UNC GREENSBORO
Board *of* Trustees

Finance *and* Administration Committee
April 01, 2025

Action Item

FAC - 1 Selection of Designer – Campus Steam & Condensate Infrastructure Improvements

Background Information

The project's scope is to replace and renew critical portions of the existing steam distribution system. Many of these piping systems are over 50 years old and need replacement. Failures have become more frequent due to the age of piping. Construction is envisioned to be sequenced to limit the overall disruption to the campus while piping sections are replaced. Areas of priority include:

1. Lines from Manhole (MH) #11 to Faculty Center and Alumni House, and MH #12 to MH #15 along College Avenue.
2. Piping between MH#27 and the Music Building / Peabody Park Bridge riser.
3. Work between MH #54 to MH #57.

Project Cost: **$16,330,438**

The University of North Carolina System website advertised the request for qualifications and letters of interest for engineering services for this project. Three (3) firms submitted letters of interest, none from Guilford County.

The Designer Selection Committee reviewed the letters of interest and invited three firms to interview on February 24, 2025, to present their qualifications and recommend the following in ranking order.

1. RMF Engineering Inc., Raleigh, NC
2. DSA Engineering, PC, Durham, NC
3. Wiley | Wilson, Raleigh, NC

The firm of RMF Engineering Inc. is recommended as the Designer for the following reasons:

1. They presented the most prepared understanding of the project phases and have the greatest familiarity with the underground utilities found on UNC Greensboro's campus.
2. RMF's team illustrated the most expertise and success in working on complex, phased projects like our Campus Steam & Condensate Infrastructure Improvements. They presented the strongest approach for maximizing value for the authorized budget.

3. RMF also presented the most cohesive approach for minimizing disruption to the campus while construction is underway.

Recommended Action

Based on the above information, the Board of Trustees of the University of North Carolina at Greensboro approves RMF Engineering, Inc., Raleigh, NC, as the Engineering firm for the Campus Steam & Condensate Infrastructure Improvements project. If agreeable terms cannot be met with the recommended firm, the Board authorizes the administration to negotiate terms with the other firms in ranking order.

Robert J. Shea, Jr.
Vice Chancellor for Finance *and*
Administration

Attachments:

- RMF Engineering, Inc. Letter of Interest

UNC Greensboro

Campus Steam and Condensate Infrastructure Improvements

RFQ: # 287-23-18454-01

January 31, 2025

RMF Engineering

Table of Contents

RMF Engineering

Section 1

UNC Greensboro Information Sheet

RMF Engineering

THE UNIVERSITY of NORTH CAROLINA GREENSBORO

Information Sheet

Firm Name: RMF Engineering, Inc

☐ HUB Certified

If HUB, Specify Type: ☐ Female ☐ Disabled ☐ American Indian ☐ Asian-American ☐ Hispanic ☐ Black ☐ Socially & Economically Disadvantaged

Point of Contact: Matthew Boatwright, PE

E-mail Address: matthew.boatwright@rmf.com

Street Address: 8081 Arco Corporate Drive, Suite 300

City: Raleigh State: NC Zip Code: 27617 County: Wake

Phone #: 919.971.9876

Fax #: 919.941.9957

Type of Firm (e.g. Architectural, Civil Engineering, Surveying, Etc): MEP and Civil Engineering

Consulting Firms

Architectural:		☐ Check If HUB	Mechanical:		☐ Check If HUB
Electrical:		☐ Check If HUB	Plumbing:		☐ Check If HUB
Structural:		☐ Check If HUB	Civil:		☐ Check If HUB
Landscape:	CLH Design, PA	☒ Check If HUB	Interior Design:		☐ Check If HUB
Other (specify type):					☐ Check If HUB
Other (specify type):					☐ Check If HUB

Section 2

Letter of Interest

RMF Engineering

RMF Engineering

8081 Arco Corporate Dr
Suite 300
Raleigh, North Carolina 27617

919.941.9876
919.941.9957 fax
www.rmf.com

Tim Rouse
UNC Greensboro Facilities Design & Construction
Gray Home Management House
105 Gray Drive
Greensboro, NC 27412

January 31, 2025

RE: Campus Steam and Condensate Infrastructure Improvements – RFQ: # 287-23-18454-01

RMF Engineering, Inc. (RMF) is pleased to have the opportunity to submit one electronic copy of RMF's qualifications for UNC Greensboro's (UNCG) Campus Steam and Condensate Infrastructure Improvements project. We are familiar with the UNCG campus and have enjoyed a 20-year working relationship with the University. RMF has completed over 40 projects for UNC Greensboro, including the recent Campus Chilled Water Infrastructure and Equipment Improvements project. As you review our qualifications, we wish to highlight the following which we believe makes us uniquely qualified for this project:

Infrastructure Utility and District Energy Experts

Our proposed team is dedicated to prime infrastructure projects and has successfully completed large scale campus steam and condensate improvement designs. What sets RMF apart from our competition is the combination of technical excellence, document quality and project management coupled with a collaborative attitude.

Campus Infrastructure Systems Experience

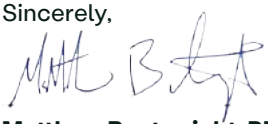
Over our 42-year history, RMF has become nationally recognized for our efforts in campus infrastructure systems master planning, analysis, design and construction administration for clients including UNC Greensboro, UNC Charlotte, North Carolina State University, Duke University and The University of North Carolina at Chapel Hill. RMF successfully provides the design of phased upgrades, with minimal interruption to the campuses of our clients.

Responsive Service, Attention to Detail

Our firm's core values include best effort for clients and technical excellence. Our team will provide UNCG with a level of service and attention to detail that sees to high quality results. Our positive working environment and skillful determination has helped us conduct large scale utility replacements for higher education clients throughout the state similar to this project.

We sincerely appreciate your consideration of RMF for this project and look forward to a continued successful relationship with UNC Greensboro. If you should need any additional information, please contact me at 919.941.9876 or matthew.boatwright@rmf.com.

Sincerely,



Matthew Boatwright, PE
Principal in Charge
RMF Engineering, Inc.

Section 3

Project Team Organization Chart

RMF Engineering

Project Organizational Chart

UNC Greensboro

Greensboro, NC

Tim Rouse
UNC Greensboro Facilities Design and Construction

Matthew Boatwright, PE
Principal in Charge / Quality Control

Elijah Lowder, PE
Project Manager /
Lead Civil Engineer

Michael Wilkins, PE
Lead Mechanical Engineer

Grace Coakley
Civil / Structural Designer

CLH Design

Landscape Architecture

Heather Rhymes, PLA
Landscape Architect

3.1 - Adequate Staff for the Proposed Project Design Team

RMF's proposed design team, led by principal in charge Matthew Boatwright, PE and project manager Elijah Lowder, PE, are well-qualified and experienced in the evaluation, design and operations of higher education facilities. RMF's personnel will be committed to the contract, ensuring a high level of technical insight and quality. This contract will have a high priority with our firm.

RMF's Raleigh, North Carolina office is backed by nearly 350+ employees in 11 offices. RMF is 100% employee owned with 23 actively working partners. Our team has adequate workload and support to carry out projects from this contract successfully.

Resumes provided are for our key personnel on this submission only and can be located in tab 6, section E of the attached SF-330 and standard resumes on the following page.

Principal in Charge / Quality Control

Matthew Boatwright, PE

Professional Experience

14
YEARS AT RMF

15
YEARS OF EXPERIENCE

Education

BS, Civil Engineering
2011, NORTH CAROLINA STATE UNIVERSITY

Registrations/Certifications

Professional Engineer
NC: #041981

Mr. Boatwright is a principal / project manager and civil engineer with experience in the design of civil utilities and solid knowledge of electrical, steam and chilled water distribution systems. His design experience is focused primarily on complex utility installations in congested sites. He also has experience with general site planning, design and permitting involving storm drainage analysis, stream buffer intrusions, site grading and hardscape restorations.

Steam Distribution System Replacement
UNC Greensboro

Campus Chilled Water Infrastructure and Equipment Improvements Phase I
UNC Greensboro

Main Campus Relocate Steam and Condensate - Phase I
East Carolina University

Hill Street Steam Vault Replacement Study and Design
Appalachian State University

Phase II Expansion of Central Utility System
University of Alabama at Birmingham

Lilly Library Utilities Relocation
Duke University

Steam Repairs Phase 8 - DH Hill
North Carolina State University

Thermal Utilities to Partners II and Toxicology
North Carolina State University

Centennial Campus Thermal Utilities Infrastructure
North Carolina State University

North Chiller Plant Transformation
Wake Forest University

Love to Boggs Steam and Condensate Replacement
Georgia Institute of Technology

Publications & Speaking Engagements

"Navigating Campus-Wide Power Upgrades with Smart Solutions," Facilities Net, February 2024

"Earth and Energy. Bridging the Gap Between Civil and Mechanical Challenges of Thermal Distributions Systems," Facilities Net, November 2022

Project Manager / Lead Civil Engineer

Elijah Lowder, PE

Professional Experience

8
YEARS AT RMF

12
YEARS OF EXPERIENCE

Education

BS, Civil Engineering
2017, NORTH CAROLINA STATE UNIVERSITY

Registrations/Certifications

Professional Engineer
NC: #052501

Mr. Lowder is a Civil Engineering Designer with experience designing civil utility distribution systems. He has knowledge of steam, hot water and chilled water distribution systems as well as power distribution systems. Mr. Lowder has experience with site planning, design, storm drainage analysis, site grading and hardscape restorations, erosion and sediment control design.

Steam Distribution System Replacement
UNC Greensboro

Campus Chilled Water Infrastructure and Equipment Improvements Phase I
UNC Greensboro

Main Campus Relocate Steam and Condensate - Phase I
East Carolina University

Phase II Expansion of Central Utility System
University of Alabama at Birmingham

Thermal Utilities to Partners II and Toxicology
North Carolina State University

Steam Distribution Assessment
North Carolina A&T State University

Steam and Condensate Upgrades from Central Steam Plant to Convocation Center
Appalachian State University

West Campus Steam Plant Renewal and Conversion
Duke University

Steam Line Replacement
Eastern NC School for the Deaf

Steam Condensate System Replacement Ph. III
University of Georgia

Lead Mechanical Engineer

Michael Wilkins, PE

Professional Experience

11
YEARS AT RMF

14
YEARS OF EXPERIENCE

Education

BS, Mechanical Engineering
2012, RENSSELAER POLYTECHNIC INSTITUTE

Registrations/Certifications

Professional Engineer
NC: #046293

Mr. Wilkins is a mechanical engineer who specializes in the analysis, design, and construction of infrastructure systems serving educational, industrial, healthcare, and commercial facilities. He is most knowledgeable in the areas of campus utilities (steam, heating water, chilled water). He has worked on everything from central heating / cooling plants to underground piping distribution systems.

Steam Distribution System Replacement
UNC Greensboro

Main Campus Relocate Steam and Condensate - Phase I
East Carolina University

Hill Street Steam Vault Replacement Study and Design
Appalachian State University

Phase II Expansion of Central Utility System
University of Alabama at Birmingham

Lilly Library Utilities Relocation
Duke University

Steam Repairs Phase 8 - DH Hill
North Carolina State University

Thermal Utilities to Partners II and Toxicology
North Carolina State University

Hot Water Plant 2
Duke University

Love to Boggs Steam and Condensate Replacement
Georgia Institute of Technology

Steam and Condensate Upgrades from Central Steam Plant to Convocation Center
Appalachian State University

West Campus Steam Plant Renewal and Conversion
Duke University

Civil / Structural Designer

Grace Coakley

Professional Experience

3
YEARS AT RMF

3
YEARS OF EXPERIENCE

Education

AS, Civil / Mechanical Engineering
2022, CARROLL COMMUNITY COLLEGE

Ms. Coakley has extensive experience in performing structural and civil engineering design for large infrastructure and buildings projects serving the higher education, government and healthcare markets. Her projects have included designs for steam, hot water and chilled water distribution systems, power distribution systems, utility tunnels and underground vaults.

Steam Distribution System Replacement
UNC Greensboro

Campus Chilled Water Infrastructure and Equipment Improvements Phase I
UNC Greensboro

Main Campus Relocate Steam and Condensate - Phase I
East Carolina University

Hot Water Plant 2
Duke University

Steam Distribution Assessment
North Carolina A&T State University

Underground Steam and Condensate Piping Replacement Analysis
Winthrop University

Academic Quad Steam and Condensate Replacement
University of Maryland, Baltimore

Steam and CHW Repairs
Georgia Institute of Technology

Steam Vault Replacement
Georgia Institute of Technology

Steam Plant Upgrades and Replacements
United States Air Force

Main Steam Pressure Reducing Station Replacement
The Architect of the Capitol

Heather Rhymes, PLA

Landscape Architect

Heather's interests and strengths include ecologically sensitive solutions, planting design, and human-centric spaces. She works on a variety of projects at CLH, including K-12, higher education, and municipal projects. Her background in functional ceramics enables her to thoughtfully combine artistry, craft, and practicality in her landscape work.

