Subapplicant information

Name of federal agency	**FEMA**
Type of submission	**Application**

GREENVILLE CITY FINANCIAL SERVICE

200 W 5TH ST
GREENVILLE, NC 27858 United States

State	DUNS #	EIN #
NC	072013451	566000229

Subapplicant type	**Local Government**
Is the subapplicant subject to review by Executive Order 12372 Process?	**No - Not selected**
Is the subapplicant delinquent on any federal debt?	**No**

Contact information

Subrecipient Authorized Representative (SAR)

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Point(s) of contact

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Becky Derderian Grants Coordinator bderderian@greenvillenc.gov	**Primary phone** 2523294438 Work **Fax**	**Additional phones** 2523294438 Work	**Mailing address** 200 W 5th St Greenville NC 27858

Community

Please provide the following information. If the Congressional district number for your community does not display correctly, please contact your State NFIP coordinator.

Add Communities

Please find the community(ies) that will benefit from this mitigation activity by clicking on the Find communities button. If needed, modify the Congressional District number for each community by entering the updated number under the U.S. Congressional District column for that community. When finished, click the Continue button. NOTE: You should also notify your State NFIP coordinator so that the updated U.S. Congressional District number can be updated in the Community Information System (CIS) database.

Community name	County code	CID number	CRS community	CRS rating	U.S. Congressional District
GREENVILLE, CITY OF	147	370191	Y	7	1,2

Please provide any additional comments below (optional).

The City of Greenville serves as the county seat for Pitt County and is the most populous municipality in the county. The city's Engineering Department is submitting this application and will oversee construction and implementation of the proposed project. The city initially identified the need for the St. Andrews Drive Critical Infrastructure Protection and Stream Restoration project in the Greens Mill Run Watershed Master Plan.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

Mitigation plan

Please provide your plan information below.

Is the entity that will benefit from the proposed activity covered by the current FEMA approved multi-hazard mitigation plan in compliance with 44 CFR Part 201?

Yes

Please provide plan detail

Plan name	Plan type	Plan approval date
Neuse River Regional Hazard Mitigation Plan	Local Multijurisdictional Multi-Hazard Mitigation Plan	09/18/2020

Proposed activity description

The proposed activity involves a nature-based solution to stabilize an unnamed tributary near St. Andrew's Drive that currently presents a flooding risk to public infrastructure and multifamily residential structures. The activity aligns with the Neuse River Regional Hazard Mitigation Plan (Attachment 1). The Neuse River Regional Plan covers five counties in eastern North Carolina and identifies flooding as a top hazard. The proposed project aims to protect residents from flood hazards. Specifically, the proposed activity will advance Goal 1 (promote the public health, safety, and general welfare of residents and minimize public and private losses due to natural hazards through local land development regulations, capital improvements, planning/investment, and proactive long-range planning regarding land use and post-disaster redevelopment) and Goal 2 (pursue funds to reduce the risk of natural hazards to existing developments where such hazards are clearly identified and the mitigation efforts are cost-effective) of the attached hazard mitigation plan.

Please provide any additional comments below (optional).

The proposed activity was first identified as a need in the City of Greenville's Greens Mill Run Watershed Master Plan (Attachment 2) and is consistent with the plan's goals and recommendations.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
1. Neuse River Regional Hazard Mitigation Plan.pdf	11/23/2021	blakely.jarrett@icf.com	Mitigation Plan Attachments	This document comprises a Hazard Mitigation Plan for the Neuse River Region of North Carolina.	
2. Greens Mill Run Watershed Master Plan.pdf	11/23/2021	blakely.jarrett@icf.com	Mitigation Plan Attachments	The City of Greenville completed a Watershed Master Plan for Greens Mill Run as part of the effort to inventory and develop master plans.	

Scope of work

The project Scope of Work (SOW) identifies the eligible activity, describes what will be accomplished and explains how the mitigation activity will be implemented. The mitigation activity must be described in sufficient detail to verify the cost estimate. All activities for which funding is requested must be identified in the SOW prior to the close of the application period. FEMA has different requirements for project, planning and management cost SOWs.

Subapplication title (include type of activity and location)

City of Greenville St. Andrews Drive- Critical Infrastructure Protection and Stream Restoration

Activities

Primary activity type

Stabilization and restoration

Primary sub-activity type

Floodplain and stream restoration

Secondary activity type (Optional)

Utility and infrastructure protection

Secondary sub-activity type

Wastewater and/or sanitary sewer system

Tertiary activity type (Optional)

Utility and infrastructure protection

Tertiary sub-activity type

Electrical/power

Geographic areas description

Located in eastern North Carolina, the city of Greenville serves as the county seat of Pitt County in the zip code 27834. Over 91,000 people reside in Greenville across 36 square miles, most of which is residential. Located less than 60 miles from North Carolina's coastline, Greenville is considered a frontline community which are communities who experience the first and worst impacts of the climate crisis. As indicated in the North Carolina Climate Science Report (Attachment 3), Greenville is vulnerable to severe storms and climate-driven disasters because of its proximity to the coast. The City is committed to taking proactive measures to protect residents from infrastructure failure, erosion risks, and climate change. The St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration Project represents an important opportunity to protect critical lifeline utilities and prepare Greenville for future severe storm events and the impacts of climate change. The proposed activity is a corridor project between 35.5752 latitude and -77.3934 longitude (to the south) and 35.5824 latitude and -77.3926 longitude (to the north) that will provide critical utility and infrastructure protection

improvements for the community. The project focuses on an area of the stream bank that runs along St. Andrews Drive. The proposed improvements are within the area bounded by Fairlane Road to the north, SW Greenville Boulevard to the south, St. Andrews Drive to the west, and Bridle Court / Brimley Drive to the east. The project area extends along the stream for approximately 3,200 feet in land that is controlled by the city. The site's drainage area is approximately 0.19 square miles with 96 percent urban land-use and 41 percent impervious area. Wetlands are not present within the floodplain corridor per the National Wetlands Inventory (NWI). The attached Project Location Map (Attachment 4) shows the project's location relative to public utilities and municipal infrastructure as well as residential and commercial properties. The threatened water and sewer infrastructure in the project area serves approximately 1,014 residents. The attached photo log (Attachment 5) also shows erosion along the project area. If left in this current condition, rainfall and severe storms will erode the stream bank and damage public utility infrastructure and residential properties.

Community lifelines

Primary community lifeline	**Safety and security**
Primary sub-community lifeline	**Community safety**
Secondary community lifeline (optional)	**Food, water, shelter**
Secondary sub-community lifeline	**Water**
Tertiary community lifeline (optional)	**Energy**
Tertiary sub-community lifeline	**Power grid**

Hazard sources

Primary hazard source	**Uncategorized**
If Uncategorized please specify	**Erosion**
Secondary hazard source (optional)	**Infrastructure failure**
Tertiary hazard source (optional)	

Is this a phased project?	**Yes**
Are you doing construction in this project?	**Yes**
Population affected	**1.1**
Detail/description of stated percentage	**The project will provide community-wide benefits from an environmental perspective, and contribute to better floodplain function and increased water quality throughout the watershed; however, a smaller portion of the City of Greenville will benefit directly from risk reduction achieved by the project. The City of Greenville's 2019 total population was 91,921. A service area for the project was identified as the population affected by the loss of sewer, electric, and water service should utilities in the tributary bed be compromised. Expert judgement and geospatial analysis were used to identify likely locations of isolation valves within the utility systems and determine a service area. Residential population within the utility service areas was determined using existing land use and U.S. Census data from**

