



ENGINEERS WEEK

Highlighting the impact of engineering projects in communities across the Granite State and the globe



Engineers Week is underway

The theme for Engineers Week 2025 — officially celebrated Feb. 16 to 22 — is “Design Your Future,” an initiative focused on celebrating engineers and engaging students.

Engineering stands at the cutting edge of innovation, playing a crucial role in crafting the solutions that will define tomorrow. From the rise of artificial intelligence and clean energy to advancements in semiconductors and biotechnology, engineers have consistently driven progress, enhancing our lives to be more efficient, comfortable, and interconnected. Through their ingenuity, knowledge, and commitment, engineering teams design solutions to tackle global challenges, propel technological progress, and contribute positively to the future of society.

Visit DiscoverE.org/EngineersWeek and learn more about the “E” in STEM.

2025 Engineer Awards • Page C9



Raymond Cook



Corey Dietrich

Engineers Week Exhibition and Banquet is Thursday

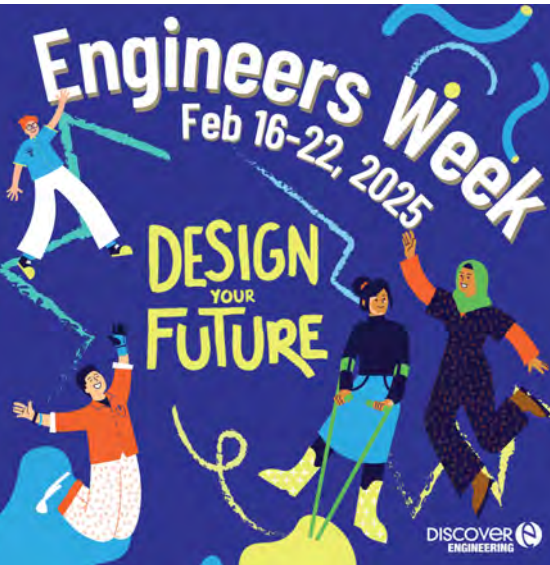
The 74th annual Engineers Week Awards will take place on Thursday at the Grappone Center in Concord.

The afternoon portion of the event will include the following educational sessions:

- “Advancements in Traffic Crash Reconstruction,” presented by Rick McAlister, president, The Crash Lab.
- “Sustainable and Resilient Pavements Under a Changing Climate,” presented by Jo Sias, professor at the University of New Hampshire.
- “Orsted South Fork Wind Project — Using 4D Modeling to Optimize Design and Construction,” presented by Christopher Cockshaw, vice president, Mott MacDonald.
- “Francis Scott Key Bridge Collapse Cleanup,” presented by Colin O’Hearn, owner, Kinetic Demolition and Engineering.

The evening hours will feature the exhibition and awards ceremony with dinner, running from 6 to 8 p.m. Keynote speaker David Macaulay, author and professor at Dartmouth College, will present “Seeing Things: A Visual Introduction to Engineering.”

For registration information, visit nspe-nh.org.



Content sourcing

Engineering firms from around the state were invited to submit articles featuring current or recently completed projects for this special advertising section.

HOYLE TANNER



PHOTO PROVIDED BY HOYLE TANNER

Hoyle Tanner provided civil and structural engineering services for the new memorial garden and labyrinth at Southern New Hampshire University.

Creating a tranquil memorial for pandemic victims and loved ones at SNHU

■ Focal point is 12-foot, 25-ton stone that aligns with the summer and winter solstices.

From Hoyle Tanner

SOUTHERN NEW HAMPSHIRE UNIVERSITY was looking for a way to honor the memory of those lost during the COVID-19 pandemic. The dream started as a vision to be both a place of gathering for small ceremonies as well as a place of solitary contemplation. Today, a new memorial is providing a place for reflection and grieving.

Partnering with the Yale School of Architecture Alumni, recent graduates submitted designs for this conceptual place of peace on the SNHU campus. The design chosen included a labyrinth pathway that leads through a 138-foot-long landscaped garden featuring concrete gathering pods, designed walkways, and freshly planted greenery with a forest backdrop.

A focal point of the project is the 12-foot-tall, 25-ton solstice stone, which is aligned with the summer and winter solstice. Visitors can find this location across from the tennis courts on campus.

The solstice stone provides a place of solace for the loss experienced by so many in recent years. A single boulder is split in two, eternal separation between what was once a single entity. By splitting the boulder, light is introduced into a place where there was once only darkness. The stone opening, facing true north, allows light to enter a once-darkened space, illuminating both faces of the stone on the solstices. These moments, when the opening of the stone casts no shadows, mark a point in time to reflect the passage of life and the changing of seasons.

Visitors walking on the paved labyrinth pathway will have a chance to sit and reflect in the concrete “pods” which hold natural stone seating options. Signs are posted at the beginning and end of the walkways, crediting the designers and explaining the stone.



