

OFFICIAL ENTRY FORM

2024-2025 ACEC/MW ENGINEERING EXCELLENCE AWARDS

Please furnish all information requested below for each entry (both submitting firm and owner/client signatures required). Please limit the project name to 45 characters. Entries will not be considered without prior payment of the ACEC/MW EEA Entry Fee.

Project Name: Church Creek Fire Tower Restoration

Project Location (City, State, Country): Church Creek, MD

Judge this entry in the following category (check one):

(see ACEC/MW EEA Criteria and Entry Submission Instructions for full listing)

- | | | | |
|--|---|--|--|
| ☐ Non-Design
[Studies, Research, and
Consulting Engineering Services] | ☐ Structural Systems
☐ Surveying & Mapping
Technology
☐ Environmental | ☐ Water & Storm Water
☐ Water Resources
☐ Transportation
☐ Special Projects | ☒ Small Projects
☐ Energy
☐ Industrial and Manufacturing
Processes and Facilities |
|--|---|--|--|

THE FIRM:

Name of Firm:	A. Morton Thomas and Associates, Inc. (AMT)		
Contact Person:	Mike Wychulis, PE		
Title:	Associate Group Leader Site and Infrastructure		
Signature:			
Address:	700 King Farm Boulevard, Suite 300		
City / State / Zip:	Rockville, MD 20850		
Phone:	301-545-2646		
Fax:		Email:	mwyichulis@amtengineering.com

AUTHORIZATION:

I hereby authorize submission of this project in the ACEC/MW 2023-24 competition:

Sr. Executive / Principal:	Matt Ernest, PE, LEED AP		
Title:	Vice President Director Site and Infrastructure		
Signature:			
Phone:	301-591-8570	Email:	mernest@amtengineering.com
Complete the information below only if different than firm information above.			
Firm:			
Address:			
City / State / Zip:			

THE CLIENT / OWNER(S)

I currently believe the work of the engineer meets the intended uses and expectations for the project and hereby grant permission to enter this project in the ACEC/MW 2023-2024 EEA competition and authorize publication of its outstanding features, unique aspects, or innovations. I confirm that the project was substantially completed and ready for use between November 1, 2022, and October 31, 2024.

Client / Owner(s):	State of Maryland, Department of General Services (DGS)		
Client / Owner Representative	Ray H. Kaliush		
Title:	Capital Project Manager Design, Construction & Energy		
Signature:	<i>Ray Kaliush</i>		
		Email:	ray.kaliush@maryland.gov



CHURCH CREEK FIRE TOWER RESTORATION

CATEGORY: J SMALL PROJECTS

STATE OF MARYLAND, DEPARTMENT OF GENERAL SERVICES (DGS)

EXECUTIVE SUMMARY

CATEGORY J: Small Projects

The Church Creek Fire Tower is located at Maryland Department of Natural Resources (DNR) Church Creek Forestry Field Office at 4329 Golden Hill Road in Church Creek (Dorchester County) Maryland. Constructed in 1932, the 120-foot tower stood as 1 of 24 towers remaining throughout Maryland and 1 of 8 located on Maryland's Eastern Shore. The tower remained operational for more than 40 years until the tower was decommissioned circa 1978 due to the advancements in fire detection technology. The tower then stood idle another 40 years until it was dismantled in 2018 due to deteriorating and unsafe conditions. A Sky Cam16 News video about the tower before its removal can be viewed at <https://youtu.be/6dMz1NRkJ6s>. DNR kept the top 40-feet of the tower including the cab for restoration. A key agreement between DNR and the Maryland Historic Trust required that 1) the tower be opened to the public, and 2) The rehabilitation will be performed in a manner that is consistent with the Secretary of the Interior's "Standards for the treatment of Historical Properties."

In 2020, the Maryland Department of General Services (DGS) engaged A. Morton Thomas and Associates, and our team of architectural, structural, geotechnical, and cost estimating subconsultants, through an on-call civil contract to provide design, permitting, historic preservation, and construction phase services for the project.

The project included civil engineering and landscape architecture services for the creation of a small park with interpretive panels around the tower as well as a new ADA accessible parking area. Architectural services were required for the historic rehabilitation of the tower. Structural engineering services were required to conduct a structural analysis of the tower and design a new foundation system to support the tower.