	2019. As the identified service areas were smaller than a census block, the number of residential units within the service area was identified. The service area residential units were compared to the number of block group residential units. The percentage of housing units present in the service area was then applied to the census block population count to obtain the population in the service area. This led to a service area of 1,014 people, or 1.1% of the City's population, for the water and sewer service area. See the attached service area maps (Attachment 6) for visualization of these service areas. Additionally, within this impacted population are residents whose characteristics can classify them as part of a disadvantaged community. FEMA defines a disadvantaged community based on a combination of variables, including disproportionate impacts from climate change, low income, high poverty, lack of access to healthcare, racial and ethnic segregation, and unemployment. Data provided by the Centers for Disease Control and Prevention (CDC) indicates that residents within the project service area are disproportionately represented in the CDC's Social Vulnerability Index (SVI) when compared to nationwide averages. The benefitting area's residential population is 48% minority populations, with 45% of all residents qualifying as low- and moderate-income individuals. Project area percentages exceed nationwide averages in multiple vulnerability indicators including poverty, unemployment, disability status, minority status, and elderly persons. For example, the percentage of residents living below the poverty line in the project area is nearly 3% higher compared to the nationwide average. The percentage of unemployed individuals is also disproportionately high in the project area. According to SVI data, unemployment is nearly 4% higher than the nationwide average. Please see the impacted population attachment (Attachment 7) for a full summary of these indices and other related information about the populations that will be impacted by the project. The proposed project will ensure continued wastewater treatment and electric power services for these disadvantaged populations in the face of climate change.
Provide a clear and detailed description of your proposed activity	**The City of Greenville will construct stream restoration and stabilization improvements to reduce erosion and flood risks while also restoring and enhancing the floodplain, stream channel, and riparian ecosystem's natural function using nature-based solutions. The proposed infrastructure project aims to protect vulnerable public utility and municipal infrastructure as well as at-risk properties from heavy rain events and the growing impacts of climate change. Funding from FEMA's Building Resilient Infrastructure and Communities (BRIC) Program will help the City of Greenville install critically needed stream restoration and stabilization improvements that will protect public infrastructure and vital community lifelines as well as reduce and eliminate the risk of repetitive damage to surrounding properties. The City of Greenville's St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration Project focuses on an area of the stream bank that runs along St. Andrews Drive. The stream bank has suffered from substantial erosion and continued erosion jeopardizes multiple public utilities including electric, water, sewer and natural gas services. The erosion also threatens surrounding properties. The goal of the project is to stabilize the stream and avoid these risks, while also providing ecosystem service benefits. Addressing the aforementioned erosion hazards is a top mitigation and resiliency priority for the City. In 2016, the City identified and prioritized stream stabilization projects as part of the Greens Mill Run Watershed Master Plan (Attachment 2). The St. Andrews Drive project was identified as one of the highest priorities and assigned a high risk for the community. The Master Plan (Attachment 2) specifically calls out the vulnerable public utility infrastructure and threatened apartment buildings near the top of the bank. An exposed gravity sewer line crosses the stream in the middle section of the project area and numerous stormwater pipes discharge along the channel. There are also several electric transformer boxes that are close to the top of the eroding stream bank. The exposed**

	public infrastructure assets provide critical services to the community and are a threat to public safety. The exposed utility infrastructure may also cause debris jams to form which may constrict channel conveyance, scour the stream bed and banks, and further destabilize the stream bank. The top of the bank is also close to multi-family residential properties. Additional erosion will threaten the structural integrity of these buildings which may result in the destruction of property and increase the risk of injuries. The project provides ancillary benefits to underground utilities such as potable water and gas as well. Several underground utilities operate under the stream and are vulnerable to erosion. Inaction will exacerbate erosion hazards and potentially disrupt service to critical utility infrastructure. The proposed mitigation measures will help reduce the risk of service disruptions and improve resiliency. To protect the project area from erosion, the City will install a series of stream stabilization and restoration improvements including bank stabilization, channel modifications, and grade control structures that incorporate nature-based solutions. The proposed improvements are within the area bounded by Fairlane Road to the north, SW Greenville Boulevard to the south, St. Andrews Drive to the west, and Bridle Court / Brimley Drive to the east. The City's proposed project is directly aligned with BRIC program goals to combat climate change and protect communities against disaster hazards. If selected, the project will advance the BRIC program's priority to encourage nature-based solutions. The proposed stream restoration and stabilization improvements will also mitigate risks to multiple community lifelines. More specifically, the project will reduce damage and destruction to property, critical services, and infrastructure from future effects of erosion. The City of Greenville is committed to creating a more resilient community and the St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration Project represents an important opportunity to invest in critical mitigation improvements that will directly benefit community residents. The project will be implemented in two phases. Phase 1 will include the preliminary design, permitting, final design, and environmental review. Phase 2 will include bidding and construction. The project is well-positioned to receive FEMA BRIC grant funding and will help FEMA achieve BRIC program goals of reducing or eliminating risk and damage from natural hazards, specifically erosion.
How will the mitigation activity be implemented?	**Addressing erosion concerns and implementing nature-based solutions is a top mitigation and resiliency priority for the City of Greenville. Furthermore, the City has demonstrated success in implementing large-scale stream restoration projects on time, and within budget. The City of Greenville's Engineering Department will manage the proposed project and implementation of the grant. The City will contract with a qualified design engineer and construction contractor through an open procurement process that meets 2 CFR 200 requirements. The City of Greenville proposes implementing the project in two phases, in accordance with FEMA's guidelines on phased projects. Phase 1 will include geomorphic assessment and preliminary design, permit drawings and application submittal, permitting, and construction drawings and specifications. Permits will be obtained from all appropriate local, state, and federal agencies for construction activity, stormwater discharges, floodplain management, land disturbance, drainage review and approval, and environmental quality reviews. Phase 1 will also include federal environmental reviews as required, and final deliverables will include construction drawings, a written scope of work, updated cost estimate for construction, and a revised benefit-cost analysis to ensure project cost-effectiveness and continued compliance with the BRIC program. Upon completion of Phase 1 and approval from FEMA, Phase 2 will consist of bidding and contracting, project construction, and project closeout. Site preparation of the bank restoration measures will necessitate a staging area for material and equipment delivery, and this is reflected in the attached Concept Plans (Attachment 8). For further details on the mitigation activity implementation, see the**

attached Preliminary Engineering Report (Attachment 9) and the Implementation Measures Attachment (Attachment 10).

Describe how the project is technically feasible and will be effective in reducing the risk by reducing or eliminating damage to property and/or loss of life in the project area. Please include engineering design parameters and references to the following: preliminary schematic or engineering drawings/design; applicable building codes; engineering practices and/or best practices; level of protection (e.g., life safety, 100-yr flood protection with freeboard, 100-yr wind design, etc.):

The City has experienced ongoing erosion issues along the stream located in the project area. The stream bank erosion threatens critical public utility infrastructure and jeopardizes the structural integrity of surrounding building and properties. The proposed project in the unnamed stream will stabilize the stream by increasing the elevation of the channel bed, regrading banks, and implementing bio-engineered and stone-based structural enhancements with surface stabilization and natural fiber matting for reinforcement. Additionally, the proposed project will implement intensive revegetation with appropriate native riparian plant species. These actions will prevent future channel downcutting and widening, reduce sediment loading, and reduce vegetation loss, therefore protecting building foundations and municipal utilities. Specifically, the proposed project includes the following: • Grading to stabilize upper banks along 4,600 feet of the channel (or 2,300 feet along each side of the bank); • Stone toe protection structures or gabion walls for approximately 1,100 feet of the channel; • Raising the channel bed to provide a minimum of one foot of cover over the exposed sewer pipe, water line, and electric service lines crossing the streambed; and • Installing grade control structures immediately upstream and downstream of utility crossings to protect them. The proposed St. Andrews Critical Infrastructure Protection and Stream Restoration project addresses three primary vulnerabilities: • Disruption in sewer services due to heavy urban rainfall and erosion within the stream that threatens exposed pipelines. An 8" gravity clay sewer line crosses the stream bed and is vulnerable to complete failure if impacted by floating debris or downstream movement of large stones. If compromised due to washout or rupture from stream debris, approximately 1,014 residents would lose wastewater treatment and conveyance services. • Disruption in electrical power services due to two transformer boxes within 1 to 2 feet of actively eroding banks. The boxes are at risk of falling in the stream if undermined by eroding soil, threatening electric power service for approximately 285 people. • Damage to 9 residences and 1 commercial buildings within 30 feet of the eroded streambank, along with associated relocation costs. This does not include vulnerable accessory structures. After mitigation, the private properties and municipal utilities will be protected via streambank stabilization measures from current and future erosion, as the proposed project would also bury exposed utility lines. These stabilization measures will remain effective through the end of the project's 30-year useful life. The use of nature-based solutions is central to the proposed mitigation strategy. The project will replant the riparian zone buffer with a riparian seed mix and herbaceous and native woody shrubs and trees. The project will also install bio-engineered (or nature-based) structural enhancements to stabilize the stream bank where most applicable. Stone-based structural enhancements will only be used where necessary. Natural fiber matting will also be used for reinforcement and improve surface stabilization. Compared to conventional stream stabilization solutions which typically depend on steel and concrete, Greenville's approach emphasizes the use of natural, locally available materials that will emulate the morphology of natural stream channels while simultaneously reducing erosion problems along the stream. The riparian vegetation will also offer water quality protection benefits. The replanted riparian vegetation will help to maintain and improve water quality by functioning as a buffer, filtering out sediments and debris. This will improve water quality and protect wildlife habitat. See the risk reduction and increased resiliency attachment (Attachment 11) for more information. The City's Greens Mill Run Watershed Master Plan (Attachment 2) defines the bankfull elevations as those associated with the channel-forming discharge, typically between the 1 and 2-year storm events. The bankfull elevation defines the channel's shape and dimensions. As the project will mitigate existing erosion caused by the bankfull elevation, the project's level of

