building.

Improved Clash Detection

We're always looking for ways to increase our standards for document quality. Flying through a 3D model in real-time not only provides incredible benefits in seeing how the design actually works, it also provides highly accurate clash detection. And because all of the trades are collaborating in real time, it quickly becomes evident where changes need to be made ahead of time, eliminating wasted time and effort.

Discover How Collaboration For Revit Can Be Implemented:

C4R and McMillan Pazdan Smith Testing

Because C4R allows users to work in a mobile and Real-Time cloud environment, a testing period of 30 days was chosen.

Items to Consider When Testing:

- Revit System and C4R Requirements/Costs:
  Refer to Autodesk Knowledge Network or Autodesk provider.

- Internet Connection:
  Although it is highly encouraged to use the fastest internet connection possible, testing was done at all McMillan Pazdan Smith (MPS) office locations. Connections were done by being connected via a hard-wire network connection as well as using the local office WIFI connection in each office.

  Testing also took place at public locations in the cities of each MPS office i.e., coffee shops, restaurants, hotels, airports etc.

  Working on a home WIFI connection was also taken into consideration and tested.

- Revit Model:
  Because MPS was only in the testing phase and did not have a model that was built or used by C4R, a current non-C4R MPS project (370 MB) was chosen to be used as the initial testing model:

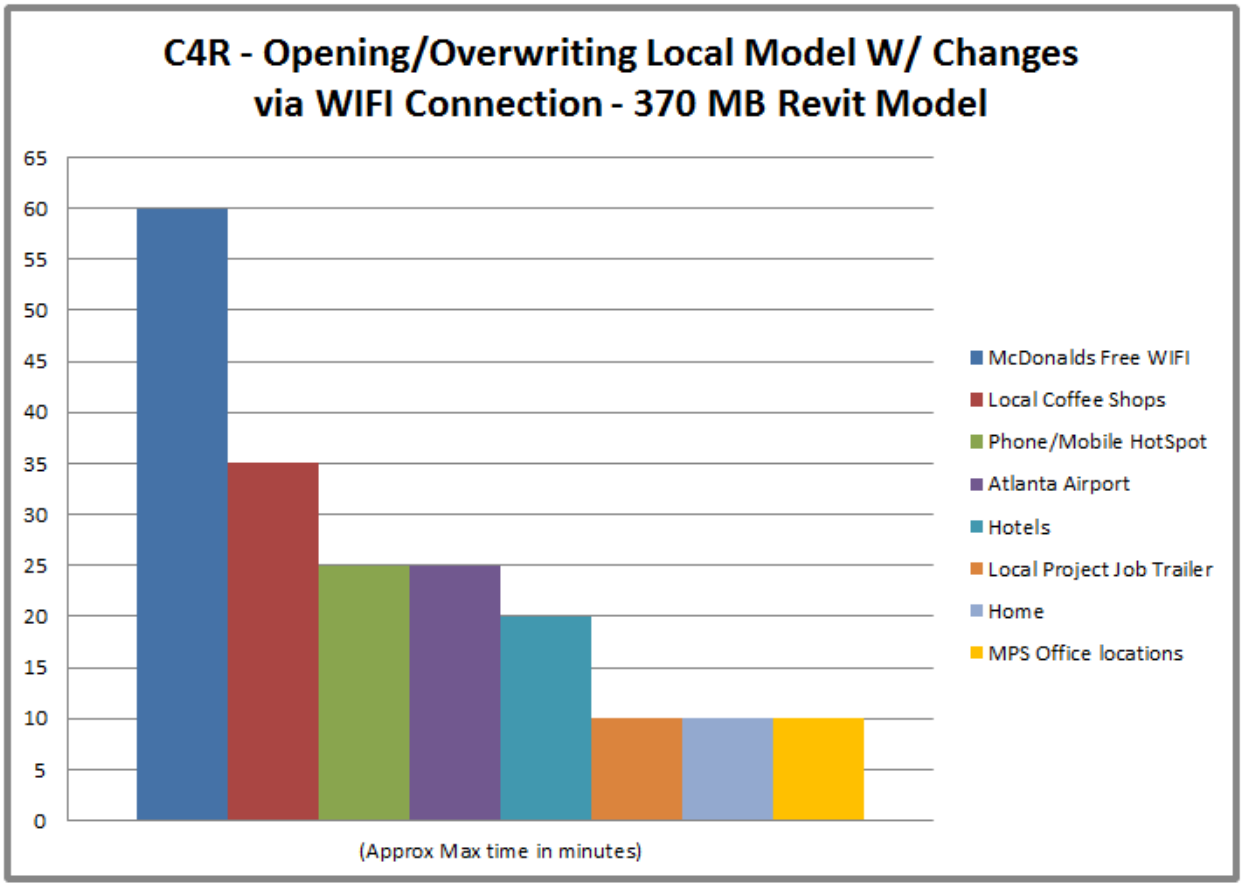
  Wofford College Jerry Richardson Indoor Stadium –
  $40 Million, 123,000 sq/ft, 3,400-seat basketball arena, 500-seat volleyball court, adaptable to seat 4,500 people for non-athletic functions, such as commencements and concerts.