Restoring and erecting the Church Creek Fire Tower was a unique project, restoring a local landmark and destination within the small community of Church Creek on Maryland's Eastern Shore for all to experience. The tower is easily accessible being less than 200-feet off Golden Hill Road and is ADA accessible.

The project was also about more than just restoring an old tower. As a result of collaborative efforts from the design team, Maryland DGS, and the Maryland DNR, the tower now stands, at one-third of its original height, as a tribute to the rich history of combating fires in rural areas throughout Maryland during the early and mid-20th century. Visible from the road again, and erected from its prone position, the Church Creek Fire Tower is now a destination where visitors can learn the unique role fire towers played throughout Maryland's history and experience the tower in a quiet and relaxed setting.

PROJECT DESCRIPTION

OVERVIEW

The Church Creek Fire Tower is located at Maryland Department of Natural Resources (DNR) Church Creek Forestry Field Office at 4329 Golden Hill Road in Church Creek (Dorchester County), Maryland. As of 2014, the 120-foot tower, constructed in 1932, stood as 1 of 24 towers remaining throughout Maryland and 1 of 8 located on Maryland's Eastern Shore. The tower remained operational for more than 40 years until the tower was decommissioned circa 1978 due to the advancements in fire detection technology. The tower then stood idle for another 40 years until it was dismantled in 2018 due to deteriorating and unsafe conditions. A Sky Cam16 News video of the tower before its removal can be viewed at <https://youtu.be/6dMz1NRk16s>. DNR kept the top 40-feet of the tower including the cab for restoration.

In 2020, the Maryland Department of General Services (DGS) engaged A. Morton Thomas and Associates, Inc. (AMT) through an on-call civil/structure contract to provide design, permitting, historic preservation, and construction phase services for the tower's rehabilitation. A key agreement between DNR and the Maryland Historic Trust required that 1) the tower be opened to the public, and 2) the rehabilitation will be performed in a manner that is consistent with the Secretary of the Interior's "Standards for the Treatment of Historical Properties."



PROJECT TEAM

Entrant's Role in the Project: AMT served as the Prime A/E, as well as Civil Engineer and Landscape Architect. AMT was responsible for the overall team management and leadership as well as the comprehensive site design, permitting, and construction phase services.

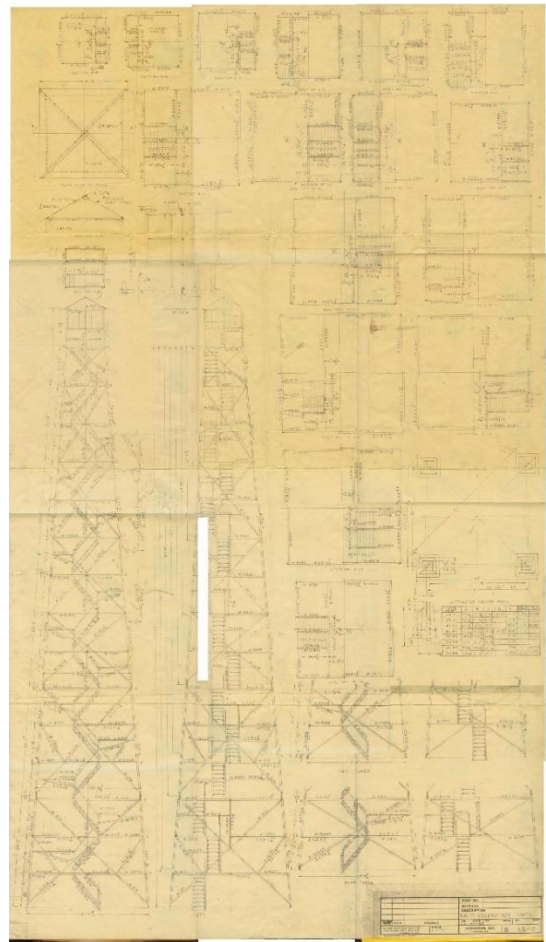
Role of Other Consultants: The tower restoration itself also required architectural, structural engineering, and geotechnical engineering services. Quinn Evans Architects provided architectural services, historic treatment procedures, and code compliance for the restoration of the tower cab and stairs. Simpson Gumpertz and Heger (SGH) provided a structural assessment and analysis of the remaining existing portion of the tower as well as the structural design of a new concrete support foundation, including new connections to the existing tower. AB Consultants provided geotechnical engineering services and coordinated material testing of the tower's existing steel to determine the tensile strength of the original steel used in the construction of the tower. Belstar provided cost estimating services for the project.

