STAHL SHEAFFER ENGINEERING

Civil / Structural Engineering Services

Ground Up Capabilities for Development

Presented by Stahl Sheaffer Engineering

a multi-discipline civil / structural engineering company

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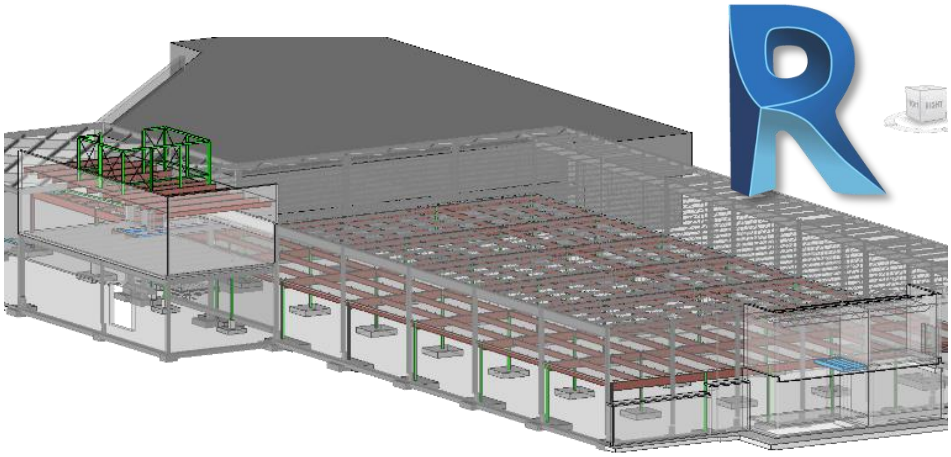
STAHL SHEAFFER ENGINEERING

Building Structural Engineering

Stahl Sheaffer has completed building design services for industries, primary schools, higher education, research facilities, private residences, and government agencies. Our expertise in support of new construction and renovation encompasses a wide variety of building types, including labs, classrooms, housing, emergency facilities, parking garages, athletic facilities, and historic structures. Our engineers are experienced with materials from steel to wood to concrete to brick and limestone. Stahl Sheaffer's structural engineering department includes a staff of professional engineers dedicated to building structures, aided by designers who provide expertise in:

- Analysis of structural capacities
- Forensic investigation
- Historic preservation
- Retrofit of existing components
- Feasibility and planning studies
- Design of new facilities
- Rehabilitation design
- Construction shoring
- Construction administration
- Construction inspection
- BIM / 3D modeling
- Compliance upgrades
- Façade restoration
- Roof repair

Our value is in the upfront analysis to identify root problems and provide solutions that are the most relevant, cost effective, and sustainable. We develop bid documents that allow consistent bids for completing necessary work. We engineer the structural design, prepare construction documents, and provide construction administration services throughout the project. Stahl Sheaffer embraces Prevention through Design (PtD). Several Stahl Sheaffer engineers have formerly served as municipal staff engineers, and know the processes involved in moving engineering designs through municipal staff reviews, design review boards, and planning commission approvals. We facilitate collaboration and avoid conflicts with multiple stakeholders, including owner project managers, architects, municipal officials, MEP's, landscape architects, and others using Revit.



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Land Development

LEED AP

Stahl Sheaffer provides a broad range of land development services including site design, survey, demolition management, traffic studies, structural engineering, permitting, utility coordination, and storm water design. As a representative of our client, Stahl Sheaffer provides a professional approach through all stages of the process, from field survey through municipal meeting attendance. We work closely with local and state agencies to resolve the many issues involved in moving a development project from design through approval. And we can provide construction management and inspection services, serving as the point of contact through project close-out. Services include:

- Site feasibility studies
- Land development plans
- Site layout & grading
- Parking lot design and layout
- Storm water management
- Erosion & sediment control plans
- Demolition & remediation management
- NPDES permit applications
- Bridge & culvert design
- Retaining wall design
- Site lighting
- Landscape design
- LEED AP design
- Perimeter fencing & retaining wall design
- Municipal meetings & review preparation

In-house topographic surveying capabilities, including Professional Land Surveyors and LiDAR technology, provide enhanced ability to manage design projects efficiently and maintain a high standard of quality. Stahl Sheaffer individuals are experienced in performing field surveying for both roadway and site development projects. Our field work facilitates the development of mapping coverage to depict existing conditions and present proposed construction. The data collected also permits the development of a digital terrain model of the site which facilitates design plans. Our field survey procedures are performed using total stations with electronic field book capability or with our mobile LiDAR unit. Field data is collected and electronically transferred to in-house computers where it is compiled, checked, and plotted.

STAHL SHEAFFER ENGINEERING

Facility Permitting

Metropolitan Government of Nashville and Davidson County
Department of Codes and Building Safety

Site Address: Permit #:

BUILDING PERMIT

Inclusive of Permits for New Construction, Additions, Renovations or Repairs

Issue Date: Parcel:
Contractor:

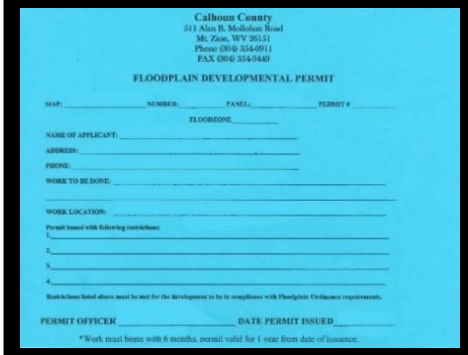
NOTICE

No work may be done on any part of a building or structure beyond the point indicated by each of the required inspections. This permit card must be posted securely, be visible from the street, and protected from the weather. Removal, alteration, or mutilation of this sign until completion of such work is in violation of the law.

All inspections required by this permit must be completed prior to issuance of Use & Occupancy Certificate.

Any building permit issued shall become invalid unless the work authorized by it shall have been commenced within six (6) months after the date of issuance, or if the work authorized by such permit is suspended or abandoned for a period of one (1) year after its issuance provided that for cause, if work authorized by it is sufficiently under way and is being diligently pursued, one or more extensions of time, for periods not exceeding ninety (90) days each, may be allowed in writing by the Director.