PHOTO PROVIDED BY HOYLE TANNER

The solstice stone, a single boulder split in two, is a symbolic feature of SNHU’s memorial garden and labyrinth.

To make this vision come to life, Hoyle Tanner provided civil engineering services including layout, alignment for the solstice stone, concrete pod engineering, grading and stormwater management for the garden and labyrinth. The angle of the sun on the winter solstice at solar noon was calculated to obtain limits for tree clearing. The sun shines through the solstice stone pieces and brightly illuminates each open face of the solstice at solar noon, creating a visual spectacle.

Hoyle Tanner’s structural engineering services included the design of the three, two-sided concrete pods which have spans ranging from 8 to 20 feet. Reinforced concrete foundations were designed for the pods as well as the solstice stone.

The project also includes pedestrian improvements to provide ADA accessibility so the memorial garden and labyrinth can be enjoyed by anyone looking for a quiet space to reflect or remember loved ones who have moved on.

To learn more about this project, visit: hoyletanner.com/projects/snhu-memorial-garden-labyrinth.



PHOTO PROVIDED BY HOYLE TANNER

This plaque credits designer Katharine Blackman for her work on the new memorial garden and labyrinth on the campus of Southern New Hampshire University.

UNDERWOOD ENGINEERS

New MBR wastewater treatment system operational on Mount Washington

■ Hollow-fiber multitube membrane bioreactor replaced the older system installed in 2009.

By Steve Clifton and Patrick Wiley
Underwood Engineers

The State of New Hampshire and the Department of Natural and Cultural Resources owns and operates a wastewater treatment facility located on the Mount Washington State Park summit. The facility treats flow from the Sherman Adams building, which can vary significantly between the peak season at 3,000 – 5,000 gallons per day (GPD) and the winter months at 200-500 GPD when Mount Washington staff are the only site occupants. The wide variation in seasonal flow combined with extreme weather and high elevation presents unique wastewater treatment challenges.

Underwood Engineers, Inc. (UEI) provided engineering and operational support for the New Hampshire Department of Administrative Services Public Works Division to optimize and evaluate the existing multitube membrane bioreactor (MBR) system that was installed in

2009. While these efforts were successful, UEI recommended facility upgrades to accommodate projected flow increases, meet more stringent effluent limits, and replace aging equipment.

General contractor Lee Corrigan, LLC, won the construction project to replace the original treatment system with a hollow-fiber MBR package plant provided by NEW-TERRA Corporation. The work was completed over a two-year period. The entire treatment facility is housed within insulated and heated shipping containers designed to withstand the extreme climate. The system is constructed with two trains for redundancy and provides additional treatment capacity.

Operators can access the treatment plant control system remotely, which allows them to control and monitor the process without physically being at the plant. This is critical for this project because it allows operators to monitor the process during extreme weather conditions that make site

visits dangerous and difficult. Both trains were seeded with bacteria (MLSS) from a nearby activated sludge facility and put into service in August 2024. This allowed the facility to begin processing wastewater during the peak season until the access road and summit closed in late October 2024. Following the seasonal shutdown, one train was removed from service in response to the reduced flow.

Since startup, the plant has met effluent discharge standards and has achieved nearly complete nitrification and denitrification during peak and winter flow conditions. The second train and EQ basin will be returned to service when the peak season kicks off this spring.

The startup and operation is provided by the N.H. Department of Natural and Cultural Resources staff, with assistance by the N.H. Department of Environmental Services and Underwood Engineers. Visitors can see the facility right between the Cog Railway tracks and the Auto Road as you approach the summit.

Steve Clifton, PE, senior vice president, and Patrick Wiley, PhD, technical leader, Underwood Engineers, authored this article.



PHOTO PROVIDED BY UNDERWOOD ENGINEERS
Veolia hollow fiber membranes are part of the wastewater treatment project servicing the facilities at the Mount Washington summit.



An exterior look at the Package Wastewater Treatment Plant for Mount Washington.
PHOTO PROVIDED BY UNDERWOOD ENGINEERS

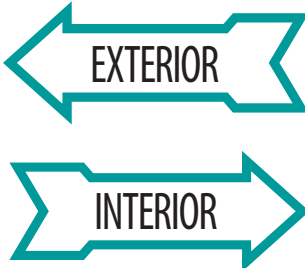


PHOTO PROVIDED BY UNDERWOOD ENGINEERS
A look at the interior of the Package Wastewater Treatment Plant on Mount Washington.

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CMA ENGINEERS

Engineering community change: Strengthening resident-owned manufactured housing cooperatives

■ In addition to working at the sites, CMA Engineers helps ROCs secure funding for necessary repairs and improvements.



By Philip Corbett
CMA Engineers

In New Hampshire, transformative infrastructure improvements in manufactured housing cooperatives are breaking cycles of failing systems and financial instability. CMA Engineers has played a key role in this transformation, helping communities secure funding and implement sustainable infrastructure solutions that ensure long-term stability.