UNIQUENESS AND/OR INNOVATIVE APPLICATIONS OF NEW OR EXISTING TECHNIQUES

No original plans were readily available for the Church Creek Fire Tower. As such, this project epitomized the use of investigative research to determine the manufacturer and style of the Church Creek Fire Tower. Properly conducting a structural evaluation and historic assessment of the tower would have been a challenging task without any original design and construction documentation for the tower.

The quest to track down the make and model of the tower started with inquiries with the Forest Fire Lookout Association (FFLA)¹ The contact at the FFLA was able to confirm that the fire tower was an Aermotor Model LS-40, which was one of the most numerous and recognizable fire tower models at that time.

The FFLA was able to provide plans for a 100-foot Aermotor LS-40 Tower from 1962. The FFLA was also able to provide plans for a 60-foot LS-40 from 1917. Comparing the two historical plans, our team determined that the LS-40 model coordinated with the team's field observations of the existing tower.



1962 Original Model Example Plan

¹ <http://www.firelookout.org/fire-lookout-types.html>

Utilizing these original design drawings, our team was able to adequately develop a design model for the 40-foot tower and cab portion of the existing tower.

FUTURE VALUE TO THE ENGINEERING PROFESSION AND ENHANCED PUBLIC AWARENESS AND ENTHUSIASM OF THE ROLE OF ENGINEERING

The Maryland DNR made a commitment to keep the tower's history alive by keeping the top 40-feet of the tower, including the cab, for its ultimate rehabilitation, erection, and opening to the public. When originally constructed, the Church Creek Fire Tower was 1 of 42 towers in Maryland. Per the Maryland Historic Trust National Register Eligibility Review Form, no tower at its original location is open to the public. The Church Creek Fire Tower will enhance public awareness and enthusiasm through its restoration and the visible presence of this local historical artifact, now a landmark.



Information Panel

The value of the project comes from the story that the Church Creek Fire Tower tells. The tower now stands as a visible historic destination because of DNR's commitment to maintain Maryland's history and make it available to the public. And hopefully, those visitors will understand and appreciate the architectural and engineering efforts that went into making this project a reality.

SOCIAL, ECONOMIC AND SUSTAINABLE DEVELOPMENT CONSIDERATIONS

The rehabilitation and opening of the tower create a new landmark destination within Church Creek and Dorchester County, creating social opportunities for Marylanders and out of state visitors alike. The new park and interpretive panels that surround the tower foster social interaction and provide insight into the history of Maryland forestry. Rather than creating a simple viewing area to look at the tower, AMT's landscape architects designed the park to surround the tower, providing visitors with a 360-degree view to create a sense of engagement with the tower and exhibit.

Visitors to the new landmark destination will have a direct positive impact on the local and regional economy with exposure to local businesses and restaurants. Additionally, other local destinations such as the Harriet Tubman Underground Railroad Visitor and Exhibit Center or the Blackwater National Wildlife Refuge may also experience an increase in visitors due to those visiting the fire tower.