Keep Job Sites Clean and Safe.



Calhoun County
511 Alan B. Mollohan Road
Mt. Zion, WV 26151
Phone (304) 354-0911
FAX (304) 354-9449

FLOODPLAIN DEVELOPMENTAL PERMIT

MAP: NUMBER: PANEL: PERMIT #

FLOODZONE

NAME OF APPLICANT:

ADDRESS:

PHONE:

WORK TO BE DONE:

WORK LOCATION:

Permit issued with following restrictions:

1.
2.
3.
4.

Restrictions listed above must be met for the development to be in compliance with Floodplain Ordinance requirements.

PERMIT OFFICER DATE PERMIT ISSUED

*Work must begin with 6 months, permit valid for 1 year from date of issuance.

Stahl Sheaffer provides non-environmental permitting services for development projects across a spectrum of facility types, including industrial, commercial, and specialty industry projects. We provide a full-service product, focusing on identifying requirements and lead times; coordinating with permitting agencies; working with the client, design professionals and contractors to develop applications; and ensuring all required permits are obtained on-time to meet project schedules. Stahl Sheaffer's services can extend throughout the life of the project, providing permit compliance coordination to ensure the job runs smoothly, permits are closed out when the work is complete, and occupancy is not delayed.

This start-to-finish permitting effort ensures projects avoid common construction delays that come from "surprise" permitting requirements and processes and keeps the project team informed on important project components than could otherwise be overlooked.

Common non-environmental facility permits include:

- Site
- Development
- Zoning
- Demolition
- Job Trailers
- Grading
- Building
- Driveway
- Fire Marshal
- Plumbing
- Electric
- HVAC
- Septic/Sewer
- Well/Water
- Storage Tanks

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STAHL SHEAFFER ENGINEERING

“ It is with great pleasure that we at Allegheny Restoration endorse our recommendation on behalf of Stahl Sheaffer engineering. Over the last ten years, Stahl Sheaffer Engineering’s team of skilled professionals has maintained a committed effort not only in engineering for the State College area, but the surrounding regions. Originating from a larger market like Pittsburgh, our company consistently works with new/different engineers and architects. Being that we work with so many, naturally we find those that excel at certain tasks more than others. We feel Stahl Sheaffer and their team are the total package. Engineering design, project management, on-site support, constant personable interaction, prompt and simple resolutions to problems, all reasons why we look forward to the opportunities to work with Stahl Sheaffer Engineering.

… efforts on the HUB parking deck and Beaver Stadium were among those that made our job, as a contractor, exponentially easier. Clear and concise drawings, simple to understand details, also most importantly knowing the region and its unique characteristics all play a role in understanding the problems that not only face the University but how those also impact the region. We believe that it is this effort by Stahl Sheaffer and their network of qualified individuals that shall continue to improve upon Penn State’s already stellar reputation of excellence. ”

Bryan Yarnell, Allegheny Restoration

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Higher Education

Stahl Sheaffer provides a complete array of civil engineering services for colleges and universities. We have performed surveys and land development planning for construction, athletic facility design, and roadway enhancements. We have been involved in large structural engineering projects, using Revit to collaborate with multiple stakeholders, including University project managers, architects, municipal officials, MEP’s, landscapers, etc. We have assisted Penn State during design and construction to document locations, steam tunnels, water lines, and other utilities using GPS technology. We have a LEED certified engineer for land development and have designed to LEED standards.

We have completed projects for many campus areas, including:

- Housing
- Agriculture Sciences
- Athletics
- Arts & Architecture
- Earth & Mineral Sciences
- Food Services
- Engineering
- Renovation Services
- Information Sciences & Technology
- Steam Services
- Transportation

Stahl Sheaffer is an approved consultant with an open-end contract for The Pennsylvania State University Office of Physical Plant, where we have been providing engineering services for hundreds of projects since 2006, including:

- Surveying & land development
- Building structural design & forensics
- Feasibility studies
- Mechanical system access
- Rooftop fall protection (across 16 campuses)
- Road & parking lot engineering
- Pedestrian & traffic services
- Construction inspection
- Facade & roof rehabilitation
- Athletic facility engineering
- Specialized & on-call services
- Chiller & steam services

MESSIAH COLLEGE
PennState
Juniata College PENNSYLVANIA 1876
LEHIGH UNIVERSITY
Rivier UNIVERSITY
Bucknell UNIVERSITY
MUSKINGUM UNIVERSITY
LOCK HAVEN UNIVERSITY

STAHL SHEAFFER ENGINEERING

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Geotechnical Engineering & Subsurface Investigations

Stahl Sheaffer specializes in Full Depth Reclamation (FDR) and Cold-in-Place Recycled (CIR) Asphalt designs to support roadway construction. Our services include sub-grade testing, embankment stabilization testing, and roadway coring, allowing us to recommend effective FDR and CIR mix designs and quality control monitoring during construction to ensure efficient soil stabilization. Stahl Sheaffer has a 5,000 sf, AASHTO re:source Accredited full-service lab in Washington County.

- AASHTO re:source Accredited Testing of Soils, Aggregate and Asphalt
- Full-Depth Reclamation (FDR) Mix Designs
- Cold In-Place Recycled (CIR) Asphalt Mix Designs
- Pavement Design & Analysis
- Foundation Design & Analysis
- Slope Stability Analysis
- Roadway Cores & Dynamic Cone Penetrometer (DCP) Testing
- Moisture Density / Compaction Testing using the latest InstroTek Nuclear Gauges

Stahl Sheaffer creates customized reports for clients which include all the laboratory and/or field data generated or collected. Based on those results, Stahl Sheaffer delivers reliable site-specific recommendations. for each project.