The challenge: A downward spiral of emergency repairs

When residents purchase a manufactured housing park as a cooperative, they often inherit deteriorating infrastructure. Aging water, sewer and electrical systems frequently fail, forcing communities into a downward spiral of costly emergency repairs. With financial resources constantly drained, cooperatives struggle to build reserves for long-term improvements. Without intervention, these communities remain stuck in reactive spending, paying premium prices

for temporary fixes rather than investing in strategic upgrades. Yet, for many residents, there are no better alternatives. Choosing not to buy the development often results in rent hikes from a private owner or displacement if the park is redeveloped. Despite infrastructure challenges, cooperative ownership remains the best path forward to long-term housing security.

CMA Engineers' role in breaking the cycle

CMA Engineers has helped over a dozen cooperatives across New Hampshire secure funding and implement infrastructure projects that stabilize their communities. Our expertise help ensure that manufactured housing cooperatives transition from emergency repairs to sustainable asset management. At Forest Park Cooperative in Jaffrey, CMA Engineers helped secure \$4 million to completely overhaul the failing water and sewer systems, significantly improving infrastructure reliability. At Frost Residents Cooperative in Derry, CMA Engineers redesigned and reconstructed water and sewer systems, utilizing Community Development Block Grants (CDBG) and state loans to create a sustainable solution. At Icey Hill Cooperative in Exeter, CMA Engineers

facilitated a CDBG-funded feasibility study, laying the foundation for a complete water and sewer system overhaul. The park faced severe sanitation issues, as contamination from a failing sewer system threatened the adjacent water supply well. To address the issue, CMA Engineers designed a new sewer system and connected the cooperative to the town's water system. This comprehensive solution ensured long-term reliability, prevented further emergency failures, and enhanced public health. At Colebrook Homeowners Cooperative in Colebrook, CMA Engineers successfully navigated CDBG grants, a New Hampshire Department of Environmental Services ARPA Grant, and U.S. Department of Agriculture loans to replace severely outdated electrical, sewer and water systems. The cooperative was consuming excessive metered water due to significant losses from widespread leaks in its aging system. By securing funding and designing a comprehensive system replacement, CMA Engineers has taken critical steps to address water loss, reduce costs, and ensure long-term affordability for residents.

Sustainable infrastructure for long-term stability

With infrastructure stabilized, cooperatives can shift from survival mode to strategic planning, building financial reserves and implementing long-term asset management

plans. These projects reinforce community resilience, ensuring that residents maintain affordable housing for generations to come. With continued support from funding agencies, engineering professionals, and organizations like Resident-Owned Communities New Hampshire (ROC-NH), CMA Engineers remains committed to helping resident-owned communities develop cost-effective, long-term infrastructure solutions that protect affordability and improve quality of life.

Philip Corbett, PE, CMA Engineers, authored this article.



Severely outdated electrical systems at Colebrook Homeowners Cooperative needed replacing.



At Forest Park Cooperative in Jaffrey, CMA Engineers helped secure \$4 million to overhaul failing water and sewer systems.



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Programs and Benefits Subject to Change.

TURNER GROUP

Bridging the gap: Engineering trust and reliability in bridge design

By Anna Giraldi
The Turner Group

Bridges are more than just physical structures; they are vital connections that support communities, economies and daily life. As bridge engineers, we must recognize that designing a bridge is not just about steel, wood and concrete — it is about engineering trust and reliability for generations to come. A bridge must instill confidence, guaranteeing the safety and security of those who depend on it daily.

Building trust begins with careful planning. The design of any bridge starts with a thorough site evaluation, bridge type determination, and material selection.

Engineers must consider the environment in which the

bridge will be built — whether spanning turbulent waters, harsh terrains, or bustling urban landscapes — to make sure the bridge fits both structurally and aesthetically with its surroundings. Each site presents unique challenges, requiring different design solutions.

Materials such as steel, wood, reinforced concrete, or composites are selected based on their ability to withstand vehicle loads, extreme weather, seismic activity, and constant wear and tear. As climate change and increasing traffic loads put new demands on infrastructure, engineers must adopt new design approaches that improve durability and sustainability.

Structural safety is ensured through adherence to engineering codes and standards such as the American Association of

State Highway and Transportation Officials (AASHTO) Bridge Design Specifications and state bridge design codes. These codes, based on decades of research, are frequently updated to reflect advancements in technology and knowledge.

Engineers must calculate load factors, stresses, and static and dynamic forces, while ensuring that every component of the bridge can perform under expected and unexpected conditions. Proven software tools allow for precise modeling, aiding the engineers with the calculations.

Inspections during construction are essential to ensure compliance with approved plans and specifications. Engineers verify material quality, and the proper installation of structural components such as founda-

tions, superstructures, and decks. Regular oversight prevents costly mistakes, enhances durability, extends longevity, and minimizes risks of future structural failures.

Beyond construction, ongoing inspections and maintenance are vital to maintaining bridge safety. Bridge inspection protocols mandate inspections every few years, with more frequent inspections for critical and aging structures. Preventive maintenance extends a bridge's lifespan and reduces the need for costly emergency repairs.