RENDERING
WOFFORD COLLEGE JJR INDOOR ARENA

WIFI Connections – Opening/Creating A New Local Model:

Multiple WIFI locations for the testing model were utilized in opening and creating a new local copy for the first time.

During that time, every connection was successful, however, results varied in times when opening and creating a new local model for the first time:

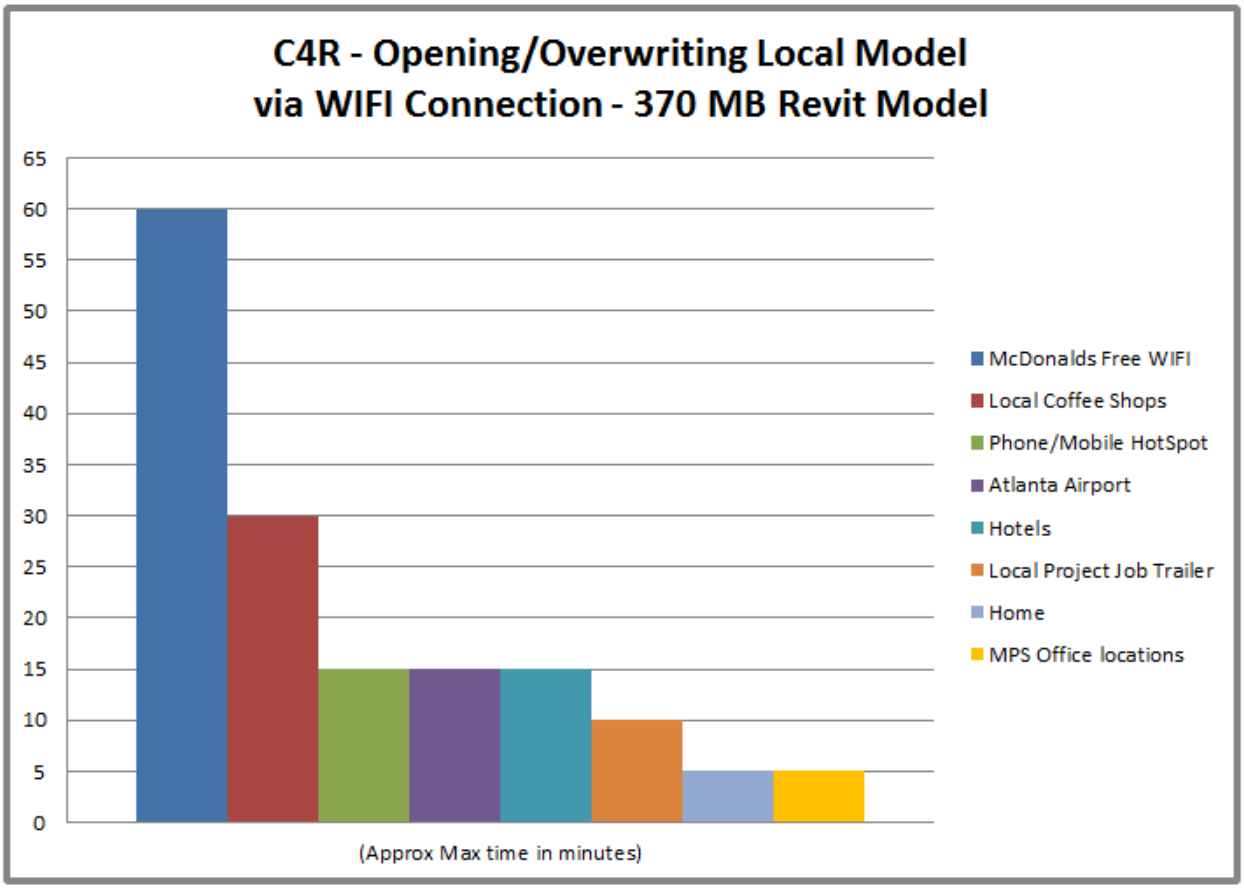


Note: Times listed above are approx. and can vary depending on local internet connection/provider and number of users on the same connection etc. For example: multiple coffee shops and hotels were chosen.

