

TECHNICAL ASSURANCE

High Performance
Building Enclosure
Experts



Statement of
Qualifications

TECHNICAL ASSURANCE

Company Overview

Technical Assurance, Inc. is a nationally-recognized building consulting firm founded in 1993. Technical Assurance, Inc.'s current staff of professionals manages building enclosure consulting and design for assignments of varied size, scope and geographic location.

Our practice includes a considerable focus on solving a variety of building system deficiencies. Areas of expertise include roofs, façades, fenestrations (doors, windows and skylights), below-grade structures, parking areas and multi-level parking structures.

In addition, a number of the Technical Assurance clients engage the company to comprehensively manage their physical assets programmatically. These kinds of assignments generally include, predictive and preventative maintenance, capital budget integration and even client staff training.

We also have a full-service Commissioning Group to improve new construction building design and perform functional testing of the system during construction. Our Commissioning Group also performs Building Retro-Commissioning to improve existing building enclosure performance and energy loss.

Technical Assurance's success is due to our ability to lead the planning, design and implementation process for projects of any type, with a history of delivering projects on time and within budget. Our staff is committed to design excellence and client service with a team approach. Each program is approached individually, without preconceptions, and designed to serve the needs of the particular client – always with the goal of achieving excellence in delivery.

The professionals at Technical Assurance, Inc. have substantial critical facility industry experience. We have an extensive staff of consultants, engineers, field technicians, project and construction managers, database managers, GIS consultants, technical staff and office support. We maintain in-house capabilities to provide asset management and produce design drawings and project specs with complete cost estimating and budget preparation. Additionally, we continue to serve our clients with bidding services and construction administration during the entire course of the task, project, or program. Our services are sought primarily by those clients who value their building assets as "critical" in running their daily operations.

Points of Differentiation

- ✓ Established knowledge of critical facility project standards, guidelines and safety and security requirements.
- ✓ 30 years of proven work experience providing planning, assessment, technical design consultation, construction observation, asset life cycle management and building enclosure commissioning (BECx) services.
- ✓ Approximately \$100 million of building envelope restoration, replacement and repair projects completed by Technical Assurance on an annual basis.
- ✓ Technical Assurance is one of the largest specialized building enclosure consulting and engineering firms in the United States.

SERVICE OVERVIEW



Building Envelope Asset Management

Technical Assurance's ON-PNT allows facility owners the ability to manage building system inventory, condition assessments and ongoing building system data within one central location. This technology provides for robust GIS mapping and automated reporting metrics for simple data consumption.



Roof Consulting

We are your partner for total roof management. With a team of highly trained roofing specialist, we deliver comprehensive solutions for the assessment, design and implementation of roofing projects of any scope and size. Our programmatic approach to roof management ensures that your roofing investment is optimized to extend the service life of the roof system and to reduce the Total Cost of Ownership.



Facade Consulting & Structural Engineering

We offer vertical facade and structural engineering services including masonry and concrete exterior walls, curtain walls, balconies, exterior insulation finishes, fenestrations (doors, windows and skylights) and structural consulting to diagnose the cause of structural distress. We design repairs and restorative solutions that protect the structural integrity and aesthetic design of the building enclosure.



Parking Garage Consulting

Technical Assurance provides comprehensive consulting services for the restoration, repair and preventative maintenance of existing parking areas. Our deep understanding of the requirements for keeping your parking areas highly maintained and safe will help you operate with a low cost of ownership and extend the life of these necessary and valuable assets.



Exterior Hardscape Consulting

The exterior hardscape serves as a first impression and welcomes visitors to your facility. Regular maintenance of these areas will improve safety and increase the perceived value of your facility. Technical Assurance provides condition assessments, functional design consulting and durability recommendations.