By combining technical expertise, innovation, and a commitment to public welfare, engineers ensure that bridges foster trust and stand the test of time.



Anna Giraldi, seniobrbridge engineer, The Turner Group, authored this article.

Anna Giraldi

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VHB

Franklin’s Mill City Park to expand after a successful opening

■ Success of Phase I has project leaders looking to continue with city’s revitalization efforts.

From VHB

The City of Franklin’s vision to rebrand around outdoor recreation is coming to life with the success of Mill City Park’s Phase I opening. This unique community revitalization project transformed 1,600 feet of the Winnepesaukee River into the Northeast’s first whitewater park, which opened in June 2022.

Project leaders estimate that the free, year-round recreational venue will bring up to 185,000 visitors annually and reinvigorate the region’s economy with up to \$6.8 million of direct spending. The project is having a direct impact on Franklin’s revitalization efforts, which over a 10-year period, has created 50 new jobs and more than \$80 million has been spent on real estate redevelopment.

Following the achievement of the park’s first phase, the project team is turning a corner and beginning work on Phase II, which will also be significant for the city’s revitalization efforts. VHB’s engineers, scientists, and cultural resources team are collaborating with the City of Franklin, the nonprofit Mill City Park, and Colorado-based design firm Recreation Engineering and Planning (REP) on this new phase, which will see the extension of the park with two new



PHOTO PROVIDED BY VHB

Mill City Park in Franklin draws crowds — both in the water and on land with the built-in seating and park area. New attractions will be added to the river during Phase II of the park’s expansion.

standing whitewater waves built, including a “surf wave” upstream in the Winnepesaukee River and a pilot channel to connect the features. These enhancements will provide year-round rapids, attracting a wide spectrum of paddling enthusiasts, including kayakers, surfers, and rafters at all experience levels.

“Phase I of the whitewater park proved that free outdoor recreation can be a cornerstone of Franklin’s economic and

social resurgence,” said Marty Parichand, executive director of Mill City Park. “Phase II will build off that growth and enhance the whitewater park with two additional features: a slalom course and New England’s first river surfing wave — yes, you will be able to ride a surfboard in the river every day of the year!”

To implement Phase II, the City of Franklin secured a \$2.5 million grant from the Department of Housing and Urban Develop-

ment (HUD). HUD Grants provide funding for a wide variety of community-based projects, such as public facilities, parks, housing, homelessness prevention, workforce training, and resilience planning. VHB assisted the city throughout the grant process, supporting the development of an environmental assessment of the area under compliance with the National Environmental Policy Act (NEPA).

The purpose of the park’s ex-

pansion is to catalyze economic recovery in the City of Franklin, providing healthy outdoor recreation opportunities within the local community and greater New Hampshire region. Phase I of the project has jumpstarted the city’s revitalization with the opening of a new coffee shop, three new restaurants, two new microbreweries, an outdoor gear store, and a major condo redevelopment project. Chinburg Builders, a New Hampshire-based development and construction firm, successfully redeveloped the underutilized Stevens Mill complex into residential units, which are already all occupied by young people flooding the area.

“We’re excited to contribute to the renewal of Franklin,” said Eric Chinburg, owner and president of Chinburg Builders. “It’s been amazing to see the impact this redevelopment has had on the community’s growth.”

The addition of two new whitewater features will generate additional employment opportunities, support the long-term vitality of Franklin’s economy, and build a better connected, equitable, and sustainable city.

Upcoming events

For those in the area, Mill City Park is hosting the 2025 Boat Bash on Saturday, March 1, an event of whitewater kayak races down the snowy slopes at Veterans Memorial Recreation Area. Be sure to mark your calendars for Mill City Park’s annual white-water festival, Winni River Days, which will take place on June 13-14.



“Phase II will build off that growth (from Phase I) and enhance the whitewater park with two additional features: a slalom course and New England’s first river surfing wave — yes, you will be able to ride a surfboard in the river every day of the year!”

MARTY PARICHAND
Mill City Park executive director

Preparing for Winter: Polar Vortex, Snow Loads, and Ice Dams

Gale Associates, Inc.

The Polar Vortex often ushers in extreme cold and heavy snowfall, presenting unique challenges for buildings. Whether it’s the risk of excessive snow loads on roofs or the formation of ice dams, taking proactive steps can mitigate damage to the roof and structure during harsh winter conditions.

Understand Snow Load Risks

Newer buildings are designed to support specific snow loads, but severe storms can push these limits. Heavy snow, especially when followed by rain or warmer temperatures, can become waterlogged, significantly increasing its weight. This additional stress may cause roof deflections, localized damage, or even collapse in extreme cases.