AASHTO re:source (formerly AMRL)

AASHTO ACCREDITED

STAHL SHEAFFER ENGINEERING

Environmental Services

Stahl Sheaffer provides environmental services including sampling, regulation, and compliance consulting to support site development for construction, mining, and drilling. Following are services available as part of our comprehensive design and consulting solutions:

- NEPA clearance documentation
- Water's and wetland impact permitting
- Wetland delineation, mitigation and remedial design
- Wetland monitoring
- Water resource and terrestrial habitat enhancement restoration design
- Natural Channel Design stream restoration construction guidance
- Threatened and endangered plant surveys
- Landscape restoration and revegetation
- Stream channel
- Aquatic and terrestrial habitat enhancement design
- Erosion and sedimentation design, inspection, permitting
- NPDES earth disturbance permitting
- Construction documentation and inspection
- Preparedness Prevention and Contingency (PPC) plan and Spill Prevention Control and Countermeasures (SPCC) plan
- Stormwater BMP selection, siting, and design
- Phase I Environmental Site Assessments (ESAs)

Stahl Sheaffer's staff of environmental scientist and engineers focus on helping our clients navigate through the environmental regulatory process smoothly and efficiently. We understand the potential project delays that often result from the environmental regulatory process and the sensitive nature of certain sites. We focus on identifying the regulatory implications early to avoid unnecessary delays during design and construction. With the use of our technological tools such as handheld GPS, GIS, and field computers helps saves our clients both time and cost.

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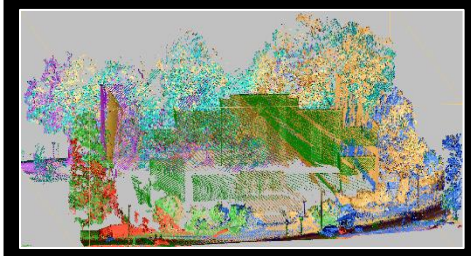
Survey & Reality Capture

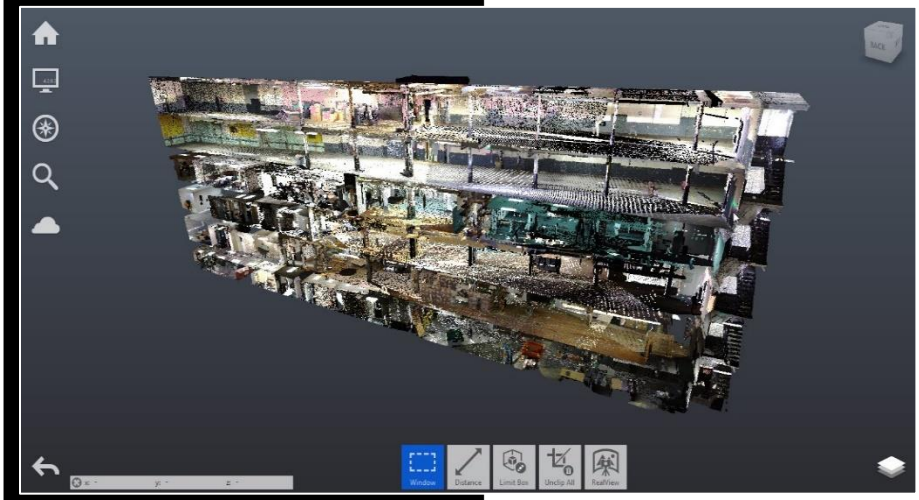


Stahl Sheaffer provides comprehensive survey and imaging services, including:

- Boundary and topographic surveys
- 360° scanning / 3D terrestrial scanning
- Utility mapping and coordination
- ALTA/ACSM surveys
- Flood elevation surveys
- Right of way documentation
- Base plan preparation
- Construction stakeout

Technology used to augment these services includes:

- **Mobile Survey-grade LiDAR Scanning** – Our newest system (Leica Pegasus:Two) produces survey grade data suitable for design work. The resolution and detail of the system is nearly 10X the operating rate of the MX2, which allows us to collect much more detailed data at higher (safer) speeds. The faster speed allows us to perform long range/high end mapping projects such as interstate corridor mapping and state highway survey contracts. Over 30 state DOTs (including Pennsylvania and Ohio) accept and approve the Pegasus:Two system as a design tool on highway projects.
- **Mobile LiDAR Scanning** *(Trimble MX2)* – Geo-referenced 3-D point cloud data useful for road infrastructure analysis, overhead utility location, bridge and overhead structure clearances, and asset inventory mapping.
- **Mobile Imaging Scanning** *(Trimble MX7)* – VISION technology allows for the collection of georeferenced high-resolution panoramic photos for road infrastructure analysis, change detection, asset inventory, and well site monitoring.
- **Ground-Based LiDAR** (FARO Focus 3D HDR System) – Survey-grade ground-based laser scanning used to collect high resolution LiDAR data and panoramic imagery to extract topography, traditional survey data, and 3D modeling information. This data can be used for stockpile volumetrics, plant process modeling, Building Information Modeling [BIM], underground tunnel and quarry mapping, road surface modeling, overhead clearance modeling, and bridge inspection and modeling.
- **Aerial Inspection** *(Matrice 200 Series Mid-Sized Drone)* – Our FAA Part 107 certified sUAS pilot, combined hardware technologies, and expertise allow us to collect data information over large distances and typically inaccessible locations.



Stahl Sheaffer is able to perform feature extraction on LiDAR and survey data to create AutoCAD and MicroStation base mapping and planimetric files, allowing engineers to make well-informed design decisions to tailor modification and construction plans to fit the situation at hand. Stahl Sheaffer can also create “intelligent” 3D models of the survey data. Project data can be imported directly into AutoDesk, Bentley, and ESRI packages as an industry standard .LAS format for clients to use directly as if on site to pull measurements, locations, and clearance information, saving time and money.

STAHL SHEAFFER ENGINEERING

Computer Building Expansion

The Pennsylvania State University, University Park, PA

- **Owner:**
  The Pennsylvania State University
- **Services:**
  Structural Engineering
- **Construction Cost:**
  $9,000,000
- **Year Completed**
  2008

Stahl Sheaffer Engineering served as the structural engineer for The Pennsylvania State University Office of Physical Plant's project to expand the Computer Building. The structural system included steel framing with composite decking and masonry sheer walls where applicable. Special consideration was required around the existing foundations to avoid influencing or undermining the existing structure.