Building Enclosure Commissioning

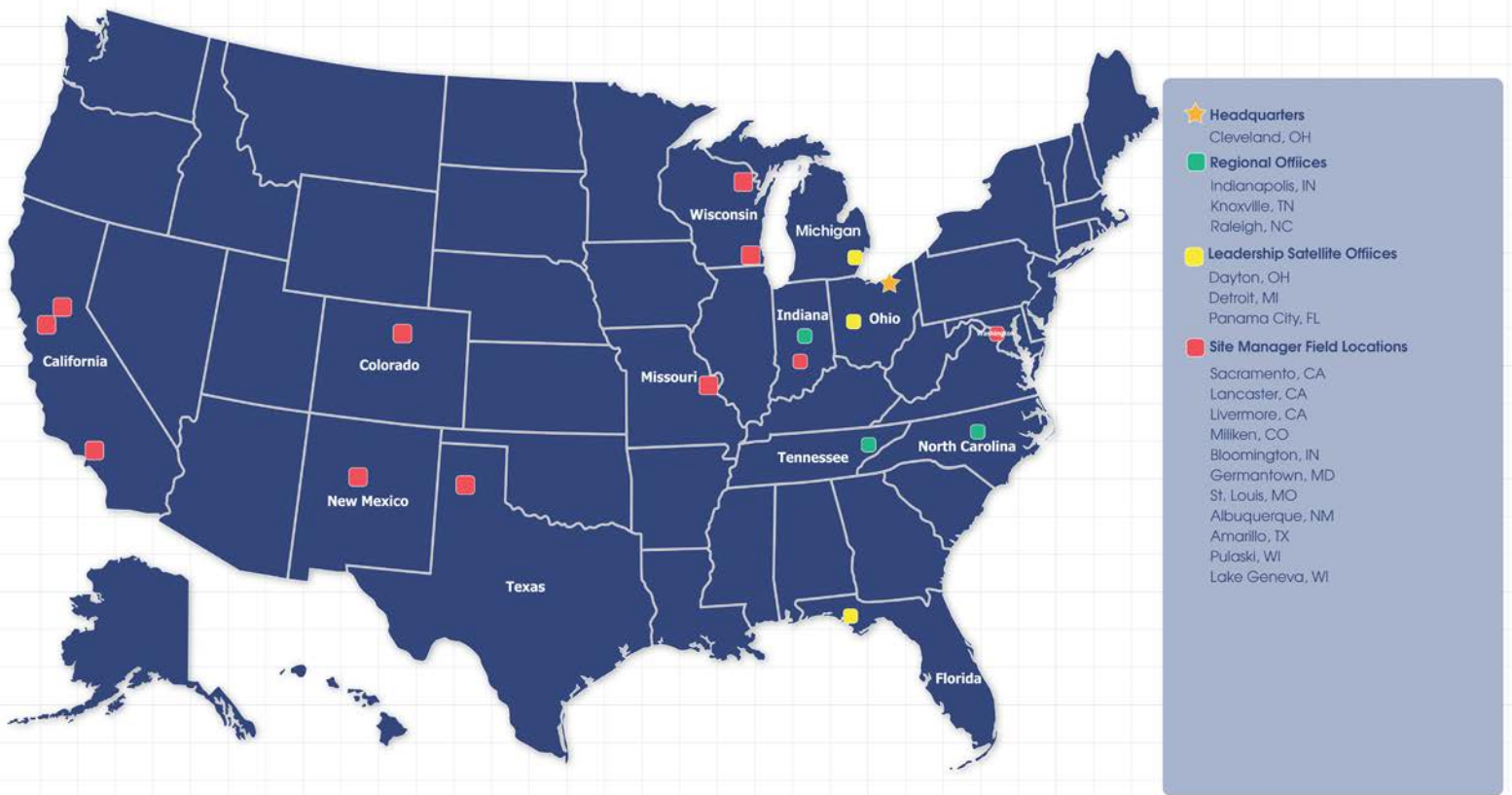
The full-serve BECx Group specializes in providing data-driven, quality improvement suggestions to new construction building design and performs functional testing during construction. Building enclosures directly affect the longevity and energy efficiency of a building. With a systematic approach to quality assurance, our BECx process improves the performance, safety and efficiency of a building and ensures that a project meets specific quality requirements.

GEOGRAPHIC COVERAGE

Technical Assurance has the capacity to provide national building enclosure consulting services. Our project-related field teams span across the United States, as we are continuously recruiting top talent in different markets in order to efficiently staff client program needs. We have successfully delivered roofing and building envelope projects across all 50 U.S. states and in Canada.

Office Locations

Headquarters	38112 Second Street, Willoughby, OH 44094
Raleigh, NC	301 Kilmayne Drive, Suite 204, Cary, NC 27511
Knoxville, TN	10426 Jackson Oaks Way, Suite 103, Knoxville, TN 37922
Indianapolis, IN	160 West Carmel Drive, Suite 244, Carmel, IN 46032



5 STEPS TO SUSTAINABILITY

Technical Assurance's unique 5 Steps to Sustainability process ensures thorough, superior results in program assessment, planning, design and management. Our process-driven approach allows our team to systematically lead all phases of building envelope programs – providing a framework for collaboration and creative solutions.