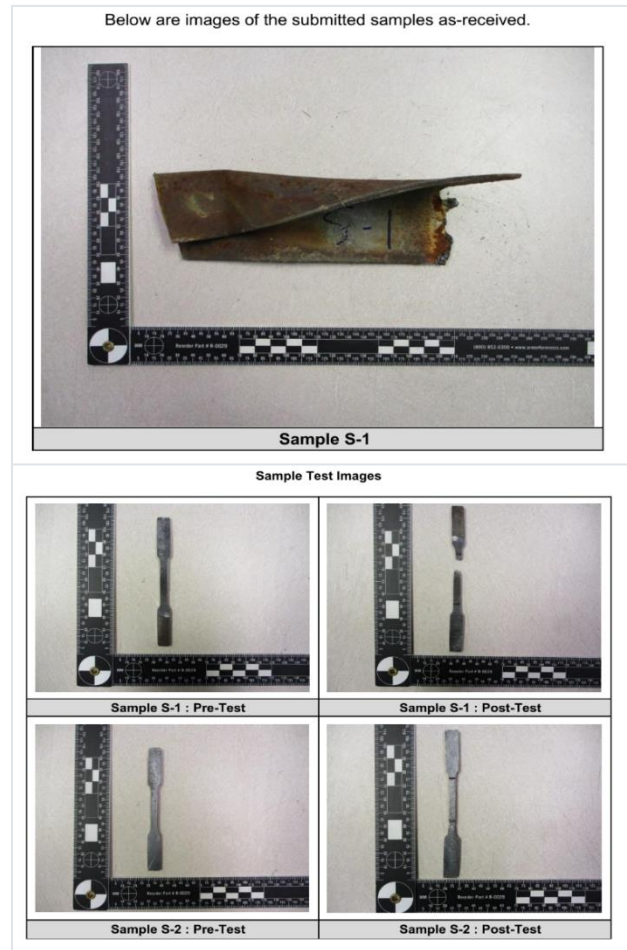
COMPLEXITY

A unique complexity of the project was to determine the actual strength and dimensions of the tower's structural members. As the tower was constructed in 1932, this required investigative research into the materials used during that time period as well as detailed field measurements of the existing tower. These were then compared to the original design drawings from 1917 and 1962. The research also entailed collaboration with experts on the restoration of similar fire towers throughout the East Coast, which was vital to understanding the structural characteristics of the tower.

Steel strength varied during the time of the tower's construction, so two steel samples were removed from a portion of the existing tower that would ultimately be removed when the tower was rehabilitated and erected. These steel samples were tested by National Technical Systems-Baltimore. The steel samples had to be machined to fit the testing equipment. The test results indicated an ultimate tensile strength of approximately 60,000 psi, which confirmed the use of A36 steel during the tower's original construction.

SGH's research into the tower's characteristics to better understand its structural capacity allowed the team to use more robust design values for the fire tower's as-built ability to resist wind and occupant loads. Additionally, the site had a high groundwater table, so a mat foundation system was required to adequately support the tower.

Another critical component to the project was making the tower cab accessible to visitors and DNR staff. Since the tower tapered from bottom to top, the cross bracing created a headroom conflict with code requirements, unless the tower structural members were modified. A variety of options and configurations were considered to comply with code while also maintaining as much of the original structure as possible. Ultimately, it was determined that removing one bottom horizontal member from the tower and raising the tower 12-inches above the bottom stair elevation would be the best way to achieve these goals. The structural analysis confirmed that the specific member could be removed without requiring additional bracing or structural strengthening measures. Additionally, during construction, the contractor needed to carefully

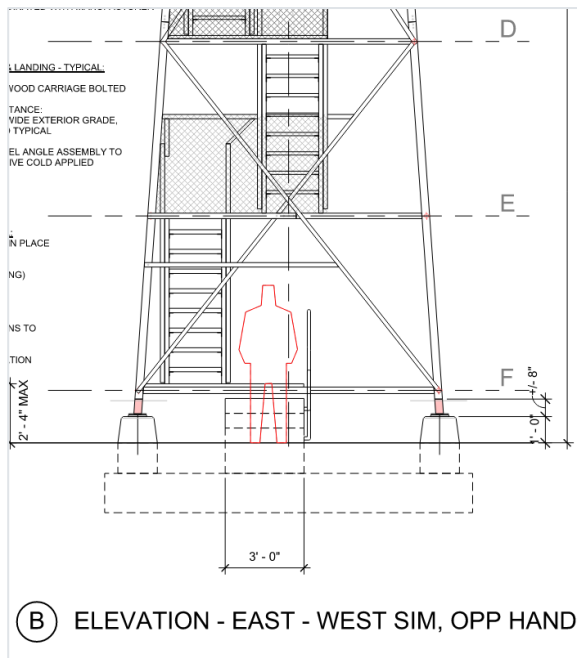


Steel Samples Used for Testing

CHURCH CREEK FIRE TOWER RESTORATION CATEGORY: J SMALL PROJECTS

STATE OF MARYLAND, DEPARTMENT OF GENERAL SERVICES (DGS)

A. Morton Thomas and Associates, Inc. | Page 5



Architectural Plan Showing Clearances

restore the structural steel to maintain capacity and connection integrity for the unique trussed tower with clamped connections.