	protection provided will be the 2-year precipitation event. In addition, the proposed project will address erosion concerns for municipal utilities and residential and commercial structures vulnerable to erosion from the streambank for the full 30-year useful life expected for the project.
Who will manage and complete the mitigation activity?	**The Grants Coordinator and Financial Services will support grant implementation and monitoring with contributions from the City's Attorney's Office. The City's Engineering Department will manage and complete the mitigation activity with support from third party design and construction firms. The City, and specifically the Engineering department, has prior experience with projects of similar scope and scale. For example, the City of Greenville successfully completed the $33-million Town Creek Culvert project in October 2020, on-time and under-budget. The project addressed drainage issues along a 250-acre downtown corridor caused by the undersized, failing culvert system. The daylighting project included many green infrastructure components, such as wetland restoration, creation of bioretention cells, and stream stabilization. By coordinating with utility plans and accounting for future development, the City believes the project will be able to handle additional stormwater runoff for years to come. In terms of timing, project planning began in Fall 2013 and was approved by City Council in October 2017. Construction spanned two and a half years.**
Will the project address the hazards identified and what risks will remain from all hazards after project implementation (residual risk)?	**The unnamed tributary presents a risk to public infrastructure (e.g., sewer and water pipes, electric transformer) and multiple residential structures as the channel has cut down its own streambed, resulting in overly high stream banks, loss of hydrologic connectivity to the adjoining floodplain, and lateral migration (erosion). The significant erosion has left the stream channel with deep incisions and bank heights that reach between 7 and 12 feet. Scour has exposed many tree root balls along the channel bank, and tributary incision has caused trees to fall into/across the channel in multiple locations. The erosion threatens to jeopardize the integrity of critical infrastructure lines. An exposed gravity sewer line crosses the tributary in the middle section of the project, and numerous stormwater pipes discharge along the channel. The exposed sewer is a risk not only to the sewer infrastructure, but also for debris jams to form, which may constrict channel conveyance, increase shear stress, and potentially scour the tributary bed and banks. There are several electric transformer boxes that are close to the top bank, with areas of localized scour threatening structures. Additional utilities along the tributary section include a water crossing at Sedgefield Drive and a water and gas line near the Fairlane Road culvert. Damage to these infrastructure lines could threaten the services they provide to the surrounding homes and businesses. Additionally, bank erosion is threatening the structural integrity of an apartment building at 313 St. Andrews Drive. The top of bank is also close to the Keswick Apartment's pool deck and several apartment buildings (including 1548 and 1574 Bridle Ct. and 305 Horseshoe Dr.). Please see the attached photo log (Attachment 5) for visuals of the erosion along the tributary. Due to the impacts of climate change, the City is predicted to experience more frequent and severe precipitation events. Specifically, Greenville could receive up to a 130% annual increase in the number of days with precipitation of 3 inches or greater by midcentury from a 1996-2015 baseline average. This data can be found in the North Carolina Climate Science Report (Attachment 3). These predicted conditions will increase the threat of erosion along the creek bed and potentially increase encroachment upon the municipal infrastructure and housing. To mitigate these hazards, the City proposes to stabilize the channel by installing bioengineered structures to protect the municipal infrastructure within and adjacent to the stream corridor and to improve the channel conditions and impart greater resilience at the site. The project proposes to install hard (stone) structures where necessary to protect municipal infrastructure and physical structures (including homes); otherwise,**

	nature-based solutions will be installed to create diverse habitats within the aquatic and riparian ecosystems and an aesthetically pleasing stream system. The channel bed will be raised to provide one foot of cover (minimum) over the sewer pipe, water line and electric service lines. Grade control structures will be installed immediately upstream, between and downstream of the utility crossings to protect them. The project also seeks to create areas of accessible floodplain along the riparian corridor to alleviate the erosive forces currently acting within the channel and to create hydraulic storage capacity. The proposed project will protect multiple community lifelines by restoring the stream's natural function and limiting vertical and lateral erosion – thereby reducing the risk to municipal infrastructure and adjacent housing units. Specifically, the project will protect the following lifelines: • Safety & Security (Community Safety): The proposed activity will preserve access to electricity, sewer, and water for residential, business, and government functions in the service area. For example, there are two government services building within the sewer service area. • Food, Water & Shelter (Water): The proposed activity will protect a water line by raising the channel bed and installing grade control structures. It will also protect the adjacent apartments which are currently threatened by lateral erosion that is worsening each year. • Energy (Power Grid): Several electric transformer boxes are close to the top of actively eroding banks; in one part of the stream, erosion exposed a buried electric service line in steel casing – presenting a threat to the power grid and continuous access to power in the service area. In restoring and stabilizing the bed of the tributary, the City of Greenville will mitigate the risks to these lifelines.
When will the mitigation activity take place?	**Greenville estimates a 35-month schedule for the scoping activities once notice to proceed is obtained. Greenville assumes that FEMA will announce FY2021 funding awards for scoping activities in September 2022. The project is expected to be completed by August of 2025. The project will be phased, with a Phase 1 subrecipient agreement expected to be in finalized by November of 2022. The total duration of Phase 1 is expected to be 18 months, with time dedicated towards design and permitting. The last two months of Phase 1 are reserved for review and developing a Phase 2 agreement. Phase 2 is expected to last 17 months, with the first three months being spent advertising and awarding a construction contract. Construction is expected to take 12 months, while the last two months of the project are reserved for project close-out. Please see the attached schedule for more information (Attachment 12).**
Explain why this project is the best alternative. What alternatives were considered to address the risk and why was the proposed activity considered the best alternative?	**Several alternatives were considered for this project, including the "No Action" alternative and a relocation alternative. The "No Action" alternative was determined to be infeasible because it would allow for continued erosion and exposure of utility lines. The tributary is experiencing severe erosion and bank instability that is threatening the nearby infrastructure and encroaching on private property. Rain events have become more severe in recent years, contributing to an increasing rate of bank erosion. This has directly jeopardized a gravity sewer line, a water line, a gas line, and power infrastructure. The city also considered utility relocation or voluntary acquisition of the adjacent multifamily property, but both options are cost-prohibitive and would depend on extensive community participation. For this reason, the proposed project represents the best alternative to reduce long term risks associated with the erosion. To reach the agreed upon project, the City performed multiple outreach activities with the public and stakeholders. Engagement first occurred prior to this application. In 2016, the City identified and prioritized stream stabilization projects as part of the Greens Mill Run Watershed Master Plan. The St. Andrews Drive project was identified as one of the highest priorities and assigned a high risk for the community. These projects were identified with help from the public and city staff, who provided information on historical flooding and erosion problems within the watershed. The input from public and city staff formed the basis of the**