12 years of professional experience

Education

Master of Landscape Architecture, NC State University, 2013

Bachelor of Arts, Furman University, 2009

Registration

Landscape Architect: North Carolina, #2302

Alamance Community College, Advanced Applied Technology Center, Graham, NC (2017)

Central Carolina Community College, Veterinary Medical Technology, Additions/Renovations, Sanford, NC (2018)

East Carolina University, Clement Residence Hall, Renovations, Greenville, NC (2018)

East Carolina University, Life Science and Biotechnology Building, Greenville, NC (2021) *LEED Silver*

East Carolina University, Medical Examiners Complex, New Construction, Greenville, NC (2024 – In Design)

Fayetteville State University, College of Education Building, Fayetteville, NC (2024 – In Construction)

NC State University, Howling Cow Creamery and Environmental Education Center Design-Build, Raleigh, NC (2019)

NC State University College of Veterinary Medicine, Equine and Farm Animal Veterinary Center Study, Raleigh, NC (2015)

NC State University, Plant Sciences Building, New Construction, Raleigh, NC (2022) *LEED Gold*

NC State University, Medium Voltage Distribution System Upgrade, Raleigh, NC (2024)

NC State University, Memorial Belltower Restoration Design-Build, Raleigh, NC (2021)

NC State University, Weisiger-Brown Parking Lot Expansion, Raleigh, NC (2018)

Raleigh Durham International Airport, Landside Expansion Program, Morrisville, NC (2024)

UNC-Chapel Hill, Chewning Tennis Center, Chapel Hill, NC (2024 – In Design)

UNC Greensboro, Chilled Water Infrastructure Upgrades, Greensboro, NC (2024 – In Construction)

UNC Greensboro, Foust Building Site Assessment, Greensboro, NC (2022)

UNC Pembroke Health Sciences Building, Pembroke, NC (2023 – In Design)

Section 4

Relevant Experience & Other Important Factors

RMF Engineering

Firm Overview

350+ employees

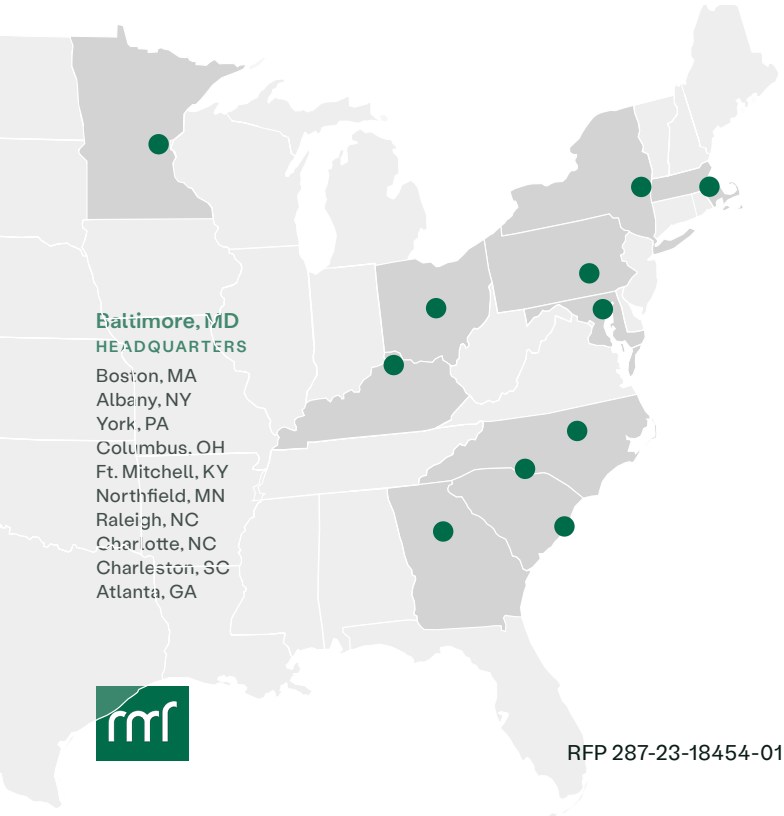
11 offices

42-year history

Founded in 1983, RMF Engineering (RMF) has been on the forefront of complex Mechanical, Electrical and Plumbing engineering solutions since before terms like efficiency, sustainability, LEED and green requirements were common terminology.

In our 42-year history, RMF has become nationally recognized for our quality analysis, planning, design and commissioning of buildings, as well as campus utility generation and distribution systems.

With over 350 staff in 11 offices, RMF is a client-focused practice routinely ranked as one of the top MEP firms in the country. We are proud of our prompt responsiveness, industry-leading tech savvy and project teams who have extensive history of working together as specialized units. As a result, you can expect to receive the highest quality contract documents, the most intelligent engineering solutions and a team that is known for seeing every project through to completion.



Full Service Engineering

We provide our clients a full range of engineering services to provide maximum energy efficiency and sustainability across their entire operational portfolio. Starting with Energy Master Planning all the way through to Commissioning, our focus is to provide technical expertise and a high level of service that leads to long-lasting relationships.

RMF's full range of services includes:

- Energy Master Planning & Decarbonization
- District Energy
- Thermal Utilities Distribution
- Power System Analysis & Design
- MEP Building Engineering
- Commissioning & Construction Quality Management

2024 » BD+C
Giants 400
RMF Ranked 27th out of 400 top US Engineering Firms

2024 » CSE
MEP Giants
RMF ranked 33rd out of 100 top North American MEP Firms

2024 » ENR
Top 500
RMF ranked 297th out of 500 top Design Firms

2024 » EC&M
Top 40
RMF ranked 28th out of 40 top Electrical Design Firms

CLH design, p.a.

Collaborative Landscape Architecture and Civil Engineering

About CLH

Established in 1993, CLH design, p.a. (CLH) is an award-winning design firm providing collaborative landscape architecture and civil engineering services throughout North Carolina. Their design staff are well known for site master planning, LEED projects, and resilient site design practices that create functional environments that endure.

CLH is experienced working with higher education facilities throughout the state of North Carolina. Their experience includes:

- 115+ projects on 13 North Carolina university campuses
- 95+ projects for eight UNC System schools: UNC Wilmington, UNC-Chapel Hill, North Carolina State University, East Carolina University, Fayetteville State University, UNC Greensboro, UNC Pembroke, and Winston-Salem State University
- 70+ projects on 19 community college campuses across North Carolina

CLH utilizes a comprehensive design approach to implement cost effective and contemporary methods to site design, particularly stormwater management, which creatively minimize their ecological footprint. Regardless of the project, CLH always strives to provide sustainable, resilient solutions.

For CLH's higher education projects, they have often dealt with existing campus utilities, whether it was re-routing, connecting to, or avoiding with new utilities. Many of these projects have included specifically dealing with multiple existing utilities and relocation and rehabilitation of existing steam tunnels, duct banks, and chiller piping. CLH has extensive experience working around existing campus utilities and collaborates well with plumbing, mechanical and electrical engineers during both the design and construction process.

UNC-Chapel Hill FedEx Global Education Center
Chapel Hill, NC

CLH At-a-Glance

- Collaborative approach to landscape architecture and civil engineering
- HUB/WBE, 26 employees in Cary, NC
- 29 LEED projects

East Carolina University Life Sciences and Biotechnology Building - LEED Silver
Greenville, NC

Wake Technical Community College Public Safety Simulation Complex
Wendell, NC

Duke University Chapel Drive Improvements
Durham, NC

400 Regency Forest Drive, Suite 120
Cary, NC 27518

919.319.6716
@clhdesignpa
www.clhdesignpa.com

Additional Information

4.1 Specialized or Appropriate Expertise

This RMF team has extensive and current experience working on projects which require utility systems to be evaluated planned and designed. All facets of the design can be covered internally by RMF including civil, mechanical, electrical and structural allowing for a well-coordinated design. Our team has extensive experience working on sensitive campus environments that require detailed pedestrian phasing and traffic control, restoration detailing and logical utility corridor planning. RMF's core business is related to the generation and distribution of utilities (steam, high temperature hot water, chilled water, electrical power, emergency power, water, sewer, telecommunications, etc.). RMF has developed a highly successful approach to identifying and implementing cost effective efficiency upgrades to campus steam systems.

UTILITY DISTRIBUTION EXPERIENCE

Many utility distribution systems have been evaluated, planned and designed by RMF. Computerized hydraulic models of hot water, steam, condensate, chilled water, domestic water, natural gas, sewer and storm water systems are routinely developed. This modeling approach can be used to determine optimum system configurations (loops, radials, etc.) as well as pipe size. A major design issue in utility distribution systems is the configuration of the piping whether to direct bury, install trenches, construct tunnels or install above ground. The firm has developed detailed economic modeling of these various installation techniques to determine the most cost effective site-specific application. RMF has designed new and rehabilitated systems for all types.

RMF has performed condition assessments of the distribution lines for mechanical, electrical and civil utilities. The condition assessments determine deficiencies inclusive of leaks, physical deterioration, prioritization of repair work including immediate notification when serious problems are found and remaining useful life. Assessments include a review of existing documentation and reports, interviews with facility personnel and field surveys using nondestructive and destructive testing.

Finding The Right Path

Utility distribution is dependent on well-planned underground alignment, attention to rights of way, boundaries and site sensitivities, and careful coordination with end-users. With our civil-mechanical-electrical-structural design team working together under one roof, RMF ensures the accuracy of these systems. We have designed hundreds of miles of underground utility systems, and our vast experience includes hydraulic analysis for water, storm drain and sanitary improvements.

STRUCTURAL EXPERIENCE

RMF Engineering specializes in providing customized structural engineering designs for the unique requirements of large educational, healthcare, military, federal, and industrial clients located on campus or large multi-building environments. RMF's wide range of structural engineering design experience includes new buildings, retrofits, renovations, and structural upgrades. Also included are numerous examples of specialty structural design for utility distribution tunnels, access vaults, transmission duct banks and support requirements for industrial and central power plants. Services encompass designs that range from standard steel frame structures to concrete structures to complicated blast proof manufacturing facilities. RMF's approach to design services includes the coordinated delivery of multi discipline engineering services followed by our experienced construction administration division to assure the project is seamless from beginning to completion.

RMF utilizes sophisticated computer software analysis using RAM and SCIA integrated with our CADD capability to ensure a quality project. In addition, our experienced engineers are assigned a project from planning to construction documents through construction administration. This cradle to grave approach minimizes problems which can occur from a lack of continuous service.

Additional Information

STEAM EXPERIENCE

RMF has completed numerous projects involving the addition, expansion and renovation of steam generating plants ranging in size from 10,000 to 1,000,000 pounds per hour (PPH) of steam with operating pressures ranging from 15 to 1,300 pounds per square inch (psig). Previous and ongoing steam plant projects completed by RMF have included the following tasks:

- Replacement / addition / expansion of steam plants with packaged and field erected boilers
- Reconstruction of boilers including tube, refractory, casing, trim, drum, and internals replacement
- Upgrade of boiler plant controls including pneumatic to electronic conversions, distributed control systems and burner management systems
- Auxiliary systems design including boiler feedwater, steam, condensate, water treatment, chemical feed, fuel (gas, oil, coal), boiler draft, and process cooling
- Facility fuel conversion from No. 6 fuel oil to No. 2 fuel oil and natural gas
- Low NOx burner retrofits
- Design of air pollution control systems (electrostatic precipitators, scrubbers, baghouses, etc.)
- Electrical power system design and upgrade (480 V, 5 kV, 15kV, 34 kV)
- Cogeneration (steam and gas turbines)
- Emergency power system design
- Building expansion design to accommodate plant expansion
- Air Permitting and dispersion modeling

MANHOLE AND VAULT DESIGN EXPERIENCE

RMF has demonstrated its expertise as a leader in the design of new and reconstructed manholes and vaults for steam, hot water, chilled water, civil and electrical utilities and has shared these, “best practices” in engineering trade publications and technical conferences. In developing designs, the primary uses of the structure are considered such as providing: steam traps, main or branch isolation valves, future expansion, structural anchoring and mechanical compensation. Maintainability is also a major design consideration since they often have to be access for trap testing, manhole inspection and repairs.

The locations of manholes in a system are not arbitrary. For safety and longevity, they require careful analysis of soil conditions, water table, surface drainage, and access location. Often manholes are installed in moist environments where high water tables are continuously present. Various methods of water proofing have successfully been applied, such as bentonite / HDPE waterproofing, bituthene membrane, fluid applied system, integrally bonded membrane, and surface coatings.

Both cast in place and precast concrete manholes are successfully used and are customarily designed for AASHTO HS-20 vehicle loading. Construction joints in concrete vaults are necessary, and it is critically important to keep water tight with barriers. In precast concrete manholes, it is customary to utilize neoprene gaskets between assembled sections. In poured concrete vaults, cold joints are equipped with integral water stops to water penetration is prevented. Even under the best conditions, some water infiltration may occur, so It is imperative that a dependable system for ground water removal be incorporated.

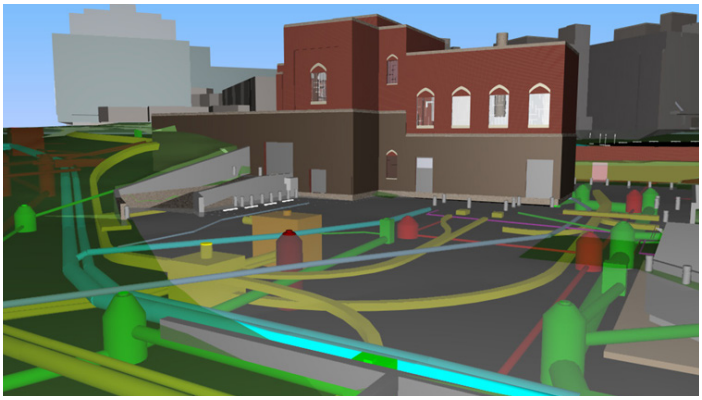
Many steam vaults have been in service for decades and can experience various types of deterioration to the concrete walls, floors, and tops. These can be replaced in their entirety with new, or if space is not available, reconstructed in place with long lasting repair materials to strengthen and seal joints. Depending on the severity of the damage, whole sections of the structure may need to be demolished and recast with new reinforced concrete.