- **Understand Your Roof’s Design:** Review structural and architectural drawings to identify snow load capacity, roof framing types, and drainage points. If these documents are unavailable, gather basic information, such as construction year and roof type, so that a design professional can perform some preliminary calculations to determine your loading capacity.
- **Ensure Effective Drainage:** Mark roof drains with flags for easy identification under snow. After storms, clear snow and ice from around drains to maintain proper flow paths for melting snow.
- **Consult Professionals When Needed:** For significant snowfalls, contact a structural engineer to evaluate snow loads and advise on safe removal.
- **Practice Safe Snow Removal:** Use tools like roof rakes to clear snow from eaves and overhangs without damaging the roof. Avoid equipment like snow blowers or aggressive methods that could harm the roofing material. Keep in mind that newer buildings are typically designed to handle a certain amount of snow on the roof. Allowing a thin layer of snow to remain can help safeguard the roofing membrane.

Preventing Ice Dams

Ice dams form when roof snow melts from building heat or sunlight and refreezes at the cold eaves, creating barriers that trap water. This pooled water can seep under shingles and cause interior damage to ceilings, walls, and framing.

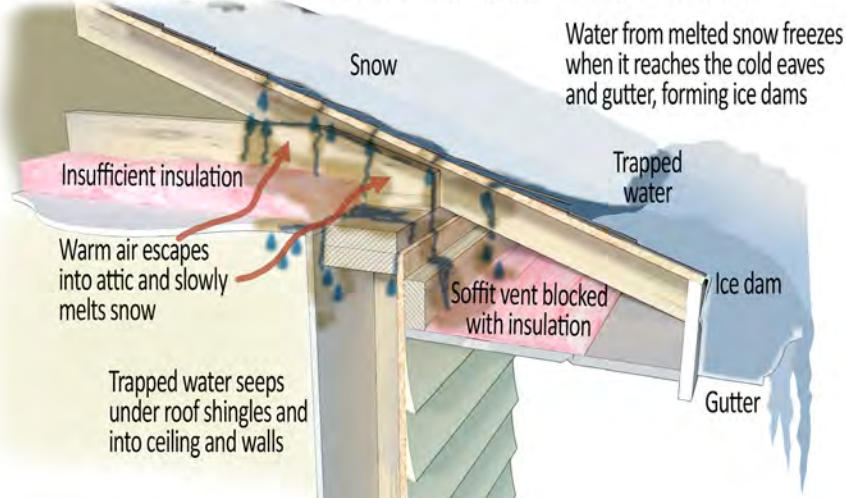
- **Insulation and Ventilation:** Keep attic spaces cold by improving ceiling insulation and attic ventilation to mitigate uneven snowmelt.
- **Clear Gutters and Downspouts:** Ensure gutters and downspouts are free of debris to allow meltwater to exit properly. Clear drainage paths at the bottom of downspouts away from the building.
- **Proactive Snow Removal:** Use roof rakes to remove snow buildup along eaves to reduce snow accumulations along the edge of the building.
- **Install Heating Systems:** Should your existing roof be susceptible to ice dam formations, coordinate with a professional to provide temporary heat trace cables to warm the roof surface to promote drainage.

If ice dams have already formed, avoid using tools like hammers or chisels, which can damage the roof. Let the ice melt naturally or hire a professional to safely address the issue. Never use an open flame to melt the ice.

Maintenance and Monitoring

- **Inspect roof conditions weekly and after significant weather events.**
- **Clear heavy snow accumulations from roofs and ensure drainage paths are open.**
- **Address recurring issues by having a professional evaluate your building to determine if poor insulation or ventilation is present.**

Potential Causes and Results from Ice Dam Conditions





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FUSS & O'NEILL

The role of engineering in economic development

■ Site design, hazardous materials, repurposing building materials, parking needs, new sidewalks, charging stations – it’s all in a day’s work for engineers.

From Fuss & O'Neill

Effective civil engineering and design can drive economic development. In downtown Manchester, multidisciplinary engineering firm Fuss & O'Neill provided comprehensive design services in support of a multi-family residential development known as 75 Canal.

This 2.3-acre site is located in a highly urbanized section of the city that is both commercial (biofabrication, health care, and technology) and recreational (SNHU Arena and Delta Dental Stadium). The establishment of this apartment complex creates 250 market rate apartment units and anchors expansion of the city's downtown core.

To achieve the transformation of a long-blighted site, Fuss & O'Neill supported the entire project lifecycle by providing site/civil engineering design, permitting support, land survey services, traffic analysis, and construction administration. Fuss & O'Neill developed site-specific solutions to address the unique challenges of this project.

During demolition, hazardous building materials were found, and urban fill was a concern. To reduce project costs and environmental impact, our design focused on balancing cuts and fills in an effort to minimize soil export from the site. To address structural and code challenges,

the design team leveraged advanced solutions for construction and phasing, such as podium construction, along with cost-efficient utility integration to advance the project.