	project idea and concept plans. The project included a robust campaign to engage stakeholders and the public through a number of mediums in order to receive information regarding problem areas within the watershed, and feedback on areas where projects were identified. A Public Involvement Plan (PIP) was developed that outlined the process by which the public and stakeholders were engaged in the watershed master plan. The general public was engaged through use of social media, the project website (www.greenvillewsmp.com), questionnaires, a series of three public meetings (held on November 5th, 2014 and November 17th, 2015), a stakeholder input meeting (September 3rd, 2014), and one-on-one onsite or phone interviews. The City also plans to hold a walking tour of the project site on January 18th, 2022 for citizens, and will hold an additional public meeting at the 60% design stage of the project. See the Greens Mill Run Watershed Master Plan (Attachment 2) and the evaluation section of this application for more information about these outreach activities.
Please identify the entity that will perform any long-term maintenance and provide a maintenance, schedule and cost information. The subapplicant or owner of the area to be mitigated is responsible for maintenance (including costs of long-term care) after the project is completed?	**The City's Engineering Department will be responsible for long-term maintenance of the project. The City currently maintains the unnamed stream and has a budget for major repairs and annual inspections through the City's overall stormwater asset management and maintenance program. Nevertheless, the City expects that additional maintenance costs will be needed for vegetation control; approximately $3,500 per year. This assumes a 4-person crew will work for 4 hours per month to maintain the stream segment. Future maintenance needs may include occasionally removing blockages and debris, repairing eroded areas (which should be reduced by the proposed project), trash and debris removal, and vegetation management. See the attached maintenance agreement letter (Attachment 13).**
Additional comments (optional)	**The City of Greenville's proposed mitigation activity for St. Andrews Drive Critical Infrastructure Protection and Stream Restoration project meets all of FEMA's priorities for the BRIC program, including the following: - Mitigating risk to public infrastructure. The proposed project will protect critical municipal utilities that could affect 1,014 residents if service was compromised due to infrastructure failure caused by erosion. - Incentivizing resilient investments in disadvantaged communities, as referenced in EO 14008. The proposed project's benefitting area has a CDC Social Vulnerability Index of 0.47, meaning that 47% of residents that will benefit from the project meet social vulnerability criteria and are more susceptible to long-term impacts from climate change. - Mitigating risk to one or more community lifelines. The proposed project will protect the Safety and Security; Food, Water, and Shelter; and Energy lifelines. - Incorporate nature-based solutions. The proposed stream restoration intentionally focuses on erosion control through bio-engineered solutions rather than channeling the stream using grey infrastructure methods. - Enhance climate resilience and adaptation. The project will prevent further erosion and flood risk that may occur in the face of a 130% increase in heavy urban rain events expected in North Carolina. - Incentivize the adoption and enforcement of the latest published editions of building codes. The City of Greenville has adopted the latest v3ersion of the International Building Codes and has a BCEGS score of 4, which indicates that the community sufficiently enforces its building code.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
9. Preliminary Engineering Report.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	The PER provides an engineering assessment of existing conditions at the project location and an initial proposed scope of work to be performed in order to properly mitigate the site in question.	
7. Impacted Population Attachment.pdf	01/06/2022	blakely.jarrett@icf.com	Scope of Work Attachments	The attachment outlines the population impacted by the project, as per qualitative criterion number 4. Also provided is a table that provides a summary of identified disadvantaged community indices, compared to nationwide averages, within the project's service area population.	
12. Project Schedule.pdf	01/06/2022	blakely.jarrett@icf.com	Scope of Work Attachments	Project schedule for the completion of the BRIC 2021 St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration project.	
13. Maintenance Letter.pdf	01/06/2022	blakely.jarrett@icf.com	Scope of Work Attachments	The Maintenance Agreement between the City of Greenville and the North Carolina State Hazard Mitigation Officer.	
6. Utility Service Area Maps.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	A map outlining the identified service area for sewer and electric utilities within the mitigation project area.	
8. Concept Plans.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	Initial concept plans for the proposed stream restoration project.	
3. North Carolina Climate Science Report.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	The North Carolina Climate Science Report is a scientific assessment of historical climate trends and potential future climate change in North Carolina under increased greenhouse gas concentrations.	
4. St. Andrews Project Location Map.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	A map outlining the project location and the utilities.	
5. Photo Log.pdf	11/23/2021	blakely.jarrett@icf.com	Scope of Work Attachments	The Photo Log provides photographs of the sites at which work is proposed to be performed under this	

Filename	Date uploaded	Uploaded by	Label	Description	Action
				mitigation project scope of work.	
11. Risk Reduction Attachment.pdf	01/06/2022	blakely.jarrett@icf.com	Scope of Work Attachments	The attachment outlines the risk reduction and resiliency effectiveness of the project, as per qualitative criterion number 1.	
10. Implementation Measures Attachment.pdf	01/06/2022	blakely.jarrett@icf.com	Scope of Work Attachments	The attachment outlines the project's implementation measures, as per qualitative criterion number 3.	

Schedule

Specify the work schedule for the mitigation activities.

Add tasks to the schedule

Please include all tasks necessary to implement this mitigation activity; include descriptions and estimated time frames.

Task Name
PHASE 1: Subrecipient Agreement

Start Month
1

Task Duration (in Months)
2 months

Task Description
Ensure written agreement is in effect.

Task Name
PHASE 1: Geomorphic Assessment and Preliminary (30%) Design

Start Month
3

Task Duration (in Months)
3 months

Task Description
Design activities for the construction solution.

Task Name
PHASE 1: Permit Drawings (60% Design) and Application Submittal

Start Month
6

Task Duration (in Months)
3 months

Task Description
Design activities through the 60% drawings milestone.

Task Name
PHASE 1: Permitting Phase

Start Month
8

Task Duration (in Months)
6 months

Task Description
Applying for and receiving permits during Phase 1.

Task Name
PHASE 1: Construction Drawings (100% Design) and Specifications

Start Month
14

Task Duration (in Months)
3 months

Task Description

Design activities to finalize the design and create a bid package.

Task Name	Start Month	Task Duration (in Months)
PHASE 1: Phase 1 Review and Phase 2 Agreement	17	2 months

Task Description
Review Phase 1 and ensure agreement is in place for Phase 2.

Task Name	Start Month	Task Duration (in Months)
PHASE 2: Bidding and Contracting	19	3 months

Task Description
Advertising bid documents, receiving and evaluating bids, and awarding a construction contract.

Task Name	Start Month	Task Duration (in Months)
PHASE 2: Project Construction	22	12 months

Task Description
Construction activities related to the tributary bank restoration scope.

Task Name	Start Month	Task Duration (in Months)
PHASE 2: Project Closeout	34	2 months

Task Description
Final inspection and project closeout.

Estimate the total duration of your proposed activities (in months).	**35**

Proposed project start and end dates

Start Date	**2022-10-01**
End Date	**2025-07-31**

Budget

Budget cost estimate should directly link to your scope of work and work schedule. You must add at least one item(s) greater than 0 for your cost estimate. As necessary, please adjust your federal/non-federal cost shares, and add the non-federal funding source(s) you are planning to use this project. Once you have completed this section, please click the Continue button at the bottom of this page to navigate to the next section.

Add budget cost types and item(s)

First, click the Add cost type button below to add cost type cost estimate and then click the Add item(s) button to add the item(s) for the cost estimate.

Grand total: $4,823,149.00

Budget type: Construction

Cost type: Cost estimate	**$4,593,476.00**
Cost type: Management cost	**$229,673.00**

Program income (optional)

Cost share

Cost share or matching means the portion of project costs not paid by federal funds.

Proposed federal vs. non-federal funding shares
Hazard Mitigation Assistance (HMA) funds may be used to pay up to 75% federal share of the eligible activity costs. For Building Resilient Infrastructure and communities (BRIC), small impoverished communities may be eligible for up to 90% federal share. For Flood Mitigation Assistance (FMA), and severe repetitive loss (SRL) properties may be eligible for up to 100% federal share. Repetitive loss (RL) properties may be eligible for up to 90% federal share. Flood Mitigation Assistance (FMA) and severe repetitive loss (SRL) properties may be eligible for up to 100% federal share. Repetitive loss (RL) properties may be eligible for up to 90% federal share.