Additional Information

3D MODELING EXPERIENCE

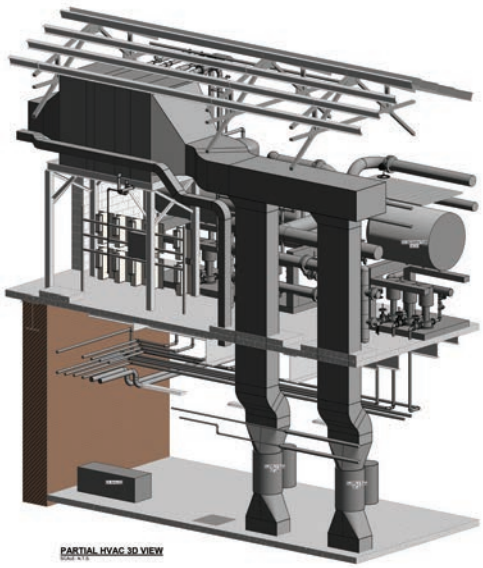
RMF has experience using 3D modeling software since 1995 including Bentley Triforma, AutoCAD MEP and Revit MEP. RMF has been using AutoCAD Civil3D software built for BIM as a tool for design, analysis and simulation of its pipe network (steam, chilled water, storm drain, sanitary sewer, water, gas, electrical/telecom ductbank, etc.) to facilitate project performance. RMF's recent experience with Civil 3D Modeling includes:

- **Steam Distribution System**
  Appalachian State University
- **Main Campus Relocate Steam and Condensate - Phase 1**
  East Carolina University
- **Fuel Oil Tank Replacement Study and Design**
  East Carolina University
- **Centennial Campus Thermal Utilities and Infrastructure**
  North Carolina State University
- **Centennial Campus Infrastructure Medium Voltage Electrical Distribution**
  North Carolina State University
- **Greek Village Medium Voltage Electrical Distribution and Site Lighting I-III**
  North Carolina State University
- **Centennial Campus Biomedical Campus Chiller Plant Expansion**
  North Carolina State University
- **Centennial Campus Power, Steam and Chilled Water**
  North Carolina State University
- **Yarbrough Chiller Plant Utilities**
  North Carolina State University
- **Hunt Library Utilities**
  North Carolina State University
- **Athletics Precinct Utility Infrastructure**
  Duke University
- **Duke Hollows Utility Infrastructure**
  Duke University
- **West Campus Steam Plant**
  Duke University
- **East Campus Steam Plant**
  Duke University
- **Steam and Condensate Piping Design**
  Winston-Salem State University



West Campus Steam Plant Renewal and Conversion / Duke University

Steam Distribution System / Appalachian State University



East Campus Steam Plant / Duke University

UNC Greensboro

Steam Distribution System Replacement

Relevant Scope

- UNC Greensboro Experience
- Campus Steam System

Project Location

Greensboro, NC

Completion Date

2020

Construction Cost

$1.5 Million

Key RMF Personnel

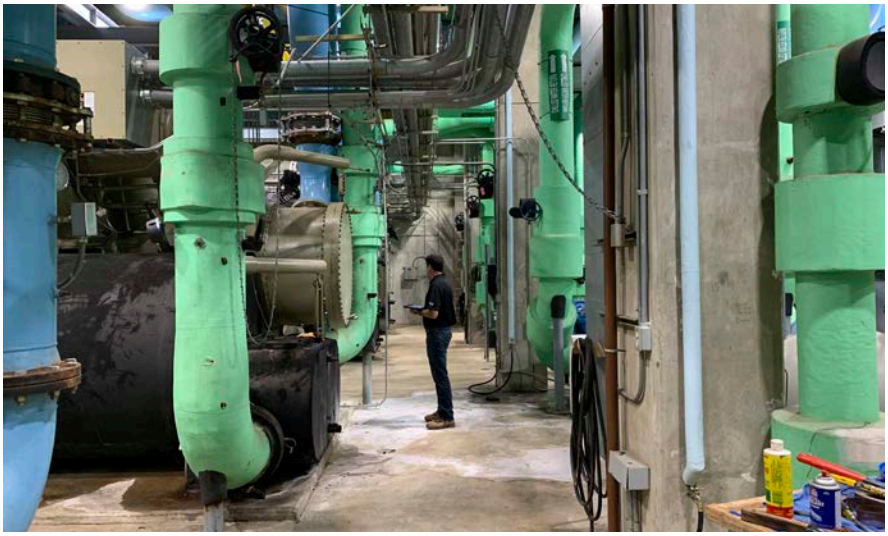
- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE
- Grace Coakley

As part of a multi-phased replacement of deteriorating steam distribution in the heart of their campus, UNC Greensboro (UNCG) contracted RMF to provide design services to replace approximately 600 LF of eight-inch HPS and four-inch PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). Approximate budgets, schedules and long term comparisons were provided for each methodology, allowing UNCG and RMF to select the system best suited for the project.

In order to accommodate the University's desired system of shallow trench distribution, RMF developed a phased approach that would provide the necessary flexibility to accommodate the available budget and construction schedule. The two phase approach was coordinated with traffic and pedestrian control requirements, bus routes and available laydown space; working to split the project due to budget and schedule restrictions at an area that would also help minimize impact to campus operations. Pedestrian phasing and traffic control was of high importance as the alignment was located directly adjacent the Elliot University Center, under a busy walkway just south of the Kaplan Commons courtyard. The utility alignment was also laid out to utilize z-bends and loops to avoid utility conflicts and sensitive areas. These features allowed the team to avoid the use of mechanical expansion joints and associated ongoing maintenance.

Multiple temporary service options were investigated and provided for consideration, including temporary electrical hot water heaters, temporary above ground stream distribution, and temporary FO Boilers. UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

Campus Chilled Water Infrastructure and Equipment Improvements Phase I



Relevant Scope

- UNC Greensboro Experience
- Campus Distribution

Project Location

Greensboro, NC

Completion Date

2025 (Est.)

Construction Cost

$11.4 Million (Est.)

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Grace Coakley

UNC Greensboro distributes chilled water to campus from two existing chiller plants on the north and south sides of campus. The goal of this project is to complete the loop between these two plants to improve campus reliability and hydraulics and to also connect four buildings in the area to the campus chilled water distribution loop. It will also allow the UNC Greensboro to remove several building chillers and cooling towers, lowering campus maintenance and improving energy efficiency.

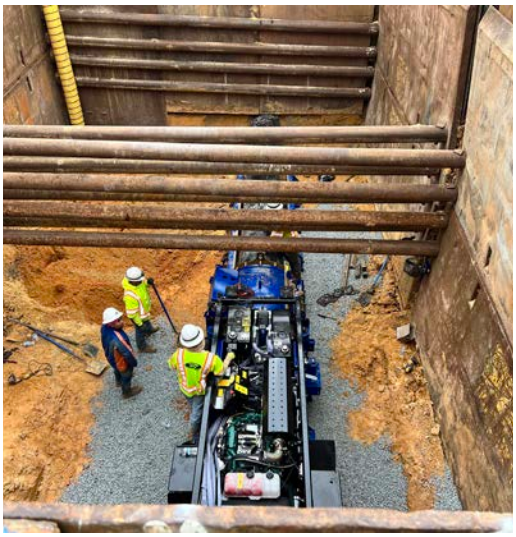
The Campus Chilled Water Infrastructure and Equipment Improvements project will complete the campus chilled water distribution loop by installing approximately 1,200 trench foot of underground 24-inch chilled water mains between McIver Plant and South Plant along Stirling Drive. New chilled water connections will be provided to four buildings on campus: Bryan, Mossman, Walker Deck and Elliott building. The Alumni building is currently fed chilled water through Elliott and will also be connected to the campus distribution system by this project through the Elliott building loop transition. A tap for future connection will also be provided for Jackson Library. Part of the project also includes providing a schematic design level study for replacing the existing 750-ton chiller in McIver Plant with a new 1500-ton chiller.

Each building's tie-in point required close coordination between underground conflicts and interior building restrictions. At several locations, the team employed creative solutions to access the building including utilizing liner plate tunnels to access basement area, routing piping through office space in a new pipe chase and utilizing void space below stairways for accessing mechanical rooms. The mechanical rooms were designed to accommodate phasing while also placing new equipment in logical and ideal locations. At Elliott, one of the existing chillers and building controls were reconfigured so that it could provide building backup and backfeed into the loop during times of low demand.

The civil design required permitting with City of Greensboro for traffic detour and road closure review and with their Public Works group for utility separation review.

East Carolina University

Main Campus Relocate Steam and Condensate - Phase 1



Relevant Scope

- Steam Distribution
- Vault Line Replacement

Project Location

Greenville, NC

Completion Date

2024

Construction Cost

$5 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE
- Grace Coakley

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are three new vaults along the run of distribution piping including an automatic sump discharge system. Three existing vaults require piping rework to either abandon a leg of existing piping or tie into the new 12-inch HPS and eight-inch PC. This project also includes interior plant piping to connect to the existing steam and condensate headers and remove any abandoned sections.

This project also consists of relocating 225 LF of existing power ductbank and an existing power manhole from the Main Campus Steam Plant to an existing manhole by method of direct buried ductbank (125 LF) and jack-and-bore (100 LF). Also included is an electrical review of the ECU electrical single lines to coordinate cable replacement in the relocated ductbank.

Appalachian State University

Hill Street Steam Vault Replacement Study and Design

Relevant Scope

- Steam Distribution

Project Location

Boone, NC

Completion Date

2025 (Est.)

Construction Cost

$1.2 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

RMF provided a study of Appalachian State University's existing steam manhole ST76-02, located within Hill Street. The manhole is located in an area with a high water table and is subjected to deicing chemicals during winter seasons. Water and deicing chemical ingress into the STMH through abandoned and existing pipe penetrations, and manhole access covers, resulted in substantial corrosion of the piping within the vault, and had corroded portions of the existing direct buried piping systems connected to this manhole.

RMF investigated solutions for relocating manhole ST76-02 outside of Hill Street to minimize water ingress and exposure to deicing chemicals, and replacement of piping between the manhole and Holmes Center.

The study also included extending a redundant waterline across Hill Street to loop into the existing system and provide a backfeed for the aging waterline in the area.

University of Alabama at Birmingham

Phase II Expansion of Central Utility System

Relevant Scope

- Steam Distribution

Project Location

Birmingham, AL

Completion Date

2018

Construction Cost

$20 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE

The University of Alabama Birmingham (UAB) owns and operates one central steam plant and three central chilled water plants. The central steam and chilled water generation and distribution systems provide service to many of the facilities across the Medical Center, Research and Academic Districts of the UAB Campus. UAB created a utility master plan (UMP) to expand these systems and connect them to all major facilities on campus. RMF designed the construction documents for Phase II of the UMP which involved expanding these systems to portions of the southwestern academic campus.

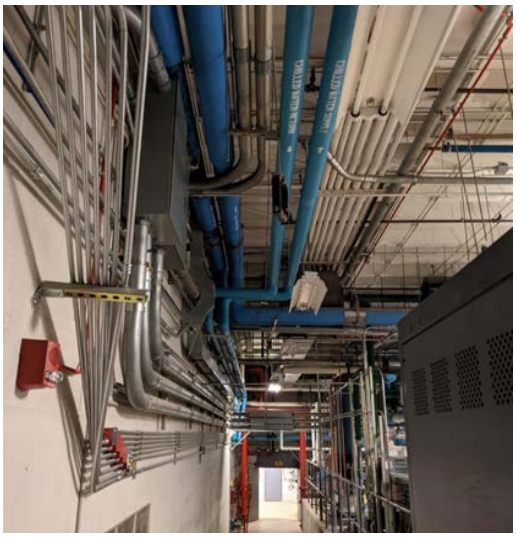
RMF designed underground distribution systems to provide central steam and chilled water access to Sterne Library, the Education Building, the Business and Engineering Complex, Blount Hall, the Alys Robinson Stephens Center and the New College of Arts and Sciences Building. The expansion also provided tie-in points for future expansions to the distribution systems.

The distribution system was designed for pre-fabricated and pre-insulated underground piping for chilled water, steam, and condensate systems. Installation was required for a combination of approximately 4,500 LF of open trench excavation and jack and bore horizontal boring.

The steam distribution systems are routed through cast-in-place utility vaults that provide redundant access points to the valves and system accessories. Expansion for the steam system was accommodated with mechanical expansion joints within the vaults. Future piping taps were provided with valves and blinds to accommodate expansion of the system to adjacent buildings and areas of campus.

North Carolina State University

Steam Repairs Phase 8 - DH Hill



Relevant Scope

- Steam Distribution

Project Location

Raleigh, NC

Completion Date

2021

Construction Cost

$1.2 Million

Key RMF Personnel

- Matthew Boatwright
- Mike Wilkins

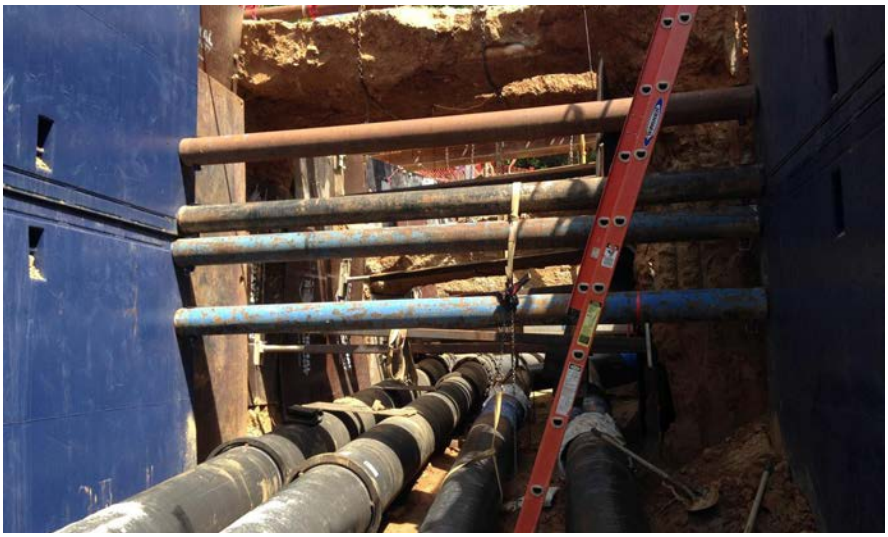
RMF provided engineering design services along with bidding and construction administration services for steam tunnel repairs and steam building connections at North Carolina State University. The overall goal of this project was to replace and repair a section of low pressure steam piping with high pressure type inside the steam tunnel. In a phased design process, RMF was able to design new high pressure steam and condensate piping to supply each building, and structurally repair steam tunnels in a high-traffic area of campus.

The new high pressure steam and pumped condensate piping within the stated tunnel met the sizing standard per the campus steam master plan. The new design covered approximately 1,400 feet of new piping, and included expansion loops, anchors, guides, and associated structural support. A thermal 3D steam pipe code stress analysis was performed for the entire steam and condensate systems, including the existing piping that was connected to as part of the project.

Custom structural details were provided to repair and replace portions of the existing tunnel and manholes, portions of which were 50 to 70 years old. Civil design included restoration design of the Campus Atrium patio dining area, which was located directly above the tunnel, and a phasing plan the allow the Atrium to remain open throughout construction.