Showing a commitment to sustainability and resilience, the design (envisioned by Jones Street Residential, led by Market Square Architects and Fuss & O'Neill, and implemented by Callahan Construction Managers) re-used elements of the former building. Re-used items included salvaged beams, reclaimed wood overhangs, and distinctive placards on the exterior of the building. The 200-spot parking deck included numerous electric vehicle charging stations. This project demonstrates Fuss & O'Neill's commitment to building partnerships with and among communities, organizations, and clients to support and advance sustainability.

In addition to the development of four-story multi-family residence, improvements surrounding the site were designed to further support the economic development benefits of this project. Offsite improvements included new sidewalks and repaving of adjacent streets. Bike lanes were added and were tied to an existing bike lane network. Traffic analysis and signal timing were performed at nearby intersections to accommodate the traffic and



PHOTO PROVIDED BY FUSS & O'NEILL

An aerial view of the new multi-family residential development at 75 Canal in downtown Manchester.

pedestrian volume.

This stunning and community-empowering project, which includes a roof deck, multiple courtyards, and a recreation room, is a catalyst for future development and provides a multimodal accessible housing option. This project is one of many supporting city growth, and Fuss & O'Neill has been involved with the development of more than 1,500 housing units in the city, as well as with transportation improvements, new hotels, mixed-use developments, and utility upgrades. Investments in community development, backed by thoughtful planning and forward-thinking engineering, are investments in the community itself.



CHRISTOPHER RUCINSKI

The finished building at 75 Canal in downtown Manchester houses 250 apartments ranging in size from studios to three-bedroom units.

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UNDERWOOD ENGINEERS

Biofilters and JellyFish lead stormwater line up on Corporate Drive

■ Top concerns were addressing deteriorating road conditions and improving water quality of nearby Hodgson Brook.

By Kate Varney
Underwood Engineers

In the spring of 2024, Underwood Engineers, the City of Portsmouth, and Pease Development Authority collaborated on the reconstruction of Corporate Drive’s roadway and drainage system design. SUR Construction, Inc., responsible for executing the construction, worked alongside these partners to reconstruct 6,600 linear feet of roadway, upgrade drainage infrastructure, and incorporate stormwater treatment to improve water quality.

This effort addressed deteriorating road conditions from a failed drainage system and aimed to improve the water quality of Hodgson Brook within Great Bay’s Watershed.

Dave Desfosses, City of Portsmouth construction manager, said, “Portsmouth always tries to lead the way in innovative stormwater treatment whenever it is possible to do so. I’m truly passionate about implementing appropriate stormwater treatment practices and the positive impact they have on our environment.”

Integrating stormwater best management practices (BMPs) into the Corporate Drive project was a key priority, as parts of the drainage system discharge directly into Hodgson Brook, a state-impaired waterway.

Stormwater treatment removes harmful pollutants like nitrogen from runoff, which can trigger algae blooms, deplete oxygen, and block sunlight, disrupting the ecosystem in waterways.

For Underwood Engineers, selecting and sizing the most effective stormwater BMPs was an exciting challenge. This project marked the debut of the recently formed Stormwater Group, whose goal was to capture and treat as much stormwater as possible using aesthetically pleasing, cost-effective, and low-maintenance systems that align with the city’s budget and maintenance capabilities.

To maximize treatment, certain catch basins were bypassed with curb inlets to redirect stormwater into grass-lined swales outside the roadway. Bunkers made by Rain Guardian were installed at each curb inlet to prevent erosion and capture road debris. At the low point of each swale, Filterra Bioretention units were placed to treat runoff with engineered media, and are planted with native shrubs, making them both functional and visually appealing.

To further enhance treatment, a JellyFish Filter was incorporated into the design. This membrane filter, housed in a 4-foot manhole, captures stormwater runoff from the closed drainage system via catch basins. The JellyFish Filter can handle high flows

while providing effective treatment and is discreetly located within the drainage system.

These proprietary stormwater systems were provided through Contech Engineered Solutions and Ferguson Waterworks who were also contributing partners in the successful completion of the project. These combined efforts were key to integrating a variety of stormwater treatment systems into the project.

Projects like this help the city meet its Municipal Separate Storm Sewer System (MS4) permit requirements and comply with the Great Bay Total Nitrogen General Permit, which both regulate nitrogen from non-point sources like stormwater runoff.

The Corporate Drive Reconstruction project improved infrastructure and demonstrated a strong commitment to sustainable stormwater management. Nine Rain Guardian bunkers, five Filterra systems, and one JellyFish Filter were installed, addressing over 1.5 acres of paved surface area significantly improving water quality. These systems collectively remove pollutants such as nitrogen, benefiting Hodgson Brook and Great Bay.

This collaboration exemplifies how innovative solutions can meet environmental, social, and budget goals, ensuring long-term positive impacts on the community and the environment.

Kate Varney, project engineer II, Underwood Engineers authored this article.



PHOTO PROVIDED BY UNDERWOOD ENGINEERS

This is an example of a Rain Guardian bunker pre-treatment unit, like the ones used in the new stormwater drainage system on Corporate Drive in Portsmouth.



