General

Statement of Qualifications for Professional Building Documentation Services

by

ARC™
ARCHITECTURAL
RESOURCE CONSULTANTS

U.S. VETS BUILDING 13

We specialize in the documentation of the built environment through 2D CAD, 3D BIM, and advanced photo imagery.

USIBD™
U.S. Institute of
BUILDING DOCUMENTATION

For more information
Contact us at 888.362.4272
info@arc-corporate.com
or visit our website at www.arc-corporate.com

ARC™
ARCHITECTURAL
RESOURCE CONSULTANTS

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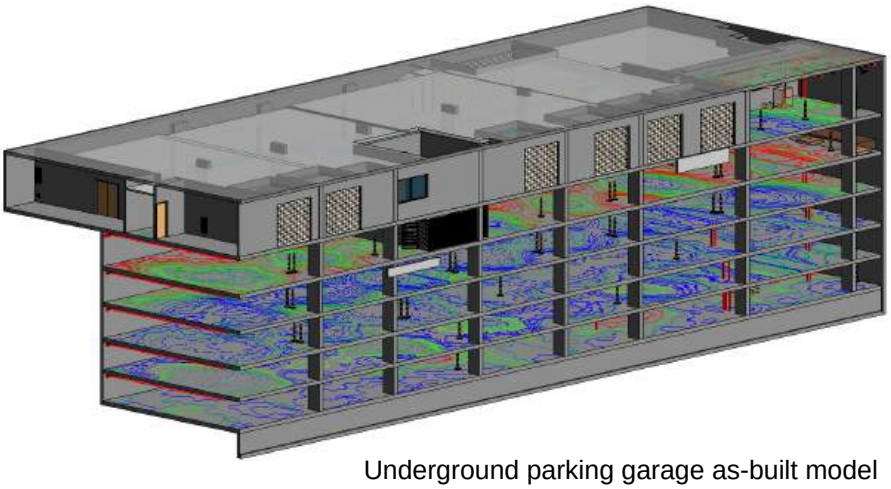
Introduction

ARC is pleased to submit this Qualification Package for Professional Building Documentation Services. While ARC is not the only provider of building documentation services, we are confident that the qualifications we present in this package will convince you that ARC is among the nation's most highly qualified and experienced providers of Professional Building Documentation services. To do this, we will present proof of our proven track record of providing the highest quality product and service as evidenced by our clients. After reviewing this package, we believe you will conclude ARC offers the highest value when considering our experience, flexibility, price and understanding of the task at hand. This package will outline key individuals from ARC's project team, sample relevant projects, references, letters of recommendation, testimonials and a third party white paper written by one of our clients.

Our mission is to assist those who recognize the complexities of existing conditions and wish to minimize their risks by proactively seeking to document such conditions in advance of them becoming an issue.



Underground parking garage as-built model with floor flatness map applied

888.362.4272
info@arc-corporate.com
www.arc-corporate.com

Expertise and the Value We Provide

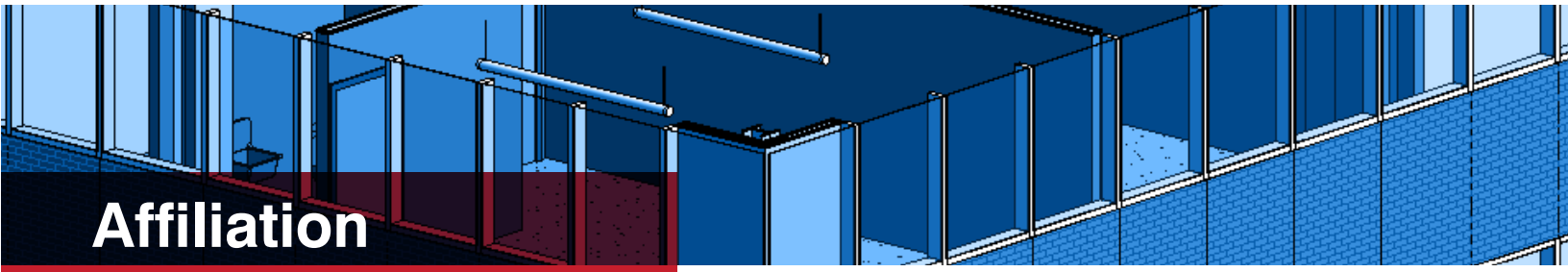
Expertise

ARC has specialized in providing high quality building documentation services since 1997. We believe that owners, designers and contractors do not need to be subjected to unforeseen existing conditions or the associated costs and time delays that often accompany them. During this time, ARC has focused on perfecting the means, methods and best practices to provide extremely accurate as-built documentation using the latest in technologies such as HDS (High Definition Survey) 3D Laser Scanning (3DLS) and advanced photo imagery.

The Value We Provide

By uncovering the unknown with regards to existing conditions, we save our clients both time and money while reducing their risk and liability. Some owners, designers and contractors consider the documentation of existing conditions to be an added expense. However, many have come to realize that accurate existing conditions documentation is the best insurance policy to save themselves time and money. Often, one change order related to unknown existing conditions can more than pay for the cost of the survey. However, by then it's too late. Savvy clients have come to realize that a design based on un-validated record drawings is only as good as the documentation itself. ARC is expert in building documentation and through its years of experience has accumulated the knowledge of how to avoid becoming the victim of expensive existing conditions change orders.

We find and fix problems before they become expensive.



Affiliation

ARC is a proud member and founding supporter of the U.S. Institute of Building Documentation (USIBD) www.usibd.org. Founded in 2012 by ARC's President and CEO, John Russo, the USIBD is a non-profit membership organization and serves as the leading resource for the building documentation industry. The USIBD was founded to promote and facilitate:

- Building Documentation as a distinct industry; establishing standards, guidelines and best practices to foster excellence in the productivity, quality and safety of the documentation process
- The codification of ethical practices to support and further the growing network of professionals dedicated to Building Documentation
- Cooperation and the exchange of information among documentation professionals who are responding to growing interest in Building Documentation by owners/operators, service providers, government agencies, and the public
- The establishment and promotion of "Certified Building Documentation Professional" certification (CBDP).
- The institution of a core educational resource dedicated to the pioneering technology of the Building Documentation industry
- Recognition of individuals for outstanding dedication and service to the Building Documentation profession

Proud Member of

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BUILDING DOCUMENTATION

www.usibd.org

Key Individuals

John M. Russo

President / CEO - ARC

John M. Russo, AIA, is an experienced architect, technologist and entrepreneur. He founded Architectural Resource Consultants (ARC), a firm that has specialized in providing outsourced architectural services to the architectural, engineering, construction and owner / operator (AEC) communities since 1997. With a professional career spanning back to 1984, Mr. Russo has developed his passion for as-built documentation of buildings and facility life cycle solutions into a thriving award winning business.

As President/CEO, Mr. Russo's responsibilities include strategic planning, day-to-day operations management, business development and client relations. Mr. Russo's professional experience includes: laser as-builts; including working with Total Station lasers and HDS 3D laser scanners, design, space planning, construction document preparation and coordination, production management, quality assurance review, agency processing and construction administration.

His project experience encompasses a broad range of project types including automotive, commercial, educational, entertainment, health care, hospitality, industrial, institutional, restaurant, retail and residential.

At ARC, Mr. Russo successfully led his team in a nationwide competition for a 5 year, $30 million IDIQ contract with the U.S. General Services Administration (GSA) for Nationwide Laser Scanning and BIM Services. Under this contract, in 2011, ARC was selected amongst its peers to develop GSA's Laser Scanning QA/QC Process for the Office of Design and Construction in which Mr. Russo played a pivotal role. In fact, ARC is the only firm to have won two consecutive 5 year GSA IDIQ contracts for nationwide laser scanning and BIM services.

Mr. Russo is a member of the Orange County Chapter of the American Institute of Architects (AIA) and is one of the founding members of the Orange County IT/CAD Manager's Technology Roundtable. He has serves as a member of the Building SMART Alliance as well as has serves on the SPAR 3D Board of Advisors. Mr.Russo has also participated on AGC's BIM Forum Level of Development (LOD) Core Group, which is responsible for the continued development of one of the most pivotal tools used by the AEC industry to specify LOD in a Building Information Model (BIM).

In 2011, Mr. Russo founded the U.S. Institute of Building Documentation (USIBD) - a non-profit membership organization dedicated to furthering excellence of building documentation for which he was awarded the SPAR Star Award in 2012 for outstanding contributions to the industry. He currently serves on the Board of Directors and as President of USIBD.

Mr. Russo has been a keynote speaker at the FARO User Conference and a featured speaker at many other industry shows and conferences such as the AIA Technology in Project Design, Delivery and Facility Management, the Leica Worldwide User Conference, the GSA BIM Conference, the GSA Technology Show Case, SPAR, Hexagon, ESRI, the Re4vit Technology Conference (RTC), and ENR's Future Tech. He has been a contributing author for the LiDAR News and GeoDataPoint and has been featured in articles in ENR, POB Magazine and LiDAR Magazine. Mr. Russo holds a Bachelor of Arts in Business Administration from California State University, Fullerton and an Associate of Arts degree in Architecture from Orange Coast College. He is a registered architect in the state of California (License no. C-24884).

OSHA 30 HOUR SAFETY CERTIFIED

USIBD U.S. Institute of BUILDING DOCUMENTATION
LEVEL OF ACCURACY
LOA v3.0 CERTIFIED
John Russo

Key Individuals

Mick Cunningham

Senior Project Architect / Director of Operations

Mick Cunningham is a Senior Project Architect with Architectural Resource Consultants (ARC) and has over 30 years of architectural work experience in building code analysis, construction document preparation, quality assurance review, interdisciplinary document coordination, plan check agency processing and construction administration on a variety of project types including healthcare, educational, commercial, industrial and retail.