North Carolina State University

Thermal Utilities to Partners II and Toxicology



Relevant Scope

- Steam Distribution

Project Location

Raleigh, NC

Completion Date

2021

Construction Cost

$9.1 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE

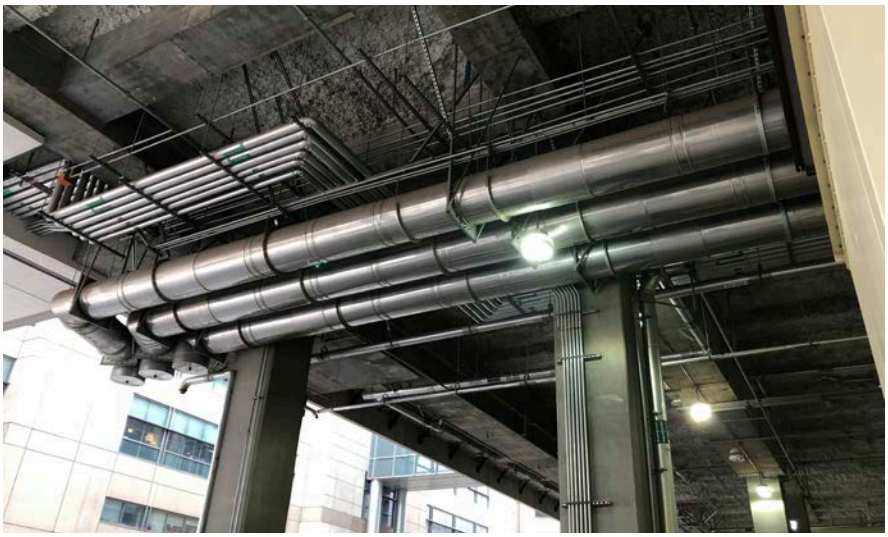
The goal for this project was to connect Partners II and Toxicology buildings to the central utility plant (CUP). Underground utilities including chilled water (CHS+CHR) and steam (HPS,PC+HPC) were extended from the Central Utility Plant to the buildings. Additionally, building mechanical rooms were converted from stand-alone generating facilities to utility receiving buildings.

RMF provided 1,600 trench-feet of underground thermal distribution design for steam using a pre-engineered, Class A, piping system and a fully restrained mechanical join ductile-iron pipe for chilled water. The design also included Structural and Mechanical design for six new steam vaults; building mechanical room design for steam PRV stations, hot water heat exchangers, hot and chilled water pumps; suite of flow and energy monitoring systems for new building connections; and design phasing drawings, notes and specifications to maintain building services during the utility transitions.

Two critical research facilities on centennial campus with aged, inefficient and unreliable cooling and heating generation systems were connected to a modern, reliable and efficient energy plant. The central plant boasts chilled water thermal storage along with combined heat and power.

Duke University

Hot Water Plant 2



Relevant Scope

- Steam Distribution
- Manhole Line Replacement

Project Location

Durham, NC

Completion Date

2020

Construction Cost

$6 Million

Key RMF Personnel

- Michael Wilkins, PE
- Gracie Coakley

RMF provided design and construction administration services for a new steam to hot water regional plant (HWP-2) housed inside an existing chiller plant (CP-1) on Duke's West Campus. The newly constructed plant is part of the University's overall plan to convert buildings from steam to low-temp hot water district energy.

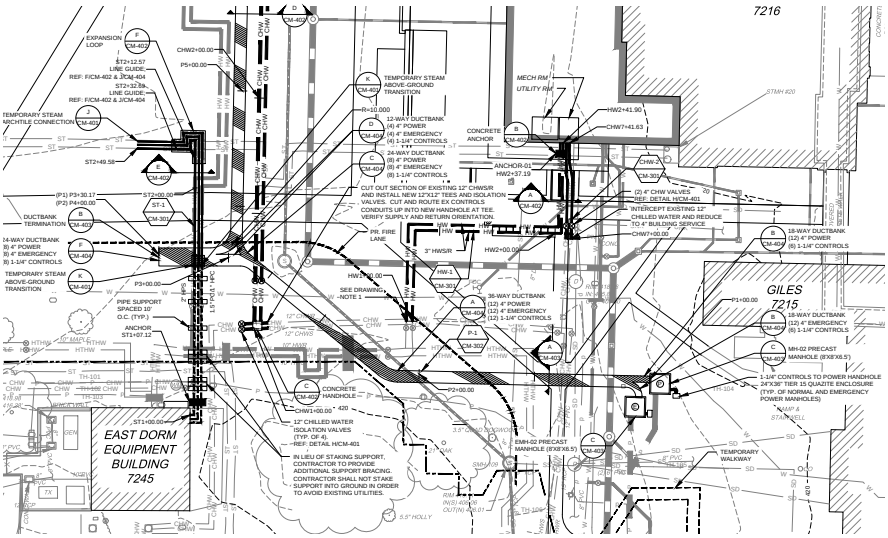
The plant consisted of three new 15,000 MBH The underground distribution needed included 1,000+ trench feet of 10" HPS (125 psig @ 353°F), six-inch CR, and one-inch HPC, four new pre-cast concrete steam vaults, and 300+ trench feet of underground 12" HWS/R (150°F @ 80 psig). One of the new pre-cast vaults was set in line with the existing underground steam system to intercept and feed the new hot water plant.

The new Hot Water Plant 2 utilized flooded vertical shell and tube heat exchangers which utilize direct high pressure steam to generate heating water without the need for a steam PRV. The condensate is subcooled at high pressure and sent back to the condensate return distribution system without the use of pumps. In effort to bring in the new underground steam, condensate, and hot water distribution, a 150 SF pipe enclosure partition was added to the basement and floor levels of the existing CP-1. Additionally, construction took place in an active and growing part of campus, along Towerview Drive and adjacent to the recently constructed Hollows Dorms.

As part of this project, RMF provided drawings and specifications associated with the renewal of an existing steam manhole along Towerview Drive (STMH-114). Renewal efforts included replacing the existing steam trap, replacing the existing electric sump pump with a steam powered sump pump, and adding a protective/waterproof liner to the interior of the manhole.

Duke University

Lilly Library Utilities Relocation



Relevant Scope

- Steam Distribution

Project Location

Durham, NC

Completion Date

2025 (Est.)

Construction Cost

$6.8 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

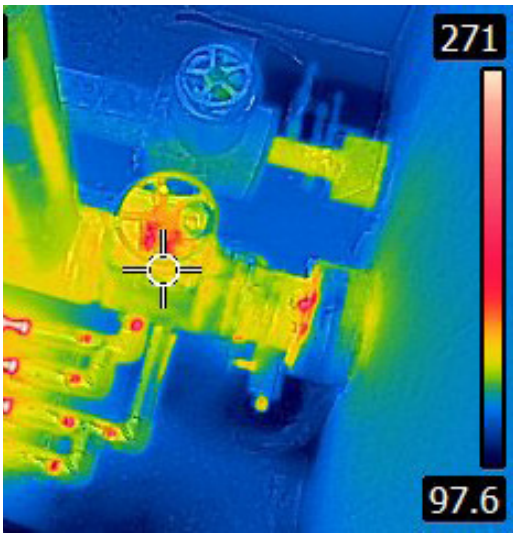
The construction of the Lilly Library Addition will impact existing chilled water, steam, storm, sanitary and domestic water water mains. This project will relocate those utilities outside of the building footprint.

Additionally, the project will extend hot water, power, and communications ductbank to the north side of the addition to create a new utility corridor through this section of east campus.

A design for the new service lines for low temperature hot water, chilled water and domestic water are being provided to account for the new mechanical room. A new electrical service yard will be provided for new normal and emergency power switches and transformers.

A section of above and underground steam distribution will be provided by the project to maintain feeds to four buildings located northwest of the construction site. This required a new connection inside the regional hot water plant, custom details for the aboveground routing and underground connection to an existing archtile tunnel system and stress analysis of both the new and existing distribution routing.

Love to Boggs Steam and Condensate Replacement



Relevant Scope

- Steam Distribution

Project Location

Atlanta, GA

Completion Date

2022

Construction Cost

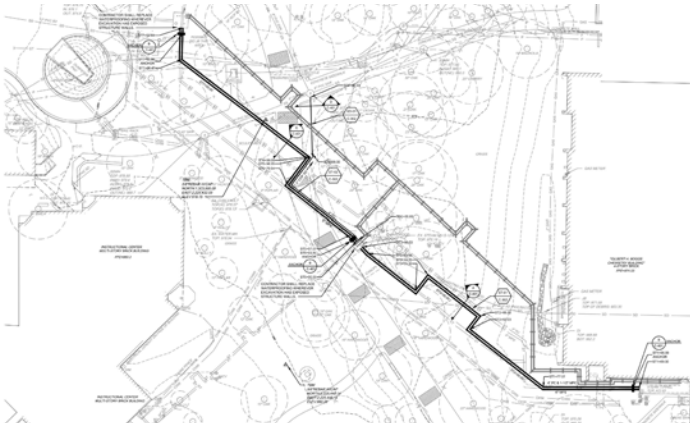
$1.55 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

The project consists of the design to replace the direct buried six-inch medium pressure steam and four-inch pumped condensate distribution piping system extending from the existing steam tunnel south of the Boggs Chemistry Building generally to the north and west, extending approximately 575 LF to existing steam manhole G12-1. Steam and condensate piping will route through a new steam manhole adjacent to existing G12-8. Steam and condensate will be reconnected to existing G-12-8.

A temporary steam and condensate system will be designed in order to facilitate minimal construction interruptions and the complete removal of all abandoned and steam and condensate piping within the utility corridor.



4.3 - Current Workload & State Projects Awarded

RMF is presently operating at 80% of productive capacity. Our firm strives to maintain a three to six-month steady backlog of work to provide continuity. As evidenced in the individual resumes, the personnel proposed for this project have worked on numerous similar projects and are fully aware of how to plan their work and budget their time accordingly to be efficient and timely. Our current workload is such that RMF could begin working on projects from this contract immediately.

RMF has worked on all 17 of the University of North Carolina System campuses, therefore, our team has extensive experience working on projects through the North Carolina State Construction Office.

4.4 Proposed Design Approach

PROJECT MANAGEMENT

Subsequent award, RMF's North Carolina Infrastructure team will develop a project execution plan. The management plan will include a detailed scope for each discipline, an assessment, design and construction schedule and a preliminary construction cost estimate. Our project management approach is to provide early action, responsive communication and a collaborative mindset.

PLANNING OPTIONS

The initial design effort will provide an assessment of the existing piping and manholes based on UNC Greensboro's input, field inspections and record document review. Options for replacements and repairs will be provided with estimated construction costs to allow the Owner to prioritize and focus the available funding towards areas of most pressing needs. The options will include clear illustrations of the comparative advantages and disadvantages such as maintenance, efficiency and campus impacts. Options will also include a comparison of system types (direct buried steam, concrete trench, insulated backfill, accessible tunnel) and discussion for which type of system is most appropriate for the various site locations.

UTILITY DESIGN

Upon completion of the assessment and selection of project scope, our team will begin detailed documentation of the existing project conditions and survey and develop a detailed alignment plan and profile. Special attention will be given to waterproofing and stress analysis at existing system connection points. Creative and detailed solutions will be provided for dewatering at manholes and for locating new systems out of flood prone areas. Detailed project phasing plans will be developed and coordinated with University events and available outages windows and building liason limitations.

CONSTRUCTION ADMINISTRATION

Our design team transforms into the construction team with the same personalities on site. This avoids any loss of project history and allows for quick and insightful responses during construction. During similar past projects on campus the CA team have been on site weekly to provide responsive and timely engineering support. The proposed team has recent experience coordinating with the City of Greensboro for utility encroachment permits, with NCDEQ to obtain E&SC and Stormwater permits for large utility projects and with the University for planning phased utility outages.

4.5 Recent Experience with Project Cost Estimates and Schedule Adherence

RMF has been very successful in completing projects within the budgetary constraints and design time allocations. Continuous in-house cost estimating is performed to insure the project, at completion, is within the construction cost budget. RMF has a close connection to construction activities and construction costs and has a proven track record of cost control. RMF performs a significant amount of work with construction management companies and has a strong history of working throughout every phase of the project to bring positive outcomes to the owner with respect to project costs and schedules.

Schedules are maintained by establishing a realistic time schedule with the client, weekly meetings between the design team members to review the schedule and reporting to the client the anticipated obstacles in maintaining the schedule. Our approach to project schedule control is a MS Project schedule used as the primary tool for indicating the sequence of events and allowable time periods for completing specific project phases and elements. The time requirements for the survey, data gathering, analysis, working sessions and conceptual design are all tracked. At the beginning of a project, the schedule is reviewed with all engineering

Additional Information

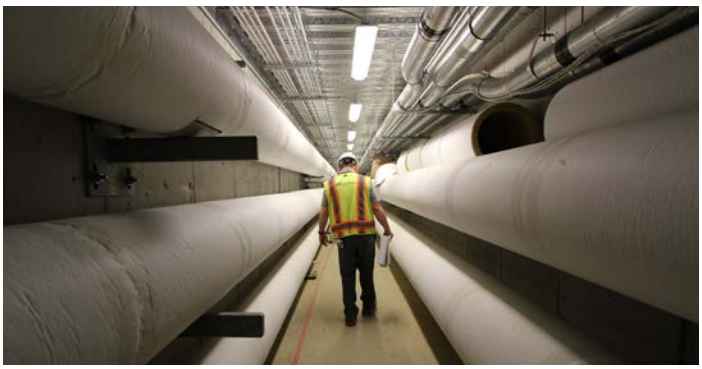
disciplines and discussed in depth with the client to ensure that everyone has a clear idea of what progress must be made by key milestones. The schedule is reviewed weekly at the in-house coordination meetings and monthly with the client. The frequent reviews ensure that no members of the design team will lose focus of the scheduled commitments.

4.6 Construction Administration Capabilities

RMF offers construction administration services on a daily, weekly or less frequent basis as required by the client. RMF believes that the design engineers are best suited to address issues in a timely manner during construction. The design engineers will remain engaged in the project throughout construction.