PHOTO PROVIDED BY UNDERWOOD ENGINEERS

This is an example of an established Filterra system – the same type used to build the new stormwater drainage system along Corporate Drive in Portsmouth.

Did you know: A few fun engineering facts about the Eiffel Tower in Paris

Metro Creative Connection

A wrought-iron lattice tower on the Champ de Mars in Paris, the Eiffel Tower was completed in 1889, when it served as the centerpiece of the World’s Fair. That’s not the only notable fact about the tower that has mesmerized millions since its completion more than a century ago.

- Though the Eiffel Tower bears his name, Gustave Eiffel was not initially enthusiastic about the structure nor did he design it. The tower was actually thought up by engineers Maurice Koechlin and Emile Nouguier, who both worked for Eiffel’s firm. While Eiffel was initially lukewarm to the engineers’ design, to his credit he encouraged fur-

ther exploration of the idea, and eventually supported a rendering that combined the ideas of Koechlin and Nouguier and the input of Stephen Sauvestre, who worked as the head of the architectural department at Eiffel’s firm.

- There is a penthouse at the top of the Eiffel Tower. Officials who now oversee the tower indicate the apart-

ment at its summit is 1,076 square feet, making it a comfortable space to utilize as an office and a place to receive distinguished guests. That’s precisely how Eiffel used the space, which was not open to the public upon the tower’s completion.

- The Eiffel Tower was not meant to be an enduring landmark. Though it’s hard to imagine Paris

without the Eiffel Tower, the structure was initially intended to be a temporary addition to the City of Light’s landscape. La Tour Eiffel notes that the tower was only intended to last 20 years but was saved by the scientific experiments conducted within it. Eiffel encouraged those experiments, which included efforts at radio transmissions.

Indeed, the tower served as a military radio post in 1903 and transmitted the first public radio program in France in 1925.

- The Eiffel Tower has been a hub of business throughout its existence. Over the years it has housed the French newspaper Le Figaro, a post office and even a theater.



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ENGINEERS WITHOUT BORDERS

NH and UNH chapters complete assessment trip to three villages in Uganda

From Engineers Without Borders

In January, seven representatives of the Engineers Without Borders New Hampshire Professional and University of New Hampshire student chapters (EWB-NH and EWB-UNH) visited the remote villages of Butooli, Dema, and Nabweyo-A in Uganda. Upon our arrival in the village of Butooli, the villagers gathered at the village center and performed joyful songs and dances. The village elders welcomed us profusely and spoke to us about their needs.

These three villages are located in the Buyende District of central Uganda. The people who live there have no electricity, no paved roads, and no running water. They survive mainly through subsistence farming, although there is rarely enough to eat. Their homes are made of clay bricks which the villagers make themselves, with thatched roofs or pieces of sheet metal for roofing held down by loose bricks. Among the many struggles they have, access to clean water is their greatest need.

Currently, the villagers retrieve drinking water from local swamps shared with farm animals and local wildlife, often located miles from their homes. Given the poor conditions of these water sources, they are constantly exposed to water and insect borne diseases that are endemic to this part of Africa. Outbreaks of waterborne disease are common and can cause deaths within the villages. Additionally, it is often children who are tasked with fetching the water, which can interrupt their ability to attend school, and also exposes them to potential violence.

During our assessment trip in January, the travel team collected data to assess the needs of the three villages. This included conducting community health assessments, meeting with the villages Water User Committees (WUCs), and conducting water quality testing of their water sources.

Using the data we've collected, we will assess the village's overall needs and available infrastructure, and analyze potential remedial alternatives so the best solution can be proposed.

Potential solutions may require the installation of bedrock supply wells, spring boxes, or designing and implementing rainwater collection systems.

EWB-NH was founded in June 2015 by local New Hampshire engineers. The organization has successfully installed bedrock supply wells in eight villages as part of a water supply project in the Buyende district. In 2026, we hope to install three more. However, EWB-NH would not be successful if it weren't for the support of our very own community. Each well we have installed costs approximately \$12,000. Thanks to the generous donations we have received over the years, more than 12,000 people now have access to clean drinking water.

If you are interested in learning more about EWB-NH, would like to donate, or would like to get involved, visit our website at ewbnh.org. We will have a fall fundraising event on Sept. 17 at Great North Aleworks in Manchester. Stay tuned for updates which will be posted on our website and Facebook page.



PHOTO PROVIDED BY EWB-NH

Villagers watch as members of Engineers Without Borders gather water samples in Uganda.



PHOTO PROVIDED BY EWB-NH

A villager scoops water from a river in Uganda. The locals share this water source with native wildlife.



The arrival of members of Engineers Without Borders is cause for celebration among the villagers in Uganda. They perform joyful songs and dances for their visitors.