Stahl Sheaffer designed isolated foundations for the large emergency generators to reduce vibration transmission to computer servers and other IT equipment. Stepped footings were incorporated as necessary to coordinate with the variable depth existing foundations. A design to reinforce selected structural members in the existing building was also performed to support new rooftop mechanical equipment.

STAHL SHEAFFER ENGINEERING

Ice Arena Conversion to Laboratory

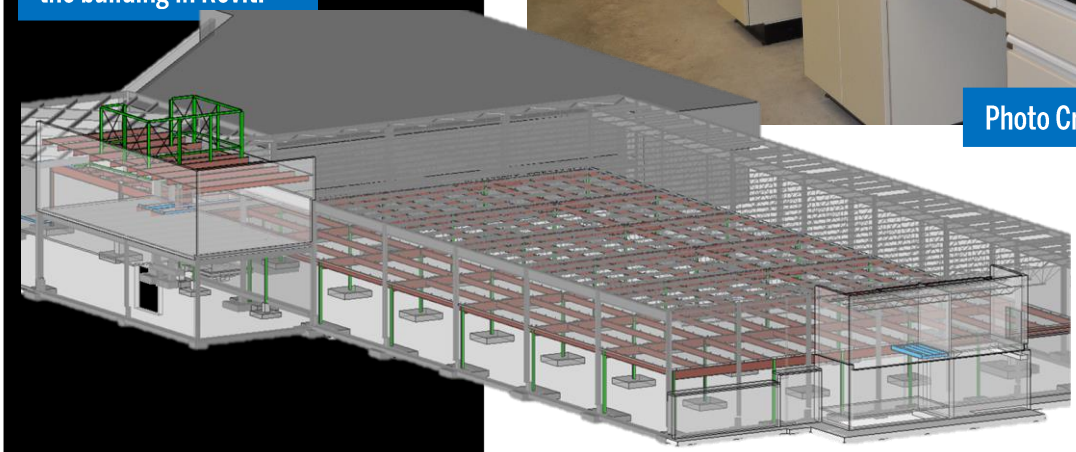
The Pennsylvania State University, University Park, PA

- **Owner:**
  The Pennsylvania State University
- **Services:**
  Structural Engineering
- **Size:**
  90,000 SF
- **Construction Cost:**
  $9,000,000
- **Year Completed:**
  2015

Following the completion of Pegula Ice Arena, the former Penn State Greenberg Indoor Sports Complex was renovated for academic and laboratory use. Stahl Sheaffer provided engineering design for the conversion of the second floor to lab space, including a new composite steel framed floor over the existing one-story mechanical room and a screenwall around the exhaust fans on the roof. The design also included the addition of a new stair tower on the south end of the building and stabilization of the remaining south wall of the existing building, which was failing due to soil pressure and poor detailing in the original construction. The new floor, designed in a compact fashion to fit within the limited confines of the existing space, was laterally isolated from the existing structure with its own lateral force resisting system. Ductwork was coordinated within the existing truss space of the original roof. Stahl Sheaffer modeled the building in Revit.

Photo Credit: Hoffman-Leakey Architects

Stahl Sheaffer modeled the building in Revit.



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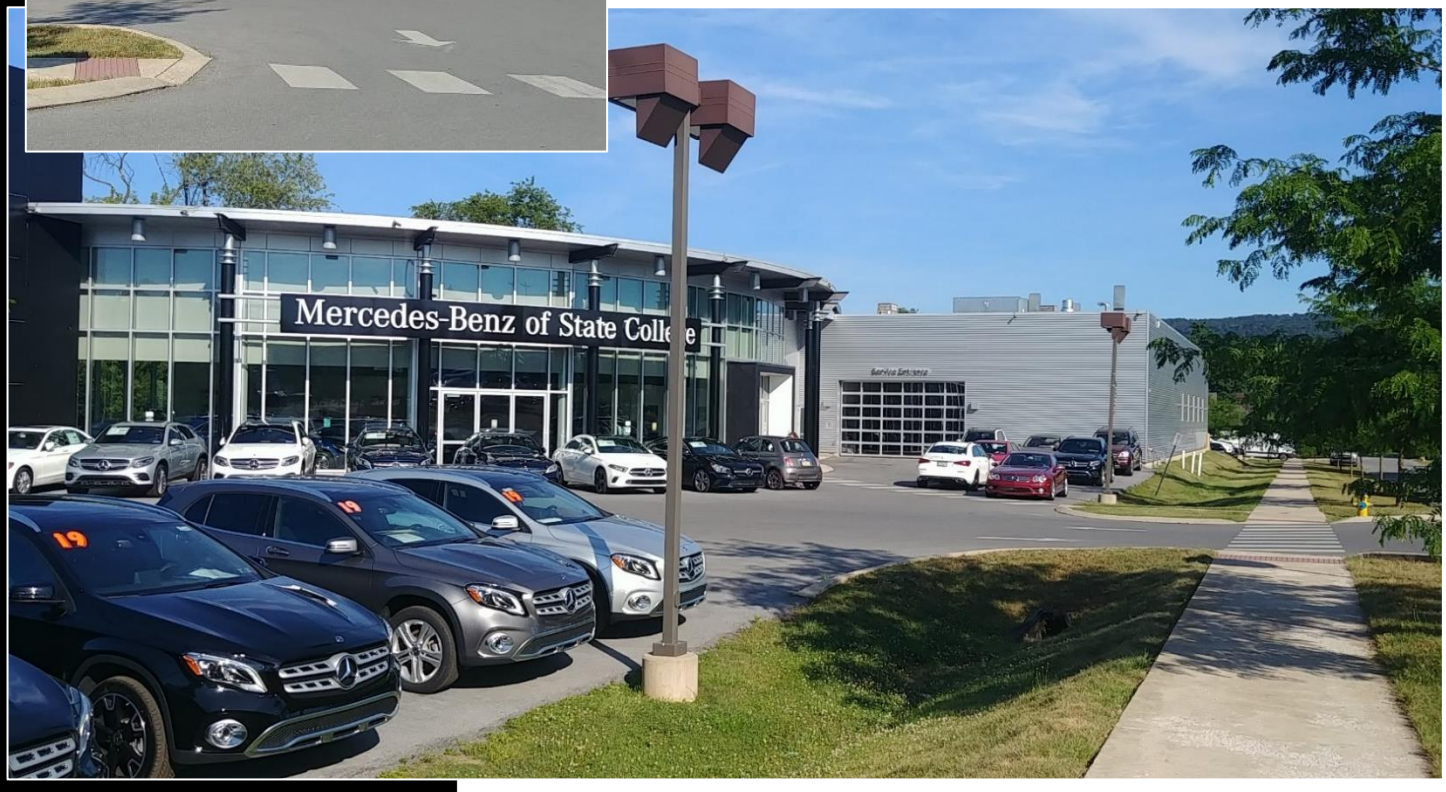
- **Owner:**
  Mercedes-Benz of State College
- **Services:**
  - Land Development Submission
  - Stormwater Analysis
- **Year Completed:**
  2011