A key area of RMF's qualify control during construction consists of frequent and timely site observations. Projects often call for numerous site visits throughout the construction sequence until final acceptance. Construction issues are continuously identified to minimize significant punch-list items at the project's closeout. Construction phase services typically include:

- Review of shop drawings
- Review of submittals, materials installed, etc.
- Request for information processing
- Conduct / attend progress meetings
- Maintain minutes of progress meetings
- Review applications for payment
- Conduct site inspections / periodic site visits
- Submit punch list
- System commissioning and testing
- Safety inspections



4.7 Proximity to and Familiarity with the Area Where Project is Located

RMF's project team is located in Raleigh, North Carolina which is approximately a 60 minute drive to UNC Greensboro. RMF previously completed the design and multi-phased replacement of deteriorating steam distribution systems in the heart of UNC Greensboro's campus and the chiller replacement at the Human Health Performance facility. Both of these projects highlight our understanding of campus guidelines, location and requirements for familiar campus systems.

"Matt [Boatwright] is one of the best CA personnel I have worked with in my 11+ years at NCSU. I would without hesitation look forward to working with him on future projects."

Jake Terrell
Construction Management
North Carolina State University

Additional Information

4.8 - Record of Successfully Completed Projects without Major Legal or Technical Problems

For the past 20 years, no judgments have been made against RMF Engineering. RMF believes in a partnership with our clients. We take great strides to ensure that mistakes do not happen; they are limited through processes such as Quality Control and Design Assurance. We can guarantee that we will be responsive to your requests and we will make certain that a concern is handled to your satisfaction.

4.9 - Energy Conservation / LEED Experience

RMF has extensive experience in energy auditing and identifying methods for reduction in annual utility operating costs. The significance of the mechanical and electrical systems warrants consideration of energy efficient design. RMF takes every opportunity to incorporate energy efficient technology and sustainable design in utility systems. RMF has experience in reducing energy consumption with innovative technologies such as solar and geothermal energy, heat recovery and daylighting, as well as green roofs and rainwater collection.

RMF has designed over 75 LEED certified projects. Recent and relevant projects include:

East Campus Steam Plant
Duke University

West Campus Steam Plant Renewal and Conversion
Duke University

Yarbrough Chilled Water Plant
North Carolina State University

District Energy Facility Hot Water to East Drive
Harvard University

North Chiller Plant
University of Massachusetts Amherst

South Campus Chiller Plant
Ohio State University

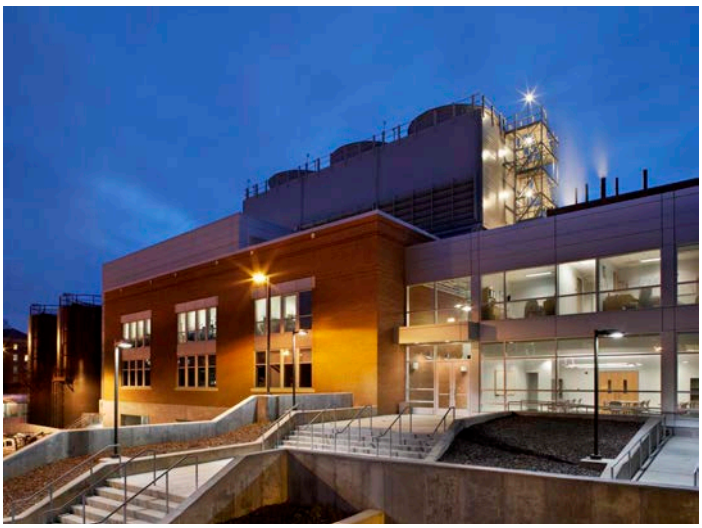
Chilled Water Plant No. 3
Ohio State University

East Campus Chiller Plant
Ohio State University

West Plant
College of William & Mary

Chilled Water Plant
Yale University Science Park

West Campus Steam Plant Renewal and Conversion / Duke University



Yarbrough Chilled Water Plant / North Carolina State University

Section 5

Minority Business Participation Plan / HUB Info

RMF Engineering

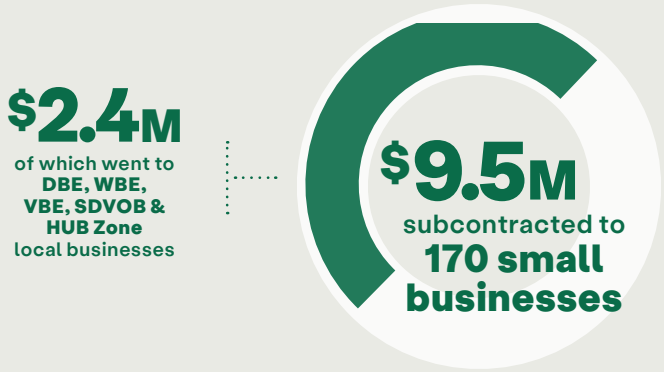
Additional Information

Historically Underutilized Business Representation in Proposed Consultant Team

HUB / MBE REPRESENTATION

RMF is firmly committed to complying with and meeting the intent of minority participation. We are dedicated to providing HUBs, MBEs, VOSBs, SDBs and WOSBs opportunities to participate as subcontractors for any contract where subcontracting of work is required by the basic contract and the application of these laws and regulations is specified, or where there is otherwise an opportunity for taking advantage of such services.

RMF subcontracted $7 million to over 190 individual small businesses over the past three years. Approximately $4.7 million of this work was subcontracted to Small Disadvantaged Businesses, Women Owned Businesses and Veteran Owned Small Businesses.



In 2023, RMF subcontracted approximately $9.5 million to nearly 170 individual small businesses. Almost $2.4 million of this work was subcontracted to Small Disadvantaged, Women Owned, Veteran Owned, Service-Disabled veteran Owned and HUB Zone businesses.

DIVERSITY, EQUITY AND INCLUSION

RMF has a strong affirmative action policy and recruits, hires, trains and promotes persons in all job titles without regard to race, color, religion, age, sex, disability, national origin, veteran status or any characteristic protected by applicable law. For 20+ years, RMF has recruited from historically black colleges and universities, including NC A&T State University, Howard University and Morgan State University.

RMF is especially excited by the advances by women and minority employees that have resulted in leadership and ownership positions in the firm.

RMF's 285+ employees represent the greatest asset to the company and each is hired and provided mentorship with the goal of achieving the highest possible career growth. Employee development and education has been the largest single focus at RMF for the last decade. A customized Project Management Program and two-year Leadership Development Program have been very successful in training the younger professional staff. **Project Manager Eli Lowder and Lead Mechanical Engineer Mike Wilkins are graduates of the Project Management program and Principal in Charge Matt Boatwright is a graduate of both programs.**

Tuition reimbursement has benefited dozens of full-time employees for securing their first and second degrees.

Everyone is encouraged at multiple levels to seek their full potential and be the best in their field. It is quite common for members of the RMF team to reach 25, 30 and 35 years of service levels, a testament to the care of employees and their loyalty.

The inclusion and empowerment of all people is recognized and incorporated throughout RMF's core values and business practices. RMF promotes and sustains an environment of belonging, respect and beliefs of our employees. We combine our individual talents, skills and experiences to enhance the lives of our employees and surrounding communities.

COMMUNITY ENGAGEMENT

Many of our staff are active participants in organizations that seek to promote diversity in the AEC professions. A number of these students have continued mentorship with RMF as engineering co-op students. Many have become full time employees.

Several of RMF's employees have taken active roles in industry organizations to promote the professional development of women and minorities in the engineering field. A long-time favorite has been the Children's Home in Baltimore, Maryland, where RMF has been its largest sponsor.

Section 6

SF-330

RMF Engineering

ARCHITECT-ENGINEER QUALIFICATIONS

PART I – CONTRACT-SPECIFIC QUALIFICATIONS

A. CONTRACT INFORMATION

1. TITLE AND LOCATION (City and State)

UNC Greensboro Campus Steam and Condensate Infrastructure Improvements (Greensboro, NC)

2. PUBLIC NOTICE DATE	3. SOLICITATION OR PROJECT NUMBER
January 10, 2025	RFQ: # 287-23-18454-01

B. ARCHITECT-ENGINEER POINT OF CONTACT

4. NAME AND TITLE

Matthew Boatwright, PE – Principal

5. NAME OF FIRM

RMF Engineering, Inc.

6. TELEPHONE NUMBER	7. FAX NUMBER	8. E-MAIL ADDRESS
919.941.9876	919.941.9957	matthew.boatwright@rmf.com

C. PROPOSED TEAM

(Complete this section for the prime contractor and all key subcontractors.)

	(Check) PRIME	(Check) J-V PARTNER	(Check) SUBCONTRACTOR	9. FIRM NAME	10. ADDRESS	11. ROLE IN THIS CONTRACT
a.	X			RMF Engineering X CHECK IF BRANCH OFFICE	8081 Arco Corporate Drive Suite 300 Raleigh, NC 27617	Mechanical, Electrical, Civil and Structural Engineering
b.			X	CLH DESIGN CHECK IF BRANCH OFFICE	400 Regency Forest Drive Suite 120 Cary, NC 27518	Landscape Architecture
c.				CHECK IF BRANCH OFFICE		
d.				CHECK IF BRANCH OFFICE		
e.				CHECK IF BRANCH OFFICE		
f.				CHECK IF BRANCH OFFICE		

D. ORGANIZATIONAL CHART OF PROPOSED TEAM

X (Attached)

INSERT ORGANIZATIONAL CHART BELOW OR ATTACH.

RMF Engineering

Project Organizational Chart

UNC Greensboro

Greensboro, NC

Tim Rouse
UNC Greensboro Facilities Design and Construction

Matthew Boatwright, PE
Principal in Charge / Quality Control

Elijah Lowder, PE
Project Manager /
Lead Civil Engineer

Michael Wilkins, PE
Lead Mechanical Engineer

Grace Coakley
Civil / Structural Designer

CLH Design
Landscape Architecture

Heather Rhymes, PLA
Landscape Architect

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Matthew Boatwright, PE	**Principal in Charge / Quality Control**	15	14

15. FIRM NAME AND LOCATION (City and State)

RMF Engineering, Inc. (Raleigh, NC)

16. EDUCATION (Degree and Specialization)	17. CURRENT PROFESSIONAL REGISTRATION (State and Discipline)
North Carolina State University BS, Civil Engineering / 2011	Professional Engineer: NC #041981

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)

Mr. Boatwright is a principal / project manager and civil engineer with experience in the design of civil utilities and solid knowledge of electrical, steam and chilled water distribution systems. His design experience is focused primarily on complex utility installations in congested sites. He also has experience with general site planning, design and permitting involving storm drainage analysis, stream buffer intrusions, site grading and hardscape restorations.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Steam Distribution System Replacement		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2019	2020
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF to provide design services to replace approximately 600 LF of 8" HPS and 4" PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

SIZE:	Campus-Wide	COST:	$1.5 Million	ROLE:	PRINCIPAL IN CHARGE / QC

b.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Campus Chilled Water Infrastructure and Equipment Improvements Ph. I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2024	2025 (Est.)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

The Campus Chilled Water Infrastructure and Equipment Improvements project will complete the campus chilled water distribution loop by installing approximately 1,200 trench foot of underground 24-inch chilled water mains between McIver Plant and South Plant along Stirling Drive. RMF provided civil, mechanical, electrical and structural engineering for phase I of the project. Design provides new chilled water connections for Bryan, Mossman, Walker Deck and Elliott buildings on campus. Part of the project also includes providing a schematic design level study for replacing the existing 750-ton chiller in McIver Plant with a new 1500-ton chiller.

SIZE:	Campus-Wide	COST:	$11.4 Million (Est.)	ROLE:	PRINCIPAL IN CHARGE / QC

c.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Thermal Utilities to Partners II and Toxicology		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
North Carolina State University	Raleigh, NC	2020	2021
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided 1,600 TF of underground thermal distribution design for steam using a pre-engineered Class-A piping system and a fully restrained mechanical join ductile-iron pipe for chilled water. The design also included structural and mechanical design for six new steam vaults. The goal for this project was to connect Partners II and Toxicology buildings to the central utility plant (CUP). Underground utilities including chilled water (CHS+CHR) and steam (HPS,PC+HPC) were extended from the central utility plant to the buildings.

SIZE:	1,600 TF	COST:	$9.1 Million	ROLE:	PRINCIPAL IN CHARGE / QC

d.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Main Campus Relocate Steam and Condensate - Phase I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
East Carolina University	Greenville, NC	2023	2024
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are new vaults along the run of distribution piping interior plant piping to connect to the existing steam and condensate headers.

SIZE:	1,000 LF	COST:	$5 Million	ROLE:	PRINCIPAL IN CHARGE / QC

e.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Little Library Chilled Water Connection		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Elizabeth City State University	Elizabeth City, NC	2024	2024
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided Elizabeth City State University with engineering services to install new chilled water service to Little Library. RMF designed underground HDPE chilled water piping to Little Library, and extended the chilled water piping to two separate mechanical rooms, where existing chillers were removed and the building was connected to the central chilled water network.

SIZE:	N/A	COST:	$750,000	ROLE:	PRINCIPAL IN CHARGE / QC

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Elijah Lowder, PE	**Project Manager / Lead Civil Engineer**	12	8

15. FIRM NAME AND LOCATION (City and State)

RMF Engineering, Inc. (Raleigh, NC)

16. EDUCATION (Degree and Specialization)	17. CURRENT PROFESSIONAL REGISTRATION (State and Discipline)
North Carolina State University BS, Civil Engineering / 2017	Professional Engineer: NC #052501

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)

Mr. Lowder is a Civil Engineer with extensive experience designing civil utility distribution systems. He is knowledgeable on various steam and chilled water distribution systems, fuel storage, electrical and hot water systems with higher education, federal and commercial clients across the state of North Carolina. Mr. Lowder also has excellent prior experience with civil construction administration for site development projects for the aforementioned utility systems containing chilled and hot water systems.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Steam Distribution System Replacement		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2019	2020
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF to provide design services to replace approximately 600 LF of 8" HPS and 4" PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

SIZE:	Campus-Wide	COST:	$1.5 Million	ROLE:	PROJECT MANAGER / LEAD CIVIL ENGINEER

b.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Campus Chilled Water Infrastructure and Equipment Improvements Ph. I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2024	2025 (Est.)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

The Campus Chilled Water Infrastructure and Equipment Improvements project will complete the campus chilled water distribution loop by installing approximately 1,200 trench foot of underground 24-inch chilled water mains between McIver Plant and South Plant along Stirling Drive. RMF provided civil, mechanical, electrical and structural engineering for phase I of the project. Design provides new chilled water connections for Bryan, Mossman, Walker Deck and Elliott buildings on campus. Part of the project also includes providing a schematic design level study for replacing the existing 750-ton chiller in McIver Plant with a new 1500-ton chiller.