Mr. Cunningham serves ARC as both a Senior Project Architect and Director of Operations. As Director of Operations, Mr. Cunningham is responsible for the overall management of ARC's production operations and the continued professional development of ARC's production staff. He also has experience in HDS (High Definition Survey) 3D Laser Scanning (3DLS), capturing and processing HDR (High Dynamic Range) 360 Degree Photo Imagery, and traditional 2D survey methodologies.

Mr. Cunningham has a Bachelor of Science in Architectural Studies and a Master of Architecture from University of Illinois at Urbana – Champaign and has also completed coursework at Coastline Community College in Fountain Valley, CA towards a Building Inspection Technology Certificate. Mr. Cunningham is a registered architect in the State of California (License no. C-23408).

Throughout his architectural career, Mr. Cunningham has been a part of many industry associations. He is a former CSI Certified Documents Technician, Certified Construction Contract Administrator and Certified Construction Specifier as well as a former ICBO Certified Plans Examiner and Certified Accessibility / Usability Specialist. Mr. Cunningham has also been a contributing author to leading industry publications such as LiDAR News and LiDAR Magazine.

Since 2012 Mr. Cunningham has been a member of USIBD (U.S. Institute of Building Documentation). Mr. Cunningham holds a certificate from a 10-Hour Hazard Recognition Training with OSHA (Occupational Safety and Health Administration).

Key Individuals

Jorge Vargas

CAD / BIM Manager

Jorge Vargas serves as ARC's CAD and BIM Manager. With over 20 years of architectural experience, Mr. Vargas coordinates survey staff on job sites is responsible for the ongoing development of ARC's CAD and BIM Standards.

Mr. Vargas is a highly skilled senior technician with experience in AutoCAD, Revit, and ReCap and is also experienced in operating HDS 3D Laser Scanners, Total Stations, and handheld laser range finders. He holds a certificate from a 10-Hour Hazard Recognition Training with OSHA (Occupational Safety and Health Administration).

Mr. Vargas received his Associates of Arts degree in AutoCAD from MTI College, Santa Ana, CA, and has studied Surveying / Mapping Sciences at Santiago Canyon College, Orange, CA. Since joining ARC in 2000, Mr. Vargas has worked on numerous projects including office buildings, health care, schools, entertainment, retail, hotels and hospitals.

Mr. Vargas is a member of USIBD (U.S. Institute of Building Documentation).

Key Individuals

Genaro (Junior) Vargas

Senior Laser Scanning Technician

Junior Vargas is a Senior Laser Scanning Technician and BIM modeler at Architectural Resource Consultants (ARC). With over 10 years of architectural experience, Mr. Vargas coordinates scanning operations on jobsites and leads the scan data post-processing efforts in the office.

Mr. Vargas is highly skilled in using ARC's Leica and FARO HDS Phase-based and Time-of-Flight 3DLaser Scanners, and utilizing Leica's Cyclone and Cloudworx, FARO Scene, Bentley Point Tools, and Technodigit's 3D Reshaper software packages as well as Autodesk's AutoCAD and Revit. He also performs 2D surveying using Hand-held Laser Range Finders and AutoCAD.

Mr. Vargas holds a certificate in Engineering Computer Aided Drafting and Design from Santa Ana College, Santa Ana, California. In addition, he has completed specialized training from both Leica Geosystems and FARO on the use and best practices of HDS laser scanning as well as processing laser scan data. Since joining ARC in 2008, Mr. Vargas has worked on numerous projects including office buildings, healthcare, schools, entertainment, retail, hotels, and hospitals.

Mr. Vargas is a member of the USIBD (U.S. Institute of Building Documentation).

OSHA 10 HOUR SAFETY CERTIFIED

LAS VEGAS CONVENTION CENTER

LAS VEGAS, NEVADA

The world renowned Las Vegas Convention Center was originally built in the 1940s and has since been added onto several times over the years. Today the convention center is comprised of four main areas: North Hall, Central Hall, South Hall, and the Grand Concourse. Each area contains a variety of spaces including: convention halls, meeting rooms and general support space encompassing over 3.8 million square feet. The Convention Authority decided to undertake an $890 million dollar renovation intended to correct a number of concerns with the existing facility.

There was no route for visitors to take to get from North Hall to South Hall without walking outdoors. The same issue existed for visitors traveling between the monorail station and the convention facility. Upon completion, a new grand concourse will join North Hall to South Hall, a new enclosed pedestrian bridge will join the monorail station to the convention center and the facility will have additional meeting room capacity and improved egress to and from the site.

The project architect was in need of an accurate building and structural grid as-built. While existing record drawings were available, there was no single, unified overall floor plan or structural grid system that combines all of the building plans into one. While attempting to piece together the existing record drawings to create an accurate as-built, the architect discovered that there were dimensional discrepancies of up to eight feet. Due to the enormous size and length of the facility, the process of assembling record drawings, that may have worked on a much smaller facility, revealed that a more accurate method and professional expertise would be required.

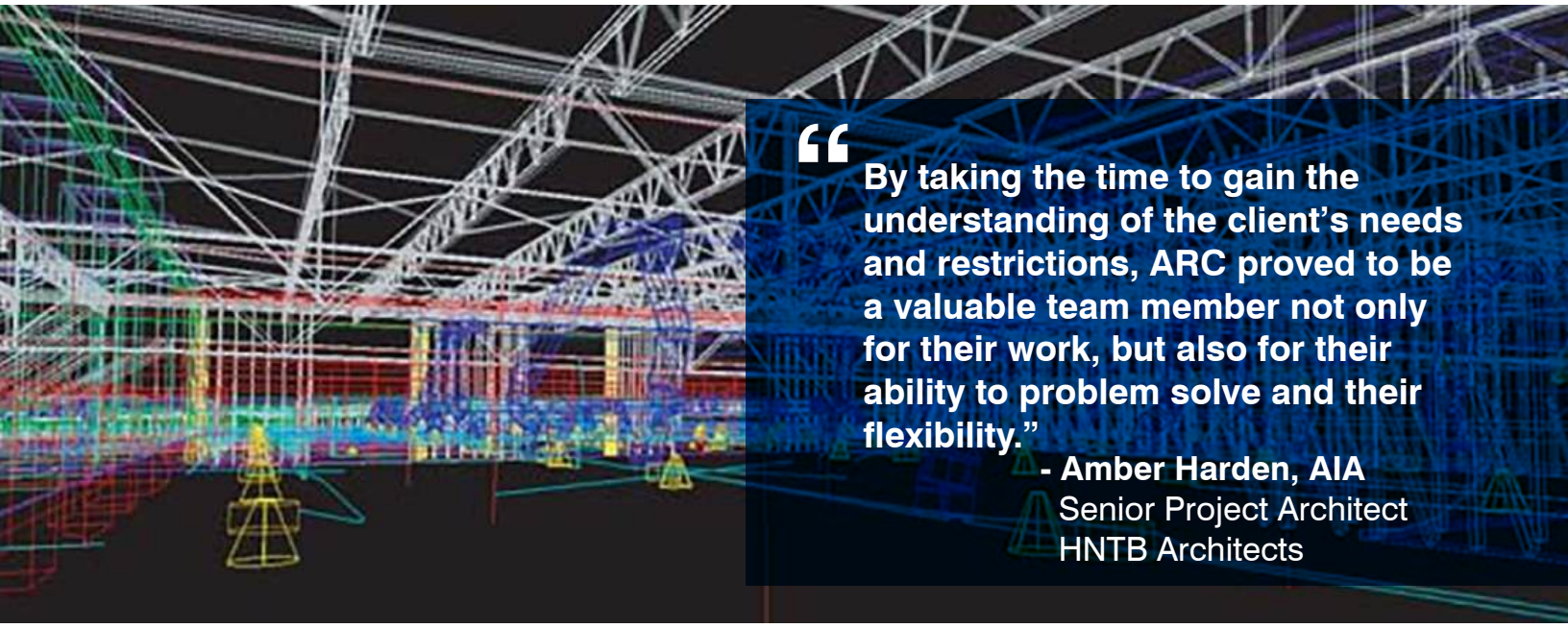
Project Square Footage
3.8 million s.f.

Market Sector
Events + Assembly

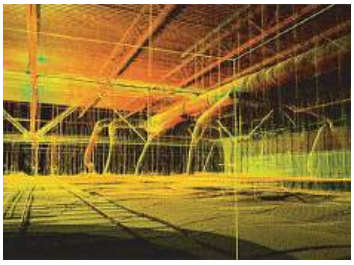
Project Type
Convention Center

Year Completed
2008

Client
HNTB, Kansas City, MO
Lanson Nichols
Vice President Sports Architecture
816.507.4453
lnichols@HNTB.com



> **“By taking the time to gain the understanding of the client’s needs and restrictions, ARC proved to be a valuable team member not only for their work, but also for their ability to problem solve and their flexibility.”**
>
> **- Amber Harden, AIA**
> Senior Project Architect
> HNTB Architects



ARC was hired to lead an experienced team of professional surveyors, document the existing conditions, and deliver accurate 2D building floor plans, a unified structural grid system, and 3D above ceiling plenum models. Due to lost time, the team had only three months to complete the task and would be required to do so while the facility remained fully operational.

Not only did ARC’s team deliver the completed project on time and on budget, but it did so without any change orders or call-backs. As a result of the timeliness and accuracy of the documents, the client maintained their schedule and expected to save millions of dollars through reduced change orders during construction.