Car Dealership Land Development Submission

Mercedes-Benz, State College, PA

Stahl Sheaffer conducted a land development submission that included stormwater analysis as well as erosion and sedimentation control recommendations for the development of a 17,000-SF building space with a showroom, services, and offices.

The development of the lot included buildings, parking, sidewalks, and analysis of the current state of the existing dealership plus an additional impervious area to allow for potential expansion. Updates included a new paved parking lot, stormwater detention/retention facilities, and grading improvements.



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Morgan Academic Center Upfit

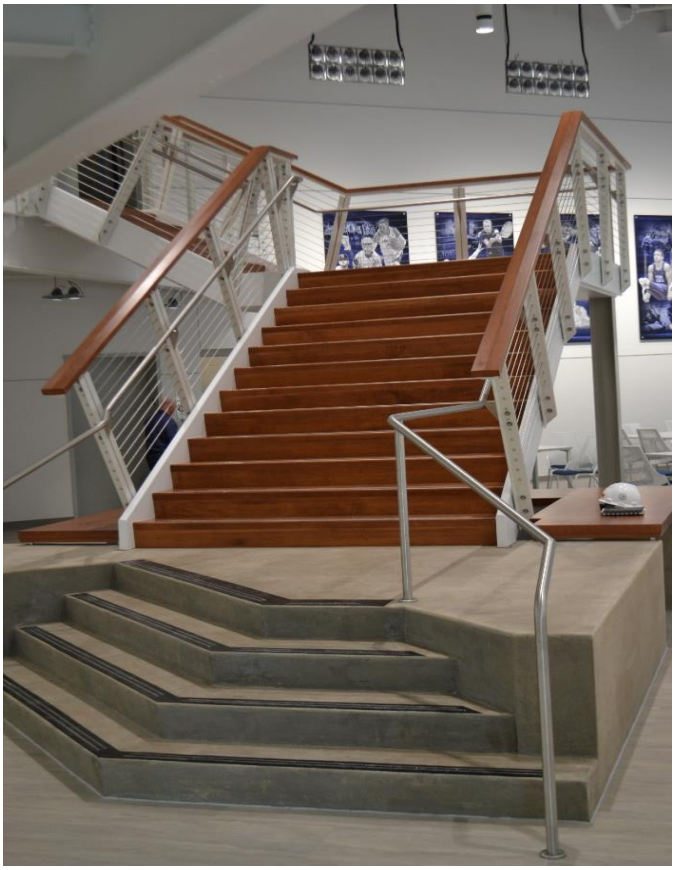
The Pennsylvania State University, University Park, PA

- **Owner:**
  The Pennsylvania State University
- **Services:**
  Structural Engineering for Renovation & Redesign
- **Size:**
  30,000 SF
- **Construction Cost:**
  $7,200,000
- **Year Completed:**
  2016

The Morgan Academic Center is a vital component in keeping Penn State's academic services and the academic performance of its 800 student-athletes from 31 programs at the forefront among the nation's premier Division I institutions.

Following the addition of the second floor in the former Greenberg Indoor Sports Complex, the front-of-house and lower floor were upfitted into the new home for the Morgan Academic Center, providing a central academic hub for Penn State student-athletes. Stahl Sheaffer was a design consultant on the team for structural engineering services. The northwest corner of the building was selectively demolished and rebuilt with curtainwall. Stahl Sheaffer assisted with details of new assembly and review of building stability. Stahl Sheaffer also assisted with detailing a new ornamental stair within a two-story atrium space, and considerations for modifying the existing lateral force resisting system for the new intended use of the space. Stahl Sheaffer prepared contract drawings to be sealed for submittal as part of permit application to L&I, including an on-drawing specification for materials and construction pertinent to Stahl Sheaffer's scope.

Read more here:
http://www.centredaily.com/sports/college/article85256802.html#storylink=cpy



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Applied Research Laboratory

The Pennsylvania State University, Ferguson Township, PA

- **Owner:**
  The Pennsylvania State University
- **Services:**
  - Survey
  - Traffic Study
  - Land Development
  - Construction Administration
- **Construction Cost**
  $5,000,000
- **Year Completed:**
  2009

Stahl Sheaffer Engineering conducted the Traffic Impact Study (TIS) and provided the site engineering and land development plans for the new Applied Research Lab in Ferguson Township for The Pennsylvania State University. Specific tasks included a site feasibility study, a survey, a lot consolidation plan, engineering design, final site plans and construction administration.

The engineering design and final site plans included stormwater collection and conveyance facilities that allowed for no additional volume of stormwater to leave the site. Stahl Sheaffer added 550 linear feet of new 8" sewer main in coordination with the University Area Joint Authority. The sewer main extension was necessary to accept flow from the new lateral for the ARL development and provided availability for potential future connections from adjacent undeveloped properties. The sewer design included five new manholes and was designed in accordance with UAJA and DEP requirements.