Is this a small impoverished community? This determines your federal/non-federal share ratio.		% Percentage	$ Dollar amount
No	Proposed federal share	71.43	3445106.00
	Proposed non-federal share	28.57	1378043.00
			Based on total budget cost: $4,823,149.00

Non-federal funding sources here
That portion of the total costs of the program provided by the non-federal entity in the form of in-kind donations or cash match received from third parties or contributed by the agency. In-kind contributions must be provided and cash expended during the project period along with federal funds to satisfy the matching requirements.

Funding source	Funding amount	% Non-federal share by source
Funding source: Stormwater Enterprise Fund	**$1,378,043.00**	**100.00%**

Please provide any additional comments below (optional).

The budget (Attachment 14) for the proposed project was developed in accordance with FEMA HMA Guidelines for cost review. All costs included in the subapplication include necessary, reasonable, and allocable costs consistent with the provisions of 2 CFR Part 200. The City relied on a combination of unit prices received in recent actual construction bids from similar projects and published reference guides on current construction costs to develop the cost line items necessary to complete each task in the scope of work. The non-federal matching fund requirement is $1,378,043, or 30% of project costs. The City has committed this overmatch of the 25% local funding requirement in accordance with FEMA BRIC program priorities and technical evaluation criteria. 30% of the non-federal funds will be provided through cash contribution by the City (Attachment 15).

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
15. Cost Share Commitment Letter.pdf	01/07/2022	blakely.jarrett@icf.com	Budget Attachments	City of Greenville cost commitment agreement.	
14. Budget.pdf	01/06/2022	blakely.jarrett@icf.com	Budget Attachments	Detailed cost estimate of the proposed project.	

Cost-effectiveness

How was cost-effectiveness determined for this project?

- [x] BCA completed in FEMA's BCA toolkit
  Subapplicant must attach supporting documentation.
- [ ] Pre-calculated benefits
- [ ] Substantial damage in special flood hazard area
- [ ] Other BCA methodology approved by FEMA in writing
- [ ] Not applicable

- [ ] Not applicable

What are the total project benefits? ($)	**7429765**
What are the total project cost? ($)	**4636908.00**
What is the benefit-cost ratio (BCR) for the entire project?	**1.60**
Was sea level rise incorporated into the flood elevations in the BCA?	**No**
Were environmental benefits added to the project benefits?	**No**
Were social benefits added to the project benefits?	**No**
Does the mitigation measure incorporate nature-based solutions?	**Yes**

Please provide any additional comments below (optional).

Following the FEMA BCA Reference Guide and Supplement, the project's BCA uses a combination of precipitation data, erosion rates, and modeled expected losses for physical damage and municipal utility failure to calculate the damages before and after the proposed mitigation project is implemented. The modeled scenarios use engineering assessments, statistical determinations of likely occurrence, and associated damages during expected events. This is consistent with FEMA's expected damages approach as detailed in the FEMA BCA Reference Guide. The BCA for this project was primarily guided by FEMA's BCA Reference Guide and Supplement and the BCA Toolkit Version 6.0. Using the methodology defined in Attachment 16, the proposed St. Andrews Critical Infrastructure Protection and Stream Restoration project is expected to generate $7,429,765 in benefits, yielding a 1.60 BCR when compared to a $4,636,908 present value project cost. The BCA quantifies the following project benefits: • Disruption in wastewater services due to heavy urban rainfall and erosion within the stream that threatens exposed pipelines. • Disruption in electrical power services due to transformer box locations on the streambank and erosion vulnerabilities for exposed pipelines. • Damage to commercial and residential buildings due to erosion vulnerabilities, along with associated relocation costs. After mitigation, the private properties and municipal utilities will be protected via streambank stabilization measures from current and future erosion. To ensure a conservative analysis, analysts assumed that the stabilization measures will remain effective through the end of the project's 30-year useful life. Mitigating erosion from the streambanks will provide substantial economic and social benefits to residents. In addition to mitigating physical damages and community

displacement, thereby saving residents money and keeping the community whole, the project will also address life safety concerns. The social vulnerability characteristics presented in the project's benefitting area demonstrate that the project directly aligns with Executive Order 14008 and the Justice40 Initiative. The Justice40 Initiative is a whole-of-government effort to deliver at least 40 percent of the overall benefits from Federal investments in climate and clean energy to disadvantaged communities. According to the Center for Disease Control and Prevention Social Vulnerability Index (CDC SVI), approximately 47% of the project's benefitting area meet one of 15 social vulnerability factors, which amounts to $3,491,990 of the total project benefits.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
16. St. Andrews BCA Technical Report.pdf	01/06/2022	blakely.jarrett@icf.com	Cost Effectiveness Attachments	A complete Benefit-Cost Analysis technical memo providing the approach and calculations used in the determination of the overall benefit-cost ratio for the proposed mitigation project.	
17. St Andrews BCA Export.zip	01/06/2022	blakely.jarrett@icf.com	Cost Effectiveness Attachments	BCA Toolkit reflecting the proper BCR used in the BCA Methodology.	

Environmental/Historic Preservation (EHP) Review Information

Introduction

An environmental/historic preservation review is required for all activities for which FEMA funds are being requested. FEMA will complete this review with the assistance of both the state or tribal government and the local applicant. It is important that you provide accurate information. If you are having problems completing this section, please contact your application point of contact.

A. National Historic Preservation Act - Historic Buildings and Structures

1. Does your project affect or is it in close proximity to any buildings or structures 50 years or more in age? **No**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [ ] The property address and original date of construction for each property affected (unless this information is already noted in the Properties section).
- [ ] A minimum of two color photographs showing at least three sides of each structure (Please label the photos accordingly).
- [ ] A diagram or USGS 1:24,000 scale quadrangle map displaying the relationship of the property (s) to the project area.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [ ] Information gathered about potential historic properties in the project area, including any evidence indicating the age of the building or structure and presence of buildings or structures that are listed or eligible for listing on the National Register of Historic Places or within or near a National Register listed or eligible historic district. Sources for this information may include the State Historic Preservation Officer, and/or the Tribal Historic Preservation Officer (SHPO/THPO), your local planning office, historic preservation organization, or historical society.

- [ ] Consideration of how the project design will minimize adverse effects on known or potential historic buildings or structures, and any alternatives considered or implemented to avoid or minimize effects on historic buildings or structures. Please address and note associated costs in your project budget.
- [ ] For acquisition/demolition projects affecting historic buildings or structures, any data regarding the consideration and feasibility of elevation, relocation, or flood proofing as alternatives to demolition.
- [ ] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Please provide an explanation and any information about this project that could assist FEMA in its review.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

B. National Historic Preservation Act - Archeological Resources

Does your project involve disturbance of ground? **Yes**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] A description of the ground disturbance by giving the dimensions (area, volume, depth, etc.) and location.
- [x] The past use of the area to be disturbed, noting the extent of previously disturbed ground.
- [x] A USGS 1:24,000 scale or other site map showing the location and extent of ground disturbance.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Any information about potential historic properties, including archeological sites, in the project area. Sources of this information may include SHPO/THPO, and/or the Tribe's cultural resources contact if no THPO is designated. Include, if possible, a map showing the relation of any identified historic properties to the project area.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

The past use of the proposed disturbance area was primarily the channel's riparian buffer which was vegetated with a mix of shrubs and overstory trees. Many of the trees had exposed tree root balls due to scouring. The proposed project area is approximately three acres, with a maximum depth of disturbance of 14 feet. Depth of disturbance will vary depending on the depth of the tributary bed. Stream stabilization will include the use of natural fiber matting. Vegetation that is disturbed or removed during implementation of this project will be replaced. The planting plan includes livestakes, herbaceous and woody shrubs and trees, and seed mix for the stream banks, suitable for frequent flooding conditions. Please see the attached SHPO coordination letter (Attachment 18) and concepts plans (Attachment 8) that delineate the area of ground disturbance. Additionally, see the attached historic places map (Attachment 19) to see that no historic places are within the project's bounds.