The team used the latest technologies to accomplish the task including GPS, digital levels, HDS laser scanners, and robotic and reflector-less total stations with measurements sent into CAD in real-time on site.

Image Descriptions

Above: Plenum model derived from point cloud data using Autodesk Architecture

Top Left: rendering of connector exterior

Middle Left: 3D laser scanner point cloud data from above-ceiling plenum scan

Bottom Left: rendering of connector interior

Featured in POB Magazine
February 2009

Awarded 2nd place in POB’s 2008 Highlights in Surveying Contest

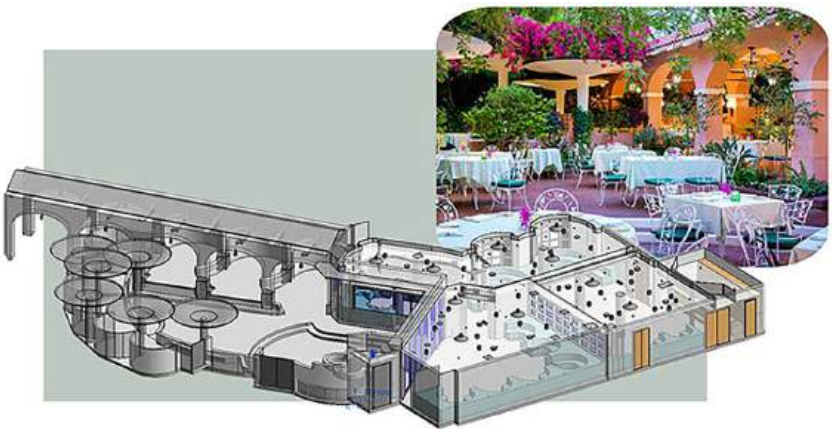
To view online article, visit https://www.pobonline.com/articles/92962-a-winning-bet

BEVERLY HILLS HOTEL

BEVERLY HILLS, CALIFORNIA

The Beverly Hills Hotel was opened in 1912, two years prior to the incorporation of the city of Beverly Hills itself. The five-star hotel consists of 210 guest rooms on 4 floors and a series of 23 unique stand-alone multi-unit villas.

Architectural Resource Consultants (ARC) was hired to provide a field survey and CAD as-builts of the hotel lobby, guest rooms, 73-year-old polo lounge, and the stairs and porte cochere in order to proceed with renovations of the facility.



Side-by-side image and 3D Revit model of the Polo Lounge

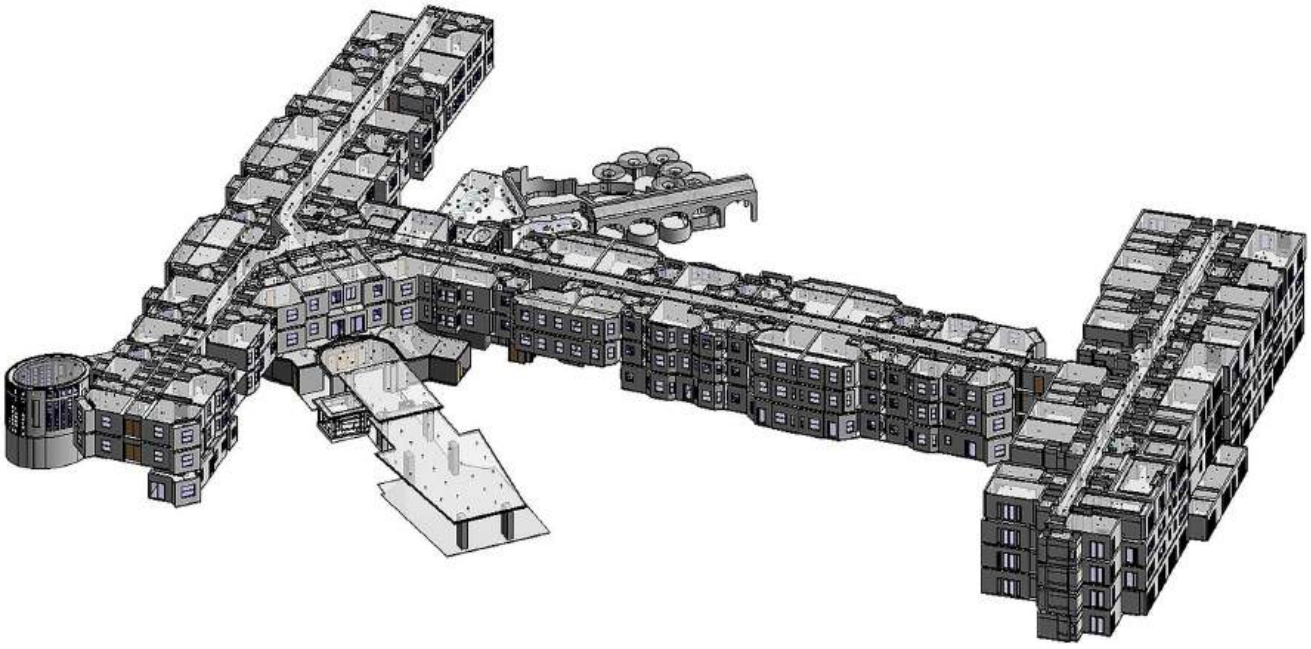
Project Square Footage
~ 136,000 s.f.

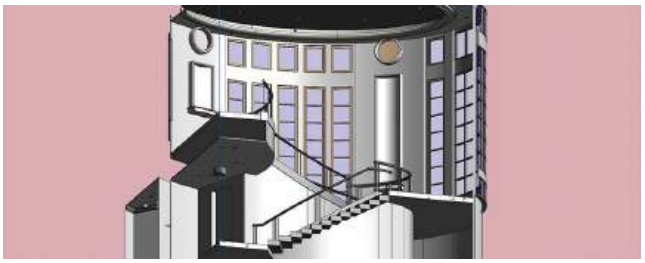
Market Sector
Hospitality

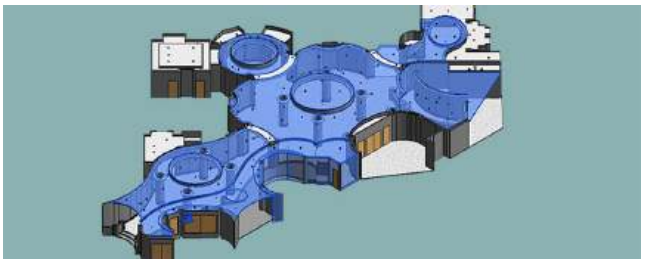
Project Type
Hotel

Year Completed
2012

Client
WATG
Rafael Velazquez
Associate Vice President / Senior Project Architect
949.270.3092
rvelazquez@watg.com







The survey was completed using 3D HDS (High Definition Survey) Laser Scanning. A survey control network was established with an intent to further expand upon it in the future. ARC also set permanent (yet discrete) control markers so that the control network could be established to a known benchmark and tied in through GPS. Laser scans were registered together and tied to the control network so the data and model were geo-referenced to a real-world coordinate system.

ARC's final deliverables included a 3D BIM of the hotel interior, 2D floor plan, 2D power/signal plan, and 2D reflected ceiling plans.

Image Descriptions

Above: 3D Revit model of the Beverly Hills Hotel guestrooms

Top left: 3D Revit model of the grand staircase

Middle left: panoramic image of the hotel lobby

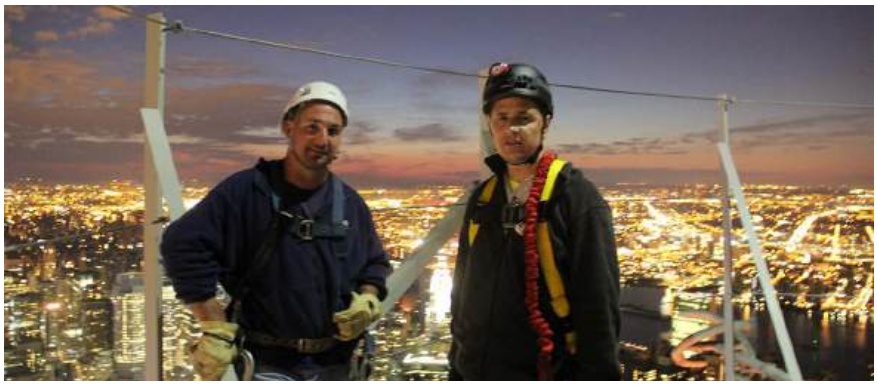
Bottom left: 3D Revit model of the hotel lobby

EMPIRE STATE BUILDING ANTENNA MAST

NEW YORK, NEW YORK

The construction of the Empire State Building lasted from March 1930 to May 1931. The 102-story building is 1,250 feet tall; 1,457 feet including its antenna mast.

Architectural Resource Consultants (ARC) provided HDS 3D Laser Scanning, photo imagery, and modeling services to document the antenna mast atop the Empire State Building.