WIFI Connections – Opening/Overwriting Local Model

Once the model had been cached and a new local model was created for the first time, testing occurred again in the same locations, but taking into consideration that the model will be overwriting and recreating a new local Revit model with no changes.

During that time, every connection was successful, however, results changed.



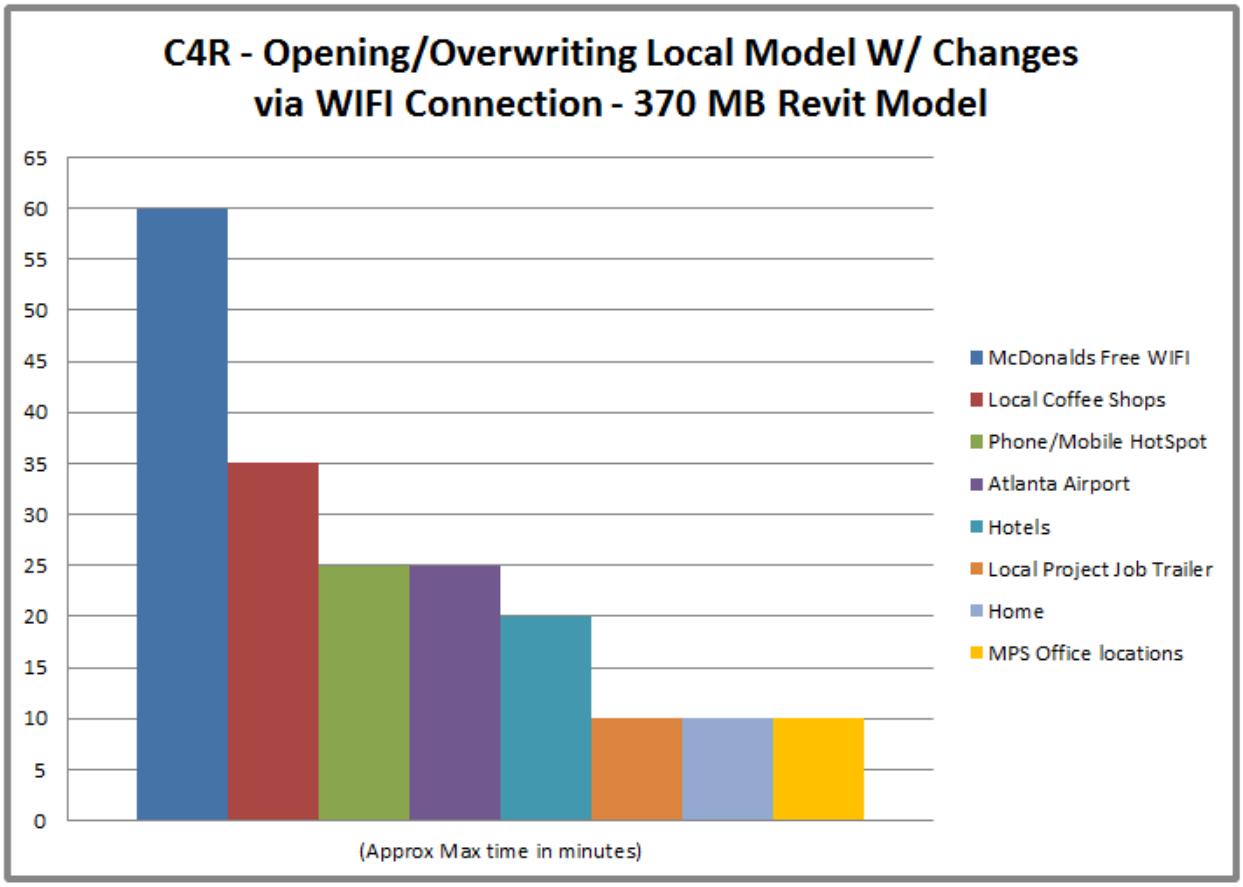
Note: Times listed above are approx. and can vary depending on local internet connection/provider and number of users on the same connection etc.