DISCOVER

Development of Owners Facilities Requirement (OFR), inspect, test, explore, excavate, evaluate and observe existing facilities and parking structures to develop an accurate condition assessment. This step frequently involves forensic investigation for facilities problems.

PLAN

Prepare and develop repair programs and capital plans along with work schedule priorities based on discovery phase findings.

SOLVE

Meet with the Owner's Team and develop design (construction documents, plans and specifications) solutions for all building and parking conditions requiring repair, restoration and/or remediation.

MANAGE

Manage and administer the construction process to ensure cost control, energy savings, quality assurance requirements and compliance with construction documents.

SUSTAIN

Implement and monitor preventive maintenance programs based on long-range component life-cycle forecast to reduce Total Cost of Ownership.

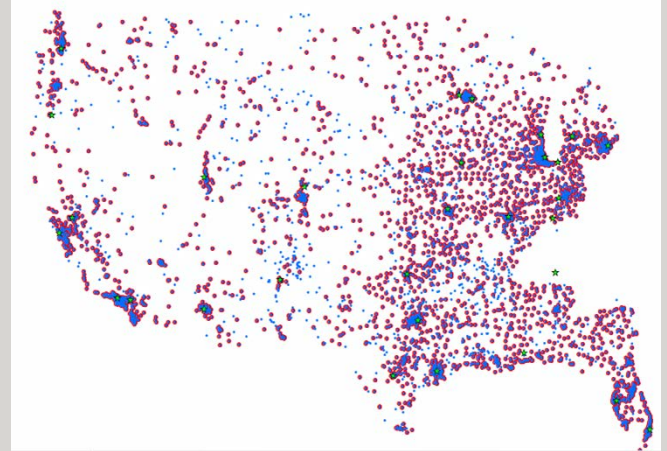


TECHNICAL ASSURANCE

**Project & Program
Experience**

United States Postal Service

Roof Asset Systems Management Program



Programmatic Value

Helped the client have a clear understanding of the condition of their massive facility portfolio, and implemented ongoing preventative maintenance efforts in order to extend the service life of the assets.

Program Specifics

Size: 116+ million SF of roofing assets

Locations:

National Program

Assessed 3,170 Facilities

OVERVIEW

In 2018, Technical Assurance, in partnership with Wood® Environment & Infrastructure Solutions, Inc. (team lead) and RoofConnect, was awarded the federal United States Postal Service (USPS) Roof Asset Management Systems (RAMS) program.

The USPS currently owns 8,215 facilities across the United States, totaling approximately 186 million square feet of roof assets valued over \$3 billion. The purpose of the RAMS program is to maintain an accurate inventory of the roofing infrastructure, to accurately and consistently assess its condition, and to develop and implement a long-term plan for maximizing its life expectancy and the associated costs for doing so.

The scope of the RAMS program includes:

- Condition assessments
- Biannual preventative maintenance
- Repair and alterations
- Emergency leak response
- Roof design services
- Roof restoration projects
- Construction management
- Quality observation

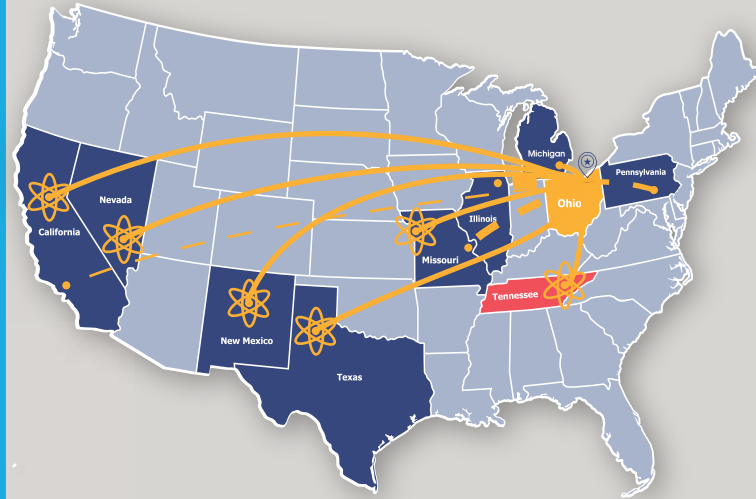
In the first year of the program, Technical Assurance assessed 3,170 facilities, totaling approximately 69.4 million SF of roof assets. Geographical coverage included the Great Lakes, Pacific, Southern and Western regions of United States.