Scan crew at the top of the Empire State Building

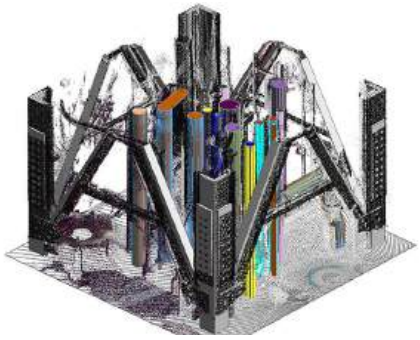
Market Sector
Commercial

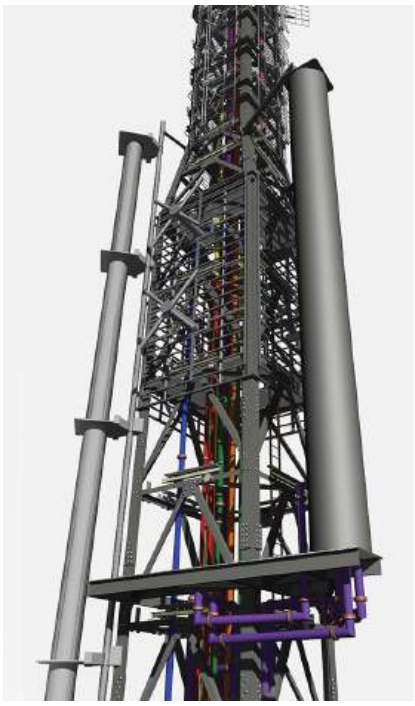
Notable Fact
World's tallest building for 40 years

Project Type
Commercial Office

Client
Meridian Design Associates
Luis Roges
Operations Principal
212.584.5430
luis@meridiandesign.com

Year Completed
2013





This was an extremely dangerous and challenging project involving climbing a 200-foot antenna mast at the top of one of the tallest buildings in the world in order to document the antenna mast structure and infrastructure. 3D laser scanning and advanced 360 HDR (High Dynamic Range) photo imagery were utilized.

ARC custom fabricated scanner rigs designed specifically to meet the unique conditions of this project. The resulting documentation led to the development of a 3D BIM.

This project demonstrates ARC's ability to perform as-built surveys in extremely challenging environments and meet expedited schedule constraints.

Image Descriptions

Left: Northwest view of antenna mast BIM model

Top left: base of the antenna mast model with laser scan data

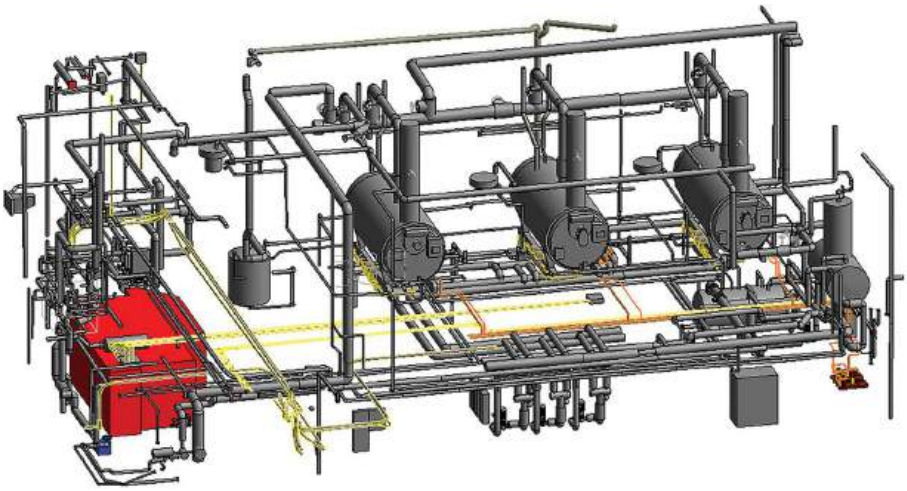
Lower left: scan technician looking upward inside the Empire State Building antenna mast

Top right: model as viewed from level 4 of the antenna mast

ALTOONA VA MEDICAL CENTER

ALTOONA, PENNSYLVANIA

The Altoona Veterans Affairs Medical Center provides medical services to nearly 25,000 men and women who have served the nation. The medical center has striven to improve the health of veterans since its opening in 1950. In 2013, the existing facility needed to renovate it's boiler room.



BIM of MEP systems

Market Sector
Healthcare

Project Type
Hospital

Year Completed
2013

Client
Miller Remick LLC
George Eustis
Director of Engineering
856.429.4000
geustis@miller-remick.com

Architectural Resource Consultants (ARC) was hired to provide High Definition Survey (HDS) 3D laser scanning (3DLS) services and deliver an As-built Revit 2012 Model.

The area captured included the entire basement level and the first floor including: boiler room, control room, tool room & restroom.

ARC's expert Revit operators modeled all penetrations in the floor and roof; all building structural features such as beams, columns, walls; and all piping that was 2" and larger.

Image Descriptions

Above: Revit model of MEP elements

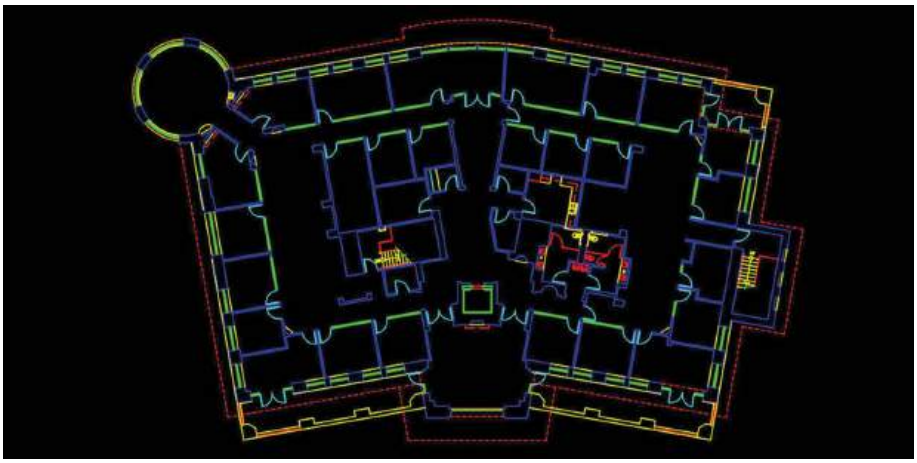
Top left: image of boiler room MEP elements

Bottom left: ARC scan technician in action on catwalks

BOMA SURVEY

TEMECULA, CALIFORNIA

Architectural Resource Consultants (ARC) was hired to create an as-built BOMA of a three-story building located in Temecula, CA. The client was investigating changing the multi-tenant second floor to single-tenant and the single-tenant third floor to multi-tenant. In order to proceed with those plans, the client needed to accurate measurements to ensure that it maximized the rentable square footage.The 2D as-built survey was performed using a Total Station Laser and Hand-held Laser Range Finders. All measurements were recorded in AutoCAD on site utilizing laptop computers for a very efficient process ensuring the accuracy of all measurements.



As-built CAD floor plan

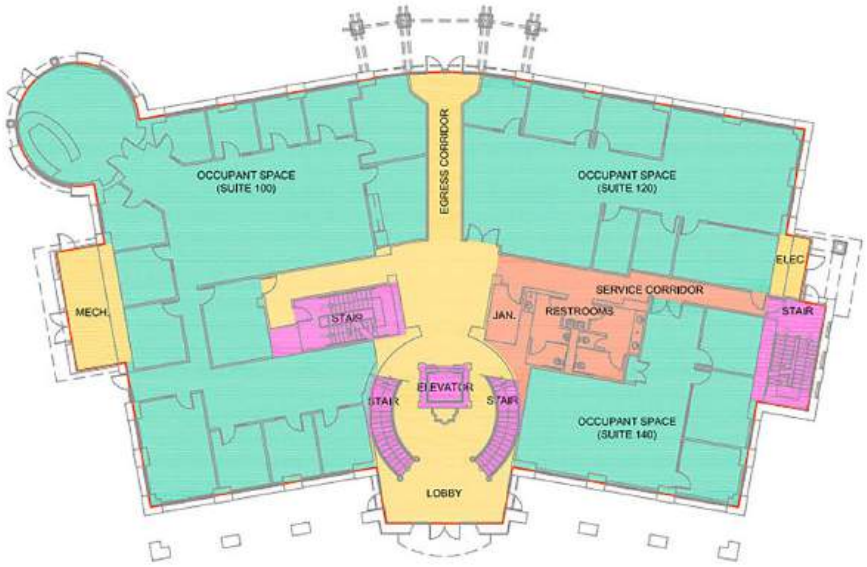
Project Square Footage
~29,646 s.f.

Market Sector
Commercial

Project Type
Commercial Office

Year Completed
2015

Client
The Garrett Group, LLC
Paul Garrett
President
951.506.6556
pgarrett@thegarrettgroup.net



VOID AREA (FIRST FLOOR)	0 S.F.
PARKING (FIRST FLOOR)	0 S.F.
OCCUPANT STORAGE (FIRST FLOOR)	0 S.F.
OCCUPANT AREA (FIRST FLOOR)	7,657.1780 S.F.
SUITE 100	4,175.9296 S.F.
SUITE 120	2,161.1847 S.F.
SUITE 140	1,320.0637 S.F.
OCC. AREA/EXTENDED CIRC. (FIRST FLOOR)	0 S.F.
BASE BUILDING CIRCULATION (FIRST FLOOR)	0 S.F.
BUILDING AMENITY AREAS (FIRST FLOOR)	0 S.F.
BUILDING SERVICE AREA (FIRST FLOOR)	1,873.4224 S.F.
FLOOR AMENITY AREA (FIRST FLOOR)	0 S.F.
FLOOR SERVICE AREA (FIRST FLOOR)	763.4918 S.F.
DEMISING LINE	