The office building is LEED-certified Silver but was designed to meet the criteria for the Gold Standards.

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Masonry Inspection for Academic West Building

Bucknell University, Lewisburg, PA

- **Owner:** Bucknell University
- **Services:** Construction Inspection
- **Construction Cost:** $22,000,000
- **Year Completed:** 2013

Stahl Sheaffer Engineering was called in to oversee masonry inspection and ensure quality control during the final stage of construction of Bucknell's Academic West building. Stahl Sheaffer provided experienced field personnel for continuous inspection of masonry construction operations throughout the duration of that phase of construction. This state-of-the-art building is LEED certified at a silver level, meeting strict standards for energy efficiency and environmental impact and stewardship.

U.S. GREEN BUILDING COUNCIL LEED SILVER USGBC

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Juniata College
PENNSYLVANIA
• 1876 •

- **Owner:**
  Juniata College
- **Services:**
  - Structural Engineering
  - Construction Administration
- **Completed:**
  2017

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Good Hall Structural Design

Juniata College, Huntingdon, PA

Stahl Sheaffer provided structural engineering and construction administration services for the code-based design of three-story, steel framed entry addition for Good Hall, including below grade basement level and full height elevator. Good Hall is Juniata College's center for social sciences, containing more than 30 classrooms, two computer facilities (including a Mac lab), the business department's case study room, the audio/visual department, and three instructional laboratories. It contains some of the college's most advanced classrooms with computerized overhead displays, surround sound speaker systems, and videoconferencing technology. Foundations were designed and analyzed to address concerns with expansive soils identified at site. The addition included composite concrete deck over steel framing. Due to large window openings and limited clearance for traditional steel cross bracing, custom truss style lateral braces were designed to distribute and resist lateral loading. The existing structure was wood stud framed; the addition was designed as an independent structure.

STAHL SHEAFFER ENGINEERING

Health Care Vestibule & Utility Room

Geisinger Hughes Center, Danville, PA

- **Owner:**
  Geisinger
- **Services:**
  - Structural Engineering
  - Construction Administration
- **Year Completed:**
  2017

Stahl Sheaffer Engineering was part of a team to provide structural engineering services for the design and detailing of a new entry vestibule and utility room located at the main entrance of the Geisinger Hughes Center North located in Danville, PA.

The structure of the entry vestibule is designed as a combination of steel framing and concrete masonry bearing walls. The vestibule framing penetrates the exterior façade of the existing building and is coordinated to be supported by the existing building columns. The vestibule is laterally supported by the existing building and adjoining proposed utility room. The adjoining utility room, a three-story open volume relying on the existing building to provide lateral stability, consists of load bearing concrete masonry unit (CMU) walls with steel framed roof. The floors of both the vestibule and utility room are slab-on-grade with standard shallow spread foundations and CMU frost walls.

Stahl Sheaffer also provided construction administration services for this project during bidding and construction stages.

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Site Engineering for New Mixed-Use Building

- **Owner:**
  Clearly Ahead Development
- **Services:**
  - Site Engineering
  - Land Development Plan
  - Soil Testing
- **Year Completed:**
  In Progress

Clearly Ahead Development, Clearfield Borough, PA

Clearly Ahead Development

Stahl Sheaffer provided civil engineering services to support KTH Architects on the development of a mixed-use building (renderings below). The site includes a driveway connection to Market Street, pedestrian access to the River Walk, on-site parking facilities, and associated stormwater management and utility connections.

Plans are to construct a two-story facility with 5,000 SF on each floor and is designed for multiple tenants and will feature on-site parking. The first floor is planned to host two to three businesses. The second floor will have multi-office spaces with a larger conference room for use during training sessions and special events. According to CEO of Clearly Ahead Development Rob Swales, the structure will have a *"warm and welcoming architectural style that bodes well with the Pennsylvania Wilds design guidelines and natural heritage of Clearfield and the Susquehanna River."*

Stahl Sheaffer provided the necessary engineering design to complete site improvement plans and obtain associated permits and approvals. Since the Rivers Landing site used to have a service garage located on it, Stahl Sheaffer also completed the necessary soil testing to determine if the existing soils still contained any contaminants that could affect the overall site plan. Stahl Sheaffer Engineering also provided the following services:

- Land development approval under the jurisdiction of Clearfield Borough
- Modification to the existing NPDES stormwater permit
- Site plans and technical specifications suitable for bidding and construction

Construction is anticipated to proceed in November 2018 and is anticipated to take 14 to 18 months.

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STAHL SHEAFFER ENGINEERING

Site Engineering for Redevelopment

- **Owner:**
  Quattro Development
- **Services:**
  - Site Engineering
  - Zoning Variance
  - **Traffic Study**
- **Year Completed:**
  2018

Quattro Development, Selinsgrove, PA

Stahl Sheaffer provided site engineering services to Quattro Development for the construction of a new single building (Mattress Warehouse) and three tenant buildings (MOD Pizza, Selinsgrove Dental and Dentures, and Chipotle) as well as an existing single tenant building (Harbor Freight). This project was a redevelopment project in which we utilized a site layout provided by the client and modified it to meet the local ordinances. Zoning variances pertaining to steep slopes and the required parking were obtained from the Township. One of the existing parcels included ROW for PPL transmission lines so the overall site design within that area had to be coordinated with the power company to ensure they met all necessary standards. Since the construction associated with the single tenant buildings was a redevelopment project, addressing stormwater runoff had to be accomplished by running multiple underground facilities is series. This allowed us to detain the necessary runoff using basins with smaller footprints. Nina Drive was also improved to be able to handle the proposed increase in traffic along with the necessary turning lanes on SR 0011.