Please provide an explanation and any information about this project that could assist FEMA in its review.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
18. SHPO Letter.pdf	01/06/2022	blakely.jarrett@icf.com	involveDisturbanceOfGround.attachmentIds	Coordination letter between the	

Filename	Date uploaded	Uploaded by	Label	Description	Action
				City of Greenville and the State Historic Preservation Officer.	
19. National Register of Historic Places Map.pdf	01/06/2022	blakely.jarrett@icf.com	involveDisturbanceOfGround.attachmentIds	Mapping information showing no historic properties within the project area.	

C. Endangered Species Act and Fish and Wildlife Coordination Act

1. Are federally listed threatened or endangered species or their critical habitat present in the area affected by the project? **Not known**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please provide the required documents either through attachment and/or comment box below.)

- [x] Information you obtained to identify species in or near the project area. Provide the source and date of the information cited.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Any request for information and associated response from the USFWS, the National Marine Fisheries Service (NMFS) (for affected ocean-going fish), or your State Wildlife Agency, regarding potential listed species present and potential of the project to impact those species.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Please provide an explanation and any information about this project that could assist FEMA in its review.

The US Fish and Wildlife Report produced a list of species and critical habitats that are known or expected to be on or near the project area (see the IPaC report attachment - Attachment 20). A request for information from the North Carolina Department of Environmental Quality regarding the potential impacts on species present has been made (see the attached DEQ letter - Attachment: 21).

2. Does your project remove or affect vegetation? **Yes**

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please provide the required documents either through attachment and/or comment box below.)

- [x] Description of the amount (area) and type of vegetation to be removed or affected.
- [x] A site map showing the project area and the extent of vegetation affected.
- [x] Photographs or digital images that show both the vegetation affected and the vegetation in context of its surroundings.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Vegetation will be removed from the existing streambank in order to provide bank stabilization, channel modifications, and grade controls. Vegetation disturbance will occur throughout most of the project's approximate three-acre area. The majority of the channel's riparian buffer is vegetated with a mix of shrubs and overstory trees. There are numerous locations where bank scour has exposed tree root balls

along the channel bank and also caused several trees to fall into or across the channel. The floodplain is maintained to the top of the bank within numerous properties. All the channel banks that are graded during the restoration will be covered with natural fiber mat. The final planting plan for the stream banks will include live stakes and seed mixes that are suitable for frequent flooding conditions. Please see the attached photo log (Attachment 5) and attached concept plans (Attachment 8) for visuals of the current vegetation and extent of the project disturbance area.

Please provide an explanation and any information about this project that could assist FEMA in its review.

3. Is your project in, near (within 200 feet), or likely to affect any type of waterway or body of water?	**Yes**

If Yes, and project is not within an existing building, you must confirm that you have provided the following: (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] A USGS 1:24,000 scale quadrangle map showing the project activities in relation to all nearby water bodies (within 200 feet).
- [x] Any information about the type of water body nearby including: its dimensions, the proximity of the project activity to the water body, and the expected and possible changes to the water body, if any. Identify all water bodies regardless whether you think there may be an effect.
- [x] A photograph or digital image of the site showing both the body of water and the project area.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Evidence of any discussions with the US Fish and Wildlife Service (USFWS), and/or your State Wildlife Agency concerning any potential impacts if there is the potential for the project to affect any water body.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)	**The proposed stabilization project located near St. Andrews Drive is along a confined section of an unnamed tributary to Greens Mill Run, as shown in the attached National Wetlands Inventory map (Attachment 22). A portion of the tributary is classified as a R4SBC by the US Fish and Wildlife Service (USFWS). The attached photo log (Attachment 5) and USGS map (Attachment 23) shows the approximate location of the tributary and its relation to the project location. Additionally, concept plans (Attachment 8) are attached to show the proposed stabilization work on the tributary. See the attached coordination letter to the North Carolina Department of Environmental Quality (NC DEQ) (Attachment 21) for additional coordination efforts.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
22. National Wetlands Inventory Map.pdf	01/06/2022	blakely.jarrett@icf.com	endangeredSpecies.attachmentIds	A map created using the National Wetlands Inventory mapping tool from the US Fish and Wildlife Services demonstrating that there are no wetlands within the project area.	
21. DEQ Letter.pdf	01/06/2022	blakely.jarrett@icf.com	endangeredSpecies.attachmentIds	Coordination letter between the City of Greenville and the North Carolina Department of Environmental Quality.	

Filename	Date uploaded	Uploaded by	Label	Description	Action
23. USGS Topographic Map.pdf	01/06/2022	blakely.jarrett@icf.com	endangeredSpecies.attachmentIds	A USGS 1:24,000 Scale Map of the proposed project location.	
20. IPaC Endangered Species Report.pdf	01/06/2022	blakely.jarrett@icf.com	endangeredSpecies.attachmentIds	U.S. Fish and Wildlife Report produced to list species and critical habitats that are known or expected to be on or near the project area.	

D. Clean Water Act, Rivers and Harbors Act, and Executive Order 11990 (Protection of Wetlands)

1. Will the project involve dredging or disposal of dredged material, excavation, adding fill material or result in any modification to water bodies or wetlands designated as 'waters of the U.S' as identified by the US Army Corps of Engineers or on the National Wetland Inventory?

Yes

Please confirm that you have provided the information listed below by selecting each check box. (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] Documentation of the project location on a USGS 1:24,000 scale topographic map or image.
- [x] A copy of a National Wetlands Inventory map or other available wetlands mapping information.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Request for information and response letter from the US Army Corps of Engineers and/or state resource agencies regarding the potential for wetlands, and applicability of permitting requirements.
- [x] Evidence of alternatives considered to eliminate or minimize impacts to wetland.
- [x] Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)

Wetlands are not present within the floodplain corridor per the National Wetlands Inventory (see attached Wetlands Map – Attachment 22). Therefore, alternatives are not considered to eliminate or minimize impacts to wetlands. Please see the attached USGS Location Map (Attachment 23), as well as a coordination request letter to the US Army Corps of Engineers (Attachment 24) for additional context.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
26. USACE Letter.pdf	01/06/2022	blakely.jarrett@icf.com	waterBodyOrWetlandModification.attachmentIds	Coordination letter between the City of Greenville and the US Army Corps of Engineers.	

E. Executive Order 11988 (Floodplain Management)

1. Does a Flood Insurance Rate Map (FIRM), Flood Hazard Boundary Map (FHBM), hydrologic study, or some other source indicate that the project is located in or will affect a 100 year floodplain, a 500 year floodplain if a critical facility, an identified regulatory floodway, or an area prone to flooding?	**No**
2. Does the project alter a watercourse, water flow patterns, or a drainage way, regardless of its floodplain designation?	**No**

F. Coastal Zone Management Act

1. Is the project located in the state's designated coastal zone?	**No**

G. Farmland Protection Policy Act

1. Will the project convert more than 5 acres of prime or unique farmland outside city limits to a non-agricultural use?	**No**

H. Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (Hazardous and Toxic Materials)

1. Is there a reason to suspect there are contaminants from a current or past use on the property associated with the proposed project?	**No**
2. Are there any studies, investigations, or enforcement actions related to the property associated with the proposed project?	**No**
3. Does any project construction or operation activities involve the use of hazardous or toxic materials?	**No**
4. Do you know if any of the current or past land-uses of the property affected by the proposed project or of the adjacent properties are associated with hazardous or toxic materials?	**No**

I. Executive Order 12898, Environmental Justice for Low Income and Minority Populations

1. Are there low income or minority populations in the project's area of effect or adjacent to the project area?	**Yes**

If Yes, you must confirm that you have provided the following either in the text box below or by attachment: (If you have not provided these documents in any other section of the application, please attach the required documents or provide the description below.)

- [x] Description of any disproportionate and adverse effects to these populations.

To help FEMA evaluate the impact of the project, please indicate below any other information you are providing. (optional)

- [x] Description of the population affected and the portion of the population that would be disproportionately and adversely affected. Please include specific efforts to address the adverse impacts in your proposal narrative and budget.

☑ Attached materials or additional comments.