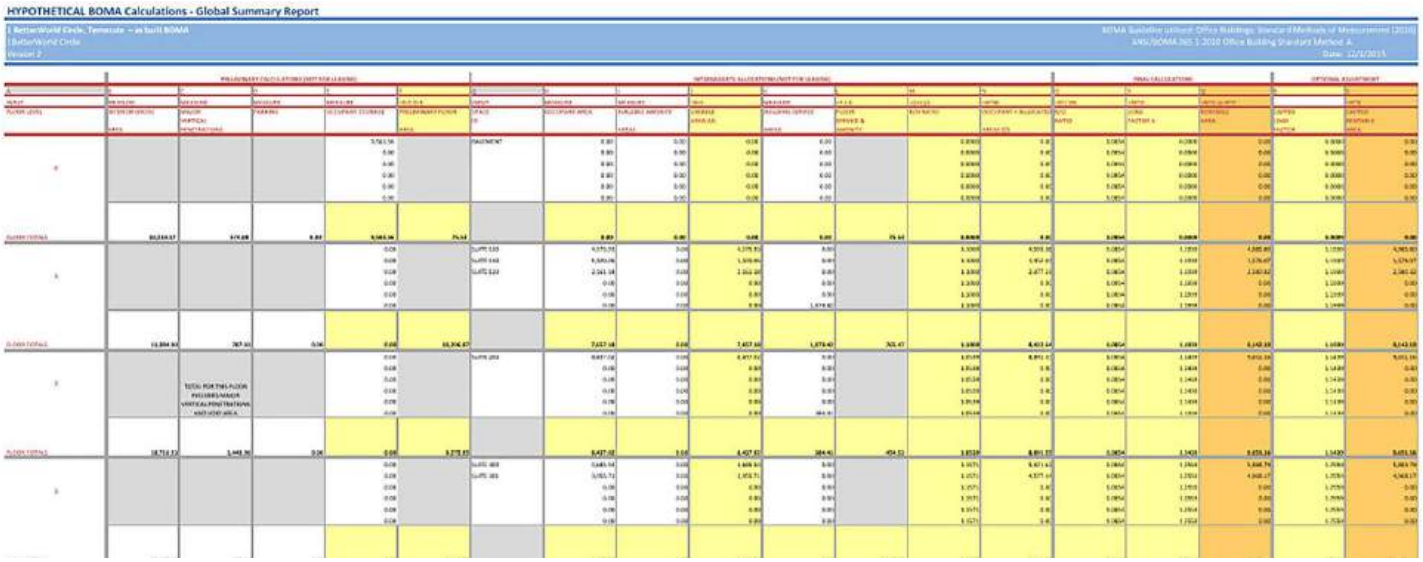
The 2D as-builts were then used to create area calculations using the ANSI/BOMA Z65.1-2010 Office Building Standard of Measure to determine the rentable square footage of each tenant space.

The items that were surveyed and represented in the as-built included the walls, doors, windows, casework and plumbing fixtures, fire risers and vertical circulation.

Image Descriptions

Above: BOMA floor plan exhibit

Below: BOMA calculations


HYPOTHETICAL BOMA Calculations - Global Summary Report

GSA QAQC PROGRAM

CENTRAL OFFICE - WASHINGTON, DC

Architectural Resource Consultants (ARC) was selected from a group of five other highly qualified peers to assist the U.S. General Services Administration (GSA) with the development of their Laser Scanning QA/QC Program Guide. GSA is known for their leadership in the development of standards for the BIM and Laser Scanning community through their BIM Guide Series. This guide effectively established a thorough procedure for ensuring high quality laser scan deliverables for GSA. This demonstrates ARC's recognized expertise in quality assurance and performance on government projects.

The purpose of this project was to develop a standardized 3D laser scanning QA/QC process for accepting laser scanning (imaging) data and associated deliverables (2D drawings from imaging data, and 3D models / BIM from imaging data).

Year Services Performed

2011-2012

GSA

3D Laser Scanning
Quality Management
Program Guide

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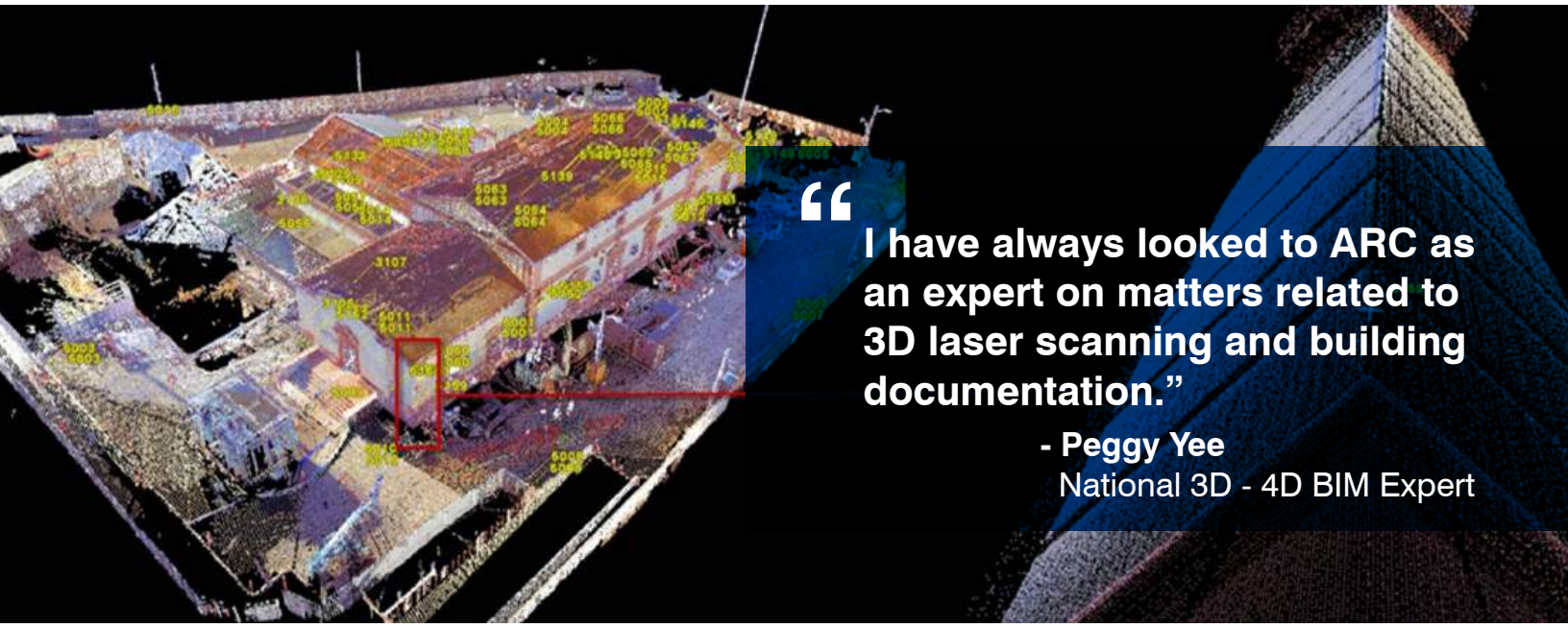
info@arc-corporate.com
www.arc-corporate.com



> **“I have always looked to ARC as an expert on matters related to 3D laser scanning and building documentation.”**
>
> **- Peggy Yee**
> National 3D - 4D BIM Expert

As part of this project, ARC was tasked with reviewing the work of two different firms. One firm scanned and modeled the Byron White Federal Court House in Denver, Colorado. ARC received the company’s scan data from the project in order to do a model check and report back any issues / feedback. ARC also had the opportunity to shadow another company while they were performing a scan of the Blair House in Washington, DC. ARC was able to watch and evaluate their process as well as review their data afterwards.

Image Descriptions

Above: Control points are shown [in yellow] within the registered scan data (left image). A quality control validation point shot on the corner of the building (right image) can be used to help validate the accuracy of the registered point cloud data.

Top left: image of front of Blair House

Bottom left: scan data provided of the Byron White Federal Court House

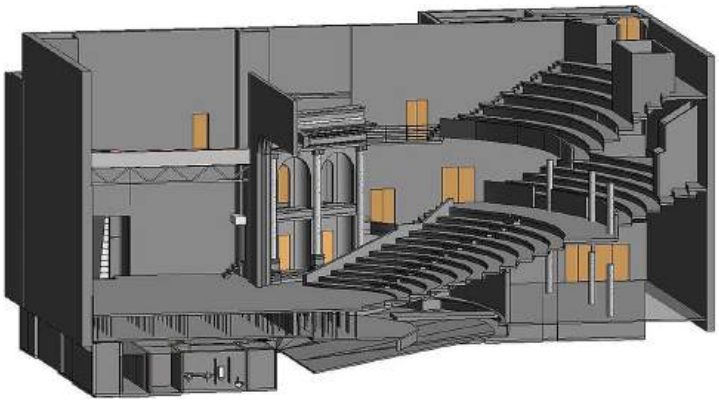
To view the ARC Authorized GSA 3D Laser Scanning Quality Management Program Guide, please visit https://www.gsa.gov/cdnstatic/_GSA_3D_Laser_Scanning_Qual_Man_Guide_-

BAM HARVEY THEATER

BROOKLYN, NEW YORK

Located in the heart of Brooklyn, the iconic BAM Theater, formerly known as the Majestic Theater, opened its doors in 1904. It served as the venue and proving ground for numerous Broadway productions. In 1942, the Majestic became a first-run movie house before it was abandoned in the 1960's.

Approximately 20 years later, a gentleman by the name of Harvey Lichtenstein discovered this gem and began to stage productions there. Subsequently, Mr. Lichtenstein raised funds for an entire renovation and transformation of the structure that was completed in 1987. In his honor, it was renamed the BAM Harvey Theater in 1999.