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STAHL SHEAFFER ENGINEERING

Lab Addition Site & Structural Design

- **Owner:**
  American Refining Group
- **Services:**
  - Site Engineering
  - Structural Engineering
  - Construction Administration
- **Year Completed:**
  2017

American Refining Group Lab, Bradford, PA


Original Structure

Stahl Sheaffer Engineering was part of a Design-Build team in partnership for the approximately 7,500-sf lab addition. The structure is a combination load bearing masonry structure (exterior walls) and steel frame (interior column line) supporting a traditional steel framed flat roof with metal deck and bar joists. A steel framed exterior canopy bearing on steel columns created a secure location for exterior storage. The floor is slab-on-grade with standard shallow spread foundations. Slab-on-grade is designed to accommodate equipment and traffic for the processes planned within the space. Interior revisions to the existing facility included new wall openings for doors and ductwork, and the design of a jib crane supported on an existing elevated floor for material handling.

Stahl Sheaffer provided site and structural engineering for this project. Site amenities included an underground storage tank for waste materials from the laboratory testing processes, site paving, and vehicular routing including tanker trucks on the restricted site area. The site was designed to accommodate the owner's needs and processes. Stahl Sheaffer designed the building structure to accommodate the local environmental loadings, equipment and process loading, and user induced loads.


New Structure

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STAHL SHEAFFER ENGINEERING

New Hotel Structural Design

Harrisburg International Airport, Harrisburg, PA

- **Owner:**
  Shaner Corporation
- **Services:**
  - Structural Engineering
  - Construction Administration
- **Construction Cost:**
  $14,000,000
- **Year Completed:**
  2018

Stahl Sheaffer provided structural engineering services for the new Fairfield Inn by Marriot, the first hotel at the Harrisburg International Airport. The four-story structure has a base footprint of 17,400 square feet and was designed to have a total of 123 guest rooms. The structure consists of hollow core precast floor and roof planks supported on reinforced concrete masonry walls and structural steel framing. The radial profile of the main entry porte cochere was designed using pre-engineered wood to frame the canopy roof and a structural steel tube support structure.

The hotel is unlike a typical Fairfield Inn & Suites hotel, with a focus on soundproofing and a flight schedule in the hotel lobby for guests to keep track of their flights. The flight schedule is tied into the airports system, so hotel guests will conveniently be updated on whether their flights are on time or delayed. Features of the hotel also include a small market, business center, fitness center, and bar.

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STAHL SHEAFFER ENGINEERING

Covenant Woods Retirement Center Renovation

COVENANT WOODS

- **Owner:**
  Covenant Woods
- **Services:**
  Structural Engineering
- **Construction Cost:**
  $27,400,000
- **Year Completed:**
  Design: 2016
  Construction: In Progress

Covenant Woods Continuing Care Retirement Community, Richmond, VA

Stahl Sheaffer provided structural engineering services for the design and renovation of the Covenant Woods Continuing Care Retirement Center. The project included two new building additions with slab-on-grade basement, with framed first and second floor added to the north end of wing C. A new slab on grade building addition with framed second floor was designed to replace an existing one-story section of building on the south end of Wing A. Each section is a steel frame supporting the floors and light-gauge steel roof trusses. Exterior walls are light-framed steel construction supporting siding or masonry veneer.

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Charter School Site & Structural Design

- **Owner:**
  Young Charters School
- **Services:**
  - Survey
  - Land Development Plan Preparation
  - Structural Design
- **Construction Cost:**
  $600,000
- **Year Completed:**
  2017

Young Scholars Charter School of Central PA, State College, PA

Stahl Sheaffer was responsible for the survey and site design for the construction of the Young Scholars Charter School, and subsequent second-story addition and parking expansion projects. Stahl Sheaffer teamed with a local architect to provide land development services, including site layout and grading, parking lot design, stormwater management, erosion and sedimentation control plan, landscaping, site lighting, and buffer yard landscaping designs.

Stahl Sheaffer also led the structural design of three phases of construction for the school. A variety of structural systems were used due to architectural requirements. Phase one included a single-story wing of classrooms and offices, as well as a large gymnasium that doubles as a cafeteria. Portions of the entry and offices consist of CMU bearing walls, while the remainder consists of wood framed bearing walls. These supported prefabricated wood trusses. Foundation consists of strip footings, CMU foundation walls and slab on grade. Phase two included a new wing for classrooms. Design and construction are similar to the original classroom wing. Stahl Sheaffer designed the structure to support adding a future second story on this wing. Phase three included the design of the second story using wood-framed construction, prefabricated wood trusses, and an elevator. Stahl Sheaffer worked with the project team to provide the structural design of load bearing walls, foundations, lintel and header beams, and a loading summary. A phased development was implemented to allow current operation and future expansion of the charter school.

In June 2016, Ferguson Township approved Stahl Sheaffer's land development plan to add the second-story building addition to provide new classrooms and administrative support, as well as the design of a new driveway to improve traffic circulation. As part of the municipal approval process, Stahl Sheaffer completed a transportation impact assessment for the expansion, which included data collection, transportation analysis, report preparation, and meetings. The final phase of the school and site improvements were completed in 2017.

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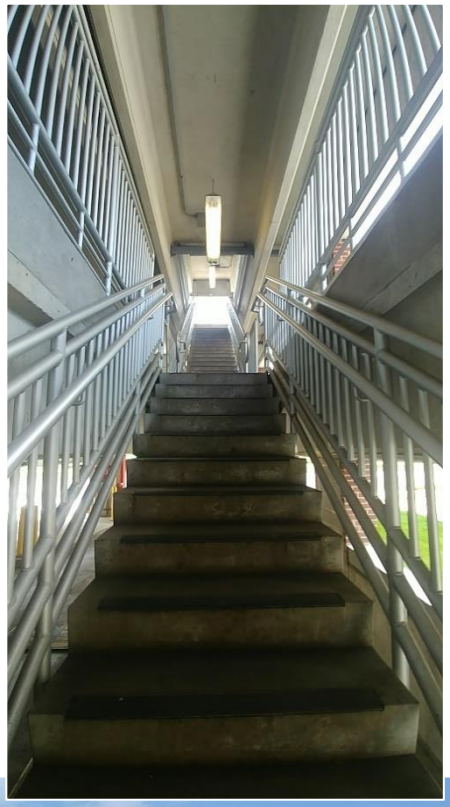
Eisenhower Parking Deck Structural Design