SUCCESSFUL FULFILLMENT OF CLIENT AND OWNER NEEDS

AMT, Quinn Evans Architects, Simpson Gumpertz and Heger, and other team members collaborated with the Maryland DGS and the Maryland DNR Forestry Division and successfully delivered a piece of Maryland fire tower history that can now be enjoyed by Marylanders and other visitors alike. The project successfully achieved the “open to the public” and “rehabilitated in a manner that is consistent with the Secretary of the Interior’s Standards for the Treatment of Historical Properties” requirements of the agreement between DNR and Maryland Historic Trust.

BUDGET AND SCHEDULE

Maryland DGS engaged AMT and our team members in September 2020 to initiate the design of the project. The design and Maryland Department of the Environment (MDE) permitting process took 11 months to complete and final bid documents were issued in August 2021.

The project’s design estimate came in at \$396,536. Due to lack of competitive bids and the historic aspect of the tower, the project was negotiated with a qualified contractor. The project was rebid in June 2022 and awarded to Willow Construction at a value of \$977,600, with another \$80,700 in alternates for additional paving efforts, for a total overall construction cost of \$1.06 million. The increase in cost resulted from the extensive labor associated with the hand removal of rust from the structure as well as other cost increases during the COVID pandemic. The tower was dedicated and opened to the public on September 27, 2024.

**Total Construction
Budgeted: \$396,536**

**Total Construction
Actual: \$1.06 million**

**Entrant’s portion of the total
project construction budget
cost: \$396,536**

**Entrant’s portion of the total
project construction actual
cost: \$1.06 million**

**Completed:
September 27, 2024**

CHURCH CREEK FIRE TOWER RESTORATION CATEGORY: J SMALL PROJECTS

STATE OF MARYLAND, DEPARTMENT OF GENERAL SERVICES (DGS)

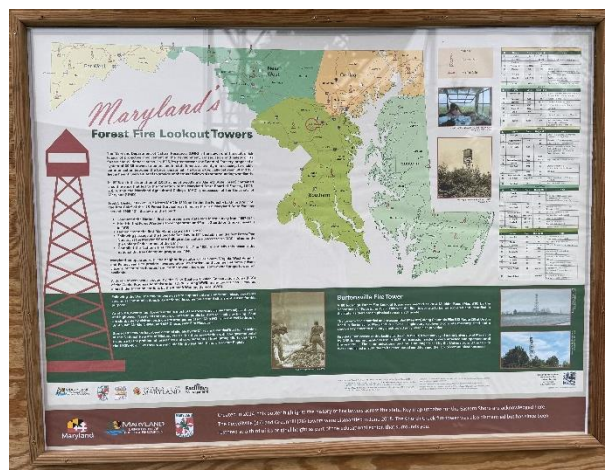
A. Morton Thomas and Associates, Inc. | Page 6

SUMMARY

Restoring and erecting the Church Creek Fire Tower was a unique project to create a local landmark and destination within the small community of Church Creek, on Maryland's Eastern Shore. The site is easily accessible by car, being less than 200-feet off Golden Hill Road, and the tower's park is also ADA accessible.

The tower and park were dedicated in the memory of Kirk P. Rodgers on September 27, 2024. Kirk was the grandson of Fred W. Besley, who served for 36 years as Maryland's first State Forester. His grandfather installed in Kirk a sense of respect and love for the forest that guided him throughout his successful career in natural resources. Kirk was a champion of the forest and environment on the local, regional, national, and international stage.

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PROJECT LOCATION

Church Creek, Maryland

CLIENT NAME

State of Maryland, Department of General Services (DGS)

CLIENT LOCATION

Baltimore, MD

FIRM NAME

A. Morton Thomas and Associates, Inc.

FIRM LOCATION

700 King Farm Blvd., Suite 300
Rockville, MD 20850

CATEGORY

Category J: Small Projects

Church Creek Fire Tower Restoration

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Original Tower (Circa 1961)



Tower and Park Overview (Looking East)