Revit model showing theater interior

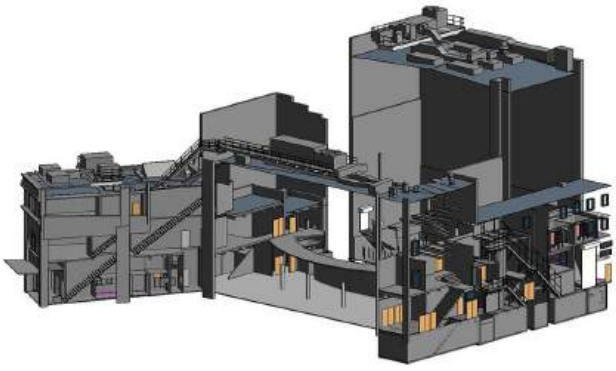
Project Square Footage
~16,500 s.f.

Market Sector
Entertainment + Sports

Project Type
Theater

Year Completed
2015

Client
Langan Engineering and Environmental Sciences
Joseph Romano, PLS
Senior Associate Surveying & Mapping
201.398.4618
jromano@langan.com



The surrounding neighborhood has since been redeveloped with plans to also refurbish the Arts Center itself. The building and street corner will be expanded to eventually include a connection to a high-rise condominium that is currently under design. Architectural Resource Consultants (ARC) was hired to process the client's provided registered scan data. ARC proceeded to model various building components including architectural elements and mechanical, electrical, and plumbing (MEP) equipment elements. A level of development (LOD) of 200 was used for the deliverable. Note: The intent of the LOD was to provide a moderate level of information in order to represent the buildings geometry, space volume, ceiling grids, line work and other specifics. Post-process modeling consisted of the buildings exterior envelope, interior architecture, and structural systems.

Image Descriptions

Above: interior architecture - view of the stage

Top Left: rendering of new additions

Bottom Left: Revit model showing interior and exterior architecture

1615 CALIFORNIA ST.

DENVER, COLORADO

Architectural Resource Consultants(ARC) was hired to provide a field survey and CAD as-built for the property. ARC approached this project by utilizing HDS (High Definition Survey) 3D laser scanning (3DLS) to document the facade. A point cloud was generated and then used to create 2D AutoCAD elevations of the two street side facades. he final 2D elevations of the facades were used to help with the restoration of the building to its original 1893 condition. The deliverables would also be used for presentations to historic preservation groups in the city.

Image of south elevation (left) and west elevation (right)

Project Square Footage

~ 26,000 s.f.

Market Sector

Historic Preservation +
Cultural Heritage

Project Type

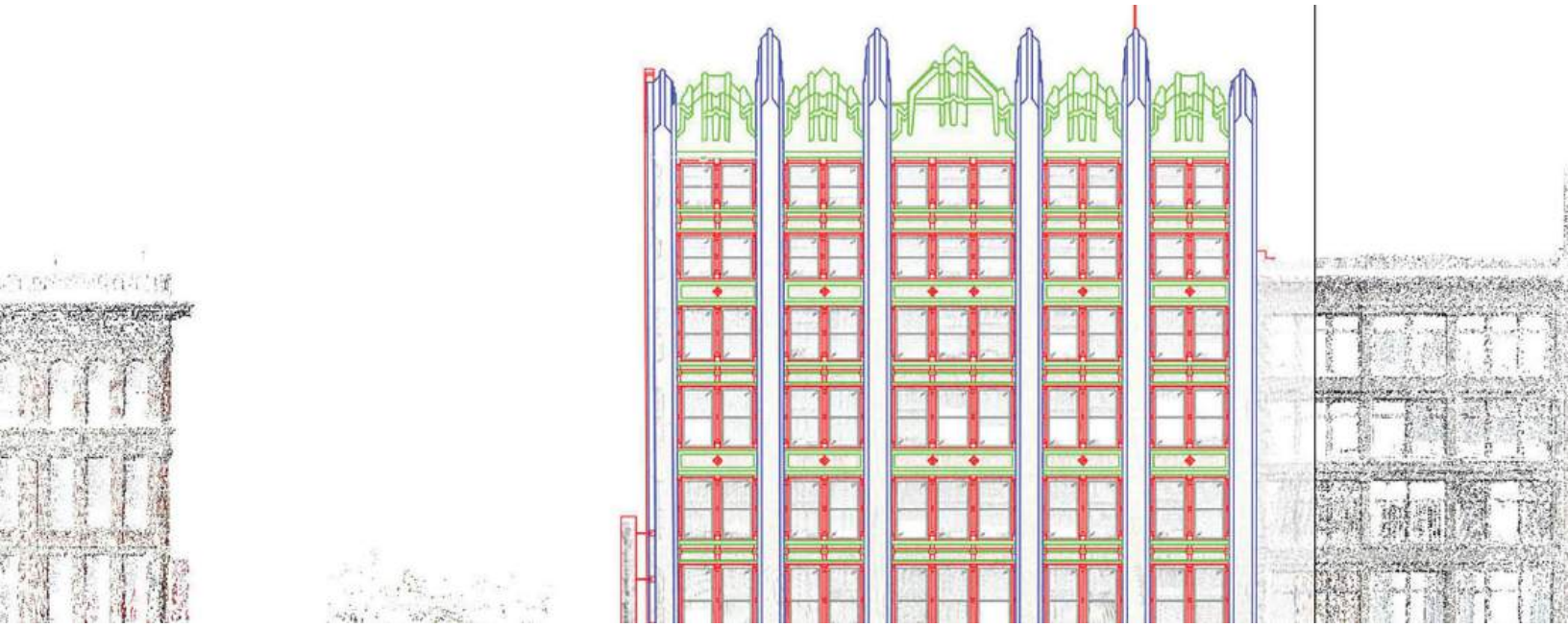
Historic Building

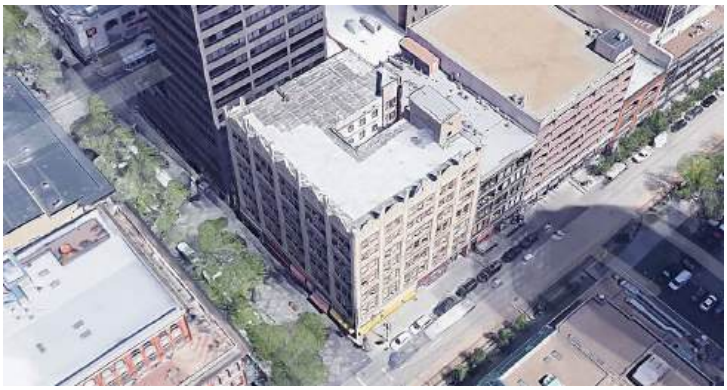
Year Completed

2017

Client

AH Architects
Art Hoy
President
720.932.8604
art@aharch.net





In order to accurately capture data for the top highest points of the facade, scans were taken from rooftops of two adjacent buildings.

Image Descriptions

Above: image of west elevation with scan data superimposed

Middle Top: aerial image of building

Bottom Left: partial north elevation

DAWSON RESIDENCE

CORONA DEL MAR, CALIFORNIA

In 2017, the Dawson's were seeking to remodel their family beach house. Architectural Resource Consultants (ARC) was hired to provide a field survey and CAD as-built for the property. ARC's deliverables were used to help the client get their renovation project approved by showing the impact that the planned renovations would have on their neighbor's sight lines.

Existing view from neighbor's window

Proposed view from neighbor's window

Project Square Footage
7,500 s.f.

Market Sector
Residential

Project Type
Single Family

Year Completed
2017

Client
Richard Krantz Architecture Inc.
Lynne Krantz
Office Manager
949.752.6345
lynnetkrantz@aol.com

Developing these proposed views was possible since all of the data was three-dimensional. The ARC team was able to position themselves from any vantage point within the scene in order to demonstrate the difference between existing conditions and the proposed design. Eight different viewpoint angles were produced from the point cloud data.

ARC later pulled more data from the initial scans and provided a full 3D model including topography to represent how steep the slope is and how the house fits into the bluff.

Image Descriptions

Above: colorized point cloud of exterior of the house

Top left: action shot taken while laser scanning from patio

Middle left: full BIM showing topography

Bottom left: action shot scanning interior

888.362.4272
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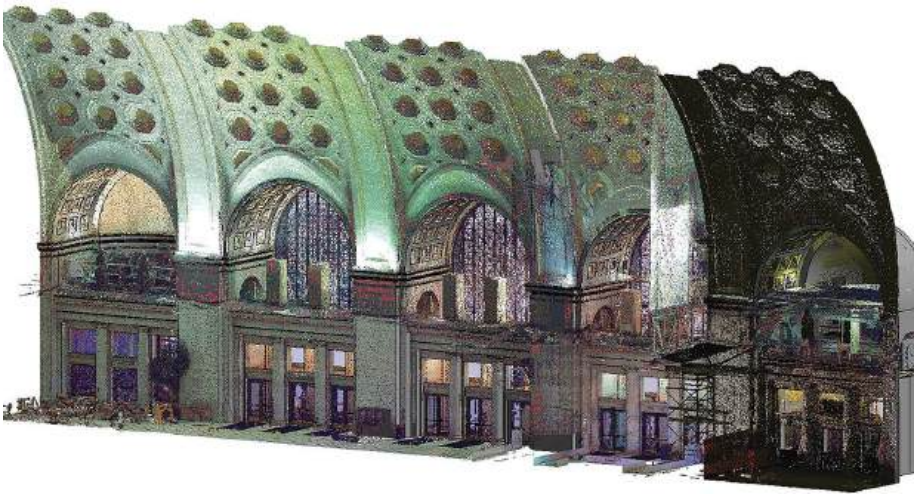
www.arc-corporate.com

UNION STATION

WASHINGTON, DC

In 2012, Amtrak disclosed a plan to renovate the Union Station, located in Washington, DC. This plan would add capacity to the station while preserving the historic site's distinctive architecture.