Additionally, the Technical Assurance team mobilized to 1,230 sites for preventative maintenance (PM) visits.

Additionally, we provided design services for roof replacement projects, and performed construction administration and quality observation on active projects.

Department of Energy National Nuclear Security Administration

Roof Asset Management Program



Programmatic Value

In 2019, Technical Assurance provided over \$1.7 million in cost savings through competitive bidding and reduced design fees.

Program Specifics

Size: 25 million SF of roofing assets

Locations:

Sandia National Laboratory –Livermore, CA
Lawrence Livermore National Laboratory – Livermore, CA
Nevada National Security Site – Las Vegas & Mercury, NV
Y-12 National Security Complex – Oak Ridge, TN
Sandia National Laboratory – Albuquerque, NM
Los Alamos National Laboratory – Los Alamos, NM
Pantex Plant – Amarillo, TX
Idaho National Laboratory – Idaho Falls, ID
Savannah River National Labs – Savannah, GA

OVERVIEW

Technical Assurance, Inc. was contracted by Honeywell FM&T to provide the implementation of a comprehensive Roof Asset Management Program (RAMP) for the U.S. Department of Energy – National Nuclear Security Administration at nine (9) different sites in ten (10) locations throughout the U.S.

The overall purpose of the RAMP is to provide high performance and energy efficient capital renewals and the implementation and management of roof sustainability repair and maintenance programs that can extend roof system life cycles and lower total cost of roof asset ownership. The scope of work called for Technical Assurance to provide:

- Complete roof condition evaluation
- Asset inventory
- Financial and budgetary modeling
- Management of roof life extension efforts
- Professional design services
- Contracting for construction services
- Quality Observation

In 2015, 21 million square feet of roofs were assessed in an expedited manner of 10 months. Reassessments of the roof assets at all sites are underway. The annual capital roof renewals average \$60+ million. [Since 2015, Technical Assurance has managed \\$395 million of design-bid-build projects through the program.](#)

Technical Assurance serves as the single prime contract holder for the design-build projects at all locations.

Nestle

Roof Assessment Program



Programmatic Value

Helping the client inventory and assess their roof portfolio within a central location; approximately 5.5 million have been assessed to-date.

Project management and construction phase documents are housed within the ON-PNT portal as these projects are completed.

Project Specifics

Locations:

Bakersfield, CA
 City of Industry, CA
 Danville, VA
 Fort Wayne, IN
 Freehold, NJ
 Gaffney, SC
 Jacksonville, IL
 Laurel, MD
 Little Chute, WI
 Medford, WI
 Morton, IL
 Mount Sterling, KY
 Solon, OH
 Springville, UT
 Waverly, IA

OVERVIEW

Technical Assurance was worked with Nestle to perform roof assessments on nearly 5.5 million square feet of roofs over fifteen (15) food manufacturing/production sites.

The inventory and assessment data was collected using the ON-PNT® mobile field app. Our team performed (and repaired) core cuts in order to determine the full roof system make up and to verify wet roof areas.

During the assessment, the following information was gathered, analyzed and included in the final reports:

- Roof deficiencies type, location and quantity
- Current leaks
- Existing defects requiring roof repair
- Wall systems that may impact roof performance
- Photographic documentation
- Condition Indices
- Total Services Life and Remaining Service Life
- Replacement Cost Estimates
- Defect Cost Estimates
- Total Cost of Ownership savings associated with performing repairs and preventative maintenance

Following the assessment, Technical Assurance provides Nestle with multi-year repair and replacement plans based on both constrained and unconstrained budgeting models.

*Project prioritizations are determined by the Mission Criticality of the building and/or roof section, the condition index and the total cost of ownership.

During roof replacement projects, Technical Assurance provides project administraton, managemnet and quality observation services.

Campbell's Soup Company

Roof Assessments, Design & Construction Phase Services

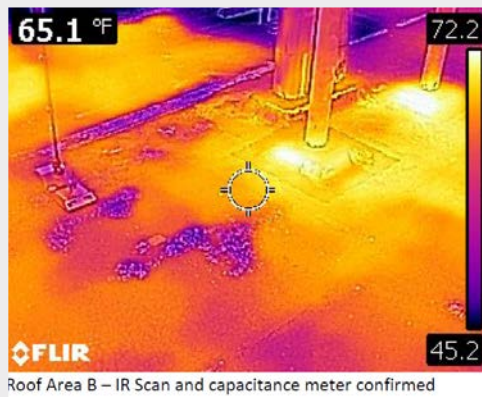
Programmatic Value

Helping the client inventory and assess their roof portfolio within a central location. Project management, design and construction phase documents are housed within the ON-PNT portal as these projects are completed.