SIZE:	Campus-Wide	COST:	$11.4 Million (Est.)	ROLE:	PROJECT MANAGER / LEAD CIVIL ENGINEER

c.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Main Campus Relocate Steam and Condensate - Phase I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
East Carolina University	Greenville, NC	2023	2024
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are new vaults along the run of distribution piping interior plant piping to connect to the existing steam and condensate headers.

SIZE:	1,000 LF	COST:	$5 Million	ROLE:	PROJECT MANAGER / LEAD CIVIL ENGINEER

d.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Replace Chilled Water & HVAC - McGennis, Messick & Speight Buildings		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
East Carolina University	Greenville, NC	2017	2018
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF's scope of work included underground chilled water distribution and short segments of underground steam and storm water. Mechanical room modifications to Speight and Messick enabled service from the central plant along with energy monitoring. Two air-handling units in Messick were also be repaired. In addition, several three-way control valves were replaced with two way control valves where appropriate for delta T improvements. This project also included the replacement of steam supply to Speight Building as well as medium voltage electrical work.

SIZE:	N/A	COST:	$2.25 Million	ROLE:	PROJECT MANAGER / LEAD CIVIL ENGINEER

e.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Phase II Expansion of Central Utility System		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
The University of Alabama at Birmingham	Birmingham, AL	2016	2018
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF designed underground distribution systems for pre-fabricated and pre-insulated underground piping for chilled water, steam, and condensate systems. RMF designed the construction documents for Phase II of the UMP which involved expanding these systems to portions of the southwestern academic campus.

SIZE:	4,500 LF	COST:	$20 Million	ROLE:	PROJECT MANAGER / LEAD CIVIL ENGINEER

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Michael Wilkins, PE	**Lead Mechanical Engineer**	14	11

15. FIRM NAME AND LOCATION (City and State)

RMF Engineering, Inc. (Raleigh, NC)

16. EDUCATION (Degree and Specialization)	17. CURRENT PROFESSIONAL REGISTRATION (State and Discipline)
Rensselaer Polytechnic Institute BS, Mechanical Engineering / 2012	Professional Engineer: NC #046293

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)

Mr. Wilkins is a mechanical engineer who specializes in the analysis, design, and construction of infrastructure systems serving educational, industrial, healthcare, and commercial facilities. He is most knowledgeable in the areas of campus utilities (steam, heating water, chilled water). He has worked on everything from central heating / cooling plants to underground piping distribution systems.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Steam Distribution System Replacement		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2019	2020
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF to provide design services to replace approximately 600 LF of 8" HPS and 4" PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

SIZE:	Campus-Wide	COST:	$1.5 Million	ROLE:	LEAD MECHANICAL ENGINEER

b.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Hill Street Steam Vault Replacement Study and Design		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Appalachian State University	Boone, NC	2024	2025 (Est.)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided a study of Appalachian State University's existing steam manhole ST76-02, located within Hill Street. The manhole is located in an area with a high water table and is subjected to deicing chemicals during winter seasons. RMF investigated solutions for relocating manhole ST76-02 outside of Hill Street to minimize water ingress and exposure to deicing chemicals, and replacement of piping between the manhole and Holmes Center.

SIZE:	N/A	COST:	$1.2 Million	ROLE:	LEAD MECHANICAL ENGINEER

c.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Steam Repairs Phase 8 - DH Hill		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
North Carolina State University	Raleigh, NC	2020	2021
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided engineering design services along with bidding and construction administration services for steam tunnel repairs and steam building connections at North Carolina State University. The overall goal of this project was to replace and repair a section of low pressure steam piping with high pressure type inside the steam tunnel.

SIZE:	1,400 LF	COST:	$1.2 Million	ROLE:	MECHANICAL ENGINEER

d.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Main Campus Relocate Steam and Condensate - Phase I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
East Carolina University	Greenville, NC	2023	2024
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are new vaults along the run of distribution piping interior plant piping to connect to the existing steam and condensate headers.

SIZE:	1,000 LF	COST:	$5 Million	ROLE:	MECHANICAL ENGINEER

e.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Lilly Library Utilities Relocation		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Duke University	Durham, NC	2024	2025 (Est.)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

The construction of the Lilly Library Addition will impact existing chilled water, steam, storm, sanitary and domestic water mains. This project will relocate those utilities outside of the building footprint. Additionally, the project will extend hot water, power, and communications ductbank to the north side of the addition to create a new utility corridor through this section of east campus.

SIZE:	N/A	COST:	$6.8 Million	ROLE:	LEAD MECHANICAL ENGINEER

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Grace Coakley	**Civil / Structural Designer**	3	3

15. FIRM NAME AND LOCATION (City and State)

RMF Engineering, Inc. (Raleigh, NC)

16. EDUCATION (Degree and Specialization)	17. CURRENT PROFESSIONAL REGISTRATION (State and Discipline)
Carroll Community College AS, Civil / Mechanical Engineering / 2022	

18. OTHER PROFESSIONAL QUALIFICATIONS (Publications, Organizations, Training, Awards, etc.)

Ms. Coakley has extensive experience in performing structural and civil engineering design for large infrastructure and buildings projects serving the higher education, government and healthcare markets. Her projects have included designs for steam, hot water and chilled water distribution systems, power distribution systems, utility tunnels and underground vaults.

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Steam Distribution System Replacement		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
UNC Greensboro	Greensboro, NC	2019	2020
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF to provide design services to replace approximately 600 LF of 8" HPS and 4" PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

SIZE:	Campus-Wide	COST:	$1.5 Million	ROLE:	CIVIL / STRUCTURAL DESIGNER

b.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Main Campus Relocate Steam and Condensate - Phase I		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
East Carolina University	Greenville, NC	2023	2024
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are new vaults along the run of distribution piping interior plant piping to connect to the existing steam and condensate headers.

SIZE:	1,000 LF	COST:	$5 Million	ROLE:	CIVIL / STRUCTURAL DESIGNER

c.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Hill Street Steam Vault Replacement Study and Design		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Appalachian State University	Boone, NC	2024	2025 (Est.)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided a study of Appalachian State University's existing steam manhole ST76-02, located within Hill Street. The manhole is located in an area with a high water table and is subjected to deicing chemicals during winter seasons. RMF investigated solutions for relocating manhole ST76-02 outside of Hill Street to minimize water ingress and exposure to deicing chemicals, and replacement of piping between the manhole and Holmes Center.

SIZE:	N/A	COST:	$1.2 Million	ROLE:	CIVIL / STRUCTURAL DESIGNER

d.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Hot Water Plant 2		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Duke University	Durham, NC	2019	2020
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

RMF provided design and construction administration services for a new steam to hot water regional plant housed inside an existing plant on Duke's West Campus. RMF provided the renewal of an existing steam manhole, replacing an existing sump pump with a steam powered pump and adding protective liner to the interior of the manhole.

SIZE:	N/A	COST:	$6 Million	ROLE:	CIVIL / STRUCTURAL DESIGNER

e.

(1) TITLE AND LOCATION (City and State)		(2) YEAR COMPLETED	
Underground Steam and Condensate Pipes Analysis		PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
Winthrop University	Rock Hill SC	2021	N/A (Study)
(3) BRIEF DESCRIPTION (Brief scope, size, cost, etc.) AND SPECIFIC ROLE		[X] Check if project performed with current firm	

This project provided a condition assessment of the existing underground steam and condensate system on the Winthrop University Campus. Winthrop currently has several steam system problems that need to be addressed and the goal of the study is to develop an action plan for immediate and long-term steam system repairs. Mechanical, Civil and Structural engineering analysis was performed for the existing buried steam and condensate infrastructure, including buried vaults and distribution mains. The analysis was delivered in a written report and presentations. The project provides a path forward for the repair and replacement of the campus steam systems.

SIZE:	Campus-wide	COST:	N/A (Study)	ROLE:	CIVIL / STRUCTURAL DESIGNER

E. RESUMES OF KEY PERSONNEL PROPOSED FOR THIS CONTRACT

(Complete one Section E for each key person.)

12. NAME	13. ROLE IN THIS CONTRACT	14. YEARS EXPERIENCE	
		a. TOTAL	b. WITH CURRENT FIRM
Heather Rhymes, PLA	Landscape Architect	**12**	**10**

15. FIRM NAME AND LOCATION *(City and State)*

CLH design, p.a. - Cary, NC

16. EDUCATION *(DEGREE AND SPECIALIZATION)*	17. CURRENT PROFESSIONAL REGISTRATION *(STATE AND DISCIPLINE)*
Master of Landscape Architecture, NC State University, 2013 Bachelor of Arts, Furman University, 2009	Landscape Architect: North Carolina #2302

18. OTHER PROFESSIONAL QUALIFICATIONS *(Publications, Organizations, Training, Awards, etc.)*

19. RELEVANT PROJECTS

a.

(1) TITLE AND LOCATION *(City and State)*

East Carolina University Clement Residence Hall Renovations
Greenville, NC

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2015 - 2016	2017 - 2018

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

CLH was part of the design team for the Clement Residence Hall Renovation project to address all code non-compliant issues. The project consisted of interior and exterior renovations to the existing building, as well as new architectural construction at the entrance lobby. CLH also completed associated landscape services, storm, and irrigation work with the improvements, as well as a new accessible route from the front door plaza area down to Reade Circle. Role: Landscape Designer. Costs: $20M.

b.

(1) TITLE AND LOCATION *(City and State)*

North Carolina State University Medium Voltage Distribution System Upgrade
Raleigh, NC

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2021 - 2022	2023 - 2024

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

CLH has been working on the medium voltage distribution system upgrade project at NC State University. This project includes an extensive upgrade to the electrical distribution system throughout Central and North Campus that will include the installation of new underground duct banks and manholes and various above-ground pieces of electrical equipment. CLH assisted by limiting adverse effects on existing trees and landscaping by the electrical improvements and assisting NCSU by providing schematic landscaping design services for various areas of campus that will be disturbed by the new work. Role: Landscape Designer. Costs: TBD.

c.

(1) TITLE AND LOCATION *(City and State)*

UNC Greensboro Chilled Water Infrastructure Upgrades
Greensboro, NC

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2023 - 2024	2024 - 2025

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

CLH is providing landscape design and assistance services associated with the proposed chilled water infrastructure upgrades for UNC Greensboro campus. CLH assisted with limiting adverse effects on existing trees and landscaping and providing landscape design and restoration plan services for areas of campus that will be disturbed by the new work. Role: Landscape Architect. Costs: TBD.

d.

(1) TITLE AND LOCATION *(City and State)*

North Carolina State University Plant Sciences Building – LEED Gold
Raleigh, NC

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016 - 2018	2019 - 2022

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

CLH provided landscape architecture services for this project. Role included the development of multiple schematic designs for a covered “porch” which provides space for casual conversation and reflection as well as overflow space from the interior hearth, allowing functions to flow from inside to outside. Role: Landscape Designer. Costs: $116 million.

e.

(1) TITLE AND LOCATION *(City and State)*

East Carolina University Life Sciences and Biotechnology Building – LEED Silver
Greenville, NC

(2) YEAR COMPLETED	
PROFESSIONAL SERVICES	CONSTRUCTION *(If applicable)*
2016 - 2018	2019 - 2021

(3) BRIEF DESCRIPTION *(Brief scope, size, cost, etc.)* AND SPECIFIC ROLE ☒ Check if project performed with current firm

CLH provided civil engineering and landscape architecture services for the Life Sciences and Biotechnology Building project. This project included construction of a new five-story building and a surface parking lot located on two Greenville city blocks. Role: Landscape Designer. Costs: $90 million.

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 1

21. TITLE AND LOCATION (City and State)

Steam Distribution System Replacement
Greensboro, NC

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2019	2020

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
UNC Greensboro	Bill Chatfield	336.334.5269

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Relevant Scope

- UNC Greensboro Experience
- Campus Steam System

Construction Cost

$1.5 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE
- Grace Coakley

As part of a multi-phased replacement of deteriorating steam distribution in the heart of their campus, UNC Greensboro (UNCG) contracted RMF to provide design services to replace approximately 600 LF of eight-inch HPS and four-inch PC. Various distribution methodologies were investigated and presented to UNCG during early design planning (direct buried, shallow trench and walkable tunnel). Approximate budgets, schedules and long term comparisons were provided for each methodology, allowing UNCG and RMF to select the system best suited for the project.

In order to accommodate the University's desired system of shallow trench distribution, RMF developed a phased approach that would provide the necessary flexibility to accommodate the available budget and construction schedule. The two phase approach was coordinated with traffic and pedestrian control requirements, bus routes and available laydown space; working to split the project due to budget and schedule restrictions at an area that would also help minimize impact to campus operations. Pedestrian phasing and traffic control was of high importance as the alignment was located directly adjacent the Elliot University Center, under a busy walkway just south of the Kaplan Commons courtyard. The utility alignment was also laid out to utilize z-bends and loops to avoid utility conflicts and sensitive areas. These features allowed the team to avoid the use of mechanical expansion joints and associated ongoing maintenance.

Multiple temporary service options were investigated and provided for consideration, including temporary electrical hot water heaters, temporary above ground stream distribution, and temporary FO Boilers. UNCG and RMF worked together to implement the most cost effective temporary solution that still met minimum demand requirements by investigating each building's seasonal usage during the estimated construction window.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 2

21. TITLE AND LOCATION (City and State)

Campus Chilled Water Infrastructure and Equipment Improvements Phase I
Greensboro, NC

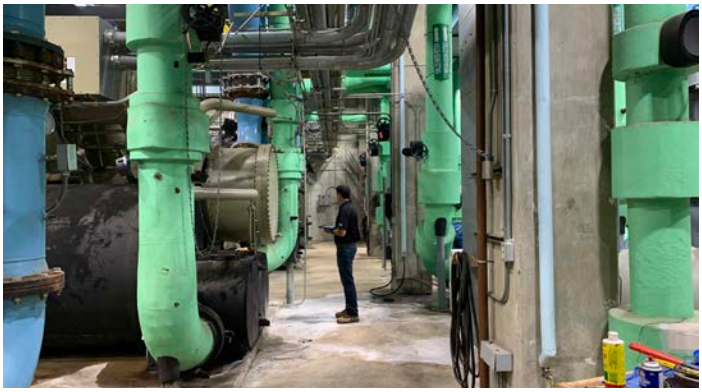
22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2024	2025 (Est.)