PHOTO PROVIDED BY EWB-NH



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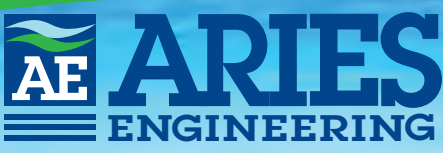
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ENGINEER OF THE YEAR

Cook’s career includes teaching at UNH, planning board service, and society memberships

The New Hampshire engineering societies has named Raymond A. Cook, PhD, PE, the 2025 New Hampshire Engineer of the Year. This prestigious award recognizes Cook’s outstanding contributions to the engineering profession, his dedication to education, and his long-standing service to both students and the community.

Cook recently retired after a remarkable 31-year career as a professor in the Civil and Environmental Engineering Department at the University of New Hampshire. Known for his passion for structural engineering and education, he taught and mentored thousands of students, shaping the next generation of civil engineers. His influence extends beyond the classroom, as he played a key role in curriculum development, student mentorship, and professional development programs.

Throughout his career, Cook has been actively involved in numerous engineering societies, including



Raymond Cook

the Structural Engineers of New Hampshire (SENH), the American Society of Civil Engineers (ASCE), and the American Concrete Institute (ACI). His research in concrete materials, structural design, and engineering education has contributed significantly to the field.

Beyond his professional achievements, Cook has been a dedicated public

servant, serving for over two decades on the West Newbury Planning Board, where he has applied his engineering expertise to help shape community infrastructure. His commitment to both his profession and his community exemplifies the highest standards of engineering excellence.

“Dr. Cook’s passion for civil engineering and his ability to inspire students is truly unparalleled,” said Anabelle Audet, vice president of ASCE-NH, who nominated him for this award. “His impact on the profession is immeasurable, and this recognition is well deserved.”

Cook joins a distinguished group of past recipients who have made lasting contributions to engineering in New Hampshire. He will be formally honored at the annual Engineers Week Banquet, where colleagues, former students, and industry professionals will celebrate his career and achievement.

YOUNG ENGINEER OF THE YEAR

Dietrich enjoys mentoring younger staff, has been a member of NSPE-NH since 2011

Corey P. Dietrich has been selected by a jury of his peers from New Hampshire’s engineering societies as the 2025 New Hampshire Young Engineer of the Year. This award will be presented at the New Hampshire Society of Professional Engineers (NSPE-NH) 74th Annual Engineers’ Week Banquet on Thursday. NSPE-NH nominated Dietrich based on his record of professional accomplishment, service to the engineering profession, and devotion to his family.



Corey Dietrich

Dietrich graduated from the University of New Hampshire in 2011 with a bachelor of science in Civil Engineering. He maintains his Professional Engineering licensure in New Hampshire and Massachusetts. His engineering experience spans 14 years, focusing on the design of stormwater systems, highways, tunnel roadways, shared-use paths, and construction traffic control.

As a project engineer at Greenman-Pedersen, Inc. (GPI), Dietrich’s role

includes leading designs on a variety of complex multidisciplinary projects and assisting the project manager with project delivery. He is passionate about the engineering profession and frequently engages in project development activities to help make crucial design decisions during an early, impactful stage. He also enjoys teaching and mentoring younger staff as they develop professionally.

Dietrich has been an active member of NSPE-NH since graduating from college. He has worked in every role in the organization, including treasurer and president (2020-22), and he is currently a national delegate.

Dietrich resides in Londonderry with his wife, Lys, and their twins. He is a dedicated husband and father who enjoys cooking delicious meals for his family, playing catch or soccer with his kids, and roasting coffee for his family and friends. He loves to share his passion for Boston sports with his family, especially the Red Sox.

2025 STEM Excellence in Teaching nominations accepted until March 21 through NSPE-NH

The New Hampshire Society of Professional Engineers (NSPE-NH) is accepting application packages for the Excellence in Teaching Awards in the winter of each school year. This year the submission deadline is March 21.

Nominate an outstanding teacher and help NSPE-NH recognize those individuals who go above and beyond to educate

children in math, science, technology and pre-engineering.

Winners in 2024 included Sheena Haney from Lincoln Street School in Exeter; Doris Garvey from Pinkerton Academy in Derry; and Jacqueline Carlozzi from Main Street Elementary in Exeter.

To download the nomination package, visit nspe-nh.org.

Thursday is Introduce a Girl to Engineering Day

Introduce a Girl to Engineering Day will be celebrated on Thursday, Feb. 20. Also known as Girl Day in the engineering community, it is a time when volunteers, educators and others act as role models, facilitate engineering activities, and show girls how engineers change the world.

DiscoverE’s research found that this simple idea helps girls develop an interest in engineering, builds their confidence in problem-solving skills, and creates a STEM identity.

A Girl Day planning toolkit for vol-

unteers and educators can be downloaded on the DiscoverE website at discovere.org.

Future City

Another popular offering from the DiscoverE organization is Future City — the ultimate STEM competition. Middle school students imagine, research, design and build cities of the future that showcase their solution to a citywide sustainability issue.

Visit futurecity.org to find a competition near you.

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