Please provide an explanation and any information about this project that could assist FEMA in its review. (optional)	**The FEMA BRIC program is prioritizing implementation of President Biden's Justice40 Initiative, which promotes social equity by directing 40 percent of the overall benefits of federal investments in climate and clean energy to disadvantaged communities. FEMA defines a disadvantaged community based on a combination of variables, while the CDC SVI weighs these variables to produce an overall vulnerability score. According to the CDC SVI, approximately 47% of the project's benefitting area meet one of 15 social vulnerability factors. Additionally, data provided by the CDC indicates that residents within the project service area are disproportionately represented in the CDC's SVI when compared to nationwide averages. See Attachment 7 for a full summary of these indices. No adverse impacts are expected to these populations by the implementation of this project. In fact, this project will provide a benefit to these populations by reducing threats to municipal infrastructure and homes.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

J. Other Environmental/Historic Preservation Laws or Issues

1. Are there other environmental/historic preservation requirements associated with this project that you are aware of?	**No**
2. Are there controversial issues associated with this project?	**No**
3. Have you conducted any public meeting or solicited public input or comments on your specific proposed mitigation project?	**Yes**
If Yes, please indicate in the text box below a description of the requirements, issues or public involvement effort.	**The city completed the Greens Mill Run Watershed Master Plan (Attachment 2) in 2017, which included this project. The master planning process used a range of communications tools to engage and solicit input from stakeholders including a questionnaire, three public meetings, social media, and direct resident contact and interviews. The top two watershed funding preferences from the questionnaire were stream restoration and water quality control.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

K. Summary and Cost of Potential Impacts

Having answered the questions in parts A. through J., have you identified any aspects of your proposed project that have the potential to impact environmental resources or historic properties?	**Yes**

If Yes, you must confirm that you have provided the following: (If you have not provided these documents in any other section of the application, please attach the required documents below.)

- [x] Evaluated these potential effects and provided the materials required in Parts A through J that identify the nature and extent of potential impacts to environmental resources and/or historic properties.
- [x] Consulted with appropriate parties to identify any measures needed to avoid or minimize these impacts.
- [x] Considered alternatives that could minimize both the impacts and the cost of the project.
- [x] Made certain that the costs of any measures to treat adverse effects are realistically reflected in the project budget estimate.

Please enter your comments below. (optional) : (Please indicate why in the text box below and any information about this project that could assist FEMA in its review).	**While the proposed project area is not in FEMA's Special Flood Hazard Area, one of the project's goals is to hydrologically reconnect the stream channel to the Greens Mill Run floodplain where possible. When the stream is "connected" to its floodplain, high flow events will have access to the adjacent floodplain, will spread out and have reduced water velocities, which will greatly reduce erosive forces within the channel and reduce risk to the neighboring structures and municipal infrastructure in and near the stream bed. This project will also likely result in enhanced water quality in the stream as a co-benefit. All supporting attachments for Sections A-J, as well as the attached FIRM maps (Attachment 25) and the attached floodplain coordination letter (Attachment 26), support this conclusion of environmental and historic impact.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
24. Floodplain Letter.pdf	11/23/2021	blakely.jarrett@icf.com	summaryCostOfImpacts.attachmentIds	Coordination letter to the North Carolina State Hazard Mitigation Officer outlining the project's compliance with local floodplain management requirements. This letter is from the City of Greenville's floodplain coordinator (a point of contact for the St. Andrews project).	
23. FIRM Maps.pdf	11/23/2021	blakely.jarrett@icf.com	summaryCostOfImpacts.attachmentIds	FEMA Flood Insurance Rate Map for the project area.	

Evaluation

Is the applicant participating in the Community Rating System (CRS)?	**Yes**
Select rating.	**7**
Is the applicant a Cooperating Technical Partner (CTP)?	**No**

Was this created from a previous FEMA HMA Advance assistance / Project scoping award?	**No**
Has the applicant adopted building codes consistent with the international codes?	**Yes**
Year of building code	**2015**
Please provide the building code.	**North Carolina Building Code 2018**
Have the applicant's building codes been assessed on the Building Code Effectiveness Grading Schedule (BCEGS)?	**Yes**
Select rating.	**4**
Describe involvement of partners to enhance the mitigation activity outcome.	**Prior to this application, external outreach and partnership coordination has taken place to develop this project idea and concept. In 2016, the City identified and prioritized stream stabilization projects as part of the Greens Mill Run Watershed Master Plan (Attachment 2). The St. Andrews Drive project was identified as one of the highest priorities and assigned a high risk for the community. These projects were identified with help from the public and city staff, who provided information on historical flooding and erosion problems within the watershed. Engaging the community, and specifically property owners within the project area, will continue to be emphasized throughout the project process. The City held a walking tour on January 18th, 2022 for citizens who are interested in the project. This allowed citizens to view the proposed project area, and understand how erosion is threatening the streambed and surrounding structures. See Attachment 27 for further information into the outreach activities associated with this project, a copy of the postcard that was shared with the public, and a mailing list. Additionally, the City of Greenville will continue to leverage existing partnerships with Pitt County, the Town of Winterville, the Town of Ayden, East Carolina University, and Pitt Community College to minimize hazards and to educate citizens about hazards and how to appropriately respond. The Greenville Utility Commission (GUC) will also serve as an important partner in enhancing activity outcomes. GUC provides electric, water, sewer and natural gas services to the City of Greenville and is owned by the citizens of Greenville but operates under a separate charter issued by the N.C. General Assembly. GUC maintains a geodatabase of electric, natural gas, water, and sewer lines. The City will therefore work closely with GUC to coordinate the work due to the project's emphasis on utility lines. See Attachment 28 for additional information on how the City will leverage partnerships for the benefit of this project.**
Discuss how anticipated future conditions are addressed by this project.	**The project will enhance climate adaptation within the City of Greenville and be responsive to the effects of future conditions associated with increased precipitation and increased land use density within the watershed. Due to the impacts of climate change, the City is predicted to experience more frequent and severe precipitation events. Specifically, Greenville could receive up to a 130% annual increase in the number of days with precipitation of 3 inches or greater by midcentury from a 1996-2015 baseline average (according to the North Carolina Science Report, Attachment 3). This is roughly equivalent to a 2-year precipitation event and is therefore defined as the bankfull elevation, which influences channel shape and dimensions. Therefore, predicted increased precipitation will increase the threat of erosion along the creek bed and increase encroachment upon the municipal infrastructure and housing. The design approach for the project addresses increased erosion/precipitation by emphasizing nature-based solutions that allow for greater stability within the reach of the tributary banks and a reduction in the severity of erosion caused by future severe precipitation events. In addition, hydraulically re-connecting the unnamed tributary to the floodplain will provide greater floodplain management benefits for future flow conditions throughout the Greens Mill Run watershed. The proposed project was informed by the master planning effort the Greens Mill Watershed, which considered and modeled the above anticipated**

	future conditions from increased precipitation and land use changes. See Attachment 29 for additional information on how the project will address climate change and other future conditions.
Additional comments (optional)	**The City's proposed project is directly aligned with multiple BRIC program technical priorities. The St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration Project mitigates the risk to public infrastructure, mitigates the risk to multiple community lifelines, and incorporates climate resiliency and adaptation strategies as well as nature-based solutions. The City is working to protect critical utility lines and housing structures from the threat of erosion and, therefore, mitigate risk to the safety and security, food, water and shelter, and energy lifelines. The project will also utilize nature-based solutions to ensure the stream is protected from future erosion threats brought on by increasingly frequent and severe precipitation events. Additionally, the City of Greenville utilizes the latest published editions of building codes. The most recent adopted codes for North Carolina are the 2018 NC Building Codes which includes: building (residential and commercial), plumbing, mechanical, energy, gas, rehab and fire codes; and a reference document for Accessibility Code (ANSI A117.1 2003 Version); 2017 National Electric Code. The City has a BCEGS score, obtained in 2012, of 4. This score demonstrates that the City has effective building codes that are well enforced; staff education and certifications are at very high levels; staffing levels are exceptional based on workloads; and the City has adopted a model code within the last five years. The St. Andrews Drive-Critical Infrastructure Protection and Stream Restoration Project additionally aligns with all the BRIC program's qualitative criteria. The project is addressing climate change related precipitation and erosion events by leveraging innovative, nature-based efforts to reduce risk to critical utility lines. This cost-effective project serves a significant percentage of disadvantaged communities, with approximately 47% of the project's benefitting area meeting one of 15 CDC defined social vulnerability factors. Additionally, outreach activities completed during the development of the Green Mill Watershed Master Plan, and partnerships with additional city departments, and the Greenville Utility Commission, will ensure a successful project outcomes.**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
27. Outreach Activities.pdf	01/06/2022	blakely.jarrett@icf.com	Evaluation Attachments	The attachment outlines the project's outreach activities, as per qualitative criterion number 5.	
29. Climate Change and Other Future Conditions Attachment.pdf	01/06/2022	blakely.jarrett@icf.com	Evaluation Attachments	The attachment outlines how the project addresses climate change and other future conditions, as per qualitative criterion number 2.	
28. Leveraging Partnerships.pdf	01/06/2022	blakely.jarrett@icf.com	Evaluation Attachments	The attachment outlines how the project leverages partnerships, as per qualitative criterion number 6.	