It must also be noted, that no changes were made to the Revit model from when the local model was created for the first time. This was simply overwriting the local model with the same Revit model only.

WIFI Connections – Opening/Overwriting Local Model With Updated Model

Once the previous testing had occurred, testing began again in the same locations, after significant changes occurred to the model and a new local model was created.

During that time, every connection was successful, however, results changed.



Note: Times listed above are approx. and can vary depending on local internet connection/provider and number of users on the same connection etc.

Best Results/Recommendations

With C4R allowing users to be successful in connecting to the model via a WIFI connection from various locations, users do have the ability in opening the model. It must be understood that different locations will result in different times.

The best recommendation is to be hard-wired into a network connection which will result in opening the model in under a three minute time frame.

Consultant/Discipline Testing

Because the primary function of using C4R is to have all consultants' models linked together via A360 and to be using a Real-Time format, MPS reached out to the structural engineer of the indoor arena testing model. They agreed to push a test model to the MPS A360 project team site and from there both models, Architectural and Structural, were connected.

Testing A360

Testing began by making adjustments in the test models to determine if each discipline could see positive results in the changes. Column, walls and other items were adjusted in both models and it was determined that C4R would produce Real-Time results when seeing changes made to each model without the need of swapping new models on a set schedule.

Testing also occurred over a two week period from different locations as well as different connections. All proved to have positive results.

In addition, additional models were created to be used and linked with the indoor arena test models. This would allow multiple linked files to be tested from various locations.

Again, all had positive results.

McMillan Pazdan Smith Pilot Projects

After testing the technical aspects of C4R over a period of 30 days and agreeing they were very successful, MPS moved forward with the workflow and to begin incorporated it into production on a pilot project.

After careful consideration, a pilot project was chosen that would share tasks between two architectural firms, consultants and contractors located between South Carolina and Georgia.