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
UNC Greensboro	David Freidman	336.334.5269

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)



Relevant Scope

- UNC Greensboro Experience
- Campus Infrastructure

Construction Cost

$11.4 Million (Est.)

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Grace Coakley

UNC Greensboro distributes chilled water to campus from two existing chiller plants on the north and south sides of campus. The goal of this project is to complete the loop between these two plants to improve campus reliability and hydraulics and to also connect four buildings in the area to the campus chilled water distribution loop. It will also allow the UNC Greensboro to remove several building chillers and cooling towers, lowering campus maintenance and improving energy efficiency.

The Campus Chilled Water Infrastructure and Equipment Improvements project will complete the campus chilled water distribution loop by installing approximately 1,200 trench foot of underground 24-inch chilled water mains between McIver Plant and South Plant along Stirling Drive. New chilled water connections will be provided to four buildings on campus: Bryan, Mossman, Walker Deck and Elliott building. The Alumni building is currently fed chilled water through Elliott and will also be connected to the campus distribution system by this project through the Elliott building loop transition. A tap for future connection will also be provided for Jackson Library. Part of the project also includes providing a schematic design level study for replacing the existing 750-ton chiller in McIver Plant with a new 1500-ton chiller.

Each building's tie-in point required close coordination between underground conflicts and interior building restrictions. At several locations, the team employed creative solutions to access the building including utilizing liner plate tunnels to access basement area, routing piping through office space in a new pipe chase and utilizing void space below stairways for accessing mechanical rooms. The mechanical rooms were designed to accommodate phasing while also placing new equipment in logical and ideal locations. At Elliott, one of the existing chillers and building controls were reconfigured so that it could provide building backup and backfeed into the loop during times of low demand.

The civil design required permitting with City of Greensboro for traffic detour and road closure review and with their Public Works group for utility separation review.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 3

21. TITLE AND LOCATION (City and State)

Main Campus Relocate Steam and Condensate - Phase 1
Greenville, NC

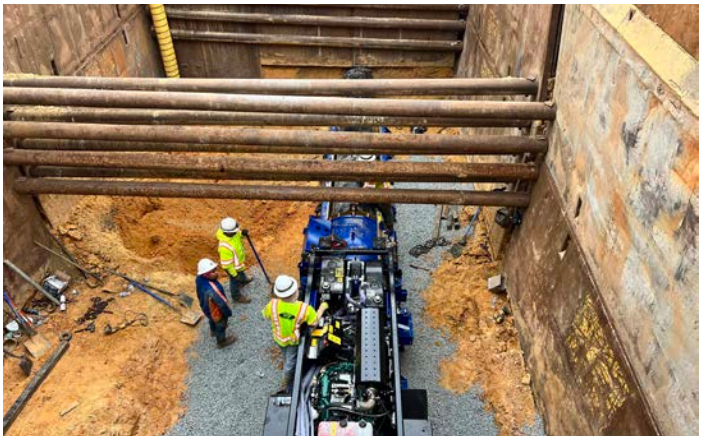
22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2023	2024

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
East Carolina University	Robert Still	919.328.6776

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)



Relevant Scope

- Steam Distribution
- Vault Line Replacement

Construction Cost

$5 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE
- Grace Coakley

This project consists of installing a new section of steam and condensate piping on East Carolina University's (ECU) main campus. 1,000 LF of 12-inch HPS and eight-inch PC distribution piping will be installed from ECU's Main Campus Steam Plant to an existing Gateway Vault (CH-20) on the north side of 14th Street by method of direct buried (900 LF) and jack-and-bore (100 LF). Also included in the project scope are three new vaults along the run of distribution piping including an automatic sump discharge system. Three existing vaults require piping rework to either abandon a leg of existing piping or tie into the new 12-inch HPS and eight-inch PC. This project also includes interior plant piping to connect to the existing steam and condensate headers and remove any abandoned sections.

This project also consists of relocating 225 LF of existing power ductbank and an existing power manhole from the Main Campus Steam Plant to an existing manhole by method of direct buried ductbank (125 LF) and jack-and-bore (100 LF). Also included is an electrical review of the ECU electrical single lines to coordinate cable replacement in the relocated ductbank.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	MEP, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 4

21. TITLE AND LOCATION (City and State)

Hill Street Steam Vault Replacement Study and Design
Boone, NC

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2024	2025 (Est.)

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Appalachian State University	Daniel Gryder	828.262.4961

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Relevant Scope

- Steam Distribution

Construction Cost

$1.2 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

RMF provided a study of Appalachian State University's existing steam manhole ST76-02, located within Hill Street. The manhole is located in an area with a high water table and is subjected to deicing chemicals during winter seasons. Water and deicing chemical ingress into the STMH through abandoned and existing pipe penetrations, and manhole access covers, resulted in substantial corrosion of the piping within the vault, and had corroded portions of the existing direct buried piping systems connected to this manhole.

RMF investigated solutions for relocating manhole ST76-02 outside of Hill Street to minimize water ingress and exposure to deicing chemicals, and replacement of piping between the manhole and Holmes Center.

The study also included extending a redundant waterline across Hill Street to loop into the existing system and provide a backfeed for the aging waterline in the area.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	MEP, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 5

21. TITLE AND LOCATION (City and State)

Phase II Expansion of Central Utility System
Birmingham, AL

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2016	2018

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
University of Alabama at Birmingham	James Gilliam	205.975.7044

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Relevant Scope

- Steam Distribution

Construction Cost

$20 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE

The University of Alabama Birmingham (UAB) owns and operates one central steam plant and three central chilled water plants. The central steam and chilled water generation and distribution systems provide service to many of the facilities across the Medical Center, Research and Academic Districts of the UAB Campus. UAB created a utility master plan (UMP) to expand these systems and connect them to all major facilities on campus. RMF designed the construction documents for Phase II of the UMP which involved expanding these systems to portions of the southwestern academic campus.

RMF designed underground distribution systems to provide central steam and chilled water access to Sterne Library, the Education Building, the Business and Engineering Complex, Blount Hall, the Alys Robinson Stephens Center and the New College of Arts and Sciences Building. The expansion also provided tie-in points for future expansions to the distribution systems.

The distribution system was designed for pre-fabricated and pre-insulated underground piping for chilled water, steam, and condensate systems. Installation was required for a combination of approximately 4,500 LF of open trench excavation and jack and bore horizontal boring.

The steam distribution systems are routed through cast-in-place utility vaults that provide redundant access points to the valves and system accessories. Expansion for the steam system was accommodated with mechanical expansion joints within the vaults. Future piping taps were provided with valves and blinds to accommodate expansion of the system to adjacent buildings and areas of campus.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Atlanta, GA | Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 6

21. TITLE AND LOCATION (City and State)

Steam Repairs Phase 8 - DH Hill
Raleigh, NC

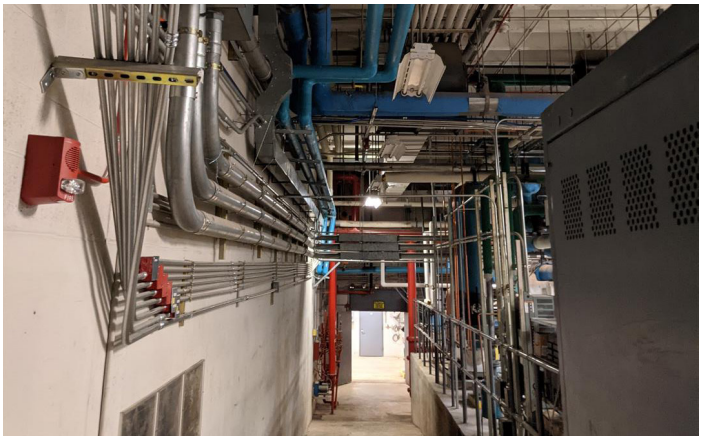
22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2020	2021

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
North Carolina State University	Laura Zaytoun	919.513.0373

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)



Relevant Scope

- Steam Distribution

Construction Cost

$1.2 Million

Key RMF Personnel

- Matthew Boatwright
- Mike Wilkins

RMF provided engineering design services along with bidding and construction administration services for steam tunnel repairs and steam building connections at North Carolina State University. The overall goal of this project was to replace and repair a section of low pressure steam piping with high pressure type inside the steam tunnel. In a phased design process, RMF was able to design new high pressure steam and condensate piping to supply each building, and structurally repair steam tunnels in a high-traffic area of campus.

The new high pressure steam and pumped condensate piping within the stated tunnel met the sizing standard per the campus steam master plan. The new design covered approximately 1,400 feet of new piping, and included expansion loops, anchors, guides, and associated structural support. A thermal 3D steam pipe code stress analysis was performed for the entire steam and condensate systems, including the existing piping that was connected to as part of the project.

Custom structural details were provided to repair and replace portions of the existing tunnel and manholes, portions of which were 50 to 70 years old. Civil design included restoration design of the Campus Atrium patio dining area, which was located directly above the tunnel, and a phasing plan the allow the Atrium to remain open throughout construction.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 7

21. TITLE AND LOCATION (City and State)

Thermal Utilities to Partners II and Toxicology
Raleigh, NC

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2020	2021

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
North Carolina State University	David Hammock	919.515.2030

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Relevant Scope

- Steam Distribution

Construction Cost

$9.1 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Elijah Lowder, PE
- Michael Wilkins, PE

The goal for this project was to connect Partners II and Toxicology buildings to the central utility plant (CUP). Underground utilities including chilled water (CHS+CHR) and steam (HPS,PC+HPC) were extended from the Central Utility Plant to the buildings. Additionally, building mechanical rooms were converted from stand-alone generating facilities to utility receiving buildings.

RMF provided 1,600 trench-feet of underground thermal distribution design for steam using a pre-engineered, Class A, piping system and a fully restrained mechanical join ductile-iron pipe for chilled water. The design also included Structural and Mechanical design for six new steam vaults; building mechanical room design for steam PRV stations, hot water heat exchangers, hot and chilled water pumps; suite of flow and energy monitoring systems for new building connections; and design phasing drawings, notes and specifications to maintain building services during the utility transitions.

Two critical research facilities on centennial campus with aged, inefficient and unreliable cooling and heating generation systems were connected to a modern, reliable and efficient energy plant. The central plant boasts chilled water thermal storage along with combined heat and power.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 8

21. TITLE AND LOCATION (City and State)

Hot Water Plant 2
Durham, NC

22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2019	2020

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Duke University	Steve Carrow	919.660.1487

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)

Relevant Scope

- Steam Distribution
- Manhole Line Replacement

Construction Cost

$6 Million

Key RMF Personnel

- Michael Wilkins, PE
- Gracie Coakley

RMF provided design and construction administration services for a new steam to hot water regional plant (HWP-2) housed inside an existing chiller plant (CP-1) on Duke's West Campus. The newly constructed plant is part of the University's overall plan to convert buildings from steam to low-temp hot water district energy.

The plant consisted of three new 15,000 MBH The underground distribution needed included 1,000+ trench feet of 10" HPS (125 psig @ 353°F), six-inch CR, and one-inch HPC, four new pre-cast concrete steam vaults, and 300+ trench feet of underground 12" HWS/R (150°F @ 80 psig). One of the new pre-cast vaults was set in line with the existing underground steam system to intercept and feed the new hot water plant.

The new Hot Water Plant 2 utilized flooded vertical shell and tube heat exchangers which utilize direct high pressure steam to generate heating water without the need for a steam PRV. The condensate is subcooled at high pressure and sent back to the condensate return distribution system without the use of pumps. In effort to bring in the new underground steam, condensate, and hot water distribution, a 150 SF pipe enclosure partition was added to the basement and floor levels of the existing CP-1. Additionally, construction took place in an active and growing part of campus, along Towerview Drive and adjacent to the recently constructed Hollows Dorms.

As part of this project, RMF provided drawings and specifications associated with the renewal of an existing steam manhole along Towerview Drive (STMH-114). Renewal efforts included replacing the existing steam trap, replacing the existing electric sump pump with a steam powered sump pump, and adding a protective/waterproof liner to the interior of the manhole.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 9

21. TITLE AND LOCATION (City and State)

Lilly Library Utilities Relocation
Durham, NC

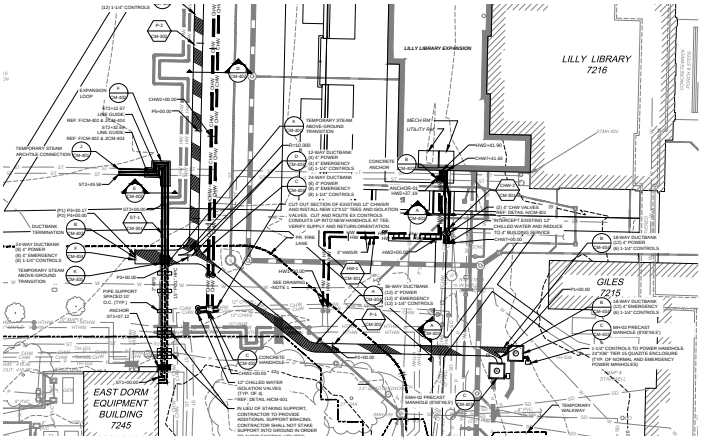
22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2024	2025 (Est.)

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Duke University	Nasser Massry	919.668.0520

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)



Relevant Scope

- Steam Distribution

Construction Cost

$6.8 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

The construction of the Lilly Library Addition will impact existing chilled water, steam, storm, sanitary and domestic water water mains. This project will relocate those utilities outside of the building footprint.

Additionally, the project will extend hot water, power, and communications ductbank to the north side of the addition to create a new utility corridor through this section of east campus.

A design for the new service lines for low temperature hot water, chilled water and domestic water are being provided to account for the new mechanical room. A new electrical service yard will be provided for new normal and emergency power switches and transformers.