Architectural Resource Consultants (ARC) performed an as-built of the historic Union Station in order to provide accurate existing conditions documentation for the major renovations being planned for the facility. ARC conducted HDS (High Definition Survey) 3D laser scanning (3DLS) on the interior spaces of the Historic Burnham Building and Concourse A.



In-progress BIM created from laser scan data

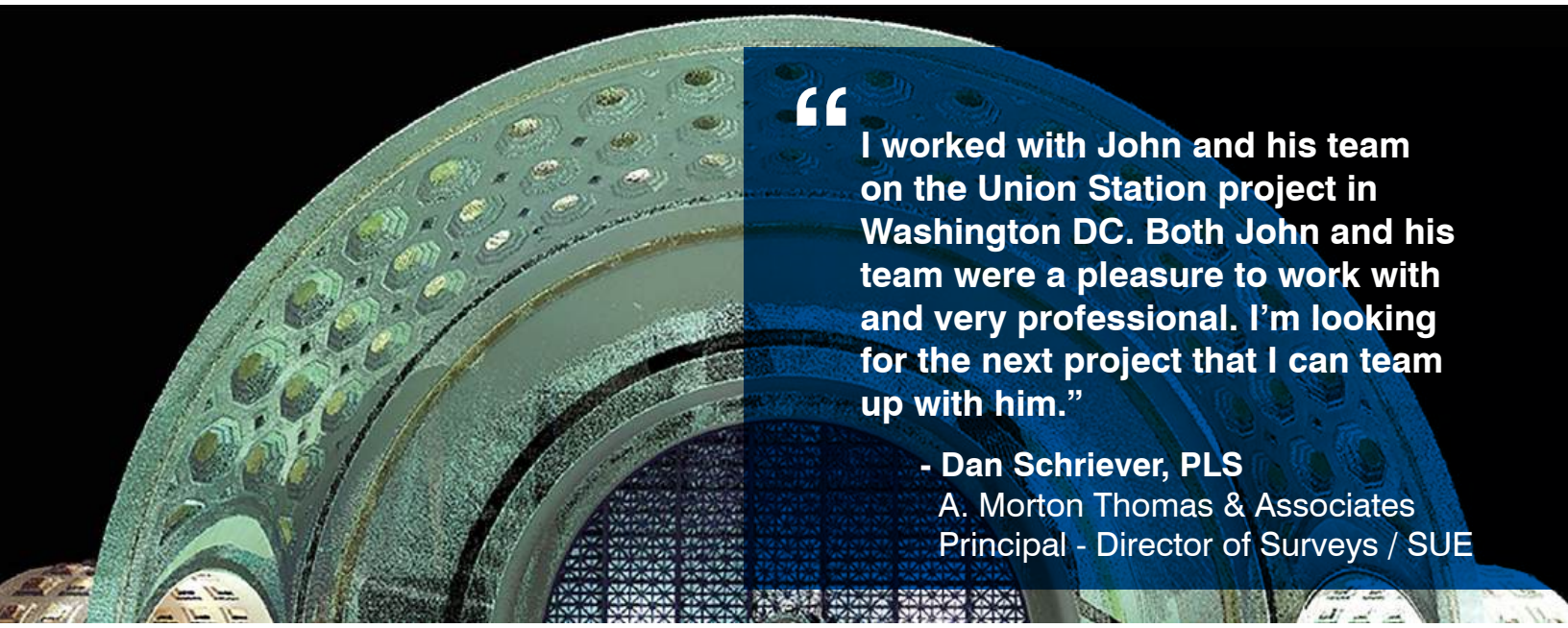
Project Square Footage
~ 657,343 s.f.

Market Sector
Aviation + Transportation

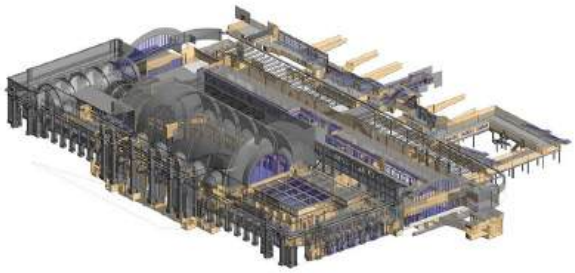
Project Type
Public Transportation

Year Completed
2015

Client
A Morton Thomas & Associates
Daniel Schriever, PLS
Principal - Director of Surveys / SUE
301.881.2545x1302
dschriever@amtengineering.com



> **"I worked with John and his team on the Union Station project in Washington DC. Both John and his team were a pleasure to work with and very professional. I'm looking for the next project that I can team up with him."**
>
> **- Dan Schriever, PLS**
> A. Morton Thomas & Associates
> Principal - Director of Surveys / SUE



ARC registered the interior scans to the survey control network, unified the data, and produced TruViews.

Once all the scan data was obtained, ARC created an overall 3D model of the building in Revit 2012 and exported it to AutoCAD to create the 2D floor plan deliverables. The scan data was also utilized for historic preservation requirements to prepare a Historic American Buildings Survey (HABS) report.

This project shows ARC's ability to model complex conditions associated with older structures and historic preservation. One of the significant challenges ARC had to overcome was scanning in a fully operational, high-volume public transportation facility. As such, most of the field operations took place at night.

Image Descriptions

Above: scan data of the Main Hall

Top Left: Revit model of Union Station

Bottom Left: ARC's Genaro Vargas laser scanning the site

Partial Client List

- Adolfson and Peterson Company
- AMF Bowling Worldwide, Inc.
- Barr & Barr
- Berding Surveying Inc.
- Carrier Johnson
- Chapman University
- Carl Karcher Enterprises
- CW Driver
- CyArk
- Deem Mechanical
- Gensler
- U.S. General Services Administration (GSA)
- HKS Architects
- HMC Architects
- HNTB
- HOK
- Kearney Police Dept.
- Langan Engineering
- Lend Lease
- LPA, Inc.
- Macerich
- Matt Construction
- McCarthy
- Perkowitz + Ruth
- Suffolk Construction
- Toyota
- Turner Construction
- University of California, Irvine
- Walt Disney Imagineering
- WATG

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www.arc-corporate.com

References

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Associate Vice President

WATG
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Luis Roges
Operation Principal

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Stephanie Laylon
Principal and Architect

Phoenix Planning & Construction
6B Liberty, Suite 210,
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stephaniel@phoenix-planning.com

Letter of Recommendation

To Whom It May Concern:

I am writing to recommend ARC Architectural Resource Consultants. Our firm worked closely with John Russo and the ARC team on the Las Vegas Convention Center project. This effort required that ARC survey well over 1 million square feet of the existing facility, while not disrupting the active use of the convention center. Numerous shows were scheduled throughout the facility during the six weeks of survey time.

ARC walked in the door and took the time to understand the facility, the client's concerns, and the opportunities and constraints involved to meet the required schedule and deliverables. A plan was developed and weekly meetings set with the client's customer service management to review the upcoming events and any long-term show schedule adjustments, which would impact the survey effort.

There was active participation by each member of the ARC team to complete the building documentation and not affect the client's operations. The desire to do the best job possible permeated through team leadership to the field surveyors and the CAD staff in the office. This served the project well and created a comfort level with our firm and the client that was clearly evident.

By taking the time to gain the understanding of the client's needs and restrictions, ARC proved to be a valuable team member not only for their work, but also for their ability to problem solve and their flexibility. Their survey work was well done and when issues did arise, as they always will, ARC stepped in and worked diligently to come up with a solution that considered the client and the schedule first and foremost.

ARC delivered their documentation within the project's timeframe and budget. They were in constant communication with our team and they worked hard to provide the building documentation required. It was not an easy task due to the nature of the building and the convention center's show schedule, but ARC proved they were highly capable with the product they delivered. We were very pleased with their efforts and look forward to the next opportunity to work with them.

Sincerely,

Amber Harden, AIA
Senior Project Architect
HNTB Architecture

Letter of Recommendation

strategy
planning
architecture
landscape
interiors

WATG

Project: Beverly Hills Hotel and Bungalows
Beverly Hills, CA
WATG Project No. 114164

To Whom It May Concern,

WATG has contracted Architectural Resource Consultants (ARC) to provide existing conditions building documentation services on various projects since 2005. Most recently we utilized their services on a renovation project for the Beverly Hills Hotel in Beverly Hills, California. Due to the five star clientele this facility serves, it was crucial that our as-built consultant demonstrate the highest level of professionalism while representing our team on site during the performance of their field survey.

ARC's field crews demonstrated a high degree of sensitivity to ensure their presence was minimized to the hotel guests. We also received very positive feedback from the Ownership regarding ARC's performance and how accommodating they were in working with the hotel staff to coordinate the on-site logistics of performing their survey work.

During the course of the work, ARC provided exceptional response time and flexibility to mobilize their team as well as recommended creative ways for us to obtain preliminary deliverables so our designers could proceed with their work prior to receiving the final as-built documentation. We found their final BIM deliverable was of exceptional quality, detail and accuracy.

It is based on my personal experience of working closely with their team that I provide my highest recommendation of ARC for providing existing conditions building documentation services.