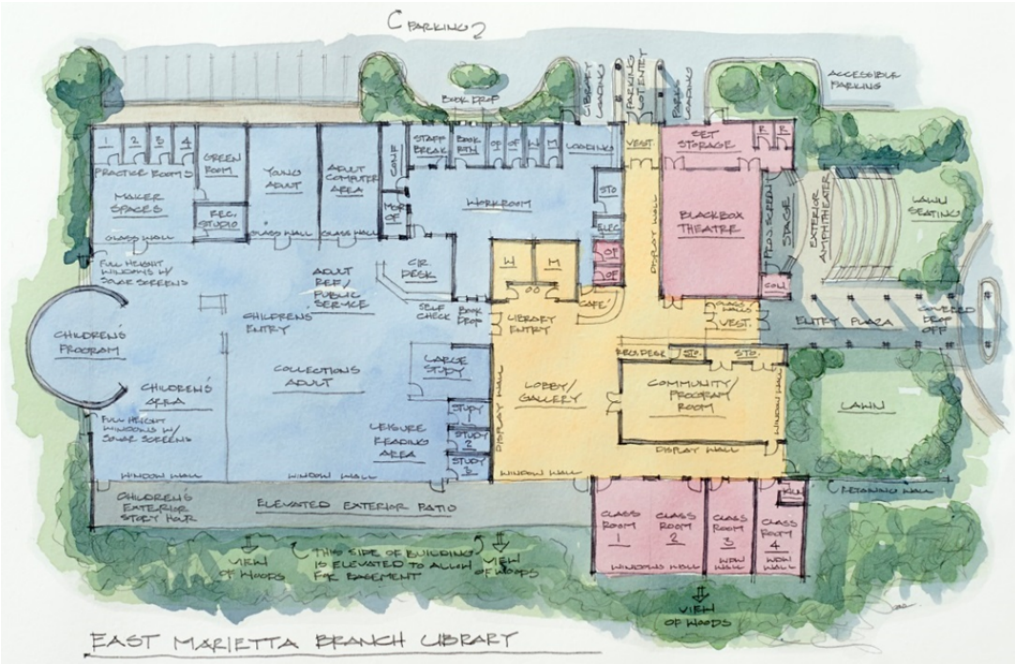
Pilot Project #1 - East Marietta Library

Marietta, GA – 1 Revit Model per discipline

Description and Construction Cost:

20,000 sq/ft Library with 11,000 sq/ft Cultural Center
Single story New Construction

Est. construction costs: $11,900.000.00



CONCEPTUAL FLOOR PLAN
CHAD ALEXANDER SMITH

Architects:

With two architectural firms, Chad Alexander Smith (Atlanta, GA.) and McMillan Pazdan Smith (Greenville & Spartanburg, SC), in partnership on the East Marietta Library Project, the architectural model needed to be shared between architects in three different locations.

BIM Kick-off

Coordination began with all consultants by establishing that C4R would be used on the project and was written into the BIM execution plan.