- **Owner:**
  The Pennsylvania State University
  Office of the Physical Plan
- **Services:**
  - Structural Inspection
  - Five-Year Maintenance Contract
- **Size:**
  230,000 SF
- **Construction Cost:**
  $770,00
- **Date Completed:**
  2013 & 2018

The Pennsylvania State University, University Park, PA

Stahl Sheaffer performed a condition inspection and prepared contract documents for both 2013 and 2018 maintenance contracts for the six-story parking garage. Evaluation included a visual inspection of the double-tee floor members, floor and roof deck members, beams, columns, spandrels, stair and elevator towers, exposed steel, sealers and deck coatings, joint sealants, expansion joints, drainage, cable barriers, and the roof office. The evaluation of the façade included a visual inspection of the exterior brick and of the precast concrete panel walls. The exterior inspection focused on deteriorated mortar joints, condition of the caulking, cracked and missing bricks, cracking and spalling of the concrete. The project also included contract administration and inspection services.



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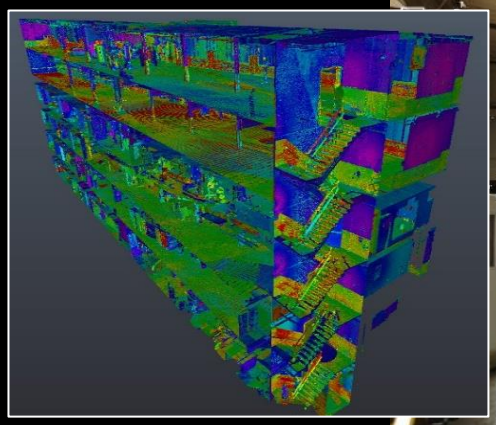
Commercial Building Scan for Upfit

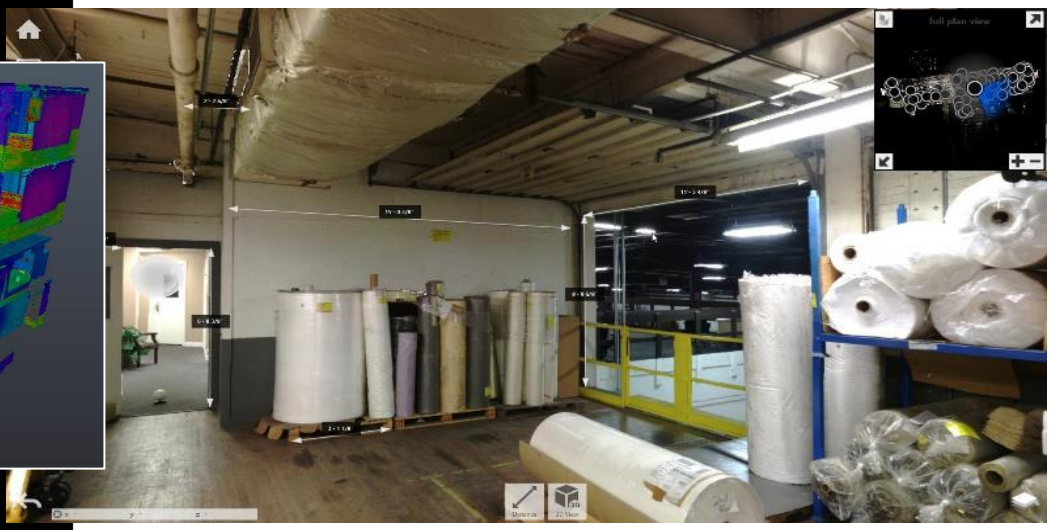
Rubberlite Incorporated

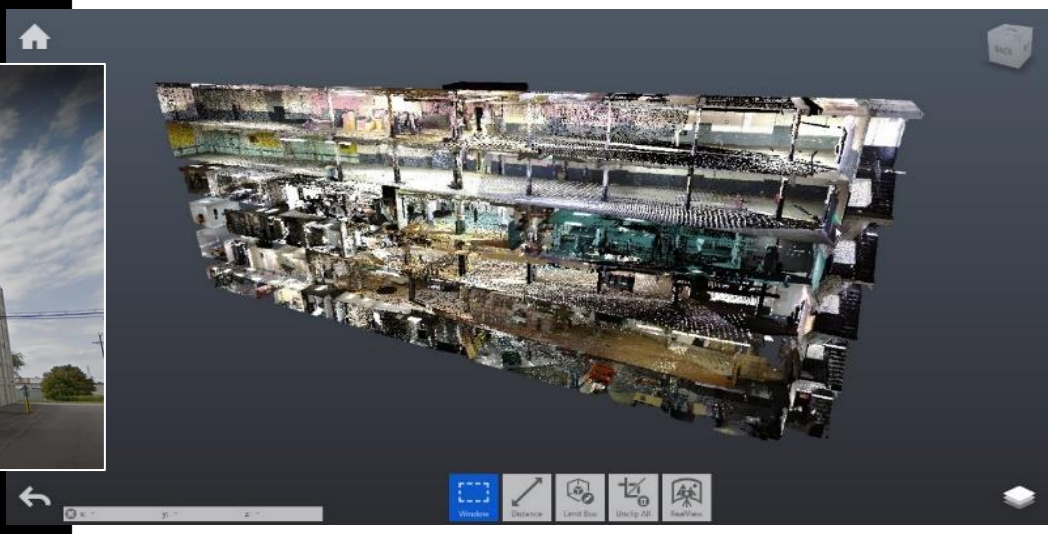
- **Client:** ET Scanning
- **Owner:** Rubberlite, Inc.
- **Services:** 3D Scanning
- **Year Completed:** 2017

Rubberlite, Inc., Huntington, WV

Stahl Sheaffer scanned a 6-story commercial building and provided point cloud data to be used for an architect fit-out. The 3D model created from the point cloud enabled development of an online “fly-through” as well as the ability to view photos of the building’s interior.







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