Sincerely

Rafael F. Velazquez, LEED AP

Senior Associate | Senior Project Architect
WATG

WATG | 8001 Irvine Center Drive, Suite 500, Irvine, California 92618 USA | tel +1 949 574 8500 fax +1 949 574 8550 | watg.com

Letter of Recommendation

U.S. General Services Administration (GSA)
Public Buildings Service (PBS)
Office of Design and Construction (ODC)

To Whom It May Concern,

It is my honor to recommend Architectural Resource Consultants to provide building documentation services for the Moscone Center in San Francisco. ARC has been an Indefinite Delivery, Indefinite Quantity (IDIQ) contract for the past three years for the General Services Administration, where I am currently serving as a Program Expert with GSA's 3D-4D-BIM Program.

ARC has been a valued asset to GSA's 3D Laser Scanning Program by providing both laser scanning services as well as program level support. Recently, GSA tasked ARC with developing a standardized Quality Assurance, Quality Control (QAQC) method for GSA. As part of this task, ARC interfaced with our building managers on a high-profile building which had both security and schedule constraints. While ARC did not specifically perform the scanning, they were instrumental in working with GSA's laser scanning team to ensure proper scanning was performed to GSA requirements. The GSA project team came to view ARC as a trusted advisor to ensuring the project was completed to high quality standards. ARC was also diligent in ensuring that all required deliverables for the QAQC task order were delivered on time and within budget. In addition, ARC has provided laser scanning services for several GSA federal buildings to across the US. When speaking to my GSA counterparts that have worked with ARC, they only have positive feedback and experiences.

Based on my experiences with ARC, I am confident that they will work collaboratively and cooperatively with your building staff while delivering the project on time and on budget. I have always looked to ARC as an expert on matters related to 3D laser scanning and building documentation. ARC has always provided me with straight-forward, objective answers and takes the time to thoroughly answer all of my questions. I highly recommend ARC to provide building documentation services at the Moscone Center.

Sincerely,

Dr. Peggy Yee, Ph.D
Program Expert
GSA 3D-4D-BIM Program

Letter of Recommendation

Architecture
Planning
Interior Design
Landscape Architecture
Engineering
Graphics

LPA

5161 California Avenue
Suite 100
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P 949 261 1001
F 949 260 1190
E lpa@lpainc.com
W www.lpainc.com

Mr. John Russo, AIA
ARCHITECTURAL RESOURCE CONSULTANTS
18025 Sky Park Circle
Suite L
Irvine, CA 92614

Re: The American
LPA Project No. 28120.10

Dear John:

Thank you for your responsive and accurate deliverables on the challenging project documentation for the City of Long Beach's historic registered project "The American Hotel."

Being that we had no drawings whatsoever for the pre-19th century structure, your ability to quickly and accurately document the building façade and plans was the most efficient and cost effective solution for us. We evaluated what it would take with our own resources to accomplish what you ultimately provided us and could not have completed the work for your provided fee. This was one of many reasons we elected to retain your services.

Though we had a very tight schedule, you were able to provide us with the deliverables in advance of our requested deadline which was a delightful surprise. Meeting with us prior to going on site and review of the deliverables to ensure our satisfaction was service that we did not expect, but found beneficial. Helping us understand how to work with the free software to gather additional information from the raw scan data was a value added service.

Receiving the laser scanned data provided us with the ability to refer back and measure areas without having to return to the site for additional field investigation. This is not only a time saving advantage, but a sustainable one also.

As you know, we were so pleased with your excellent service that we are working with you again for the documentation of another project, the Malibu Community Library. We are confident that the same service will be provided on this project.

Feel free to list us as references for your future projects. We will be glad to relay our great experiences with you and your team.

Sincerely,

LPA, Inc.

Lawrence Chiu, AIA, LEED® AP
Associate

Letter of Recommendation

PHOENIX
Planning and Construction Services, Inc.
Architecture ▪ Planning ▪ Interiors ▪ Estimating

Regarding: **Architectural Resource Consultants (ARC)**
To: **Prospective Clients**

Phoenix Planning has worked with ARC for the past eleven years. They have performed as-built documentation services, and architectural construction document cad drafting for us.

When performing the field work, they have represented our team in a professional manner. We never have any concerns in their interfacing directly with tenants, or occupants of the facilities they are documenting. They have worked with us on tight schedules and responded quickly to our needs both in the field or in the office. We have found their as-built documentation to be exceptionally detailed, providing an outstanding level of information for all aspects of documentation.

In working on construction documents, we have found them to maintain the project schedule, providing check sets in plenty of time for review and coordination prior to submittal. They keep excellent records of all redline/comment sets which can be critical during clarifications during different phases of the project.

We recommend ARC highly and look forward to our continuing relationship.

Sincerely,

Phoenix Planning and Construction Services, Inc.

Stephanie M. Laylon, AIA

SML:pmw

23272 Mill Creek Drive, Suite 220 ▪ Laguna Hills, CA 92653-1642
Phone: (949) 581-9370 ▪ Fax: (949) 581-9444
www.phoenix-planning.com

Statements of Recommendation

Unbelievable professionalism. ARC's ability to work from limited instruction and oversight while delivering a great product is really unbelievable. What a great AEC partner."
Sean Meehan (President) - Allied Design / Management Group (ADMG)
562.243.3387

Very professional team, as-built deliverables on time. Good communication. Highly recommend using ARC."
Ken Murai (Director of Campus Design) - Chapman University Campus Planning
murai@chapman.edu
714.532.7783

The ARC Team that completed the as-built surveys for us was very thorough. The end product was detailed and completed in a timely manner. Scheduling the team last minute was quickly accommodated and the client was impressed with the delivery schedule."
Crystal Fiedler, LEED AP (Architecture and Design Manager) - Allsteel
fiedlercr@allsteel.com

ARC has been a great partner in helping our firm develop BIM competency and process."
South Cole, LEED AP (VDC Manager) - Linbeck Group, LLC
scole@linbeck.com

Renderings are always on time and look great, team is very responsive to our needs. Create great renderings sometimes with little information and having to piece together drawings and photos to create the space. A job well done and would recommend to anyone."
Jane Skulmoski , Principal | Director of Operations - Modus Design Group
jane@modus.la

Lend Lease White Paper

Summary of 3D Laser Scan for DC Project A Tenant Improvement

In April of 2013 ARC Consultants performed an HDS laser scan of existing conditions within a highly secure room for a tenant improvement project related to upgrade of major electrical and mechanical systems as well as installation of a new IT backbone. Due to previous building experience Lend Lease determined that in order to get an accurate depiction of the existing conditions a scan would need to be completed of the space in order to determine actual location of existing systems and size of existing structural members. Having completed construction on two structures located within the same complex Lend Lease was aware of the inaccuracy of the existing building as-built drawings in relation to the as-built condition and the negative effect these discrepancies would have on coordination and construction. Without the scan it could have taken as long as a month to field measure, verify existing conditions, and prepare a shop drawings for Lend Lease to then provide a complete clash report for coordination

The room in which the scan was performed measured approximately 1000 sf and included existing MEP and Structural systems such as above ceiling conduit, ductwork, concrete beams, access flooring, fire protection piping, and doors and frames. The scan was completed in less than 4 hours and the deliverable was provided to Lend Lease within 7 days from the completion of the HDS scan, the properties of the deliverable provided to Lend Lease are as follows:

- 3D Revit File of all systems with high level of detail indicating each modeled element as its own specific solid.
- Tru-View 3D web based model that provided Lend Lease with the ability to view the 3D product without any Autodesk software. This viewer also provides the user with ability to investigate elevations of items within the model along with distance measurements between to solids.

The Revit file provided went above and beyond expectations in regards to timely submission as well as the level of detail within the modeled space. The accuracy and detail provided could not have been any better; for example the scanning technology was able to provide exact elevations from slab to access floor using the point cloud that matched field measurements taken for verification. These measurements also coincided with controls pulled from land surveyors using established points at ground elevation outside the building that were taken into the structure for subcontractor use during construction. Lend Lease was able to effectively convert the Revit file into a 3D Autocad file which was then distributed to subcontractors for coordination. Lend Lease was able to use this model in conjunction with the Architects model to perform a complete clash of new systems (3D files provided by subcontractors) and the existing elements (3D model from HDS scan). The HDS laser scan provided Lend Lease with the ability to import all 3D files into Navisworks and provide the Owner and Subcontractors with a full clash report of the new vs. existing work, increasing amount of pre-fabricated material and cutting down on field installation time.

Quick Project Facts:

-Cost to complete scan - $3,680.00
-Total working days from date of scan to release of clash report – 10 days

Bovis Lend Lease Inc.
12310 Sunrise Valley Drive
Reston, VA 20191

Telephone 301.354.3100
Facsimile 301. 354.3151
www.lendlease.com

Lend Lease

Summary

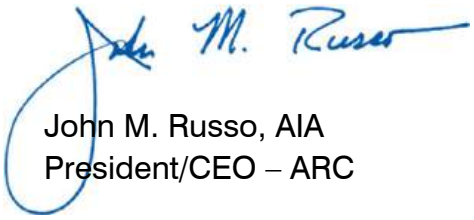
Thank you for taking time to read through our Qualification Package. We realize how important it is for you to make the right selection for your project and your chosen trusted partner. We hope we have demonstrated that our qualification to perform the required services meet or exceeds your expectations.

Documenting existing conditions is not a side service for us. It is our primary focus. As architects, we understand the impact unforeseen conditions can have on design and construction. It is our mission to capture and document reality in a way that accurately represents the real world so that our clients can focus on what they are good at.

It is our commitment to support your team throughout this project. At any time should you question the accuracy of our deliverables we will return to the site and verify, to your satisfaction, our delivered work product.

Again, thank you for your time and consideration of ARC. We are confident you will find ARC's work product to be of the highest quality and our service of the utmost in professionalism. We look forward to the opportunity to serve you.

Sincerely,



John M. Russo, AIA
President/CEO – ARC

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