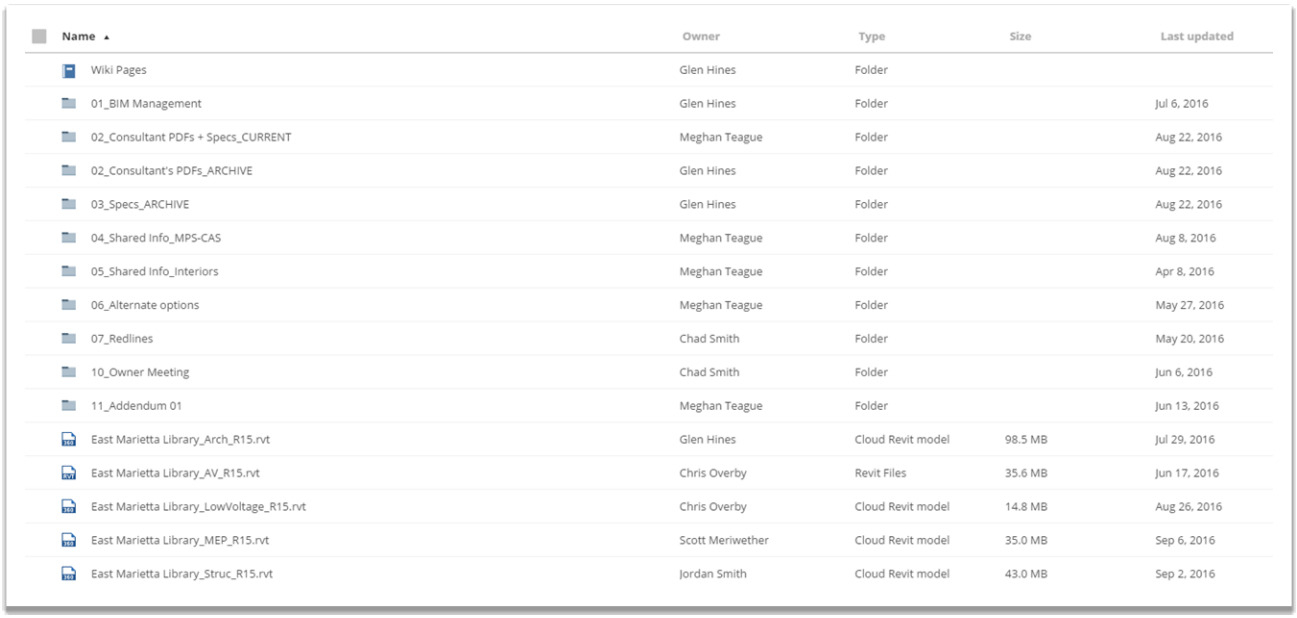
Consultants/Contractors:

Structural	Atlanta, GA
MEP	Atlanta, GA
Interiors	New York, NY
Contractor	Atlanta, GA

A360 Project Site

East Marietta Library

A project A360 team site was created to allow all users, consultants and contractors to share project models and other information, i.e., document, redlines, photos etc. during the scope of the project.



Name	Owner	Type	Size	Last updated
Wiki Pages	Glen Hines	Folder		
01_BIM Management	Glen Hines	Folder		Jul 6, 2016
02_Consultant PDFs + Specs_CURRENT	Meghan Teague	Folder		Aug 22, 2016
02_Consultant's PDFs_ARCHIVE	Glen Hines	Folder		Aug 22, 2016
03_Specs_ARCHIVE	Glen Hines	Folder		Aug 22, 2016
04_Shared Info_MPS-CAS	Meghan Teague	Folder		Aug 8, 2016
05_Shared Info_Interiors	Meghan Teague	Folder		Apr 8, 2016
06_Alternate options	Meghan Teague	Folder		May 27, 2016
07_Redlines	Chad Smith	Folder		May 20, 2016
10_Owner Meeting	Chad Smith	Folder		Jun 6, 2016
11_Addendum 01	Meghan Teague	Folder		Jun 13, 2016
East Marietta Library_Arch_R15.rvt	Glen Hines	Cloud Revit model	98.5 MB	Jul 29, 2016
East Marietta Library_AV_R15.rvt	Chris Overby	Revit Files	35.6 MB	Jun 17, 2016
East Marietta Library_LowVoltage_R15.rvt	Chris Overby	Cloud Revit model	14.8 MB	Aug 26, 2016
East Marietta Library_MEP_R15.rvt	Scott Meriwether	Cloud Revit model	35.0 MB	Sep 6, 2016
East Marietta Library_Struc_R15.rvt	Jordan Smith	Cloud Revit model	43.0 MB	Sep 2, 2016

Project Summary

After six months of design and multiple design changes in the project, East Marietta Library has been issued for construction. With all discipline models linked together via A360 and by using C4R in Revit, collaboration was and continues to be very successful.

With the success of technical testing and the quick success/results of the pilot project, McMillan Pazdan Smith invested in 5 additional licenses and moved to test C4R on Pilot Project #2 that would also run parallel with the Pilot Project #1.