A section of above and underground steam distribution will be provided by the project to maintain feeds to four buildings located northwest of the construction site. This required a new connection inside the regional hot water plant, custom details for the aboveground routing and underground connection to an existing archtile tunnel system and stress analysis of both the new and existing distribution routing.

25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Raleigh, NC	Mechanical, Electrical, Civil, Structural

F. EXAMPLE PROJECTS WHICH BEST ILLUSTRATE PROPOSED TEAM'S QUALIFICATIONS FOR THIS CONTRACT

(Present as many projects as requested by the agency, or 10 projects, if not specified. Complete one Section F for each project.)

20. EXAMPLE PROJECT KEY #: 10

21. TITLE AND LOCATION (City and State)

Love to Boggs Steam and Condensate Replacement
Atlanta, Georgia

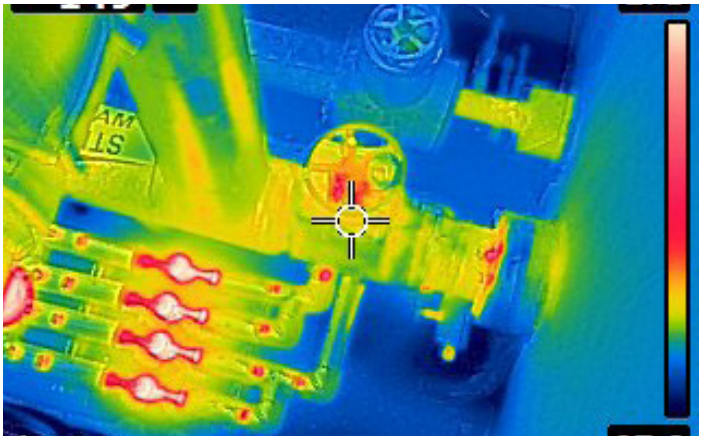
22. YEAR COMPLETED

PROFESSIONAL SERVICES	CONSTRUCTION (if applicable)
2021	2022

23. PROJECT OWNER'S INFORMATION

a. PROJECT OWNER	b. POINT OF CONTACT NAME	c. POINT OF CONTACT TELEPHONE NUMBER
Georgia Institute of Technology	Greg Spiro, PE, CEM, LEED AP	470.351.9867

24. BRIEF DESCRIPTION OF PROJECT AND RELEVANCE TO THIS CONTRACT (Include scope, size, and cost)



Relevant Scope

- Steam Distribution

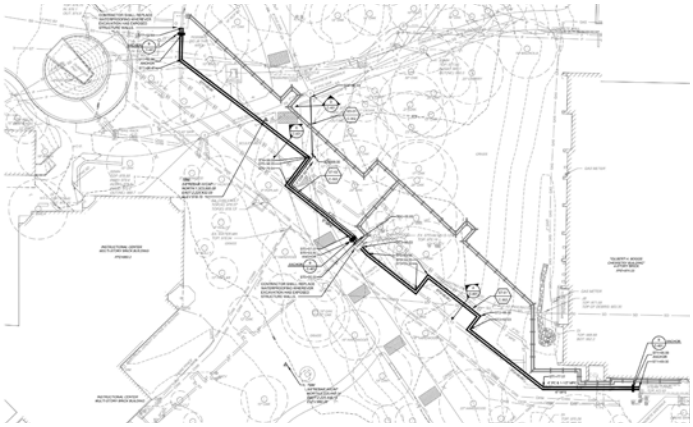
Construction Cost

$1.55 Million

Key RMF Personnel

- Matthew Boatwright, PE
- Michael Wilkins, PE

The project consists of the design to replace the direct buried six-inch medium pressure steam and four-inch pumped condensate distribution piping system extending from the existing steam tunnel south of the Boggs Chemistry Building generally to the north and west, extending approximately 575 LF to existing steam manhole G12-1. Steam and condensate piping will route through a new steam manhole adjacent to existing G12-8. Steam and condensate will be reconnected to existing G-12-8. A temporary steam and condensate system will be designed in order to facilitate minimal construction interruptions and the complete removal of all abandoned and steam and condensate piping within the utility corridor.



25. FIRMS FROM SECTION C INVOLVED WITH THIS PROJECT

	(1) FIRM NAME	(2) FIRM LOCATION (City and State)	(3) ROLE
a.	**RMF Engineering, Inc.**	Atlanta, GA / Raleigh, NC	Civil, Structural

G. KEY PERSONNEL PARTICIPATION IN EXAMPLE PROJECTS

26. NAMES OF KEY PERSONNEL (From Section E, Block 12)	27. ROLE IN THIS CONTRACT (From Section E, Block 13)	28. EXAMPLE PROJECTS LISTED IN SECTION F (Fill in "Example Projects Key" section below before completing table. Place "X" under project key number for participation in same or similar role.)									
		1	2	3	4	5	6	7	8	9	10
Matthew Boatwright, PE	Principal in Charge / Quality Control	X	X	X	X	X	X	X		X	X
Elijah Lowder, PE	Project Manager / Lead Civil Engineer	X	X	X		X		X			
Michael Wilkins, PE	Lead Mechanical Engineer	X		X	X	X	X	X	X	X	X
Grace Coakley	Civil / Structural Designer	X	X	X					X		

29. EXAMPLE PROJECTS KEY

NO.	TITLE OF EXAMPLE PROJECT (From Section F)	NO.	TITLE OF EXAMPLE PROJECT (From Section F)
1	**Steam Distribution System Replacement** UNC Greensboro	6	**Steam Repairs Phase 8 - DH Hill** North Carolina State University
2	**Campus Chilled Water Infrastructure and Equipment Improvements Phase I** UNC Greensboro	7	**Thermal Utilities to Partners II and Toxicology** North Carolina State University
3	**Main Campus Relocate Steam and Condensate - Phase I** East Carolina University	8	**Hot Water Plant 2** Duke University
4	**Hill Street Steam Vault Replacement Study and Design** Appalachian State University	9	**Lilly Library Utilities Relocation** Duke University
5	**Phase II Expansion of Central Utility System** University of Alabama at Birmingham	10	**Love to Boggs Steam and Condensate Replacement** Georgia Institute of Technology

H. ADDITIONAL INFORMATION

30. PROVIDE ANY ADDITIONAL INFORMATION REQUESTED BY THE AGENCY. ATTACH ADDITIONAL SHEETS AS NEEDED.

NORTH CAROLINA BOARD OF EXAMINERS
FOR ENGINEERS AND SURVEYORS
4601 Six Forks Rd Suite 310
Raleigh, North Carolina 27609

RMF Engineering, Inc, P.C.
5520 Research Park Drive, Ste 300
Baltimore, MD 21228

This is to Certify that:

RMF Engineering, Inc, P.C. is licensed with the North Carolina Board of Examiners for Engineers and Surveyors, and is authorized to practice ***engineering*** under the provisions of Chapter 89C and 55B of the General Statutes of North Carolina.

This authorization must be renewed annually, and **expires on June 30, 2025**

License No. : C-1125

THE NORTH CAROLINA BOARD OF EXAMINERS FOR ENGINEERS AND SURVEYORS

Executive Director

POST IN PLACE OF BUSINESS

Issued 06/14/2024

Telephone	FAX	EMAIL Address	WEB Site
(919) 791-2000	(919) 791-2012	ncbels@ncbels.org	***.ncbels.org

I. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

31. SIGNATURE

32. DATE
January 31, 2025

33. NAME AND TITLE
Matthew Boatwright, PE - Principal

ARCHITECT-ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER (If any): RFQ: # 287-23-18454-01

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (or Branch Office) NAME: RMF Engineering, Inc.		3. YEAR ESTABLISHED: 1983	4. UNIQUE ENTITY IDENTIFIER: Y7YJFTG997E7
2b. STREET: 8081 Arco Corporate Drive, Suite 300		5. OWNERSHIP a. TYPE: Corporation	
2c. CITY: Raleigh	2d. STATE: NC	2e. ZIP CODE: 27617	b. SMALL BUSINESS STATUS: No
6a. POINT OF CONTACT NAME AND TITLE: Matthew Boatwright, PE – Principal			7. NAME OF FIRM (If Block 2a is a Branch Office): RMF Engineering, Inc.
6b. TELEPHONE NUMBER: 919.251.6364	6c. EMAIL ADDRESS: matthew.boatwright@rmf.com		
8a. FORMER FIRM NAME(S) (If any): Ross Murphy Finkelstein, Inc.		8b. YEAR ESTABLISHED: 1983	8c. UNIQUE ENTITY IDENTIFIER: Y7YJFTG997E7

9. EMPLOYEES BY DISCIPLINE

a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	c. No. of Employees (2) BRANCH
02	Administrative	41	3
06	Architect		
12	Civil Engineers	11	3
21	Electrical Engineers	26	4
42	Mechanical Engineers	50	10
57	Structural Engineers	4	
10	Chemical Engineers		
08	CADD Technicians	10	9
15	Construction Engineers	5	
12/21/42	Junior Engineers/Designers	45	
15	Construction Inspector	4	
52	Sanitary Engineer		
	Architectural Designer	1	
	Civil Designer	16	3
	Commissioning Agent	22	5
	Electrical Designer	28	6
	Energy Engineer	4	
	Inspector		
	Information Technology	7	
	Plumbing Engineer	4	1
	Mechanical Designer	72	10
	Total	350	54

10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS

a. Profile Code	b. Experience	c. Revenue Index Number (see below)
A06	Airports; Terminals; Hangers; Freight Handling	3
A08	Animal Facilities	5
B01	Barracks; Dormitories	5
E02	Educational Facilities; Classrooms	7
F02	Field Houses; Gymnasiums; Stadiums	5
G01	Garages; Vehicle Maint. Facilities; Parking Decks	1
H04	Heating, Ventilating, Air Conditioning	7
H09	Hospitals & Medical Facilities	7
L01	Laboratories; Medical Research Facilities	7
L06	Lighting (Exterior; Street; Memorials; Athletic Fields)	3
P07	Plumbing & Pipe Design	6
P08	Prisons & Correctional Facilities	3
P12	Power Generation, Transmission, Distribution	6
R05	Refrigeration Plants/Systems	7
R06	Rehabilitation (Buildings; Structures; Facilities)	5
R08	Research Facilities	7
S09	Structural Design; Special Structures	3
S11	Sustainable Design	7
T02	Testing & Inspection Services	2
T06	Tunnels & Subways	6
U03	Utilities (Gas & Steam)	6
V01	Value Analysis; Life-Cycle Costing	1

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS (Insert revenue index number shown at right)

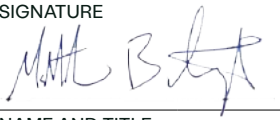
a. Federal Work	8
b. Non-Federal Work	9
c. Total Work	10

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE
The foregoing is a statement of facts.

a. SIGNATURE



b. DATE: January 31, 2025

c. NAME AND TITLE: Matthew Boatwright, PE – Principal

ARCHITECT – ENGINEER QUALIFICATIONS

1. SOLICITATION NUMBER *(If any)*: RFQ: # 287-23-18454-01

PART II – GENERAL QUALIFICATIONS

(If a firm has branch offices, complete for each specific branch office seeking work.)

2a. FIRM (OR BRANCH OFFICE) NAME: **CLH design, p.a.**	3. YEAR ESTABLISHED: 1993
	4. UNIQUE ENTITY IDENTIFIER: 968278309
2b. STREET: 400 Regency Forest Drive, Suite 120	5. OWNERSHIP
	a. TYPE: S-Corporation
2c. CITY: Cary; 2d. STATE: NC; 2e. ZIP CODE: 27518	b. SMALL BUSINESS STATUS: HUB Certified with NC Dept. Of Admin.
6a. POINT OF CONTACT NAME AND TITLE: Renee Pfeifer, PLA, ASLA - President	7. NAME OF FIRM *(If block 2a is a branch office)*
6b. TELEPHONE NUMBER: 919.319.6716; 6c. E-MAIL ADDRESS: rpfeifer@clhdesignpa.com	
8a. FORMER FIRM NAME(S) *(If any)*	8b. YR. ESTABLISHED; 8c. UNIQUE ENTITY IDENTIFER: 968278309

9. EMPLOYEES BY DISCIPLINE				10. PROFILE OF FIRM'S EXPERIENCE AND ANNUAL AVERAGE REVENUE FOR LAST 5 YEARS		
a. Function Code	b. Discipline	c. No. of Employees (1) FIRM	c. No. of Employees (2) BRANCH	a. Profile Code	b. Experience	c. Revenue Index Number *(see below)*
02	Administrative	2		A08	Animal Facilities	4
12	Civil Engineers	6		C06	Churches	1
12a	Civil Engineer Intern	3		C11	Community Facilities	3
15	Construction Inspector	3		E02	Educational Facilities; Classrooms	6
39	Landscape Architects	8		F02	Field Houses; Gyms; Stadiums	2
39a	Landscape Designers	4		H09	Hospital & Medical Facilities	1
				L04	Libraries; Museums; Galleries	1
				P13	Public Safety Facilities	2
				R04	Recreation Facilities/ Parks	3
				S13	Storm Water Handling & Facilities	1
				U03	Utilities (Gas & Steam)	1
	Other Employees					
	Total	26				

11. ANNUAL AVERAGE PROFESSIONAL SERVICES REVENUES OF FIRM FOR LAST 3 YEARS

(Insert revenue index number shown at right)

a. Federal Work	0
b. Non-Federal Work	6
c. Total Work	6

PROFESSIONAL SERVICES REVENUE INDEX NUMBER

1. Less than $100,000
2. $100,000 to less than $250,000
3. $250,000 to less than $500,000
4. $500,000 to less than $1 million
5. $1 million to less than $2 million
6. $2 million to less than $5 million
7. $5 million to less than $10 million
8. $10 million to less than $25 million
9. $25 million to less than $50 million
10. $50 million or greater

12. AUTHORIZED REPRESENTATIVE

The foregoing is a statement of facts.

a. SIGNATURE 

b. DATE: **October 29, 2024**

c. NAME AND TITLE: Renee Pfeifer, PLA, ASLA - President

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CONTACT

Matthew Boatwright, PE

919.941.9876

matthew.boatwright@rmf.com

RMF Engineering

8081 Arco Corporate Dr Suite 300

Raleigh, North Carolina 27617

919.941.9876