Project Specifics

Locations:

Pepperidge Farms Plant | Williard, Ohio
 Snyder's of Hanover | Ashland, OH
 Snyder's Lance Chips Plant | Charlotte, NC
 Snyder's Snacks Pretzel Factory | Hanover, PA



Roof Area B – Partial overview of roof area; ponding water over primary east/west corridor

OVERVIEW

Technical Assurance has been engaged by Campbell's Soup Company to provide roof assessment, testing and quality observation services on a number of their manufacturing facilities.

During the assessment, the following information was gathered, analyzed and included in the final reports:

- Roof deficiencies type, location and quantity
- Current leaks
- Existing defects requiring roof repair
- Wall systems that may impact roof performance
- Photographic documentation
- Condition Indices
- Total Services Life and Remaining Service Life
- Replacement Cost Estimates
- Defect Cost Estimates
- Total Cost of Ownership savings associated with performing repairs and preventative maintenance

Following the assessment, Technical Assurance provides Campbell's with multi-year repair and replacement plans based on both constrained and unconstrained budgeting models. Project prioritizations are determined by the Mission Criticality of the building and/or roof section, the condition index and the total cost of ownership.

Additionally, Technical Assurance provided design, bid and quality observation services for the roof replacement project on the Pepperidge Farms, Willard, OH plant. The same services are underway at the Hanover, PA Pretzel Factory.

Geisinger Henry Cancer Center

Building Enclosure Commissioning (BECx)



Value

The identification of issues during construction and verification that systems are being installed properly. This process ensures continuous weather and thermal barriers. The BECx services also helped the client achieve LEED certification.

Project Specifics

Client:	HF Lenz
Owner:	Geisinger Wyoming Valley Medical Center
Size:	+/- 92,000 GSF Addition
Cost:	\$80 million

OVERVIEW

Geisinger's Henry Cancer Center engaged the design team of the original building to design the significant expansion to the Wyoming Valley campus. The expansion will stand as a new main hospital entrance for the campus, reshaping the arrival experience as part of a holistic approach that focuses on health and wellness.

Technical Assurance was engaged to provide building enclosure commissioning/consulting services on the addition construction. This addition acts as a bridge between the existing campus structure and the future healthcare environment. The team is taking measures to achieve LEED certification.

Our team began involvement during the design and CD phase of the project, continuing through construction.

- Design and CD Phase – third-party review of enclosure related drawings and specifications, development of a commissioning plan
- Construction Phase – Shop drawing and technical review, periodic technical quality observation during typical installation points of the building enclosure
- 10-month post occupancy review
- Performance Testing:
 - ASTM D4541 Adhesion of Weather Barrier Coatings
 - ASTM C1153 Roof Insulation Infrared Scanning
 - ASTM E1105 Pressurized Chamber Water Infiltration Testing
 - AAMA 501.2 Water Hose Testing of Window Systems

Goodyear Headquarters

Facade Assessment & Recommendations



Value

Our team outlined two (2) remediation strategies for eliminating chronic water infiltration issues.

Project Specifics

Size: 7 Stories

Location: Akron, OH

OVERVIEW

Technical Assurance, Inc. was retained by IRG Realty Advisors to provide an inspection and testing for the curtain wall system of the Goodyear Tire and Rubber Company World Headquarters in Akron, OH. The majority of the evaluation was conducted from a 125' man lift, with other portions conducted from roof sections.

The World Headquarters is a relatively new facility experiencing water intrusion issues only four (4) years after construction was complete. The curtain wall system was in mediocre condition mostly due to fabrication and installation issues. Our assessment found details that were inconsistent and appear reactionary and not part of the original design or concept.

Due to the number of fabrication and installation issues of the curtain wall system, a restoration project would be extremely expensive. At this point, it was recommended to pursue a proactive/reactive maintenance program. While this sounds contradictory, it is best to deal with issues as they arise and be positioned to quickly, thoroughly, correctly and efficiently perform the required repairs.