Pilot Project #2 - Wild Dunes Hotel Resort Phase II

Isle of Palms, SC – 5 Revit Models per discipline

Description and Construction Cost:

The Wild Dunes Phase II Resort project is creating the new “front door” for the resort. The project is anchored by a 7 story - 150 room full service/family oriented room Hotel which consists of a 1,400sq/ft service oriented Spa with 3 outdoor plunge pools, a 8,000 sq/ft Ballroom devisable into 6 meeting areas, a 2,000sf Fitness Center, 4 kitchens of various scales, 3,500 sq/ft Administrative support, and 3,000sf of rooftop Event space with an 8,000 sq/ft of exterior Terrace overlooking the Ocean. Exterior grounds improvements involve extending and renovating the existing Promenade and new pool plaza levels and amenities. Within the project scope, we are also constructing a new destination Restaurant, an 600sf outdoor Pavilion, and a 400 sq/ft Welcome Center with three-lane covered canopy

Est. construction costs: $45,000.000.00

WILD DUNES HOTEL RESORT PHASE II - RENDERING
MCMILLAN PAZDAN SMITH ARCHITECTS

Architects:

McMillan Pazdan Smith – 7 users between 2 MPS locations

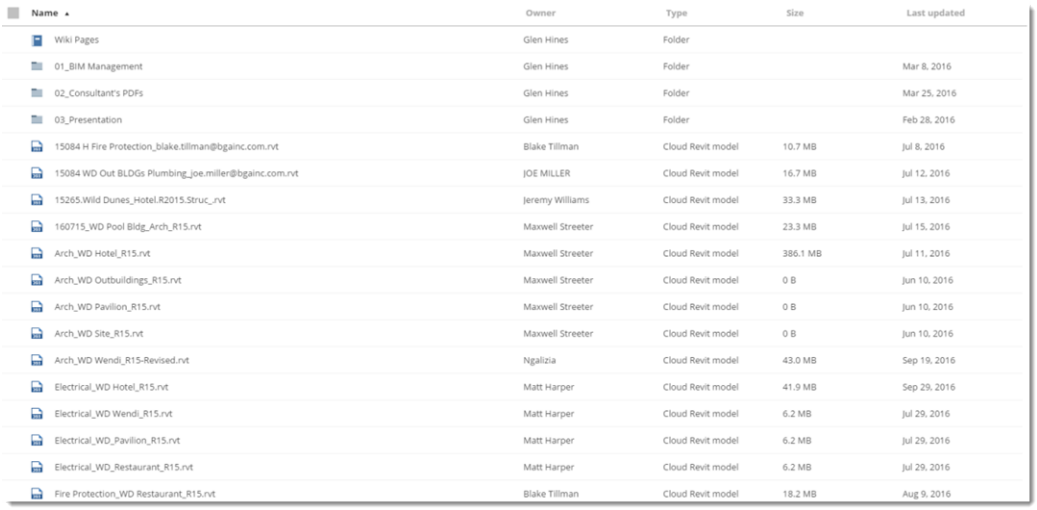
Consultants/Contractors:

Structural	North Charleston, SC
MEP	Columbia, SC
Interiors	Miami, FL

A360 Project Site

Wild Dunes Hotel Phase II

A project A360 team site was created to allow all users and other consultants to share project models and project information, i.e., document, redlines, photos etc. during the scope of the project.