Comments & attachments

▸ Community	1 comment, 0 attachments
▸ Mitigation plan	1 comment, 2 attachments
▸ Scope of work	1 comment, 11 attachments
▸ Budget	1 comment, 2 attachments
▸ Cost-effectiveness	1 comment, 2 attachments
▸ Evaluation	1 comment, 3 attachments
▸ Environmental/Historic Preservation (EHP)	0 comment, 9 attachments
▸ Location	0 comment, 1 attachments

Introduction

Project location

Provide a detailed description of the proposed project's location.	**The site of this mitigation activity is Greenville, North Carolina 27834. The proposed activity is a corridor project between 35.5752 latitude and -77.3934 longitude (to the south) and 35.5824 latitude and -77.3926 longitude (to the north). The proposed stabilization project is located near St. Andrews Drive along a confined section of an unnamed tributary to Greens Mill Run, positioned between Southwest Greenville Boulevard and Fairlane Road, running parallel to St. Andrews Drive. The site's drainage area is approximately 0.19 square miles with 96 percent urban land-use and 41 percent impervious area. The City of Greenville proposes to stabilize and rehabilitate approximately 3,200 feet along the tributary, the majority of which is degraded. This property is owned by the City of Greenville. Regarding the stream restoration and bank stabilization measures, the design approach will emphasize nature-based solutions to create diverse habitats within the aquatic and riparian ecosystems and an aesthetically pleasing stream system. Refer the attached Vicinity Map (Attachment 30) and Preliminary Engineering Report (Attachment 9) for more information.**
Latitude	**35.577858**
Longitude	**-077.392874**

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action
30. St. Andrews Vicinity Map.pdf	01/06/2022	blakely.jarrett@icf.com	Project Location Attachments	Mapping information displaying the vicinity of the project area within the City of Greenville.	

Project benefiting area

Provide a detailed description of the proposed project's benefiting area.	**The City of Greenville's 2019 total population was 91,921. The total estimated population impacted by the loss of sewer, electric, and water service within the tributary service area is approximately 1,014**

people, or 1.1% of the City's population. The entire service area will benefit from resilient sewer, water, and electric infrastructure. Please see the attached service area map (Attachment 6) for further information. Additionally, the FEMA BRIC program is prioritizing implementation of President Biden's Justice40 Initiative, which promotes social equity by directing 40 percent of the overall benefits of federal investments in climate and clean energy to disadvantaged communities. FEMA defines a disadvantaged community based on a combination of variables, including disproportionate impacts from climate change, low income, high poverty, lack of access to healthcare, racial and ethnic segregation, and unemployment. The Center for Disease Control's (CDC) 2018 Social Vulnerability Index (CDC SVI) weighs these variables and combines them to produce an overall vulnerability score for each census tract in the US. According to the CDC SVI, approximately 47% of the project's benefitting area meet one of 15 social vulnerability factors. Additionally, data provided by the CDC indicates that residents within the project service area are disproportionately represented in the CDC's SVI when compared to nationwide averages. Project area percentages exceed nationwide averages in multiple vulnerability indicators including poverty, unemployment, disability status, minority status, and elderly persons. For example, the percentage of residents living below the poverty line in the project area is nearly 3% higher compared to the nationwide average. The percentage of unemployed individuals is also disproportionately high in the project area. According to SVI data, unemployment is nearly 4% higher than the nationwide average. Please see the impacted population attachment (Attachment 7) for a full summary of these indices.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

Project impact area

Provide a detailed description of the proposed project's impact area.

This proposed stream restoration/stabilization and utility protection project is located near and parallel to St. Andrews Drive in Greenville, NC within a reach of an unnamed tributary to Greens Mill Run between Southwest Greenville Boulevard and Fairlane Road. The project extends for approximately 3,200 feet along the tributary, the majority of which is degraded. The tributary is surrounding on either side by residential and commercial structures. Please see the attached project location map (Attachment 4) for additional information. The vertical degradation and lateral migration of the tributary bed are extreme and have exposed several elements of municipal infrastructure. If stabilization measures are not immediately installed, numerous gas, electric, sanitary sewer, and stormwater utilities; commercial and residential structures; and, other adjacent features are at risk of being damaged by the predicted bank erosion. The stabilization/restoration project proposes to install hard (stone) structures only where necessary to protect municipal infrastructure and physical structures; otherwise, nature-based solutions will be installed to create diverse habitats within the aquatic and riparian ecosystems and an aesthetically pleasing stream system. The project also seeks to create areas of accessible floodplain along the riparian corridor to alleviate the erosive forces currently acting within the channel and to create hydraulic storage capacity. See the attached preliminary engineering report (Attachment 9) for additional information about the scope of work of the project.

Attachments

Filename	Date uploaded	Uploaded by	Label	Description	Action

Project site inventory

Does this project subapplication propose to mitigate a property/structure(s)? **Yes**
(Examples: residential home, commercial building, bridge, fire station, levee, pumping station, wastewater treatment plant, telephone pole, electric line, etc.)

Please describe how the propert(ies) will be selected upon subgrant approval. (Example: Saferoom Lottery Project, Fix the Bricks Project)

Please download the excel template, and then fill out the template with building or infrastructure data.

Enter the location of the property/structure.

List of location(s) (10 locations)

Status	Location ID	Address	Inventory type	Structure type	Mitigation action
✓	25639	1548 Bridle Court , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25640	1574 Bridle Court , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25641	305 Bridle Court , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25642	1530 Hooker Road , Greenville, NC, Pitt, 27834	Building	Commercial	Other retrofit
✓	25643	319 St. Andrews Drive , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25644	319 St. Andrews Drive , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25645	319 St. Andrews Drive , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25646	319 St. Andrews Drive , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25647	319 St. Andrews Drive , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit
✓	25648	1530 Bridle Court , Greenville, NC, Pitt, 27834	Building	Residential	Other retrofit

Assurances and certifications

OMB number: 4040-0009, Expiration date: 02/28/2022 View burden statement

SF-424D: Assurances - Construction Programs

Content:

OMB Number: 4040-0009
Expiration Date: 02/28/2022

Certain of these assurances may not be applicable to your project or program. If you have any questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this

application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will not dispose of, modify the use of, or change the terms of the real property title or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure nondiscrimination during the useful life of the project.
4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.
5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progressive reports and such other information as may be required by the assistance awarding agency or State.
6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
10. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C.§§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C.§794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C.§§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee- 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.
13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C.§874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.
15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a--1 et seq.).
18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.
20. Will comply with the requirements of Section 106(g) of the Trafficking Victims Protection Act (TVPA) of 2000, as amended (22 U.S.C. 7104) which prohibits grant award recipients or a sub-recipient from (1) Engaging in severe forms of trafficking in persons during the period of time that the award is in effect (2) Procuring a commercial sex act during the period of time that the award is in effect or (3) Using forced labor in the performance of the award or subawards under the award.