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Wiki Pages	Glen Hines	Folder		
01_BIM Management	Glen Hines	Folder		Mar 8, 2016
02_Consultant's PDFs	Glen Hines	Folder		Mar 25, 2016
03_Presentation	Glen Hines	Folder		Feb 28, 2016
15084 H Fire Protection_blake.tillman@bgainc.com.rvt	Blake Tillman	Cloud Revit model	10.7 MB	Jul 8, 2016
15084 WD Out BLDGs Plumbing_joe.miller@bgainc.com.rvt	JOE MILLER	Cloud Revit model	16.7 MB	Jul 12, 2016
15265.Wild Dunes_Hotel.R2015.Struc_.rvt	Jeremy Williams	Cloud Revit model	33.3 MB	Jul 13, 2016
160715_WD Pool Bldg_Arch_R15.rvt	Maxwell Streeter	Cloud Revit model	23.3 MB	Jul 15, 2016
Arch_WD Hotel_R15.rvt	Maxwell Streeter	Cloud Revit model	386.1 MB	Jul 11, 2016
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Arch_WD Pavilion_R15.rvt	Maxwell Streeter	Cloud Revit model	0 B	Jun 10, 2016
Arch_WD Site_R15.rvt	Maxwell Streeter	Cloud Revit model	0 B	Jun 10, 2016
Arch_WD Wendi_R15-Revised.rvt	Ngalizia	Cloud Revit model	43.0 MB	Sep 19, 2016
Electrical_WD Hotel_R15.rvt	Matt Harper	Cloud Revit model	41.9 MB	Sep 29, 2016
Electrical_WD Wendi_R15.rvt	Matt Harper	Cloud Revit model	6.2 MB	Jul 29, 2016
Electrical_WD_Pavilion_R15.rvt	Matt Harper	Cloud Revit model	6.2 MB	Jul 29, 2016
Electrical_WD_Restaurant_R15.rvt	Matt Harper	Cloud Revit model	6.2 MB	Jul 29, 2016
Fire Protection_WD Restaurant_R15.rvt	Blake Tillman	Cloud Revit model	18.2 MB	Aug 9, 2016

Project Summary

Because the project is currently still in the design stage stage, enough information has been obtained to prove positive results.

Current McMillan Pazdan Smith C4R – A360 Projects

After extensive testing on the pilot projects, MPS moved forward in purchasing additional licenses and into implementing C4R into its daily work flow.

Anderson Institute of Technology

Anderson, SC – 1 Revit Model per discipline

Description and Construction Cost:

At 118,000 sf, the Anderson Institute of Technology is shared by three school districts and provides a CATE based curriculum. The facility will serve 1,400 students per day; 700 in the morning and 700 in the afternoon. The programs served by the facility include Health Science, Information Technology, Auto Mechanics, Welding, Machine Tool and Mechatronics.

Est. Construction Costs: $21,000,000
To be completed in 2019.

ANDERSON INSTITUTE OF TECHNOLOGY - RENDERING
MCMILLAN PAZDAN SMITH ARCHITECTS

Fairforest Middle School

Spartanburg, SC – 1 Revit Model per discipline

Description and Construction Cost:

Fairforest Middle School serves 1,100 students and provides a STEM based curriculum for 6th, 7th + 8th grade. The 225,000 sf two story building features three grade level communities designed around a learning commons, cafeteria, gym and planetarium.

Est. Construction Costs: $35,000,000
To be completed in 2019.

FAIRFOREST MIDDLE SCHOOL - RENDERING
MCMILLAN PAZDAN SMITH ARCHITECTS

Warren Mills Redevelopment

Spartanburg, SC – 2 Revit Model per discipline

Description and Construction Cost:

A 172,000 sf brownfield redevelopment of a 4 story, former textile mill into 82 residential units, a 500 seat banquet hall, future restaurant tenant spaces, offices, and a farmers market.

Est. Construction Costs: $18,000,000.00
To be completed in 2017.

WARREN MILLS - RENDERING
MCMILLAN PAZDAN SMITH ARCHITECTS

Spartanburg High School

Spartanburg, SC – 4 Revit models per discipline

Description and Construction Cost:

400k sf new high school for 2100-2500 students, 2 stories + basement. Additionally the project will include multiple sports fields and small field houses, and a full size high school football stadium.

Est. Construction Costs: $128,000,000.00
To be completed in 2019.

SPARTANBURG HIGH SCHOOL - RENDERING
MCMILLAN PAZDAN SMITH ARCHITECTS